



# FORUM GEOBOTANICUM

An Electronic Journal of Geobotanical Research

## Contents:

**Detlev Drenckhahn, Helga Drenckhahn**

*Trifolium micranthum* Viv. an Nordseedeichen von Schleswig-Holstein –  
Charakterisierung der Pflanzen und ihrer Habitate, Status in Deutschland und  
Nachbargebieten

*Trifolium micranthum* Viv. at the North Sea dikes of Schleswig-Holstein –  
characterization of plants and their habitats, status in Germany and neighbouring  
countries

pp 1 - 13

DOI 10.3264/FG.2018.0308

**Heinrich E. Weber**

Nomenklatorische Korrektur in der Gattung *Rubus*  
Nomenclatural correction in the genus *Rubus*

p 14

DOI 10.3264/FG.2018.1227

**Detlev Drenckhahn, Werner Jansen, Heinrich E. Weber**

*Rubus pseudoglotta* Drenckhahn & W. Jansen, eine neue deutsch-dänische  
Brombeerart aus dem Formenkreis des *Rubus phylloglotta* (Frid.) Å. Gust.

*Rubus pseudoglotta* Drenckhahn & W. Jansen, a new bramble species with  
German-Danish distribution related to *R. phylloglotta* (Frid.) Å. Gust.

pp 15 - 23

DOI 10.3264/FG.2018.1228

**Ben J.M. Zonneveld**

The DNA weights per nucleus (genome size) of more than 2350 species of the  
Flora of The Netherlands, of which 1370 are new to science, including the pattern  
of their DNA peaks

pp 24 - 78

DOI 10.3264/FG.2019.1022

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## Preface

Forum Geobotanicum is an electronic journal devoted to disseminate information concerning geographical distribution, ecology, morphology, taxonomy and conservation of vascular plants in the European Union with a main focus on middle Europe. It covers from molecular biology to environmental aspects. The focus is to publish original papers, reviews and announcements for the educated generalist as well as the specialist in this broad field. Forum Geobotanicum does not aim to supplant existing paper journals, but will be much more flexible in format, publication time and world-wide distribution than paper journals. Many important studies are being currently published in local journals and booklets and some of them are published privately. Hence, these studies will become aware to only a limited readership. Forum Geobotanicum will encourage authors of such papers to submit them as special issues of the journal. Moreover, the journal is planning to build up an E-mail-address section to support communication between geobotanists in Europe. The editors are optimistic that this electronic journal will develop to a widely used communication forum that will help to stimulate activities in the entire field of geobotany in middle Europe. To overcome problems of long term archivation and effective taxonomic publication of articles published electronically in Forum Geobotanicum, print versions of each volume of the journal and appropriate digital storage devices will be delivered freely to selected university libraries and state libraries in middle Europe.

Forum Geobotanicum ist eine elektronische Plattform, deren Zielsetzung darin besteht, neue Erkenntnisse der geobotanischen Forschung in der Europäischen Union mit Schwerpunkt Mitteleuropa umfassend zu verbreiten. Das Journal befasst sich mit allen Fragen von Verbreitung, Ökologie, Morphologie und Taxonomie von Gefäßpflanzen und soll das gesamte Spektrum der Geobotanik von molekularbiologischen Aspekten bis zu Umwelt- und Naturschutzfragen abdecken. Der Hauptfokus liegt auf der Publikation von Originaluntersuchungen und Übersichtsartikeln sowie Behandlung aktueller Fragen des Naturschutzes. Die Zielgruppen sind Personen mit Allgemeinkenntnissen in der Botanik und Floristik sowie Spezialisten auf den Gebieten der Geobotanik und Pflanzensystematik. Das Journal soll keine Zeitschrift in Druckform ersetzen, sondern eine Ergänzung zu den traditionellen Publikationsorganen bilden. Der Vorteil der Zeitschrift liegt in ihrer Flexibilität und raschen Publikationszeit nach Begutachtung der eingereichten Manuskripte und den Möglichkeiten, in größerem Umfang Fotografien und andere Abbildungen zu veröffentlichen. Der Vorteil einer elektronischen Zeitschrift besteht weiterhin darin, dass die Veröffentlichungen weltweit jedermann sofort zugänglich sind. Viele durchaus wichtige Untersuchungen aus dem Bereich der Geobotanik erscheinen in lokalen Publikationsorganen, wie Jahrbüchern und Heimatkalendern, oder auch im Eigenverlag. Da solche Veröffentlichungen bibliographisch kaum erfasst werden, können sie auch nicht in adäquater Weise wahrgenommen werden. Forum Geobotanicum soll ermöglichen, dass auch solche Publikationen in einer Literaturreihe bekannt gemacht werden und ggf. nach Klärung von Copyright-Fragen als Supplemente der Zeitschrift ins Netz gestellt werden. Forum Geobotanicum nutzt die Vorteile des Internets, indem es abrufbare Hilfen, wie ein Verzeichnis von Adressen, Pflanzenlisten etc. zur Verfügung stellt. Insgesamt soll die Kommunikation zwischen Geobotanikern in Mitteleuropa erleichtert und eine Kommunikationsplattform etabliert werden, die die Aktivitäten auf dem gesamten Wissenschaftsgebiet stimuliert.

Das Journal ist uneigennützig und für Autoren und Benutzer kostenfrei. Für die Kostendeckung sind Sponsoren erwünscht, denen eine begrenzte Möglichkeit zur Darstellung eingeräumt werden kann. In der Anfangsphase wird das Journal von einem kleinen Herausbergremiumbetrieben. Sollte sich Forum Geobotanicum erfolgreich weiter entwickeln, ist an eine Erweiterung des Herausbergremiums auf Experten aus allen Nationen des mitteleuropäischen Raums gedacht. Um eine langfristige Verfügbarkeit der Publikationen zu gewährleisten, wird jeder Jahrgang von Forum Geobotanicum ausgedruckt, gebunden und mit digitalem Datenträger versehen an ausgewählte Universitätsbibliotheken, Landes- und Staatsbibliotheken Deutschlands und wichtiger Städte Mitteleuropas zur Archivierung und Ausleihe versandt.

# Instructions for Authors

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## Title Page

It should contain the following information:

- a) The full title of the paper without abbreviations. The title should be as brief and informative as possible, specifying clearly the content of the article. If the title (legend) is german, an english subtitle must be added.
- b) Full names of all authors indicating the corresponding authors and their full postal and electronic address.

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Authors must provide between three and six keywords, which must not be part of the title of the paper.

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All abbreviations must be explained when used first in the text.

## Language

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## Introduction (Einleitung)

It should be brief and limited to the definition of the problem, the aims and purposes of the research and its relation with other studies in the field.

## Methods (Methoden)

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## Results (Resultate)

Results should be clearly presented. Tables and figures should only be included if required to fully understand the data.

## Discussion (Diskussion)

The aim of this section is the interpretation of the results and their relation to the existing knowledge. The information given in any part of the text may be cited but not repeated in the Discussion Section. Alternatively Results and Discussion can be presented in one section.

## Acknowledgements (Danksagung)

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a) In the text:

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Provide files at 85 mm (single column) or 175 mm width (double column) and up to 210 mm in length allowing enough space for the legend.

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Detlev Drenckhahn, Helga Drenckhahn

## ***Trifolium micranthum* Viv. an Nordseedeichen von Schleswig-Holstein – Charakterisierung der Pflanzen und ihrer Habitate, Status in Deutschland und Nachbargebieten**

### ***Trifolium micranthum* Viv. at the North Sea dikes of Schleswig-Holstein – characterization of plants and their habitats, status in Germany and neighbouring countries**

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**Abstract:** A new distribution area with numerous growth sites of *Trifolium micranthum* has been discovered at the sea dikes of the North Sea coast of Schleswig-Holstein in Germany between the estuary of river Elbe and the island of Nordstrand with main occurrence on the peninsula Eiderstedt. Geographically this area links the Dutch population with the West Baltic population in Denmark and is the only semi natural growth site of this tiny clover in Germany. The other current growth sites in Germany are located on cemeteries in Nordrhein-Westfalen. *T. micranthum* prefers the steep inner slopes of sea dikes (30% gradient) with their higher diversity of vegetation and open ground sites created by grazing and tracks of sheep. Grazing creates significant reduction of the size of various parts of the clover (miniaturization). The paper also provides morphometric data on distinguishing features that are controversially treated in the literature, e.g. the length of pedicels with 0.6–1.1 mm (mean 0.8 mm), flower size (corolla with calyx) below 3 mm (mean 2.4 mm) and number of flowers per inflorescence of (1)2–6(8). A drawing of *T. micranthum* is provided that may help to discover new growth sites.

**Kurzfassung** In der vorliegenden Arbeit wird ein neues Teilareal von *T. micranthum* mit zahlreichen Vorkommen an den Nordseedeichen von Schleswig-Holstein zwischen der Elbeästuar und der Insel Nordstrand mit Schwerpunkt auf der Halbinsel Eiderstedt mitgeteilt, das geographisch zwischen dem Vorkommen in den Niederlanden und dem Ostsee-Areal in Dänemark vermittelt. Es handelt sich um die einzigen weitgehend naturnahen Wuchsorte der Art in Deutschland. Die anderen beiden aktuellen deutschen Vorkommen befinden sich auf Friedhöfen in Nordrhein-Westfalen. *T. micranthum* wächst bevorzugt an den steilen und artenreicheren Innenböschungen der Seedeiche, deren Vegetation durch intensive Schafbeweidung und Trittsuren kurz und lückig gehalten wird. Die Beweidung bewirkt eine signifikante Größenreduktion (Miniaturisierung) verschiedener Pflanzenteile. Widersprüchliche Angaben zu bestimmungskritischen Merkmalen werden durch morphometrische Untersuchungen überprüft. Unter anderem beträgt die Länge der Blütenstiele 0,6–1,1 mm (im Mittel 0,8 mm) und die Blüten mit Kelch sind deutlich unter 3 mm lang (im Mittel 2,4 mm). Die Zahl der Blüten der Infloreszenz beträgt (1)2–6(8). Eine graphische Darstellung soll bei Artbestimmung und Auffinden neuer Wuchsorte behilflich sein.

**Keywords** *Trifolium micranthum*, *Trifolium dubium*, Anatomy, Ecology, Distribution range

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## **Einleitung**

*Trifolium micranthum* Viv. (Armlütiger Klee) ist eine diploide ( $2n=16$ ) mediterran-atlantische Kleeart, die in der Vergangenheit (Gams 1925) zusammen mit der phänotypisch am nächsten stehenden Kleeart, *T. dubium* Sibth., auch im Subspeziesrang geführt wurde (*T. filiforme* subsp. *micranthum* (Viv.) Bonnier & Layens). *T. dubium* ist jedoch eine allotetraploide Art ( $2n=30$ ), die durch Hybridisierung von *T. micranthum* und *T. campestre* Schreber ( $2n=14$ ) entstanden ist (Ansari et al. 2008). *T. micranthum* ist im gesamten Mittelmeerraum und darüber hinaus ostwärts bis in die Kaukasusregion und nordöstlich bis Ungarn verbreitet. Sein atlantisches Areal reicht vom westlichen Nordafrika über die Iberische Halbinsel, Frankreich, Belgien und Holland nordwärts bis nach Großbritannien und Irland (Coombe 1968). Von (Süd)Norwegen gibt es nur einen historischen Fund ohne nähere Angaben von 1884 bei Kristiansand (Lid & Lid 2005, Jan Weseberg pers. Mitt.). Ein disjunktes nordöstliches Areal befindet sich im westlichen Ostseegebiet von Dänemark. Diesem können auch die ehemaligen Einzelvorkommen von der Flensburger Förde und im Hinterland der Howachter Bucht in Ostholstein (Raum Lütjenburg) zugeordnet werden (Raabe 1964, 1981), die aber seit 1980 nicht mehr bestätigt wurden. In Deutschland gilt die Art als vom Aussterben bedroht (Korneck et al. 1996, Rote-Liste-Kategorie 1).

In der vorliegenden Arbeit wird ein neues Teilareal von *T. micranthum* mit zahlreichen Vorkommen an den Nordseedeichen von Schleswig-Holstein mitgeteilt, das räumlich zwischen dem Vorkommen an der Nordseeküste von Holland und dem Ostsee-Areal in Dänemark vermittelt.

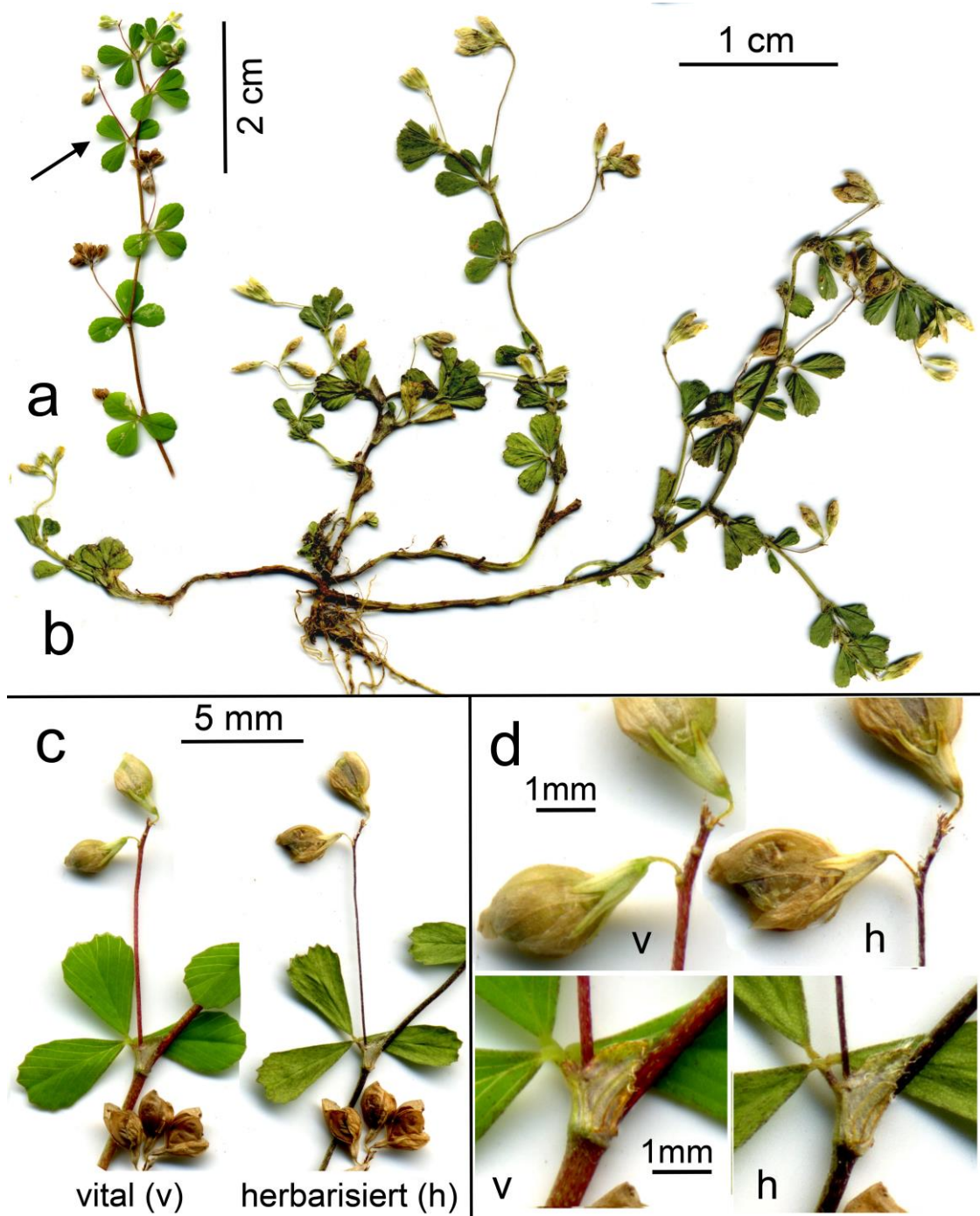


Abb. 1 (a, c, d) Scans von herbarisierten (h) und (noch) vitalen (v) Pflanzenteilen und (b) einer Gesamtpflanze von *T. micranthum* von einem beweideten Seedeich (Grothusenkoog). In (c, d) sind Abschnitte des in (a) gezeigten Astes abgebildet (Pfeil), der vor und nach Herbarisierung gescannt wurde. Die Herbarisierung führt zur Schrumpfung der Querdurchmesser nicht aber der Längen von Blättchen, Infloreszenz- und Blütenstielen.

Fig. 1 Scans of herbarized (h) and still vital (v) parts of *T. micranthum* and (b) of a herbarium specimen of a whole plant, all collected at the sea dike of Grothusenkoog Schleswig-Holstein. In (c, d) part of the specimen shown in (a) (arrow) is displayed at higher magnification. Diameters of pedicels, peduncles and leaflets shrunk significantly but their length as well as the dimensions of fruits remained largely unchanged.

Diese Funde wurden zum Anlass genommen, eine Übersicht über das aktuelle Vorkommen der Art an seiner nordöstlichen europäischen Verbreitungsgrenze zu erstellen. Wegen in der deutschen Literatur nahezu durchgängig mit Fehlern behafteten Angaben zu Erkennungsmerkmalen der Art (siehe unten) werden auch Kennzeichen und Anatomie von *T. micranthum* behandelt und abgebildet (Abb. 1–6).

## Material und Methoden

Im Juni 2015 und 2017 wurden die Seedeiche von Büsum bis Nordstrand durch Stichproben abgesucht. (Abb. 6). An jedem aufgesuchten Seedeichpunkt wurden rund 300 m

Deichlänge in der oberen und unteren Hälfte auf der Außen- und Innenböschung zu zweit abgesucht. Zwischen Büsum und dem Eidersperrwerk wurden 6 Deichstellen aufgesucht, auf der Halbinsel Eiderstedt zwischen dem Eidersperrwerk bis Simonsberg bei Husum insgesamt 16 Deichstellen, auf Nordstrand 5 Deichstellen und eine weitere Deichstelle nördlich der Arlau-Schleuse. Nicht begangen wurden die Deichabschnitte vom Simonsberger Koog bis Schobüll, der Nordstrander Damm und die Deichabschnitte im westlichen Nordstrand zwischen Süderhafen und Strucklahnungshörn. Ebenfalls wurden die Binnendeiche von Nordstrand zum Beltringharder Koog nicht begangen. Die durch 26 Stichproben abgesuchte Deichlänge betrug 77,5 km; im Durchschnitt wurden also die Seedeiche in Abständen von 3 km aufgesucht.

Von den meisten Stellen wurden Belegexemplare gesammelt und auch einige Pflanzen für weitere Untersuchungen eingetopft. Vermessungen erfolgten an vitalen und herbarisierten Pflanzen, die mit 1200–3200 dpi eingescannt und anschließend mit Adobe Photoshop-Cs Version 8.0.1 vermessen wurden. Um den Schrumpungsgrad der Strukturen zu ermitteln, wurden frische Pflanzenteile nach Entnahme sofort eingescannt (2400 dpi) und dieselben Teile als Herbarpräparate erneut eingescannt und vermessen (Abb. 1). Die wesentlichen Details der graphischen Darstellung von *T. micranthum* in Abb. 5 basieren auf originalgetreuen Pausen eingescannter Pflanzenteile. Quantitative Daten werden überwiegend als arithmetisches Mittel  $\pm$  Standardfehler angegeben, gefolgt (abgesetzt durch Klammern oder Semikolon) von Variationsbreite und Zahl (n) der untersuchten Objekte.

## Befunde

### Kennzeichen

**Herbarisierungseffekte** Die Vermessung von vitalen und herbarisierten Pflanzen ergab, dass die Längsachsen wie Stängel, Blütenkopfstiele, Blütenstiele, Kelche einschließlich Kelchzähnen und (geschlossenen) Kronen nicht oder vernachlässigbar schrumpfen (siehe Abb. 1c, d). Ebenfalls blieben die Dimensionen der reifen und noch unreifen Hülsen weitgehend unverändert. Die Durchmesser von Stängel, Blütenstandstielen (Pedunkel) und Blütenstielen schrumpften dagegen um 30–50 %. Das entspricht den Durchmessern dieser (vertrockneten) Strukturen zur Fruchtreife (Abb. 3f). Die Blättchen schrumpften (wohl abhängig vom lokalen Pressdruck) um etwa 10–40% in der Breite, aber nicht oder nur geringfügig in der Länge (Rhachis, Blattstiel).

**Habitus** *T. micranthum* besitzt eine bis zu 7 cm lange Pfahlwurzel mit teils kräftigen Seitenwurzeln. Der Stamm verzweigt sich nach wenigen mm in 3–6 Stängel, deren basalen Abschnitte sich seitlich ausbreiten und sich bei fehlender Beweidung nach wenigen cm bis 24 cm Höhe aufrichten und noch mehrere Nebenäste abgeben können. An den beweideten Deichen bleiben die Pflanzen flach ausgebreitet und können Durchmesser bis 18 cm erreichen.

**Blüten** Die Art ist durch ihre sehr kleinen Blüten (unter 3 mm) und Blütenstände mit wenigen Einzelblüten gekennzeichnet:  $2,9 \pm 0,15$  (1–7; n= 66) Blüten/Früchte pro Blütenstand/Fruchtstand an den beweideten Seedeichen und  $4,16 \pm 0,19$  (1–7; n=49) Blüten/Früchte an nicht beweideten Stellen (Zäune, Lagerplätze). Dieser Unterschied ist hoch signifikant ( $p < 0,001$ ; doppelter *t*-Test). Wiinstedt (1908)

gibt 3–6 Blüten pro Blütenstand aus Dänemark an. Die Blütenstände von Exemplaren der dänischen Insel Mejlø/Fünen (leg. Th. Schiøtz, 9.6.1890, Herbar KIEL) tragen  $4,4 \pm 0,13$  (2–7, n=60) Blüten ebenfalls hoch signifikant unterschiedlich von den Werten der Deiche, aber nicht unterschiedlich von den Werten der nicht beweideten nordfriesischen Deichabschnitte. Die Blüten sind besonders bei Sonne schwach geöffnet, öffnen sich vereinzelt noch einmal am Folgetag und bleiben dann dauerhaft geschlossen (Beobachtung an eingetopften Pflanzen). Die Einzelblüten (aus dem Kelch ragende Corolla um 1,7 mm) können aus dem aufrechten Stand des Beobachters bei genauem Hinsehen noch erkannt werden (Abb. 2, 5). Die beweideten und flach ausgebreiteten Pflanzen (Durchmesser 6–18 cm) erscheinen als grüne Kissen, die mit winzig kleinen (ca. 1,5 mm langen) gelben Spitzen übersät sind („wie gelbe Kommata wirkende Blütenköpfe“, Lunau 1959). *T. dubium* bildet dagegen bis 8 mm breite, zuerst umgekehrt breit kegelförmige und, bei Beginn des Verblühen (mit sich herabsenkenden unteren Blüten), kopfförmige Blütenstände mit  $9,23 \pm 0,22$  (5–20, n=35) Blüten pro Blütenstand.

Die Länge der Blüten beträgt zusammen mit dem Kelch  $2,35 \pm 0,14$  (2,1–2,6; n=44) mm. Die aus dem Kelchbecher herausragende geschlossene Krone (Corolla) ist  $1,7 \pm 0,02$  (1,5–1,9; n=29) mm lang und  $0,83 \pm 0,02$  (0,7–0,9; n=20) mm breit. Die Fahne ist endständig meistens ausgerandet und besitzt keine deutlichen Riefen. Die Flügel sind kürzer als die Fahne und überragen den unteren Fahnenrand bis 0,3 mm. Das Schiffchen wird von den Flügeln seitlich vollständig bedeckt. Während der Fruchtreife verfärben sich die Blütenblätter zunächst weißlich, dann hellbraun und verlängern sich noch um bis 0,3 mm. Die Länge des Kelchbecher-Oberrandes beträgt  $0,71 \pm 0,02$  (0,5–0,8; n=20) mm und die der beiden oberen Kelchzähne 0,3 mm und der unteren drei Zähne 0,5–0,7 mm. Die Spitzen der Kelchzähne sind mit 1–3 bis 0,3 mm langen abstehenden weißen Haaren besetzt, die im Blüten- oder Fruchtstadium oft abfallen.

Bei *T. dubium* sind die Einzelblüten ebenfalls deutlich größer (3–4 mm) als die von *T. micranthum* mit breiteren und etwas bauchigen (löffelförmigen) Fahnen mit 4–6 angedeuteten Riefen. Die Fruchtstände sind breit kegelförmig gedrängt (Abb. 2, 3).

**Hülsen/Früchte** (Abb. 3, 4) Sie enthalten zu etwa gleichen Anteilen 1 oder 2 Samen. Reife einsamige Hülsen sind ohne den 0,2 mm langen endständig hochgekrümmten Schnabel 1,6–1,8 mm und bei zwei Samen 2,0–2,4 mm lang, im Durchschnitt aller Hülsen  $1,9 \pm 0,02$  (1,5–2,4; n=32) mm lang. Die Breite beträgt  $1,21 \pm 0,02$  (0,9–1,4; n=32) mm. Sie sind seitlich und manchmal auch endständig nicht vollständig von den vertrockneten und häutig versteiften Kronblättern bedeckt (Abb. 3, 4). Bei *T. dubium* ist die Bedeckung wegen der größeren Corolla mit breiterer und längerer Fahne meistens komplett (Abb. 2 d). Die breit ovalen Samen sind übereinstimmend mit Zorić et al. (2010) knapp 1 mm groß (Durchschnitt  $0,97 \times 0,76$  mm; n=9), linsenförmig abgeplattet und glänzend hell- bis dunkel kastanienbraun (Abb. 4). Bei *T. dubium* ist meistens (>80%) nur ein Samen pro Hülse enthalten (etwas größer). Die Hülse platzt am Oberrand unter oder neben der häutig versteiften Fahne auf. Die Fruchtsiele können sich gleichzeitig verdrehen und Kippbewegungen der Hülsen bewirken, so dass die Samen ohne sonstige äußere Einwirkungen in solchen Fällen herausfallen (Fotoserie in Abb. 4).

**Blütenstiele (Pedizelli)** Sie sind an den Deichen  $0,77 \pm 0,26$  (5–11; n=49) mm lang. Das Längenverhältnis zwischen Blütenstiel und Kelchbecher (0,71 mm) beträgt 1,10 (0,7–1,6). Exemplare von Mejlø / Fünen (siehe oben) besitzen

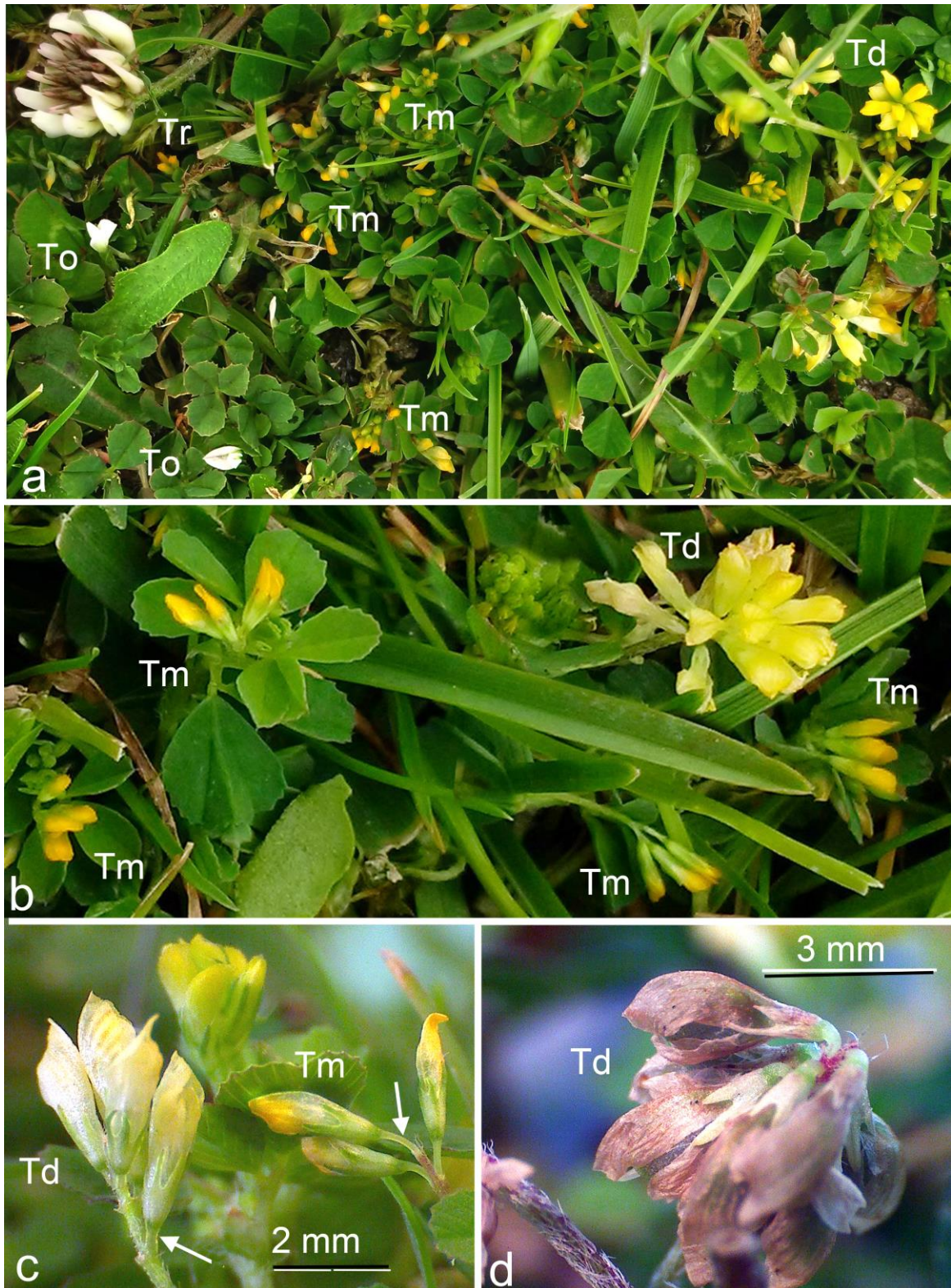


Abb. 2 Feldkennzeichen von *T. micranthum* (Tm.) an beweideten Seedeichen. (a, b) Mischbestände mit *T. dubium* (Td), *T. ornithopodioides* (To) und *T. repens* (Tr). (c) Stärkere Vergrößerung von Blütenständen; Pfeile zeigen auf Blütenstiele. (d) Fruchtstand von *T. dubium* (Td); beachte die vollständige Bedeckung der Früchte durch die häutig versteifte Corolla.

Fig. 2 Field marks of *T. micranthum* (Tm.) at grazed sea dikes. (a, b) Mixed stands with *T. dubium* (Td), *T. ornithopodioides* (To) and *T. repens* (Tr). (c) Close-up views of inflorescences; arrows point to pedicels. (d) Fruits of *T. dubium* (Td) completely hidden by the stiffened membranous corolla.



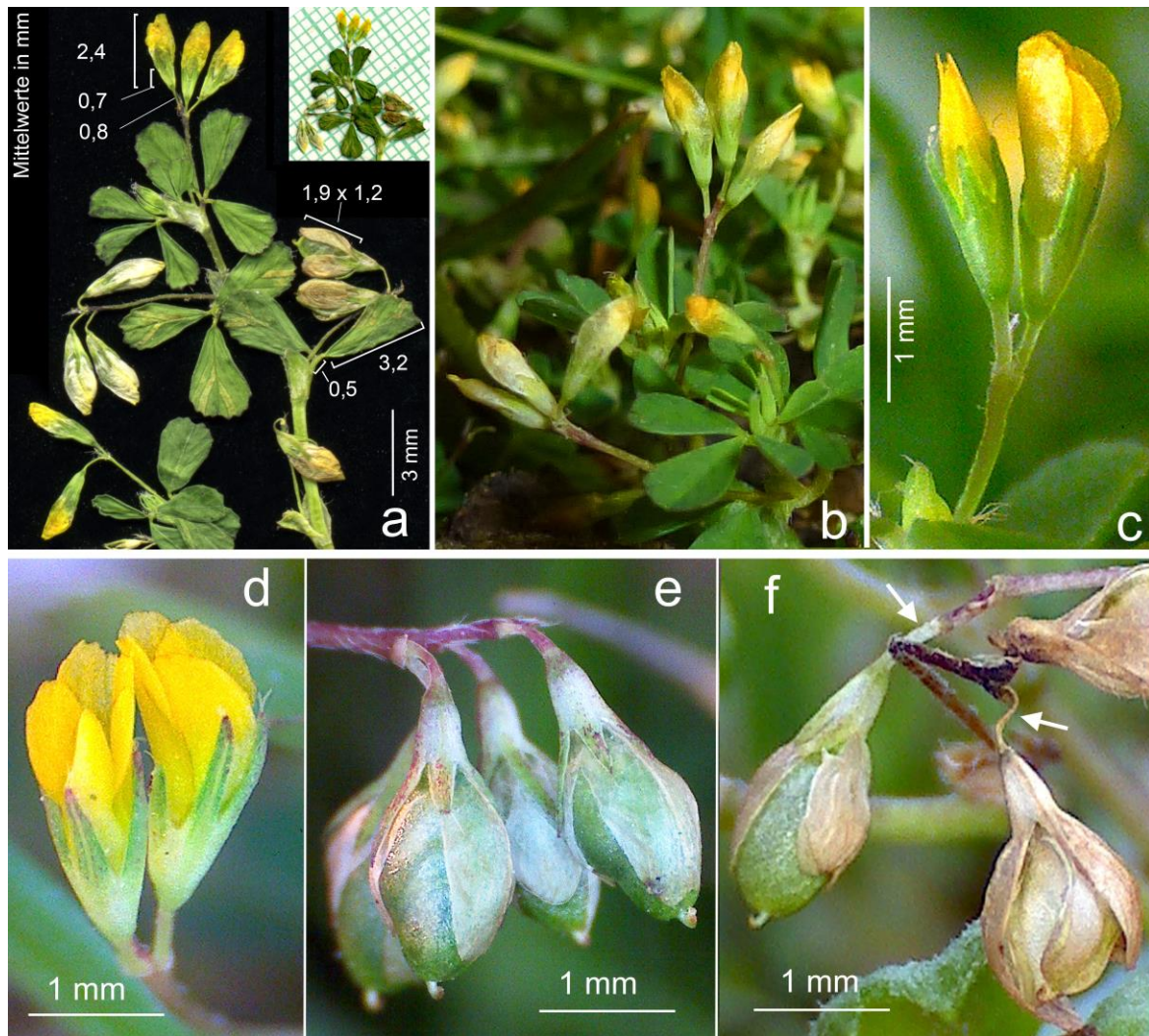


Abb. 3 Blüten- und Fruchtstände von *T. micranthum* bei stärkerer Vergrößerung. In (a) sind Durchschnittswerte der für die Bestimmung relevanten Strukturen eingetragen. Pfeile in (f) zeigen auf Fruchtsiele, die bei der reifen Frucht geschrumpft sind.

Fig. 3 Close-up views of inflorescences and fruits of *T. micranthum*. Panel (a) includes average dimensions of structures relevant for determination. Arrows in (f) point to pedicels that are shrunken in mature fruits.

ebenfalls ein Längenverhältnis von um 1. Coombie (1968) gibt übereinstimmend das Verhältnis mit 1–1,5 an. Die Blütenstiele von *T. micranthum* sind in vivo 0,15–0,2 mm dick, zur Fruchtreife durch Austrocknung unter 0,1 mm (Abb. 3). Sie stehen zunächst aufrecht, und verlängern sich noch etwas (um 0,2 mm), fächern dann beim Verblühen in verschiedene Richtungen auf, oft waagrecht bis mäßig herabgekrümmt (Abb. 3).

**Infloreszenzstiele (Pedunkel)** Die Länge beträgt an den Deichen  $5,61 \pm 0,36$  (3,3–11;  $n=34$ ) mm und ist signifikant kürzer ( $p < 0,01$ , doppelter  $t$ -Test) als die von unbeweideten Pflanzen am Lagerplatz des Grothusenkooges 1917 ( $8,42 \pm 0,31$ ; 3,7–10,3 mm;  $n=23$ ), Mönkhagen/Ostholstein ( $9,31 \pm 0,2$ ; 4,3–10,5 mm;  $n=11$ , KIEL) und von der unbewohnten dänischen Insel Mejlø ( $11,6 \pm 0,36$ ; 4,7–14,5 mm;  $n=31$ , KIEL). Bei *T. dubium* stehen die 0,3–0,6 mm langen und 0,3–0,4 mm dicken Blütenstiele (Vitalmaße) zunächst straff aufrecht und biegen schon während des Verblühens einheitlich hakenförmig nach unten um (Abb. 2).

Die Blütenstiele sind bei *T. dubium* ca. 20–60% kürzer als der Kelchbecher (Längenverhältnis 0,4–0,8).

**Blätter** Die Blättchen sind annähernd gleich groß. Sie sind im oberen Drittel gezähnt mit 4–5 Zähnen (*T. dubium*: 5–7 Zähne) meistens mit gestutzter oft seicht ausgerandeter Spitze. Die vermessenen Mittelblättchen sind an den Deichen  $3,2 \pm 0,92$  (2–4,4;  $n=44$ ) mm lang und signifikant ( $p < 0,01$ ) um ca. 20% kürzer als die Blättchen von Pflanzen benachbarter, unbeweideter Abschnitte ( $3,9 \pm 0,92$ ; 2,3–4,8 mm;  $n=33$ ) und der Belege von Mejlø ( $4,9 \pm 0,44$ ; 2,3–6,5 mm;  $n=19$ ). Für Spanien, Frankreich und England wird die Blättchenlänge mit 5–8 mm angegeben (Muñoz Rodriguez et al. 2015, Coulot & Rabaute 2013, Stace 2010). Zu Aspekten der Beweidungs-Miniaturisierung siehe unten (Habitat und Ökologie). Die Blätter an den Knoten mit Blütenständen von *T. micranthum* besitzen unabhängig vom Beweidungsgrad sehr kurze aus der Nebenblattscheide hervorgehende Stiele  $0,52 \pm 0,05$  (0,1–1,1;  $n=36$ ) mm. Die Stiele der Blättchen sind ebenfalls sehr kurz (bis 0,3 mm) und annähernd gleich lang. An den Stängelabschnitten (Knoten) ohne Blütenstände und an Stängelverzweigungen (Abb. 6) sind die Blattstiele dagegen 2–5 mm lang. Bei *T. dubium* sind die Blattstiele an den Blüten tragenden Stängelabschnitten außerhalb der

Nebenblattscheide mit (1)2–3(5) mm immer deutlich länger als die Blattstiele von *T. micranthum* an den Infloreszenzabgängen. Das mittlere Blättchen ist bei *T.*

*dubium* meistens länger gestielt (0,4–1,8 mm) als die Seitenblättchen (0,2–0,4 mm) (aber an den Deichen oft nicht).

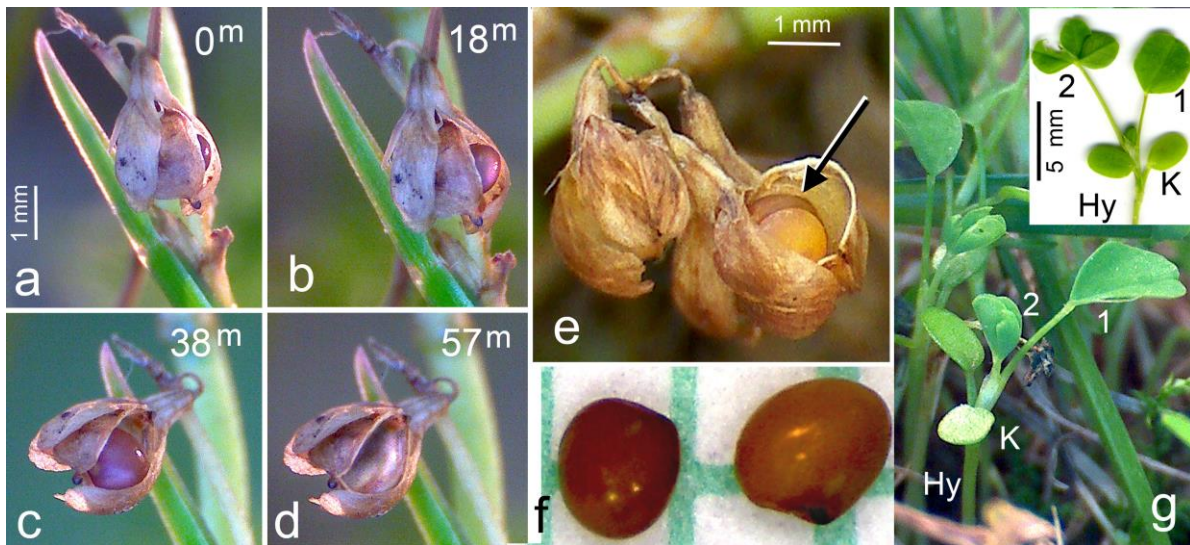


Abb. 4 (a–d) Auswahl von vier Fotografien aus einer Serie von in Minutenabständen (m) aufgenommenen Schnappschüssen mit Dokumentation von Hülseöffnung und Samenfreisetzung; beachte die während des Öffnungsvorganges erfolgte Kippbewegung der Hülse mit spontaner Entleerung. (e) Geöffnete Hülse mit zwei Samen, (f) Samen auf mm-Papier und (g) Sämlinge in vivo (im Ausschnitt ein Vitalscan) mit Abschnitten des Hypokotyls (Hy), je zwei Keimblättern (K), einem Primärblatt (1) und dreizähligen Folgeblättern (2).

Fig. 4 (a–d) Selection of four images of a series of photographs taken at intervals of one minute (m) each to document the process of opening of the fruit capsule and seed release. Note tilting movement of the fruit during capsule opening with spontaneous seed release. (e) Opened capsule with two seed, (f) seeds on graph paper (mm scale), and (g) seedlings in vivo (inset shows scan of vital seedling) with cotyledones (K), parts of the hypocotyl (Hy), primary leaf (1) and following three-foliolate leaf generations (2).

**Nebenblätter (Stipel)** Die beiden Nebenblätter sind komplett stängelumfassend, schmal bis breit lanzettlich teils auch mit abgerundeter Spitze, und randlich mit einzelnen Haaren besetzt (Abb. 1d, 3a, 6). Sie sind ringsum mit dem Knoten und mittig mit dem Blattstiel verwachsen und liegen dem Stängel seitlich an oder sind flügelartig abgespreizt (Abb. 3a unten, Abb. 6). Ihre Länge beträgt an den Infloreszenzen tragenden Knoten  $2,1 \pm 0,07$  (1,3–2,9;  $n=36$ ) mm (gemessen von der Spitze bis zum Knoten am Abgang des Blattstängels). Bei *T. dubium* sind sie an den Deichen etwas länger 2,4 (1,8–3,8 mm) aber statistisch nicht signifikant. Auch ihre Form unterscheidet sie nicht deutlich von den Nebenblättern von *T. micranthum*. Die Nebenblätter sind mit dem Blattstiel untrennbar über eine Länge von  $1,0 \pm 0,03$  (0,7–1,6;  $n=36$ ) mm verwachsen. Dieser ist dort abgeplattet ist mit einem mittelständigen und je einem seitlichen nach basal etwas divergierenden Leitungsbündel.

#### Jahreszyklus

*T. micranthum* keimt bereits Mitte September und besitzt Ende September neben den ovalen (bis  $4 \times 2$  mm) und bis 4 mm gestielten Keimblättern bereits zwei weitere Laubblattgenerationen. Das erste Laubblatt (Primärblatt) ist ungeteilt (ca.  $2,5 \times 4$  mm), das zweite bereits dreizählig mit bis zu 5 mm langem Stiel (Abb. 4). Die ersten Blüten wurden am 10. Mai gesehen (St. Peter-Brösüm 2016) noch vor der Blüte von *T. dubium*. Die Hauptblühphase liegt zwischen Ende Mai und Ende Juni. Anfang Juli verschwinden die Blüten und Ende Juli beginnen die Pflanzen zu verwelken.

Aber ein Fund in voller Blüte von K. Nikoleizig bei Mönkhagen (Ostholstein, KIEL!) ist auf den 15. 8 1965 datiert (Schreibfehler?).

#### Habitat, Ökologie

Die Pflanzen wachsen ganz überwiegend an der steileren Innenböschung der Seedeiche und dort bevorzugt im unteren Drittel und teils auch auf den ebenen Flächen am inneren Deichfuß (Innenberme) einschließlich Grabenböschungen (Abb. 5). Dabei ist es unerheblich, ob die Innenböschung nach Norden, Süden oder Osten gerichtet ist. Die steilere Innenböschung (Neigung 1:3) weist im Vergleich zur flacheren Außenböschung (1:6) (Zitscher 1966) in der Regel vermehrt gestörte Bodenstellen auf mit Trampelstufen der Schafe. *T. ornithopodioides* bevorzugt dagegen die Südseite der Deiche und dort gerne den Mittelabschnitt der Böschung unabhängig davon, ob es sich um die Innen- oder Außenböschung handelt. Intensive Beweidung scheint für das Vorkommen beider Kleearten notwendig zu sein. Auf Deichabschnitten mit geringerer Beweidungsintensität und der Notwendigkeit zur Mahd fehlt *T. micranthum* weitgehend (und auch *T. ornithopodioides*). An allen Wuchsstellen kommt stets *T. dubium* als Zeigerart vor, oft in unmittelbarer Nachbarschaft. Das trifft auch für Bestände in Dänemark zu (Wiinstedt 1908). Auch andere Kleearten der Deiche (*T. repens*, *Medicago lupulina* und *T. ornithopodioides*) können in direkter Nachbarschaft zu *T. micranthum* wachsen und mit ihm Mischbestände bilden (Abb. 2). Diese Kleearten lassen aber keine besondere Be-



Abb. 5 (a) Typischer Wuchsort im unteren Drittel der Innenböschung der Seedeiche der Nordseeküste von Schleswig-Holstein – hier am Süderdeich von Westerhever – mit charakteristischer Wuchsform von (b) beweideten und (c) unbeweideten Pflanzen, die vereinzelt im Schutz von Zäunen wachsen.

Fig. 5 (a) Typical growth site of *T. micranthum* at the lower third of the inner slope of sea dikes at the North Sea coast of Schleswig-Holstein – here at the Süderdeich of Westerhever – with characteristic habitus of (b) grazed plants and (c) non grazed plants which occasionally grow protected underneath fences.

vorzugung des unteren Deichdrittels erkennen. Da *T. micranthum* eine annuelle Sippe ist, kann die Art in manchen Jahren vollständig fehlen. Das gilt auch für *T. ornithopodioides* (mehrfach so am Deich von St. Peter Brösum).

An den Deichen waren Blätter und Fruchtsiele der vermessenen Pflanzen um ca. 20–25% verkürzt und die Zahl der Blüten pro Blütenstand um ebenfalls ca. 25% reduziert (siehe oben). Diese Form der Miniaturisierung von Blättern, Pedunkel und Infloreszenzen können zusammen mit der flachen Ausbreitung der Äste als Anpassung an die Beweidung gesehen werden im Sinne einer Minderung der

Verbisswahrscheinlichkeit. Die kürzeren Pedunkel können möglicherweise die Zeitspanne zwischen Beginn des Auswachsens der Infloreszenzen und der Fruchtreife verkürzen und die geringere Blütenzahl pro Köpfchen den Reifungsprozess der Früchte durch exklusivere Nährstoff-Versorgung beschleunigen.

Folgende Pflanzenarten (teils stark verbissen) wurden am 7. Juni 2015 auf einer 1 m<sup>2</sup> große Fläche um einen 200 cm<sup>2</sup> großen Bestand von *T. micranthum* in St. Peter-Brösum notiert:

*Achillea millefolium*, *Anthoxanthum odoratum*, *Cerastium holosteoides*, *Bellis perennis*, *Cynosurus cristatus*, *Cirsium vulgare*, *Geranium molle*, *Hordeum secalinum*, *Scorzoneroides autumnalis*, *Leontodon saxatilis*, *Lolium perenne*, *Bromus hordeaceus*, *Medicago lupulina*, *Plantago coronopus*, *Plantago lanceolatus*, *Poa pratensis*, *Ranunculus bulbosus*, *Sherardia arvensis*, *Torilis nodosa*, *Trifolium dubium*, *Trifolium ornithopodioides*, *Trifolium repens*, *Veronica serpyllifolia*.

An einer zweiten 1 m<sup>2</sup> großen Fläche bei Westerhever Norddeich (Höhe Heerstraße) im Juni 2016 wurde dasselbe Artenspektrum gefunden außer *Torilis nodosa*, *Cirsium vulgare* und *Hordeum secalinum*. Zusätzlich wuchs dort im 1m-Radius *Taraxacum sect. Ruderalia* und *Hypocheris radicata*.

Dieses Artenspektrum ist (außer *T. ornithopodioides*) typisch für die Nordseedeiche in Schleswig-Holstein (siehe Raabe 1981). Es handelt sich teilweise um wärmeliebende und konkurrenzschwache Arten, die lückenhafte Vegetation bevorzugen und auf gedüngten Wirtschaftsweiden und Äckern zurückgedrängt werden.

### Verbreitung

#### Seedeiche der Westküste Schleswig-Holsteins

Es wurden insgesamt 28 Deichabschnitte mit je rund 300 m Länge abgesucht, also etwa 8 km Deichstrecke. Das entspricht einer zehnpromzentigen Stichprobe. An 15 Stellen (ca. 50% der Stichproben) wurde *T. micranthum* nachgewiesen. Das bedeutet aber nicht, dass der Klee auf der Hälfte der 78 km langen Deichstrecke zu erwarten ist. In Abb. 7 ist zu erkennen, dass *T. micranthum* inhomogen verteilt ist. Auf dem 14 km langen Deichabschnitt zwischen Büsum und dem Eidersperwerk und dem 13 km langen Deichabschnitt auf Nordstrand wurde jeweils nur je ein kleines Vorkommen gefunden. Zwei Drittel aller Nachweise befinden sich auf dem rund 40 km langen Seedeichabschnitt im West- und Nordteil der Halbinsel Eiderstedt zwischen Grothusenkoog und Adolphskoog. Am Binnendeich nördlich und südlich der Arlau Schleuse wurde *T. micranthum* nicht gefunden (schwach beweideter Deich mit reichlich Goldhafer). Ein weiterer Fund von *T. micranthum* außerhalb des Untersuchungsgebietes stammt aus 2016 von einem Lagerplatz am Seedeich westlich von Brunsbüttelkoog (J. Hebbel, pers. Mitt., Fotobelege!).

Die größten mehr oder minder zusammenhängenden Bestände (teils mit Lücken von mehreren 10 m) befinden sich (a) am Seedeich des Grothusenkooges auf einem Lagerplatz vor dem inneren Deichfuß (Innenberme) und an beiden Böschungen des Seedeiches (120 m Länge) und (b) am südlichen Seedeichabschnitt von Westerhever (nach Norden gerichtete Innenböschung) von Süderweg 10 bis 4, (Abb. 5). Ebenfalls scheint die Sippe an der Innenböschung (unteres Drittel) des 8 km langen Seedeiches des Jordflether Kooges vom Everschop-Siel ostwärts bis Ülvesbüll möglicherweise kontinuierlich verbreitet zu sein (alle drei dort besuchten Deichabschnitte mit teils größeren Beständen) und kommt auch an den westlich und östlich anschließenden Deichabschnitten des Ülvesbüll- und Norderheverkooges vor.

**Wuchsorte** Die Koordinaten und Zuordnung zu Quadranten der Topographischen Karten (TK) wurden auf den Karten der Käferfauna Deutschlands (<https://www.kerbtier.de>) ermittelt. Wenn nicht anders vermerkt, Funde von D. und H. Drenckhahn (DD/HD). ! = Herbarbeleg oder Foto von D. Drenckhahn gesehen.

TK 2120-211 Westlich Brunsbüttelkoog, Lagerplatz nahe des Deiches, dort teils auf Schotter wachsend (2016, J. Hebbel, Fotobelege!). TK 1818-222 Hedwigenkoog, Zwei kleine Gruppen von 100-150 cm<sup>2</sup> (2017 DD/HD); in diesem Bereich liegt auch ein Fund von E.-W. Raabe am 28.6.1969 (HBG!). TK 1718-1232 Grothusenkoog, Lagerplatz am Ende der Zufahrtstraße zum Deich (Koogchausee), Deich-Innen- und Außenböschung, auf dem Lagerplatz teils flächendeckend, mehrere tausend Pflanzen (2015-2017 DD/HD); 2017 am Deich durch Herbizideinsatz zur chemischen Distelbekämpfung verschwunden (2017 DD/HD). TK 1718-1141 St. Peter-Süderhöft, Eckhof, Winkel an der Innenböschung zwischen Seedeich und Altdeichrampe zusammen mit *T. ornithopodioides*, letzterer mit Hauptbestand auf der nach Süden gerichteten Außenböschung (2015-2017 DD/HD). TK 1617-4214/-4223 Brösumer Siel, innerer Deichfuß am Altdeich 200 m westlich der Schleuse zusammen mit *T. ornithopodioides*, mehrere 300-500 cm<sup>2</sup> große Bestände (2007-2017, aber nicht 2010, 2014, 2016 DD/HD). TK 1618-1321 Süderhever Koog nördlich der Schleuse auf der Innenberme, reicher Bestand, in gering beweidetem Rasen teils aufrecht wachsend (2015-2017 DD/HD). TK 1617-2244 Westerhever-Leikenhusen, Deich-Innenböschung unteres Drittel, von Haus Süderweg 10 bis 4 über 450 m verstreute reiche Bestände (2017 DD/HD). TK 1617-2232 Westerhever-Stuffhusen, Deichkrone Außenkante neben Überfahrt des Wirtschaftsweges, solitärer 400 cm<sup>2</sup> großer Bestand (2017 DD/HD). TK 1518-3333/-3334 Westerhever-Norderdeich, Ende Heerstraße, lockerer Bestand bis 400 m westlich an Innenberme und Grabenböschung, teils auch an Innen- und Außenböschung des Deiches; auf der nach Süden gerichteten Innenböschung einmal zusammen mit *T. ornithopodioides* (2016-2017 DD/HD). TK 1518-4334 Norderheverkoog-Mitte, Ende Schäferweg, mehrere kleine Gruppen am inneren Deichfuß am Ende der Rampe des Überfahrtweges (2017 DD/HD). TK 1518-4432 Norderheverkoog-Ost, Deich-Innenböschung 200 westlich der Deichzufahrt einzelne Pflanzen (2017 DD/HD). TK 1518-4442 Everschop-Siel, unmittelbar östlich des Schleusenhauses, Deich-Innenböschung oberes und mittleres Drittel, mehrfach kleinere Gruppen und Einzelpflanzen (2015 DD/HD). TK 1519-3344 Jordflether Koog Parkbucht 50 m westlich der Straße nach Kaltenhörn, größerer Bestand (mehrere 100 Pflanzen) auf der Innenberme zwischen Fuß der Überfahrtrampe und Zaun; 2015 auch im oberen Drittel nahe der Deichkrone auf Höhe der Parkbucht (2015-2017 DD/HD). TK 1519-3423 Jordflether Koog nahe der Straße nach Friedrichskoog, kleine Gruppe an der Deich-Innenböschung, unteres Drittel (2017 DD/HD). TK 1519-4133 Ülvesbüll Koog, 100 m nordöstlich der einzigen Deichzufahrt, am Fuß der Überfahrtrampe zwei kleine 200-500 cm<sup>2</sup> große Gruppen (2016-2017 DD/HD). TK 1519-14 Nordstrand Süderhafen, Zaun an der Überwegung zum Hafen, oberes Drittel der Deich-Außenböschung, mehrere aufrechte Pflanzen zusammen mit *Torilis nodosa* (2017 DD/HD).

#### Frühere Vorkommen in Schleswig-Holstein

**Ostholstein** TK 2328-3 Bereich Trittau ohne Ortsangabe („Juni 1965“, K. Nikoleizig, KIEL!, in Raabe et al.1987 Zuordnung zum Quadranten 3, der auf dem Herbarbeleg nicht angegeben ist). TK 2029-334 Mönkhagen, 1 km südwestlich der Schule „reichlich“; hier befindet sich eine

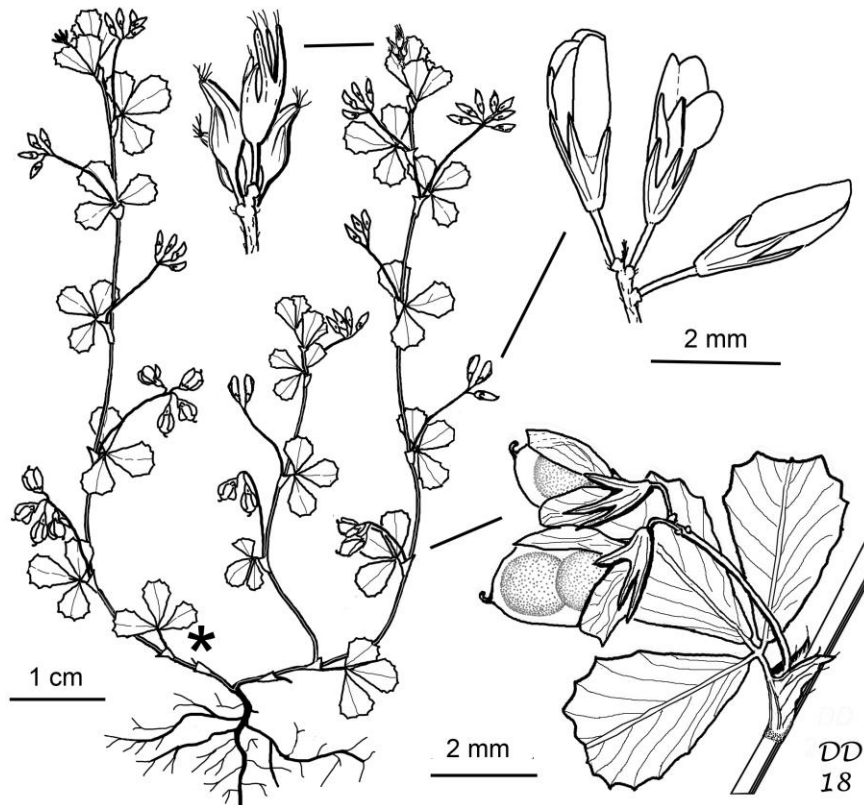


Abb. 6 Detailgetreue Zeichnung von *T. micranthum* mit Hervorhebung bestimmungsrelevanter Pflanzenteile. Die Laubblätter der basalen Sprossabschnitte (\*) besitzen im Gegensatz zu den Laubblättern der blütenträgenden Sprossabschnitte deutlich längere Stiele

Fig. 6 Drawing of *T. micranthum* with magnification of plant parts relevant for determination. Asterisk indicates leaves of basal stem parts with clearly visible petioles which are much longer than short petioles of the flowering stem parts.

Tabelle 1 Bestimmungsrelevante Strukturen von *T. micranthum* und *T. dubium*.

Table 1 Distinguishing features of *T. micranthum* and *T. dubium*

Struktur	<i>T. micranthum</i>	<i>T. dubium</i>
Blütenstand	(1)2–5(8) Blüten leicht gefächert	5–20 Blüten dicht gedrängt kegel-kopfförmig
Blüte + Kelch	2,4 (2–3) mm lang	3–3,6 mm lang
Blütenstiel- Länge	≥ Kelch ohne Zähne 0,8 (0,5–1,1) mm	< Kelch ohne Zähne 0,4–0,6 mm
Fruchtstand	lockere Gruppe Früchte aufrecht bis hängend	breit kegelförmig straff herabgebogene Fruchtstiele/Früchte
Frucht	von welcher Corolla meistens inkomplett umhüllt	von welcher Corolla meistens komplett umhüllt
Samen/Frucht	1–2	1 (selten 2)
Blattstiel an Infloreszenz- abgängen	0,5 (0,1–1,1) mm kürzer als Nebenblatt- Scheide	1,5–4 mm viel länger als Neben- blatt-Scheide
Mittelblätt- chen-Stiel	0,2–0,3 mm nicht länger als Seitenblättch.-Stiele	bis 1,5 mm meistens länger als Seitenblättch.-Stiele

Sandgrube (15.8.1961, K. Nikoleizig KIEL!). TK 2129-1 Zarpfen, Kreis Storman (Raabe 1970), kein Herbarbeleg. TK 1930-113 östlich Ottendorf, Kreis Eutin, südlich Peper See, Rand der Landstraße, Erstnachweis für Schleswig-Holstein (1.6.1959, zwei Herbarbelege KIEL!, ein Beleg LUB!, Lunau 1959). TK 1729-1 Westlich Lütjenburg, Hangweiden (Raabe 1964), keine Herbarbelege. TK 1629-3 Raum Giekau-Gadendorf, u.a. Kiesgrubenweide westlich Nienthal, Hangweide östlich Emkendorf, Weide auf Höhe 96,8 nördlich Emkendorf (Raabe 1964), keine Herbarbelege von diesen Lokaltäten in KIEL, HBG, LUB. TK 1629-4 Lütjenburg/Kossau, Vegetationsaufnahme 21.5.1964 (F. Mang, KIEL!); in Raabe (1964) wird der Ort dieser Vegetationsaufnahme als „Ziegeleiwiesen nordöstlich von Lütjenburg“ beschrieben; ebendort (29.5.1964 E.-W. Raabe, HBG!; Foto des Beleges in Raabe, 1964). Ende Mai 1986 konnte die Art an diesen Wuchsorten um Lütjenburg bei einer eintägigen Nachsuche nicht mehr nachgewiesen werden (F. Dunkel, pers. Mitt.). TK1123-442 Langballigau, Flensburger Förde, „seeseitiger Strandwall“ (25. 5. 1967, leg. E.-W. Raabe, HBG!) und „sandiger alter Steinwall im Bereich der Mündung der Langballigau“ (26.5.1967, leg. H. E. Weber, Herbar H. E. Weber!). Eine Nachsuche Ende Mai 1986 durch F. Dunkel erbrachte keinen Nachweis mehr (F. Dunkel, pers. Mitt.). Dieser Wuchsort am Südufer der Flensburger Förde kann in Zusammenhang mit zwei Fundorten der Art von vor 1930 am nördlichen (dänischen) Fördeufer gesehen werden, die in der Verbreitungskarte von Jessen (1930) eingetragen sind. Ein Herbarbeleg etwa 25 km nördlich liegt vom Galgenberg bei Apenrade in Dänemark vor (Hinrichsen, ohne Datum, HBG!).

**Westküste:** Nur ein historischer Fund in TK 1818-22 Hedwigenkoog nördlich Büsum, Seedeich (28.6.1969, leg. E.-W. Raabe, HBG!). Raabe (1981) führt Näheres zu diesem Fund aus: "Den kleinsten Klee kennen wir zwar bisher lediglich an einer einzigen Stelle des Seedeiches nördlich Büsum, mehrfach dagegen an ähnlich günstigen Kleinklimatalagen des Ostens, doch halten wir dafür, dass diese Art an unseren Nordseedeichen bisher übersehen sein könnte, zumal sie nur während der sehr kurzen Blütezeit im Mai einwandfrei diagnostiziert werden kann" (Anmerkung: Die Hauptblütezeit erstreckt sich aber bis Ende Juni).

#### Vorkommen im übrigen Deutschland

In Deutschland wurde die Art nach 1990 nur an einer Stelle im südöstlichen Niedersachsen und an verschiedenen Stellen in Nordrhein-Westfalen nachgewiesen (Netzwerk Phytodiversität Deutschland 2013, Haeupler et al. 2003, Garve 2007, G. Loos, pers. Mitt.).

**Niedersachsen** Hier gilt die Art als unbeständiger Neophyt (Garve pers. Mitt.). TK 3616-4 Wimmer, Landkreis Osnabrück (1994, K. Lewejohann in Garve 2007).

**Nordrhein-Westfalen** TK 4129-3 Olfen-Kökelsum südwestlich Lüdinghausen, sandige Pferdeweide, Uferböschung am nördlichen Steverufer (1996–1997 G. Loos & D. Büscher pers. Mitt.). TK 5002-3 westlich Geilenkirchen, Sandgrubenbereich der Tevener Heide (1995, Bomble & Schmitz 2014, F.W. Bomble pers. Mitt.). TK 3917-14 Bielefeld, Neuer Friedhof, seit über 20 Jahren nachgewiesen, zuletzt „in großen Mengen in zahlreichen Zierrasen auf dem Neuen Friedhof“ (29.05.2016, I. Sonneborn/A. Jagel, in Bochumer Bot. Ver. 2017). TK 5202-22 Aachen, Friedhof Hüls „in großen Beständen in Scherrasen und in Pflasterfugen“ (11.06.2016, F.W. Bomble in Bochumer Bot. Ver. 2017). Das Vorkommen in der Sandgrube westlich von Geilenkirchen (nur 1995, Bomble pers. Mitt.) kann in einem räumlichen Bezug zum nahe gelegenen natürlichen Vorkommen auf Flusssdünen an der Maas (Weeda et al. 1984) gesehen werden, und die Friedhofsvorkommen in Aachen und Bielefeld fügen sich gut in die Berichte aus dem benachbarten Belgien ein, wo sich der Klee neuerdings auf kurz geschorenen Rasen von Militärfriedhöfen ausbreitet (Vorkommen auf 80 der 137 Militärfriedhöfe, Van Landuy et al. 2004, siehe unten).

#### Vorkommen in Holland und Dänemark

Die aktuelle Verbreitung ist in Abb. 7 dargestellt. Näheres siehe unten im Absatz „Gefährdung in Deutschland und Nachbargebieten“.

## Diskussion

**Kennzeichen** Ein wichtiges Erkennungsmerkmal *T. micranthum* sind die 0,8 mm (0,5–1,1) mm langen Blütenstiele, die so lang oder etwas länger als der Kelchbecher ohne Zähne sind. Muñoz Rodriguez et al. (2015) geben in Übereinstimmung 0,5–1 mm für iberische Pflanzen und Coulot & Rabaute (2013) 0,5–1,5 mm für Pflanzen Frankreichs an. Auch die Angaben in Coombie (1968) lassen auf dieselbe Länge schließen (1,5 Mal so lang wie der Oberrand des Kelchbeckers, der 0,7 mm lang ist). Stace (2010) gibt eine Länge von ca. 1,5 mm an, was als Mittelwert deutlich zu lang ist. Die Angaben in Haeupler & Muer (2000), Rothmaler (2013 und frühere Auflagen) und Oberdorfer et al. (2001) von 2 mm langen Blütenstielen entsprechen definitiv nicht der Realität. In einer Bestimmungshilfe von Christensen et al. (2013) werden ebenfalls 2

mm lange Blütenstiele angegeben und eine Skizze von Leaney (2012) entsprechend abgeändert. Die Zahl der Blüten pro Infloreszenz europäischer, iberischer, französischer, englischer, deutscher und dänischer Pflanzen (Muñoz Rodriguez et al. 2015, Coombie 1968, Coulot & Rabaute 2013, vorliegende Untersuchung) beträgt (1)2–6(8), auf den Britischen Inseln ausnahmsweise bis 10 (Stace 2010). In der zuvor zitierten deutschen Literatur werden abweichend davon 12–15 Blüten als Obergrenze angegeben. Diese Ungereimtheiten in deutschen Schriftmalen gehen sehr wahrscheinlich auf ungeprüfte Übernahmen der Angaben von Gams (1925) in Hegi zurück (2 mm lange Blütenstiele, 2–15 Blüten/Infloreszenz) und auch auf die Abbildung in Rothmaler (2013), in der nicht nur die Blütenstiele viel zu lang sondern auch die Kelchzähne inkorrekt gleich lang dargestellt sind. Die dichte Zähnung und fehlende Ausrandung/Stutzung der Blättchen in Rothmaler (2013) ist ebenfalls untypisch für *T. micranthum*. Die Abbildung 1388 von *T. micranthum* in Gams (1925) steht teilweise im Widerspruch zur Beschreibung und stellt eine Pflanze mit Teilmerkmalen von *T. dubium* dar. Die Abb. 6 dieser Arbeit basiert auf Scans, Fotos und Herbarexemplaren.

**Unterscheidungsmerkmale zu *T. dubium*** (Tab. 1): (a) der oft etwas lockere Blüten/Fruchtstand von *T. micranthum* besteht nur aus 2–6 (vereinzelt auch mal 8), im Durchschnitt 3–4 Blüten/Früchten – bei *T. dubium* dagegen stets kompakt kegel- oder kopfförmig mit meistens deutlich mehr als 5 (bis 20) Blüten/Früchten; (b) die dünnen, flexiblen Blütenstiele bei *T. micranthum*, von denen die meisten so lang oder länger als der Kelchbecher (ohne Zähne) sind – bei *T. dubium* dagegen kürzer als der Kelchbecher; (c) die fast sitzenden Blätter im Bereich der Infloreszenzabgänge von *T. micranthum*, die kürzer als die Nebenblattscheide sind – bei *T. dubium* dagegen stets viel länger (meistens >2mm) – und (d) das Stielchen des Mittelblättchens, das bei *T. micranthum* stets so lang ist wie die Seitenblättchenstiele – bei *T. dubium* dagegen oft deutlich länger.

**Habitat, Ökologie** *T. micranthum* ist eine konkurrenzschwache Art, deren Vorkommen an lückige Vegetation gebunden ist. Diese kommt natürlicherweise auf nährstoffarmen, oft sandigen Substraten vor, die aber wegen der intensiven Landnutzung inzwischen großflächig verschwunden sind. Wuchsorte an der dänischen Ostseeküste scheinen teilweise noch weitgehend natürlich zu sein. Dort wurde der Klee am Übergang zwischen Strandwall und höher gelegen, ausgesüßten Grünlandflächen gefunden (Wiinstedt 1908). Auch der Wuchsort am Strandwall bei Langballigau an der Flensburger Förde (siehe oben) befand sich in einem natürlichen Habitat. Strandwallvorkommen sind auch von der Insel Falster / Dänemark belegt (Herbarbelege in AAU!). In Holland könnte das Vorkommen auf Flusssdünen an der Maas auch als natürlich angesehen werden (Weeda et al. 1987). Dagegen liegen die Vorkommen in den Dünengebieten an der Küste von Belgien (dort nur im Westen nahe der Grenze nach Frankreich vorkommend, D’hondt et al. 2012) und von Holland auf beweideten oder durch Pflegemaßnahmen anthropogen beeinflusster (kurz gehaltener) oder beweideter Vegetation, einmal in von Kaninchen verbissenem *Luzula campestris*-Bestand (D’hondt et al. 2012; Drees et al. 2009).

Die Seedeiche sind Ersatzwuchsorte, die trotz nährstoffreicher Bodengrundlage aus fruchtbarem Marschland (Klei) eine artenreiche Vegetation aufweisen, weil jegliche Düngung unterbleibt und insbesondere auf den steilen Innenböschungen (33% Gefälle) durch Trittsuren nackte

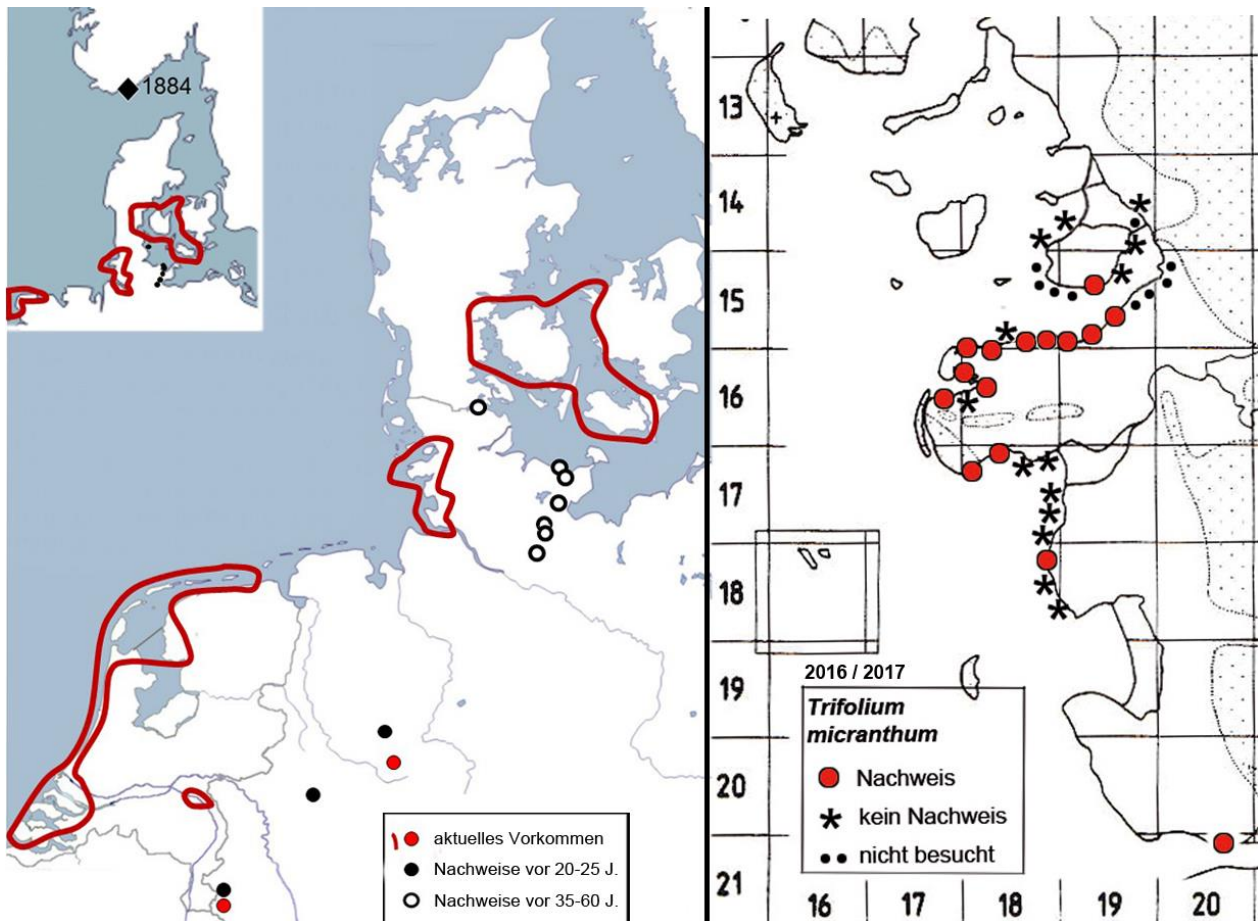


Abb. 7 Aktuelle Verbreitung (rot) und ehemalige Vorkommen (schwarz) von *T. micranthum* an seiner nordöstlichen Verbreitungsgrenze. Die systematisch untersuchten Seedeichabschnitte in Schleswig-Holstein sind durch Symbole gekennzeichnet. Die Deichabschnitte zwischen Brunsbüttelkoog (TK 2120-2) und dem Untersuchungsgebiet ab TK 1818 sind bisher nicht auf Vorkommen von *T. micranthum* geprüft worden.

Fig. 7 Current distribution (red) and former records (black) of *T. micranthum* at its northeastern range. Sea dikes systematically screened for occurrence of *T. micranthum* are marked by symbols, i.e. red dots (records), asterisks (no records); dotted stretches (not investigated). Sea dikes between the most southern record (Brunsbüttelkoog, TK 2120-2) and the study area (TK 1818 northwards) were not investigated.

Bodenstellen entstehen und die Vegetation durch Beweidung teils auf wenige cm niedrig und lückig gehalten wird. Ähnliches beschreibt Raabe (1964) von den ehemaligen Wuchsorten auf alten Viehweiden bei Lütjenburg in Ostholstein, wo die Sippe bevorzugt an steilen Hängen mit 30% Gefälle wuchs mit einer ähnlichen artenreichen Begleitvegetation wie an den Innenböschungen der Deiche an der Nordseeküste. Auch ist die Deichaußenseite stärker durch Salz beeinflusst (winterliche Sturmfluten, salzhaltige feuchte Luft) mit vermehrtem Vorkommen von halophilen Pflanzen wie *Trifolium fragiferum*, *Juncus gerardii*, teils auch *Parapholis strigosus*. Ein Vorkommen von *T. micranthum* an Seedeichen ist auch von Holland bekannt insbesondere von den Deichen der nordöstlichen Zuiderzee (Weeda et al. 1987). Die (notwendige) Beweidung der Seedeiche ist sehr wahrscheinlich auch für die Verbreitung der Samen von *T. micranthum* über Hufe und Klauen (Epizoochorie), aber auch durch Nahrungsaufnahme und Dung (Endozoochorie) von Bedeutung (Couvreur et al. 2005, D'hondt & Hoffmann 2010). Die hartschaligen Kleesamen werden nicht verdaut (Russi et al. 1992). Endozoochorie von Kleesamen durch Schafe spielt in Neuseeland eine besondere Rolle bei der Ausbreitung von Weißklee (Suckling 1952).

Auf den (britischen) Militärfriedhöfen in Belgien darf nach den Bestimmungen der Commonwealth War Graves Commission die Grashöhe nie 3 cm überschreiten. Unter diesen Bedingungen scheint *T. micranthum* ideale Wuchsbedingungen zu finden. Außerdem wird die Art wahrscheinlich durch Mähgeräte auf Friedhöfen verbreitet und durch Transport der Geräte auch auf entferntere Friedhöfe verfrachtet (Anthropochorie). Die belgische Friedhofpopulation von *T. micranthum* unterscheidet sich aufgrund der AFLP-Analyse (amplified fragment length polymorphism) verschiedener Marker von der Küstendünenpopulation (D'hont et al. 2012). Das lässt auf Selektion bestimmter Mutanten oder Einschleppung aus anderen Populationen schließen. Ein genetischer Vergleich zwischen den Friedhofpopulationen von Belgien und Nordrhein-Westfalen wäre in diesem Zusammenhang interessant.

#### Gefährdung in Deutschland und Nachbargebieten

*T. micranthum* gilt in den Ländern an seiner nordöstlichen Verbreitungsgrenze als bedroht, in Holland als sehr bedroht (seit 1950 Abnahme über 50%, Gesamtbestand unter 2500 Exemplaren, Sparrius et al. 2014), in Deutschland als vom Aussterben bedroht (Korneck et al. 1996) und in Dänemark

als potenziell bedroht (Wind & Pihl 2004). Die starke Ausdünnung des Bestandes in Holland ist in den Verbreitungskarten von FLORON dokumentiert (NDFF 2017). In Dänemark sind die Verbreitungspunkte seit der Darstellung in Jessen (1930) ziemlich konstant geblieben (Hartvig 2015). In Deutschland könnte aufgrund der hier mitgeteilten Vorkommen die Rote-Liste-Kategorie 1 „vom Aussterben bedroht“ auf 2 „stark gefährdet“ herabgestuft werden. Die Seedeiche sind als Ersatzwuchsorte für inzwischen fast völlig verloren gegangene, artenreiche Magerweiden zu sehen. Ihre Eignung als Wuchsorte für *T. micranthum* hängt von der intensiven Schafbeweidung ab. Eine Aufgabe der Beweidung oder eine weniger intensive Beweidung könnten das Vorkommen von *T. micranthum* bedrohen. Als eine neue Gefährdungsform von *T. micranthum* und anderen seltenen Deichpflanzen kann der neuerliche Einsatz von Herbiziden an den Deichen zur Bekämpfung von Disteln gesehen werden (siehe oben) anstatt diese, wie bisher, mechanisch durch Mahd oder gezielt mit der Sense zu kontrollieren.

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## Nomenklatorische Korrektur in der Gattung *Rubus*

### Nomenclatural correction in the genus *Rubus*

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**Abstract** Because of the older homonym *Rubus tilioides* Gand. 1884 the name *Rubus tiliifrons* W. Jansen & H. E. Weber is established as new name for *Rubus tilioides* W. Jansen & H. E. Weber 2010.

**Zusammenfassung** Wegen des älteren Homonyms *Rubus tilioides* Gand. 1884 wird für *Rubus tilioides* W. Jansen & H. E. Weber 2010 der neue Name *Rubus tiliifrons* W. Jansen & H. E. Weber veröffentlicht.

**Keywords** *Rubus* L. sectio *Corylifolii*, New name, Nomen novum

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### Neuer Name für *Rubus tilioides* W. Jansen & H. E. Weber 2010

Aus Thüringen, Sachsen und Sachsen-Anhalt wurde 2010 eine *Corylifolii*- Sippe als *Rubus tilioides* W. Jansen & H. E. Weber beschrieben (Abb.1, 2). Herr Dr. Jean-Marie Royer (Chaumont, Frankreich) hat freundlicherweise darauf hingewiesen, dass M. Gandoger bereits 1884 denselben Namen verwendet hat. Er ist dort als „*R. tilioides* Gdgr. mss.“ und als neuer Name für „*R. tiliaefolius* Pierrat non Whe.“ aufgeführt. Man kann den Hinweis auf sein Manuskript so deuten, dass Gandoger den Namen nur als nomen provisorium betrachtete und ihn somit nicht gültig veröffentlichen wollte. Allerdings heißt es im Index auf Seite 268 „*R. tilioides* Gdgr.“, wobei nicht anzunehmen ist, dass Gandoger an dieser Stelle das Taxon anders beurteilte. Vielmehr dürfte es sich um eine Kurzform für den Index handeln. Im International Plant Names Index (IPNI, ipni.org) fehlt der Name *Rubus tilioides* Gand. Offenbar wurde er im Gegensatz zu den übrigen dort behandelten und bei IPNI aufgeführten Arten als nicht gültig veröffentlicht angesehen.

Man kann jedoch auch die Ansicht vertreten, dass Gandoger wie auch an anderen Stellen lediglich einen Hinweis auf die Quelle seines Namens geben und ihn durchaus definitiv veröffentlichen wollte. Dann wäre *Rubus tilioides* W. Jansen & H. E. Weber ein jüngeres Homonym und ein illegitimer Name. Daher wird hiermit ein neuer Name für dieses Taxon etabliert:

*Rubus tiliifrons* W. Jansen & H. E. Weber nom. nov. pro nom. *Rubus tilioides* W. Jansen & H. E. Weber 2010, Mitt Florist Kart Sachsen-Anhalt 15: 4, non *R. tilioides* Gandoger 1884, Mém Soc d'Emul Doubs ser 5, 8: 234.

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Abb. 1 Holotypus (Teil) von *Rubus tiliifrons* W. Jansen & H. E. Weber (aus Weber 2010)

Fig. 1 Holotype (part) of *Rubus tiliifrons* W. Jansen & H. E. Weber (taken from Weber 2010)



Abb. 2. *Rubus tiliifrons* W. Jansen & H. E. Weber am locus typicus (aus Weber 2010)

Fig. 2 *Rubus tiliifrons* W. Jansen & H. E. Weber at the type locality (taken from Weber 2010)

Detlev Drenckhahn, Werner Jansen, Heinrich E. Weber

## ***Rubus pseudoglotta* Drenckhahn & W. Jansen, eine neue deutsch-dänische Brombeerart aus dem Formenkreis des *Rubus phylloglotta* (Frid.) Å. Gust.**

***Rubus pseudoglotta* Drenckhahn & W. Jansen, a new bramble species with German-Danish distribution related to *R. phylloglotta* (Frid.) Å. Gust.**

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**Abstract** *Rubus pseudoglotta* Drenckhahn & W. Jansen is a tetraploid new member of the *Rubus* section *Corylifolii*, series *Subradula*, which was formerly included in the variability spectrum of *R. phylloglotta* (Frid.) Å. Gust.. This new species is distinguished by 4 (3–5)-nate leaves with obovate acuminate to cuspidate terminal leaflets with short-haired upper side and light greenish tangibly hairy under side. Stems grow arcuate, partly climbing, are obtusely angled, moderately hairy, green to reddish brown coloured, and armed with 10–20 straight, slender prickles, 2–4 (5) mm long, numerous pricklets, stalked glands and bristlets. Pedicels of inflorescence are armed with 2–8 (per cm) slender straight to slightly curved prickles (1–2 mm long) and studded with numerous stalked glands (up to 0.6 mm long) and some bristles. The species prefers road sides and hedgerows. The distribution area of *R. pseudoglotta*, known so far, extends from the area between Rendsburg and the surroundings of the city of Kiel in Schleswig-Holstein and reaches north to the Danish islands of Als and Fyn. A further outcome of this study is that there is no safe record of *R. phylloglotta* in Schleswig-Holstein/Deutschland and that it is questionable whether *R. phylloglotta* occurs outside the island Tåsinge in Denmark at all.

**Zusammenfassung** *Rubus pseudoglotta* Drenckhahn & W. Jansen ist eine tetraploide Brombeerart aus der Sektion *Corylifolii* (Serie *Subradula*), die bisher zum Variabilitäts-Spektrum von *R. phylloglotta* (Frid.) Å. Gust. gezählt wurde. Charakteristische Merkmale sind die 4 (3–5)-zähligen Blätter mit obovaten Endblättchen mit kurzer (ca. 1 cm) abgesetzter Spitze, kurzhaariger Blattoberseite und fühlbar behaarter grüner Blattunterseite. Die flach bogigen, teils klimmenden Schösslinge sind überwiegend stumpfkantig, grün bis rötlichbraun, schwach behaart und reichlich mit 2–4 (5) mm langen, geraden bis schwach gekrümmten Stacheln und kleineren Stacheln, Stachelhöckern, Stieldrüsen und Borsten besetzt. Die Blütenstiele sind mit 2–8 (pro cm) schlanken, geraden bis leicht gekrümmten Stacheln (1–2 mm lang) und zahlreichen Stieldrüsen (teils bis 0,6 mm lang) besetzt. Die Sippe wächst bevorzugt an Straßen- und Wegrändern und in Hecken. Die bekannt gewordenen Fundstellen erstrecken sich von Rendsburg bis in das Umfeld von Kiel, nordwärts bis zu den dänischen Inseln Alsen und Fünen. Unsere Untersuchungen zeigen weiterhin, dass *R. phylloglotta* bisher nicht in Schleswig-Holstein/Deutschland nachgewiesen wurde. Ob *R. phylloglotta* überhaupt außerhalb der Insel Tåsinge in Dänemark vorkommt, bedarf weiterer Nachforschungen.

**Keywords** False Tongue-Leaf Blackberry, *Rubus* Section *Corylifolii*, New Species, Species nova, Genome size, Distribution

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### **Einleitung**

Im Rahmen von Untersuchungen über Status und Verbreitung des *Rubus phylloglotta* (Frid.) Å. Gust. wurden alle Herbarbelege der Sippe in Hamburg (HBG), Lund (LD) und Kopenhagen (C) und den Herbarien der Autoren dieser Arbeit untersucht. Dabei stellte sich eine erhebliche morphologische Heterogenität heraus, die auch Martensen (2011) bemerkte und als Variabilität der Art interpretierte. Der Lectotypus von *R. phylloglotta* (zwei Bögen C 2/2018/44 und 45, sel. Weber 1981) wurde im August 1913 westlich des Ortes Strammelse auf der dänischen Insel Tåsinge von N. Sörensen gesammelt. An der Typuslokalität hat C. E. Gustafsson 1937 Belege zur Bestimmung der Chromosomenzahl gesammelt (LD 2000268), die durch Å. Gustafsson erfolgte (Gustafsson 1939). Die Sippe erwies sich als tetraploid. *R. phylloglotta* wächst immer noch an der Typuslokalität und wurde dort im Juli 2018 eingehend vom Erstautor untersucht. Zahlreiche Belege einer Brombeersippe, die *R. phylloglotta* zugerechnet wurde (Martensen et al. 1983, Martensen 2018, Weber 1981, Jansen 2013), aber die in wesentlichen Merkmalen eine Sonderstellung einnimmt (Jansen 2013), stammen vom östlichen Kreis Rendsburg-Eckernförde in Schleswig-Holstein mit Schwerpunkt im Umfeld der Stadt Kiel. Dort hatte Otto Gelert die

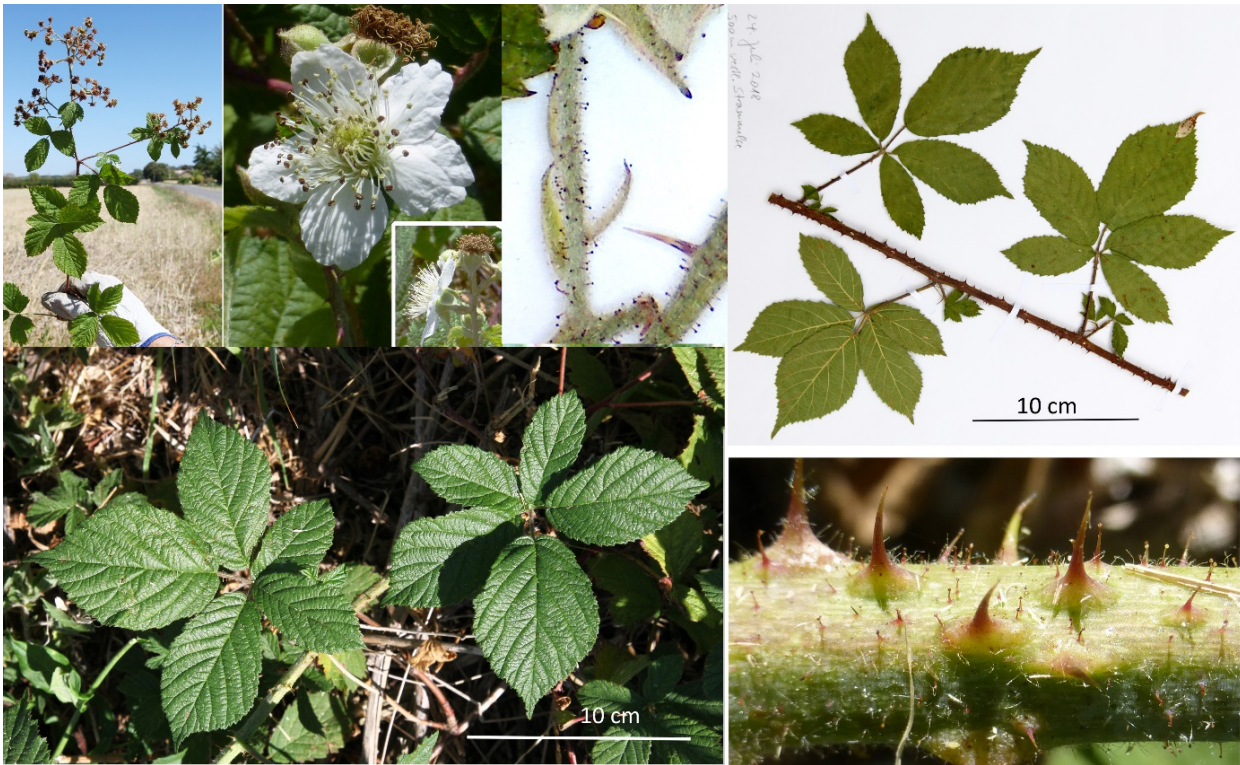


Abb. 1 Fotografien mit herbarisiertem Abschnitt eines Schösslings von *R. phylloglotta* am locus classicus westlich des Ortes Strammelse auf der Insel Tåsinge in Dänemark (24.07.2018, Fotos D. Drenckhahn). Die abgebildeten Pflanzenteile stimmen mit den Typusbelegen im Herbar Kopenhagen überein.

Fig. 1 Compilation of photographs (24.07.2018 Photo D. Drenckhahn) and one herbarized piece of a primocane of *R. phylloglotta* from the type locality west of the village Strammelse on the island of Tåsinge in Denmark. The depicted *Rubus* parts are consistent with the type material of the Copenhagen herbarium.



Abb.2 Erstnachweis von *R. pseudoglotta* (als „*Rubus pyracanthus* Lg. f.“ benannt) durch O. Gelert im August 1886 westlich des Viehburger Gehölzes, Kiel (Ausschnitte aus dem Beleg C 1-2018-4 des Herbars Kopenhagen).

Fig. 2 First record of *R. pseudoglotta* (named “*Rubus pyracanthus* Lg. f.”) collected by O. Gelert in August 1886 west of Viehburg Forest, Kiel (part of a specimen of the Copenhagen herbarium C 1-2018-4).

Sippe bereits 1886 westlich des Viehburger Gehölzes in Kiel gesammelt (C 1-2018-4, Abb. 2). Diese von *R. phylloglotta* abweichende Brombeersippe wird im Folgenden als eine eigenständige Art, *R. pseudoglotta* Drenckhahn & W. Jansen, beschrieben und charakterisiert

## Material und Methoden

Es wurden Materialien von 25 Wuchsorten ausgewertet, darunter 63 Schösslingsblätter mit 5–12 cm langen Schösslings-Segmenten und einem Schösslings-Durchmesser von 4–6 mm. Schösslinge und deren Blätter unter 4 mm Schösslings-Durchmesser wurden nicht berücksichtigt. Die

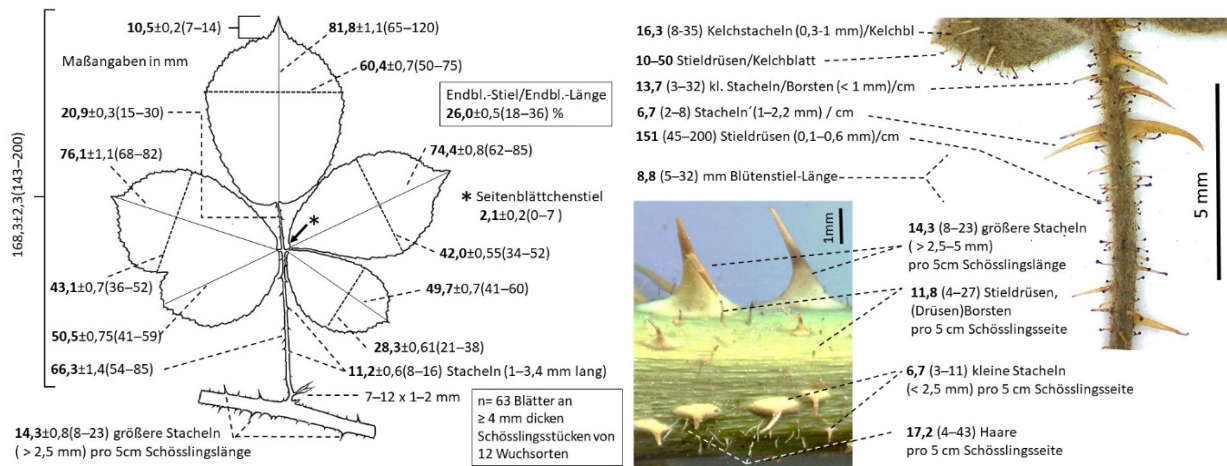


Abb. 3. *Rubus pseudoglotta*, quantitative Angaben (Mittelwerte, Variationsbreite und meistens auch  $\pm$  Standardfehler) von Schösslings-Blättern ( $n=63$ ), Schösslingen ( $n=32$ ) und Blütenstielen ( $n=55$  für die Längenangaben,  $n=16$  für Angaben zu Stacheln und Indument).

Fig. 3. *Rubus phylloglotta*, measured values (arithmetic mean, variation and in most cases  $\pm$  standard error) of primocane leaves ( $n=63$ ), primocanes ( $n=32$ ) and pedicels ( $n=55$  with respect to length,  $n=16$  concerning numbers of prickles, stalked glands etc.).

Zahl der Stacheln wurde an Schösslingen, Blattstielen, Blütenstandsachse und Blütenstielen allseitig ermittelt und (mit Ausnahme der Blattstiele) als Zahl pro Längeneinheit der betreffenden Struktur angegeben. Drüsen, Haare und Borsten wurden auf einer Schösslings-Seitenfläche (1/5 Umfangsfläche) erfasst und pro cm Länge berechnet (Zahl pro Flächeneinheit). Blüten: Zwölf Blüten/Frucht-Zweige von zehn verschiedenen Wuchsorten wurden untersucht, darunter  $n=55$  Blütenstiele, 42 Kronblätter und zehn Blüten-durchmesser wurden direkt am Strauch und auf Fotografien der Blüten (mit angelegtem Zentimetermaß) gemessen. Für die Vermessung von Strukturen  $>5$  mm wurde ein Lineal mit 0,5 mm Skala verwendet. Strukturen  $<5$  mm bis 0,05 mm wurden an eingescannten (1200 dpi) Pflanzenteilen mit dem Messwerkzeug-Programm von Adobe Photoshop CS (Version 8.0.1) vermessen. Haare der Blattoberseite wurden auf Lupen-Fotografien gezählt, die bei tangentialer Beleuchtung der Blätter aufgenommen wurden, um die Haare besser sichtbar zu machen. Es wurden 10 mm<sup>2</sup> große Probefelder ausgezählt, die Zählergebnisse gemittelt und auf 1 cm<sup>2</sup> Fläche hochgerechnet. Die quantitativen Angaben erfolgen überwiegend als arithmetisches Mittel  $\pm$  Standardfehler und Variationsbreite (durch Semikolon oder Klammer abgesetzt), siehe Abb. 3. Die Bestimmung der Genomgröße (2C-Werte) erfolgte mittels Durchflusszytometrie von Zellen der mit einer Rasierklinge in kleinste Fragmente zerkleinerten Blattstiele (Drenckhahn et al. 2017).

## Ergebnisse

**Holotypus** Altwittenbek, Altwittenbeker Str., 450 m östlich, Straßenböschung, 1626-141, 54°22.1285'N, 10°3.3989'E, 28. June 2018, ID 280618-1, D. Drenckhahn, HBG.  
**Isotypus** ID 280618-2, B.

### Description (Fig. 2–6)

**Stem** low arching (30–120 cm) at first, then trailing up to 6.5 m, in hedges climbing up to 2 m high, subsequently hanging down, obtuse-angled with flat or slightly bulging sides, diameter of primocane mid portion 4.8(3–6.5) mm, green becoming reddish on sun-exposed sides, moderately hairy

(17.2[4–43] hairs per 5cm side), studded with scattered stalked glands and bristles 11.8(4–27) per 5 cm side, prickles considerably changing in size from tubercles and 1–2.5 mm long prickles (6.7[3–11] per 5 cm side) to larger prickles (14.3[8–23] per 5cm cane), 3.8(2.5–5.1) mm in length, slender, patent or somewhat declining, straight to slightly curved, yellowish green to brown reddish with lighter tips, prickle base greenish to reddish, narrow oval.

**Leaves** 3–5-nate (3-nate 27%, 4-nate 40%, 5-nate 33%), 168 (135–200) mm long, upper side densely hairy ( $>200$  to locally  $>500$  hairs/cm<sup>2</sup>), hairs very short 0.26 (0.1–0.6) mm; underside of leaflets moderately hairy on nerves and lamina (hairs 0.1–0.5 mm long) not felty. **Terminal leaflet** 81.8(65–96) mm long, 60.4(50–75) mm broad (greatest diameter in apical third), ratio of diameters 1.35(1.1–1.63), narrow to broad obovate, occasionally almost roundish, base narrowed emarginate to entire, apex acuminate to cuspidate (apex 7–14 mm), fairly evenly serrate (1–1.5 mm deep) with broad mucronate teeth, margin flat or slightly undulate; **petiolule** 20.9 (15–45) mm, i.e. 26.2(18–36)% length of leaflet. **Lateral leaflets** on average 10% shorter and 30% narrower than terminal leaflet: 60.4(50–75) mm  $\times$  42(34–52) mm, petiolules 2.1(0–7) mm. **Basal leaflets** 49.7(41–60) mm  $\times$  28.3(21–38) mm. **Petiole** with continuous upper sulcus, 66.3 (54–85) mm long, on an average 40 % of leaf length and 33% longer than length of basal leaflets; prickles 11.4 $\pm$ 0.6 (8–16), 1–3.4 mm long, slender and straight to slightly curved, occasionally with few interspersed stalked glands, pricklets and acicles. **Stipules** mostly lanceolate, 11(9–14) mm  $\times$  1.1 (0.8–2.1) mm, surface and margin fringed with scattered stalked glands.

**Inflorescence** Flowering mainly second half of June, flowering branches (laterals) up to 95 cm long with 3–7 ternate leaves (up to 70 mm in length), the upper ones at base of or within terminal panicle ternate to simple. Inflorescence pyramidal consisting of a broad paniculate to loosely corymb terminal portion (4–9 cm broad  $\times$  7–12 cm long) with 12–28 flowers and 3–4 separate pedunculate flower clusters or small panicles borne in the 1–4 axils below, bearing (1)4–10 flowers each; axis flexuose, becoming reddish on sun-exposed side, moderately hairy with varying numbers of rather strong, slightly curved prickles (8–25 per 5 cm) of

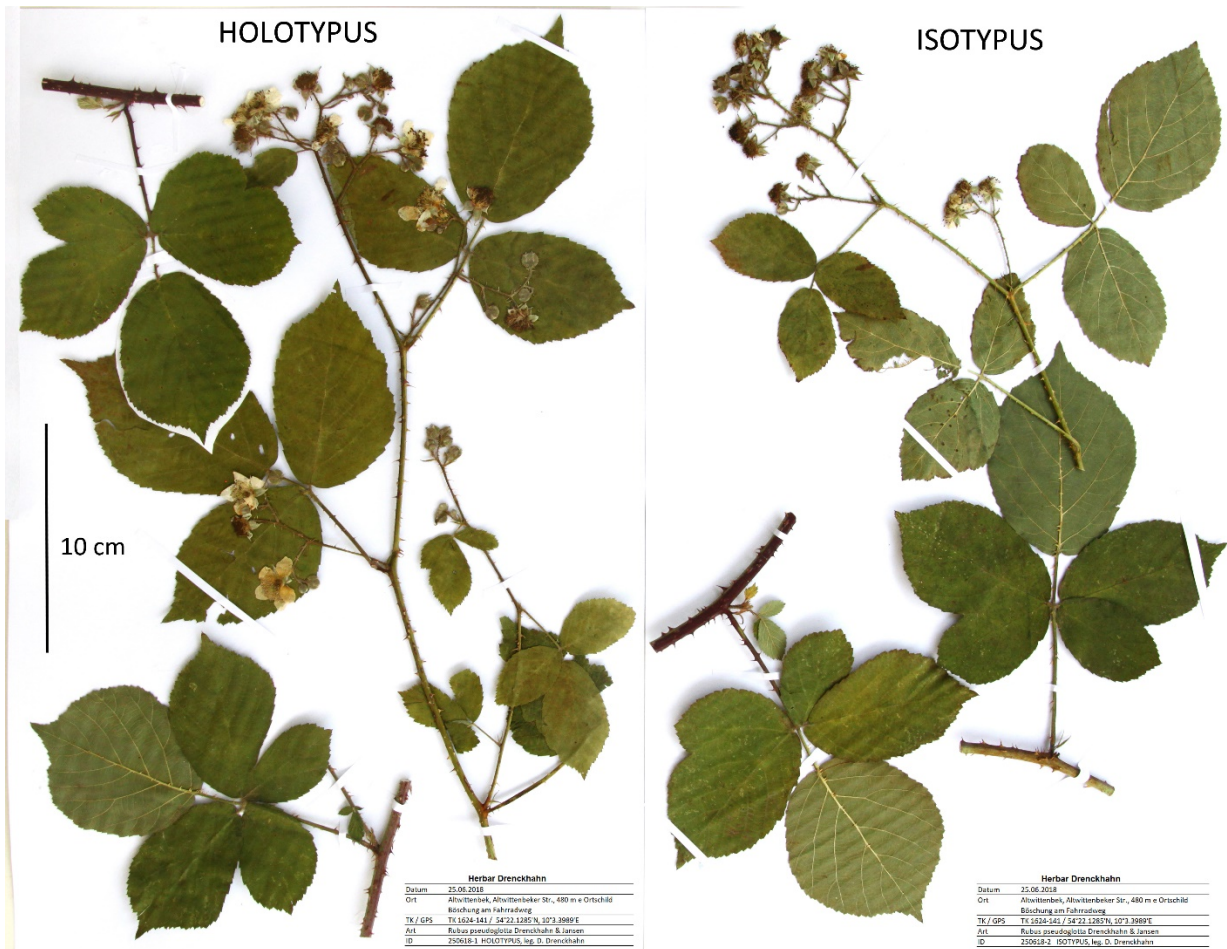


Abb. 4 Holotypus und Isotypus von *R. pseudoglotta*, der bislang *R. phylloglotta* zugerechnet wurde. Die Endblättchen wurden umgewendet, um beide Seiten eines Blattes sehen zu können.

Fig. 4 Holotype and Isotype of *R. pseudoglotta* which was previously attributed to *R. phylloglotta*. Terminal leaflets were turned over to see both sides of the same leaf.

different sizes (1.6–4.2 mm long) interspersed with pricklets and bristles and numerous stalked glands (10–40 per 5 cm); pedicels 8.8 (5–32) mm long with dense spreading to adpressed hairs, numerous stalked glands (0.1–0.6 mm long, > 50 per cm), prickles slender, straight, patent 1–2.2 mm long, 6.7 (2–8) per cm.; flowers 2.5–3 cm in diameter; sepals 4–6 mm, short pointed, loosely reflexed after petal fall, inner side white felty, outer side covered with dense short simple hairs and stellate hairs, several needle-shaped pricklets (8–35) and 10–50 stalked glands; petals white with wrinkled surface, narrow cuneate at base, 12–15 mm long and 7–8 mm broad, not touching neighbouring petals; stamens reflexed at petal fall, erect to clasping afterwards, 6–7 mm long exceeding styles, filaments white, anthers glabrous (white, turning brown); styles whitish green, carpels and receptacle glabrous, occasionally with single hairs.

**Chromosomes, Genome size** Nuclear DNA content (2C-values) of two plants (Flintbek) was 1.52 and 1.53 pg, respectively, which is typical of a tetraploid set ( $2n=28$ ) of chromosomes (Drenckhahn & Zonneveld 2017). Genome size of *R. caesius*, a sexual and well established tetraploid species, is in the same range (1.50 pg, Würzburg).

**Taxonomy** The epithet *pseudoglotta* refers to the former inclusion of this species in the variability spectrum of *R. phylloglotta* (Frid.) Å. Gust. The proposed name is ‘False

Tongue-Leaf Blackberry’ and, in German, ‘Falsche Zungenblättrige Haselblattbrombeere’. *R. pseudoglotta* is distinguished from *R. phylloglotta* (Fig. 1) by (a) broader and apically more obtuse cuspidate terminal leaflets, (b) more or less sessile upper lateral leaflets, which are petiolate in *R. phylloglotta* (5–13 mm), (c) sparsely hairy canes in contrast to densely hairy canes in *R. phylloglotta* and (d) numerous pricklets at sepals (largely absent in *R. phylloglotta*).

#### Deutsche Kurzbeschreibung

*Rubus pseudoglotta* ist eine tetraploide ( $2n=28$ ) Brombeerart aus der Sektion *Corylifolii*, Serie *Subradula*, wie auch *R. phylloglotta* (Gustafsson 1939). Charakteristische Merkmale sind die 4(3–5)-zähligen Blätter mit länglich bis gedrunen obovaten Endblättchen mit kurzer, ca. 1 cm langer, abgesetzter Spitze, dicht kurzhaarig besetzter Blattoberseite ( $>200/cm^2$ ) und fühlbar behaarter grüner Blattunterseite. Die Seitenblättchen sind meistens kaum oder nur wenige mm gestielt. Die flach bogigen, teils klimmenden Schösslinge sind überwiegend stumpfkantig, gewölbt bis flachseitig, grün bis rötlichbraun, schwach behaart (schnell verkahlend) und reichlich mit 2,5–4(5) mm langen, meistens geraden oder schwach gekrümmten Stacheln (8–23 pro 5 cm) und vielen kleineren oft drüsenköpfigen Stacheln, Stachelhöckern, Stieldrüsen und Borsten besetzt. Die Blütenstiele (durchschnittlich knapp 1 cm lang, vereinzelt um 3 cm, sind

mit 6(2–8, pro cm) schlanken, geraden bis leicht gekrümmten Stacheln (1–2 mm lang) besetzt und mit zahlreichen Stieldrüsen (teils bis 0,6 mm lang) und Drüsenborsten versehen. Die Sippe wächst bevorzugt an Straßen- und Wegrändern und Hecken (Knicks). Die bekannt gewordenen Fundstellen erstrecken sich von Rendsburg bis in das Umfeld von Kiel und nordwärts bis zu den dänischen Inseln Alsen und Fünen.

#### Verbreitung (Abb.6)

**Dänemark** 0826-43 (TK Gitter, Deutschland), SE Bøjden, Str. nach Egsmark, Fünen (Fyn), 24.07.1980 leg. H.-O. Martensen (Herb. Weber) – 0927-11, W Sineberg, Fünen (Fyn), Wäldchen, 23.07.1980 leg. H.-O. Martensen (HBG 1297/08), Abb. 7. – 1024-22, Stevning/Alsen (Als), 31.08.-1985 leg. H.-O. Martensen (HBG 1297/12 und C 2/2018/27).

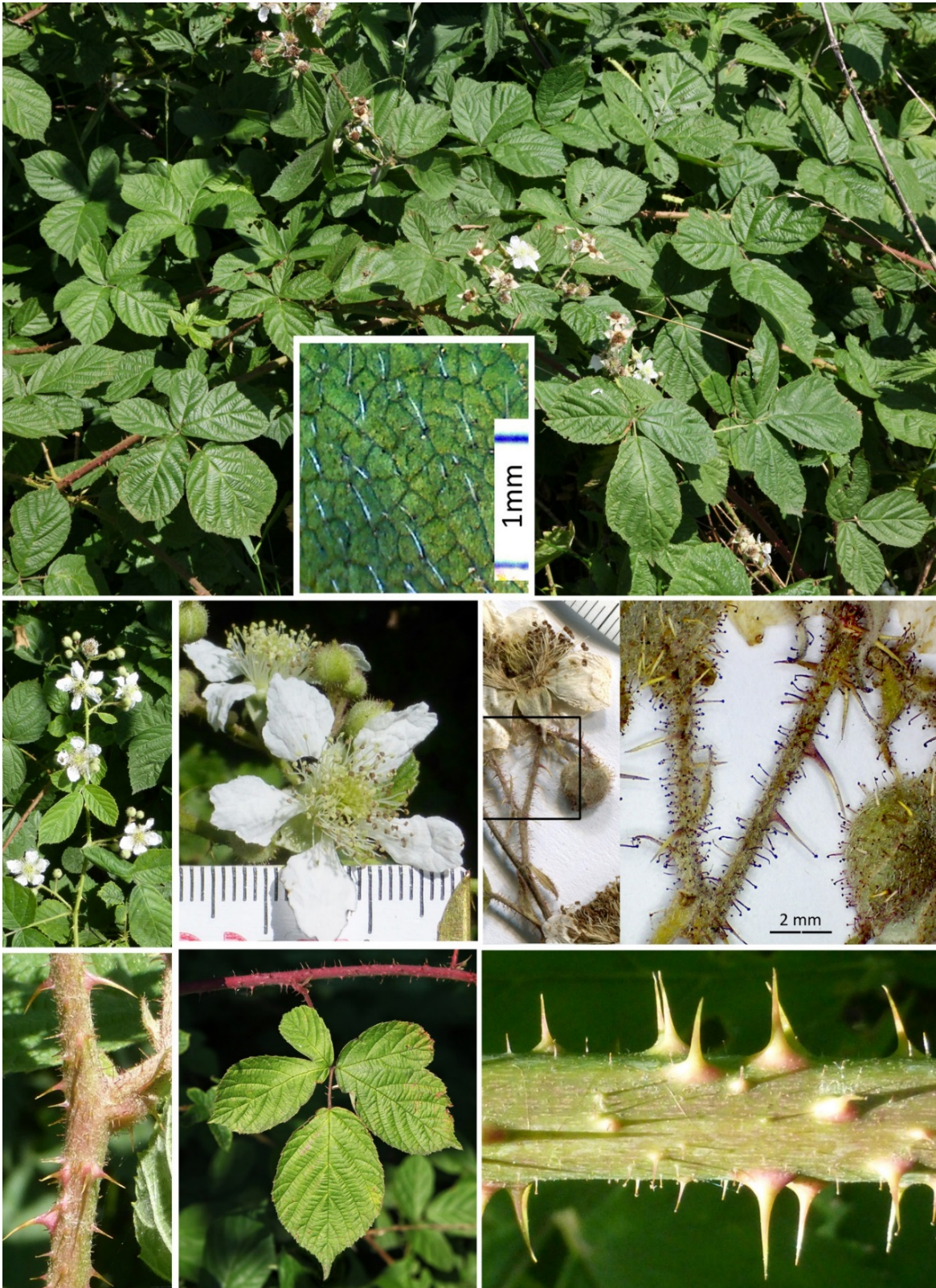


Abb. 5 Kennzeichen von *R. pseudoglotta* an der Typus-Lokalität 450 m östlich Altwittenbek. Fotos D. Drenckhahn  
Fig. 5 Characteristics of *R. pseudoglotta* from the type locality 450 m east of Altwittenbek.

**Deutschland/Schleswig-Holstein** 1325-411, N Großgrödersby, Straßen-E-Seite (R 3559457/H 6057647), 14.07.2011 (Herb. Jansen 110710.3), G.-U. Kresken/H.-O. Martensen. – 1325-411, N Großgrödersby, Straßen-W-Seite (R 3559441/H 6057641), 14.07.2011 G.-U. Kresken/H.-O. Martensen. – 1624-423, S Ehlersdorf, Redder (R 3551768/H 6022798), 02.09.2005 (Herb. Jansen 05902.1), G.-U. Kresken/W. Jansen. – 1626-11, E Wulfshagen, Str. Teepott, (Herb. Jansen, leg. E. Walsemann 79817.2, det. Martensen) – 1626-112, NE Wulfshagen, 24.08.1980 H.-O. Martensen (Herbar Weber 24.8.80/4) – 1626-112, NE Blickstedt, 24.08.1980 H.-O. Martensen (HBG 1294/09). – 1626-112, NW Blickstedt, Straßen-SW-Seite (R 3567165/H 6029673), 11.07.2011 (Herb. Jansen 110711.4), G.-U. Kresken/W. Jansen (Hinweis von H.-O. Martensen). – 1626-112, NW Blickstedt, Straßen-NE-Seite (R 3567146/H 6029703), 11.07.2011 G.-U. Kresken/W. Jansen. – 1626-112, NW Blickstedt, Straßen-S-Seite (R 3566696/H 6029953), 11.07.2011 G.-U. Kresken/W. Jansen (Hinweis von H.-O. Martensen). – 1626-121, S Felmerholz, Straßen-E-Seite (R 3568689/H 6029336), 11.07.2011 (Herb. Jansen 110711.3), G.-U. Kresken/W. Jansen (Hinweis von H.-O. Martensen). – 1626-121, SW Felmerholz, Straßen-N-Seite (R 3567856/H 6029542), 11.07.2011 G.-U. Kresken/W. Jansen. – 1626-121, SW Felmerholz, Straßen-N-Seite (R 3567887 / H 6029540), 11.07.2011 G.-U. Kresken/W. Jansen. – 1626-121, SW Felmerholz, Straßen-S-Seite (R 3567947/H 6029505), 11.07.2011 G.-U. Kresken/W. Jansen. – 1626-123, SE Blickstedt, SE-Rand Grothmoor, Straßen-NW-Seite (R 3568790/H 6027993) 11.07.2011 (Herb. Jansen 110711.2), G.-U. Kresken/W. Jansen (Hinweis von H.-O. Martensen). – 1626-141, SE-Rand von Altwittenbek (R 3568377/H 6026593), 30.08.2009 (Herb. Jansen 090830.2), G.-U. Kresken/W. Jansen (Hinweis von H.-O. Martensen). – 1626-141, SE Altwittenbek, am Kanal, Redder (R 3568901/H 6026280), 30.08.2009 (Herb. Jansen 090830.3), G.-U. Kresken/W. Jansen (Hinweis von H.-O. Martensen). – 1626-141, E Altwittenbek, Wegabzweigung von der K90 (R 3568957/H 6027067), 30.08.2009 G.-U. Kresken/W. Jansen (Hinweis von H.-O. Martensen). – 1626-141, E Altwittenbek (R 3568808/H 6027046), 30.08.2009 G.-U. Kresken/W. Jansen (Hinweis von H.-O. Martensen). – 1626-144, W Suchsdorf, bei der Schmiedekate (R 3569520/H 6025425), 01.09.1980 H.-O. Martensen (HBG 1294/04), 30.08.2009 (Herb. Jansen 090830.5), G.-U. Kresken/W. Jansen. – 1626-231, Projensdorfer Wald nordöstlich Suchsdorf, Waldrand (R 3570787/H 6026672), 30.08.2009 (Herb. Jansen 090830.6), G.-U. Kresken/W. Jansen. – 1626-321, Ottendorf, E-Rand, Straßen-SE-Seite (R 3568795/H 6023850), 01.09.1980 H.-O. Martensen (HBG 1294/04, und Herb. Jansen 110708.7), 08.07.2011, G.-U. Kresken/W. Jansen. – 1626-321, N Ottendorf, Straßen-E-Seite (R 3568062/H 6024390), 11.07.2011 (Herb. Jansen 110711.1), G.-U. Kresken/W. Jansen (Hinweis von H.-O. Martensen). – 1626-322, N Kronshagen, Viehdamm, 01.09.1981 H.-O. Martensen (HBG 1294/07). – 1626-332, Melsdorf (R 3567279/H 6020797), 08.07.2011 (Herb. Jansen 110708.6), G.-U. Kresken/W. Jansen. – 1626-411, Kopperpahl N Kronshagen (R 3570605/H 6024695), 01.09.1980 H.-O. Martensen (HBG 1294/9), 08.07.2011 (Herb. Jansen 110708.8), G.-U. Kresken/W. Jansen. – 1726-121, N Mielkendorf, Ihlkate, Straßen-S-Seite (R 3568806/H 6018982), 08.07.2011 (Herb. Jansen 110708.4), G.-U. Kresken/W. Jansen (Hinweis von H.-O. Martensen). – 1726-312, N Rumohr, Juli 1981 A. Pedersen (HBG 1294/04). – 1726-141, E Rumohr, NW Streitberg, Redder (R 3568300/H 6015215), 13.07.2009 (Herb. Jansen 090609.2), G.-U. Kresken/W. Jansen

(Hinweis von H.-O. Martensen). – 1726-222, Kronsburg, N Hopfenlandsberge (R 3575226/H 6018781), 08.07.2011 (Herb. Jansen 110708.3), G.-U. Kresken/W. Jansen (Hinweis von H.-O. Martensen). – 1726-224, Kiel, E Kronsburg, Gewerbegebiet, Knick (R 3575860/H 6017343) 08.07.2011 (Herb. Jansen 110708.2), G.-U. Kresken/W. Jansen (Hinweis von H.-O. Martensen). – 1726-232, S Meimersdorf (R 3572606/H 6015350), 07.07.2010 (Herb. Jansen 100707.7), G.-U. Kresken/W. Jansen. – 1726-241, ESE Meimersdorf, an der K 16, Knick (R 3573726/H 6016195), 07.07.2010 (Herb. Jansen 100707.5), G.-U. Kresken/W. Jansen. – 1726-311, Knick S Bornhorst bei Rumohr (SW Rumohr) (R 3565799/H 6013352), 13.07.2009 (Herb. Jansen 090713.3 und 100707.4), G.-U. Kresken/W. Jansen. – 1727-131, S Wellsee, NW Rönne (R 3576258/H 6016398), 08.07.2011 (Herb. Jansen 110708.1), G.-U. Kresken/W. Jansen (Hinweis von H.-O. Martensen).

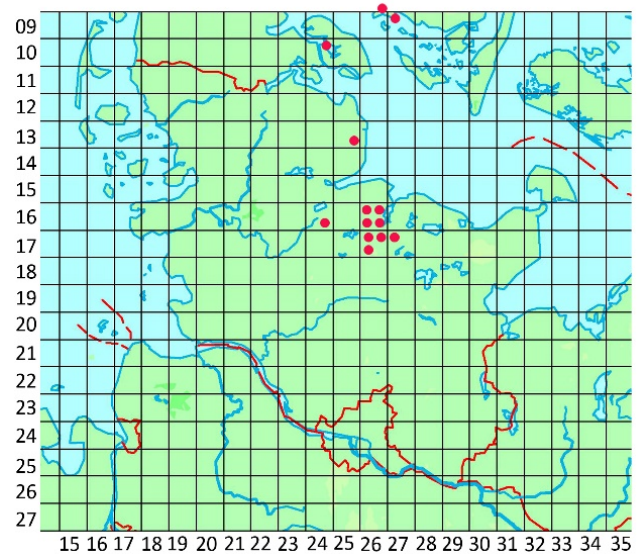


Abb. 6 Bekannte Verbreitung von *R. pseudoglotta*, dargestellt auf der Grundlage von Quadranten der topographischen Karten 1:25.000.

Fig. 6 Known distribution of *R. pseudoglotta* mapped on the basis of the topographical map grid 1:25.000 at quadrant resolution.

## Diskussion

*Rubus pseudoglotta* wurde bisher in den recht weit gefassten *R. phylloglotta* einbezogen (Weber 1981 verweist u.a. auf den in Abb. 2 gezeigten Beleg von O. Gelert als zu *R. phylloglotta* gehörig) und auch Martensen (2011) zählte die in der vorliegenden Untersuchung als *R. pseudoglotta* abgegliederte Art noch zum Variabilitäts-Spektrum von *R. phylloglotta*. Das war rückblickend gesehen sinnvoll, weil dadurch eine erste Systematik in die Sektion *Corylifolii* gebracht und die Aufmerksamkeit und Sammeltätigkeit betreffend *R. phylloglotta* gefördert wurde, so dass jetzt auf einer verbesserten Kenntnisbasis Revisionen vorgenommen werden können.

Ein Vergleich von Abb.1 (*R. phylloglotta*) mit den Abb. 2–5, 7 (*R. pseudoglotta*) zeigt die besonders ins Auge fallenden Unterschiede in der Blattform: *R. phylloglotta* hat im Vergleich zu *R. pseudoglotta* schmalere und mehr allmählich zugespitzte Endblättchen mit einem Achsenverhältnis (Längsachse/Querachse) von  $1,72 \pm 0,05$  (1,4–2,0;  $n=18$ ) versus  $1,35 \pm 0,02$  (1,1–1,6;  $n=63$ ) bei *R. pseudoglotta* (hoch signifikanter Unterschied von  $p \ll 0,01$ ). Die oberen Seitenblättchen sind bei *R. phylloglotta* meistens  $>5$  mm



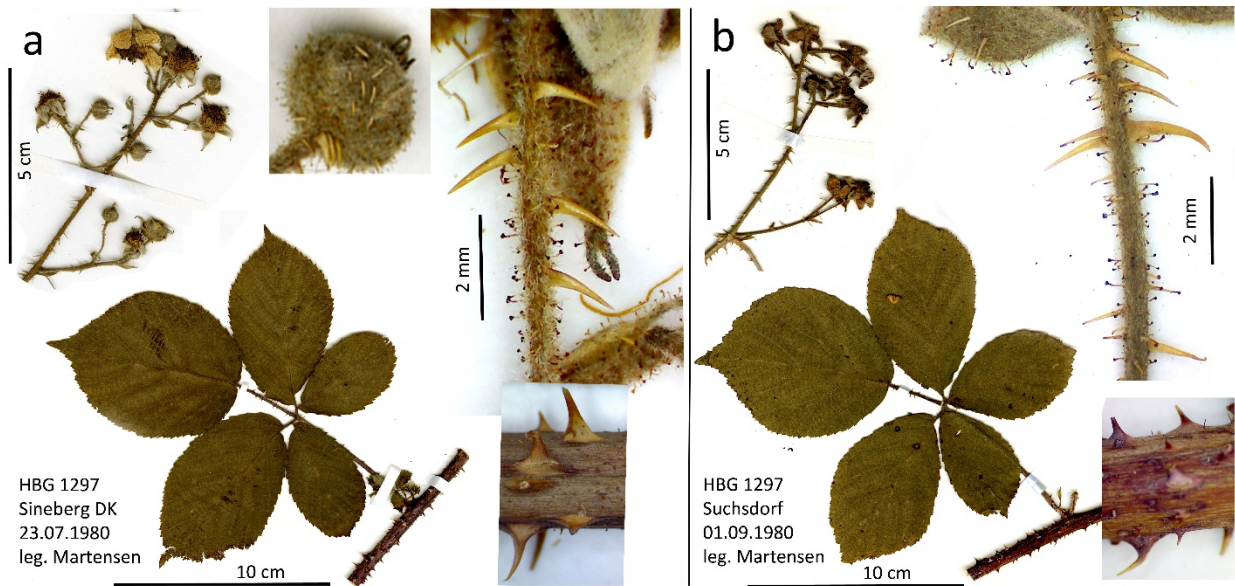


Abb. 7 Herbarbelege (Ausschnitte) von *R. pseudoglotta* von (a) der Insel Fünen (Fyn), Dänemark (Sineberg Wäldchen, leg. H.-O. Martensen HBG 1297/08), der alle Merkmale der Art vereinigt und (b) ein fast identisch aussehender Beleg vom selben Jahr westlich von Kiel/ Schleswig-Holstein (Suchsdorf, leg. H.-O. Martensen HBG 1297/04).

Fig. 7 Herbarium specimens (parts) of *R. pseudoglotta* from (a) island of Fyn, Denmark (Sineberg Grove, leg. H.-O. Martensen HBG 1297/08) which displays all characteristics of this species and (b) a specimen with nearly identical features from west of Kiel/Schleswig-Holstein (Suchsdorf, leg. H.-O. Martensen, HBG 1297/04).

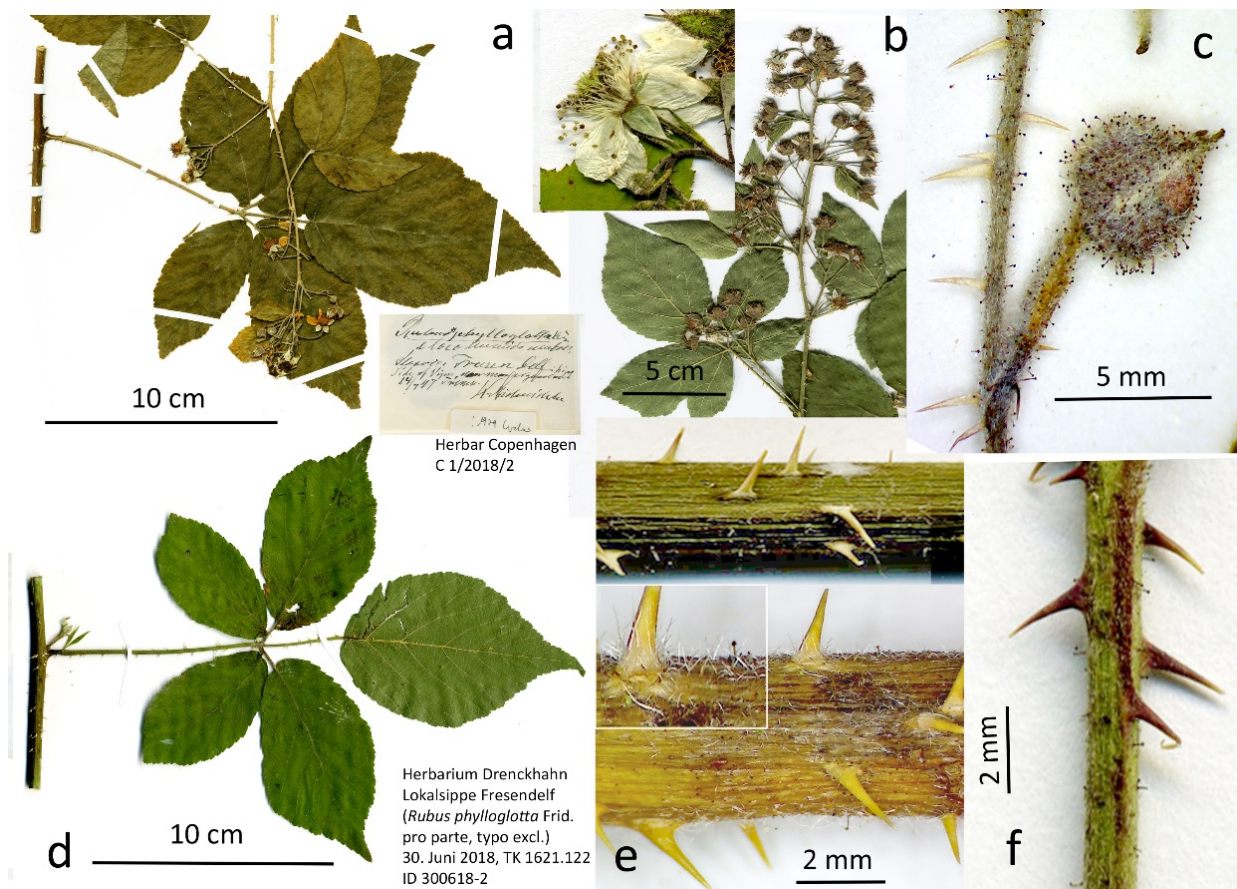


Abb. 8 Fresendelfer Lokalsippe, die bislang *R. phylloglotta* zugerechnet wurde. (a) Blatt und (e) (unten) Schössling eines Herbarbeleges (C 1/2018/2) von K. Friderichsen vom 14.7.1897, als *Rubus phylloglotta* benannt. (b-d, f) und (e) (oben) zeigen Teile einer Pflanze vom Fresendelf von Ende Juni 2018.

Fig. 8 Local bramble 'Fresendelf' which was previously attributed to *R. phylloglotta*. (a) leaf and (e) (lower panel) show parts from a herbarium specimen collected by K. Friderichsen on 14.7.1897 and named by him *Rubus phylloglotta*. (b-d, f) and (e) (upper panel) are parts of a specimen from Fresendelf collected end of June 2018.



Abb. 9 Lokalsippe „Schwabstedt-Ostenfeld“, die bislang *R. phylloglotta* zugerechnet wurde. Fotos D. Drenckhahn  
 Fig. 9 Local bramble variety ‘Schwabstedt-Ostenfeld’ which was previously attributed to *R. phylloglotta*.

gestielt, bei *R. pseudoglotta* fast sitzend (<3mm). Die Endblättchenserratur ist bei *R. phylloglotta* meistens schwach periodisch, und die Art hat stark behaarte Schösslinge (>40 Haare/cm Seite, oft bis in das äußere Drittel der Stacheln reichend), während bei *R. pseudoglotta* die Schösslingsbehaarung schwach ist (bis 10 Haare/cm Seitenfläche) und später abschnittsweise völlig verschwindet. Nadelstacheln fehlen auf den Kelchblättern von *R. phylloglotta* (nur an der Basis gelegentlich einige) und sind bei *R. pseudoglotta* reichlich vorhanden.

In den Verbreitungskarten von Martensen et al. (1983), Martensen (2011) und Jansen (2013) sind auch Funde von *R. phylloglotta* auf der Geest zwischen Husum und Schwabstedt eingetragen. Nach derzeitigem Kenntnisstand handelt es sich dort um zwei unterschiedliche Lokalsippen, die sich deutlich von *R. phylloglotta* und auch *R. pseudoglotta* unterscheiden:

**1. Lokalsippe „Fresendelf“** (Abb. 8). Diese Sippe wurde bereits am 14. Juli 1897 von Friderichsen bei Fresendelf (Schleswig-Holstein) aufgesammelt und von ihm als *R. phylloglotta* bezeichnet (C 1/2018/1, -2, -3, -7, -8, -9, -10), noch bevor 1913 N. Sörensen den Typus auf Tåsinge in Dänemark gesammelt hatte. Die Fresendelfer Sippe unterscheidet sich deutlich von *R. phylloglotta* und *R. pseudoglotta*, vor allem durch die Blattmorphologie, die flache ( $\pm 1$  mm) Serratur mit breittlichen mucronulierten Zähnen, einen lang ausgezogenen, oft gedrehten, schiefen Spitzenbereich, die kleinen ( $\leq 3$ mm), einheitlich geneigten, schlanken Hauptstacheln der Schösslinge. Von *R. pseudoglotta* und der Schwabstedt-Ostenfelder Lokalsippe unter-

scheidet sich die Fresendelfer Lokalsippe weiterhin durch eine dichte Schösslings-Behaarung.

**2. Lokalsippe „Schwabstedt-Ostenfeld“** (Abb. 9): Diese ebenfalls lang zungenblättrige Sippe ist über eine Strecke von 5,5 km im Dreieck zwischen Fresendelf, Schwabstedt und Ostenfeld verbreitet. Sie steht *R. hystricopsis* (Frid.) Å. Gust. nahe mit einem dicht stacheligen borstigen Blütenstand und unterscheidet sich schon dadurch von *R. phylloglotta*. Sie erinnert durch die reich bestachelten Achsen mit vielen drüsenköpfigen Borsten und Stacheln an stachelreiche Ausprägungen von *R. pseudoglotta*, aber unterscheidet sich von diesem vor allem durch die lang ausgezogenen Endblättchen und deren enge Serratur. Der DNA-Gehalt (2C-Wert) von zwei Pflanzen von verschiedenen Wuchsorten bei Hollbüllhuus betrug 1,53 und 1,54 pg. Es handelt sich demzufolge auch um eine tetraploide Sippe ( $2n=28$ ) wie *R. phylloglotta* und *R. pseudoglotta*.

**Schlussfolgerung** Aus den Untersuchungen dieser Studie kann gefolgert werden, dass *R. phylloglotta* nicht in Schleswig-Holstein (Deutschland) vorkommt. Ob die *R. phylloglotta* zugerechneten Funde auf der Insel Langeland (Martensen 2011), Süd-Fünen (u.a. C 2/2018/23, leg. N. Sörensen) und nördlich Hadersleben/Haderslev (LD 2001676, leg. K. Friderichsen 1891 – als *R. friesii* bezeichnet – sowie C 2/2018/04, -29 und -34, leg. A. Pedersen 1983) noch in den Variationsbereich des Typus von *R. phylloglotta* von Tåsinge fallen, bedarf weiterer Untersuchungen an den Wuchsorten.

Eine von *R. phylloglotta* deutlich unterschiedene Brombeerart mit deutsch-dänischer Verbreitung und Schwerpunkt des Vorkommens im Umfeld der Stadt Kiel ist der hier eingehend charakterisierte *R. pseudoglotta*.

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Ben J.M. Zonneveld

## The DNA weights per nucleus (genome size) of more than 2350 species of the Flora of The Netherlands, of which 1370 are new to science, including the pattern of their DNA peaks

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**Abstract** Besides external characteristics and reading a piece of DNA (barcode), the DNA weight per nucleus (genome size) via flow cytometry is a key value to detect species and hybrids and determine ploidy. In addition, the DNA weight appears to be related to various properties, such as the size of the cell and the nucleus, the duration of mitosis and meiosis and the generation time. Sometimes it is even possible to distinguish between groups or sections, which can lead to new classification of the genera. The variation in DNA weight is also useful to analyze biodiversity, genome evolution and relationships between related taxa. Moreover, it is important to know how large a genome is before one determines the base sequence of the DNA of a plant. Flow cytometry is also important for understanding fundamental processes in plants such as growth and development and recognizing chimeras. In the literature, DNA weight measurements are usually limited to one genus and often only locally (Siljak et al. 2010; Bai et al. 2012). In this study, however, it was decided to investigate all vascular plants from one country. This can also contribute to the protection of rare plants. This study is the first flora in the world whose weight of DNA per nucleus and peak patterns has been determined. More than 6400 plants, representing more than 2350 (sub)species (more than 90%) have been collected, thanks to the help of almost 100 volunteers of Floristisch Onderzoek Nederland (Floron). Multiple specimens of many species have therefore been measured, preferably from different populations, in some cases more than fifty. For 1370 species, these values were not previously published. Moreover, a good number of the remaining 45% are new for The Netherlands. In principle, each species has a fixed weight of DNA per nucleus. It has also been found that, especially between the genera, there are strong differences in the number of peaks that determine the DNA weight, from one to five peaks. This indicates that in a plant or organ there are sometimes nuclei with multiples of its standard DNA weight (multiple ploidy levels). It is impossible to show graphs of more than 2350 species. Therefore, we have chosen to show the peak pattern in a new way in a short formula. Within most genera there are clear differences in the DNA weights per nucleus between the species, in some other genera the DNA weight is hardly variable. Based on about twenty genera that

were previously measured completely in most cases ('t Hart et al. 2003; Veldkamp and Zonneveld 2011; Soes et al. 2012; Dirkse et al. 2014, 2015; Verloove et al. 2017; Zonneveld [et al.] 2000–2018), it can be noted that even if all species of a genus have the same number of chromosomes, there can still be a difference of up to three times in the weight of the DNA. Therefore, a twice larger DNA weight does not have to indicate four sets of chromosomes. Finally, this research has also found clues to examine further the current taxonomy of a number of species or genera.

**Samenvatting** Naast uiterlijke kenmerken en het lezen van een stukje DNA (barcoding), is het DNA-gewicht per kern (via flow cytometrie) een sleutelwaarde om soorten en hybriden te detecteren en ploïdie te bepalen. Daarnaast blijkt het DNA-gewicht met verschillende eigenschappen samen te hangen, zoals met de grootte van de cel en de kern, de duur van de mitose en meiose en met de generatie tijd. Soms is het zelfs mogelijk om tussen groepen of secties onderscheid te maken, wat tot nieuwe indeling van de geslachten kan leiden. De variatie in DNA-gewicht is ook nuttig om biodiversiteit, genoom evolutie en relaties tussen verwante taxa te analyseren. Bovendien is van belang te weten, hoe groot een genoom is, alvorens men van een plant de base-volgorde van het hele DNA kan bepalen. Flow cytometrie is ook belangrijk voor het begrijpen van fundamentele processen in planten zoals groei en ontwikkeling en het herkennen van chimaeren. In de literatuur wordt het meten van het DNA-gewicht meestal beperkt tot één geslacht en ook nog vaak alleen lokaal. In deze studie is echter besloten om alle vaatplanten van één land te onderzoeken. Dit kan dan ook een bijdrage leveren bij de bescherming van zeldzame planten. Deze studie is de eerste flora ter wereld waarvan het gewicht van het DNA per kern en de piekpatronen zijn bepaald. Hiervoor zijn ruim 6400 planten verzameld die ruim 2350 (onder)soorten (meer dan 90 %) vertegenwoordigen, vooral dankzij de hulp van bijna 100 vrijwilligers van Floristisch Onderzoek Nederland (Floron). Van veel soorten zijn dus meerdere exemplaren gemeten, bij voorkeur uit verschillende populaties, van sommigen wel meer dan vijftig. Voor 1370 soorten zijn dit niet eerder gepubliceerde waarden. Bovendien is van de overige 45 % ook

een flink aantal nieuw voor Nederland. In principe heeft elke soort een vast DNA- gewicht per kern. Er is ook gevonden dat vooral tussen geslachten, er sterke verschillen zijn in het aantal pieken die het DNA-gewicht aangeven, van een tot wel vijf pieken. Dit geeft aan dat in een plant of orgaan er soms kernen zijn met veelvoud van het standaard DNA-gewicht (meerdere ploëdie niveaus). Het is ondoenlijk om grafieken van alle 2350 soorten weer te geven. Daarom is er voor gekozen om het piekenpatroon op een nieuwe manier in een korte formule weer te geven. Binnen de meeste geslachten zijn er duidelijk verschillen in de DNA-gewichten per kern tussen de soorten, in enkele andere geslachten is het DNA-gewicht nauwelijks variabel. Gebaseerd op een twintigtal geslachten die eerder in de meeste gevallen compleet gemeten zijn, kan opgemerkt worden dat ook als alle soorten van een geslacht hetzelfde aantal chromosomen hebben, er toch een verschil tot meer dan driemaal in het gewicht van het DNA kan zijn. Een groter DNA-gewicht hoeft dus niet op meer dan 2 sets chromosomen te wijzen. Tenslotte heeft dit onderzoek ook aanwijzingen gevonden om de huidige taxonomie van een aantal soorten of genera nader tegen het licht te houden.

**Key words:** Genome size, DNA weight, 2C-value, Dutch Flora, peak profiles

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**Abbreviations** Aa/aa: main standard, only mentioned in special cases; Aa15.9: *Agave americana* 'Aureomarginata' 15.9 pg; ad: adventive; A'dam: Amsterdam; Afrik. Pl.: Afrikaander plein; AGS: Alpine garden society UK; arb.: arboretum; BG: Botanical Garden; BZ: B. Zonneveld added; c.: circa, about; CCDB: Chromosome Counts Database; Chl22.8: *Chlorophytum comosum* 22.8 pg; cu: cultivated; E: East; ex: exote; FL: Floron list recognized after 2005; gr: groot/large; haem72: *Haemanthus albiflos* 72pg; hort.: hortorum/from the garden; HT: Heemtuin; k.: kade; kl: klein/small; l.: lane; L.dorp: Leiderdorp; N: North; NDV: Ned. Dendrologische Vereniging; n.c.: Locality not communicated; NHM: Natuurhistorisch museum; NRV: Ned. Rotsplanten Vereniging; NVV: Ned. Varen Vereniging; Nwijk: Noordwijk; pg: 1 picogram = 10<sup>-12</sup> gram, ≈ 978 x 10<sup>6</sup> base pairs; pl.: plein; R'dam: Rotterdam; Sans2.7: *Sanseveria trifasciata* 2.7 pg; seed10x: 10 seeds used; s.l.: sensu lato/in broad sense; s.s.: sensu stricto/in narrow sense; str.: street; v.: veld; Var': variegated leaf; W: West; w.: weg/road; Z: South.

## Introduction

The importance of flow cytometry for all kinds of applications has increased considerably in recent years. The weight of DNA per nucleus and also of separate chromosomes can now be determined. To make this clearer, some basic information may be helpful.

Plants and animals are made up of cells. Each cell contains a nucleus. Each nucleus contains long double strands of DNA made up of four bases, abbreviated with A, T, G and C. These strands are surrounded by proteins. DNA strands + proteins are divided into a number of pieces that are called chromosomes. Chromosomes can vary greatly in size and number in different organisms, so the number of chromosomes is not directly a measure of the weight of DNA in the nucleus. In diploid organisms, each chromosome is present in duplicate, so there are two sets of chromosomes. In most organisms only a limited part of this DNA codes for genes or characteristics. In humans with 7 picograms (pg) of DNA per nucleus, this is less than 2%, representing about 25.000 genes.

A number of alternative, not entirely overlapping terms are used for the weight of DNA per nucleus: weight of DNA per nucleus, quantity of DNA per nucleus, nuclear DNA weight, 2C-value, nuclear weight, genome size and genome weight. See 2x, 2n and 2C below for an explanation. It should be noted that nuclear weight is incorrect because the DNA represents less than 1 permille of the nuclear weight. Here we use the DNA weight or weight of the DNA or just DNA, whereby per nucleus and nuclear are often omitted. A code (e.g. **2C** 4C 8C) has been devised to indicate the number of peaks as seen in the flow cytometer, with the highest peak in bold. These peaks represent the different number of chromosome sets (ploëdies) measured in a sample. Genomic weight is actually 1C, so one set of chromosomes, but is *pars pro toto* also often used for 2C-value. Kew DNA C-values (Bennet and Leitch 2012) is a collection of all published DNA weights of mainly economically important crops with 8700 measurements. It includes many duplicates and measurements with methods other than propidium iodide. The DNA weight can be used for all kinds of applications, especially because it can be determined quickly and relatively cheaply. Commercially, it is usually used to check whether a plant is (has become) polyploid or to determine the number of bases of the nuclear DNA before sequencing.

In this article we want to give an overview of the DNA weights of the Dutch flora, but also reflect on the following questions: Are we dealing with one or two species? Are there differences in DNA weight within or between genera? Does the weight of the DNA mean that the right species is measured? What is the possible other parent of this hybrid? How do the DNA weights relate between plants with different growth habits and environments? What is the relationship between chromosome numbers and DNA weight? What is the relationship between the amount of DNA per chromosome and the number of chromosomes or the weight of the DNA per nucleus? Is there a relationship between peak patterns and the weight of DNA? Can peak patterns be characteristic for families, genera or species?

## Materials

When we talk about the flora, we mean the Dutch vascular plants. These include the seed plants and part of the spore plants (pines, ferns and horse tails). This study focuses on all 2119 names mentioned in the Heukels flora (no 23) of The Netherlands (Van der Meijden, 2005). This has been supplemented with a selection of the 680 species from the online species list of the Dutch Flora (Verspreidingsatlas.nl,

FLORON, as of 2019), which were observed after 2005. Also included are about 400 species, from the list made available by H. Duistermaat, which will be published in the Heukels no 24 and whose DNA weight had already been measured. In the end, 270 species of Heukels list (2019) and 250 of the FLORON list (2019) were not available for the study. This brings the total number of taxa measured to 2350 as of May 2019, from 2586 taxa listed in Table 1. Measurements are still lacking for extinct species, very rare species and hybrids, and recently published species, including many adventitious plants. If we look at the number of genera, the situation is as follows: of 624 genera, all species present in The Netherlands have been measured; of 115 genera not all present species have yet been measured and of 22 genera not a single species has yet been measured. The latter 22 are, probably not by chance, all monotypic for The Netherlands. In total there are 762 genera of which from 739 genera (97 %) at least one species has been measured. Many species, especially the common ones, were collected by the author. In addition, almost 100 volunteers of Floron (see supplement) helped to collect living material, especially from the rare species. In principle, an attempt was made to use as much 'field-collected' material as possible. If this was not possible, material from botanical gardens was also used, as indicated in the supplement. Some hard-to-obtain species were collected abroad. If later a wild Dutch plant did become available, it was exchanged or supplemented with the foreign species. There are also 75 species in the Heukels flora (2005), which are extinct in The Netherlands. So far, a third of these have been measured.

Checking the correct name of the plants has been done as follows: 1. Checking the morphology of the plant using the Heukels flora and for as far as possible, also by expert colleagues, like H. Duistermaat, the writer of the new Heukels flora. 2. In principle, the large local knowledge of the cooperating volunteers of FLORON was taken as the starting point 3. Comparing the DNA weight with the same and different species within the genus, both our own measurements and what can be found in the literature (Bennet and Leitch 2012). 4. Comparison with known chromosome numbers. 5. Comparison with peak patterns of previously measured plants 6. In case of doubt, plants are collected and measured again, preferably also from other locations.

More than 700 vouchers were made from species collected by G. Dirkse, S. Gongrijp and F. Adema, for example. Also H. Duistermaat has made vouchers of some measured plants. Unfortunately, vouchers could not be made for all of them. Often a single leaf or a few seeds were available, too few for a meaningful voucher. If entire plants had been asked for a voucher, florists would not have been able to collect all kinds of rare species, which of course should not been pulled out.

Occasionally only seeds were available. One or more of these were measured, depending on the size. The remaining seeds were sown to identify the species further and to measure the plant itself. The seeds of 250 species were measured (barely in Table 1), but this gives a separate problem. In principle, you get a diploid 2C peak of the young plant, the embryo, and a triploid 3C peak of the reserve food, the endosperm (Fig. 1b) (the endosperm in conifers is 1C, i.e. haploid). However, sometimes there is only one peak, because the embryo is dead or because no nuclei can be isolated from the endosperm and then it is not easy to decide whether nuclei were extracted from the embryo of the endosperm. If earlier measurements show

that we only measure endosperm, the result for the endosperm is multiplied by 2/3. This is especially true for very fine seeds. For larger seeds, the embryo can often be separated from the endosperm. Incidentally, nuclei from six-year-old seeds of *Heracleum sosnowskyi* could still be isolated. This could mean that it might be worth testing this for rare species, which are present with seed in the herbarium. As long as there is germination, whole nuclei must still be present

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## Methods

The method to determine the DNA weights of the nuclei is most extensively described in Verloove et al. 2017, and is summarized below. A small piece of leaf, leafstalk, bark, root or seed is finely chopped together with a standard and buffer (changed from Bharathan et al. 1994) with a razor blade. One cm<sup>2</sup> alive, so not necessarily fresh=newly picked leaves etc. is sufficient. The DNA in the nuclei is made fluorescent with propidium iodide, after which the whole suspension is filtered over a 20 µm (1µm=10<sup>-6</sup> m) filter. The more DNA there is per nucleus, the stronger the fluorescence of the DNA. An alternative staining is with DAPI. This is usually used by commercial companies to determine the ploidy. This fluorescence, unlike the propidium iodide used here, works only on the A and T bases instead of all four bases of the DNA. DAPI only indicates how many times the DNA of one species fluoresces more than another species, so a relative value, but not the absolute weight. This is caused by the fact that the total A-T content of the DNA between species can vary from 40 to 70 %. In *Arabidopsis thaliana* we find for example 58.6 % and in *Allium cepa*, the onion 70 % A-T.

After half an hour, the fluorescence of 1000–5000 nuclei in the suspension is measured in a few minutes using the flow cytometer. This is repeated after one hour. Almost all measurements are done with the flow cytometer of Becton-Dickinson-Accuri C6. For 131 species I have chosen from more than 6000 measurements made with the previous Partec flow cytometer (measurements made before 1–5–2012), due to lack of new material. Checks indicated that there is hardly any difference between the two devices.

As standard plant almost always *Agave americana* 'Aureomarginata' 2C=15.9 pg was used. Exceptions are for ferns, *Artemisia* etc., for which *Agave attenuata* 2C=7.9 pg was used. The reason is that the DNA weight of some genera more or less coincides with the most commonly used standard *A. americana*. *Clivia miniata* 2C=38.0 pg is used as standard for tulips and *Haemanthus albiflos* 2C=72.0 pg for *Fritillaria*, because these standards are closer to the unknown.

If several individuals of a species have been measured and the values were close together, the average is calculated for Table 1. The error margin of most measurements is +/- 2 %. Deviating DNA weights and possible polyploid plants (indicated by the symbol #) can be found in Table 2. The ploidy cannot be determined directly from the DNA weights and the tems derived or inferred ploidy must be used. The weight of the DNA per nucleus is expressed in picogram (pg). Although DNA is also present in the many mitochondria and chloroplasts, this is hardly a problem, because these organs have only short pieces of DNA of a few hundred bases. RNA also fluoresces with propidium iodide, but this does not pose a problem, because the buffer contains a RNA-degrading

enzyme. One can convert the DNA weight to the number of base pairs, where 1 picogram ( $10^{-12}$  gram) equals 978 Mbp=978 million base pairs (Doležel et al. 2003). Examples are *Arabidopsis* with 0.32 pg DNA per nucleus, humans with almost 7 pg and *Galanthus nivalis* with 72 pg. There is hardly any relationship of the DNA weight with the complexity of an organism. Even if within a genus all species have the same number of chromosomes, there can be a factor up to 3 (or more) difference in the DNA weight (see also Fig. 5). One may wonder whether it also happens that plants differ in the number of chromosomes (by splitting or fusing) but still have the same DNA weight. The frequency of this can perhaps be deduced from those cases where a number of close chromosome numbers for a species are mentioned, for example  $2n = 30, 32, 34, 36, 40$  in *Erophila*.

### General Remarks

**Flow cytometry** The DNA weight per nucleus, as it can be determined by flow cytometry, is a useful third way and sometimes a key value to distinguish between species. In a number of cases, especially when a larger number of plants per species were available, there sometimes appears to be variation within a species. This is considered when discussing the individual genera.

To understand the significance of DNA weight (genome size), you can compare it with the question which of the books in a pile are the same. With barcoding, for example, you can read line 10 on page 20. If two identical lines are found, we are dealing with the same book. With flow cytometry you weigh the books and if there are two books of 273 grams, it almost certainly also involves two identical books. The advantage of flow cytometry is that it is faster and cheaper. The disadvantage is that living material is needed, while barcoding can work with dried material. In addition, DNA weights don't indicate in principle any relationships. However, related species also often appear to have similar DNA weights. Flow cytometry can therefore lead to a genus being split into different genera, as happened with the succulent plants *Haworthia* and *Aloe* (Zonneveld 2002, 2015c). Barcode reads pieces of DNA from a few hundred bases and determines the order of the four letters (bases). It can that way distinguish between individuals and make a pedigree. However, how big must the difference be between the read pieces of DNA to name two plants as separate species: 3% difference, 10% difference etc.? In yeast, with hardly any usable morphological characteristics, one has solved it arbitrarily by calling a yeast as a separate species if between two (closely related) species the DNA sequence differs by more than 20%. That's also the difference between man and mouse! However, humans and chimpanzees differ less than 5% in their DNA sequences. Sometimes, within a genus, there are species with a strong discrepancy between the number of chromosomes counted and the DNA weights measured. This is sometimes, but not always, an indication that the aberrant species belongs in a different genus. Examples are *Alyssum* (now *Aurinia*) *saxatile* and *Orobanche purpurea* (now *Phelipanche*).

It is striking that none of the more than 2350 measured species has less DNA than *Arabidopsis* with 0.32 pg. *Arabidopsis thaliana* was once chosen as a research object because of its small genome, its rapid growth, 6 weeks from seed to seed, many seeds, small stature and the possibility to grow it in large numbers in a small space (Kornneef and Meinke 2010) and the

efficient transformation methods using *Agrobacterium tumefaciens* (Vergunst et al. 1998). I had the impression of annual plants, which are usually fast growers, that they have little DNA. This seems to be confirmed in Table 4. However, when annual plants are compared with perennials, both for monocotyls and dicotyls you get a completely different picture. This is due to the large number of sedges (*Carex* spec.), perennials with little DNA. On the other hand, it is due to the very high values found for the species of the *Liliales* and *Asparagales*. The species with little DNA often have "as compensation" multiple peaks/ploidies (more than two sets of chromosomes) in nuclei of different organs such as in the leaf, the more active part of a plant.

To place the determination of the DNA weights of plants in a slightly broader context: Mosses, also plants, of which there are also about 160 species measured (not yet published) vary from 0.2 to 2.5 pg. It should be noted that the DNA contents of 80% of the mosses is below 1 pg, whereas for higher plants this applies to only 14% of the species. Also interesting is that *Riccia*, a liver worth, has with  $n=8$ , 0.77 pg and *R.* (subsp.?) *rhenana* with  $n=16$ , 1.21 pg. Although no plants, it is interesting for comparison (e.g. for the author, because the genetics of both species have been worked on for 15 years) to mention that according to the literature the fungus *Aspergillus nidulans* has 0.029 pg ( $n=8$ ) and milk yeast, *Kluyveromyces lactis*, has 0.011 pg DNA ( $n=6$ ) per nucleus. So roughly 10 to 30 times less than *Arabidopsis thaliana*, the plant with the lowest amount of DNA per nucleus of the Dutch vascular plants (0.32 pg).

**Hybrids** Many species are known that have diploid and tetraploid or higher cytotypes or 'chromosome strains'. These occur in nature not only through direct chromosome doubling. Another way of forming tetraploids is the formation of unreduced or  $2n$  gametes. In a diploid plant, the unreduced  $2n=2x$  gamete does not have half of the diploid number of chromosomes ( $x$ ) but the parent number  $2x$ . Although this can occur in two species simultaneously, it seems less unlikely, unless they are self-pollinators. There are also exceptions when an entire population tends to form unreduced gametes. This can occur when exceptional environmental factors, such as sudden heat or cold, occur. If it occurs in a diploid plant, a triploid plant will develop after cross fertilization. This hybrid is usually sterile, unless it forms again a unreduced, now triploid ( $=3x$ ), gamete. Fertilized with the haploid ( $x$ ) gamete of one of the parents, this results in a more or less fertile autotetraploid ( $4x$ ). If that doesn't happen, the triploid usually dies out. In some cases, however, the triploids can propagate vegetatively and can then be very successful (locally). This vegetative reproduction, often by stolons or by apomixis, is relatively common in triploids, because these are the only ones that can multiply despite the triploidy. Tetraploids originate mainly from crossing tetraploids with diploids that produce  $2x$  gametes. Another possibility is vegetative reproduction via apomixis. Seed is still formed, from maternal tissue often after pollen stimulation (not fertilization). The offspring is identical to the mother plant. It is often wrongly thought that species cannot cross, because the number of chromosomes is different or because the ploidy is different. In crosses between diploids and tetraploids of the same species, but also between different species, the following situations can be encountered: 1. They do not cross 2. They do cross but the triploid is sterile (the

survivors multiply vegetatively or via apomixis). 3. The triploid gives some seedlings, such as *Hyacinthoides hispanica x non-scripta* (Zonneveld, not published). In triploid *Hosta*, the offspring usually have lost quite a few chromosomes, which causes them to return more or less to the diploid state (Zonneveld and Pollock 2012 a, b). 4. Sometimes two diploid parents that are not easy to cross, turn out to form a hybrid, but this one is often triploid. 5. The diploid and the tetraploid cross and in one step a tetraploid is formed, because the diploid plant makes 2x gametes. 6. If both diploid parents make unreduced gametes, a tetraploid hybrid can occur in one step (e.g. *Aesculus x carnea*). Usually crosses between diploids and tetraploids do not appear to be such a problem, although the hybrid is often sterile. If two species do not cross, this may indicate that the parents are not so related and that the genomes cannot cooperate with each other, or with the chloroplasts or with the mitochondria. However, if there is a complete, for example geographical separation, no crossing barriers are built up or may be lost. Then the resulting species can often, even after a long time, cross normally, as shown by crosses between some Euro-Asian and American species. When a species splits into two populations, but the populations still grow close together, they tend to build up crossing barriers. Crossing barriers can occur at all levels. I found a nice example when making crosses with the cactus *Echinopsis*. 1. The pollen does not germinate on the stigma, i.e. there is no fertilisation and the whole flower falls off after a few days. 2. There is a normal cherry-sized fruit, but it contains no seeds. 3. The fruit does contain seeds but they do not germinate. 4. The seed does germinate but the seedlings all appear to be chlorotic (yellow-green) and almost always die. This is because the nuclear genome of one parent does not work well with the chloroplast genome of the other parent 5. The hybrid is formed, but appears sterile.

Hybrids often have characteristics of both parents. However, this is not always the case. If one parent has a high ploidy level and the other does not, there are hardly any characters visible in the hybrid from the plant with the low ploidy level as in hybrids with *Sedum suaveolens* which is 20-ploid. It is then prudent to take the low ploidy parent as the female parent. It also depends on whether a characteristic inherits dominant, recessive or intermediate. This is difficult to predict when crossing species. When crossing a species with naturally white flowers and a species with red flowers, the hybrid can be red, white or intermediate pink. The general opinion seems to be that two cytotypes must not only differ morphologically but also geographically, ecologically or reproductively in order to be named separately. But then there is the question: two separate subspecies or two species. Based on my own observations, among other things based on tens of years of thousands of crossbreeding experiments with all kinds of plants and fungi, I will give two examples. The ivy *Hedera helix* occurs as diploid, especially in the forests, and as tetraploid (*Hedera hibernica*), mainly planted and originating from the Atlantic coast. They are clearly different: *H. hibernica* has larger, less incised and less marbled leaves and tends less to climb and bear less fruit. They are often not considered as separate species. On the other hand, the value of hairiness or blue/grey leaf colour can be questioned. In the succulent *Echeveria* many crosses have been made. Here these characteristics appear to be based on one or two genes. It would not surprise me if this applies to several other species. Yet

species are often distinguished on these characteristics. Also the environment can have a strong influence on these characters. An *Elymus (Elytrigia) atherica* with strong blue-grey leaves from the banks of the Grevelingen meer, gave after a few weeks in the garden a new, but plain green leaf.

For a geneticist it is striking that hybrids are sometimes referred to as (sub)species. Examples are:

- (a) *Nymphaea x candida* (*N. alba x N. tetragona*) as *N. alba* subsp. *candida*
- (b) *Aesculus x carnea* (*A. hippocastaneum x A. pavina*) as *A. carnea*.
- (c) *Spartina x anglica* (*S. alternifolia x S. maritima*) doubled, as *S. anglica*.

On the other hand, for example *Oenothera x fallax* and *Crocus x stellaris* are presented as hybrid.

### Chromosome number and DNA weight

The difference between 2n, 2x and 2C is as follows. 2n and 2x refer to the number of chromosomes per nucleus, i.e. the number of pieces in which the DNA is divided.

(a) (1)x is one set of chromosomes, 2x is two sets, 3x is three sets etc.

(b) 2n is the number of chromosomes in a somatic nucleus and can refer to different ploidies, it can contain two or more sets of chromosomes. So for a diploid: 2n=2x, for a triploid: 2n=3x, for a tetraploid: 2n=4x, etc. Nuclei of gametes, i.e. pollen grains and egg cells usually have half of the parental number of chromosomes, indicated by (1)n. Sometimes this number is not halved. These are called 2n gametes (unreduced gametes or gametes with the parental chromosome number). This is an important cause of the formation of polyploids.

(c) 2C refers to the weight of DNA per somatic nucleus, and this is independent of the number of chromosomes. Again, we can distinguish between 2Cn=2Cx=diploid and 2Cn=4Cx is a tetraploid etc. The distinction between 2Cn and 2Cx is not often used. We usually speak of 2C-value or DNA weight or genome size per somatic nucleus and 'per somatic nucleus' is usually omitted. The 2C in Table 1, for instance, says nothing about the ploidy, but indicates the DNA weight of the nuclei with the lowest ploidy level present. It is often the only peak or the peak with the lowest, basal ploidy when there are multiple peaks. In Fig. 1 and 2 eight common DNA patterns are given, as seen in the flow cytometer. 2C can be any ploidy here, including triploids and aneuploids (incomplete sets of chromosomes). If one 2C-value is measured for a species and there are for example three possible chromosome numbers, it cannot be decided which ploidy is applicable. Usually we see that with autotetraploids the weight of DNA per nucleus is slightly less than twice the diploid weight (genome downsizing; Simonin et al. 2018). That is because, if all chromosomes and thus genes are present four times, loss of some genes or even chromosome (parts) does not have to lead to problems. However, also the 'release' of transposons in the new cell environment and a subsequent DNA increase cannot be excluded. Nor can a change in the regulation (strength) of a gene be ruled out. A good example is *Narcissus poeticus* which has a very small corona (1.5 cm diameter) with a (partial) red color. After a strong selection process, this has eventually led to daffodils that have a large red corona. This is probably because the regulation of the gene for red is no longer limited to a small part of the corona.



### Pitfalls

1. If there are two species of the same genus with an unknown number of chromosomes, one with a DNA weight of 10 pg, the other with 20 pg, there are two possible explanations: (a) The species with 20 pg is the tetraploid form, so it should have twice as many chromosomes. (b) The species with 20 pg has the same number of chromosomes but each with double the DNA content and is a different species. If the chromosome numbers are not known, it is not easy to decide between the two possibilities. Even if chromosome numbers are known, this does not always lead to an unequivocal conclusion. For *Ruppia cirrhosa* that is known to have  $2n=20$ , 40 or 60 chromosomes, twice as much DNA has been measured as for *R. maritima* with  $2n=20$ . From this it seems easy to deduce that the measured plant of *R. cirrhosa* has  $2n=40$  chromosomes. However, a factor 2 difference with the same numbers of chromosomes is common in many genera, so the above conclusion is not justified. Based on the DNA weight it is not possible to determine the ploidy level of a certain population of *R. cirrhosa*. In other words: determining the variation in ploidy levels can only be done when populations within the same species are compared.
2. One can only determine the exact ploidy level if earlier plants from the same species from a known ploidy level have been measured.
3. Even if within a genus all species have the same number of chromosomes, there can be a factor up to three difference in the weight of the DNA (e.g. *Helleborus*, Zonneveld 2001).
4. If only one peak is seen, after chopping together standard and unknown species, it may be that there were no nuclei isolated from the unknown species. It is also possible that both coincide exactly.
5. One should also be aware of species that apparently have twice as much DNA as the standard. It may be that the first peak coincides with the standard.
6. There is sometimes some background noise. If the first peak is very small, it could happen that it does not exceed the noise. You then measure the first peak you see, unaware of the fact that it is actually the second peak with twice as much DNA. A more definitive answer can be obtained by checking previous measurements, a different plant part or a different standard.
7. Finally, another standard was used when the peak of a species with a single peak was so close to the standard that it could not be determined which one was the peak of the standard and which of the unknown.

### Reasons for measuring nuclear DNA weight (genome size) by Flow Cytometry

1. It can show derived polyploidy (triploids, tetraploids etc.).
2. It shows endopolyploidy (*Sedum*, *Brassica*, *Sanseveria*).
3. If the seed bearer is known, the DNA of pollen donor can be calculated for the hybrid.
4. If the parents have different DNA weights, the hybridity of the F1 is easily shown.
5. Hybridity test can be done already with F1 seed or seedling.
6. Identical DNA weights within a genus suggest that two plants could belong to the same species.
7. Bulb species can be tested without growing them up.
8. It can be used to follow cell lineages in all organs in ploidy chimeras.
9. Different DNA weights can indicate that two plants belong to different species

10. Close DNA weights of species of a genus often suggests a relationship.

11. DNA weights can proof/disprove taxonomic results based on morphology.

12. High or low DNA weights can indicate life histories (annuals/perennials etc.).

13. DNA weights in a genus can differ up to three times with the same chromosome number.

14. It can be used to recognize apomictic plants (diploid pollen/egg cells).

15. DNA content of each chromosome can be estimated from its karyotype.

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## Results

### Technical considerations

Angiosperms basically consist of 3 meristem layers, called L1, L2, and L3, as present in the top meristem. These three layers can be found in all parts of the plant, except in the root which consists of one layer, the L3. This is different from the different tissues as often described for leaves. If the layers are genetically different, we speak of a chimera, but this is rare in wild plants. In the monocotyl *Hosta*, which I studied best in this respect, the L1 forms one cell layer (but several cell layers in the edge of the leaf), the L2 forms one cell layer (from which the gametes are formed) and the L3 is made up from 6–8 cell layers (from which the bulk of the leaf and the roots are formed). These three layers fit over each other like two gloves over one hand. They can usually be found in all organs with the flow cytometer if they differ in ploidy. All three layers are sometimes visible in chloroplast-chimera of *Hosta* and *Dracaena* (Zonneveld 2000, 2007, 2014a, 2018). Dicotyls have a slightly different structure: L1 forms only a thin outer layer, the cuticle, so the edge of the leaf is the L2 layer and below it, in the center, is the L3 layer. So with chloroplast-chimeras of dicotyls only two layers are different in color. A good example for monocotyls is the well-known *Sanseveria trifasciata* 'Aureomarginata'. This is a mutation where the border, the L1, has turned yellow, a so-called chloroplast chimera. Such a sharply separated L1 is best seen in monocotyls. However, in the same *Sanseveria* this yellow margin is tetraploid and the green centre diploid. We call this a ploidy chimera. This *Sanseveria* is therefore simultaneously a chloroplast chimera and a ploidy chimera. These two types of chimeras are mostly selected in culture, especially after tissue culture, and one rarely encounter them in nature. This is because, during seed formation, the chimera structure is lost, as the gametes are almost only formed from a single layer, the L2. Plants whose nuclear DNA weight is measured in the flow cytometer show one or more peaks of nuclear DNA (Fig.1, 2). This means that apart from a "diploid" nucleus, tetraploid, octoploid and even 16 and 32-ploid nuclei are often measured. Humans also show this phenomenon of cells with locally higher ploidies in very active organs, such as the liver, heart, muscle, placenta and tumor cells. In contrast, roots, derived exclusively from the L3, almost always show (but not in *Hieracium* and a few others), for a diploid, two peaks in the flow cytometer: a diploid and a tetraploid peak, Fig. 1b (tetraploid and octoploid in a tetraploid plant). The tetraploid nuclei of the root usually account for 25–50% of the total and are only found in the cortex and not in the stele, both in the primary (germ) root and in the secondary roots (*Hosta*).

The values given here for the weight of DNA per nucleus only concern the lowest, basal, 2C-value. The polyploid or higher peaks, which can be found in Table 2, are useful to determine the location of the lowest 2C value compared to the standard. It would be interesting to investigate how the different ploidy levels are limited to specific tissues. If several chromosome sets are present, DNA doublings did occur, as preceded by normal cell division, but without actual cell division having taken place afterwards. This is called endopolyploidy. This peak pattern is indicated here with par example 2C 4C 8C 16C 32C (briefly represented as: 2C-32C) (Fig. 1, 2). So not with 2x etc. because the latter stands for the number of chromosomes. The peak with the lowest value is always indicated with 2C (actually 2Cn). Even if it is a polyploid (which is not always known), the smallest peak is 2C. If there are multiple peaks, the highest peak, with the type of nuclei that is most common in the tissue used, is often shown in Table 1 in bold. The weight of the DNA can give an indication about the number of chromosomes in some genera. However, because the chromosomes are not actually counted, one speaks of inferred or derived or assumed ploidy.

These peak patterns often appear to be genus- and even family specific. Almost half of the species have only a single peak like conifers, ferns, trees and many grasses, but also most shrubs. This means that all nuclei of a plant (at least in the measured plant part!) have the same DNA weight and there are no higher ploidy levels.

The following hypothesis could be made: Bushes look like dwarf forms of trees with their single peak, perhaps adapted to worse conditions such as cold, high altitude or shade. It may also be that these small shrubs are woody herbs, but have not acquired the ability to grow into large trees. The opposite, a herbaceous plant that has grown in size, but is poorly hardened, seems to be the case with *Sambucus*, Elder, which has a lot of DNA (25 pg). *Sambucus edulis* is even herbaceous. If we go further back in time it may be that deciduous trees were derived from herbaceous plants, not from conifers or ferns. Perhaps herbaceous plants had the advantage over conifers that they had a factor of 10 to 20 times less DNA than conifers (Zonneveld 2013). Herbaceous plants such as the *Ranunculaceae* that are basally splitted from the phylogenetic tree, have a relatively large amount of DNA. They have apparently not developed the ability to loose DNA.

However, the peak pattern also depends on the plant part used. Leaf stalks seem to have fewer peaks than leaves. Besides the plant part, its age can also have an influence. Leaves that have that with the increase of the ploidy the peaks become smaller, in other words, the higher the ploidy levels the smaller the number of the relevant nuclei. However, that is not always the case. Also two equally large peaks occur and even that the second peak is larger than the first one. Many species only have a small second peak (Fig. 1d). These are supposed to be temporary tetraploid nuclei of cells that go into division (indicated by brackets (4C)). Also when there are three peaks there is variation. Usually it is found that the first peak is the largest (Fig. a). However, relatively often the second peak is the largest and sometimes the first and second peaks are the same size. More than three peaks can be found especially in succulents and other species with very little DNA. Species with little DNA are often plants that have a short generation time such as *Arabidopsis*. In these species with little DNA and

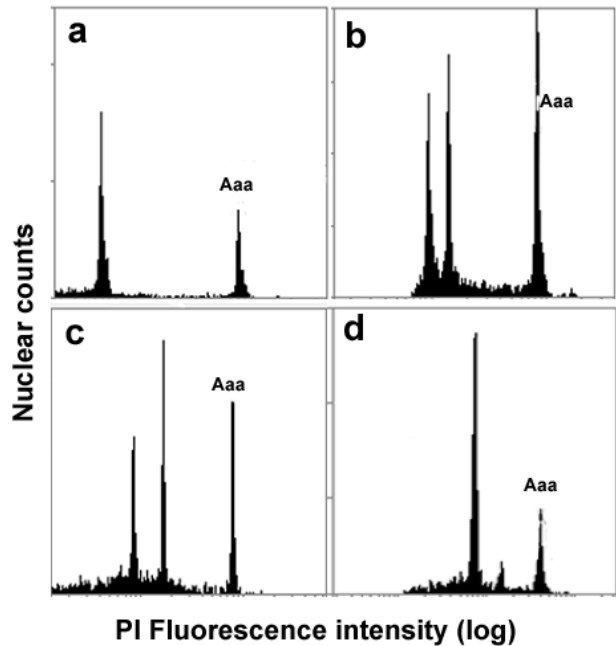


Fig.1 Examples of peak profiles (logarithmic) in the flow cytometer of nuclei stained with propidium iodide (PI). The *Agave americana* 'Aureomarginata' (Aaa) peak (2C=15.9 pg) is used as internal standard for determination of the DNA contents of the sample nuclei. (a) *Picris echioides* (2C); (b) *Linaria dalmatica* seed (2C, 3C); (c) *Echeveria agavoides* root (2C, 4C); (d) *Plantago lanceolata* (2C 4C).

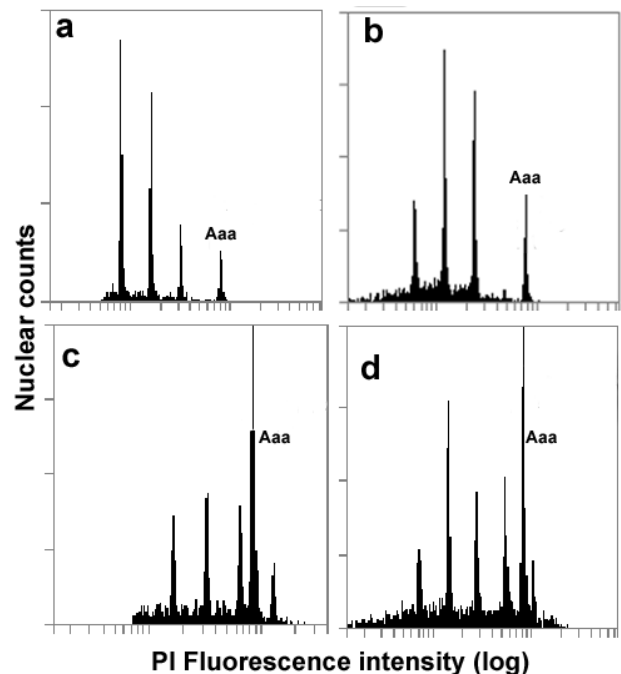


Fig. 2 Examples of peak profiles (logarithmic) in the flow cytometer (PI: Propidium iodide, Aaa peak: *Agave americana* 'Aureomarginata' nuclei). (a) *Lepidium latifolium* (2C, 4C, 8C); (b) *Viola odorata* (2C, 4C, 8C); (c) *Sedum telephium* (yellow centre) (2C, 4C, 8C, 16C); (d) *Graptopetalum filiferum* (2C–32C=2C, 4C, 8C, 16C, 32C).

usually a short growth period, the occurrence of multiple peaks can compensate for the low weight of DNA per nucleus. If locally much of a certain product is needed, or if larger cells are needed, the weight of the DNA can be increased, for example, by doubling the weight of the DNA throughout the plant. However, if at the same time little DNA is required for other reasons, the plant can still get a lot of product by increasing ploidy locally, in certain organs, e.g. in the leaf. We find this, for example, in cacti and other succulents that make a lot of mucus (polysaccharides) to prevent dehydration. The plant then remains essentially diploid and also continues to form haploid gametes. It is even more subtle not to double the whole genome locally, but only the number of copies of the required gene. Polyploidy not only serves to make more of a particular product, but it is also correlated with larger cells and increased resistance to UV radiation

### **Nuclear DNA weight (genome size) of measured plants**

More than 2350 species (as of May 2019) of more than 6400 measurements are listed in Table 1 (see the end of the paper). Standard deviations (not indicated) were for nearly all species about 2%. Table 1 also gives the possibility to compare all kinds of variables per species such as chromosome number, frequency of occurrence and peak pattern. The list contains all plant names that can be found in the Heukels flora (Van der Meijden 2005), including the not measured plants, the hybrids and the 75 extinct species. To save space, one is referred to the Heukels flora for the author names. Furthermore, italics indicate that a species is printed in small type in the Heukels flora.

As many as 1376 species were measured for the first time, i.e. that the measurement is new to science (based on Kew Plant DNA C-value index 2012). Almost 55% of the DNA weights are therefore new to science and of the remaining 45% many are new for The Netherlands. The Heukels list has been supplemented with 175 measured species described for The Netherlands after 2005, indicated in a separate column with Fl. (Floron, Verspreidingsatlas.nl, 2019) and 236 species of my choice, indicated with BZ. HD indicates plants that are added based on a list of newly to be added species to the new Dutch Flora of H. Duistermaat. If several DNA values are measured that cannot be attributed to ploidy, the arithmetic average is taken or, if there are any outliers, the median, i.e. the average of the most common numbers. Table 1 summarizes the results of the measurements. The ploidy or peak pattern that is mentioned for the species has never before been described in such detail and noted in this way. That is why a detailed explanation is given below. The frequency of occurrence per square kilometer (kfk) is largely taken from the Veldgids Nederlandse flora (Eggelte 2014), which ranges from extinct (0) to very common (9).

Heukels indicates that there are 138 plant families in The Netherlands that together contain a total of 719 genera. This has been supplemented to 762 genera. Of 97 % of all genera at least one species has been measured. Of about 624 genera all Dutch species were measured. There are also 340 genera monotypic, i.e. only one species of this genus is found in The Netherlands. There is also a list of chromosome numbers. These are largely taken from the English flora (Stace, 2010). Italics indicate whether the numbers refer to English species or whether they are species from the remaining of Europe. This is supplemented with data from the recently published site of the

Chromosomal Count Data-base (Rice et al. 2015) with the chromosome numbers as counted worldwide. In the case that more than three chromosome numbers are known of a species, only the two extreme numbers are given (e.g. 24–96). There was also a column with the chromosome numbers of 600 Dutch species (370 if we subtract the multiple counts on a species) as counted in the years 1963 and later by Gadella and Kliphuis. However, this column has been omitted because it hardly added anything new. Finally, sometimes a chromosome number is mentioned, derived from the DNA weight. Counting chromosomes is not only time consuming, but mistakes are also easily made. It is a laborious job; one has to look for cells with dividing nuclei, with a high chance of counting errors. You are already happy if you can count 10 nuclei per day. It is therefore not very surprising that sometimes the number of chromosomes does not seem to correspond to the weight of the DNA and that chromosome numbers often differ. Moreover, the chromosome numbers are largely based on English species and these results can sometimes be different in The Netherlands. However, a comparison between the numbers of Gadella and Kliphuis and those of Stace shows that most DNA values match. If we exclude the differences in ploidy level, there are only 15 really different values. These are often based on a single pair of chromosomes, suggesting counting mistakes. In addition, there are 58 of the 373 counts in which Gadella and Kliphuis have one chromosome number and Stace several. Finally, there are 40 cases where Gadella and Kliphuis has found several chromosome numbers within a species, of which Stace only gives a single number. Chromosome numbers are also often useful, for example if the DNA weight does not seem to match the number of chromosomes. Then further attention should be paid to the measurements and to the species concerned. The combination of all these data per species on one line is also very useful. Comparing the measurements of Table 1 with the DNA values in the list of Kew (Bennett and Leitch 2012) is the obvious thing to do. However, it turned out that for only half of the measurements, DNA values can be found in the Kew list. This is because the values of the Kew list are taken from the literature and are largely limited to plants with a commercial interest. More importantly, several, often very different values are mentioned. This is caused by, among other things, the use of different devices with different light sources, different DNA dyes and different standards. The choice between these options proved to be too arbitrary to arrive at a meaningful comparison.

**Polyploids** are often found in nature at the edge of the area of the species (Zonneveld 2005, 2009, 2010). This means that they can be found relatively often with increasing height or more to the cold North. Table 2 shows an overview of the diploid plants that also appear to have polyploid cytotypes. The word "appear" is used because no chromosomes have actually been counted in this study. The species with possible multiple ploidies in different collections are indicated by a symbol (#) in Table 1. It is striking that of the 21 hexaploid plants (with 6 sets of chromosomes), 11 plants with about the same phenotype occur as triploid forms while of the 100 tetraploid plants only 18 with same phenotype also occur as triploid forms. It suggests that it occurs more often that a triploid plant becomes a hexaploid than that a triploid becomes a tetraploid plant. Tetraploids therefore often do not seem to originate via

Table 2 Species with possible polyploid cytotypes based on their DNA weight. &gt; 6x: inferred ploidies larger than 6C.

Species	p/2C	pg/3C	pg/4C	pg/6C (>)	Species	pg/2C	pg/3C	pg/4C	pg/6C (>)
Achillea ptarmica	3.80		7.22		Luzula pilosa	0.54	0.72	1.05	
Actaea spicata	11.7		20.4		Malus domestica 'Kanzi' / 'Jonagold'	1.60	2.41		
Adiantum raddianum	12.6	18.00			Malva verticillata / ssp. crispa	1.87		3.82	
Adiantum venustum	11.9	15.70			Malva moschata	1.58	2.57	2.96	
Ajuga reptans groen / 'Black Scallop'	2.41		4.47		Milium effusum	5.17		9.11	
Ailanthus altissima	1.38	2.2			Montia minor / fontana cf	0.69		1.13	
Allium sphaerocephalon	26.2	39.0			Muscari botryoides / alba	8.60		19.1	
Allium vineale	40.8	62.5			Myosotis scorpioides ssp. nemorosa / ssp. scorpioides	0.82			2.44
Alnus japonica	2.50		5.28		Myosotis dubia / discolor	0.62			1.84
Anemone coronaria	16.0		32.1		Nasturtium officinale / microphyllum	0.80		1.53	
Anthemis tinctoria	6.52	9.68			Neottia ovata	35.9	55.4		
Arabis glabra	0.70	1.22		2.07	Nepeta cataria	0.84	1.39		
Arabis hirsuta / hirsuta sagitata	0.56		1.29		Nymphaea marliacea	3.10	4.90	5.90	
Aristolochia clematitis	0.90	1.32			Odontites vernus / ssp. serotinus	1.12		2.08	
Artemisia absinthium	5.48		9.81		Oenanthe fistulosa 'Variegata'	1.35		2.45	
Artemisia argyi	8.95	12.8			Ononis spinosa / repens	1.56		2.75	
Artemisia campestris campestris / maritima	10.7	16.5			Orchis mascula	19.3	31.2		
Asparagus officinalis ssp. officinalis	2.88		6.15		Papaver argemone	3.08		5.92	
Atriplex patula	1.79?		3.61		Pinguicula vulgaris	1.45		2.98	
Beta vulgaris maritima	1.43	2.30	2.76		Poa pratensis	3.68		6.98	
Briza media	6.68		13.2	18.0	Polygonum arenastrum / aviculare	1.65	2.44		
Bromus hordeaceus ssp. thominei	9.8?		20.8		Potamogeton alpinus	0.97		1.85	
Bromus racemosus racemosus / commutatus	12.6		22.5		Potamogeton lucens	1.28	1.80		
Bunium bulbocastanum	0.93	1.43		2.69	Potamogeton obtusifolius (oblongum)	0.96	1.45		
Buxus sempervirens	1.58	2.30			Potentilla anserina	1.09	1.61		
Calepina irregularis	0.43		0.92		Potentilla indica	3.51		6.52	
Callitriche stagnalis	2.62		5.5		Potentilla sterilis	0.54			> 6C
Campanula glomerata	3.65		7.5		Prunus avium	0.86		1.63	
Capsella bursa-pastoris	0.97	1.27			Ranunculus aquatilis diffusus	3.26		7.26	10.60
Cardamine hirsuta	0.50		0.98	1.67	Ranunculus hederaceus	4.04		7.67	
Cardamine pratensis	0.97	1.49			Raphanus sativus wit / zwart	1.26		2.41	
Catalpa bignonioides / ovata	1.04		2.09		Rosa glauca	1.16		2.07	
Catapodium rigidum	6.52		12.7		Rosa majalis	0.96			2.68
Cephalanthera damasonium	37.1		70.5		Rosa multiflora	1.21		2.19	
Cerastium fontanum ssp. fontanum	2.74		5.63		Rudbeckia hirta	4.54		10.0	
Cerastium fontanum ssp. holosteoides		5.62			Rudbeckia fulgida	8.41	12.9	16.9	
Cerastium tomentosum	1.31		2.70		Rudbeckia laciniata	10.60		23.1	
Ceratophyllum demersum	1.10		2.11		Sagina maritima / cf	0.68			2.03
Chenopodium quinoa	1.90	3.07			Salicornia europaea / ssp. brachystachya	1.25		2.57	
Chenopodium hybridum	1.22	1.79			Salicornia (europaea ssp.) stricta	1.26		2.58	
Clinopodium menthifolium	0.98		2.06		Salix aurita	0.80		1.70	
Crassula tillaea	0.63		1.1		Salix caprea	0.91	1.35		
Cuscuta europaea	2.54		5.14		Salix x mollissima	0.89	1.22		
Cyclamen coum	11.5	14.8	21.9		Salvia verbenaca / ssp. clandestina	0.78		2.72	3.23
Dactylorhiza fuchsii cf	11.7		21.6		Salvia verticillata	1.61		3.20	
Dactylorhiza incarnata	13.8	18.8	28.8		Salvinia natans	2.77	3.67		
Dactylorhiza incarnata ssp. coccinea	7.44				Sanguisorba officinalis	2.38	3.14		
Dact. majalis ssp. praetermissa	14.5	19.8	26.2		Scrophularia vernalis	0.82		1.74	
Equisetum scirpioides	42.0		74.3		Sedum album	0.56		1.11	1.65
Eragrostis minor	1.70			> 6C	Sedum telephium	2.28	3.60	4.59	
Euphorbia myrsinites	4.14	5.8			Sempervivum montanum	0.62		1.31	
Fritillaria imperialis	101		200		Senecio vulgaris	2.55	3.47		
Geranium molle	0.92		1.77		Silene baccifera	14.0		29.6	
Fallopia japonica	7.30	9.30			Sinapis arvensis	0.75	1.17		2.25
Forsythia x intermedia 'Arnold P' / 'Fergana'	1.67		3.98		Sisyrinchium bermudianum	6.41	9.58		
Gagea pratensis 4x, 5x, 6x, 10x	32.7	39.9	47.5	75.8	Sonchus oleraceus	1.06			3.31
Gagea villosa	16.0		32.0		Spergularia salina	0.65		1.16	
Galanthus elwesii	55.3		105.8	157.0	Spiraea japonica	0.54	0.85		
Galanthus nivalis	72.3	105.3			Spirodela polyrhiza	0.39		0.92	> 6C
Galium mollugo	2.12	3.58	4.12		Stellaria pallida	0.57	0.78	0.99	
Galium palustre	3.75	4.96			Sutera cordata	1.51		2.97	
Gentiana pneumonanthe	5.41		9.72		Taraxacum officinale / laevigatum	2.87	3.95		
Hedera helix / hibernica	2.95		6.06		Thalictrum flavum	2.33		4.35	
Helianthus tuberosus	10.5		22.9		Thalictrum minus	2.33	3.93		
Hyacinthoides x massartiana	50.1	69.6			Trifolium campestre	0.74		1.57	
Hydrochaeris morsus-ranae	2.13		4.40	7.94	Trifolium suffocatum	0.45		0.87	
Hypericum maculatum ssp. obtusiusculum	0.91	1.56			Tripleurospermum inodora / maritima	5.92	9.92		> 6C
Jacobaea paludosa	8.57	13.20			Tulipa sylvestris	(61)	90.4	115.7	
Lagarosiphon major	3.52		7.28		Urtica dioica ssp. subinermis / ssp. dioica	1.34		2.51	
Lamium maculatum	2.77		5.99	> 6C	Veronica chamaedrys	1.47		2.98	
Lathraea clandestina	2.21		4.23		Veronica hederifolia / ssp. lucorum	3.02	4.25		
Lemna gibba	1.20	1.60			Veronica peregrina	1.14		2.26	
Lemna minor	0.89	1.44		2.91	Veronica triphyllos	0.97	1.42		
Lepidium virginicum	0.69		1.19		Vulpia bromoides	5.49			14.4
Lolium perenne	5.26		11.1	> 6C	Wahlenbergia hederacea	0.89		1.99	
Lonicera caprifolium	2.16	3.21		> 6C	Zanichella palustris / ssp. pedicellata	1.21	1.83		

triploids, but by doubling the DNA of the diploid plant. Other possibilities for the formation of tetraploids is from crossing tetraploid plants with diploid plants that make  $2n$  gametes (unreduced gametes) and from crossing a diploid with an hexaploid plant. A distinction should also be made between crossing within the species and between two species (auto-versus allopolyploidization). The different values in Table 2 cannot simply be attributed to polyploidy. They may also have been caused by measurement errors, incorrect identifications or other causes. It is more interesting, if this is not the case and the polyploid types are also confirmed in the literature. When in doubt, several measurements have been made on the same species. Plants of a species can differ from each other in many ways. Also different chromosome numbers within a species occur. It cannot be excluded, that there also different DNA weights within a species. An important question when talking about species is: when is an (auto)-tetraploid called only an aberrant cytotype, a variety, subspecies or, as in *Agrimonia*, a separate species. Tetraploids are not always larger, thicker in leaf or with larger flowers or fruits compared to the diploid plant. However, they usually have larger stomata and pollen grains. Tetraploids can also be smaller and grow slower, like in *Hosta* and *Cyclamen*. Moreover, not all plants with large fruits are also polyploid, as is evident with most cultivated apples or giant pumpkins that seem to be diploid plants.

**Nuclear DNA weights of families and orders** are listed in Table 3. In total there are 138 families with 762 genera in The Netherlands (2005). Of these, 340 genera are monotypic for The Netherlands, i.e. there is only one species of this genus. This overview makes it possible to speculate about the relationship between DNA weight and phylogeny. For eight families of monocotyls (on average 12.43 pg) with the highest number of species, the average was calculated separately. *Typhaceae*, *Sparganiaceae*, *Cyperaceae* and *Juncaceae* range from 0.68 pg to 1.6 pg on average per family. Then there is a jump to the *Alismatales* with 7.5 pg and another jump to the *Poaceae* with 10 pg average. It then goes up via 29.8 pg for the *Asparagales* to 56.8 pg average for the *Liliales*. Also of the dicotyls, with an average of 4.51 pg, ten families were examined. Here the differences in DNA weights are more gradual with 1.51 pg for the *Brassicaceae* to 6.31 pg for the *Asteraceae*. Exceptions are the *Ranunculaceae* with 19.5 pg that are basally split of from the phylogenetic tree. Trees and shrubs are split into deciduous trees, shrubs and woody climbing plants. Deciduous trees (114x) have by far the least DNA with an average of 1.77 pg. Shrubs, including species such as *Erica*, *Thymus*, *Hypericum* etc., total 169, have an average of 2.82 pg, and Climbing Plants have 5.67 pg. The latter is mainly due to the high values for *Clematis*. The Gymnosperms stand out with 14 times as much DNA as the deciduous trees + shrubs. The conifers have a DNA weight that is even 20 times as large as that of deciduous trees s.s.. The *Ranunculaceae* have an average of 19.5 pg, the Gymnosperms 18.5 pg and the spore plants 26.2 pg. The *Cycadaceae* also belong in this list with about 40 pg (Zonneveld et al. 2012a, 2016). If we compare this with 9 other families of dicotyls with an average of about 3.6 pg, it seems to confirm that the *Ranunculaceae* are rightly found as a basic split in the phylogenetic tree of dicotyls.

The development of the higher (advanced) seed plants is then accompanied by a massive loss of DNA. (Alternative: The

original ancestor may already have had little DNA and could therefore evolve into many species). The same movement can be seen in the monocotyls where the *Cyperales* have 90% less DNA per nucleus than the *Asparagales*, *Liliales* and *Poaceae*. We could then consider the last three orders as more basic. However, it seems better to see a link with the life cycle of plants with bulbs and tubers. In summer, autumn and winter the germling is formed by many cell divisions. This germling mainly grows out in spring by increasing the size of the already present cells. So here there is a separation between cell division in summer/winter and flowering/cell expansion in spring.

Table 3 Average (av.) nuclear DNA weights (pg) of orders/families analysed (anal.) with highest numbers of genera, arranged according to DNA weight. Deciduous trees, bushes, climbers were analysed separately.

Orders / Families analysed	pg (av.)	Genera anal.	Species (anal.) of all species
<b>MONOCOTYLEDONS</b>	12.43		373/554
<b>(151 of 169 genera)</b>			
Typhaceae	0.68	1	4/5
Sparganiaceae	1.15	1	4/4
Cyperaceae	1.18	16	94/110
Juncaceae	1.60	2	25/32
Alismatales	7.15	26	66/75
Poaceae	10.0	72	158/192
Orchidaceae	24.2	18	33/49
Asparagales (+Orch.)	29.3	37	82/99
Liliales	56.8	4	21/21
remaining			16
<b>DICOTYLEDONS</b>			
<b>(290 of 530 genera)</b>	4.5		1511/1711
Dicotyls (no Ranunculaceae)	3.6		1463/1655
Brassicaceae	1.51	45	98/109
Amaranthaceae	1.80	12	42/59
Rosaceae	2.06	24	127/151
Lamiaceae	2.16	24	74/82
Plantaginaceae	2.73	15	53/62
Caryophyllaceae	2.82	24	73/79
Apiaceae	3.96	40	62/73
Fabaceae	4.62	30	88/94
Asteraceae	6.31	60	199/232
Ranunculaceae	19.47	16	48/56
remaining			240
<b>GYMNOSPERMS: 17 of 25 g</b>	26.2		88/92
Fems	16.8	13	63/66
Equisetaceae	48.9	1	18/18
Lycopsidea	12.7	3	7/8
Remaining			8
<b>CONIFERS 12 genera</b>	18.5	12	62/62
<b>Trees, bushes, climbers</b>			
Deciduous trees	1.77		114/118
Bushes	2.82		169/181
Climbers	5.67		19/19

**Positive correlation between DNA weight and chromosome number** was observed in the following genera:

*Agrimonia, Acer, Anthoxanthum, Arenaria, Alisma Alopecurus, Atriplex, Avena, Bromus, Capsella, Catapodium, Cirsium, Convolvulus, Cornus, Crataegus, Doronicum, Drosera, Echium, Erodium, Galeopsis, Holcus, Hordeum, Hypericum, Inula, Kickxia, Lotus, Ludwigia, Lythrum, Nasturtium, Odontites, Ononis, Persicaria, Phleum, Polygala, Polygonum, Polypodium, Prunus, Rorippa, Rosa, Salicornia, Scleranthus, Setaria, Solidago*

#### DNA contents of subgroups of monocotyls, dicotyls, ferns and gymnosperms

In Table 4 each of these 4 categories were subdivided into four subgroups: 1. annuals and biennials (Therophytes plus Hemipterophytes pro parte), 2. perennials (Chamaephytes plus Hemipterophytes pro parte plus Geophytes), 3. aquatic plants (Hydrophytes plus Helophytes) and 4. trees plus shrubs (Phanerophytes) plus woody climbing plants. It may seem strange to combine annuals and biennials into monocarpic plants, but it sometimes depends on the richness of the soil or the time of germination or the temperature whether a plant is annual or biennial (*Oenothera*, summer and winter wheat, etc.)

Table 4 Average nuclear DNA weights (pg) with respect to taxonomic division and growth habit. Polyploids are mostly excluded.

Orders	total (nr.)	annual	perennial	water-	trees	not	mean
		biennial	1098	plants	bushes	known	
Monocotyles	555	8.8	16.5	4.3	0.0	4.6	12.4
Dicotyles	1729	3.4	6.2	5.1	2.6	4.2	4.5
Conifers	33	0	0	0	35.9	0	35.9
Ferns	94	0	27.8	5.9	0	0	25.9

The first observation that strikes is that the gymnosperms can only be found in the subgroup trees and shrubs. Ferns can only be found in perennials and aquatic plants. The monocotyls have an average of 12.4 pg for all four subgroups and 4.5 pg for the dicotyls. The higher value for the monocotyls is mainly due to the high values of the *Liliales* and *Asparagales*. The low value for the dicotyls is mainly caused by the low values for the trees (no monocotyl trees in The Netherlands). For both monocotyls and dicotyls we find almost twice as much DNA in the perennials compared to annuals and biennials. For aquatic plants we find the same numbers in mono- and dicotyls. However, the monocotyl aquatic plants have 50% less DNA than the annuals and biennials, while the dicotyl aquatic plants have 50% more DNA per nucleus than the annuals and biennials.

#### Interspecific and intergeneric variation of Nuclear DNA contents

The nuclear DNA weights of the more than 2250 (sub)species of the Dutch flora, divided into DNA weight classes, increasing by 0.5 pg is shown in Fig. 3. All 230 values above 20 pg are summarized in the last column. Using larger classes e.g. per 5 pg (from 10 pg upwards) was no improvement, because then small classes suddenly seem large. Most species fall into the range of 1–3 pg. This means that some species may have the same amount of DNA, but still are not related. So the same amount of DNA is not proof that it is the same species. However, difference in DNA

weight for different species within a genus, if they are not multiples, can indicate separate species.

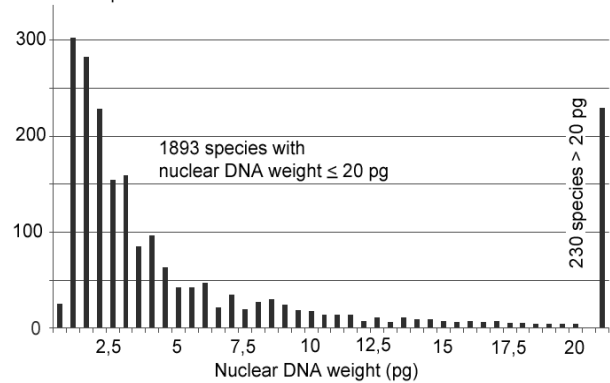


Fig. 3 Nuclear DNA weights of more than 2250 (sub)species of the Dutch flora, divided into DNA weight classes, increasing by 0.5 pg.

If we divide dicotyls and monocotyls into 8 classes with increasing DNA weights and increasing class sizes, especially in the three classes with 1–10 pg the dicotyls are best represented. This gives a different picture if we do not present the numbers (which are much higher for the dicotyls) but the percentages (Fig. 4). Especially in the highest and lowest classes the monocotyls are by far the largest group.

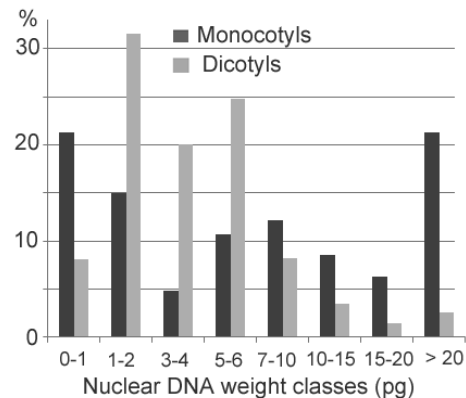


Fig. 4 Frequency distribution of monocots and dicots, ordered by increasing DNA weight.

#### Nuclear DNA weight in relation to number of chromosomes of different species

In Fig 5 Picograms are plotted against the chromosome numbers, in those cases where chromosome numbers (240 cases) of Gadella and Kliphuis (1963–1973) and Stace (2010) match and where no ploidies were found in both. In Fig. 5 the number of chromosomes from  $2n=6$  to  $2n=100$  was compared with the weight of nuclear DNA (between 0.3–62 pg). There are only 17 taxa with more than 62 pg out of the total of 2350 taxa, so there is a fair coverage. There is a considerable variation of nuclear DNA weight  $5.76 \pm 0.516$  (0.3–62) pg (mean  $\pm$  standard error, variation) independent of chromosome number. But there is no negative or positive correlation between nuclear DNA content and chromosome number. The average DNA content remains the same irrespective of the number of chromosomes. This is the reason why the average content of DNA of chromomes

decreases with the number of chromosomes per nucleus. However, it should be emphasized in this context that at the intraspecific level there is a linear correlation between nuclear DNA weight and the number of chromosomes in virtually all species studied (Leitch and Bennet 2004 and own observations).

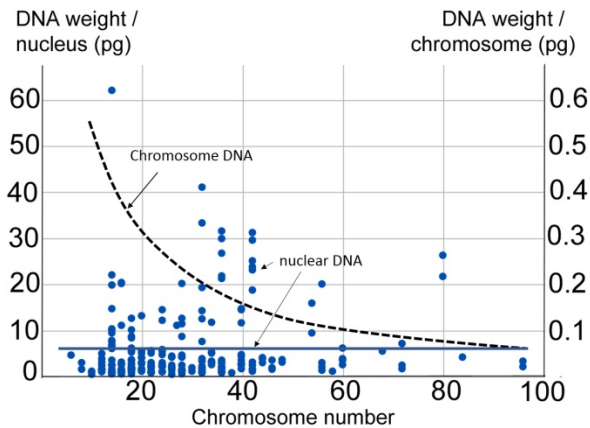


Fig. 5 Nuclear DNA contents (0.3–62 pg) plotted against chromosome number ( $2n=6-100$ ). The DNA weight does not increase and does not correlate with chromosome numbers (blue regression line) but displays considerable interspecific variations (blue dots). As expected, the average DNA contents of chromosomes decreases with the increase of the number of chromosomes (dashed curve).

## Discussion

Collecting and studying data often leads to new insights. Therefore, below is discussed per family, genus or species what was noticed about the measured DNA weights. Publishing only DNA weights is of little use without explanatory notes. Moreover, there is no hesitation in making suggestions for further research and formulating hypotheses.

**Most trees and shrubs**, but also ferns, have only one peak in the flow cytometer, i.e. only have nuclei with one DNA weight in the measured plant part. Overall, it is also striking that conifers, ferns (and *Cycadaceae*, Zonneveld 2012a, 2016) have roughly 10 to 30 times as much DNA as most deciduous trees and many herbaceous plants. It is also clear that most annual/biennial species and many deciduous trees have little DNA. This can indicate an ancestry of the trees from annual/biennial herbs. These low DNA weights (and probably higher growth rate as a seedling) of the deciduous trees could be an important reason why the conifers occur now mainly in northern regions (Simonis et al. 2018). Because of the cold, the growth rate may not play such a major role. Branching leaf nervation (but think of ferns and *Ginkgo*, P. Baas) (de Boer et al. 2012), successful symbiosis with insects and conquering the land from the water (Gomez et al. 2012) are cited as other reasons.

**Abies** The five species all have a single peak like almost all conifers. Four of the six species had  $2n=24$ . Given the similar DNA weights of the other two species, they probably also had  $2n=24$  (later found in the literature in Chromosome Count Database=CCDB). This is called derived or inferred chromosome numbers.

**Acer** The species have two peaks where the first peak is the highest (indicated in bold). A peak between brackets (4C) means a rather small peak. In many cases, the second small peak is

likely caused by still dividing cells, which temporarily have a double DNA weight. It is also found that *A. pseudoplatanus* has twice as much DNA as *A. platanoides*, in accordance with the double number of chromosomes of the first one. Also Maples with dark leaves do not differ in DNA weight from the normal green leaved forms. A dwarf form of the Norway maple does not differ from the mother plant in DNA weight either.

**Achillea ptarmica** There is only one chromosome number known:  $2n=18$  (in the literature the chromosomes of 70 plants are counted). It seems that there are two cytotypes of *A. ptarmica*.

**Acorus calamus** For the time being, it seems that only one DNA weight occurs in the Netherlands, although only two plants have been measured.

**Actaea spicata** Two values were measured, 11.7 and 20.4 pg, with the second, grown from seed obtained through the Alpine Garden Society (AGS), originated from an English garden.

**Adonis** The four taxa that have been measured, with roughly 30 pg, have a lot of DNA, i.e. 10–20 times more than many other annual plants. They belong to the basal split-off dicotyls (*Ranunculaceae*) which all have high amounts of DNA.

**Aesculus x carnea** The measurements show that this is a tetraploid plant, a so-called amphidiploid=allotetraploid resulting from a cross between the *A. hippocastaneum* and the not very hardy, red-flowering (sometimes yellow) chestnut *A. pavia* from the U.S. This means that the entire genome of both species has been combined, not half of each as is usually the case. *A. x carnea* is almost sterile, but still has 50% good pollen and is usually grafted. The few seeds that are formed, however, do germinate.

**Ajuga reptans** occurs in nature both with green leaves and, more rarely, with almost black leaves. *A. reptans* 'Black Scallop' is more stocky and has darker leaves. This one turned out to be tetraploid.

**Alchemilla** The DNA weight of the all 7 measured species is about 3.7 pg, with a range of only 3.56 to 3.89 for the 35 measurements on 12 species

**Agrostis** Two of the *Agrostis* species (*A. capillaris* from 6.49 to 7.81 pg and *A. gigantea* from 12.7 to 13 pg) have a rather wide range in the amount of DNA. This is may be an example showing that not in all cases a species has a single DNA weight.

**Allium** *A. vineale* and *A. sphaerocephalon* also seems to occur as a triploid. There is a relation between the number of chromosomes and the DNA weight for most of the species measured here. Exceptions are *A. paradoxum* and *A. ursinum* with a lot of DNA: 57.8 and 63.7 pg respectively and only  $2n=16$  and 14 chromosomes. This could indicate the existence of a second genus next to *Allium*.

**Alnus** Of the cultivated *A. x spaethii* (*A. japonicus x subcordata*) the chromosome number is not known, but from the DNA measurements it appears to be an allotetraploid.

**Amaranthus** *A. blitum* (small and large form) and *A. emarginata* have 50% more DNA than the other species in this genus. This could indicate that they are triploid hybrids. It is striking that there are not only diploid but up to 16-ploid peaks, where the second peak is often the highest. That the second peak is the highest, is apparently a family characteristic because it is also found in e.g. *Atriplex*, *Chenopodium* and *Salicornia*, which too belong to the *Amaranthaceae*.

**Anagallis** *A. tenella* ( $2n=22$ ) has twice as much DNA as *A. arvensis* with  $2n=40$  (sometimes 20), but half the number of chromosomes. It seems that the Dutch form of *A. arvensis* has  $2n=20$ .

**Anchusa** Five different colour forms of *Anchusa*, from yellow to blue from Thea Spruijt's garden, all had about 27 pg. *A. officinale* has 13.8 pg. *A. ochroleuca* has 25.3 pg. So it looks like an unreduced gamete ( $2x$ ) of *A. officinalis* has merged with a reduced gamete (also  $2x!$ ) of the tetraploid *A. ochroleuca*:  $13.8 + 12.7 = 26.5$ . Because allotetraploids ( $4x$ ) are often fertile, this explains the hybrid swarms that are seen.

**Anemone** The five species all have about the same high amount of DNA. *A. blanda* also occurs as a triploid. Deviating is *A. apennina*, which has a similar weight of DNA, but would only have half the number of chromosomes (Rice et al. 2015). The light-blue flowered *A. nemorosa* 'Robinsoniana' is triploid. It could be a hybrid of the blue-flowered *A. apennina* with a unreduced gamete of *A. blanda*. Triploids are more often found in hybrids of not very related species, as the two similar sets of genomes in the hybrid give a more or less normal meiosis.

**Anthriscus** Although the chromosome numbers reported in the literature do not differ much, the DNA measurements seem to indicate that *A. cereifolium* and *A. sylvestris* appear as diploid, tetraploid and oktoploid forms. The chromosomes may have been partially split, but this can have no effect on the DNA weight.

**Apium graveolens** For *Apium*, chromosomes were counted 70 times and they are reported to have equal numbers of chromosomes. However, the cultivated celery differs greatly from the three other diploid *Apium* species as they appear to be hexaploid. This is true for all three cultivated forms, sold as bunches of small leaves or as "thick roots" or as large bleached leaves (pale celery).

**Arabidopsis thaliana** This species is often cultivated for research purposes and is 'fully' sequenced. This resulted in a DNA weight of 0.28 pg. However, measurements with the flow cytometer and comparisons with *Drosophila melanogaster* and the nematode *Cenorhabditis elegans* clearly showed that it had to be 0.32 pg (=314 Mb) (Bennett et al. 2003). The difference is caused by large, repetitive pieces of DNA (e.g. ATC ATC ATC etc), of which it is difficult to determine the frequency of the repeats.

**Arenaria** *A. leptocladus* has half the DNA and half the number of chromosomes compared to *A. serpyllifolia*. One could perhaps also call them subspecies.

**Artemisia** It seems plausible that *A. campestris* subsp. *campestris* with 10.7 pg DNA ( $2n=18$ , 36) is a tetraploid and subsp. *maritima* with 16.4 pg ( $2n=54$ ) hexaploid.

**Asparagus** Plants collected in the dune (both subsp.) have about 6 pg DNA per nucleus. For the cultivated forms we measured not only tetraploids with 6 pg but also diploids with 3 pg. The upright plants in the dune are probably feral plants. The low growing plants could be a simple mutation of the upright form as an adaptation (sea breeze?) to the growth in the dunes.

**Arum** The two Dutch species have different DNA weights. The other 25 species will be treated in a separate article.

**Asplenium** Perhaps they can be divided into two groups as follows: one group with two southern species with  $2n=72$  and 8.9 and 10.1 pg and the other 10 northern species with 12.8 to 19.1 pg with  $2n=144$ . Also *A. scolopendrium* with 17.2 pg but only 72 chromosomes appeared to have  $2n=144$  in 5 of the 38 plants counted in the CCDB. Apparently the Dutch form has

$2n=144$ . *A. trichomanes* subsp. *pachyrachis* with 19.1 pg deviates from subsp. *quadrivalens* with 18.2 pg.

**Aster** Of the 10 measured species (now *Symphiotrichum*) *A. tripolium* with by far the most DNA with 12.6 pg, has the smallest number of chromosomes with  $2n=18$ . It is also no longer classified with *Symphiotrichum*, like the other asters are (Dirkse et al. 2014).

**Atriplex** In most species, not the first, which is more often the case, but the second peak is the highest, just like in other *Amaranthaceae*. There are 9 *Atriplex* species in the Netherlands, 7 of them have been measured. The species with 18 chromosomes have 1.5–2 pg and those with 36 chromosomes about 3.4 pg.

**Avena** *A. sativa* and *A. fatua* have the same amount of DNA with 26.5 pg and are both  $2n=42$ . *Avena fatua* is also mentioned as a synonym of *A. sativa* and could therefore be a feral oat.

**Beta vulgaris** Plants measured appear to be triploid. Each year triploid sugar beets are made by crossing diploids with tetraploids. Triploids do not flower as fast as diploids, which increases the sugar yield. The cultivated beet therefore has one and a half times as much DNA as the wild beet as found on sea dikes and as in the beetroot and the chard. Nowadays, however, diploid F1 hybrids of sugar beet seem also to be cultivated.

**Blysmus rufus** This species has seven times as much DNA as *B. compressus* while the number of chromosomes is equal or slightly less. This could indicate a different genus.

**Bolboschoenus** The three species have little DNA per nucleus, i.e. circa 0.5 pg. There is hardly any difference in DNA weight between *B. maritimus* growing in brackish water and *B. laticarpus* in fresh water.

**Brassica** The numbers of chromosomes match the DNA weights. They also show three peaks with the first or the second largest. In this way it is easy to distinguish the tetraploid *B. napus* from the diploid oilseed rape, *B. rapa*, which usually adorns the verges. By the way, pakchoi and turnip greens are also forms of *B. rapa*.

**Briza** *B. media*, a perennial plant, appears to be not only diploid, but also tetraploid and hexaploid. *B. maxima*, an annual plant, appears to be diploid.

**Bunium bulbocastanum** For this species with  $2n=20$ , 22 three values were measured: 0.93. 1.43 and 2.69 pg. It resembles three different cytotypes, diploid, triploid and hexaploid. We see this combination of DNA weights relatively often (Table 2).

**Capsella** The 28 plants supplied by florists as *C. rubella* have half the DNA weight compared to the 26 times measured *C. bursa-pastoris*. This suggests that the former is diploid and *C. bursa-pastoris* tetraploid. There is doubt about the taxonomic status of *C. rubella*.

**Cardamine** Only one out of the 19 plants is possibly polyploid in *C. pratensis*. For *C. pratensis* an average of 1.65 pg is found. The species growing in the swamp, *C. palustris*, is polyploid with 2.4 times as much DNA and 3.87 pg. However, the many different chromosome numbers for *C. pratensis* mentioned in the literature leave plenty of room for a different interpretation. It has been counted 1372 ! times according to CCDB.

**Carex** The species can unfortunately hardly be distinguished with flow cytometry. Species with more and deviating DNA weights are: *C. careophyllea* (1.37 pg); *C. davalliana* (1.25 pg); *C. dioica* (1.28 pg); *C. flacca* (2.48 pg); *C. panicea* (1.58 pg) and *C. trinervis* with 1.31 pg. There appears to be no relation to the number of chromosomes.



***Caltha*** No difference in DNA value was found between *C. palustris* subsp. *palustris* and subsp. *araneosa*. The bird's nest roots seem to be caused by the regular emergence of the roots above the water by the tidal action as in the Biesbosch.

***Catapodium*** For *C. rigidum*, three plants average 6.7 pg were measured and once 12.7 pg. This last measurement may be *C. maritimum*, for which I measured 12.2 three times, but it can also be a tetraploid *C. rigidum*.

***Cerastium*** *C. fontanum* seems to have two different DNA values indicating diploidy and tetraploidy just as in *C. pumilum* and *semidecandrum*. This may correspond to the two subspecies. The cultivated *C. tomentosum* also has a more compact form with smaller leaves. This small *C. tomentosum* has half the weight of the DNA.

***Chenopodium*** Those with  $2n=18$  seem to split into two groups: 6 species with about 0.90 pg (now split off as *Dysphania*. Mosyakin et al. 2008) and 2 species with 1.6 pg. In addition, there are 6 species with more DNA and more chromosomes, but there doesn't seem to be a correlation.

***Corynephorus canescens*** Its DNA weights of 2.8, 3.0, 3.2 and 3.4 pg are rather variable. It could indicate that there are more species involved.

***Cotoneaster*** Based on DNA weights two groups can be distinguished with circa 1.5 pg and  $2n=34$  and with 3 pg and  $2n=68$ . Two species differ from this: *C. horizontalis* with 1.39 pg and  $2n=68$  and *C. integerrimus* with  $2n=68$  (34, 51) and 1.42 pg. The fact that there are no intermediate values seems to indicate that hybridisation between these two groups is rare if present.

***Crassula*** The two Dutch species have the same amount of DNA. *C. tillaea* can hardly be kept alive in culture, while *C. helmsii*, especially found in ponds, even grows excellently under dry conditions.

***Crepis*** At 18.0 pg, *C. biennis* has 2 to 4 times as much DNA as the other species but it also has many chromosomes. *C. capillaris* has with  $2n=6$  the lowest chromosome number of the Dutch flora, as far as I know.

***Cuscuta*** *C. lupuliformis*, with one instead of two styles in the other species, stands out with 10 to 30 times as much DNA as the other cuscutas. *C. campestris* on the other hand has 4 times as many chromosomes as other cuscutas, but the least DNA of all *Cuscuta* species measured here. There seems to be no connection with the number of chromosomes. For *C. europaea* three values were found that can indicate diploid, triploid and tetraploid plants, while in the literature only one chromosome number is known. There may be other species involved, but a wrong identification cannot be ruled out. The endosperm of this species also turns out to be hexaploid instead of triploid and it made no difference in DNA weight whether it parasitized on *Humulus* or *Urtica*. The same is true for *C. epithimum*, parasitizing on *Galium* or *Rosa*.

***Cyperus*** In *C. longus* with  $2n=14$  or about 120 chromosomes and *C. esculentus* ( $2n=18, 108, 206$ ) but only 0.7 pg, the chromosome numbers mentioned in the literature raise questions.

***Dactylorhiza*** For *D. incarnata*, 13.9, 18.9 and 29 pg were measured. Maybe these are diploid, triploid and tetraploid plants, but 85% of the 59 plants counted have  $2n=2x=40$  in the literature. *D. incarnata* subsp. *coccinea* has only half of the DNA weight: 7.63 pg. This may not be a subspecies but a different species. In *D. majalis* subsp. *praetermissa*, plants with solid green leaves or spotted leaves have the same DNA weight.

***Deutzia*** Both species have 26 chromosomes but 13.4 and 3.0 pg DNA. However, at CCDB I also found  $2n=130$  for *D. scabra*, that fits better.

***Diplotaxus*** The large *D. tenuifolia* has less DNA and less chromosomes than the smaller growing *D. muralis*.

***Dryopteris*** The eight species of ferns listed in the Heukels flora are supplemented with 5 other species. In total, 220 plants were collected and measured (Hovenkamp et al. 2018). Two of the 13 species are diploid (*D. affinis* and *D. expansa*), three triploid and thus 8 tetraploid (from 32.6 to 37.9 pg). Although I have measured 59 times the here added triploids *D. x borrieri* and *D. x cambrensis*, the DNA difference between these two triploids (which partly have other parents) is far from clear. Recently these two triploid hybrids are considered as species (Hovenkamp et al. 2018).

***Eleocharis*** There are considerable differences in DNA content between the species, and not so much correlation with the number of chromosomes. Maybe not enough plants were counted.

***Elymus*** The six species (was *Elytrigia*), are easy to distinguish with the flow cytometer: *E. arenosa* 20.7 pg, *E. repens* 23.1 pg, *E. juncea* 24.9 pg, especially found on the beach, *E. atherica* 28.9 pg, mainly in the dunes, *E. campestris* 30.1 pg and the hybrid of *E. atherica x juncea*, *E. x obtusiuscula* with 26.4 pg. (The view on the species used here is also based on unpublished research by G. Dirkse et al.) It is striking that of each species, 5 or more plants have been measured including *E. x obtusiuscula* (synonyms *E. maritima*, *E. x acuta*). However, *E. x obtusiuscula* is only indicated on the NDFF Verspreidingsatlas for a single location, the Grient. So it seems that it occurs much more often and is confused with the other species. A plant was found in Katwijk, exit 4, which had 37.2 pg. Possibly *E. juncea x (juncea x atherica)* and it then has  $2n=49$ , according to the calculation. Or is it a hybrid with *Leymus arenarius*?

***Epilobium*** This genus has little DNA, between 0.65 and 0.89 pg. So the values are close together. For *E. komarovianum* the doubtful value of 4.33 pg was first measured. Afterwards it turned out that this is another small leaved creeper: *Anagallis tenella*. The true *E. komarovianum* from the botanical garden of Amstelveen has 0.64 pg.

***Equisetum*** There are about 20 species worldwide, most of them have been measured (to be published), except for a few South American ones. Of all species, as far as counted, it is mentioned that they have 216 chromosomes. Nevertheless, there seem to be clearly three, not overlapping, groups in terms of DNA weights: seven species with 24–31 pg, eight species with 42–60 pg and three species with 80 pg (all three are hybrids). So they seem to be diploids, tetraploids and hexaploids. However, a publication (Bennert et al. 2005) made it clear that the first two groups, despite a factor of two difference in DNA weight, are diploid. So the three hybrids are then probably triploid. The second group with 41–60 pg has then chromosomes about 2 times as large chromosomes as the first group. The remark about the same number of chromosomes seems debatable. The doubtful status of *E. debile* and (the synonym?) *E. japonicum* must be reassessed, as their DNA weights differ from all other *Equisetum* species measured.

***Eragrostis*** *E. minor* is the species with the highest amount of DNA of the 4 measured species. *Eragrostis pilosa* must nowadays be called *E. multicaulis*. Several chromosome numbers of both *E. minor* and *E. multicaulis* are reported. However, in The Netherlands these have only been found for *E.*

*minor*. Nowadays *E. tef*, an important grain in Ethiopia, is also grown in The Netherlands.

**Erica** It shows only one DNA peak, just like many other woody shrubs and that even applies to a plant that you can hardly call a shrub.

**Erigeron** The species can be kept reasonably apart in terms of DNA weight. This does not apply to *E. daveauanus* who was already earlier considered synonymous with *E. sumatrensis* and has the same DNA weight. Remarkable for annual plants is the absence of higher ploidies in the leaf. There are (except *E. annuus*) instead higher DNA weights of 4–6 pg.

**Erinus** The white flowering, hairy form as well as the purple flowering, glabrous form of *E. alpinus*, growing in the Alps and naturalized on walls in the UK, have been measured. Although they have the same amount of DNA, they don't cross in the garden and I wonder if they are two species.

**Erodium** *E. cicutarium* has 2.75 pg DNA per nucleus. Because the subsp. *dunensis* has a lower DNA weight, 2.13 pg, this indicates a separate species. In the dunes I also found the hybrid *E. dunense* x *E. lebellii* (1.25 pg, = *E. x anaristatum*) with 1.58 pg. All of them have three peaks.

**Erophila** Three to four species are mentioned in the European floras. I measured the DNA weights of almost 100 plants, which according to me also represent 4 species that can (partly) be distinguished morphologically: the diploids *E. majuscula* (+ *E. praecox* 2x), the tetraploid *E. praecox*, the hexaploid *E. verna* s.s. (+ *E. glabrescens*) and the oktoploid *E. boerhavii* (+ *E. praecox* 8x), with respectively on average 0.64, 1.17, 1.64 and 2.24 pg. Although there is a small range in DNA weights, there are no intermediate values. The number of 4 species corresponds to the 4 species recognised by Winge (1940) (under invalid names). He counted hundreds of chromosomes of *Erophila* from The Netherlands, England and Denmark, crossed them and did grow them all under the same conditions. He also found that they are plants which fertilize themselves already in the closed bud (self-pollinators). In an old Heukels flora (1982), plants with elongated, oval and round siliques are already mentioned separately. 15 of the measured plants are also sequenced, but the different probes do not give an unambiguous answer (oral communication H. Duistermaat). Considering all the available data it seems reasonable to me to use 4 species as a basis. If we include the barcoding, *E. verna* seems to have about as much DNA as *E. glabrescens* and the oktoploid *E. praecox* as much DNA as *E. boerhavii*. In addition, diploid plants have been measured that coincide with *E. majuscula* in terms of DNA weight, but which differ morphologically due to the lack of stellate hairs, among other things. That might also be a diploid *E. praecox*. If we add this up, we arrive at 4 species with three cytotypes for *E. praecox*. At least 3 species can be found north of the Lighthouse in Noordwijk (Wantveld). All have three peaks. According to the latest insights, they are all placed now in *Draba* (Bomble 2006).

**Euphorbia** There are also all kinds of discrepancies between chromosome numbers and DNA weights. Especially *E. palustris* (2n=16, 20) and *E. paralias* with 2n=16 but respectively 8.10 and 1.59 pg stand out. Do they have to be transferred to another genus or should chromosomes of more plants be counted?

**Fallopia** (now *Reynoutria* p.p. Schuster et al. 2011). In England 2.7 pg was measured for *F. sachalinensis* (2n=44 (66, 132), *japonica* (2n=44, 88) and *japonica compacta* (2n=32, 40, 44). However, for these species I measured 8.8, 9.4(7.3) and 7.6 pg. And also 7.4 pg for *F. x bohemia*, which would be a hybrid of

*F. japonica x sachalinensis* (7.3 x 8.8 = 8.1 pg). There is also 6.3 pg measured from plants from experimental crosses. The Dutch plants are hexaploid and octoploid as also measured in the Czech Republic (Suda et al. 2010). For *F. japonica* hexaploid, septaploid and oktoploids values are indicated. The origin could be explained as follows: 4x X 8x → 6x X 8x → 7x. A small problem: the tetraploid has not yet been found in The Netherlands. The three fallopias that are not classified under *Reynoutria* do indeed have much less DNA than these three *Reynoutria*. *F. convolvulus* has twice as much DNA as *F. dumetorum*, in accordance with its higher chromosome number.

**Ficaria** Findings on 2C-values have already been published in *Gorteria* (Zonneveld 2015a; Veldkamp 2015) in which eight (sub)species are distinguished worldwide. By far the most plants in The Netherlands are *F. verna*. In rare cases, it still produces seed. Escaped from gardens and probably also imported (via caravans?) from England, *F. ambigua* occurs in the Netherlands (in Heukels Flora as *F. verna* subsp. *grandiflorum*). Recently it has been demonstrated that tetraploid *F. verna* can be divided into two groups with 31 pg for the eastern form and 34 pg for the western form (Drenckhahn et al. 2017). Intermediate values are found in The Netherlands. The possible diploid ancestors of *F. verna* are *F. calthifolia* and *F. ambigua*.

**Fritillaria** For the Dutch species, *Fritillaria* has the highest amount of DNA per nucleus. *F. meleagris* has 107 pg and *F. imperialis* 101 pg, but there is also a cultivated form: *F. imperialis* 'Maxima' with 200 pg DNA.

**Gagea** This genus with 5 Dutch species has been extensively investigated (Zonneveld et al. 2015). *G. pratensis* occurs in 4 different ploidies: 4x, 5x, 6x and even 10x. Half of the almost 200 measured gageas, consist of the pentaploid *G. pratensis* and even 80% of the Dutch gageas are *G. pratensis*.

**Galanthus** Of the 20 or so species only a few occur "wild" in The Netherlands (Zonneveld et al. 2003). By far the most are *G. nivalis* with 72 pg, 10 times as much DNA per nucleus as humans. Recently, besides the *G. elwesii*, that is about the first to flower in spring with broad grey leaves, now *G. woronowi* is increasingly imported with broad, green leaves.

**Galeopsis** *G. tetrahit* is an allotetraploid (Müntzing 1932, Bendiksbj et al. 2011), *G. speciosa x pubescens*, and has 3.29 pg. One parent, *G. pubescens*, has 1.86 pg and for the other parent *G. speciosa* we find 2.21 pg. Then we get 2.21+1.86=4.07 pg this does not correspond to the measured value. An alternative is that *G. tetrahit* is a hybrid of *G. speciosa x segetum*. The DNA weight of *G. segetum* (1.33 pg) fits much better: (2.21+1.33=3.54 pg). Moreover, *G. segetum* (pale yellow) is much more common than *G. pubescens*. The recent publication by Bendiksbj et al. (2011) designates *G. pubescens* and *G. sulphurea* (not measured, (the latter also with yellow flowers) as alternative parents.

**Galium** Of the common *G. mollugo* several ploidies are mentioned. 17 measurements (range 3.58–4.12 pg) have not yet shown this, although there do seem to be differences in the amount of DNA. It is striking that, of the 6 out of the 17 with the highest values, there are 5 plants from the dunes which do not occur in the other 12 taxa. This suggests that the dune form might be another (sub)species. It is doubted whether the pale yellow *G. x pomeranicum* is the hybrid *G. mollugo* (now *G. album*?) x *G. verum*, or just a pale *G. verum*. As far as DNA weight is concerned, this cannot be solved since both parents and the "hybrid" have the same amount of DNA. *Galium aparine* stands out with the second highest chromosome number but only 2.05

pg. Also *G. pumilum* with  $2n=(44-66)$  88 has no more DNA than other species with half the number of chromosomes. This may indicate  $2n=44$  for *G. pumilum*.

**Geranium** *G. sanguineum* has by far the highest amount of DNA: 8.28 pg combined with the largest number of chromosomes, namely  $2n=84$ . *G. purpureum* has with 32 chromosomes only 1.09 pg. Both the purple and the white flowering form of *G. robertianum* were measured with the same result. All Geraniums give three peaks with the second (sometimes together with the third) the highest peak.

**Ginkgo biloba** *Ginkgo* is not a conifer but has just like conifers a haploid endosperm.

**Glyceria** It is not clear why *G. maxima* with 60 chromosomes has 13 times more DNA with 13.4 pg than *G. declinata* with 20 chromosomes, but only 1.01 pg. With their DNA weights, the species can be kept apart properly.

**Hedera** The plants wild in The Netherlands, occur in two ploidies: the diploid species, which we find mainly in the forest, and the tetraploid species with the double number of chromosomes and a double DNA weight. This *Hedera hibernica* is mainly planted as a hedge and on slopes and does not climb very often. That is why it flowers less often and the birds can spread far fewer seeds. The leaf is larger, is almost not marbled and has fewer pointed lobes. Hybrids have not yet been found, despite the fact that 40 collections have been measured. *H. hibernica* (Kirchner) Bean seems to be a separate species.

**Helianthus** *H. tuberosus* can be crossed with *H. rigidus*. *H. tuberosus* rarely or never flowers in The Netherlands, but after the warm summer and autumn of 2018 the first buds were seen in mid-October. The hybrid has as much DNA as *H. tuberosus* but flowers richly. It occurs in at least two forms: with and without tubers. Maybe both characteristics, tubers or flowers or both, have been selected separately? There is no difference in DNA weight between short-stemmed sunflowers (1 m) and long-stemmed forms (3 m).

**Helicotricon** *H. pratense* has  $2n=126$  chromosomes, which is nine (!?) times as many as *H. pubescens*. Yet *H. pratense* has only 3.5 times more DNA. It may indicate a massive loss of DNA, after doubling.

**Helleborus** All 16 species have the same chromosome number  $2n=32$ . However, the weight of the DNA per nucleus varies from 19 to 36 pg in the different species (Zonneveld 2001). This means that in the species with the highest amount of DNA, the chromosomes must be twice as large.

**Heracleum** The same DNA weight for *H. mantegazzianum* is found as for *H. sosnowskyi*. That does not automatically mean that it is the same species, but considering the other similar characteristics, it might be.

**Hieracium** It shows, with the limited number of measurements on Dutch plants, no clear relationship of the DNA weight with the chromosome numbers. Incidentally, the roots (used to measure the DNA weights for this genus) only show a single peak, unlike many other plants whose roots have two peaks, 2C and 4C.

**Hordeum** *H. marinum* is diploid with  $2n=14$  and the three other Dutch hordeums, *H. jubatum*, *murinum* and *secalinum* are tetraploid with  $2n=28$ . They also have corresponding DNA weights. What is special is that barley, *H. vulgare*, which has been cultivated for centuries, is still simply a diploid with the corresponding DNA weight. This probably also applies to rye. On the other hand, wheat and oats have evolved in culture to hexaploid plants.

**Hyacinthoides** In The Netherlands the hybrids between *H. hispanica* and *H. non-scripta* dominate. Both parents are relatively rare in pure form. However, there is also a triploid form with broad leaves that is often cultivated and flowers later. The triploid also produces limited amounts of seed. Sowing 50 seeds yielded 34 seedlings. In terms of DNA weight, they fall between the diploid grandparents and the triploid hybrid (not shown here). They have lost a lot of DNA, as is often seen in offspring of triploids (Zonneveld and Pollock, 2012a).

**Hydrocharis morsus-ranae** This species occurs with two DNA weights: 4.4 and mostly with 8.6 pg, diploid and tetraploid plants, but only a single chromosome number is mentioned in the literature. Twice 2.1 pg was measured, but it is suspected that these were young *Nymphaea peltata* plants (should have been recognized by their serrated leaf edge).

**Impatiens** *I. parviflora* has the smallest flowers but the highest amount of DNA of the six *Impatiens* species measured here. Its hybrid with *I. balfourii* indicates unreduced gametes in *I. balfourii*. However, the hybrid is fertile and the seedlings are very uniform in the garden, also in terms of flower color and flower shape. Maybe seed is produced without fertilization. *I. glandulifera* is easy to control, because the seed loses its germinative capacity after a year. If all plants are removed before flowering, there will be nothing left for the following year as I experienced in 1974 and again in 2019.

**Inula** Among the four inulas, *I. britannica* seemed to be the only one to show a discrepancy between the DNA weight and the number of chromosomes. Perhaps it might have double the number of chromosome as is also frequently mentioned in the CCDB (Rice et al. 2015).

**Jacobaea** All seven species have  $2n=40$ . Also they all show only one peak except the two subspecies of *J. vulgaris* which have three peaks. Maybe they don't belong in this genus. *J. paludosa* has roughly twice as much DNA, as much as *J. aquatica* x *vulgaris*, an allotetraploid. However, a factor of two difference within a genus is common, but it seems here a different situation.

**Juncus** Also in *Juncus* there is no direct correlation between chromosome numbers and DNA weight. Some really stand out, like *J. maritimus* with only 0.32 pg, *J. bufonius* with the highest number of chromosomes with  $2n=108$  but only 1.72 pg DNA and *J. capitatus* with only  $2n=18$  but still 0.72 pg. Sorted by DNA there seem to be two groups: 30 species with (0.32) 0.6–1.3 pg and 7 species with 1.8–3.9 pg (1.8–2.6 and 3.7–3.9 (3x), with no clear connection with the number of chromosomes. All species have only one peak.

**Lamium** With *L. maculatum*, DNA values of on average 2.78 pg (measured 5 times) are found, but also 5.8 and 11.7 pg. However, there is only one chromosome number  $2n=18$  (counted 43 times) and even the 2.78 pg is actually twice as much as you expect, compared to the other lamiums. Maybe the selection for larger white spots is responsible or other species are involved.

**Lathraea** *L. clandestina* occurs in two ploidies with 2.18 and 4.18 pg. The same holds for *L. squamaria*.

**Lathyrus** In the eleven *Lathyrus* species with, except one,  $2n=14$  chromosomes, the DNA weights vary from 8.85 to 20.4 pg. The only one with three times more chromosomes, *L. palustris* with  $2n=42$ , has only 31.5 pg or 50 % more DNA. All *Lathyrus* have 2–4 peaks.

**Lemna and Spirodela**, All 7–9 species of the Dutch Flora did grow within a radius of 2 km in Leiden ZW in 2015. The following year *L. minuta* appeared to have taken over almost the whole of The Netherlands. Maybe this was due to the following

frost-free winter. A number of "species" also appeared to have different amounts of DNA, which can sometimes be explained by differences in ploidy. It could also be different species, as has already been found for *Wolffia*.

**Leontodon** *L. saxatilis* has compared to the other 2 species with 4.04 and 4.83 pg, very little DNA with 1.41 pg, although it has a slightly lower number of chromosomes ( $2n=8$  versus  $2n=12$  and 14).

**Lepidium** Six of the nine species have less than 1 pg DNA with 16 chromosomes. Only one of them, *L. densiflorum* has double the number of chromosomes. On the other hand, *L. draba* with 64, 80 chromosomes, does not exceed 1.97 pg.

**Leucanthemum** According to R. Haveman (2017), the common Dutch (tetraploid?) *Leucanthemum* should be called *L. ircutianum* instead of *L. vulgare* (the much rarer diploid plant). Alternatively, both cytotypes (also counted by Gadella and Klijphuis, 1963) could continue to be called *L. vulgare*.

**Linum** The two *Linum* species have the same amount of DNA but respectively 16 and 30 chromosomes. There could be a tetraploid *L. catharticum*.

**Littorella uniflora** For such a small plant, *L. uniflora* has a lot of DNA, 12.1 pg. The same is even more true for *Luronium natans* with 43 pg.

**Lonicera** All five species have  $2n=18$  and three of the five have about 2 pg DNA. *L. periclymenum* has a lot of DNA, 6.3 pg, but it also listed with 36 and 54 chromosomes.

**Luzula** *L. campestris* with  $2n=12$  has almost as little DNA as *L. pilosa* with  $2n=66$ . *L. multiflora* subsp. *multiflora* is hexaploid with 2.78 pg and subsp. *congesta* is octoploid with 3.28 pg. Are these separate species like for example *L. congesta* (Thuill) Lej?

**Lycium** Goji berries are now superfood. As a result, plants of *L. barbarum* with 5.84 pg are falsely offered as *L. chinense* that measures 4.01 pg. *L. barbarum* is found in Katwijk also with round instead of elongated berries. The plants of Noordwijk, Huisterduinstraat with 4.99 pg then seemed to be hybrids. Both species are native to China. According to R. van Moorsel (2014) (NDFFF, Verspreidingsatlas), the much rarer *L. chinense* never seeds in The Netherlands.

**Lysimachia** *L. clethroides*, the only species grown in The Netherlands with white flowers, has 2–3–4 times as much DNA as the other 5 *lysimachias* with yellow flowers.

**Malus** The wild *Malus* has about as much DNA and chromosomes as a number of cultivated apples (to be published with all other fruits, vegetables and herbs). It is often assumed that the cultivated plants have such large fruits or flowers because they are polyploid, i.e. that the DNA has at least been doubled. This seems not always to be the case, as is found with eating apples.

**Malva** *M. verticillata* is measured with 1.87 and 3.82 pg. The highest value is for the var. *crispa*. *M. verticillata* has a large number of chromosome types, namely circa 42, 76, 84, 112 and 126. So a var. *crispa* with twice as much DNA is not surprising. Also if this is compared with the other malvas that mainly have  $2n=42$  and from 1.5 to 3 pg.

**Marsilia quadrifolia** This plant has very little DNA for a fern, 2.55 pg. But the ferns *Pilularia* and *Azolla* are in the same order of magnitude, the other ferns measured are above 10 pg. These three ferns are all growing in/on the water.

**Marubium vulgare** This species grew in a Swiss botanical garden. A leaf of this species has been measured, due to the lack of a Dutch specimen.

**Medicago** *M. (sativa subsp.) falcata* with  $2n=16(32)$  has exactly the same DNA weight as *M. sativa* subsp. *sativa* with  $2n=32$ . Just like the hybrid *M. x varia*. So it seems that *M. falcata* is just a subspecies of *sativa* and has  $2n=32$  in The Netherlands. This is confirmed in the new chromosome list (Rice et al. 2015). Both subspecies are likely hexaploid if they are compared with the other diploid medicagos.

**Milium** *M. effusum* with  $2n=(14)28(42)$  has 5.17 pg and *M. vernale* with  $2n=(8) 14 18(36)$  has 6.24 pg. It is not possible to determine which chromosome number applies here.

**Montia** For *M. minor* 0.69 pg was measured twice. For three other plants received as *M. minor* I found 1.14 pg. That is probably *M. fontana*, corresponding to a fourth plant received under that name (1.19 pg). Both have up to 16-ploid nuclei.

**Myosotis** All species have up to 16-ploid nuclei. *M. laxa* subsp. *laxa* and subsp. *caespitosa* have different DNA weights namely 3.12 and 2.49 pg. If we take  $2x=22$  and 0.8 pg as base numbers (based on all myosotis data), these appear to be octoploids and hexaploids. They might be separate species. This seems also to be the case for *M. scorpioides* subsp. *scorpioides* and subsp. *nemorosa*. These not only have different chromosome numbers namely  $2n=22$  and 66 but also the corresponding DNA weights namely 0.82 and 2.45 pg. So they seem to be diploids and hexaploids. Also the diploid *M. dubia* and the hexaploid *M. discolor* may be better considered as separate species.

**Nepeta** With *N. x faasseni* (*Nepetella x Nepeta racemosa*), there is something strange. With this taxus 0.68 pg is measured. For *N. racemosa* 1.68 pg was measured. The easiest way to calculate the unknown parent of a hybrid is to multiply the hybrid by 2 and then subtract the known parent:  $(2 \times 0.68) \text{ minus } 1.68 = -0.32$  pg for the other parent, a negative DNA weight! Was the wrong *N. racemosa* (from seed) measured or has another *N. racemosa* with half of the DNA been used? For *N. cataria* 0.84, 1.18, 1.39 and 1.55 pg were measured.

**Nasturtium** In a box of watercress from the supermarket it appears that both *N. officinale* and *N. microphyllum* can be found. That different species (not cultivars or varieties) are sold under one name also applies to spinach, rucola and spring onion. Two onion species are used interchangeably for spring onion, depending on the season.

**Nymphaea** *N. x candida* is a hybrid between *N. alba* and *N. tetragona*. This hybrid in turn is backcrossed with *N. alba*=*N. x borealis*.

**Oenothera** All species have, in The Netherlands, just like *Oenanthe* all the same number of chromosomes, only one peak and about the same amount of DNA. The exception is *Gaura lindheimeri*, which is now also placed in *Oenothera*. However, it has only half of the DNA weight. **Onopordum** That the size of the plant is usually no indication for the weight of the DNA we see at *O. acanthium* with 2.76 pg.

**Ophioglossum vulgatum** This small fern has 44.6 pg and about 540 chromosomes. *O. azoricum* has with 65.3 pg and even 740 chromosomes, 50 % more DNA than *O. vulgatum*. It is considered a hybrid with *O. lusitanicum* ( $n=120, 240, 480$ ) (Khandelwal 1990).

**Ornithopus** All three species have exactly the same amount of DNA, the same number of chromosomes and all three, three peaks.

**Orchis** and **Ophrys** The investigated species, all with high amounts of DNA (20–30 pg) have three peaks, i.e. have "diploid, tetraploid and octoploid" nuclei.

**Orobanch** Nearly all species have  $2n=38$  and more or less comparable amounts of DNA. The one exception is *O. purpurea* with 24 chromosomes. Contrary to expectations, it has roughly twice as much DNA as the other 8 species. It has now a different name: *Phelipanche purpurea* (Jacq.) Sojak.

**Oxalis** *O. dillenii* with (16) 24 chromosomes has only 10% of the weight of the DNA of *O. acetosella* with  $2n=22$ .

**Papaver** *P. rhoeas* has with 5.2 pg and  $2n=14$  half the DNA weight of *P. dubia* with  $2n=42$  and 10.5 pg. However, also here Rice et al. 2015 offer a solution, which also indicate 14 and 28 as possible chromosome numbers for *P. dubia*. For *P. argemone* there are three different amounts of DNA: 3.1, 5.9 and 7.96 pg DNA, the first of which was measured from seed.

**Paris quadrifolia** This species, measured against *Haemanthus albiflos* with 72 pg, has a lot of DNA, namely 109 pg. 109 pg is not yet a record, *Viscum album* and *Fritillaria* 'Maxima' have almost twice as much DNA.

**Pastinaca** *P. sativa* subsp. *urens* seemed to me a separate species with its 3.01 pg compared to subsp. *sativa* with 3.49 pg. It turns out that this has already been implemented as *P. umbrosa* Stevens.

**Persicaria** *P. amphibia* with  $2n=66$ , 88 and 96 has less DNA than expected, compared to the other persicarias.

**Petrorhagia** *P. saxifraga* has twice as many chromosomes as *P. prolifera* but only 25% more DNA.

**Phalaris** *P. canariensis* with  $2n=12$  has almost as much DNA as *P. arundinacea* which has  $2n=28$  (counted 5 times).

**Phragmites australis** This species also occurs in a more compact form on the edge of the mudflats along the sea. However, there was no difference in the DNA weight with the two meter high reed, which grows along the fresh water ditches.

**Phyteuma** The whitish *P. spicata* is much rarer in The Netherlands than the black-blue colored form. There is a slight but consistent difference in DNA weight: 2.40 pg for the white form and 2.48 pg for the blue form (6 plants of each measured and in all 12 cases the blue form had a slightly higher DNA weight). There are several morphological differences and together it seems opportune to consider them as separate species. The five light-blue to nearly white hybrids growing in my garden showed a much lower seed set, but they were the first to flower and had shorter flower spikes (Drought?).

**Phytolacca** Although they are often added together, I still tend to distinguish three species: *P. acinosa* with 6.21 pg (and probably  $2n=72$ ); *P. esculenta* (also with upright fruit bunches) with slightly less DNA 5.71 pg and also  $2n=72$  and *P. americana* (with hanging fruit bunches) with half of the number of chromosomes  $2n=36$  and half of the DNA 2.55 pg. Each species has been measured six times with the same result.

**Plantago** The species have, except for *P. media* and *P. asiatica* ( $2n=24$ ), about the same number,  $2n=(10)-12$  chromosomes. However, the weight of the DNA varies from 1.1 to 3.5 pg. That is just within what is found more often. *P. asiatica*, which has been in the garden as a variegated plant for years, comes back true from seed. It also seems to be an annual plant, but is often considered to be a form of *P. major*. However, the weight of the DNA is clearly different, 3.45 pg instead of 1.48 pg for *P. major*. In terms of DNA weight, it could be a hybrid between *P. major* and *P. media*, but the plant is less than half the size of its supposed parents. On the other hand, a purple-leaved form of *P. major* that has always leaves that are twice the size, has the same amount of DNA as *P. major*.

**Platanthera** *P. montana* has almost twice as much DNA per nucleus as *P. bifolia*, while they have the same number of chromosomes with  $2n=42$  (counted 40 times). The question is if they are separate species. Both have 3–4 peaks, just like many other orchids, even though they have a lot of DNA. This is perhaps related to the fact that from orchids always a single leaf was received to prevent destroying the plants. Leaves contain more often/always more peaks.

**Polygala** The three species can be easily separated in terms of DNA weight with 0.83, 1.05 and 1.88 pg.

**Polygonum** There are three DNA weights: 2.55 pg (*P. aviculare* subsp. *aviculare*,  $2n=6x=60$ ); 1.73 pg (*P. aviculare* subsp. *demersum*, (H. Duistermaat det.),  $2n=4x=40$ ) and 1.95 pg (*P. oxisperrum* subsp. *raii*). Total 60 samples were measured. So there seem to be 3 species. An alternative is that there are almost as many tetraploids (measured 24 times) as hexaploids (measured 30 times) in *P. aviculare* s.l. No hybrids have been found in 60 collections.

**Polypodium** The two Dutch species are notoriously difficult to separate in the field. Without a good microscope you could not solve that, as is true for more "field" characteristics. However, the DNA weights are very different: 29.2 pg (range 28.6–31.6) for *P. vulgare* and 44.9 pg (range 43.4–48.7 pg) for *P. interjectum*. Of the 61 plants measured, 13 were found to be hybrid *P. x mantoniae*. However, these fall into two groups of 6 and 7 plants: the first group has 37.5–39.5 pg, average 37.2 pg, according to the calculation the hybrid *P. x mantoniae* has  $(29.2+44.9)/2=37$  pg. The second group, however, with 32.5–36.1 pg, 34.3 pg on average, deviates. These plants mainly came from Soest. So it seems that the lower values are backcrosses of *P. x mantoniae* with *P. vulgare*. Another possibility is that one of the parents in Soest has a lower value.

**Populus** Of the six poplars, five are close to 1 pg. An exception is the nowadays often cultivated, semi-pillar hybrid *P. x canescens* 'Koster' which has 1.5 pg. Apparently a triploid plant, with one of the parents making unreduced gametes or one of the parents was tetraploid.

**Potamogeton** The species can be divided into two groups: a group with almost 1 pg and a group with almost 2 pg. However, many more chromosome numbers are mentioned. Maybe they differ only in chromosome number not in the amount of DNA. Most plants have three peaks.

**Potentilla** The species have different DNA weights and chromosome numbers, with no clear connection between them.

**Primula** The three Dutch primroses are close together in DNA weight and have all three 4 peaks as also found for *Pseudofumaria*.

**Prunus** *P. laurocerasus* has roughly 7–10 times more DNA than the other 10 *Prunus*, but that corresponds to its much larger number of chromosomes. The roundish purple or dark red plums that we find in the supermarket in winter are not the oval European *P. domestica* but another, Japanese, species, *P. salicina/triflora* with a different DNA weight.

**Quercus** The value for *Q. robur x petraea*, 2.20 pg, is higher than the parents with respectively 1.98 and 2.06 pg, but the difference is not really significant.

**Ranunculus** There is no clear distinction in DNA weight, peak pattern or chromosome numbers between the terrestrial and aquatic plants. *R. aquatilis* gives two values: 7.26, 8.89, and for subsp. *diffusus* 3.26 and 10.60 pg. This clearly deserves further investigation. Seven species with  $2n=32$  have DNA weights of 7.44–19.3 pg and three species with  $2n=16$  have 4.0, 5.94, and

6.33 pg. It is then striking that *R. bulbosus* also has with  $2n=16$ , 11.0 pg and even 18.5 pg ( $2n=32$ , 64?). *R. polyanthemos* with only 0.91 pg is most likely misidentified. Also special is *R. parviflorus* for which both 6.6 and 12.1 pg were measured, both obtained from the same collector.

**Rhamnus** In *Rhamnus*, DNA contents and chromosome numbers are close together. *R. cathartica* with 0.94 pg ( $2n=24$ ) and *R. frangula* with 0.71 pg and  $2n=20$ .

**Ribes** *R. speciosum* is the only one that differs a little in DNA weight: 2.23 pg versus 1.84–2.04 of the other 7 *Ribes* species. It is the only one from California.

**Ricinus communis** This fast growing annual with a size of up to 2 m, has only a little DNA 0.8 pg. It has the appropriate name Miracle tree.

**Rorippa** *R. sylvestris* is a weed of meadows and moist pastures and is feared by farmers as it is poisonous to livestock.

**Rosa** There are 26 wild roses in The Netherlands. These are diploid, triploid, tetraploid, pentaploid and hexaploid plants (Bakker et al. 2011). There must have been a lot of hybridisation. In a few cases the DNA content does not match the ploidy. It can be a wrongly named species or wrong count.

**Rubus** There are more than 200 wild blackberries in The Netherlands (van de Beek et al. 2014). However, these are (often) apomictic clones. Of the four small subgenera five of the total seven species were measured and of the largest subgenus *Rubus* one of each series (36 series, 6 more to do) was attempted to measure, in total 41 species. Also here there are species that are inferred to be diploid, triploid, tetraploid, pentaploid and hexaploid.

**Rudbeckia** To the two species in the flora, a third species is added, *R. fulgida*, which also can be regularly encountered (in gardens). All three have different DNA weights. However, there also seem to be many hybrids.

**Rumex** *R. rugosus* is used as a vegetable and is said to be derived from *R. acetosa* and that fits on the basis of their DNA weights. *R. acetosa* is also similar to *R. thyrsiflorus* in terms of the small number of chromosomes and the relatively large weight of DNA. They thus seem to be related. Of the latter, both male and female specimens are measured. That the male plant has a chromosome more is not shown by the weight of the DNA. Is this a case of chromosome cleavage? *Rumex hydrolapathum* has by far the highest amount of DNA, 15.3 pg, corresponding to its larger number of chromosomes ( $2n=130$ , 200). However, three *Rumex* species with  $2n=(40)$  60 have only about 4 pg. Probably these are not very related. All *Rumex* species show three peaks.

**Rupia** *R. cirrhosa* with  $2n=20$ , 40 and 60 has twice as much DNA as *R. maritima* with  $2n=20$ . The conclusion seems justified that *R. cirrhosa* has  $2n=40$ . However, it may as well be  $2n=20$ , because a factor of 2 difference with the same numbers of chromosomes is not uncommon. So even in this simple case with 2 species it is not possible to determine the ploidy of *R. cirrhosa* based on the DNA weight. Suppose that only  $2n=40$  was counted for *R. cirrhosa* then it would be wrong to conclude that it is a tetraploid.

**Sagina** Most species have less than 1 pg and show 3 to 4 DNA peaks. *Rumex* also shows three peaks with an average of 5 pg. So there doesn't seem to be such a strong correlation between DNA weight and the number of peaks. Better said: in nature there are exceptions to every rule.

**Salicornia** Of *S. europaea* the DNA weight of the large plants of a nursery in Zeeland was 1.22 pg, the same as what grew in the wild a few km away. Plants of Rottum, (*S. procumbens* / *stricta*?)

have twice as much DNA with 2.53 pg. The question is, whether this is a single tetraploid species. Also striking is that what you buy at the fishmonger in winter and comes from Israel or Chile has another value: 1.95 pg. This could be a hybrid of e.g. *S. europaea* x *procumbens*, but also another non-Dutch species like the Mediterranean *S. perennans*.

**Salvinia** A plant received from Germany (Romerberg) is, in terms of DNA weight, exactly between the two other species. So probably a hybrid or another species.

**Salix** Most *Salix*, 16 species measured, have less than 1 pg. The species that have roughly twice as much DNA (8 species), also have twice as many chromosomes. *Salix x dasyclados* is then hexaploid with 2.24 pg which may have to do with its origin from a cross between three species. Almost all *Salix* species have two DNA peaks. This is unusual for trees, which usually have a single peak only.

**Sambucus** The four species are close together in DNA weight. The herbaceous elder does not deviate in this respect. They have for trees / bushes a lot of DNA with about 25 pg. Most shrubs have, just like trees, ten times less DNA. Is *Sambucus* perhaps an example of a moderately woody herbaceous genus?

**Schoenoplectus** *S. pungens* has almost twice as many chromosomes as the other four species, but the DNA content is similar. Are the chromosomes largely split in two parts?

**Scilla** A very big difference is found between the three scillas, *S. bifolia* has 9.6 pg and the other two scillas have 51.6 and 75 pg. They are now also placed in different genera.

**Scleranthus** *S. perennis*, the perennial species has half the DNA (and half the number of chromosomes) compared to the annual *Scleranthus*. You would expect the opposite.

**Scrophularia** For *Scrophularia vernalis* also diploid and tetraploid forms are found.

**Sedum** Remarkable with the sedums (and other succulents) is that they have three to five peaks. This may have something to do with the fact that they produce a lot of mucus (polysaccharides) to retain moisture.

**Senecio** Despite the fact that *S. nemorensis* and *S. sarracenicus* are also considered to be  $2n=40$  like the other senecios, they have 2–3 times more DNA. Such a difference is not uncommon.

**Silene** *S. baccifer*, the only Dutch silene with berries instead of dry fruits, has much more DNA than the other silenes. Maybe it would be better to put it back in *Cucubalus*. There also seems to be a tetraploid form. Despite relatively much DNA, 2–5 pg, all silenes show three peaks. The zinc-tolerant form of *S. vulgaris* was also measured, but no difference was found. *S. latifolia alba* and *S. dioica* have the same amount of DNA. However, the hybrid appears to have 1.5 times as much, so it is triploid and one of the parents has made unreduced ( $2n$ ) gametes. This may indicate, just like in other cases where two diploid parents produce a triploid hybrid, that the parents are not very related. The hybrid can only be formed if unreduced gametes are formed by one of the parents, so that a partial diploid situation with 2 sets of one of the parents is present in the hybrid.

**Silybum** I once found a plant with beautiful, silver striped leaves in a neglected flowerbed in Noordwijk aan Zee. That turned out to be a thistle, *S. marianum*. Later I found out that the plant deviated with white flowers instead of purple ones.

**Sisymbrium** All six species are very close together and have with 0.65 pg very little DNA. As often, this is "compensated" by the higher ploidy in the leaf.

**Solanum** With the cultivated tomatoes *S. lycopersicum* all measured cultivars, from small roma types to beef tomatoes,

have the same amount of DNA in their leaves, regardless of the size or shape of the fruits. All six Dutch solanums have more DNA than tomatoes. Recently diploid potato varieties have been developed that can be grown from seed instead of tubers. Instead of buying young potatoes every year, you can now buy F1 hybrid seed. That saves a lot in freight costs. However, potatoes can only be harvested from seed after two years.

**Solidago** For all four species, different DNA weights were measured. This is for what it is worth, because there seems to be a lot of hybridizing.

**Sonchus** *S. arvensis* has as much DNA as the subsp. *maritima*. Both have roughly twice as much DNA, considering the ploidy, as the other species.

**Spirodela polyrhiza** This is the largest of the 7(9) Dutch duckweed species, but it has the lowest amount of DNA.

**Stachys** The species have both great variation in DNA weight per nucleus: 1.83–9.36 pg, and in chromosome number:  $2n=10-102$ . This is not correlated, almost the opposite. *S. officinalis* with by far the highest amount of DNA, 9.36 pg, but only  $2n=16$  is also classified as *Betonica* L. There also seems to be a triploid form of *S. palustris*.

**Stellaria** The species fall between 0.95 and 2.67 pg in terms of DNA and  $2n=22, 26, 44$  in terms of chromosome number. The exception is *S. palustris* with 7.71 pg and  $2n=circa 130$ . *S. pallida* varies from 0.57 via 0.78 to 0.99 pg. These are probably diploid, triploid and tetraploid plants.

**Sutera cordata** I noticed in the garden center, that the flowers were slightly larger than in previous years. Measurement showed that it was indeed a tetraploid cultivar.

**Symphytum** *S. orientale* with pure white flowers has only 0.98 pg DNA, although the chromosome number does not deviate from the other species. It was grown from seed and the flowers are indeed pure white.

**Tagetes** *T. patula* has almost twice as much DNA with half the number of chromosomes compared to the other *Tagetes* species.

**Tanacetum** *T. vulgare* has the same number of chromosomes but twice as much DNA as *T. parthenium*.

**Taraxacum** *Taraxacum* is a genus with a large number of often apomictic species. However, the dune form *T.* (subsp.) *laevigatum* has 4.0 pg DNA per nucleus (measured three times, tetraploid?) and the more common form (measured ten times, triploid) has 2.84 pg. It therefore seems logical to consider the dune form (with leaf incisions pointing downwards) as a separate species. Especially because all 28 dandelions from the *Taraxacum* section of the Czech Republic had also about 2.7 pg.

**Thesium** it could easily be shown that the collected *Thesium* species with 0.67 pg was indeed a species different from *T. humifusum* with 1.65 pg.

**Thlaspi** The species with the largest number of chromosomes also have a larger DNA weight.

**Thymus** They look like a (mini) deciduous trees in terms of DNA, with little DNA and only one peak.

**Torilis.** *T. arvensis*, with  $2n=12$  has 2.91 pg DNA, *T. nodosa* with  $2n=24$  has 1.83 pg.

**Trapa natans** This species has been purchased in a garden center.

**Trifolium** The species vary from  $2n=10$  to 18 with once  $2n=32$ . The largest outlier is *T. medium* with  $2n=80$  and also a lot of DNA: 8.43 pg.

**Triglochin** *T. maritima*, , has twice as many chromosomes as *T. palustris* (in GB) but 3.5 times as much DNA (in The Netherlands). Moreover, two of the five species measured from

this genus appear to be intermediate in terms of DNA weight. Are there hybrids between these two taxa or is it a separate species?

**Tripleurospermum** *T. maritimum*, mostly (always?) found along the coast of The Netherlands, has 9.80 pg. The material provided as *T. inodorum* has only 5.89 pg. One may wonder if they are separate species, or a diploid and a tetraploid form of the same species.

**Triticum** The now popular spelt, *T. aestivum* has as much DNA as regular wheat. It is a back-grown old-fashioned wheat variety with a rather low yield.

**Tulipa sylvestris** This is the only tulip that is probably native in The Netherlands. It is a tetraploid with 115.7 pg. The diploid form *T. australis* is more a species of southern Europe. Of both I had measured about ten plants. I was surprised to find a triploid with 90.4 pg on a small island on the south coast of Norway, where ballast sand was unloaded and loaded. But where did this triploid come from? The riddle seems solved when I got a plant from close by the old harbor town of Enkhuizen, which also turned out to be a triploid.

**Typha** The three species have barely more than half a picogram of DNA per nucleus.

**Urtica** *T. dioica* subsp. *dioca* has twice as much DNA as subsp. *subinermis* (syn: subsp. *galicifolia* according to Stace (2010)). The species new for The Netherlands, *U. membranacea*, does not differ much from the other *Urtica* species with its 1.75 pg.

**Utricularia** Just like *Typha* it has little DNA, about half a pg.

**Vaccinium** *V. oxycoccus* seems to occur in The Netherlands as a diploid plant with  $2n=24$ , considering its DNA weight. The English numbers indicate  $2n=48$  and 72. However, Rice et al. 2015, also indicates  $2n=24$  in two of the 50 plants counted.

**Valerianella** With 0.42 pg it is one of the Dutch species with the least DNA. Comparable are *Juncus maritimus* with 0.32 pg, *Spirodela polyrhiza* with 0.37 pg, *Aruncus dioicus* with 0.39 pg and *Arabidopsis thaliana* with 0.32 pg.

**Valeriana** Female plants of *V. dioica* appeared to have almost 10 % more DNA than male plants. Each was measured two times. A third measurement unfortunately did not confirm this.

**Valisneria spiralis** This waterplant has a lot of DNA with 21.7 pg.

**Verbascum** This is one of the largest Dutch herbaceous plants together with *Heracleum* and *Onopordum*. Their low amounts of DNA do not match this.

**Veronica** With 25 species it is one of the larger Dutch genera of higher plants. There is a good correlation between the number of chromosomes and the weight of DNA per nucleus. *V. hederifolia* seems to consist of two species: subsp. *lucorum* (measured five times  $2n=54$ ) has 4.12 pg and the subsp. *hederifolia* 3.01 pg (measured nine times,  $2n=36$ ).

**Vicia** The species have  $2n=12, 14$  (28) chromosomes with about 4–8 pg. Here is the outsider *Vicia faba*, the broad bean, with  $2n=12$  but 26.5 pg DNA. This is seven times as much as with *V. sativa*, also with  $2n=12$ . The increase in DNA may be due to massive insertions of transposons. These are virus-like particles that can jump into different places in the DNA and multiply in this way. But maybe *Vicia faba* belongs to another genus.

**Vinca** *V. major* with  $2n=96$  has twice as many chromosomes as *V. minor*. However, the weight of the DNA for *V. major*, 4.07 pg, is more than twice as large (1.53 pg) This is not the usual outcome for an autotetraploid and indicates that *V. major* is not a doubled *V. minor*.

*Viola V. curtisii* and *V. tricolor*, are the only pair within the genus in The Netherlands, that have the chromosome number  $2n=26$ . However, *V. curtisii* has about 10% more DNA per nucleus. One may wonder if they belong to the same species.

***Viscum album*** The mistletoe has a very high amount of DNA with 180 pg. Since it has only 20 chromosomes and humans have 46 chromosomes with almost 7 pg, it can be calculated that an average chromosome in *Viscum* is more than 60 times larger than a human chromosome.

***Vulpia V. myuris*** ( $2n=42$ ) and *V. fasciculata* ( $2n=28$ ) have almost the same amount of DNA with 12.9 and 12.7 pg respectively. Perhaps one of the two is not properly identified or there are more cytotypes.

***Wolffia*** Probably it has to be split into five different species based on barcoding. This is confirmed by the different DNA weights. The originally native *W. arrhiza* has 4.78 pg, *W. globosa* 3.50 pg, *W. minigibba* cf 1.61 pg and *W. australiana* 0.95 pg. *W. columbiana* (often referred to as *W. arrhiza* in publications) now 2.55 pg.

***Xanthium X. strumarium*** subsp. *strumarium* has 4.84 pg and subsp. *italicum* 5.37 pg. So they seem to be separate species.

***Zanichellia*** Also the two subspecies of *Z. palustris*, where subsp. *palustris* has 1.23 pg and subsp. *pedicillata* 1.83 pg could point to different species. It also may be a triploid plant.

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### Table 1 (next page)

Table 1 Summarizing table of all measured species with their nuclear DNA weights (2C-values), ploidies, chromosome numbers, number of measured specimens (n) per species, status, Dutch name, new names and family.

**A** All names from Heukels Flora 2005, plus new species found after that date (column I). *Italics*: small print in Heukels Flora. Asterisk (\*) = (also) measured with *Agave attenuata* (7.9 pg). # = Other ploidies (#), see [supplement](#) (Table 5) and Table 2 for further information. **B** Average picogram (pg) DNA per nucleus = 2C-value, based on at least two different measurements and measured against *Agave americana* ‘Aureomarginata’. **C** Somatic chromosome numbers (2n) from Stace (2010) and (Rice et al. 2015). c = circa, about. **D** Number of plants measured (n). **E** Peak profiles (see Fig. 1, 2). 2C is first (only) peak, **bold** = largest peak, (4C) very small peak 2C–32C = 2C, 4C, 8C, 16C, 32C. **F** Status. Frequency class (Eggelte 2014). 0 = extinct to 9 = common, ad = adventive, cu = cultivated, ex = exote. **G** Dutch plant names, n.d. not decided on yet. **H** New species added since 2005: from **FL**oron list (B. Odé 2016), from **H**. Duistermaat list and from **B**. Zonneveld. **I** Families (138).

For further details, see Table 5 in Electronic Supplement

[http://www.forum-geobotanicum.net/articles/vol\\_8-2018/zonneveld\\_flora-of-the-netherlands/zonneveld\\_flora-of-the-netherlands\\_supplement.pdf](http://www.forum-geobotanicum.net/articles/vol_8-2018/zonneveld_flora-of-the-netherlands/zonneveld_flora-of-the-netherlands_supplement.pdf)

A	B	C	D	E	F	G	H	I
Species (mainly Heukels Flora)	2C	Chrom. nr.	n	Peak	Status	Dutch name	new	family
<i>Abies alba</i>	35.5	24	2	2C	cu	Gewone zilverspar		Pinaceae
<i>Abies concolor</i>	37.3	24	1	2C	cu	Colorado zilverspar	FL	Pinaceae
<i>Abies grandis</i>	35.1	24	2	2C	cu	Reuzenzilverspar		Pinaceae
<i>Abies nordmanniana</i>	35.2	24	1	2C	cu	Kaukasische zilverspar		Pinaceae
<i>Abies pinsappo</i>	38.1	24	1	2C	cu	Spaanse zilverspar	FL	Pinaceae
<i>Abies procera</i>	34.4	24	1	2C	cu	Edelspar	FL	Pinaceae
<i>Abies veitchii</i>	34.9	24	1	2C	cu	Japanse zilverspar		Pinaceae
<i>Abutilon theophrastii</i>	2.31	42	1	2C, (4C)	6	Fluweelblad		Malvaceae
<i>Acalypha australis</i>	1.65	(20) 40	1	2C, (4C)	1	n. d.	FL	Euphorbiaceae
<i>Acer campestre</i>	1.40	26	1	2C, (4C)	8	Spaanse aak		Sapindaceae
<i>Acer negundo</i>	1.04	26	2	2C, (4C)	cu	Vederesdoom		Sapindaceae
<i>Acer platanoides</i>	1.45	26	5	2C, (4C)	7	Noorse esdoorn		Sapindaceae
<i>Acer pseudoplatanus</i>	2.78	52	2	2C, (4C)	9	Gewone esdoorn		Sapindaceae
<i>Acer sacharinum</i>	2.23	52	1	2C, (4C)	cu	Witte esdoorn		Sapindaceae
<i>Achillea filipendula</i> 'Cloth of Gold'	6.43	18, 36, 54	1	2C	cu	Geel duizendblad	FL	Asteraceae
<i>Achillea millefolium</i> *	15.9	54	4	2C	9	Duizendblad		Asteraceae
<i>Achillea ptarmica</i> #	7.17	18	5	2C	8	Wilde bertram		Asteraceae
<i>Acanthus mollis</i>	2.37	56	1	2C, 4C	ad	Akant	FL	Acanthaceae
<i>Aconitum vulparia</i>	31.9	16	5	2C, 4C	1	Gele monnikskap		Ranunculaceae
<i>Aconitum napellus</i>	24.7	(16, 24) 32	2	2C, 4C, 8C, 16C	cu	Blauwe monnikskap		Ranunculaceae
<i>Aconitum x stoerkianum</i>	36.9		2	2C,	cu	Aconitum napellus x variegata		Ranunculaceae
<i>Acorus calamus</i>	1.29	18-45	2	2C, 4C	8	Kalmoes		Acoraceae
<i>Acorus gramineus</i>	0.84	18, 22, 24	3	2C, 4C	cu	Graskalmoes	BZ	Acoraceae
<i>Actaea spicata</i> #	20.4	16	2	2C	4	Christoffelkruid		Ranunculaceae
<i>Actinidea deliciosa</i>	4.74	174	5	2C	cu	Kiwi		Actinidiaceae
<i>Adiantum capillus-veneris</i>	11.6	60	1	2C, 4C, 8C	cu	Echt venushaar		Pteridaceae
<i>Adiantum diaphanum</i> cf	11.7	116, 232	1	2C	1	Smal venushaar		Pteridaceae
<i>Adiantum raddianum</i>	17.9	120	2	2C, 4C	cu	Fijn venushaar		Pteridaceae
<i>Adiantum venustum</i>	15.8	120	5	2C, 4C	cu	n. d.	BZ	Pteridaceae
<i>Adonis aestivalis</i> *	31.0	32	2	2C	0	Zomeradonis		Ranunculaceae
<i>Adonis annua</i> *	33.7	32	1		cu	Herfst adonis		Ranunculaceae
<i>Adonis flammea</i> *	30.8	32	2	2C	cu	Kooltje-vuur		Ranunculaceae
<i>Adonis vernalis</i> *	28.3	16	1		0	Voorjaars adonis		Ranunculaceae
<i>Adoxa moschatelina</i>	29.8	36	2	2C, 4C	6	Muskuskruid		Adoxaceae
<i>Aegopodium podagraria</i>	6.82	22, 42, 44	6	2C, 4C,	9	Zevenblad		Apiaceae
<i>Aesculus hippocastanum</i>	1.22	40	8	2C, (4C)	cu	Witte paardenkastanje		Sapindaceae
<i>Aesculus parviflora</i>	0.97	40	1	2C, (4C)	cu	Herfstpaardekastanje	FL	Sapindaceae
<i>Aesculus pavia</i> 'Yellow'	1.39	40	2	2C	cu	Rode paardenkastanje	BZ	Sapindaceae
<i>Aesculus x carnea</i>	2.55	80	5	2C, (4C)	cu	Aesc. pavia x hippocastaneum		Sapindaceae
<i>Aethusa cynapium</i>	2.93	20	2	2C	8	Hondspeterselie		Apiaceae
<i>Agastache foeniculum</i>	1.21	18	2	2C, 4C	cu	Dropnetel	FL	Lamiaceae
<i>Agrimonia eupatoria</i>	2.97	28	1	2C, 4C	7	Gewone agrimonie		Rosaceae
<i>Agrimonia procera</i>	5.91	56	1	2C, 3C, 4C	5	Welriekende agrimonie		Rosaceae
<i>Agrostemma githago</i>	4.20	48	1	2C, 4C	5	Bolderik		Caryophyllaceae
<i>Agrostemma gracile</i>		24			cu	Oosterse bolderik		Caryophyllaceae
<i>Agrostis canina</i>	3.60	14	2	2C, 4C	7	Moerasstruisgras		Poaceae
<i>Agrostis capillaris</i>	7.07	28	6	2C,	9	Gewoon struisgras		Poaceae
<i>Agrostis castellana</i>		28, 42			3	Tweetoppig struisgras	FL	Poaceae
<i>Agrostis gigantea</i>	13.2	42	4	2C	8	Hoog struisgras		Poaceae
<i>Agrostis stolonifera</i>	10.3	28	2	2C	9	Fioringras		Poaceae
<i>Agrostis vinealis</i>	6.86	28, c. 56	4	2C	6	Zandstruisgras		Poaceae
<i>Agrostis x fouillardeana</i>					ad	Agrostis capillaris x castelana		Poaceae
<i>Ailanthus altissima</i>	2.20	64, 80	3	2C	cu	Hemelboom		Simaroubaceae
<i>Aira caryophyllea</i>	12.7	14, 28	1	2C	8	Zilverhaver		Poaceae
<i>Aira praecox</i>	6.78	14	2	2C	8	Paashaver		Poaceae
<i>Ajuga chamaepitys</i>	2.29	28	1	2C, (4C)	0	Akkerzenegroen		Lamiaceae
<i>Ajuga genevensis</i>	2.56	32	2	2C, (4C)	ad	Harig zenegroen		Lamiaceae
<i>Ajuga pyramidalis</i>	2.35	32	3	2C, (4C)	1	Piramidezenegroen		Lamiaceae
<i>Ajuga reptans</i> ssp reptans #	2.35	32	6	2C, (4C)	8	Kruipend zenegroen		Lamiaceae
<i>Ajuga reptans</i> 'Atropurpurea'	2.18	32	1	2C, (4C)		Kruipend zenegroen	HD	Lamiaceae
<i>Akebia quinata</i>	1.45	16, 32	2	2C, (4C)	ad	Schijnaugurk/klimbes	FL	Lardizabalaceae
<i>Alcea rosea</i>	2.62	26-56	2	2C	cu	Stokroos		Malvaceae
<i>Alchemilla acutiloba</i>	3.75	c. 100-109	8	2C, 4C	2	Spitslobbige vrouwenmantel		Rosaceae
<i>Alchemilla alpina</i> cf	3.78	c. 105	6	2C, (4C)	1	Alpenvrouwenmantel	BZ	Rosaceae
<i>Alchemilla epipsila</i>	3.63	106	2	2C, 4C	cu	n. d.	BZ	Rosaceae
<i>Alchemilla erythropoda</i>	3.80	96-101	2	2C	cu	Dwergvrouwenmantel	BZ	Rosaceae
<i>Alchemilla filicaulis</i>		c. 103, c. 150			1	Fijnstengelige vrouwenmantel		Rosaceae
<i>Alchemilla glabra</i>	3.79	c. 96-110	1	2C, 4C	3	Kale vrouwenmantel		Rosaceae
<i>Alchemilla micans</i>		c. 93-110			2	Slanke vrouwenmantel		Rosaceae
<i>Alchemilla mollis</i>	3.71	102-106	6	2C	6	Fraaie vrouwenmantel		Rosaceae
<i>Alchemilla monticola</i>		101-110			1	Bergvrouwenmantel		Rosaceae
<i>Alchemilla saxatilis</i> cf	3.73	120-152	2	2C, 4C	ex	n.d.	BZ	Rosaceae
<i>Alchemilla subcrenata</i>		104			1	Geplooide vrouwenmantel		Rosaceae
<i>Alchemilla vetteri</i>		154			1	n.d.		Rosaceae
<i>Alchemilla xanthochlora</i>	3.70	c. 107	1	2C, 4C	1	Geelgroene vrouwenmantel		Rosaceae
<i>Alisma gramineum</i>	23.3	14	3	2C	5	Smalle waterweegbree		Alismataceae
<i>Alisma lanceolatum</i>	44.4	28	2	2C	6	Slanke waterweegbree		Alismataceae
<i>Alisma plantago-aquatica</i>	21.9	14	2	2C	9	Grote waterweegbree		Alismataceae
<i>Alliaria petiolata</i>	2.30	36, 42	2	2C, 4C, 8C	9	Look-zonder-look		Brassicaceae
<i>Allium carinatum</i>	47.1	16, 24	1	2C, 4C	2	Berglook		Alliaceae

A	B	C	D	E	F	G	H	I
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<i>Allium cepa</i>	34.3	16, 24	4	2C, 4C	cu	Ui		Alliaceae
<i>Allium neapolitanum</i>	87.3	32, 36, 40	2		cu	n. d.		Alliaceae
<i>Allium oleraceum</i>	55.4	32, 40	1	2C, 4C	5	Moeslook		Alliaceae
<i>Allium paradoxum</i>	55.4	16	2	2C, 4C	3	Armbloemige look		Alliaceae
<i>Allium pendulinum</i>	42.0	14, 18	1	2C, 4C	1	Italiaanse knoflook	BZ	Alliaceae
<i>Allium roseum</i>	78.9	16-40	2	2C	cu	n. d.	HD	Alliaceae
<i>Allium porrum</i>	52.0	32	3	2C, 4C	cu	Prei		Alliaceae
<i>Allium ramosum</i>	65.3	(16) 32	1	2C		Chinese bieslook	HD	Alliaceae
<i>Allium schoenoprasum*</i>	15.7	16, 32	5	2C, 4C, 8C	6	Bieslook		Alliaceae
<i>Allium scorodoprasum</i>	47.2	16, 28	2	2C, 4C	4	Slangenlook		Alliaceae
<i>Allium sphaerocephalon #</i>	26.4	16 (32)	3		ad	Kogellook	FL	Alliaceae
<i>Allium triquetrum</i>	36.9	18, 27	3	2C, 4C	cu	<i>Driekantige look</i>		Alliaceae
<i>Allium tuberosum</i>	64.8	32	2		1	Chinese knoflook	FL	Alliaceae
<i>Allium ursinum</i>	62.0	14	3	2C, 4C	6	Daslook		Alliaceae
<i>Allium vineale#</i>	41.1	32	8	2C, 4C	9	Kraailook		Alliaceae
<i>Allium zebdanense</i>	29.0	18, 45	3	2C, 4C	1.0	Bochtig look		Alliaceae
<i>Alnus cordata</i>	1.13	28, 42	3	2C, (4C)	cu	Hartbladige els		Betulaceae
<i>Alnus glutinosa</i>	1.14	28	2	2C, (4C)	9	Zwarte els		Betulaceae
<i>Alnus incana</i>	1.24	28	1	2C, (4C)	7	Witte els		Betulaceae
<i>Alnus x pubescens</i>	1.22	28	1	2C, (4C)	cu	<i>Alnus glutinosa x incana</i>		Betulaceae
<i>Alnus x spaethii</i>	2.58	BZ: 56	2	2C, (4C)	cu	<i>Alnus japonica x subcordata</i>	BZ	Betulaceae
<i>Alopecurus aequalis</i>	7.06	14	2	2C	6	Rosse vossenstaart		Poaceae
<i>Alopecurus bulbosus</i>	13.9	14 (21, 28)	1	2C, (4C)	4	Knolvossenstaart		Poaceae
<i>Alopecurus geniculatus</i>	14.3	28	6	2C	9	Geknikte vossenstaart		Poaceae
<i>Alopecurus myosuroides</i>	7.52	14	3	2C, 4C	7	Duist		Poaceae
<i>Alopecurus pratensis</i>	12.6	28	1	2C	9	Grote vossenstaart		Poaceae
<i>Alopecurus x hybridus</i>						Grote x Geknikte vossenstaart		Poaceae
<i>Althaea hirsuta</i>		36			ad	Ruige heemst		Malvaceae
<i>Althaea officinalis</i>	3.90	42	4	2C	6	Heemst		Malvaceae
<i>Alyssum alyssoides</i>	1.44	(16, 24) 32	3	2C	4	Bleek schildzaad		Brassicaceae
<i>Alyssum saxatile</i>	1.46	16	3	2C, 4C, 8C, 16C	cu	Rotsschildzaad		Brassicaceae
<i>Alyssum maritimum</i>	0.83	24	2	2C, 4C, (8C)	cu	Zilverchildzaad	BZ	Brassicaceae
<i>Amaranthus albus</i>	1.09	32, 34	1	2C, 4C, 8C, 16C	5	Witte amarant		Amaranthaceae
<i>Amaranthus blitoides</i>	1.16	32	2	2C, 4C, 8C,	5	Nerfamarant		Amaranthaceae
<i>Amaranthus blitum</i>	1.59	16, 34	5	2C, 4C, 8C, 16C	6	Kleine majer		Amaranthaceae
<i>Amaranthus caudatus</i>	1.05	32, 34, 64	1	2C, 4C, 8C,	ad	Kattenstaart amarant		Amaranthaceae
<i>Amaranthus deflexus</i>		34			ad	Liggende majer		Amaranthaceae
<i>Amaranthus emarginata</i>	1.46	34	1	2C, 4C, 8C, 16C	ex	n. d.	BZ	Amaranthaceae
<i>Amaranthus graecizans</i>		32, 34			ad	Afrikaanse amarant		Amaranthaceae
<i>Amaranthus hybridus ssp. bouchonii</i>	1.18	32	2	2C, 4C, 8C, 16C	6	Franse amarant		Amaranthaceae
<i>Amaranthus hybridus ssp. hybridus</i>	1.12	24, 32	4	2C, 4C, 8C, 16C	6	Basterd amarant		Amaranthaceae
<i>Amaranthus palmeri</i>		32, 34			ad	Tweehuizige amarant		Amaranthaceae
<i>Amaranthus retroflexus</i>	1.18	34	2	2C, 4C, 8C, 16C	7	Papegaaienkruid		Amaranthaceae
<i>Amaranthus rudis</i>		32			ad	Oeveramarant		Amaranthaceae
<i>Amaranthus standleyanus</i>		34			ad	Argentijnse amarant		Amaranthaceae
<i>Ambrosia artemisiifolia</i>	2.66	36	4	2C	ad	Alsem ambrosia		Asteraceae
<i>Ambrosia psilostachya</i>	5.95	72, 108, 144	3	2C	4	Zand ambrosia		Asteraceae
<i>Ambrosia trifida</i>	4.05	24	3	2C	ad	Driedelige ambrosia		Asteraceae
<i>Amelanchier lamarekii</i>	2.52	68	2	2C, 4C	8	Amerikaans krentenboompje		Rosaceae
<i>Ammi majus zd</i>	3.73	22	1	2C, 3C, 4C	ad	Groot akkerscherm		Apiaceae
<i>Ammi visnaga</i>	4.94	20, 22	1	2C, (4C)	ad	Fijn akkerscherm		Apiaceae
<i>Ammophila arenaria</i>	8.98	28	4	2C, 4C	7	Helm		Poaceae
<i>Amsi(n)ckia micrantha</i>	1.93	32	1	2C, (4C)	ad	Amsi(n)ckia		Boraginaceae
<i>Anacamptis coriophora</i>		36			0	Wantsenorchis		Orchidaceae
<i>Anacamptis morio</i>	21.8	36	1	2C, 4C	3	Harlekijn		Orchidaceae
<i>Anacamptis pyramidalis</i>	26.8	36	3	2C, 4C, 8C	4	Honskruid		Orchidaceae
<i>Anagallis arvensis ssp. arvensis</i>	2.45	(20) 40	5	2C, 4C, 8C	8	Rood (blauw) guichelheil		Primulaceae
<i>Anagallis arvensis (as ssp. foemina)</i>	2.43	40	3	2C, (4C)	2	Blauw guichelheil		Primulaceae
<i>Anagallis monelli</i>	2.86	20, 22	1	2C, 4C	1	Spaans guichelheil	BZ	Primulaceae
<i>Anagallis tenella</i>	4.42	22	5	2C, 4C	4	Teer guichelheil		Primulaceae
<i>Anaphalis margaritacea 'Yedoensis</i>	7.83	28	1	2C	cu	Pracht rozenkransje		Asteraceae
<i>Anchusa arvensis*</i>	31.2	48	5	2C, (4C)	8	Kromhals		Boraginaceae
<i>Anchusa ochroleuca*</i>	25.4	24	2	2C	2	Geelwitte ossentong		Boraginaceae
<i>Anchusa officinalis*</i>	13.8	16	4	2C, (4C)	6	Gewone ossentong		Boraginaceae
<i>Anchusa x baumgartenii*</i>	26.7	BZ:28	5	2C	ad	<i>Anchusa ochroleuca x officinalis.</i>		Boraginaceae
<i>Andromeda polifolia</i>	2.18	48	2	2C, (4C)	5	Lavendelhei		Ericaceae
<i>Anemone apennina</i>	28.7	16	2	2C	4	Blauwe anemoon		Ranunculaceae
<i>Anemone blanda#</i>	31.1	16, 32	5	2C	cu	Oosterse anemoon		Ranunculaceae
<i>Anemone nemorosa</i>	38.9	30 (16-46)	9	2C, (4C)	8	Bosanemoon		Ranunculaceae
<i>Anemone ranunculoides</i>	35.4	32	7	2C	4	Gele anemoon		Ranunculaceae
<i>Anemone x hybrida</i>	20.2	16	1	2C, (4C)	cu	Hoge anemoon	HD	Ranunculaceae
<i>Anemone x lipsiensis</i>	37.0		9	2C	cu	Bleekgele anemoon	BZ	Ranunculaceae
<i>Anethum graveolens</i>	2.81	22	1	2C, 4C	cu	Dille		Apiaceae
<i>Angelica archangelica</i>	6.41	22	4	2C	7	Grote engelwortel		Apiaceae
<i>Angelica sylvestris</i>	5.13	22	3	2C	9	Gewone engelwortel		Apiaceae
<i>Anisantha diandra</i>	24.4	56	1	2C, 4C	1	Hoge dravik		Apiaceae
<i>Anisantha madritensis</i>	9.91	28	1	2C	1	Spaanse dravik		Poaceae
<i>Anisantha sterilis</i>	6.21	14	2	2C, 4C	9	IJle dravik		Poaceae
<i>Anisantha tectorum</i>	5.76	14	3	2C, 4C	7	Zwenkdravik		Poaceae
<i>Anoda cristata</i>	5.65	60	1	2C, 4C	ad	Straalvrucht		Malvaceae
<i>Antennaria dioica</i>	7.33	28	1	2C	3	Rozenkransje		Asteraceae
<i>Anthemis arvensis</i>	8.55	18	1	2C	6	Valse kamille		Asteraceae

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<i>Anthemis cotula</i>	3.72	18	1	2C	5	Stinkende kamille		Asteraceae
<i>Anthemis tinctoria</i> * #	9.80	18	2	2C	5	Gele kamille		Asteraceae
<i>Anthericum liliiago</i> *	13.6	30	4	2C, 4C, 8C	1	Grote graslelie		Asparagaceae
<i>Anthoxanthum aristatum</i>	7.39	10	2	2C	6	Slofhak		Poaceae
<i>Anthoxanthum odoratum</i>	13.1	20	2	2C	9	Gewoon reukgras		Poaceae
<i>Anthriscus caucalis</i>	1.17	14	1	2C, 4C	7	Fijne kervel		Apiaceae
<i>Anthriscus cereifolium</i>	2.45	18	2	2C, 4C	cu	Echte kervel		Apiaceae
<i>Anthriscus sylvestris</i>	4.16	16	5	2C,	9	Fluitenkruid		Apiaceae
<i>Anthyllis vulneraria</i>	0.90	12	4	2C, 4C, 8C	6	Wondklaver		Fabaceae
<i>Antirrhinum majus</i>	1.27	16	2	2C, 4C	ad	Grote leeuwenbek		Fabaceae
<i>Apera interrupta</i>	8.73	14	1	2C	4	Stijve windhalm		Poaceae
<i>Apera spica-venti</i>	10.3	14	1	2C, 4C	8	Grote windhalm		Poaceae
<i>Aphanes arvensis</i>	2.75	48	9	2C	7	Grote leeuwenklauw		Rosaceae
<i>Aphanes australis</i>	0.85	16	4	2C, 4C	7	Kleine leeuwenklauw		Rosaceae
<i>Apium graveolens</i>	7.28	22, BZ: 66	9	2C	6	Selderij (+knolselderij)		Apiaceae
<i>Apium inodatum</i>	2.17	22	1	2C	5	Ondergedoken moerasscherm		Apiaceae
<i>Apium nodiflorum</i>	1.97	22	3	2C, (4C)	7	Groot moerasscherm		Apiaceae
<i>Apium repens</i>	1.34	22	1	2C, (4C)	3	Kruipend moerasscherm		Apiaceae
<i>Aquilegia vulgaris</i>	0.82	14	1	2C, 4C	6	Wilde akelei		Ranunculaceae
<i>Arabidopsis arenosa</i>	0.85	16, 18, 32	2	2C, 4C, 8C, 16C	4	Rozetsteenkens		Brassicaceae
<i>Arabidopsis thaliana</i>	0.32	10	9	2C-4C-32C	9	Zandraket		Brassicaceae
<i>Arabis (alpina ssp.) caucasica</i>	0.95	16	3	2C, 4C, 8C	cu	Randjesbloem	FL	Brassicaceae
<i>Arabis glabra</i> #	1.22	12	3	2C, 4C, 8C,	4	Torenkruid		Brassicaceae
<i>Arabis hirsuta</i> ssp. <i>hirsuta</i> #	0.67	16, 32	2	2C, 4C, 8C, 16C	5	Ruige scheefkelk		Brassicaceae
<i>Arabis hirsuta</i> ssp. <i>Sagittata</i> #	0.56		3	2C, 4C, 8C, 16C	2	Pijlscheefkelk		Brassicaceae
<i>Aralia elata</i>	2.57	24	2	2C, (4C)	ad	Duivelswandelstok	BZ	Araliaceae
<i>Arctium lappa</i>	3.97	36	4	2C	8	Grote klit		Asteraceae
<i>Arctium minus</i>	4.70	36	1	2C, (4C)	9	Gewone klit		Asteraceae
<i>Arctium nemorosum</i>		36			3	Bosklit		Asteraceae
<i>Arctium tomentosum</i>	4.15	36	2	2C	5	Donzige klit		Asteraceae
<i>Arctium x ambiguum</i>		36			1	<i>Arctium lappa</i> x <i>tomentosum</i>		Asteraceae
<i>Arctium x mixtum</i>					1	<i>Arctium minus</i> x <i>tomentosum</i>		Asteraceae
<i>Arctium x nothum</i>					ad	<i>Arctium lappa</i> x <i>minus</i>		Asteraceae
<i>Arctostaphylos uva-ursi</i>	2.34	52	1	2C, 3C	2	Berendruif		Ericaceae
<i>Arenaria leptoclados</i>	0.79	20	3	2C, 4C, (8C)	1	Tengere zandmuur		Caryophyllaceae
<i>Arenaria serpyllifolia</i> ssp. <i>serpyllifolia</i>	1.55	40	3	2C, 4C	8	Gewone zandmuur		Caryophyllaceae
<i>Arenaria serpyllifolia</i> ssp. <i>lloidii</i>		40			0	Gedrongen zandmuur		Caryophyllaceae
<i>Aristolochia clematitis</i> #	0.90	14	2	2C, 4C	4	Pijpbloem		Aristolochiaceae
<i>Armeria maritima</i>	8.89	18	3	2C	6	Engels gras		Plumbaginaceae
<i>Armeria maritima</i> var. <i>hallii</i>	9.10	18	1	2C	1	Engels gras (zinkplant)	BZ	Plumbaginaceae
<i>Armoracia rusticana</i>	1.44	32	6	2C, 4C, 8C	5	Mierikswortel		Brassicaceae
<i>Arnica montana</i>	3.21	38	2	2C	4	Valkruid		Asteraceae
<i>Amoseris minima</i>		18			4	Korensla		Asteraceae
<i>Aronia x prunifolia</i>	2.84	34	3	2C	6	Appelbes 'Nero'		Rosaceae
<i>Aronia arbutifolia</i> 'Red Berry'	2.89	34	1	2C	cu	Gewone appelbes	FL	Rosaceae
<i>Aronia melanocarpa</i> 'Black Berry'	2.88	34	1	2C	cu	Zwarte appelbes	FL	Rosaceae
<i>Arrhenatherum elatius</i> * ssp. <i>bulbosum</i>	16.2	28	1	2C, 4C, 8C	5	Knolglanshaver (bont)		Poaceae
<i>Arrhenatherum elatius</i> * ssp. <i>elatius</i>	15.9	28	3	2C	9	Gewone glanshaver		Poaceae
<i>Artemisia abrotanum</i> *	12.5	18	3	2C	cu	Citroenkruid	BZ	Asteraceae
<i>Artemisia absinthium</i> * #	9.70	18	3	2C, 4C	5	Absintalsem		Asteraceae
<i>Artemisia annua</i> *	3.86	18	1	2C	ad	Zomeralsem	FL	Asteraceae
<i>Artemisia biennis</i> *	6.81	18	4	2C	5	Rechte alssem		Asteraceae
<i>Artemisia campestris</i> * ssp. <i>campestris</i> #	10.7	16, 18, 36	1	2C	3	Wilde averuit		Asteraceae
<i>Artemisia campestris</i> * ssp. <i>Maritima</i> #	16.1	54	4	2C	3	Duinaveruit		Asteraceae
<i>Artemisia dracunculoides</i> *	25.9	18-72	2	2C	cu	Dragon		Asteraceae
<i>Artemisia ludoviciana</i> 'Silver Queen' *	14.8	18, 36	3	2C	cu	Westerse bijvoet	FL	Asteraceae
<i>Artemisia maritima</i> *	16.2	54	5	2C	6	Zeealsem		Asteraceae
<i>Artemisia princeps</i> *	10.1	34, 36	9	2C	ad	Wijde alssem	FL	Asteraceae
<i>Artemisia selengensis</i> *	13.8	36	2	2C	ad	n. d.	FL	Asteraceae
<i>Artemisia verlotiorum</i> *	13.7	48, 50, 52	19	2C	1	Herfstalsem		Asteraceae
<i>Artemisia vulgaris</i> *	6.51	16 (18)	8	2C	9	Bijvoet		Asteraceae
<i>Artemisia x wurzellii</i> *	10.1	34	2	2C	1	<i>Artemisia vulgaris</i> x <i>verlotiorum</i>	BZ	Asteraceae
<i>Arum italicum</i>	28.0	84	15	2C, 4C	5	Italiaanse aronskelk		Araceae
<i>Arum maculatum</i>	20.0	56	7	2C, 4C, 8C	7	Gevlekte aronskelk		Araceae
<i>Aruncus dioicus</i>	0.44	18	3	2C, 4C, 8C	cu	Geitebaard		Rosaceae
<i>Asarum europaeum</i>	14.0	26	2	2C	1	Mansoor	HD	Aristolochiaceae
<i>Asclepias syriaca</i>	0.80	22	2	2C, 4C, 8C, 16C	1	Zijdeplant		Apocynaceae
<i>Asclepias tuberosa</i>	1.05	22	2	2C, 3C, 4C, 6C, 12C		Knolzijdeplant	FL	Apocynaceae
<i>Asparagus officinalis</i> ssp. <i>officinalis</i>	5.92	40	1	2C, 4C, 8C	cu	Wilde asperge (Duin)		Asparagaceae
<i>Asparagus officinalis</i> ssp. <i>prostratus</i>	6.01	40 (80)	8	2C, 4C, 8C	6	Liggende asperge (Duin)		Asparagaceae
<i>Asparagus officinalis</i> ssp. <i>officinalis</i>	6.06	20, 40	3	2C, 4C, 8C	cu	Gekweekte asperge	BZ	Asparagaceae
<i>Asparagus officinalis</i> ssp. <i>officinalis</i>	2.89	BZ: 20	6	2C, 4C, 8C	cu	BGU / BGL / Peru	BZ	Asparagaceae
<i>Asperugo procumbens</i>		48			1	Scherpkruid		Boraginaceae
<i>Asperula arvensis</i>		22			ad	Akkerbedstro		Rubiaceae
<i>Asperula cynanchica</i>	3.96	40	1	2C, 4C	0	Kalkbedstro		Rubiaceae
<i>Asplenium adiantum-nigrum</i> *	18.4	144	3	2C	3	Zwartsteel		Aspleniaceae
<i>Asplenium ceterach</i> *	13.7	144	3	2C	2	Schubvaren		Aspleniaceae
<i>Asplenium fontanum</i> *	10.1	72	2	2C	0	Genaaalde streepvaren		Aspleniaceae
<i>Asplenium foreziense</i> *	17.8	144	3	2C	1	Forez-streepvaren		Aspleniaceae
<i>Asplenium marinum</i> * cf	18.0	144	3	2C	cu	n. d.	BZ	Aspleniaceae
<i>Asplenium obovatum</i> * ssp. <i>lanceolatum</i>	17.0	72 (144)	5	2C	1	Lancetbladige streepvaren	BZ	Aspleniaceae
<i>Asplenium obovatum</i> * cf	18.3	144	1	2C	1	n. d.	BZ	Aspleniaceae

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<i>Asplenium ruta-muraria*</i>	12.8	144	5	2C	7	Muurvaren		Aspleniaceae
<i>Asplenium scolopendrium*</i>	17.0	72 (144)	7	2C	6	Tongvaren		Aspleniaceae
<i>Asplenium septentrionale*</i>	13.8	144	2	2C	1	Noordse streepvaren		Aspleniaceae
<i>Asplenium trichomanes* ssp. quadrivalens</i>	18.2	(72) 144	10	2C	5	Steenbreekvaren		Aspleniaceae
<i>Asplenium trichomanes* ssp. pachyrachis</i>	19.1	144	3	2C	1	Steenbreekvaren	BZ	Aspleniaceae
<i>Asplenium viride</i>	8.81	72	3	2C	1	Groensteel		Aspleniaceae
<i>Aster cordifolius cf</i>	3.52	16, 32	1	2C,	1	n. d.	BZ	Asteraceae
<i>Aster laevis</i>	5.37	48	1	2C, (4C)	cu	Gladde aster		Asteraceae
<i>Aster novi-belgii</i>	4.48	48	1	2C, 4C	cu	Nieuw-Nederlandse aster		Asteraceae
<i>Aster tripolium</i>	12.8	18	4	2C	8	Zulte		Asteraceae
<i>Aster x versicolor</i>					cu	<i>Aster laevis x novi-belgii</i>		Asteraceae
<i>Astragalus cicery</i>		64			ad	Bergerwt		Fabaceae
<i>Astragalus glycyphyllos</i>	1.60	16	1	2C, 4C, 8C	4	Hokjespeul		Fabaceae
<i>Astrantium major</i>	19.3	(14) 28	1	(2C), 3C	cu	Groot sterrenscherm	HD	Apiaceae
<i>Athyrium filix-femina*</i>	15.1	80	5	2C	8	Wijfjesvaren		Athyriaceae
<i>Atriplex glabriuscula</i>	1.82	18	3	2C, 4C, 8C	5	Kustmelde		Amaranthaceae
<i>Atriplex hortensis</i>	2.02	18	1	2C, 4C, 8C	cu	Tuinmelde		Amaranthaceae
<i>Atriplex laciniata</i>	1.58	18	1	2C, 4C, 8C	3	Gelobde melde		Amaranthaceae
<i>Atriplex littoralis</i>	1.63	18	3	2C, 4C, 8C	6	Strandmelde		Amaranthaceae
<i>Atriplex longipes</i>		18			5	Gesteelde spiesmelde		Amaranthaceae
<i>Atriplex patula</i>	4.03	36	6	2C, 4C	9	Uitstaande melde		Amaranthaceae
<i>Atriplex pedunculata</i>		18			3	Gesteelde zoutmelde		Amaranthaceae
<i>Atriplex portulacoides</i>	2.76	36	4	2C, 4C	6	Gewone zoutmelde		Amaranthaceae
<i>Atriplex prostrata</i>	1.87	18	9	2C, 4C, 8C	9	Spiesmelde		Amaranthaceae
<i>Atriplex x gustafssoniana</i>					0	<i>Atriplex longipes x prostrata</i>		Amaranthaceae
<i>Atropa bella-donna</i>	3.92	72	3	2C, 4C	4	Wolfskers		Solanaceae
<i>Aubretia deltoidea</i>	0.76	16	1	2C, 4C, 8C, 16C	cu	Aubretia		Brassicaceae
<i>Aucuba japonica 'Variegated'</i>	24.5	16, 32	3		cu	Broodboom, Aucuba		Garryaceae
<i>Avena fatua</i>	26.4	42	1	2C, (4C)	6	Oot		Poaceae
<i>Avena sativa</i>	26.5	42	1	2C, 4C	cu	Haver		Poaceae
<i>Avena sterilis</i>		42			ad	Wilde haver		Poaceae
<i>Avena strigosa*</i>	16.5	14, 28	1	2C, 3C, 6C	ad	Evene		Poaceae
<i>Axyris amarantoides</i>		18			ad	Hoormelde		Amaranthaceae
<i>Azolla cristata</i>					1	Kleine kroosvaren		Salviniaceae
<i>Azolla filiculoides*</i>	1.58	44, 66	5	2C	8	Grote kroosvaren		Salviniaceae
<i>Azolla caroliniana* cf</i>	1.14		1	2C	cu	n. d.	BZ	Salviniaceae
<i>Baccharis halimifolia</i>	4.52	18	1	2C	cu	Struikaster		Asteraceae
<i>Baldellia ranunc. ssp. ranunculoides</i>	25.8	16	2	2C	5	Stijve moerasweegbree		Alismataceae
<i>Baldellia ranunc. ssp. repens</i>	25.7	16	1	2C	3	Kruipende moerasweegbree		Alismataceae
<i>Ballota nigra ssp. nigra</i>		20			ad	Echte ballote		Lamiaceae
<i>Ballota nigra ssp. meridionalis</i>	2.67	20	2	2C, (4C)	6	Stinkende ballote		Lamiaceae
<i>Barbarea intermedia</i>	0.47	16	2	2C, 4C, 8C, 16C	6	Bitter barbarakruid		Brassicaceae
<i>Barbarea stricta</i>	0.56	14, 16, 18	1	2C, 4C, 8C, 16C	7	Stijf barbarakruid		Brassicaceae
<i>Barbarea verna</i>	0.57	16	2	2C, 4C, 8C, 16C	ad	Vroeg barbarakruid		Brassicaceae
<i>Barbarea vulgaris</i>	0.57	16	3	2C, 4C, 8C	8	Gewoon barbarakruid		Brassicaceae
<i>Bassia hirsuta</i>		18			0	Ruig zoutkruid		Amaranthaceae
<i>Bassia scoparia</i>	2.07	18	1	2C, 4C, (8C)	ad	Studentenkruid / Zomercypres		Amaranthaceae
<i>Bellevalia romana</i>	21.2		2		ad	n. d.	FL	Asparagaceae
<i>Bellis perennis</i>	3.56	18	4	2C	9	Madeliefje		Asteraceae
<i>Berberis aggregata</i>	2.94	28	1	2C	cu	Roze berberis		Berberidaceae
<i>Berberis aquifolium</i>	2.46	28	1	2C	cu	Mahonie		Berberidaceae
<i>Berberis julianae</i>	3.20	28	1	2C, 4C	cu	Chinese Zuurbes		Berberidaceae
<i>Berberis thunbergii</i>	3.50	28	1	2C	1	Japane berberis		Berberidaceae
<i>Berberis vulgaris</i>	3.48	28	4	2C, 4C	6	Zuurbes		Berberidaceae
<i>Berteroa incana</i>	1.36	16	2	2C, 4C	7	Grijskruid		Brassicaceae
<i>Berula erecta</i>	1.13	18, 20	3	2C	8	Kleine watereppe		Apiaceae
<i>Beta vulgaris ssp. vulgaris</i>	2.28	18, 27, 36	4	2C, 4C, 8C, 16C	cu	Suikerbiet		Amaranthaceae
<i>Beta vulgaris ssp. maritima #</i>	1.49	18	3	2C, 4C, 8C, 16C	4	Strandbiet / Kroot		Amaranthaceae
<i>Betula pendula</i>	0.98	28	1	2C	9	Ruwe berk		Betulaceae
<i>Betula (x?) pubescens</i>	2.89	56	1	2C	7	Zachte berk		Betulaceae
<i>Betula nigra</i>	0.95	28	1	2C	cu	Zwarte berk	BZ	Betulaceae
<i>Betula utilis 'Doorenbosch'</i>	2.06	28, 56	3	2C	cu	Ziverberk	BZ	Betulaceae
<i>Bidens cernua</i>	4.70	24	4	2C,	8	Knikkend tandzaad		Asteraceae
<i>Bidens connata</i>	6.41	48, 72	1	2C	7	Smal tandzaad		Asteraceae
<i>Bidens frondosa</i>	3.45	48	3	2C	8	Zwart tandzaad		Asteraceae
<i>Bidens pilosa</i>	6.27	(24-48) 72	6	2C	ad	n. d.	BZ	Asteraceae
<i>Bidens radiata</i>	4.41	(36) 48	5	2C	3	Riviertandzaad		Asteraceae
<i>Bidens subalternans</i>	6.21	48	1	2C	ad	n. d.	BZ	Asteraceae
<i>Bidens tripartita</i>	6.60	48	1	2C	9	Veerdelig tandzaad		Asteraceae
<i>Bifora radians</i>		20			ad	Holzaad		Apiaceae
<i>Blackstonia perfoliata ssp. serotina</i>	2.67	40	1	2C, (4C)	2	Herfstbitterling		Gentianaceae
<i>Blackstonia perfoliata ssp. perfoliata</i>	2.77	40	2	2C	3	Zomerbitterling	BZ	Gentianaceae
<i>Blechnum spicant</i>	15.4	68	1	2C	7	Dubbelloof		Blechnaceae
<i>Blysmus compressus</i>	0.67	44, 78	2	2C	4	Platte bies		Cyperaceae
<i>Blysmus rufus</i>	4.24	40	2	2C, (4C)	4	Rode bies		Cyperaceae
<i>Bolboschoenus maritimus</i>	0.52	40-110	4	2C	8	Heen (zoute3 water); zeebies		Cyperaceae
<i>Bolboschoenus laticarpus</i>	0.54		2	2C	ad	Oeverbies, Heen (zoete water)	FL	Cyperaceae
<i>Bolboschoenus planiculmis</i>	0.58	50-108	2	2C	1	Oostelijke bies	BZ	Cyperaceae
<i>Borago officinalis</i>	3.54	16	3	2C, 4C, (8C)	cu	Bernagie		Boraginaceae
<i>Botrychium lunaria*</i>	29.1	90	1	2C	5	Gelobde maanvaren		Ophioglossaceae
<i>Botrychium matricariifolium</i>		180			0	Vertakte maanvaren		Ophioglossaceae
<i>Brachypodium pinnatum</i>		16, 28, 36			5	Gevinde kortsteel		Poaceae

A	B	C	D	E	F	G	H	I
Species (mainly Heukels Flora)	2C	Chrom. nr.	n	Peak	Status	Dutch name	new	family
<i>Brachypodium sylvaticum</i>	0.89	18, 28, 44	2	2C	6	Boskortsteel		Poaceae
<i>Brassica juncea</i>	2.30	36	2	2C	4	Sarepta mosterd	BZ	Brassicaceae
<i>Brassica napus</i>	2.44	38	3	2C, 4C, 8C	cu	Koolraap (Koolzaad)		Brassicaceae
<i>Brassica nigra</i>	1.31	16	2	2C, 4C, 8C	7	Zwarte mosterd		Brassicaceae
<i>Brassica oleracea</i> ssp. <i>oleracea</i>	1.35	18	17	2C, 4C, 8C	cu	Wilde kool		Brassicaceae
<i>Brassica rapa</i>	1.11	20	11	2C, 4C, 8C, 16C	cu	Raapzaad, pakchoi, raapsteeltjes		Brassicaceae
<i>Briza media</i> #	6.68	14	7	2C, 4C	6	Beventjes		Poaceae
<i>Briza maxima</i>	9.00	14	2	2C, 4C, 8C	cu	Groot trilgras	FL	Poaceae
<i>Bromopsis erecta</i>	21.4	28-112	3	2C	4	Bergdravik		Poaceae
<i>Bromopsis inermis</i> ssp. <i>pumpelliana</i>		42, 56			ad	Amerikaanse kweekdravik		Poaceae
<i>Bromopsis ramosa</i> ssp. <i>benekenii</i>		28			1	Bosdravik		Poaceae
<i>Bromopsis ramosa</i> ssp. <i>ramosa</i>	26.1	42	2	2C	2	Ruwe dravik		Poaceae
<i>Bromus arvensis</i>	11.5	14	1	2C	ad	Akkerdravik		Poaceae
<i>Bromus bromoideus</i>	22.3	28	1	2C	0	Ardense dravik		Poaceae
<i>Bromus corymbosus</i> cf	22.9		3	2C		n. d.		Poaceae
<i>Bromus hordeaceus</i> ssp. <i>thominei</i> #	20.8	28	4	2C	9	n. d.		Poaceae
<i>Bromus hordeaceus</i> ssp. <i>hordeaceus</i>	20.1	28	3	2C	9	Zachte dravik	BZ	Poaceae
<i>Bromus inermis</i> ssp. <i>inermis</i>	11.9	28-70	1	2C	6	Kweekdravik	BZ	Poaceae
<i>Bromus lepidus</i>		28			ad	Sierlijke dravik		Poaceae
<i>Bromus racemosus</i> ssp. <i>commutatus</i> #	22.4	14, 28	3	2C, 4C	5	Grote Trosdravik		Poaceae
<i>Bromus racemosus</i> ssp. <i>racemosus</i>	12.0	14, 28	1	2C	ad	Trosdravik		Poaceae
<i>Bromus secalinus</i>	22.2	28	1	2C	1	Dreps		Poaceae
<i>Brunnera macrophylla</i>	4.10	12	2	2C, 4C, 8C	cu	Kaukasisch vergeetmijnietje		Boraginaceae
<i>Bryonia dioica</i>	3.92	20	3	2C, 4C, 8C	8	Heggenrank		Cucurbitaceae
<i>Buddleja davidii</i>	2.90	76	4	2C	7	Vlinderstruik		Scrophulariaceae
<i>Bunias orientalis</i>	5.31	14	1	2C, 4C, 8C, 16C	4	Grote hardvrucht		Brassicaceae
<i>Bunium bulbocastanum</i> #	0.93	20	5	2C, 4C	4	Aardkastanje		Apiaceae
<i>Bupleurum falcatum</i>	0.80	16-32	2	2C, (4C)	1	Sikkelgoudscherm		Apiaceae
<i>Bupleurum rotundifolium</i>	1.56	16	1	2C, (4C)	ad	Doorwas		Apiaceae
<i>Bupleurum subovatum</i>		16			ad	Smalle doorwas		Apiaceae
<i>Bupleurum tenuissimum</i>	0.82	16	1	2C	3	Fijn goudscherm		Apiaceae
<i>Butomus umbellatus</i>	12.5	26, 39	3	2C	8	Zwanenbloem		Butomaceae
<i>Buxus sempervirens</i> #	1.57	28,; BZ: 42	3	2C, (4C)	cu	Buxus		Buxaceae
<i>Cabomba caroliniana</i>	7.30	24, 96, 104	1	2C, 4C	1	Waterwaaier	FL	Cabombaceae
<i>Cakile maritima</i>	1.53	18	2	2C, 4C, 8C	5	Zeeraket		Brassicaceae
<i>Calamagrostis canescens</i> cf	7.73	28	1	2C, 4C	8	Hennegras		Poaceae
<i>Calamagrostis epigejos</i>	7.65	28, 56	2	2C	8	Duinriet		Poaceae
<i>Calamagrostis pseudophragmites</i>		28			0	Rivierstruisriet		Poaceae
<i>Calamagrostis stricta</i>		28			3	Stijf struisriet		Poaceae
<i>Calamagrostis x gracilescens</i>					1	Calamagrostis canescens x stricta		Poaceae
<i>Calammophila X baltica</i>	8.03	28, 42	2	2C	6	Noordse helm		Poaceae
<i>Calaminthe nepeta</i>	1.46	24, 48, 72	1	2C	cu	Bergsteentijm	BZ	Lamiaceae
<i>Calendula arvensis</i>	5.35	36, 44	1	2C, (4C)	ad	Akkergoudsbloem		Asteraceae
<i>Calendula officinalis</i>	2.91	28, 32	1	2C	cu	Goudsbloem		Asteraceae
<i>Calepina irregularis</i> #	0.92	14, 28	2	2C, 4C, 8C	1	Kalkraket		Brassicaceae
<i>Calla palustris</i>	2.16	36, 72	2	2C, 4C	6	Slangenwortel		Araceae
<i>Calistephus chinensis</i>	5.69	18 (36)	1	2C	cu	Chinese aster	FL	Asteraceae
<i>Callitriche hamulata</i>	8.14	28, 38	1	2C	5	Haaksterrenkroos		Plantaginaceae
<i>Callitriche brutia</i> ssp. <i>hamulata</i>	7.90	28, 38	2	2C	8	Sterrekroos		Plantaginaceae
<i>Callitriche brutia</i>	3.67	38	1	2C	8	Gesteeld sterrekroos	BZ	Plantaginaceae
<i>Callitriche cophocarpa</i>		10, 12			1	Gekield sterrenkroos		Plantaginaceae
<i>Callitriche hermaphrodita</i>		6			2	Rond sterrenkroos		Plantaginaceae
<i>Callitriche obtusangula</i>	3.57	10	2	2C	5	Stomphoekig sterrenkroos		Plantaginaceae
<i>Callitriche palustris</i>	2.71	20	1	2C	1	Klein sterrenkroos		Plantaginaceae
<i>Callitriche platycarpa</i>	5.45	20	5	2C	8	Gewoon sterrenkroos		Plantaginaceae
<i>Callitriche stagnalis</i> # cf	2.63	10	4	2C	5	Gevleugeld sterrenkroos		Plantaginaceae
<i>Callitriche truncata</i>		6			1	Doorschijnend sterrenkroos		Plantaginaceae
<i>Calluna vulgaris</i> ssp. <i>vulgaris</i>	1.26	16	1	2C	8	Struikhei		Ericaceae
<i>Calluna vulgaris</i> ssp. <i>hirsuta</i>					1	Struikhei		Ericaceae
<i>Caltha palustris</i> * ssp. <i>araneosa</i>	33.3	24	2	2C, (4C)	3	Spindotterbloem		Ranunculaceae
<i>Caltha palustris</i> ssp. <i>palustris</i>	33.1	24	7	2C, 4C	8	Gewone dotterbloem		Ranunculaceae
<i>Camelina sativa</i> ssp. <i>alyssum</i>		40			0	Vlashedtent		Brassicaceae
<i>Camelina sativa</i> ssp. <i>sativa</i>	1.77	40	1	2C, 4C	ad	Zaadhuttent		Brassicaceae
<i>Campanula carpatica</i>	3.20	34	1	2C, 4C, 8C	1	Karpatenklokje		Brassicaceae
<i>Campanula garganica</i>	2.52	34	6	2C, 4C	1	n. d.	BZ	Campanulaceae
<i>Campanula glomerata</i> #	3.65	30	2	2C	1	Kluwenklokje / bloembos		Campanulaceae
<i>Campanula latifolia</i>	3.12	34	2	2C	4	Breed klokje		Campanulaceae
<i>Campanula medium</i>	3.54	34	1	2C	1	Marietteklokje		Campanulaceae
<i>Campanula patula</i>	6.64	20, 40	1	2C	1	Weideklokje		Campanulaceae
<i>Campanula persicifolia</i>	6.84	16 (32)	4	2C	5	Prachtklokje		Campanulaceae
<i>Campanula portenschlagiana</i>	2.87	34	5	2C, 4C	1	Dalmatie klokje (langere buis)		Campanulaceae
<i>Campanula poscharskyana</i>	2.84	34	3	2C, 4C, 8C	5	Kruipklokje (langere slippen)		Campanulaceae
<i>Campanula pyramidalis</i>	3.42	34	2	2C, 4C	ad	Piramideklokje	FL	Campanulaceae
<i>Campanula rapunculoides</i>	8.21	68, 102	1	2C	6	Akkerklokje		Campanulaceae
<i>Campanula rapunculus</i>	3.17	20	2	2C, 4C	6	Rapunzelklokje		Campanulaceae
<i>Campanula rhomboidalis</i>		34			1	Bergklokje		Campanulaceae
<i>Campanula rotundifolia</i>	4.47	68, 102	1	2C	8	Grasklokje		Campanulaceae
<i>Campanula trachelium</i>	5.11	34	2	2C, 4C	3	Ruig klokje		Campanulaceae
<i>Cannabis sativa</i>	1.22	20	2	2C, 4C, 8C	cu	Hennep		Cannabaceae
<i>Capsella bursa-pastoris</i> #	0.84	16, 32	26	2C, 4C, (8C)	9	Herderstasje		Brassicaceae
<i>Capsella rubella</i>	0.47	16	28	2C, 4C, 8C	2	Rood herderstasje	FL	Brassicaceae
<i>Cardamine amara</i>	0.49	16	2	2C, 4C, 8C, 16C	6	Bittere veldkers		Brassicaceae

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Species (mainly Heukels Flora)	2C	Chrom. nr.	n	Peak	Status	Dutch name	new	family
<i>Cardamine bulbifera</i>	4.33	32-128	1	2C	ad	Bolletjeskers		Brassicaceae
<i>Cardamine corymbosa</i>	1.49	48	1	2C, 4C	ex	Eenbloemige veldkers		Brassicaceae
<i>Cardamine flexuosa</i>	1.15	32	13	2C, 4C, 8C, 16C	8	Bosveldkers		Brassicaceae
<i>Cardamine occulta</i>	1.71	64	19	2C, 4C, 8C	4	Aziatische veldkers	FL	Brassicaceae
<i>Cardamine hirsuta</i> #	0.50	16	13	2C, 4C, 8C	9	Kleine veldkers		Brassicaceae
<i>Cardamine impatiens</i>	0.43	16	5	2C, 4C, 8C, 16C	5	Springzaadveldkers		Brassicaceae
<i>Cardamine palustris</i>	3.75	64, 80		2C, 4C		n. d.	BZ	Brassicaceae
<i>Cardamine pratensis</i> #	1.65	30-72	20	2C, 4C, 8C	9	Pinksterbloem		Brassicaceae
<i>Carduus acanthoides</i>	1.81	22	3	2C, (4C)	4	Langstekelige distel		Asteraceae
<i>Carduus crispus</i>	2.55	16	1		9	Kruldistel		Asteraceae
<i>Carduus nutans</i>	1.81	16	2	2C	7	Knikkende distel		Asteraceae
<i>Carduus tenuiflorus</i>	7.03	54	1	2C	2	Tengere distel		Asteraceae
<i>Carduus x stangii</i>					2	<i>Carduus crispus x nutans</i>		Asteraceae
<i>Carex acuta</i>	1.02	82, 83, 84	1	2C	8	Scherpe zegge		Cyperaceae
<i>Carex acutiformis</i>	0.92	38	1	2C	8	Moeraszegge		Cyperaceae
<i>Carex appropinquata</i>		64			2	Paardenhaarzegge		Cyperaceae
<i>Carex aquatilis</i>	0.88	76, 77	1	2C	4	Noordse zegge		Cyperaceae
<i>Carex arenaria</i>	0.86	28-64	2	2C	7	Zandzegge		Cyperaceae
<i>Carex brizoides</i>	0.73	58	2	2C	3	Trilgraszegge		Cyperaceae
<i>Carex buxbaumii</i>	1.66	74, 106	1	2C	3	Knotszegge		Cyperaceae
<i>Carex caryophylla</i>	1.37	68	1	2C	5	Voorjaarszegge		Cyperaceae
<i>Carex cespitosa</i>		78			1	Polzegge		Cyperaceae
<i>Carex colchica</i>	0.68	58	1	2C	2	Rivierduinzegge	BZ	Cyperaceae
<i>Carex crawfordii</i>	0.69	68	1	2C, (4C)	1	IJle hazenzegge		Cyperaceae
<i>Carex curta</i> (syn <i>canescens</i> )	0.81	56, 62	1	2C	8	Zompzegge		Cyperaceae
<i>Carex curvata</i>	0.75	c86	1	2C	1	Gekromde zegge	BZ	Cyperaceae
<i>Carex davalliana</i>	1.25	46	1	2C	1	Veenzegge	FL	Cyperaceae
<i>Carex diandra</i>	0.96	60	1	2C	5	Ronde zegge		Cyperaceae
<i>Carex digitata</i>	0.79	48, 50	1	2C	2	Vingerzegge		Cyperaceae
<i>Carex dioica</i>	1.28	52	1	2C, (4C)	1	Tweehuizige zegge		Cyperaceae
<i>Carex distans</i>	0.84	74	2	2C	6	Zilte zegge		Cyperaceae
<i>Carex disticha</i>	0.74	62	1	2C	8	Tweerijige zegge		Cyperaceae
<i>Carex divisa</i>	0.84	60	1	2C	1	Kustzegge		Cyperaceae
<i>Carex divulsa</i>	0.82	58	1	2C	2	Groene bermzegge		Cyperaceae
<i>Carex echinata</i>	0.85	58	1	2C	6	Sterzegge		Cyperaceae
<i>Carex elata</i>	1.02	74, 75, 76	1	2C	7	Stijve zegge		Cyperaceae
<i>Carex elongata</i>	0.84	56	1	2C	7	Elzenzegge		Cyperaceae
<i>Carex ericetorum</i>	1.37	30	1	2C	2	Heidezegge		Cyperaceae
<i>Carex extensa</i>	0.71	60	3	2C	5	Kwelderzegge		Cyperaceae
<i>Carex flacca</i>	2.44	76	3	2C	7	Zeegroene zegge		Cyperaceae
<i>Carex flava</i>		60	1		2	Gele zegge		Cyperaceae
<i>Carex grayi</i>	1.11	52	1	2C	ad	Morgensterzegge	FL	Cyperaceae
<i>Carex hartmanii</i>		68	1		1	Kleine knotszegge		Cyperaceae
<i>Carex hirta</i>	0.65	112	3	2C	9	Ruige zegge		Cyperaceae
<i>Carex hostiana</i>	0.78	56	1	2C	5	Blonde zegge		Cyperaceae
<i>Carex laevigata</i>		71, 72	1		1	Gladde zegge		Cyperaceae
<i>Carex lasiocarpa</i>	0.89	56	1	2C	6	Draadzegge		Cyperaceae
<i>Carex lepidocarpa</i> cf	0.65	68	1	2C	1	Schubzegge		Cyperaceae
<i>Carex ligERICA</i>	0.74	58	3	2C	3	Rivierduinzegge	BZ	Cyperaceae
<i>Carex limosa</i>		56, 62, 64	0		0	Slijkzegge		Cyperaceae
<i>Carex muricata</i> cf	0.88	56, 58	2	2C	2	Dichte bermzegge		Cyperaceae
<i>Carex muskingumensis</i>	0.75	80	1	2C	ad	Palmzegge		Cyperaceae
<i>Carex nigra</i>	0.99	83, 84, 85	3	2C	8	Zwarte zegge		Cyperaceae
<i>Carex oederi</i> ssp. <i>oederi</i>	0.87	70	4	2C	5	Dwergzegge		Cyperaceae
<i>Carex oederi</i> ssp. <i>oedocarpa</i>	0.84		3	2C, 4C	7	Geelgroene zegge		Cyperaceae
<i>Carex otrubae</i>	0.90	58	2	2C	8	Valse voszegge		Cyperaceae
<i>Carex ovalis</i>	0.60	64	1	2C, (4C)	8	Hazenzegge		Cyperaceae
<i>Carex pallascens</i>	0.92	64	1	2C	6	Bleke zegge		Cyperaceae
<i>Carex panicea</i>	1.58	32	1	2C	7	Blauwe zegge		Cyperaceae
<i>Carex paniculata</i> ssp. <i>lusitanica</i>	0.82	60, 62, 64	4	2C, 4C, 8C	8	Pluimzegge		Cyperaceae
<i>Carex pendula</i>	0.89	58, 60	1	2C	3	Hangende zegge		Cyperaceae
<i>Carex pilosa</i>	1.17	42, 44	1	2C	ad	Gewimperde zegge	FL	Cyperaceae
<i>Carex pilulifera</i>	1.26	18	1	2C	8	Pilzegge		Cyperaceae
<i>Carex praecox</i>	0.74	58	1	2C	1	Vroege zegge		Cyperaceae
<i>Carex pseudobrizzoides</i> cf	0.73	58	2	2C	2	Valse zandzegge cf	BZ	Cyperaceae
<i>Carex pseudocyperus</i> cf	0.85	66	4	2C	8	Hoge cyperzegge		Cyperaceae
<i>Carex pulicaris</i>	0.75	58, 60	2	2C	4	Vlozegge		Cyperaceae
<i>Carex punctata</i>	0.77	68	1	2C	2	Stippelzegge		Cyperaceae
<i>Carex reichenbachii</i>	0.72	58	1	2C	2	Valse zandzegge		Cyperaceae
<i>Carex remota</i>	0.93	60, 62	5	2C	8	IJle zegge		Cyperaceae
<i>Carex riparia</i>	0.91	72	1	2C, 4C, 8C	8	Oeverzegge		Cyperaceae
<i>Carex rostrata</i>	0.91	72-82	2	2C	8	Snavelzegge		Cyperaceae
<i>Carex scoparia</i>	0.70	56-70	1	2C	1	n. d.	FL	Cyperaceae
<i>Carex spicata</i>	0.80	58	1	2C	7	Gewone bermzegge		Cyperaceae
<i>Carex strigosa</i>	0.74	66	2	2C	1	Slanke zegge		Cyperaceae
<i>Carex sylvatica</i>	0.79	58	1	2C	4	Boszegge		Cyperaceae
<i>Carex tomentosa</i>	0.95	48	1	2C	1	Viltzegge		Cyperaceae
<i>Carex trinervis</i>	1.31	84, 85	2	2C	6	Drienvrige zegge		Cyperaceae
<i>Carex vesicaria</i>	0.98	74, 82	1	2C	6	Blaaszegge		Cyperaceae
<i>Carex vulpina</i>	0.77	65, 68	1	2C	4	Voszegge		Cyperaceae
<i>Carex vulpinoidea</i>		52, 54			2	Ribbelzegge		Cyperaceae
<i>Carex x boeninghausiana</i>					1	<i>Carex paniculata x remota</i>		Cyperaceae



A	B	C	D	E	F	G	H	I
Species (mainly Heukels Flora)	2C	Chrom. nr.	n	Peak	Status	Dutch name	new	family
<i>Carex x elytroides</i>					7	Carex acuta x nigra		Cyperaceae
<i>Carex x fulva</i>	0.76		1	2C	2	Carex hostiana x oederi		Cyperaceae
<i>Carex x kneuckeriana</i>	0.89		1	2C	1	Carex otrubae x remota		Cyperaceae
<i>Carex x timmiana</i>					2	Carex nigra x trinervis		Cyperaceae
<i>Carlina vulgaris</i>	8.69	20	2	2C	6	Driedistel		Asteraceae
<i>Carpinus betulus</i>	3.57	16, 32, 64	4	2C	8	Haagbeuk		Betulaceae
<i>Carthamus tinctorius</i>	2.67	24	1	2C	ad	Saffloer		Asteraceae
<i>Carum carvi</i>	4.31	20	5	2C	6	Karwij		Apiaceae
<i>Carum verticillatum</i>	1.55	20, 22	1	2C	1	Kranskarwij		Apiaceae
<i>Castanea sativa</i>	1.68	22, 24	3	2C, (4C)	8	Tamme kastanje		Fagaceae
<i>Catabrosa aquatica</i>	6.29	20	1	2C,	7	Watergras		Poaceae
<i>Catalpa bignonioides</i>	2.12	40	2	2C, (4C)	cu	Trompetboom		Bignoniaceae
<i>Catapodium marinum</i>	12.2	14, 28	4	2C, (4C)	3	Laksteeltje		Poaceae
<i>Catapodium rigidum</i> #	6.52	14	4	2C, (4C)	3	Stijf hardgras		Poaceae
<i>Caucalis platycarpus</i>		20			ad	Caucalis		Apiaceae
<i>Celtis australis</i>	1.73	20, 40	2	2C	ad	Europese netelboom	BZ	Cannabaceae
<i>Centaurea calcitrapa</i>	2.13	20	2	2C	2	Kalketrip		Asteraceae
<i>Centaurea cyanus</i>	1.66	24	1	2C, 4C	7	Korenbloem		Asteraceae
<i>Centaurea jacea</i>	4.01	44	1	2C	9	Knoopkruid		Asteraceae
<i>Centaurea montana</i>	5.82	24, 40, 44	2	2C	ad	Bergcentaurie		Asteraceae
<i>Centaurea scabiosa</i>	3.47	20	2	2C, (4C)	5	Grote centaurie		Asteraceae
<i>Centaurea solstitialis</i>		16			ad	Zomercentaurie		Asteraceae
<i>Centaurea stoebe</i>	1.72	18	1	2C	1	Rijncentaurie		Asteraceae
<i>Centaurium erythraea</i>	2.14	40	3	2C, (4C)	7	Echt duizendguldenkruid		Gentianaceae
<i>Centaurium littorale</i>	2.35	40	2	2C, (4C)	5	Strandduizendguldenkruid		Gentianaceae
<i>Centaurium pulchellum</i>	2.55	c. 34, 36	5	2C	7	Fraai duizendguldenkruid		Gentianaceae
<i>Centaurium x intermedium</i>		40, 50, 60			1	Centaurium erythreum x littorale		Gentianaceae
<i>Centranthus ruber</i>	1.18	32	2	2C	cu	Spoorbloem		Caprifoliaceae
<i>Centunculus minimus</i> #	1.84	22	4	2C	4	Dwergbloem		Primulaceae
<i>Cephalanthera damasonium</i> #	37.1	32, 36, 54	1		2	Bleek bosvogeltje		Orchidaceae
<i>Cephalanthera longifolia</i>	35.6	32, 34	1	2C, 4C	0	Wit bosvogeltje		Orchidaceae
<i>Cephalanthera rubra</i>		36, 44, 48			0	Rood bosvogeltje		Orchidaceae
<i>Cerastium arvense</i>	2.62	72	4	2C, 4C	8	Akkerhoornbloem		Caryophyllaceae
<i>Cerastium brachypetalum</i>		90			2	Kalkhoornbloem		Caryophyllaceae
<i>Cerastium diffusum</i> cf	2.44	72	3	2C, 4C, 8C	6	Scheve hoornbloem		Caryophyllaceae
<i>Ceras.fontanum</i> ssp. holosteoides	5.62	71, 108, 144	1	2C, 4C, (8C)	3	Glanzige hoornbloem		Caryophyllaceae
<i>Cerastium fontanum</i> ssp. vulgare #	5.60	72, 108, 144	5	2C, 4C,	9	Gewone hoornbloem		Caryophyllaceae
<i>Cerastium glomeratum</i>	1.66	72	5	2C, 4C, (8C)	8	Kluwenhoornbloem		Caryophyllaceae
<i>Cerastium glutinosum</i> cf	1.25	70	1	2C, 4C, 8C	1	Bleke hoornbloem		Caryophyllaceae
<i>Cerastium pumilum</i>	3.52	72, 90	1	2C, 4C	3	Steenhoornbloem		Caryophyllaceae
<i>Cerastium semidecandrum</i>	1.32	(18) 36	4	2C, 4C, 8C	8	Zandhoornbloem		Caryophyllaceae
<i>Cerastium tomentosum</i> #	2.68	72	4	2C, 4C, 8C	cu	Viltige hoornbloem		Caryophyllaceae
<i>Ceratocapnos claviculata</i>	0.66	32	2	2C-4C-32C	8	Rankende helmbloem		Papaveraceae
<i>Ceratochloa carinata</i>	12.4	56	4	2C, (4C)	6	Gekielde dravik		Poaceae
<i>Ceratochloa cathartica</i>		28, 42, 56			ad	Paardengras		Poaceae
<i>Ceratophyllum demersum</i> #	1.10	24-72	2	2C, 4C	9	Grof hoornblad		Ceratophyllaceae
<i>Ceratophyllum submersum</i>	0.43	24, 40, 72	1	2C, (4C)	5	Fijn hoornblad		Ceratophyllaceae
<i>Chaenomeles japonica</i>	1.43	34	1	2C, (4C)	cu	Japanse sierkwee	HD	Rosaceae
<i>Chaenorhinum minus</i>	0.90	14	2	2C	7	Kleine leeuwenbek		Plantaginaceae
<i>Chaenorhinum origanifolium</i>	1.20	14	1	2C	1	Marjoleinbekje		Plantaginaceae
<i>Chaerophyllum aureum</i>	1.65	22	1	2C	1	Gouden ribzaad		Apiaceae
<i>Chaerophyllum bulbosum</i>	1.72	22	3	2C, (4C)	5	Knolribzaad		Apiaceae
<i>Chaerophyllum temulum</i>	4.81	14, 22	3	2C	8	Dolle kervel		Apiaceae
<i>Chamaecyparis x lawsoniana</i>	21.6	22	1		cu	Lawson's cypres		Cupressaceae
<i>Chamerion angustifolium</i>	1.47	36	1	2C	9	Wilgenroosje		Onagraceae
<i>Chelidonium majus</i>	2.31	12	1	2C, 4C, 8C	9	Stinkende gouwe		Papaveraceae
<i>Chenopodium album</i>	3.54	(36) 54	11	2C, (4C)	9	Melganzenvoet		Amaranthaceae
<i>Chenopodium ambrosioides</i>	1.09	(16) 32 (64)	4	2C, 4C, 8C, 16C		Welriekende ganzenvoet		Amaranthaceae
<i>Chenopodium berlandieri</i>		36			ad	Texaanse ganzenvoet		Amaranthaceae
<i>Chenopodium bonus-henricus</i>	2.44	36	1	2C, 4C, 8C	2	Brave hendrik		Amaranthaceae
<i>Chenopodium botrys</i>	0.95	18	1	2C, 4C, 8C, 16C	4	Druifkruid		Amaranthaceae
<i>Chenopodium chenopodioides</i>		18	1		2	Beursjesganzenvoet		Amaranthaceae
<i>Chenopodium ficifolium</i>	1.66	18	1	2C, 4C, 8C	8	Stippelganzenvoet		Amaranthaceae
<i>Chenopodium foliosum</i>	0.90	18	1	2C, 4C, C8, 16C	5	Rode aardbeispinazie		Amaranthaceae
<i>Chenopodium giganteum</i>	3.55	54	3	2C, 4C	ad	Boomspinazie	BZ	Amaranthaceae
<i>Chenopodium glaucum</i>	0.78	18	3	2C, 4C, 8C, 16C	8	Zeegroene ganzenvoet		Amaranthaceae
<i>Chenopodium hircinum</i> cf	3.87	36	3	2C, (4C)	2	n. d., smells like rotten fish	BZ	Amaranthaceae
<i>Chenopodium hybridum</i>	1.79	18	1	2C, (4C)	5	Esdoornganzenvoet		Amaranthaceae
<i>Chenopodium murale</i>	1.08	18	1	2C, 4C, 8C	5	Muurganzenvoet		Amaranthaceae
<i>Chenopodium polyspermum</i>	1.65	18	2	2C, 4C, 8C	8	Korrelganzenvoet		Amaranthaceae
<i>Chenopodium pumilio</i>	0.81	18	2	2C, 4C, 8C		Liggende ganzenvoet		Amaranthaceae
<i>Chenopodium quinoa</i> #	3.06	18-54	6	2C, 4C, 8C, 16C	cu	Quinoa		Amaranthaceae
<i>Chenopodium rubrum</i>	1.85	36	6	2C, 4C, 8C	8	Rode ganzenvoet		Amaranthaceae
<i>Chenopodium schraderianum</i>	0.81	18	1	2C, 4C, 8C	ad	Gekield duifkruid		Amaranthaceae
<i>Chenopodium vulvaria</i>	0.91	18 (36, 72)	1	2C, 4C, 8C, 16C		Stinkende ganzenvoet		Amaranthaceae
<i>Chionodoxa luciliae</i>	8.55	18, 20	2	2C	cu	Middelste sneeuwroem		Asparagaceae
<i>Chionodoxa sardensis</i>	8.30	18	3		cu	Kleine sneeuwroem		Asparagaceae
<i>Chionodoxa siehei</i>	8.70	18	6	2C	5	Sneeuwroem		Asparagaceae
<i>Chondrilla juncea</i>	3.25	15!	1	2C	2	Knikbloem		Asteraceae
<i>Chrysosplenium alternifolium</i>	1.78	48	1	2C, 4C, 8C	4	Verspreidbladig goudveil		Saxifragaceae
<i>Chrysosplenium oppositifolium</i>	1.08	42	1	2C, (4C)	4	Paarbladig goudveil		Saxifragaceae
<i>Cicendia filiformis</i>	1.17	26	2	2C, 4C	4	Draadgentiaan		Gentianaceae

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Species (mainly Heukels Flora)	2C	Chrom. nr.	n	Peak	Status	Dutch name	new	family
<i>Cicer arietinum</i>	1.79	14, 16	1	2C, 4C, 8C	ad	Kikkererwt		Fabaceae
<i>Cichorium endivia</i>	2.02	18	5	2C	cu	Andijvie		Asteraceae
<i>Cichorium intybus</i>	2.87	18	3	2C	7	Wilde cichorei		Asteraceae
<i>Cicuta virosa</i>	2.18	22	1	2C	7	Waterscheerling		Apiaceae
<i>Circaea alpina</i>		22			1	Alpenheksenkruid		Onagraceae
<i>Circaea lutetiana</i>	1.14	22	4	2C	7	Groot heksenkruid		Onagraceae
<i>Circaea x intermedia</i>	1.14	22	3	2C, (4C)	2	Klein heksenkruid		Onagraceae
<i>Cirsium acaule</i>	2.64	34	2	2C	3	Aarddistel		Asteraceae
<i>Cirsium arvense</i>	2.94	34	1	2C	9	Akkerdistel		Asteraceae
<i>Cirsium dissectum</i>	2.49	34	1	2C	6	Spaanse ruiter		Asteraceae
<i>Cirsium eriophorum</i>	3.62	34	1	2C	3	Wollige distel		Asteraceae
<i>Cirsium oleraceum</i>	2.44	34	1	2C	4	Moesdistel		Asteraceae
<i>Cirsium palustre</i>	2.53	34	3	2C, 4C, 8C	9	Kale jonker		Asteraceae
<i>Cirsium vulgare</i>	5.43	68	2	2C	9	Speerdistel		Asteraceae
<i>Cirsium x forsteri</i>	2.41		1	2C	2	<i>Cirsium dissectum</i> x <i>palustre</i>		Asteraceae
<i>Cirsium x rigens</i>	2.56		1	2C	cu	<i>Cirsium acaule</i> x <i>oleraceum</i>		Asteraceae
<i>Citrullus lanatus</i>	0.95	22	8	2C, 4C, 8C	cu	Watermeloen		Cucurbitaceae
<i>Cladium mariscus</i>	0.54	36, c. 60	1	2C	5	Galigaan		Cyperaceae
<i>Claytonia perfoliata</i>	4.13	36	2	2C, 4C, 8C	8	Winterpostelein		Portulacaceae
<i>Claytonia sibirica</i>	6.97	24, 36, 48	1	2C, 4C, 8C	7	Roze Winterpostelein		Portulacaceae
<i>Clematis montana</i>	19.1	16	1	2C, (4C)	cu	Bergbosrank	FL	Ranunculaceae
<i>Clematis vitalba</i>	20.2	16	2	2C	7	Bosrank		Ranunculaceae
<i>Clematis viticella</i>	20.6	16	4	2C, (4C)	2	Italiaanse clematis		Ranunculaceae
<i>Clethra alnifolia</i>	3.00	32	1	2C	cu	Clethra		Clethraceae
<i>Clinopodium ascendens</i> cf	0.93	48	1	2C, 4C	1	Opstijgende steentijm	BZ	Lamiaceae
<i>Clinopodium acinos</i>	1.43	18	1	2C, (4C)	5	Kleine steentijm		Lamiaceae
<i>Clinopodium calamintha</i>	2.00	48, 72	1	2C	ex	Kleine bergsteentijm		Lamiaceae
<i>Clinopodium grandiflorum</i> cf	1.82	22	1	2C	cu	Grote steentijm		Lamiaceae
<i>Clinopodium menthifolium</i> #	1.77	24	4	2C	2	Bergsteentijm		Lamiaceae
<i>Clinopodium vulgare</i>	1.02	20	3	2C, 4C	3	Borstelkrans		Lamiaceae
<i>Cochlearia danica</i>	1.54	42	2	2C, 4C, 8C, 16C	8	Deens lepelblad		Brassicaceae
<i>Cochlearia officinalis</i> ssp. <i>anglica</i>		36-60			4	Engels lepelblad		Brassicaceae
<i>Cochlearia officinalis</i> ssp. <i>officinalis</i>	1.65	24	4	2C, 4C, 8C, 16C	4	Echt lepelblad		Brassicaceae
<i>Coincya monensis</i>	3.81	24, 48	1	2C, 4C, 8C	3	Muurbloemmosterd		Brassicaceae
<i>Coix lacryma-jobi</i> leaf	4.45	20	3	2C, 4C	ad	Jobs tranen		Poaceae
<i>Colchicum autumnale</i>	5.80	24-42	2	2C, (4C)	4	Herfsttijloos		Colchicaceae
<i>Colchicum byzantinum</i>	6.90	40	1	2C	cu	Droogbloeiër		Colchicaceae
<i>Collinsia heterophylla</i>	4.17	14	1	2C, (4C)	cu	n. d.		Plantaginaceae
<i>Colutea arborescens</i> cf	1.42	16	3	2C, 4C, 8C	cu	Europese blazenstruik		Fabaceae
<i>Colutea orientalis</i>		16			cu	Oosterse blazenstruik	FL	Fabaceae
<i>Colutea x media</i>	1.44	16	1	2C, 4C, 8C	cu	<i>Colutea orientalis</i> .x <i>arborescens</i>		Fabaceae
<i>Comarum palustre</i>	1.30	35, 40, 64	1	2C, 4C, (8C)	7	Wateraardbei		Rosaceae
<i>Conium maculatum</i>	2.84	22	2	2C	6	Gevlekte scheerling		Apiaceae
<i>Conopodium majus</i>	1.67	22	1	2C	1	Frans aardkastanje		Apiaceae
<i>Conringia orientalis</i>	1.30	14	1		ad	Witte steenraket		Brassicaceae
<i>Consolida ajacis</i> * #	14.8	16	2	2C	cu	Valse ridderspoor		Ranunculaceae
<i>Consolida hispanica</i>						Oosterse ridderspoor		Ranunculaceae
<i>Consolida regalis</i>	7.59	16	2	2C	3	Wilde ridderspoor		Ranunculaceae
<i>Convallaria majalis</i>	37.5	32, 36, 38	11	2C	8	Lelietje-van-dalen		Asparagaceae
<i>Convolvulus arvensis</i>	3.17	48	2	2C, 4C	9	Akkerwinde		Convolvulaceae
<i>Convolvulus lineatus</i>		30 (60)			ad	Calandsklokje		Convolvulaceae
<i>Convolvulus sepium</i>	1.44	22	4	2C, 4C	9	Haagwinde		Convolvulaceae
<i>Convolvulus silvatica</i>	1.49	22	4	2C, 4C	ad	Gestreepte winde		Convolvulaceae
<i>Convolvulus soldanella</i>	1.53	22	2	2C, 4C	5	Zeewinde		Convolvulaceae
<i>Convolvulus tricolor</i>	1.02	20	1	2C, 4C, 8C	cu	Dagschone	FL	Convolvulaceae
<i>Conyza</i> : zie <i>Erigeron</i>		18, 36, 54	--	2C, (4C)	1	Fijnstraal		Asteraceae
<i>Corallorrhiza trifida</i>		40, 42, 84			0	Koraalwortel		Orchidaceae
<i>Coriandrum sativum</i>	4.69	22	4	2C, (4C)	cu	Koriander		Apiaceae
<i>Corispermum intermedium</i>	1.07	18	3	2C, 4C, 8C, 16C	6	Smal vlieszaad		Amaranthaceae
<i>Corispermum marschallii</i>		18			0	Breed vlieszaad		Amaranthaceae
<i>Cornus mas</i>	6.76	18, 54	2	2C	cu	Gele kornoelje		Cornaceae
<i>Cornus sanguinea</i> ssp. <i>sanguinea</i>	2.45	22	3	2C, (4C)	7	Rode kornoelje	HD	Cornaceae
<i>Cornus sanguinea</i> ssp. <i>australis</i>	2.47	22	1	2C	cu	n. d.	HD	Cornaceae
<i>Cornus sericea</i>	2.02	22	1	2C	cu	Canadese kornoelje		Cornaceae
<i>Cornus suecica</i>	1.97	22	1	2C, 3C	1	Zweedse kornoelje		Cornaceae
<i>Coronopus didymus</i>	0.81	32	3	2C, 4C, 8C, 16C	6	Kleine varkenskers		Brassicaceae
<i>Coronopus squamatus</i>	1.03	32	3	2C, 4C, 8C, 16C	7	Grove varkenskers	BZ	Brassicaceae
<i>Corrigiola litoralis</i>	0.82	16, 18	2	2C, 4C, 8C	4	Riempjes		Caryophyllaceae
<i>Cortaderia selloana</i>	8.36	(16) 32	3	2C	cu	Pampasgras	HD	Poaceae
<i>Corydalis cava</i> #	2.16	16, 32	2	2C, 4C, 8C	4	Holwortel		Papaveraceae
<i>Corydalis cheiranthifolia</i>	1.13	12, 16	1	2C, 4C, 8C	cu	Varenhelmbloem	FL	Papaveraceae
<i>Corydalis solida</i>	1.50	16, 24, 32	2	2C, 4C, 8C, 16C	6	Vingerhelmbloem		Papaveraceae
<i>Corylus avellana</i>	0.83	22, 28	5	2C	9	Hazelaar		Betulaceae
<i>Corylus maxima</i>	0.85	22, 28	1	2C	cu	Lambertsnoot	FL	Betulaceae
<i>Corylus colurna</i>	0.92	28	4	2C	cu	Turkse hazelaar	BZ	Betulaceae
<i>Corynephorus canescens</i>	3.07	14	9	2C, (4C)	8	Buntgras		Poaceae
<i>Cosmos bipinnatus</i>	2.54	24	3	2C	cu	Cosmea		Asteraceae
<i>Cotoneaster ambiguus</i> / <i>lucidus</i>	2.90	68	4	2C	cu	n. d.	FL	Rosaceae
<i>Cotoneaster bullatus</i>	2.83	68	2	2C	2	Grote boogcotoneaster	FL	Rosaceae
<i>Cotoneaster dammeri</i>	1.55	34	2	2C	cu	n. d.	FL	Rosaceae
<i>Cotoneaster dielsianus</i>	2.93	68	1	2C	2	Diel's cotoneaster	FL	Rosaceae
<i>Cotoneaster divaricatus</i>	2.99		1	2C	cu	n. d.	FL	Rosaceae

A	B	C	D	E	F	G	H	I
Species (mainly Heukels Flora)	2C	Chrom. nr.	n	Peak	Status	Dutch name	new	family
<i>Cotoneaster franchetii</i>	2.85	68	1	2C	cu	n. d.	FL	Rosaceae
<i>Cotoneaster hjelmqvistii</i>	2.83		1	2C	cu	Dwergmispel	FL	Rosaceae
<i>Cotoneaster horizontalis</i>	1.39	68	1	2C, (4C)	cu	Vlakke dwergmispel		Rosaceae
<i>Cotoneaster integerrimus</i>	1.42	34-102	1	2C	1	Wilde dwergmispel		Rosaceae
<i>Cotoneaster rehderi</i>	2.97		1	2C	cu	Rimpelige cotoneaster		Rosaceae
<i>Cotoneaster salicifolius</i>	1.42	34	2	2C	cu	Wilgbladige cotoneaster		Rosaceae
<i>Cotoneaster sternianus cf</i>	2.87		1	2C	cu	Witte boogcotoneaster		Rosaceae
<i>Cotoneaster zabellii</i>	1.60		1	2C	cu	n. d.	FL	Rosaceae
<i>Cotoneaster x suecicus</i>	1.41	34	2	2C	cu	n. d.	FL	Rosaceae
<i>Cotoneaster x watereri</i>	1.44		1	2C	cu	n. d.	FL	Rosaceae
<i>Cotula coronopifolia</i>	3.83	20, 40	2	2C	4	Goudknopje		Asteraceae
<i>Cotula australis</i>		(18) 36			ad	Kamilleknopje	FL	Asteraceae
<i>Crambe abyssinica cf</i>	6.22	60	1		ad	Afrikaanse bolletjeskool		Brassicaceae
<i>Crambe maritima</i>	4.77	60	6	2C, 4C, 8C	4	Zeekool		Brassicaceae
<i>Crassula helmsii</i>	0.63	36	2	2C, 4C, 8C	1	Watercrassula		Crassulaceae
<i>Crassula tillaea #</i>	0.63	16, 32, 64	5	2C, 4C, 8C	3	Mosbloempje		Crassulaceae
<i>Crataegus crus-galli</i>	3.20	51, 68	3	2C	cu			Rosaceae
<i>Crataegus laevigata</i>	1.47	34	8	2C	7	Tweestijlige meidoorn		Rosaceae
<i>Crataegus monogyna</i>	1.52	34	5	2C	9	Eenstijlige meidoorn		Rosaceae
<i>Crataegus rhipidophylla / rosiformis</i>	2.88	68	1	2C	cu	Koraalmeidoorn	BZ	Rosaceae
<i>Crataegus x macrocarpa</i>	2.41	51	8	2C	1	<i>Crataegus laevigata x rhipidophylla</i>	BZ	Rosaceae
<i>Crataegus x media</i>	1.58	34	3	2C	cu	<i>Crataegus laevigata x monogyna</i>		Rosaceae
<i>Crataegus x subphaerica</i>	3.12	BZ: 85	6	2C	1	<i>Crataegus monogyna x rhipidophylla</i>	FL	Rosaceae
<i>Crepis biennis*</i>	17.9	40	1	2C	7	Groot streepzaad		Asteraceae
<i>Crepis capillaris</i>	4.47	6	2	2C, (4C)	9	Klein streepzaad		Asteraceae
<i>Crepis foetida</i>	4.57	8, 10	1	2C	2	Stinkend streepzaad		Asteraceae
<i>Crepis paludosa</i>	9.04	12	2	2C	5	Moerasstreepzaad		Asteraceae
<i>Crepis setosa</i>	3.80	8	1	2C	ad	Borstelstreepzaad		Asteraceae
<i>Crepis tectorum</i>		8	1		6	Smal streepzaad		Asteraceae
<i>Crepis vesicaria ssp. taraxacifolia</i>	5.64	8	1	2C	5	Paardenbloemstreepzaad		Asteraceae
<i>Crithmum maritimum</i>	4.72	20	2	2C, 4C, 8C	3	Zeevenkel		Apiaceae
<i>Crocus angustifolius</i>	7.32	12	2	2C	cu	n. d.	HD	Iridaceae
<i>Crocus chrysanthus</i>	8.10	20	2		cu	Vroege crocus		Iridaceae
<i>Crocus flavus</i>	9.80	8	1		cu	<i>Geel-oranje crocus</i>	BZ	Iridaceae
<i>Crocus sativus</i>	10.2	24	3		cu	Safranrocus	BZ	Iridaceae
<i>Crocus tommasianus</i>	7.80	16	2	2C	4	Boerenkrokus		Iridaceae
<i>Crocus vernus</i>	20.3	8, 16, (32)	4	2C	5	Bonte krokus		Iridaceae
<i>Crocus x stellaris</i>	13.1	10, 14	2	2C	cu	<i>Crocus angustifolius x flavus</i>		Iridaceae
<i>Cruciata laevipes</i>	0.71	22	2	2C, 4C, 8C, 16C	5	Kruisbladwalstro		Rubiaceae
<i>Cryptomeria japonica</i>	20.60	22	1		cu	Sikkelcipres		Crupessaceae
<i>Cucumis melo</i>	1.04	24	9	2C, 4C, 8C, 16C	cu	Meloen		Cucurbitaceae
<i>Cucumis sativus</i>	0.86	24	7	2C, 4C, 8C, 16C	cu	Komkommer		Cucurbitaceae
<i>Cucurbita pepo</i>	1.03	44	9	2C, 4C, 8C, 16C	cu	Sierpompoen, Courgette		Cucurbitaceae
<i>Cucurbita maxima</i>	1.07	40	5	2C, 4C, 8C, 16C	cu	Reuzenkalabas	FL	Cucurbitaceae
<i>Cuminum cyminum</i>	4.64	14	1	2C	cu	Komijn		Apiaceae
<i>Cuscuta campestris #</i>	1.22	56	4	2C, 4C, 8C	3	Veldwarkruid		Convolvulaceae
<i>Cuscuta epilinum</i>		42			0	Vlaswarkruid		Convolvulaceae
<i>Cuscuta epithymum</i>	1.42	14	3	2C, 4C, 8C	6	Klein warkruid on Galium		Convolvulaceae
<i>Cuscuta epithymum</i>	1.32	14	3	2C, 4C, 8C	6	Klein warkruid on Rosa spinosissima		Convolvulaceae
<i>Cuscuta europaea #</i>	5.15	14	10	2C, 4C, 8C	6	Groot warkruid		Convolvulaceae
<i>Cuscuta gronovii</i>	9.83	60	1	2C, 4C	2	Oeverwarkruid		Convolvulaceae
<i>Cuscuta lupuliformis</i>	49.0	28	3	2C, 4C	5	Hopwarkruid		Convolvulaceae
<i>Cymbalaria muralis</i>	0.98	14	2	2C	7	Muurleeuwenbek		Plantaginaceae
<i>Cymbalaria muralis ssp. visianii</i>	1.07		1	2C,	1	n. d.		
<i>Cynodon dactylon</i>	2.29	36	2	2C, 4C	6	Handjesgras		Poaceae
<i>Cynoglossum officinale</i>	1.97	24	1	2C, 4C, 8C	6	Veldhondstong		Boraginaceae
<i>Cynoglossum amabile</i>	1.51	24	1	2C, 4C, 8C, 16C	1	n. d.	BZ	Boraginaceae
<i>Cynosurus cristatus</i>	5.94	14	2	2C, 4C	8	Kamgras		Poaceae
<i>Cynosurus echinatus</i>		14			ad	Stekelkamgras		Poaceae
<i>Cyperus eragrostis</i>	1.45	42	4	2C	1	Bleek cypergras		Cyperaceae
<i>Cyperus esculentus</i>	0.66	108 (206)	1	2C	3	Knolcyperus		Cyperaceae
<i>Cyperus flavescens</i>		50, 70			0	Geel cypergras		Cyperaceae
<i>Cyperus glomeratus</i>	1.28		2	2C	0	n. d.	BZ	Cyperaceae
<i>Cyperus fuscus</i>	0.49	36	2	2C	5	Bruin cypergras		Cyperaceae
<i>Cyperus gregorianus</i>	0.85		1	2C		n. d.	BZ	Cyperaceae
<i>Cyperus longus</i>	0.70	14, c. 120	1	2C	1	Rood cypergras		Cyperaceae
<i>Cyperus zumula</i>	0.61		1	2C	cu	Kattegras	BZ	Cyperaceae
<i>Cyrtomium falcatum*</i>	22.9	82, 123	2	2C	cu	IJzervaren		Dryopteraceae
<i>Cyrtomium fortunei*</i>	21.0	82, 123	2	2C	ad	Smalle ijzervaren	FL	Dryopteraceae
<i>Cystopteris fragilis*</i>	15.6	168, 252	4	2C	3	Blaasvaren		Athyriaceae
<i>Cytisus scoparius</i>	2.21	24, 46, 48	1	2C	9	Brem		Fabaceae
<i>Dactylis glomerata</i>	8.59	28	2	2C	9	Kropaar		Poaceae
<i>Dactylorhiza elata ssp. sesquipedalis</i>		80	0	2C,	0	Grote rietorchis		Orchidaceae
<i>Dactylorhiza incarnata var. incarnata #</i>	29.0	0 (BZ: 60, 8)	5	2C	6	Vleeskleurige orchis		Orchidaceae
<i>Dactylorhiza incarnata var. lobelii</i>						Vleeskleurige duinorchis		Orchidaceae
<i>Dactylorhiza incarnata var. coccinea</i>	7.44	BZ: 20	2	2C,	1	Steenrode orchis	FL	Orchidaceae
<i>Dactylorhiza maculata ssp. fuchsii #</i>	11.6	40	5	2C, 4C	5	Bosorchis		Orchidaceae
<i>Dactylorhiza maculata ssp. maculata</i>	18.6	80	1	2C, 4C	6	Gevlekte orchis		Orchidaceae
<i>Dactylorhiza majalis ssp. majalis cf</i>	21.6	80	1	2C, 4C	5	Brede orchis		Orchidaceae
<i>Dactylorhiza majalis ssp. praeterm. #</i>	26.3	80	7	2C, (4C)	6	Rietorchis		Orchidaceae
<i>Dactylorhiza majalis ssp. sphagnicola</i>					2	Veenorchis		Orchidaceae
<i>Dactylorhiza traunsteineri</i>		80				Smalle orchis		Orchidaceae

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Species (mainly Heukels Flora)	2C	Chrom. nr.	n	Peak	Status	Dutch name	new	family
<i>Dactylorhiza viridis</i> *	14.9	40	2	2C, 4C, 8C	2	Groene nachtorchis		Orchidaceae
<i>Danthonia decumbens</i>	4.19	36	1		8	Tandjesgras		Poaceae
<i>Daphne laureola</i>	6.08	18	2	2C, 4C	1	Zwart peperboompje		Thymelaeaceae
<i>Daphne mezereum</i>	6.20	18	3	2C, 4C, 8C	3	Rood peperboompje		Thymelaeaceae
<i>Datura stramonium</i>	4.24	24	6	2C, 4C	6	Doornappel		Solanaceae
<i>Daucus carota</i>	1.19	18	5		8	Wilde peen		Apiaceae
<i>Daucus carota</i> 'Sativus'	1.18	18	8	2C, (4C)	8	Winterpeen		Apiaceae
<i>Deschampsia cespitosa</i>	8.60	26, 39, 52	1	2C, 4C	8	Ruwe smele		Poaceae
<i>Deschampsia flexuosa</i>	12.2	14, 28	2	2C	9	Bochtige smele		Poaceae
<i>Deschampsia setacea</i>	4.94	14	1	2C	3	Moerassmele		Poaceae
<i>Descurainia sophia</i>	0.61	28, 56	1	2C, 4C, 8C, 16C	7	Sofiekruid		Brassicaceae
<i>Deutzia gracilis</i>	3.08	26	5	2C	cu	Witte deutzia		Hydrangeaceae
<i>Deutzia scabra</i>	13.4	26, 130	5	2C	cu	Roze deutzia		Hydrangeaceae
<i>Dianthus armeria</i>	1.00	30	1	2C, 4C, 8C	4	Ruige anjer		Caryophyllaceae
<i>Dianthus barbatus</i>	1.54	30	2	2C, 4C, 8C	cu	Duizenschoon		Caryophyllaceae
<i>Dianthus carthusianorum</i>	1.19	30	3	2C, 4C, 8C	1	Karthuizer anjer		Caryophyllaceae
<i>Dianthus deltooides</i>	0.93	30	1	2C, 3C, 4C, 6C	4	Steenanjer		Caryophyllaceae
<i>Dianthus giganteus</i>	1.19	30	3	2C, 4C, 8C	2	Hoofdjes anjer	BZ	Caryophyllaceae
<i>Dianthus superbus</i>	1.53	30, 60	1	2C, 4C, 8C	0	Prachtanjer		Caryophyllaceae
<i>Dicentra spectabilis</i>	1.37	16, 28, 32	1	2C, 4C, 8C	cu	Mariahartje	FL	Papaveraceae
<i>Dicentra eximia</i>	1.11	16	1	2C, 4C, 8C	cu		FL	Papaveraceae
<i>Digitalis lanata</i>	2.69	56 (112)	2		ad	Wollig vingerhoedskruid	FL	Plantaginaceae
<i>Digitalis lutea</i>	5.03	16-112	2	2C, 4C, 8C	ad	Geel vingerhoedskruid		Plantaginaceae
<i>Digitalis purpurea</i>	2.02	56	2	2C	8	Vingerhoedskruid		Plantaginaceae
<i>Digitaria ischaemum</i>	2.05	36, 45	2	2C	8	Glad vingergras		Poaceae
<i>Digitaria sanguinalis</i>	2.46	18, 28, 36-48	6	2C, 4C	7	Harig vingergras		Poaceae
<i>Diploxys muralis</i>	2.56	42	3	2C, 4C, 8C, 16C	6	Kleine zandkool		Brassicaceae
<i>Diploxys tenuifolia</i>	1.67	22	2	2C, 4C, 8C	7	Grote zandkool		Brassicaceae
<i>Dipsacus fullonum</i>	6.65	(16) 18	3	2C	8	Grote kaardebol		Caprifoliaceae
<i>Dipsacus laciniatus</i>	7.05	(16) 18	5	2C	1	Slipbladkaardebol		Caprifoliaceae
<i>Dipsacus pilosus</i>	10.4	18	1	2C, 4C, 8C, 16C	5	Kleine kaardebol		Caprifoliaceae
<i>Dipsacus strigosus</i>	8.69	18	1	2C	ad	Slanke kaardebol	FL	Caprifoliaceae
<i>Dittrichia graveolens</i>	1.99	18	1	2C	1	Kamfer alant		Asteraceae
<i>Dittrichia viscosa</i>		18			ad	Kleverige alant		Asteraceae
<i>Doronicum orientale</i>	5.92	60	1	2C	cu	Oosterse zonnebloem	FL	Asteraceae
<i>Doronicum pardalianches</i>	6.76	60	1	2C	2	Hartbladzonnebloem		Asteraceae
<i>Doronicum plantagineum</i>	10.0	120	2	2C	4	Weegbreezonnebloem		Asteraceae
<i>Draba muralis</i>	0.95	32	1	2C, 4C, 8C	4	Wit hongerbloempje		Brassicaceae
<i>Drosera anglica</i>	6.15	40	1	2C	1	Lange zonnedaauw		Droseraceae
<i>Drosera intermedia</i>	2.96	20	1	2C	7	Kleine zonnedaauw		Droseraceae
<i>Drosera rotundifolia</i>	2.75	20	2	2C	7	Ronde zonnedaauw		Droseraceae
<i>Drosera x obovata</i>					0	<i>Drosera anglica x rotundifolia</i>		Droseraceae
<i>Dryopteris affinis</i> *	16.6	82	50	2C	3	Geschubde mannetjesvaren		Dryopteraceae
<i>Dryopteris x borrieri</i> * cf	25.3	123	36	2C	2	Matte geschubde mannetjesvaren	BZ	Dryopteraceae
<i>Dryopteris x cambrensis</i> * cf	24.6	123	23	2C	1	n. d.	BZ	Dryopteraceae
<i>Dryopteris carthusiana</i> *	34.6	164	26	2C	7	Smalle stekelvaren		Dryopteraceae
<i>Dryopteris cristata</i> *	34.8	164	6	2C	6	Kamvaren		Dryopteraceae
<i>Dryopteris cycadina</i> *	27.7	82	6	2C	1	n. d.	FL	Dryopteraceae
<i>Dryopteris dilatata</i> *	37.9	164	26	2C	7	Brede stekelvaren		Dryopteraceae
<i>Dryopteris expansa</i> *	20.9	82	1	2C	1	Tere stekelvaren		Dryopteraceae
<i>Dryopteris filix-mas</i> *	32.6	164	26	2C	8	Mannetjesvaren		Dryopteraceae
<i>Dryopteris x critica</i> *	40.1	BZ: 205	6	2C	ad	n. d.		Dryopteraceae
<i>Dryopteris x deweveri</i> *	36.6	164	2	2C	2	<i>Dryopteris carthusiana x dilatata</i>		Dryopteraceae
<i>Dryopteris x complexa</i> *	33.6	164	2	2C	1	<i>Dryopteris affinis x filix-mas</i>		Dryopteraceae
<i>Dryopteris x uliginosa</i> *	34.7	164	3	2C	1	<i>Dryopteris carthusiana x cristata</i>		Dryopteraceae
<i>Echinacea purpurea</i> *	15.4	22	2	2C	1	Rode zonnehoed	BZ	Boraginaceae
<i>Echinochloa crus-galli</i>	3.26	36-72	5	2C, 4C	8	Europese hanenpoot		Poaceae
<i>Echinochloa muricata</i>	1.95	48	2	2C, 4C	1	Stekelige hanenpoot		Poaceae
<i>Echinochloa frumentacea</i>	3.59	(36, 48) 54	1	2C, 4C	1	n. d.	FL	Poaceae
<i>Echinops exaltatus</i>	8.95	30	1	2C	cu	Stekelige kogeldistel		Asteraceae
<i>Echinops sphaerocephalus</i>	8.34	30, 32	1	2C	cu	Beklierde kogeldistel		Asteraceae
<i>Echium plantagineum</i>	0.76	16	2	2C, 4C, 8C, 16C	1	Weegbreeslangenkruid	BZ	Boraginaceae
<i>Echium vulgare</i>	1.74	32	4	2C, 4C, 8C, 16C	7	Slangenkruid		Boraginaceae
<i>Egeria densa</i>	11.5	48	1	2C, 4C	cu	Egeria		Hydrocharitaceae
<i>Eichornia crassipes</i>	2.90	32	2	2C	cu	Waterhyacinth	FL	Pontederiaceae
<i>Elaeagnus angustifolia</i>	1.17	28	1	2C, (4C)	cu	Smalle olijfwilg		Eleagnaceae
<i>Elaeagnus commutata</i>	1.49	28	1	2C, (4C)	cu	Zilverolijfwilg		Eleagnaceae
<i>Elaeagnus multiflora</i>	1.55		1	2C, (4C)	cu	Langstelige olijfwilg		Eleagnaceae
<i>Elatine hexandra</i>	1.42	72	1	2C, (4C)	4	Gesteeld glaskroos		Elatinaceae
<i>Elatine hydropiper</i>	0.59	40	1	2C	2	Klein glaskroos		Elatinaceae
<i>Elatine triandra</i>		40			ad	Drietallig glaskroos		Elatinaceae
<i>Eleocharis acicularis</i>	2.63	20, 56	2	2C	7	Naaldwaterbies		Cyperaceae
<i>Eleocharis multicaulis</i>	3.60	20	1	2C	6	Veelstengelige waterbies		Cyperaceae
<i>Eleocharis ovata</i>		10			1	Eivormige waterbies		Cyperaceae
<i>Eleocharis palustris</i>	10.8	16, 37, 38	3	2C	8	Gewone waterbies		Cyperaceae
<i>Eleocharis quinqueflora</i>	1.14	20, 50, c.136	2	2C	5	Armbloemige waterbies		Cyperaceae
<i>Eleocharis uniglumis</i>	9.50	40-90	1	2C	6	Slanke waterbies		Cyperaceae
<i>Eleogiton fluitans</i>	0.57	60	1	2C	6	Vlottende bie		Cyperaceae
<i>Eleusine indica</i> ssp. <i>indica</i>	1.43	18, 36	1	2C	ad	Plat handjesgras		Poaceae
<i>Elodea canadensis</i>	2.77	24, 48	1	2C	7	Brede waterpest		Hydrocharitaceae
<i>Elodea nuttallii</i>	8.35	48	2	2C,	9	Smalle waterpest		Hydrocharitaceae
<i>Elymus caninus</i> *	16.9	28	4	2C, (4C)	5	Hondstarwegras		Poaceae

A	B	C	D	E	F	G	H	I
Species (mainly Heukels Flora)	2C	Chrom. nr.	n	Peak	Status	Dutch name	new	family
<i>Elymus arenosus</i> cf	20.7		5	2C	--	Mainzerkweek	BZ	Poaceae
<i>Elymus athericus</i>	28.9	42	10	2C	6	Zeekweek		Poaceae
<i>Elymus campestris</i>	30.1		27	2C	--	Veldkweek	BZ	Poaceae
<i>Elymus junceus</i> ssp. boreoatlanticus	24.9	28	8	2C	5	Biestarwegras		Poaceae
<i>Elymus junceus</i> x ( <i>x acutus</i> ) cf	37.2	BZ: 49	1	2C	--	Biestarwegras hybrid	BZ	Poaceae
<i>Elymus repens</i>	23.1	42	8	2C, (4C)	9	Kweek		Poaceae
<i>Elymus x obtusiusculus</i>	26.4	35	8	2C, (4C)	6	Basterdkweek, <i>E. atherica</i> x <i>juncea</i>		Poaceae
<i>Empetrum nigrum</i>	1.25	26, 52	4	2C	7	Kraaihei		Ericaceae
<i>Ephedra gerardiana</i>	33.4	14, 18	1	2C	cu	Chinese Ephedra	FL	Ephedraceae
<i>Epilobium ciliatum</i>	0.67	36	7	2C, (4C)	7	Beklierde basterdwederik		Onagraceae
<i>Epilobium hirsutum</i>	0.87	36	3	2C	9	Harig wilgenroosje		Onagraceae
<i>Epilobium komarovianum</i>	0.64	36	1	2C	cu	Kruipende basterdwederik		Onagraceae
<i>Epilobium lanceolatum</i>	0.83	36	2	2C	1	Lancetbladige basterdwederik		Onagraceae
<i>Epilobium montanum</i>	0.77	36	6	2C	8	Bergbasterdwederik		Onagraceae
<i>Epilobium obscurum</i>	0.65	36	1	2C	6	Donkergroene basterdwederik		Onagraceae
<i>Epilobium palustre</i>	0.65	36	2	2C, (4C)	7	Moerasbasterdwederik		Onagraceae
<i>Epilobium parviflorum</i>	0.80	36	4	2C	9	Viltige basterdwederik		Onagraceae
<i>Epilobium roseum</i>	0.65	36	2	2C	6	Bleke basterdwederik		Onagraceae
<i>Epilobium tetragonum</i>	0.68	36	3	2C, 4C	8	Kantige basterdwederik		Onagraceae
<i>Epimedium alpinum</i>	8.41	12	1	2C	cu	Epimedium		Berberidaceae
<i>Epipactis atrorubens</i>	27.2	(38) 40 (60)	2	2C	2	Bruinrode wespenorchis		Orchidaceae
<i>Epipactis helleborine</i> ssp. <i>helleborine</i>	26.9	(36) 40 (44)	3	2C, (4C)	8	Brede wespenorchis		Orchidaceae
<i>Epipactis helleborine</i> ssp. <i>neerlandica</i>	26.9		3	2C	5	Duinwespenorchis		Orchidaceae
<i>Epipactis muelleri</i>		38			1	Geelgroene wespenorchis		Orchidaceae
<i>Epipactis palustris</i>	28.5	40-48	2	2C, (4C)	6	Moeraswespenorchis		Orchidaceae
<i>Equisetum arvense</i>	28.6	216	6	2C, 4C	9	Heermoes		Equisetaceae
<i>Equisetum fluviatile</i>	29.3	216	4	2C, (4C)	8	Holpijp		Equisetaceae
<i>Equisetum hyemale</i>	53.2	216	7	2C, 4C	4	Schaafstro		Equisetaceae
<i>Equisetum palustre</i>	30.4	216	9	2C, 4C	8	Lidrus		Equisetaceae
<i>Equisetum pratense</i>	24.0	216	1	2C, 4C	0	Veldpaardenstaart	BZ	Equisetaceae
<i>Equisetum ramosissimum</i>	57.3	216	4	2C	2	Vertakte paardenstaart	BZ	Equisetaceae
<i>Equisetum ramosissimum</i> x var. <i>debile</i>	49.8	216	2	2C, 4C	n. d.		BZ	Equisetaceae
<i>Equisetum</i> ( <i>hyemale</i> / <i>ramos</i> var) <i>jap.</i> cf	49.7		4	2C, (4C)	n. d.		BZ	Equisetaceae
<i>Equisetum scirpioides</i> #	42.0	216	4	2C	ad	Dwergholpijp	FL	Equisetaceae
<i>Equisetum sylvaticum</i>	25.6	216	6	2C, 4C	4	Bospaardenstaart		Equisetaceae
<i>Equisetum telmateia</i>	27.4	216	6	2C, 4C	4	Reuzenpaardenstaart		Equisetaceae
<i>Equisetum variegatum</i>	59.8	216	2	2C, 4C	3	Bonte paardenstaart		Equisetaceae
<i>Equisetum x alsaticum</i>	85.8		1	2C	n. d.		BZ	Equisetaceae
<i>Equisetum x ascendens</i>	82.2		3	2C, 4C	1	n. d.	FL	Equisetaceae
<i>Equisetum x geisertii</i>	85.9		1	2C, 4C	n. d.		BZ	Equisetaceae
<i>Equisetum x litorale</i>	30.6	216	1	2C, 4C	8	<i>Equisetum arvense</i> x <i>fluviatile</i>		Equisetaceae
<i>Equisetum x moorei</i>	57.3	216	4	2C	2	<i>Equisetum hyemale</i> x <i>ramosissimum</i> .	BZ	Equisetaceae
<i>Equisetum x trachyodon</i>	59.4	216	1	2C	1	<i>Equisetum variegatum</i> x <i>hyemale</i>		Equisetaceae
<i>Eragrostis minor</i> #	1.64	20-80	8	2C, (4C)	6	Klein liefdegras		Poaceae
<i>Eragrostis multicaulis</i>	1.43	20-72	15	2C	8	Stijf Straatliefdegras		Poaceae
<i>Eragrostis</i> sp.	1.13		1	2C, 4C	n. d.		BZ	Poaceae
<i>Eragrostis tef</i>	1.72	40	6	2C, 4C	cu	Teff	BZ	Poaceae
<i>Eragrostis virescens</i>	2.49	60	1	2C, (4C)	1	n. d.	BZ	Poaceae
<i>Eranthis hyemalis</i>	23.7	16, 48	6	2C	5	Winterakoniet		Ranunculaceae
<i>Erica cinerea</i>	0.79	24	1	2C	2	Rode dophei		Ericaceae
<i>Erica x darleyensis</i>	1.23		1	2C	cu	<i>Erica carnea</i> x <i>eugena</i>	FL	Ericaceae
<i>Erica scoparia</i>	0.89	24	3	2C	2	Bezemdophei		Ericaceae
<i>Erica tetralix</i>	1.01	24	2	2C	8	Gewone dophei		Ericaceae
<i>Erigeron acris</i>	2.81	18	3	2C	6	Scherpe fijnstraal		Asteraceae
<i>Erigeron acris</i> ssp. <i>serotinus</i>	2.85		1	2C	ad	n. d.	BZ	Asteraceae
<i>Erigeron annuus</i>	4.55	18+9B	10	2C, (4C)	6	Zomerfijnstraal		Asteraceae
<i>Erigeron bonariensis</i>	4.46	18, 36, 54	11	2C	1	Gevlamde fijstraal		Asteraceae
<i>Erigeron canadensis</i>	0.97	18	13	2C, (4C)	9	Canadese fijnstraal		Asteraceae
<i>Erigeron karvinskianus</i>	3.88	18-54	8	2C	cu	Muurfijnstraal		Asteraceae
<i>Erigeron sumatrensis</i>	4.74	54	24	2C	1	Hoge fijnstraal		Asteraceae
<i>Erigeron sumatrensis</i> (+ <i>daveauanus</i> )	4.81		14	2C		Canadese fijnstraal	BZ	Asteraceae
<i>Erigeron floribundus</i>	5.14	54	20	2C		Ruige fijnstraal	BZ	Asteraceae
<i>Erigeron x huelsenii</i>						<i>Erigeron acer</i> x <i>canadenis</i>	BZ	Asteraceae
<i>Erigeron x flahaultianus</i>						<i>Erigeron bonariensis</i> x <i>canadenis</i>	BZ	Asteraceae
<i>Erigeron acer</i> x <i>floribunda</i>	3.98	BZ: 36	1	2C		<i>Erigeron acer</i> x <i>floribundus</i>	BZ	Asteraceae
<i>Erinus alpinus</i>	1.02	14	2	2C	cu	'Alpenleverbalsem'	BZ	Scrophulariaceae
<i>Eriophorum angustifolium</i>	1.02	58	3	2C	7	Veenpluis		Cyperaceae
<i>Eriophorum gracile</i>		60, 76	1		2	Slank wollegras		Cyperaceae
<i>Eriophorum latifolium</i>		54, 58, 72	1		1	Breed wollegras		Cyperaceae
<i>Eriophorum vaginatum</i>	0.84	58	3	2C	6	Eenrig wollegras		Cyperaceae
<i>Erodium cicutarium</i>	2.71	40	5	2C, 4C, 8C	9	Gewone reigersbek		Geraniaceae
<i>Erodium</i> ( <i>cicut.</i> ssp) <i>dunense</i>	2.11	40	18	2C, 4C, 8C	5	Duinreigersbek		Geraniaceae
<i>Erodium lebelii</i>	1.25	20	2	2C, 4C, 8C	6	Kleverige reigersbek		Geraniaceae
<i>Erodium x anaristatum</i>	1.58	30	2	2C, 4C, 8C	3	<i>Erodium lebellii</i> x <i>dunensis</i>	FL	Geraniaceae
<i>Erodium moschatum</i>	1.86	20	2	2C, 4C, 8C	1	Muskusreigersbek	FL	Geraniaceae
<i>Erophila majuscula</i> (+ <i>praecox</i> diploid?)	0.64	14	5	2C, 4C, 8C, 16C	--	Vroegeling	BZ	Brassicaceae
<i>Erophila praecox</i> tetraploid 4x	1.15	32	8	2C, 4C, 8C	--	Vroegeling	BZ	Brassicaceae
<i>Erophila verna</i> (+ <i>glabrescens</i> )	1.64	30-44 (46)	58	2C, 4C, 8C	8	Vroegeling		Brassicaceae
<i>Erophila boerhavia</i> (+ <i>praecox</i> octoploid)	2.23	30 (48-56)	27	2C, 4C		Vroegeling	HD	Brassicaceae
<i>Eruca vesicaria</i> (ssp. <i>glabrescens</i> )	1.41	22	1	2C, 4C, 8C, 16C	ad	Zwaardherik		Brassicaceae
<i>Eruca sativa</i>	2.35	22	1	2C, 4C, 8C		Rucola	BZ	Brassicaceae
<i>Erucastrum gallicum</i>	2.31	30	1	2C, 4C	6	Schijnraket		Brassicaceae

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Species (mainly Heukels Flora)	2C	Chrom. nr.	n	Peak	Status	Dutch name	new	family
<i>Eryngium campestre</i>	3.62	14, 28	1	2C	7	Kruisdistel		Apiaceae
<i>Eryngium maritimum</i>	2.59	16	2	2C,	5	Blauwe zeedistel		Apiaceae
<i>Eryngium planum</i>	2.71	16	1	2C, (4C)	ev	Vlakke kruisdistel	BZ	Apiaceae
<i>Erysimum aureum</i>	1.02		2	2C, 4C	ad	Kleinbloemige muurbloem	BZ	Brassicaceae
<i>Erysimum cheiranthoides</i>	0.44	16	8	2C, 4C, 8C, 16C	8	Gewone steenraket		Brassicaceae
<i>Erysimum cheiri</i>	0.87	14	2	2C, 4C, 8C	4	Muurbloem		Brassicaceae
<i>Erysimum repandum</i>		16			ad	Uitgespreide steenraket		Brassicaceae
<i>Erysimum virgatum</i> (hieracifolium?)	1.71	48	1	2C, (4C)	3	Stijve steenraket		Brassicaceae
<i>Erysimum x marshallii</i>	2.76	42	1	2C	cu	Oranje muurbloem		Brassicaceae
<i>Eschscholtzia californica</i>	0.92	12	3	2C, 4C, 8C, 16C	cu	Slaapmuts		Papaveraceae
<i>Euonymus europaeus</i>	1.99	32	4	2C	8	Wilde kardinaalsmuts		Celastraceae
<i>Euonymus japonicus</i>	0.67	32	4	2C	cu	Japanse kardinaalsmuts	BZ	Celastraceae
<i>Euonymus latifolius</i>	2.06	64	1	2C	cu	Brede kardinaalsmuts	FL	Celastraceae
<i>Eupatorium cannabinum</i>	5.12	20	3	2C, (4C)	9	Koninginnenkruid		Asteraceae
<i>Eupatorium purpureum</i>	4.75	20	2	2C	cu	Purper leverkruid	FL	Asteraceae
<i>Euphorbia amygdaloides</i> 'Rubra'	6.73	20	1	2C,	2	Amandelwolfsmelk		Euphorbiaceae
<i>Euphorbia characias</i>	6.48	20	1	2C,	1	Vroege wolfsmelk	HD	Euphorbiaceae
<i>Euphorbia cyparissias</i>	2.15	20, 40	1	2C, (4C)	6	Cipreswolfsmelk		Euphorbiaceae
<i>Euphorbia dulcis</i>	4.71	12, 18, 24	1	2C, (4C)	ad	Zoete wolfsmelk	FL	Euphorbiaceae
<i>Euphorbia epithymoides</i>	1.56	14	1	2C, 3C	ad	Kleurige wolfsmelk		Euphorbiaceae
<i>Euphorbia esula</i>	3.78	60	3	2C, (4C)	8	Heksenmelk		Euphorbiaceae
<i>Euphorbia exigua</i>	1.51	24	3	2C, (4C)	5	Kleine wolfsmelk		Euphorbiaceae
<i>Euphorbia helioscopia</i>	2.11	42	2	2C, (4C)	8	Kroontjeskruid		Euphorbiaceae
<i>Euphorbia lathyris</i>	2.51	20	1	2C, (4C)	6	Kruisbladige wolfsmelk		Euphorbiaceae
<i>Euphorbia lucida</i>	4.44	28, 40	1	2C, (4C)	ad	Glanzende wolfsmelk	BZ	Euphorbiaceae
<i>Euphorbia maculata</i>	1.17	28	3	2C, (4C)	1	Straatwolfsmelk		Euphorbiaceae
<i>Euphorbia myrsinites</i>	4.05	20	4	2C, (4C)	cu	Blauwgroene wolfsmelk	BZ	Euphorbiaceae
<i>Euphorbia palustris</i>	8.31	16, 20	6	2C,	5	Moeraswolfsmelk		Euphorbiaceae
<i>Euphorbia paralias</i>	1.59	16	1	2C, (4C)	3	Zeewolfsmelk		Euphorbiaceae
<i>Euphorbia peplus</i>	0.72	16	2	2C, (4C)	8	Tuinwolfsmelk		Euphorbiaceae
<i>Euphorbia platyphyllos</i>	1.58	30	1	2C, (4C)	1	Brede wolfsmelk		Euphorbiaceae
<i>Euphorbia prostrata</i>	0.66	18	1	2C, (4C)	2	Geribde wolfsmelk	FL	Euphorbiaceae
<i>Euphorbia seguieriana</i>	1.78	40	1	2C, (4C)	3	Zandwolfsmelk		Euphorbiaceae
<i>Euphorbia serpens</i>	1.06	22, 24	1	2C, (4C)	ad	Gladde wolfsmelk		Euphorbiaceae
<i>Euphorbia stricta</i>		20, 28	1		2	Stijve wolfsmelk		Euphorbiaceae
<i>Euphrasia micrantha</i>	2.38	44	1	2C, 4C	1	Slanke Ogentroost		Orobanchaceae
<i>Euphrasia nemorosa</i>		44	1		1	Bosogentroost		Orobanchaceae
<i>Euphrasia officinalis</i>		22	1		1	Beklierde ogentroost		Orobanchaceae
<i>Euphrasia stricta</i>	2.25	20, 28	2	2C, 4C, 8C	7	Stijve ogentroost		Orobanchaceae
<i>Euphrasia tetraquetra</i>	2.37	44	3	2C, 4C, 8C	ad	Vierrijige ogentroost		Orobanchaceae
<i>Euribia divaricata</i>	3.68	18	1	2C	1	n. d.	BZ	Asteraceae
<i>Euribia macrophylla</i>		72			cu	Grote aster	HD	Asteraceae
<i>Euribia schreberi</i> cf	3.78	54	3	2C	1	Middelste netelaster	BZ	Asteraceae
<i>Fagopyrum esculentum</i>	2.85	16 (32)	4	2C, 4C	cu	Boekweit		Polygonaceae
<i>Fagopyrum tataricum</i>	1.14	16	1	2C, 4C, 8C	0	Franse boekweit		Polygonaceae
<i>Fagus grandifolia</i>	1.15		1		cu	Amerikaanse beuk	FL	Fagaceae
<i>Fagus orientalis</i>	1.13	24	2		cu	Oosterse beuk	FL	Fagaceae
<i>Fagus sylvatica</i>	1.14	24	1	2C	8	Beuk		Fagaceae
<i>Falcaria vulgaris</i>	2.90	22	1	2C	1	Sikkelkruid		Apiaceae
<i>Fallopia baldschuanica</i>	3.27	20	6	2C, 4C, 8C	cu	Chinese bruidsluier		Polygonaceae
<i>Fallopia convolvulus</i>	3.02	40	2	2C, 4C	9	Zwaluw tong		Polygonaceae
<i>Fallopia dumetorum</i>	1.54	20	7	2C, 4C, 8C	8	Heggenduizendknoop		Polygonaceae
<i>Fallopia japonica</i>	9.30	(66) 88	12	2C, 4C	8	Japanse duizendknoop		Polygonaceae
<i>Fallopia japonica compacta</i> x ssp. Japonica	7.40	66	4			Japanse duizendknoop	BZ	Polygonaceae
<i>Fallopia sachalinensis</i>	8.70	(44) 66, 88	4		7	Sachalinse duizendknoop		Polygonaceae
<i>Fallopia x bohémica</i>	7.40	(44) 66 (88)	8		3	Fallopia japonica x sachalinensis		Polygonaceae
<i>Fallopia x conollyana</i>	6.48	BZ: 54	1		1	Fallopia baldschuanica x japonica		Polygonaceae
<i>Fatsia japonica</i>	2.99	24, 48	2	2C,	cu	Vingerplant	BZ	Araliaceae
<i>Festuca arenaria</i> *	18.1	56	2	2C, (4C)	6	Duinzwenkgras		Poaceae
<i>Festuca arundinacea</i> *	17.3	42	2	2C	8	Rietzwenkgras		Poaceae
<i>Festuca brevipila</i> * cf	13.5	42	1	2C, 4C	6	Hard zwenkgras		Poaceae
<i>Festuca filiformis</i> *	4.30	14	1	2C, 4C	8	Fijn schapengras		Poaceae
<i>Festuca gigantea</i> *	20.0	42	4	2C, (4C)	7	Reuzenzwenkgras		Poaceae
<i>Festuca heterophylla</i> *	21.9	28, 42	2	2C	ad	Draadzwenkgras		Poaceae
<i>Festuca lemanii</i> *	14.2	42	1	2C	3	Groot zwenkgras		Poaceae
<i>Festuca ovina</i> * cf	14.1	28	1	2C, 4C	2	Schapengras		Poaceae
<i>Festuca ovina</i> * ssp. guestphalica		28			1	Zinkschapengras		Poaceae
<i>Festuca ovina</i> * ssp. hirtula (as rubra)	9.70	28	2		ad	Ruig schapengras		Poaceae
<i>Festuca pallens</i> *		14, 21, 28			0	Kalkzwenkgras		Poaceae
<i>Festuca pratensis</i> *	6.04	14	2	2C, 4C, 8C	8	Beemdlanbloem		Poaceae
<i>Festuca rubra</i> *	5.75	42	1	2C, 4C	9	Rood zwenkgras		Poaceae
<i>Festulolium X braunii</i> cf	6.34	14	3		ad	Fest. pratensis x Lol. multiflorum		Poaceae
<i>Festulolium X loliaceum</i>		14, 21			2	Fest.prat x Lol.per.Trosraigras		Poaceae
<i>Festulpia X</i>		42			0	Festuca rubra x Vulpia myuros.		Poaceae
<i>Festulpia X</i>					0	Festuca rubra x Vulpia bromoides		Poaceae
<i>Ficaria verna</i>	33.3	32	50	2C, 4C	9	Gewoon speenkruid		Ranunculaceae
<i>Ficaria ambigua</i> (as ssp. grandiflora)	20.6	16	15	2C	1	Vreemd speenkruid		Ranunculaceae
<i>Ficus carica</i>	0.79	26	3	2C, (4C)	cu	Vijg		Moraceae
<i>Filago arvensis</i>		28	1		1	Akkerviltkruid		Asteraceae
<i>Filago lutescens</i>	1.64	28	1	2C, 4C	1	Geel viltkruid		Asteraceae
<i>Filago minima</i>	1.40	28	1	2C	6	Dwergviltkruid		Asteraceae
<i>Filago pyramidata</i>		28			0	Spatelviltkruid		Asteraceae

A	B	C	D	E	F	G	H	I
Species (mainly Heukels Flora)	2C	Chrom. nr.	n	Peak	Status	Dutch name	new	family
<i>Filago vulgaris</i>	1.85	28	1	2C, 4C, 8C	2	Duits viltkruid		Asteraceae
<i>Filipendula ulmaria</i>	0.79	14, 16	1	2C, 4C, 8C, 16C	9	Moerasspirea		Rosaceae
<i>Filipendula vulgaris</i>	0.85	14	6	2C, 4C	1	Knolspirea		Rosaceae
<i>Foeniculum vulgare</i>	3.53	22	6	2C, 4C, 8C	cu	Venkel		Apiaceae
<i>Forsythia suspensa</i>		24, 28			ad	Hangende forsythia		Oleaceae
<i>Forsythia viridissima</i>	2.01	28	1	2C	cu	Rechte forsythia		Oleaceae
<i>Forsythia x intermedia</i> #	1.82	58	9	2C, 4C	cu	Forsythia suspensa x viridissima		Oleaceae
<i>Fragaria moschata</i>	1.59	42	2	2C, 4C	1	Grote bosaardbei		Rosaceae
<i>Fragaria vesca</i>	0.59	14	7	2C, 4C, 8C	7	Bosaardbei		Rosaceae
<i>Fragaria x ananassa</i>	1.96	56	4	2C, 4C	cu	Aardbei F. virginiana x chilensis		Rosaceae
<i>Fraxinus angustifolia</i>	1.76	46	1	2C	cu	Smalbladige es	FL	Oleaceae
<i>Fraxinus excelsior</i>	1.84	46	2	2C	9	Es		Oleaceae
<i>Fraxinus ornus</i>	2.01	46	1	2C	cu	Pluimes	FL	Oleaceae
<i>Fritillaria imperialis</i> #	101	24, 48	2	2C	cu	Keizerskroon		Liliaceae
<i>Fritillaria meleagris</i>	107	24	4	2C, (4C)	5	Wilde kievitsbloem		Liliaceae
<i>Fumaria capreolata</i>	1.39	56, 64	1	2C, 4C, 8C	4	Rankende duivenkervel		Papaveraceae
<i>Fumaria muralis</i>	1.20	48	1	2C, 4C, 8C	5	Middelste duivenkervel		Papaveraceae
<i>Fumaria officinalis</i>	1.76	32, 48	1	2C, 4C, 8C	7	Gewone duivenkervel		Papaveraceae
<i>Gagea lutea</i>	42.7	6x=72	22	2C, 4C	4	Bosgeelster		Liliaceae
<i>Gagea lutea var glauca</i>	42.3	6x=72	15	2C, 4C	4	Grauwe bosgeelster	BZ	Liliaceae
<i>Gagea minima</i>	14.9	2x=24	2	2C, 4C	1	Spitse geelster		Liliaceae
<i>Gagea pratensis</i>	32.7	4x=48,	30	2C, 4C	5	Weidegeelster	BZ	Liliaceae
<i>Gagea pratensis</i>	39.9	5x=60,	99	2C, 4C	5	Weidegeelster		Liliaceae
<i>Gagea pratensis</i>	45.6	6x=72	22	2C, 4C	5	Weidegeelster	BZ	Liliaceae
<i>Gagea pratensis</i>	75.8	10x=120	2	2C, 4C	5	Weidegeelster	BZ	Liliaceae
<i>Gagea spathacea</i>	46.7	9x=108	18	2C, 4C	4	Schedegeelster		Liliaceae
<i>Gagea villosa*</i>	16.9	24 (36-72)	15	2C, 4C	3	Akkergeelster		Liliaceae
<i>Gagea villosa* #</i>	32.3	48	5	2C, 4C	1	Akkergeelster	BZ	Liliaceae
<i>Gaillardia x grandiflora</i>	24.7	72	1	2C	ad	Kokarde bloem	FL	Asteraceae
<i>Galanthus caucasicus</i>	59.1	24	12	2C	cu	Kaukasisch sneeuwkllokje		Amryllidaceae
<i>Galanthus ebwesii</i> #	55.3	24, 48, 72	13	2C	cu	Groot sneeuwkllokje		Amryllidaceae
<i>Galanthus ikariae</i>	68.7	24	6	2C	cu	Glanzend sneeuwkllokje		Amryllidaceae
<i>Galanthus nivalis</i> #	72.2	24-48	25	2C	7	Gewoon sneeuwkllokje		Amryllidaceae
<i>Galanthus plicatus</i>	55.6	24	8	2C	cu		HD	Amryllidaceae
<i>Galanthus woronowii</i>	56.4	24	14	2C	cu		HD	Amryllidaceae
<i>Galega officinalis</i>	3.96	16	2	2C	cu	Galega		Fabaceae
<i>Galeopsis angustifolia</i>	1.22	16	1	2C	3	Smalle raai		Lamiaceae
<i>Galeopsis bifida</i>	3.22	32	6	2C, (4C)	7	Gespleten hennepnetel		Lamiaceae
<i>Galeopsis ladanum</i>		16			1	Brede raai		Lamiaceae
<i>Galeopsis pubescens</i>	1.86	16	2	2C, (4C)	2	Zachte hennepnetel		Lamiaceae
<i>Galeopsis segetum</i>	1.33	16	1	2C, (4C)	6	Bleekgele hennepnetel		Lamiaceae
<i>Galeopsis speciosa</i>	2.18	16	2	2C, (4C)	7	Dauwnetel		Lamiaceae
<i>Galeopsis tetrahit</i>	3.29	32	7	2C, (4C)	9	Gewone hennepnetel		Lamiaceae
<i>Galinsoga parviflora</i>	1.62	16	2	2C	9	Kaal knopkruid		Asteraceae
<i>Galinsoga quadriradiata</i>	4.14	32	4	2C	9	Harig knopkruid		Asteraceae
<i>Galium aparine</i>	2.05	22-88	2	2C, 4C, 8C	9	Kleefkruid		Rubiaceae
<i>Galium boreale</i>	3.46	44	2	2C, 4C	1	Noords walstro		Rubiaceae
<i>Galium elongatum</i>	4.53	96	1	2C, 4C		n. d.		Rubiaceae
<i>Galium glaucum</i>		22, 44			0	Zegroen walstro		Rubiaceae
<i>Galium mollugo</i> #	3.95	22, 44	15	2C, 4C	8	Glad walstro		Rubiaceae
<i>Galium odoratum</i>	1.77	(22) 44	6	2C, 4C, 8C	6	Lievelvrouwebedstro		Rubiaceae
<i>Galium palustre</i> #	5.01	24-144	6	2C, 4C	9	Moeraswalstro		Rubiaceae
<i>Galium parisiense</i>		22, 44, 66	1		ad	Frans walstro		Rubiaceae
<i>Galium pumilum</i>	3.45	(44, 66) 88	6	2C, 4C	3	Kalkwalstro		Rubiaceae
<i>Galium saxatile</i>	3.00	44	1	2C, 4C	8	Liggend walstro		Rubiaceae
<i>Galium spurium</i>		20, 44			ad	Akkerwalstro		Rubiaceae
<i>Galium sylvaticum</i>	2.07	22	4	2C, 4C, 8C	0	Boswalstro		Rubiaceae
<i>Galium tricorntum</i>		44			0	Driehoornig walstro		Rubiaceae
<i>Galium uliginosum</i>	1.32	22, 44	1	2C, 4C	7	Ruw walstro		Rubiaceae
<i>Galium verum</i>	3.93	44	9	2C, 4C	8	Geel walstro		Rubiaceae
<i>Galium x pomeranicum</i>	3.71	44	2	2C, 4C	3	Bleekgeel walstro		Rubiaceae
<i>Gaudinia fragilis</i>	3.44	14	1	2C, 4C, 8C	ad	Gaudinia	FL	Poaceae
<i>Gaultheria mucronata</i>	3.18	66	3	2C	ad	'Parelbes'	FL	Ericaceae
<i>Gaultheria procumbens</i>	2.39	38	2	2C	cu	Bergthee	FL	Ericaceae
<i>Genista anglica</i>	1.54	12, 48	3	2C, 4C, 8C	7	Stekelbrem		Fabaceae
<i>Genista germanica</i>	1.81	44-48	3	2C,	1	Duitse brem		Fabaceae
<i>Genista pilosa</i>	2.09	24 (45)	4	2C,	6	Kruipbrem		Fabaceae
<i>Genista tinctoria</i>	1.80	48 (96)	5	2C, (4C)	5	Verfbrem		Fabaceae
<i>Gentiana cruciata</i>	8.03	52	4	2C	4	Kruisbladgentiaan		Gentianaceae
<i>Gentiana pneumonanthe</i> #	9.62	26	5	2C	6	Klokjesgentiaan		Gentianaceae
<i>Gentianella amarella*</i>	15.7	36	1	2C	4	Slanke gentiaan		Gentianaceae
<i>Gentianella campestris</i>	5.13	36	1	2C	2	Veldgentiaan		Gentianaceae
<i>Gentianella germanica</i>		36			2	Duitse gentiaan		Gentianaceae
<i>Gentianopsis ciliata</i>		44			1	Franjgentiaan		Gentianaceae
<i>Geranium columbinum</i>	1.57	18	1	2C, 4C, 8C	4	Fijne ooievaarsbek		Geraniaceae
<i>Geranium dissectum</i>	1.40	22	2	2C, 4C, 8C	9	Slipbladige ooievaarsbek		Geraniaceae
<i>Geranium endressii</i>	3.13	26, 28	2	2C, 4C, (8C)	cu	Roze ooievaarsbek		Geraniaceae
<i>Geranium lucidum</i>	1.73	20, 40	2	2C, 4C, 8C, 16C	4	Glanzige ooievaarsbek		Geraniaceae
<i>Geranium macrorrhizum</i>	3.37	46, 92	2	2C, 4C, 8C	cu	Rotsooievaarsbek		Geraniaceae
<i>Geranium molle</i> #	1.77	26	3	2C, 4C, 8C	9	Zachte ooievaarsbek		Geraniaceae
<i>Geranium nodosum</i>	3.53	28	1	2C, 4C, (8C)	ad	Knopige ooievaarsbek	FL	Geraniaceae
<i>Geranium phaeum</i>	3.37	28	1	2C, 4C, 8C, 16C	5	Donkere ooievaarsbek		Geraniaceae

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<i>Geranium pratense</i>	4.83	28	2	2C, 4C, 8C	6	Beemdooievaarsbek		Geraniaceae
<i>Geranium purpureum</i>	1.09	32 (64)	9	2C, 4C, 8C	4	Klein robertskruid		Geraniaceae
<i>Geranium pusillum</i>	1.78	26	4	2C, 4C, 8C	9	Kleine ooievaarsbek		Geraniaceae
<i>Geranium pyrenaicum</i>	2.79	28	2	2C, 4C, 8C	6	Bermooievaarsbek		Geraniaceae
<i>Geranium robertianum</i>	2.53	32	10	2C, 4C, 8C	8	Robertskruid		Geraniaceae
<i>Geranium rotundifolium</i>	1.14	26	3	2C, 4C, 8C	2	Ronde ooievaarsbek		Geraniaceae
<i>Geranium sanguineum</i>	8.36	84	3	2C	cu	Bloedooievaarsbek		Geraniaceae
<i>Geranium sylvaticum</i>	4.92	28	2	2C, 4C	cu	Bosooievaarsbek		Geraniaceae
<i>Geum macrophyllum</i>	2.31	42	1	2C, 4C, 8C	1	Groot nagelkruid		Rosaceae
<i>Geum rivale</i>	2.45	42	3	2C, 4C	4	Knikkend nagelkruid		Rosaceae
<i>Geum urbanum</i>	3.13	42	2	2C, 4C	8	Geel nagelkruid		Rosaceae
<i>Geum x intermedium</i>					1	Geum rivale x urbanum		Rosaceae
<i>Ginkgo biloba</i>	22.3	24	5	2C	cu	Ginkgo	FL	Ginkgoaceae
<i>Gilia achilleifolia</i>	6.77	18	1	2C	ad	n. d.	BZ	Polemoniaceae
<i>Gilia capitata</i>	6.23	18	2	2C	cu	n. d.	BZ	Polemoniaceae
<i>Gladiolus communis</i>	7.42	60, 90, 120	1	2C	ad	Wilde gladiool	BZ	Iridaceae
<i>Glaucium flavum</i>	2.02	12	2	2C, 4C, 8C	4	Gele hoornpapaver		Papaveraceae
<i>Glaux maritima</i>	3.05	30	2	2C, 4C, 8C	7	Melkkruid		Primulaceae
<i>Glebionis coronaria* cf</i>	15.5	18	1	2C, (4C)	cu	Gekroonde ganzenbloem		Asteraceae
<i>Glebionis segetum*</i>	14.7	18	4	2C, (4C)	8	Gele ganzenbloem		Asteraceae
<i>Glechoma hederacea</i>	1.97	36	4	2C	9	Hondsdrif		Lamiaceae
<i>Glyceria declinata</i>	1.01	20	2	2C, 4C	5	Getand vlotgras		Poaceae
<i>Glyceria fluitans</i>	2.66	40	3	2C, 4C	9	Mannagras		Poaceae
<i>Glyceria maxima*</i>	13.3	(56) 60	4	2C, 4C	9	Liesgras		Poaceae
<i>Glyceria notata</i>	2.62	40	6	2C, 4C, 8C	5	Stomp vlotgras		Poaceae
<i>Glyceria striata</i>	2.08	20	1	2C, (4C)	ex	Gestreept vlotgras	BZ	Poaceae
<i>Glyceria x pedicellata</i>		40			2	Glyceria fluitans x notata		Poaceae
<i>Glycine max</i>	2.51	40	1	2C, 4C	cu	Soja		Fabaceae
<i>Gnaphalium luteo-album</i>	2.40	14	5	2C, 4C	7	Bleekgele droogbloem		Asteraceae
<i>Gnaphalium sylvaticum</i>	4.48	56	2	2C,	7	Bosdroogbloem		Asteraceae
<i>Gnaphalium uliginosum</i>	0.95	14	1	2C, 4C	8	Moerasdroogbloem		Asteraceae
<i>Goodyera repens</i>	11.4	30	3	2C, 4C, 8C	4	Dennenorchis		Orchidaceae
<i>Gratiola officinalis</i>	3.11	32	1	2C, (4C)	1	Genadekruid		Plantaginaceae
<i>Groenlandia densa</i>	0.51	30	1	2C, 4C, 8C	6	Paarbladig fonteinkruid		Potamogetonaceae
<i>Guizotia abyssinica</i>	6.59	30	2	2C	ad	Gingelikruid, negerzaad		Asteraceae
<i>Gymnadenia conopsea</i>	14.3	40	3	2C, 4C, 8C	3	Grote muggenorchis		Orchidaceae
<i>Gymnadenia conopsea ssp. densiflora</i>		40			1	n. d.		Orchidaceae
<i>Gymnocarpium dryopteris*</i>	15.9	160	2	2C	4	Gebogen driehoeksvaren		Athyriaceae
<i>Gymnocarpium robertianum *</i>	14.1	160-168	2	2C	2	Rechte driehoeksvaren		Athyriaceae
<i>Gypsophila muralis</i>	1.88	34	1	2C, 4C	3	Gipskruid		Caryophyllaceae
<i>Gypsophila paniculata</i>	3.01	34	2	2C, 4C, 8C	cu	Pluimgipskruid		Caryophyllaceae
<i>Hammarbya paludosa</i>		28			1	Veenmosorchis		Orchidaceae
<i>Hedera helix</i>	3.02	48	28	2C, (4C)	9	Klimop		Araliaceae
<i>Hedera hibernica</i>	6.22	96	14	2C, (4C)	cu	Atlantische klimop	BZ	Araliaceae
<i>Helianthemum nummularium</i>	5.66	20	1	2C	2	Geel zonneroosje		Cistaceae
<i>Helianthus annuus</i>	6.85	34	4	2C	ad	Zonnebloem		Asteraceae
<i>Helianthus tuberosus</i>	23.4	102	5	2C	cu	Aardpeer		Asteraceae
<i>Helianthus x laetiflorus</i>	23.2	102	5	2C	6	Stijve zonnebloem (rigidus x tuber.)		Asteraceae
<i>Helianthus rigidus</i>		102			ad	Stijve aardpeer	FL	Asteraceae
<i>Helichrysum arenarium</i>	2.07	28	1	2C, (4C)	1	Strobloem		Asteraceae
<i>Helictotrichon pratense</i>	35.8	126	1	2C, 4C, 8C	3	Beemd haver		Poaceae
<i>Helictotrichon pubescens</i>	10.1	14	2	2C, 4C, 8C	6	Zachte haver		Poaceae
<i>Heliotropium europaeum</i>	2.44	(24) 36, 48	1	2C	ad	Europese heliotroop		Boraginaceae
<i>Helleborus argutifolius</i>	18.9	32	1		cu	Corsicaans nieskruid	HD	Ranunculaceae
<i>Helleborus foetidus</i>	23.3	32	2	2C	1	Stinkend nieskruid		Ranunculaceae
<i>Helleborus lividus ssp. corsicus</i>	19.0	32	1	2C	cu	Nieskruid	FL	Ranunculaceae
<i>Helleborus orientalis</i>	30.0	32	6			Oosters nieskruid	HD	Ranunculaceae
<i>Helleborus viridis</i>	30.6	32	2	2C	3	Wrangwortel		Ranunculaceae
<i>Heracleum mantegazzianum</i>	3.65	22	2	2C, 4C	8	Reuzenberenklauw		Apiaceae
<i>Heracleum sosnowskyi</i>	3.58	22	4	3C	2	n. d.	FL	Apiaceae
<i>Heracleum sphondylium</i>	4.51	22	4	2C	9	Gewone berenklauw		Apiaceae
<i>Hermium monorchis</i>	22.5	38, 40	5	2C, 4C	3	Honingorchis		Orchidaceae
<i>Herniaria glabra</i>	1.35	18	2	2C, 4C, 8C, 16C	5	Kaal breukkruid		Caryophyllaceae
<i>Herniaria hirsuta</i>	2.62	36	5	2C, 4C	ad	Behaard breukkruid		Caryophyllaceae
<i>Hesperis matronalis</i>	8.01	14-32	2	2C	cu	Damastbloem		Brassicaceae
<i>Heuchera sanguinea</i>	1.19	14	1	2C	cu	Purperklokje		Saxifragraceae
<i>Hibiscus trionum</i>	3.73	28, 56	2	2C	ad	Drie-urenbloem		Malvaceae
<i>Hibiscus syriacus</i>	4.76	80	1	2C	cu	Althaeastruik	HD	Malvaceae
<i>Hieracium amplexicaule</i>	14.3	27, 36	5	2C, 4C	2	Stengelomvattend havikskruid		Asteraceae
<i>Hieracium aurantiacum</i>	7.76	36, 45	2	2C	7	Oranje havikskruid		Asteraceae
<i>Hieracium caespitosum</i>	8.71	36	1	2C	5	Weidehavikskruid		Asteraceae
<i>Hieracium glaucinum ssp. simulatum</i>	10.3	27	1	2C	ad	Vroeg Havikskruid	BZ	Asteraceae
<i>Hieracium lactucella</i>	4.09	18	6	2C	2	Spits havikskruid		Asteraceae
<i>Hieracium laevigatum</i>	11.0	27	1	2C	9	Stijf havikskruid		Asteraceae
<i>Hieracium maculatum</i>	10.4	27	1	2C	1	Bochtig havikskruid		Asteraceae
<i>Hieracium murorum</i>	10.6	27	2	2C, 4C	5	Muurhavikskruid		Asteraceae
<i>Hieracium peleterianum ssp. pelet.</i>	3.63	18	6	2C	1	Valse muizenoor		Asteraceae
<i>Hieracium pilosella</i>	7.10	18-63	10	2C	8	Muizenoor		Asteraceae
<i>Hieracium piloselloides</i>	9.63	45	2	2C	5	Grijs havikskruid		Asteraceae
<i>Hieracium sabaudum ssp. rigens</i>	12.0		1			Steenhavikskruid	BZ	Asteraceae
<i>Hieracium sabaudum*</i>	15.4	(18) 27	2	2C	7	Boshavikskruid		Asteraceae
<i>Hieracium umbellatum</i>	8.55	18	3	2C	8	Schermhavikskruid		Asteraceae



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<i>Hieracium velutinum</i>	10.7	27 (36)	3	2C	1	Valse muizenoor grijswit		Asteraceae
<i>Hieracium vulgatum</i>	11.3	27	1	2C	7	Dicht havikskruid		Asteraceae
<i>Hieracium x brachiatum</i>	13.2	27-72	1	2C	1	<i>Hieracium pilosella x praealtum</i>		Asteraceae
<i>Hieracium x flagellare</i>	7.73	45	2	2C	2	<i>Hieracium cespitosum x pilosella</i>		Asteraceae
<i>Hieracium x schultesii</i>	5.60	27, 36, 45	2	2C	1	<i>Hieracium lactucella x pilosella</i>		Asteraceae
<i>Hieracium x stolleniferum</i>	7.48	36	3	2C	1	<i>Hieracium aurantiacum x pilosella</i>		Asteraceae
<i>Hierochloa odorata</i>	8.38	28	2	2C, 4C, 8C	6	Veenreukgras		Poaceae
<i>Himantoglossum hircinum</i>	25.6	24, 36	2	2C,	2	Bokkenorchis		Orchidaceae
<i>Hippocrepis comosa</i>	3.99	14, 28	1	2C, (4C)	0	Paardenhoefklaver		Fabaceae
<i>Hippophae rhamnoides</i>	2.41	24	1	2C	7	Duindoorn		Eleagnaceae
<i>Hippuris vulgaris</i>	1.38	32	2	2C, (4C)	7	Lidsteng		Plantaginaceae
<i>Hirschfeldia incana</i>	0.99	14	3	2C, 4C, 8C, 16C	3	Grijze mosterd	BZ	Brassicaceae
<i>Holcus lanatus</i>	3.41	14	1	2C, 4C	9	Gestreepte witbol		Poaceae
<i>Holcus mollis</i>	6.00	28-49	1	2C, 4C	9	Gladde witbol		Poaceae
<i>Holosteum umbellatum</i>	1.86	20	1	2C, 4C, 8C	4	Heelbeen		Caryophyllaceae
<i>Honckenya peploides</i>	7.90	(48, 64) 68	2	2C	6	Zeepostelein		Caryophyllaceae
<i>Hordeum europaeus</i>	20.2	28	1		1	Bosgerst		Poaceae
<i>Hordeum distichon</i>		14			ad	Chevaliergerst		Poaceae
<i>Hordeum jubatum*</i>	17.3	28	2	2C	4	Kwispelgerst		Poaceae
<i>Hordeum marinum</i>	9.01	14	1	2C	4	Zeegerst		Poaceae
<i>Hordeum murinum</i>	19.6	28	3	2C, 4C	9	Kruipertje		Poaceae
<i>Hordeum secalinum</i>	20.1	28	1	2C, 4C	7	Veldgerst		Poaceae
<i>Hordeum vulgare</i>	10.0	14	10	2C, 4C	cu	Gerst		Poaceae
<i>Hornungia procumbens</i>	0.96	12	2	2C, 4C, 8C	ad	n. d.	BZ	Brassicaceae
<i>Hottonia palustris</i>	1.84	20	1	2C, 4C, 8C	8	Waterviolier		Primulaceae
<i>Houttuynia cordata</i>	1.78	24-126	1	2C, 4C	cu	Moerasanemoon		Saururaceae
<i>Humulus lupulus</i>	5.68	20	7	2C, 4C	9	Hop		Cannabaceae
<i>Huperzia selago*</i>	18.1	264	3	2C	2	Dennenwolfsklauw		Lycopodiaceae
<i>Hyacinthoides hispanica</i>	48.4	16, 24	5	2C	cu	Spanse hyacint		Asparagaceae
<i>Hyacinthoides non-scripta</i>	46.0	16, 24	3	2C	7	Wilde hyacint		Asparagaceae
<i>Hyacinthoides x massartiana #</i>	50.1	16, 24	1	2C	cu	<i>Hyacinthoides hispanica x non-scripta</i>		Asparagaceae
<i>Hyacinthus orientalis</i>	56.8	16, 24	6	2C	cu	<i>Hyacint</i>		Asparagaceae
<i>Hydrocharis morsus-ranae #</i>	8.14	(14) 28	13	2C, 4C	8	Kikkerbeet		Hydrocharitaceae
<i>Hydrocotyle ranunculoides</i>	1.62	48	2	2C, (4C)	4	Grote watermavel		Araliaceae
<i>Hydrocotyle vulgaris</i>	2.11	96	5	2C	8	Gewone watermavel		Araliaceae
<i>Hyoscyamus niger</i>	2.76	34	1	2C, 4C, 8C	5	Bilzekruid		Solanaceae
<i>Hypericum androsaemum</i>	2.17	40	1	2C	cu	Mansbloed		Hypericaceae
<i>Hypericum calycinum</i>	2.70	20 (40)	2		cu	Grootbloemig hertshooi		Hypericaceae
<i>Hypericum canadense</i>		16			ex	Canadese hertshooi		Hypericaceae
<i>Hypericum elodes</i>	1.28	16, 32	2	2C	6	Moerashertshooi		Hypericaceae
<i>Hypericum hirsutum</i>	0.71	18	3	2C	4	Ruig hertshooi		Hypericaceae
<i>Hypericum humifusum</i>	0.77	16	2	2C	7	Liggend hertshooi		Hypericaceae
<i>Hypericum maculatum ssp. maculatum</i>		16			2	Gevlekt hertshooi		Hypericaceae
<i>Hypericum maculatum ssp. obtusiusculum</i>	1.56	32	9	2C	7	Kantig hertshooi		Hypericaceae
<i>Hypericum majus</i>	0.51	16	1	2C, (4C)	cu	n. d.	FL	Hypericaceae
<i>Hypericum montanum</i>	0.80	16	3	2C, (4C)	2	Berghertshooi		Hypericaceae
<i>Hypericum perforatum</i>	1.59	32	1	2C, (4C)	9	Sint-Janskruid		Hypericaceae
<i>Hypericum pulchrum</i>	0.89	18	2	2C	4	Fraai hertshooi		Hypericaceae
<i>Hypericum tetrapterum</i>	0.87	16	2	2C	8	Gevleugeld hertshooi		Hypericaceae
<i>Hypericum x desetangii</i>	1.63	32, 48	6	2C	3	<i>Hypericum maculatum x perforatum</i>		Hypericaceae
<i>Hypericum x inodorum</i>	0.95	40	1	2C	cu	n. d.	BZ	Hypericaceae
<i>Hypochaeris glabra</i>	3.48	10	2	2C	5	Glad biggenkruid		Asteraceae
<i>Hypochaeris maculata</i>		10			0	Gevlekt biggenkruid		Asteraceae
<i>Hypochaeris radicata</i>	2.93	8	2	2C,	9	Gewoon biggenkruid		Asteraceae
<i>Hyssopus officinalis</i>	0.95	12	2	2C, (4C)	cu	<i>Hyssop</i>		Lamiaceae
<i>Iberis amara</i>	1.80	14	3	2C, 4C, 8C,	cu	Bittere scheefbloem		Brassicaceae
<i>Iberis umbellata</i>	1.36	14-34	1	2C, 4C, 8C	cu	Scheefkelk		Brassicaceae
<i>Ilex aquifolium</i>	1.87	40	1	2C	8	Hulst		Aequifoliaceae
<i>Ilex crenata</i>	2.00	34	3	2C	cu	Japane hulst	FL	Aequifoliaceae
<i>Ilex x antaclerensis</i>	2.01		1		cu	n. d.	BZ	Aequifoliaceae
<i>Ilex x meserveae</i>	c. 1.89		3		1	<i>Ilex rugosa x aquifolium</i>	BZ	Aequifoliaceae
<i>Illecebrum verticillatum</i>	0.92	10	1	2C, 4C, 8C, 16C	6	Grondster		Caryophyllaceae
<i>Impatiens balfourii</i>	2.91	14	4	2C, 4C, 8C	cu	Tweekleurig springzaad		Balsaminaceae
<i>Impatiens capensis</i>	1.71	14	1	2C, 4C, 8C	3	Oranje springzaad		Balsaminaceae
<i>Impatiens tricornis</i>	3.60		1	2C	1	Ruig springzaad	FL	Balsaminaceae
<i>Impatiens glandulifera</i>	1.96	18	4	2C, 4C, 8C	8	Reuzenbalsemien		Balsaminaceae
<i>Impatiens noli-tangere</i>	1.44	20, 40	2	2C, 4C, 8C, 16C	6	Groot springzaad		Balsaminaceae
<i>Impatiens parviflora</i>	4.31	24, 26	8	2C, 4C,	6	Klein springzaad		Balsaminaceae
<i>Impatiens parviflora x balfourii cf</i>	4.80	BZ: 26	2	2C, 4C	cu	n. d.	BZ	Balsaminaceae
<i>Imperata cylindrica</i>	1.57	20 (40, 60)	1		cu	Japans bloedgras		Poaceae
<i>Inula britannica</i>	6.97	(16, 24) 32	2	2C	6	Engelse alant		Asteraceae
<i>Inula conyza</i>	7.56	32	2	2C	6	Donderkruid		Asteraceae
<i>Inula helenium</i>	4.67	20	3	2C	ad	Griekse alant		Asteraceae
<i>Inula racemosa</i>	4.59	20	3	2C	2	Trosalant	FL	Asteraceae
<i>Inula salicina</i>	3.59	16	2	2C	0	Wilgalant		Asteraceae
<i>Ipheion uniflorum</i>	19.1	12, 24	6	2C, 4C	cu	Voorjaarsster	FL	Amaryllidaceae
<i>Ipomoea purpurea</i>	1.57	30	4	2C, 4C	cu	Dagbloem	BZ	Convolvulaceae
<i>Iris foetidissima*</i>	15.4	40	6		1	Stinkende lis		Iridaceae
<i>Iris germanica</i>	26.9		3	2C, 4C	cu	Blauwe lis	HD	Iridaceae
<i>Iris japonica</i>	16.9	32-60	1	2C, 4C	cu	Japane iris	HD	Iridaceae
<i>Iris pseudacorus</i>	11.7	34	4	2C,	9	Gele lis		Iridaceae
<i>Iris reticulata</i>	14.1	20	1	2C, 4C	cu	n. d.	HD	Iridaceae

A	B	C	D	E	F	G	H	I
Species (mainly Heukels Flora)	2C	Chrom. nr.	n	Peak	Status	Dutch name	new	family
<i>Isatis tinctoria</i>	1.23	28	4	2C, 4C, 8C	5	Wede		Brassicaceae
<i>Isoetes echinospora*</i>	7.54	22	1	2C	2	Kleine viesvaren		Isoetaceae
<i>Isoetes lacustris*</i>	25.6	110	4	2C	1	Grote viesvaren		Isoetaceae
<i>Isolepis setacea</i>	0.95	22	2	2C	7	Borstelbies		Cyperaceae
<i>Iva xanthifolia</i>	6.25	28, 36	1	2C, 3C	ad	Iva		Asteraceae
<i>Jacobaea aquatica</i> var. <i>erratica</i>	4.47	40	1	2C	1	Waterkruiskruid		Asteraceae
<i>Jacobaea aquatica</i> var. <i>aquatica</i>	4.21	40	5	2C, (4C)	5	Waterkruiskruid		Asteraceae
<i>Jacobaea aquatica</i> x <i>vulgaris</i>	8.52	BZ: 80	5	2C, (4C)	cu	n. d.	BZ	Asteraceae
<i>Jacobaea erucifolia</i>	6.74	40	1	2C	8	Viltig kruiskruid		Asteraceae
<i>Jacobaea maritima</i>	4.99	40	1	2C	cu	Zilverkruiskruid		Asteraceae
<i>Jacobaea paludosa</i>	8.48	40	3	2C	7	Moeraskruiskruid		Asteraceae
<i>Jacobaea vulgaris</i> ssp. <i>dunensis</i>	4.40	40	1	2C, 4C, 8C	5	Duinkruiskruid		Asteraceae
<i>Jacobaea vulgaris</i> ssp. <i>vulgaris</i>	4.45	40	16	2C, 4C, 8C	9	Jakobskruiskruid		Asteraceae
<i>Jasione montana</i>	3.01	12	3	2C, 4C	8	Zandblauwtje		Campanulaceae
<i>Jasminum nudiflorum</i>	2.09	26, 52	3	2C	cu	Winterjasmijn		Oleaceae
<i>Juglans regia</i>	1.33	32	3	2C	cu	Okkernoot, Walnoot		Juglandaceae
<i>Juglans nigra</i>	1.27	32	3	2C	cu	Zwarte Walnoot	HD	Juglandaceae
<i>Juncus acutiflorus</i>	2.56	40	2	2C	8	Veldrus		Juncaceae
<i>Juncus alpinarticulatus</i>	1.99	40	3	2C	6	Alpenrus		Juncaceae
<i>Juncus amabilis</i>	0.61		2	2C	ad	n. d.	BZ	Juncaceae
<i>Juncus ambiguus</i>	0.66	34	1	2C	5	Zilte greppelrus		Juncaceae
<i>Juncus aridicola</i>	0.57		2	2C	ad	n. d.	BZ	Juncaceae
<i>Juncus articulatus</i>	3.69	80	6	2C	9	Zomprus		Juncaceae
<i>Juncus australis</i>	0.55		6	2C	ad	n. d.	BZ	Juncaceae
<i>Juncus balticus</i>	1.14	84	1	2C	5	Noordse rus		Juncaceae
<i>Juncus bufonius</i>	1.72	(30) 98 (102)	3	2C	9	Greppelrus		Juncaceae
<i>Juncus bulbosus</i>	1.77	40	1	2C	8	Knolrus		Juncaceae
<i>Juncus canadensis</i>		80			2	Canadese rus		Juncaceae
<i>Juncus capitatus</i>	0.72	18	1	2C	1	Koprus		Juncaceae
<i>Juncus compressus</i>	0.58	40, 44	1	2C	7	Platte rus		Juncaceae
<i>Juncus conglomeratus</i>	0.61	42	2	2C	9	Biezenknoppen		Juncaceae
<i>Juncus continuus</i>	0.60		4	2C	ad	n. d.	BZ	Juncaceae
<i>Juncus distegus</i>	0.63		1	2C	ad	n. d.	BZ	Juncaceae
<i>Juncus dudleyi</i>	3.78	c84, 42	1	2C	1	Samengetrokken rus	FL	Juncaceae
<i>Juncus edgariae</i>	0.60	40	4	2C	ad	n. d.	BZ	Juncaceae
<i>Juncus effusus</i>	0.69	40, 42	1	2C, 4C	9	Pitrus		Juncaceae
<i>Juncus ensifolius</i>		40			3	Zwaardrus		Juncaceae
<i>Juncus filicaulis</i>	0.56		2	2C	ad	n. d.	BZ	Juncaceae
<i>Juncus filiformis</i>		40, 80			5	Draadrus		Juncaceae
<i>Juncus flavidus</i>	0.55		1	2C	ad	n. d.	BZ	Juncaceae
<i>Juncus foliosus</i>		26			1	Gestreepte greppelrus		Juncaceae
<i>Juncus gerardii</i>	3.91	84	2	2C	7	Zilte rus		Juncaceae
<i>Juncus gregiflorus</i>	0.63		1	2C	ad	n. d.	BZ	Juncaceae
<i>Juncus imbricatus</i>	1.01		3	2C	ad	n. d.	BZ	Juncaceae
<i>Juncus inflexus</i>	0.76	40, 42	1	2C	8	Zeegroene rus		Juncaceae
<i>Juncus maritimus</i>	0.33	40, 48	2	2C	6	Zeerus		Juncaceae
<i>Juncus ochrocoleus</i>	0.55		5	2C	ad	n. d.	BZ	Juncaceae
<i>Juncus pallidus</i>	0.60		4	2C	ad	n. d.	BZ	Juncaceae
<i>Juncus procerus</i>	0.60		3	2C	ad	n. d.	BZ	Juncaceae
<i>Juncus pygmaeus</i>	1.05	40	1	2C	4	Dwergrus		Juncaceae
<i>Juncus radula</i>	0.62		1	2C	ad	n. d.	BZ	Juncaceae
<i>Juncus</i> sp.	0.61		5	2C	ad	n. d.	BZ	Juncaceae
<i>Juncus squarrosus</i>	0.82	40	1	2C	8	Trekrus		Juncaceae
<i>Juncus subnodulosus</i>	1.29	40	2	2C	7	Paddenrus		Juncaceae
<i>Juncus subsecundus</i>	0.55		1	2C	ad	n. d.	BZ	Juncaceae
<i>Juncus tenageia</i>					4	Wijdbloeiende rus		Juncaceae
<i>Juncus tenuis</i>	1.01	32-84	5	2C	8	Tengere rus		Juncaceae
<i>Juncus usitatus</i>	0.54		3	2C	ad	n. d.	BZ	Juncaceae
<i>Juncus vaginatus</i>	0.59		1	2C	ad	n. d.	BZ	Juncaceae
<i>Juncus</i> x <i>diffusus</i>	0.65		3	2C	ad	<i>Juncus effusus</i> x <i>inflexus</i>	BZ	Juncaceae
<i>Juncus</i> x <i>kern-reichgeltii</i>					2	<i>Juncus conglomeratus</i> x <i>effusus</i>		Juncaceae
<i>Juniperus communis</i>	22.9	22	4	2C	6	Jeneverbes		Cupressaceae
<i>Kerria japonica</i> 'Pleniflora'	0.93	18		2C	cu	Kerria	FL	Rosaceae
<i>Kickxia elatine</i>	3.09	36	2	2C	5	Spiesleeuwenbek		Plantaginaceae
<i>Kickxia spuria</i>	1.85	18	2	2C, (4C)	5	Eironde leeuwenbek		Plantaginaceae
<i>Knautia arvensis*</i>	14.1	16, 20, 40	1	2C, 4C	6	Beemdkroon		Caprifoliaceae
<i>Knautia dipsacifolia*</i>	14.1	40, 60	2	2C, 4C	1	Bergknautia		Caprifoliaceae
<i>Koeleria albescens</i> cf.	5.01	28	3	2C, 4C	6	Duinfakkelgras	BZ	Poaceae
<i>Koeleria macrantha</i>	5.42	14, 28	1	2C, 4C	2	Blauw fakkelgras	FL	Poaceae
<i>Koeleria pyramidata</i>	8.72	14-84	3	2C,	1	Smal fakkelgras		Poaceae
<i>Koelreuteria paniculata</i>	0.80	22, 30	2	2C, (4C)	cu	Gele zeepboom		Sapindaceae
<i>Laburnum alpinum</i>	2.54	48	3	2C, 4C	cu	Alpen gouden regen	BZ	Fabaceae
<i>Laburnum anagyroides</i>	2.57	48	2	2C, 4C	cu	Gouden regen		Fabaceae
<i>Laburnum</i> x <i>watereri</i> 'Vossii'	2.71		1	2C, 4C	cu	<i>Laburnum alpinum</i> x <i>anagyroides</i>		Fabaceae
<i>Laburnocytisus</i> 'Adamii'	2.54	48	3	2C, 4C	cu	X ( <i>Laburnum</i> + <i>Cytisus</i> )	BZ	Fabaceae
<i>Lactuca saligna</i>		18		2C	0	Wilgsla		Asteraceae
<i>Lactuca sativa</i>	5.99	18	3	2C	cu	Sla		Asteraceae
<i>Lactuca serriola</i>	6.08	18	1	2C	8	Kompassla		Asteraceae
<i>Lactuca tatarica</i>	8.60	16, 18	1	2C	1	Strandsla		Asteraceae
<i>Lactuca virosa</i>	7.84	18	4	2C	3	Gifsla		Asteraceae
<i>Lagarosiphon major</i> #	3.52	22	2	2C, 4C, 8C	ex	Verspreidbladige waterpest	FL	Hydrocharitaceae
<i>Lagurus ovatus</i>	6.68	14	2	2C	4	Hazenstaart		Poaceae

A	B	C	D	E	F	G	H	I
Species (mainly Heukels Flora)	2C	Chrom. nr.	n	Peak	Status	Dutch name	new	family
<i>Lamarckia aurea</i>		14			1	Pluimstaartje		Poaceae
<i>Lamiastrum galeob. ssp. argentatum</i>	5.82	36	2	2C	5	Bonte gele dovenetel		Lamiaceae
<i>Lamiastrum galeobdolon ssp. galeob.</i>	5.86	18, 36	3	2C, 4C, 8C	4	Gele dovenetel		Lamiaceae
<i>Lamium album</i>	1.81	18	2	2C, 4C, 8C	9	Witte dovenetel		Lamiaceae
<i>Lamium amplexicaule</i>	1.26	18	1	2C, 4C	8	Hoenderbeet		Lamiaceae
<i>Lamium confertum</i>	2.72	36	1	2C, (4C)	1	Brede dovenetel		Lamiaceae
<i>Lamium hybridum</i>	2.60	36	1	2C, 4C	6	Ingesneden dovenetel		Lamiaceae
<i>Lamium maculatum #</i>	2.78	18	5	2C, 4C	7	Gevlekte dovenetel		Lamiaceae
<i>Lamium purpureum</i>	1.49	18	2	2C	9	Paarse dovenetel		Lamiaceae
<i>Landoltia punctata</i>	0.97	46	2	2C	1	Smal kroos	FL	Araceae
<i>Lappula squarrosa</i>	1.59	48 (54)	2	2C, 4C, 8C	ad	Stekelzaad		Boraginaceae
<i>Lapsana communis</i>	2.63	14	1	2C	9	Akkerkool		Asteraceae
<i>Larix decidua</i>	26.0	24	1		cu	Europese lork		Pinaceae
<i>Larix kaempferi</i>	26.4	24	1		cu	Japanse lork		Pinaceae
<i>Larix x marschlinii</i>	27.9	24	1	2C	cu	<i>Larix decidua</i> x <i>kaempferi</i>		Pinaceae
<i>Lathraea clandestina #</i>	2.20	42	8	2C, 4C, 8C	cu	Paarse schubwortel		Orobanchaceae
<i>Lathraea squamaria #</i>	2.95	36	4	2C, 4C, 8C, 16C	1	Bleke schubwortel		Orobanchaceae
<i>Lathyrus aphaca</i>	9.37	14	1	2C,	1	Naakte lathyrus		Fabaceae
<i>Lathyrus hirsutus</i>	12.0	14	1	2C, 4C	3	Ruige lathyrus		Fabaceae
<i>Lathyrus japonicus</i>	12.3	14	2	2C, 4C	3	Zeelathyrus		Fabaceae
<i>Lathyrus latifolius</i>	22.6	14	1	2C, 4C, 8C	cu	Brede lathyrus		Fabaceae
<i>Lathyrus linifolius</i>	11.4	14	2	2C	3	Knollathyrus		Fabaceae
<i>Lathyrus niger</i>	13.8	14	1	2C, 4C, 8C	0	Zwarte lathyrus		Fabaceae
<i>Lathyrus nissolia</i>	8.94	14	2	2C, 4C, 8C	4	Graslathyrus		Fabaceae
<i>Lathyrus palustris</i>	31.5	42	1	2C, 4C	6	Moeraslathyrus		Fabaceae
<i>Lathyrus pratensis</i>	11.6	14, 28	4	2C, 4C	9	Veldlathyrus		Fabaceae
<i>Lathyrus sylvestris</i>	20.4	14	1	2C, 4C	5	Boslathyrus		Fabaceae
<i>Lathyrus tuberosus*</i>	14.4	14	3	2C, (4C)	7	Aardaker		Fabaceae
<i>Lavatera thuringiaca</i>	7.22	44	1	2C	cu	n. d.	FL	Malvaceae
<i>Lavendula angustifolia</i>	2.44	36-54	3	2C, (4C)	cu	Echte lavendel	HD	Lamiaceae
<i>Leersia oryzoides</i>	1.83	48, 60	2	2C, (4C)	5	Rijstgras		Poaceae
<i>Legousia hybrida</i>		20			3	Klein spiegelklokje		Campanulaceae
<i>Legousia speculum-veneris</i>	2.10	20	3	2C, 4C	4	Groot spiegelklokje		Campanulaceae
<i>Lemna aequinoctialis</i>	1.01	20-80	1	2C	1	n. d.	FL	Araceae
<i>Lemna gibba #</i>	1.24	40-80	14	2C, 4C	8	Bultkroos		Araceae
<i>Lemna minor #</i>	0.86	(20) 40	19	2C	9	Klein kroos		Araceae
<i>Lemna minuta</i>	0.79	40	17	2C	6	Dwergkroos		Araceae
<i>Lemna trisulca</i>	1.17	40, 44	3	2C, (4C)	8	Puntkroos		Araceae
<i>Lemna turionifera</i>	1.13	40, 42 (80)	11	2C	1	Knopkroos		Araceae
<i>Lens culinaris</i>	9.26	14	1	2C	cu	Linze		Fabaceae
<i>Leontodon autumnalis</i>	4.24	12	4	2C	9	Vertakte leeuwentand		Asteraceae
<i>Leontodon hispidus</i>	4.83	14	1	2C, (4C)	6	Ruige leeuwentand		Asteraceae
<i>Leontodon saxatilis</i>	1.41	8	2	2C, (4C)	8	Kleine leeuwentand		Asteraceae
<i>Leonurus cardiaca</i>	1.57	18	3	2C, (4C)	5	Hartgespan		Lamiaceae
<i>Lepidium campestre</i>	0.78	16	2	2C,	6	Veldkruidkers		Brassicaceae
<i>Lepidium densiflorum</i>	0.75	32	1	2C, 4C, 8C	ad	Dichtbloemige kruidkers		Brassicaceae
<i>Lepidium draba</i>	1.97	64, 80	3	2C, 4C, 8C	7	Pijlkruidkers		Brassicaceae
<i>Lepidium graminifolium</i>	2.54	16, 48	1	2C, 4C	3	Graskers		Brassicaceae
<i>Lepidium heterophyllum</i>	0.40	16	1	2C, 4C, 8C	4	Rozetkruidkers		Brassicaceae
<i>Lepidium latifolium</i>	1.18	24	3	2C, 4C, 8C	4	Peperkers		Brassicaceae
<i>Lepidium neglectum</i>		32			5	Vergeeten kruidkers		Brassicaceae
<i>Lepidium perfoliatum</i>		16			ad	Doorgroeiende kruidkers		Brassicaceae
<i>Lepidium ruderales</i>	0.73	16, 32	1	2C, 4C, 8C	5	Steenkruidkers		Brassicaceae
<i>Lepidium sativum</i>	1.25	16, 24	1	2C, 4C, 8C, 16C	cu	Tuinkers		Brassicaceae
<i>Lepidium virginicum #</i>	0.68	(16) 32	3	2C, 4C	5	Amerikaanse kruidkers		Brassicaceae
<i>Leucanthemum paludosum</i>	7.54	18	1	2C	1	Kleine margriet		Asteraceae
<i>Leucanthemum vulgare</i>	21.0	18, 36, 54	7	2C	9	Gewone margriet		Asteraceae
<i>Leucojum aestivum</i>	72.3	22	10	2C	4	Zomerklokje		Amaryllidaceae
<i>Leucojum vernum</i>	80.8	20, 22, 24	15	2C	4	Lenteklokje		Amaryllidaceae
<i>Levisticum officinale</i>	10.2	22	2	2C	cu	Lavas		Apiaceae
<i>Leycesteria formosa</i>	1.75	18	1	2C, (4C)	cu	Fazentenbes		Caprifoliaceae
<i>Leymus arenarius</i>	40.3	56	2	2C	6	Zandhaver		Poaceae
<i>Ligustrum ovalifolium</i>	2.93	46	1	2C	cu	Haagliguster		Oleaceae
<i>Ligustrum vulgare</i>	3.41	46	1	2C	7	Wilde liguster		Oleaceae
<i>Lilium bulbiferum ssp. bulbiferum</i>	95.0	24	1		cu	Oranje lelie		Liliaceae
<i>Lilium bulbiferum ssp. croceum</i>	95.1	24	12	2C	2	Roggelelie		Liliaceae
<i>Lilium martagon</i>	93.8	24	2		cu	Turkse lelie		Liliaceae
<i>Limnanthes alba</i>		10			cu	Donzige moerasbloem		Limnathaceae
<i>Limnanthes douglasii</i>	4.28	10	1	2C, 4C	cu	Geelwitte moerasbloem		Limnathaceae
<i>Limonium binervosum</i>	7.07	27, 35,	2	2C	ad	Kliflamsoor	FL	Plumbaginaceae
<i>Limonium humile</i>	6.05	(36, 48) 54	1	2C	1	IJle lamsoor		Plumbaginaceae
<i>Limonium vulgare</i>	5.37	18, 36, 45	8	2C	6	Lamsoor		Plumbaginaceae
<i>Limosella aquatica</i>	1.54	40	2	2C	6	Slijkgroen		Plantaginaceae
<i>Linaria arvensis</i>		12			0	Blauwe leeuwenbek		Plantaginaceae
<i>Linaria dalmatica</i>	1.78	12	2	2C, 3C	ad	Dalmatië bekje	FL	Plantaginaceae
<i>Linaria purpurea</i>	1.90	12	1	2C	1	Walstroleeuwenbek		Plantaginaceae
<i>Linaria repens</i>	1.77	12	1	2C	5	Gestreepte leeuwenbek		Plantaginaceae
<i>Linaria supina</i>	1.61	12	1	2C	ad	Liggende leeuwenbek		Plantaginaceae
<i>Linaria vulgaris</i>	1.57	12	1	2C	9	Vlasbekje		Plantaginaceae
<i>Lindernia dubia</i>	0.80	18	1	2C	1	Schijngenadekruid	FL	Scrophulariaceae
<i>Linnaea borealis</i>	1.83	32	1	2C	3	Linnaeusklokje		Caprifoliaceae
<i>Linum catharticum</i>	1.46	16	3	2C	6	Geelhartje		Linaceae

A	B	C	D	E	F	G	H	I
Species (mainly Heukels Flora)	2C	Chrom. nr.	n	Peak	Status	Dutch name	new	family
<i>Linum usitatissimum</i>	1.39	30	2	2C	cu	Vlas		Linaceae
<i>Liparis loeselii</i>	12.9	26, 32	1	2C	5	Groenknolorchis		Orchidaceae
<i>Lithospermum arvense</i>	3.07	40	1	2C, 4C, (8C)	4	Ruw parelzaad		Boraginaceae
<i>Lithospermum officinale</i>	1.26	28	1	2C, 4C, (8C)	5	Glad parelzaad		Boraginaceae
<i>Littorella uniflora</i>	12.23	24	2	2C, 4C, (8C)	5	Oeverkruid		Plantaginaceae
<i>Lobelia dortmanna</i>	2.06	14	1	2C	3	Waterlobelia		Campanulaceae
<i>Lobelia erinus</i>	3.03	14, 28, 42	1	2C	cu	n. d.	HD	Campanulaceae
<i>Lobelia inflata</i>		14			1	Blaaslobelia		Campanulaceae
<i>Lobelia pedunculata</i>	3.70	28	2	2C, 4C	cu	Gazonlobelia	FL	Campanulaceae
<i>Lolium multiflorum</i> cf	10.5	14	2	2C, 4C	8	Italiaans raaigras		Poaceae
<i>Lolium perenne</i> #	5.26	14	2	2C, 4C, 8C	9	Engels raaigras		Poaceae
<i>Lolium remotum</i>		14			0	Vlasdolik		Poaceae
<i>Lolium temulentum</i>	8.27	14	1	2C	0	Dolik		Poaceae
<i>Lolium x hybridum</i>					2	<i>Lolium perenne</i> x <i>multiflorum</i>		Poaceae
<i>Lonicera caprifolium</i> #	2.16	18	3	2C, (4C)	ad	Tuinkamperfoelie		Caprifoliaceae
<i>Lonicera japonica</i>	1.93	18	1	2C	cu	n. d.	BZ	Caprifoliaceae
<i>Lonicera nitida</i>	1.99	18	2	2C,	cu	Buxuskamperfoelie	BZ	Caprifoliaceae
<i>Lonicera periclymenum</i>	6.91	18, 36, 54	4	2C,	9	Wilde kamperfoelie		Caprifoliaceae
<i>Lonicera tatarica</i>	1.79	18	2	2C, (4C)	cu	Tartaarse kamperfoelie		Caprifoliaceae
<i>Lonicera xylosteum</i>	1.81	18	1	2C, 4C	2	Rode kamperfoelie		Caprifoliaceae
<i>Lotus corniculatus</i>	2.48	24	3	2C, 4C	9	Gewone rolklover		Fabaceae
<i>Lotus (corniculatus?) 'Sativus'</i>	2.33		2	2C, 4C	cu	Rechte rolklover		Fabaceae
<i>Lotus glaber</i>	1.20	12	3	2C, 4C, (8C)	7	Smalle rolklover		Fabaceae
<i>Lotus pedunculatus</i>	1.14	12	3	2C, 4C	9	Moerasroklaver		Fabaceae
<i>Ludwigia grandiflora</i>	3.14	80	1	2C	ex	Waterteunisbloem		Onagraceae
<i>Ludwigia palustris</i>	0.84	16	2	2C, (4C)	7	Waterlepeltje		Onagraceae
<i>Ludwigia peploides</i>	0.59	16	1	2C	ex	Kleine waterteunisbloem		Onagraceae
<i>Lunaria annua</i>	0.95	30	2	2C, 4C, 8C, 16C	cu	Tuinjudaspenning		Brassicaceae
<i>Lunaria rediviva</i>	0.77	28, 30	2	2C, 4C, 8C, 16C	1	Wilde judaspenning		Brassicaceae
<i>Lupinus angustifolius</i>	2.00	40, 48	1	2C, 4C, 8C	ad	Blauwe lupine		Fabaceae
<i>Lupinus luteus</i>	2.94	48-56	1	2C, 4C, 8C, 16C	cu	Gele lupine		Fabaceae
<i>Lupinus polyphyllus</i>	1.62	48	1	2C, 4C	7	Vaste lupine		Fabaceae
<i>Lupinus x regalis</i>	1.62		1	2C	cu	Lupine arborescens.x polyphyllus	BZ	Fabaceae
<i>Luronium natans</i>	44.0	42	3	2C, 4C	6	Drijvende waterweegbree		Alismataceae
<i>Luzula nivea</i>	1.84	12	4			n. d.		
<i>Luzula campestris</i>	0.76	12 (18-36)	1	2C	9	Gewone veldbies		Juncaceae
<i>Luzula luzuloides</i>	1.80	12	1	2C, 4C	4	Witte veldbies		Juncaceae
<i>Luzula multiflora</i> ssp. <i>congesta</i>	3.28	48	1	2C	3	Dichtbloemige veldbies		Juncaceae
<i>Luzula multiflora</i> ssp. <i>multiflora</i>	2.78	36	1	2C	6	Veelbloemige veldbies		Juncaceae
<i>Luzula pilosa</i> #	0.54	(62) 66	3	2C, 4C, 8C	6	Ruige veldbies		Juncaceae
<i>Luzula sylvatica</i>	1.42	12	1	2C	4	Grote veldbies		Juncaceae
<i>Lycium barbarum</i>	5.84	24	4	2C, (4C)	5	Boksdooorn		Solanaceae
<i>Lycium chinense</i>	4.01	24 (36, 48)	3	2C, 4C, 8C	cu	Chinese boksdooorn, Gojibes	FL	Solanaceae
<i>Lycium chinense</i> x <i>barbarum</i> cf	4.99	BZ: 24	4	2C, 4C	cu	n. d.	BZ	Solanaceae
<i>Lycopodium annotinum</i>	9.43	68	1	2C	3	Stekende wolfsklauw		Lycopodiaceae
<i>Lycopodium clavatum</i>	5.51	68	3	2C	4	Grote wolfsklauw		Lycopodiaceae
<i>Lycopodium complanatum</i>		46			0	Vlakke wolfsklauw	BZ	Lycopodiaceae
<i>Lycopodium tristachyum</i>	5.53	46	1	2C, (4C)	3	Kleine wolfsklauw		Lycopodiaceae
<i>Lycopodiella inundata</i> *	17.9	156	2	2C	6	Moeraswolfsklauw		Lycopodiaceae
<i>Lycopus europaeus</i>	1.02	22	2	2C	9	Wolfsfoot		Lamiaceae
<i>Lysichiton americanus</i>	6.36	28	2	2C	1	Gele moeraslantaarn		Araceae
<i>Lysichiton camtschatcensis</i>	5.20	28	1		cu	Witte moeraslantaarn	BZ	Araceae
<i>Lysimachia clethroides</i>	12.9	24	3	2C	cu	Witte troswederik	FL	Primulaceae
<i>Lysimachia nemorum</i>	3.41	16, 18	1	2C, 4C	5	Boswederik		Primulaceae
<i>Lysimachia nummularia</i>	4.77	(30-36) 43	2	2C, 4C	9	Penningkruid		Primulaceae
<i>Lysimachia punctata</i>	4.53	30	7	2C	cu	Puntwederik		Primulaceae
<i>Lysimachia thyriflora</i>	2.92	42	2	2C, 4C	8	Moeraswederik		Primulaceae
<i>Lysimachia vulgaris</i>	8.59	(42) 84	3	2C	9	Grote wederik		Primulaceae
<i>Lythrum hyssopifolia</i>	1.44	20	1	2C	3	Kleine kattenstaart		Lythraceae
<i>Lythrum junceum</i>		10			1	Kruipkattenstaart		Lythraceae
<i>Lythrum portula</i>	0.58	10	2	2C	7	Waterpostelein		Lythraceae
<i>Lythrum salicaria</i>	3.30	60	5	2C	9	Grote kattenstaart		Lythraceae
<i>Macleaya cordata</i>	1.29	20	1	2C, 4C, 8C	ad	Pluimpapaver	FL	Papaveraceae
<i>Maianthemum bifolium</i>	30.3	6, c. 38, c. 4	4	2C	8	Dalkruid		Asparagaceae
<i>Malcolmia maritima</i>	0.55	14, 16	2	2C, 4C, 8C	cu	Zeevioelier		Brassicaceae
<i>Malus domestica</i> #	1.61	34	31	2C	7	Eetappel		Rosaceae
<i>Malus sylvestris</i>	1.76	34	5	2C	7	Wilde appel		Rosaceae
<i>Malva alcea</i>	10.6	84	5	2C	5	Vijfdelig kaasjeskruid		Malvaceae
<i>Malva moschata</i> #	2.93	42	7	2C, (4C)	7	Muskuskaasjeskruid		Malvaceae
<i>Malva neglecta</i>	1.53	42	2	2C, (4C)	8	Klein kaasjeskruid		Malvaceae
<i>Malva parviflora</i> cf	3.51	42	2	2C	ad	Kleinbloemig kaasjeskruid		Malvaceae
<i>Malva pusilla</i>	1.46	42	5	2C	ad	Rond kaasjeskruid		Malvaceae
<i>Malva sylvestris</i>	1.56	42	3	2C	8	Groot kaasjeskruid		Malvaceae
<i>Malva verticillata</i> ssp. <i>crispa</i> #	3.82	c. 76-126	1	2C	cu	Dessertblade	BZ	Malvaceae
<i>Malva verticillata</i> ssp. <i>verticillata</i> #	1.87	42-126	1	2C	cu	Dessertbladen		Malvaceae
<i>Malva x clementii</i> cf	7.02		1	2C,	1	n. d.	BZ	Malvaceae
<i>Marrubium vulgare</i>	2.72	34	1	2C, (4C)	2	Malrove		Lamiaceae
<i>Marsilea quadrifolia</i> *	2.55	40	2	2C	1	Klaverbladvaren		Marsileaceae
<i>Matricaria chamomilla</i>	5.67	18	1	2C	9	Echte kamille		Asteraceae
<i>Matricaria discoidea</i>	4.75	18	2	2C	9	Schijfkamille		Asteraceae
<i>Matteuccia struthiopteris</i> *	26.8	78, 80	3	2C, 4C	cu	Struisvaren		Onocleaceae
<i>Mazus reptans</i>	2.21		1	2C	cu	n. d.	HD	Phrymaceae

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Species (mainly Heukels Flora)	2C	Chrom. nr.	n	Peak	Status	Dutch name	new	family
<i>Meconopsis cambrica</i>	6.80	22	1	2C, 4C, 8C	cu	Schijnpapaver		Papaveraceae
<i>Medicago arabica</i>	1.22	16	2	2C, 4C, 8C, 16C	7	Gevlekte rupsklaver		Fabaceae
<i>Medicago lupulina</i>	1.40	16	2	2C, 4C	9	Hopklaver		Fabaceae
<i>Medicago minima</i>	1.20	16, 32	1	2C, 4C	4	Kleine rupsklaver		Fabaceae
<i>Medicago polymorpha</i>	1.06	14, 16	6	2C, 4C, 8C	3	Ruige rupsklaver		Fabaceae
<i>Medicago sativa</i> ssp. <i>sativa</i>	3.58	16, 32	4	2C, 4C	cu	Luzerne (alfalfa)		Fabaceae
<i>Medicago sativa</i> ssp. <i>falcata</i>	3.56	16, 32	3	2C, (4C)	6	Sikkelklaver		Fabaceae
<i>Medicago x varia</i>	3.72	32	1	2C, 4C, 8C	5	<i>Medicago falcata</i> x <i>sativa</i>		Fabaceae
<i>Melampyrum arvense</i>	14.9	18	2	2C, 4C, 8C	1	Wilde weit		Orobanchaceae
<i>Melampyrum pratense</i> *	15.5	18	2	2C, 4C	7	Hengel		Orobanchaceae
<i>Melica nutans</i>	5.70	18	1	2C, 4C	ad	Knikkend parelgras		Poaceae
<i>Melica uniflora</i>	5.10	18	2	2C, 4C, 8C	5	Eenbloemig parelgras		Poaceae
<i>Melilotus albus</i>	2.59	16	1	2C, 4C, 8C	8	Witte honingklaver		Poaceae
<i>Melilotus altissimus</i>	2.83	16	1	2C, 4C, 8C	7	Goudgele honingklaver		Fabaceae
<i>Melilotus indicus</i>	2.05	16	1	2C, 4C	3	Kleine honingklaver		Fabaceae
<i>Melilotus officinalis</i>	2.70	16	1		8	Citroengele honingklaver		Fabaceae
<i>Melissa officinalis</i>	1.94	32, 34, 64	1	2C	cu	Citroenmelisse		Lamiaceae
<i>Melittis melissophyllum</i>	1.07	30	1	2C	ad	Bijenblad	FL	Lamiaceae
<i>Mentha aquatica</i>	3.28	96	9	2C, 4C, 8C	9	Watermunt		Lamiaceae
<i>Mentha arvensis</i>	2.62	72	1	2C	8	Akkermunt		Lamiaceae
<i>Mentha longifolia</i>	0.95	24, 48	2	2C	6	Hertsmunt		Lamiaceae
<i>Mentha pulegium</i>	0.89	20	1	2C	3	Polei		Lamiaceae
<i>Mentha spicata</i>	1.50	36	3	2C	cu	Aarmunt		Lamiaceae
<i>Mentha suaveolens</i>	1.07	24	3	2C, (4C)	3	Witte munt		Lamiaceae
<i>Mentha x gracilis</i> cf	2.61	54-120	2	2C, (4C)	1	<i>Mentha arvensis</i> x <i>spicata</i>		Lamiaceae
<i>Mentha x piperita</i> cf	1.78	66-120	2	2C	cu	<i>Mentha aquatica</i> x <i>spicata</i>		Lamiaceae
<i>Mentha x rotundifolia</i>	0.88	24	1	2C, 4C, 8C, 16C	6	Wollige munt		Lamiaceae
<i>Mentha x verticillata</i>	4.41	42-132	1	2C	6	<i>Mentha arvensis</i> x <i>aquatica</i>		Lamiaceae
<i>Menyanthes trifoliata</i>	4.03	54	1	2C	7	Waterdrieblad		Menyanthaceae
<i>Mercurialis annua</i>	1.29	16 (32, 48)	2	2C, 4C, 8C, 16C	7	Tuinbingelkruid		Euphorbiaceae
<i>Mercurialis perennis</i>	7.21	64	4	2C, 4C	4	Bosbingelkruid		Euphorbiaceae
<i>Mespilus germanica</i>	1.79	34	6	2C, 4C	6	Mispel		Rosaceae
<i>Metasequoia glyptostroboides</i>	19.3	22	2		cu	Watercypres		Cupressaceae
<i>Mibora minima</i>	9.92	14 (28)	2	2C, 4C	2	Dwerggras		Poaceae
<i>Micropyrum tenellum</i>		14			1	Grindstijfgras		Poaceae
<i>Milium effusum</i> #	5.17	(14) 28 (42)	5	2C, 4C	6	Bosgiestgras		Poaceae
<i>Milium vernale</i>	6.24	14, 18 (36)	2	2C, 4C	4	Ruw gierstgras		Poaceae
<i>Mimulus guttatus</i>	0.86	28	2	2C, (4C)	5	Gele maskerbloem		Phrymaceae
<i>Mimulus moschatus</i>		32			cu	Muskusplantje		Phrymaceae
<i>Mimulus luteus</i> 'Bonfire red'	1.41	60, 62, 64	2	2C	cu	Gevlekte maskerbloem	BZ	Phrymaceae
<i>Minuartia hybrida</i>		46			2	Tengere veldmuur		Caryophyllaceae
<i>Minuartia stellata</i>	2.00	32	2	2C, (4C)	cu	Griekse veldmuur	BZ	Caryophyllaceae
<i>Miscanthus sinensis</i>	5.58	36-42	3	2C, 4C	cu	Klein prachtriet	FL	Poaceae
<i>Miscanthus x giganteus</i>	7.42	57	1	2C		Groot prachtriet	BZ	Poaceae
<i>Misopates orontium</i>	0.88	14, 16	1	2C, (4C)	5	Akkerleeuwenbek		Plantaginaceae
<i>Moehringia trinervia</i>	2.94	24	3	2C, 4C, 8C	8	Drienerfmuur		Caryophyllaceae
<i>Moenchia erecta</i>		36			0	Kruismuur		Caryophyllaceae
<i>Molinia caerulea</i>	3.51	36, 90	1	2C, 4C	9	Pijpenstrootje		Poaceae
<i>Moneses uniflora</i>		26			2	Eenbloemig wintergroen		Ericaceae
<i>Monotropa hypopitys</i>	6.78	16, 48	1	2C	3	Stofzaad		Ericaceae
<i>Montia fontana</i> #	1.14	20 (40)	4	2C, 4C, 8C, 16C	4	Groot bronkruid		Portulacaceae
<i>Montia minor</i>	0.69	20	3	2C, 4C, 8C, 16C	5	Klein bronkruid		Portulacaceae
<i>Morella caroliniensis</i>					1	Wasgagel		Myricaceae
<i>Morus nigra</i>	0.76	308	2	2C, (4C)	cu	Zwarte moerbij		Moraceae
<i>Muscari armeniacum</i>	8.92	18, 36	2	2C	cu	Langbladige druifhyacint		Asparagaceae
<i>Muscari botryoides</i> #	8.47	18, 36	3	2C	6	Blauwe druifjes (white flowers.)		Asparagaceae
<i>Muscari comosum</i>	8.40	18, 28	2	2C	4	Kuifhyacint		Asparagaceae
<i>Muscari latifolium</i>	9.70	18	2	2C	cu	Brede druifhyacint	FL	Asparagaceae
<i>Myagrum perfoliatum</i>	1.26	14	1	2C, 4C, 8C	1	Myagrum	FL	Brassicaceae
<i>Mycelis muralis</i>	3.77	18	2	2C	6	Muursla		Asteraceae
<i>Myosotis arvensis</i>	1.96	36, 48, 52	10	2C, 4C, (8C)	9	Akker vergeet-mij-nietje		Boraginaceae
<i>Myosotis discolor</i>	1.84	72	27	2C, 4C	7	Veelkleurig vergeet-mij-nietje		Boraginaceae
<i>Myosotis (discolor ssp) dubia</i>	0.62	24	14	2C, 4C, 8C, 16C	6	Veelkleurig vergeet-mij-nietje		Boraginaceae
<i>Myosotis laxa</i> ssp. <i>cespitosa</i> cf	2.49	(22, 44) 88	5	2C, 4C	3	Zomp vergeet-mij-nietje		Boraginaceae
<i>Myosotis laxa</i> ssp. <i>laxa</i>	3.33	88	3	2C, 4C	5	Zomp vergeet-mij-nietje	BZ	Boraginaceae
<i>Myosotis ramosissima</i>	1.15	48	13	2C, 4C, 8C	7	Ruw vergeet-mij-nietje		Boraginaceae
<i>Myosotis scorpioides</i> ssp. <i>nemorosa</i> #	0.84	22	7	2C, 4C, 8C, 16C	5	Weide vergeet-mij-nietje		Boraginaceae
<i>Myosotis scorpioides</i> ssp. <i>scorpioides</i> #	2.44	64, 66	20	2C, 4C	8	Moerasvergeet-mij-nietje		Boraginaceae
<i>Myosotis sylvatica</i>	0.67	18	5	2C, 4C, 8C, 16C	6	Bos vergeet-mij-nietje		Boraginaceae
<i>Myosoton aquaticum</i>	4.16	28	1	2C, 4C	8	Watermuur		Caryophyllaceae
<i>Myosurus minimus</i>	2.45	16	4	2C, 4C, 8C	6	Muizenstaart		Ranunculaceae
<i>Myrica gale</i>	1.70	48	1	2C	7	Wilde gagel		Myricaceae
<i>Myriophyllum alterniflorum</i>	0.47	14	1	2C	5	Teer vederkruid		Haloragaceae
<i>Myriophyllum aquaticum</i>	1.51	48	4	2C, (4C)	1	Parelvederkruid		Haloragaceae
<i>Myriophyllum heterophyllum</i>	0.62		1	2C, 4C, 8C	1	Ongelijkbladig vederkruid		Haloragaceae
<i>Myriophyllum robustum</i> cf	1.84		5	2C	ex	n. d.	FL	Haloragaceae
<i>Myriophyllum spicatum</i>	2.77	42	4	2C	8	Aarvederkruid		Haloragaceae
<i>Myriophyllum verticillatum</i>	1.10	28	1	2C	6	Kransvederkruid		Haloragaceae
<i>Myrrhis odorata</i>	1.73	22	2	2C, 4C	5	Roomse kervel		Apiaceae
<i>Najas marina</i>	0.41	12	1	2C-32C	4	Groot nimfkruid		Hydrocharitaceae
<i>Najas minor</i>		12-56			2	Klein nimfkruid		Hydrocharitaceae
<i>Narcissus poeticus</i>	26.0	14, 21, 28	5	2C	cu	Witte narcis		Amaryllidaceae

A	B	C	D	E	F	G	H	I
Species (mainly Heukels Flora)	2C	Chrom. nr.	n	Peak	Status	Dutch name	new	family
<i>Narcissus pseudonarcissus</i>	23.8	14	5	2C	4	Wilde narcis		Amaryllidaceae
<i>Nardus stricta</i>	4.16	26	1	2C, 4C	7	Borstelgras		Poaceae
<i>Narthecium ossifragum</i>	0.93	26	1	2C, (4C)	5	Beenbreek		Nartheciaceae
<i>Nasturtium microphyllum</i> #	1.60	64	7	2C, 4C, 8C, 16C	7	Slanke waterkers		Brassicaceae
<i>Nasturtium officinale</i> #	0.82	32	3	2C, 4C, 8C	4	Witte waterkers		Brassicaceae
<i>Nemesia melissaefolia</i>	1.45	18	1	2C	1	Kransnemesia		Scrophulariaceae
<i>Neotinea ustulata</i>		42			0	Aangebrande orchis		Orchidaceae
<i>Neottia cordata</i> *	50.2	36-44	2	2C, 4C	4	Kleine keverorchis		Orchidaceae
<i>Neottia nidus-avis</i> *	31.5	36	2	2C, 4C, 8C	2	Vogelnestje		Orchidaceae
<i>Neottia ovata</i> * #	36.3	34-36	5	2C, 4C, 8C	6	Grote keverorchis		Orchidaceae
<i>Nepeta cataria</i> #	1.18	(18) 34, 36	4	2C, (4C)	4	Wild kattenkruid		Lamiaceae
<i>Nepeta racemosa</i> cf	1.75	18 (36)	2	2C	cu	Blauw kattenkruid		Lamiaceae
<i>Nepeta x faassenii</i>	0.68	26	2	2C, (4C)	cu	Grijs kattenkruid		Lamiaceae
<i>Neslia paniculata</i>		14			ad	Vinkenzaad		Brassicaceae
<i>Nicandra physalodes</i>	2.48	20	3	2C, 4C, 8C	ad	Zegekruid		Solanaceae
<i>Nicotiana sylvestris</i>	5.55	24	1	2C, 4C, 8C	ad	Witte trompettabak	BZ	Solanaceae
<i>Nicotiana tabacum</i>	8.71	48	3	2C, 4C	cu	Tabak		Solanaceae
<i>Nigella arvensis</i>		12			0	Wilde nigella		Ranunculaceae
<i>Nigella damascena</i>	24.0	12	1	2C	cu	Juffertje-in-het-groen		Ranunculaceae
<i>Nonea lutea</i>	1.47	14	3	2C, 4C, 8C	1	Geel monnikskruid		Boraginaceae
<i>Nuphar advena</i>		34			cu	n. d.		Nymphaeaceae
<i>Nuphar lutea</i>	5.27	34	2	2C	8	Gele plomp		Nymphaeaceae
<i>Nymphaea alba</i>	4.46	84	4	2C	8	Witte waterlelie		Nymphaeaceae
<i>Nymphaea marliacea</i> #	5.90		5	2C, (4C)	cu	gele,roze,witte bloem		Nymphaeaceae
<i>Nymphaea tetragona</i> var. minima	3.59	28, 56, 112	2			n. d.	BZ	Nymphaeaceae
<i>Nymphaea x candida</i>	5.99	BZ: 112	3	2C, (4C)	1	Noordelijke waterlelie		Nymphaeaceae
<i>Nymphaea x borealis</i>	5.37	BZ: 98	1	2C, (4C)		<i>Nymphaea alba</i> x ( <i>x candida</i> )	BZ	Nymphaeaceae
<i>Nymphoides peltata</i>	1.81	54	3	2C	8	Watergentiaan		Menyanthaceae
<i>Ocimum basilicum</i>	5.10	48, 52, 76	2	2C	cu	Basilicum		Lamiaceae
<i>Odontites vernus</i> ssp. serotinus	1.18	18, 20	2	2C, 4C, 8C	7	Rode ogentroost		Orobanchaceae
<i>Odontites vernus</i> ssp. vernus #	2.45	(20) 40	3	2C, 4C, 8C	1	Akkerogentroost		Orobanchaceae
<i>Odontites vernus</i> ssp. litoralis						Vroege ogentroost		Orobanchaceae
<i>Oenanthe aquatica</i>	2.03	22	2	2C, (4C)	8	Watertorkruid		Apiaceae
<i>Oenanthe crocata</i>	1.52	22	1	2C, 4C, 8C	2	Dodemansvingers		Apiaceae
<i>Oenanthe fistulosa</i> Variegated #	1.35	22	2	2C, (4C)	8	Pijp torkruid		Apiaceae
<i>Oenanthe lachenalii</i>	1.46	22	4	2C, (4C)	6	Zilt torkruid		Apiaceae
<i>Oenanthe peucedanifolia</i>		22			0	Varkenskervel-torkruid		Apiaceae
<i>Oenanthe pimpinelloides</i>	1.38	22	1	2C, (4C)	1	Bevermeltorkruid		Apiaceae
<i>Oenanthe silaifolia</i>		22			1	Weidekervel-torkruid		Apiaceae
<i>Oenothera biennis</i>	2.31	14	3	2C	6	Middelste teunisbloem		Onagraceae
<i>Oenothera deflexa</i>	2.26		3	2C	5	Zandteunisbloem		Onagraceae
<i>Oenothera glazioviana</i>	2.31	14	2	2C	5	Grote teunisbloem		Onagraceae
<i>Oenothera glazioviana</i> ssp. rubricalix	2.39	14	3	2C	1	d rode calix		Onagraceae
<i>Oenothera oakesiana</i>	2.40	14	1	2C	2	Duinteunisbloem	FL	Onagraceae
<i>Oenothera oehlkersii</i>	2.21	14	1	2C	ad	Bleke teunisbloem	FL	Onagraceae
<i>Oenothera parviflora</i>	2.29	14	1	2C	ad	Kleine teunisbloem	FL	Onagraceae
<i>Oenothera royfraseri</i>	2.19	14	2	2C	1	n. d.	FL	Onagraceae
<i>Oenothera rubricaulis</i>	2.37	14	1	2C	1	n. d.	FL	Onagraceae
<i>Oenothera oakesiana</i> cf	2.20	14	1	2C		n. d.	FL	Onagraceae
<i>Oenothera victorinii</i>	2.33		1	2C,	ad	n. d.	FL	Onagraceae
<i>Oenothera villosa</i>	2.47	14	1	2C	ad	n. d.	FL	Onagraceae
<i>Oenothera lindheimeri</i>	1.32	14	1	2C	cu	Prachtkaars	BZ	Onagraceae
<i>Oenothera x fallax</i>	2.32	14	2	2C	6	<i>Oenothera biennis</i> x <i>glazioviana</i>		Onagraceae
<i>Omphalodes verna</i>	2.42	42, 48	1	2C, 4C, 8C	cu	Vroeg vergeet-mij-nietje		Boraginaceae
<i>Onobrychis viciifolia</i>	2.54	28	1	2C, 4C, 8C	3	Esparcette		Fabaceae
<i>Onoclea sensibilis</i> *	32.5	74	1	2C	cu	Bolletjes varen		Onocleaceae
<i>Ononis repens</i> ssp. repens #	2.68	60	4	2C, 4C	5	Kruipend stalkruid		Fabaceae
<i>Ononis repens</i> ssp. spinosa #	1.49	30	2	2C, 4C, 8C	7	Kattendoorn		Fabaceae
<i>Onopordum acanthium</i>	2.69	34	2	2C, (4C)	6	Wegdistel		Asteraceae
<i>Ophioglossum azoricum</i>	65.3	720	1	2C	1	Azorendaddertong		Ophioglossaceae
<i>Ophioglossum vulgatum</i>	44.7	c. 540	4	2C	6	Addertong		Ophioglossaceae
<i>Ophrys apifera</i>	21.3	36	3	2C, 4C, 8C	5	Bijenorchis		Orchidaceae
<i>Ophrys holoserica</i>	20.6	36	1	2C, 4C, 8C		Hommelorchis	BZ	Orchidaceae
<i>Ophrys insectifera</i>	22.2	36	2	2C, 4C, 8C	3	Vliegenorchis		Orchidaceae
<i>Orchis anthropophora</i>	29.6	42	1	2C, (4C)	2	Poppenorchis		Orchidaceae
<i>Orchis mascula</i> #	20.8	42	6	2C, (4C)	3	Mannetjesorchis		Orchidaceae
<i>Orchis militaris</i>	23.9	42	3	2C, 4C, 8C	3	Soldaatje		Orchidaceae
<i>Orchis purpurea</i>	18.7	42	1	2C, 4C, 8C	3	Purperorchis		Orchidaceae
<i>Orchis simia</i>		42			2	Aapjesorchis		Orchidaceae
<i>Orchis x hybrida</i>					1	<i>Orchis militaris</i> x <i>purpurea</i>		Orchidaceae
<i>Oreopteris limbosperma</i> *	13.5	68	1	2C	4	Stippelvaren		Thelypteridaceae
<i>Origanum majorana</i>	1.94	30	2	2C	cu	Echte marjolein		Lamiaceae
<i>Origanum vulgare</i>	1.77	30	1	2C, (4C)	6	Wilde marjolein		Lamiaceae
<i>Orlaya grandiflora</i>	1.68	20	1	2C, F2336	ad	Straalscherm		Apiaceae
<i>Ornithogalum pyramidale</i>	17.3	24, 54	1		ad	Piramidevogelmelk		Asparagaceae
<i>Ornithogalum nutans</i>	43.9	14-42	1		5	Knikkende vogelmelk		Asparagaceae
<i>Ornithogalum pyrenaicum</i>	30.2	16, 32	4	2C, 4C, (8C)	cu	Bosvogelmelk	FL	Asparagaceae
<i>Ornith. umbellatum</i> ssp. <i>campestre</i>	43.6	27, 28	1		ad	n. d.		Asparagaceae
<i>Ornith. umbellatum</i> ssp. <i>umbellatum</i>	48.1	54 (16-104)	5	2C,	8	Gewone vogelmelk		Asparagaceae
<i>Ornithopus compressus</i>	1.23	14	2	2C, 4C, (8C)	3	Geel vogelpootje		Fabaceae
<i>Ornithopus perpusillus</i>	1.23	14	2	2C, 4C, (8C)	8	Klein vogelpootje		Fabaceae
<i>Ornithopus sativus</i>	1.19	14	1	2C, 4C, (8C)	cu	Serradelle		Fabaceae

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<i>Ornithopus x martinii</i> cf	1.26		1	2C, 4C, (8C)	1	Ornithopus compressus x perpus.	BZ	Fabaceae
<i>Orobanche amethystea</i>	5.40	38	1	2C	1	Violette bremraap	BZ	Orobanchaceae
<i>Orobanche caryophyllacea</i>	7.66	38	5	2C	5	Walstrobremaap		Orobanchaceae
<i>Orobanche elatior</i>		38			1	Centauriebremraap		Orobanchaceae
<i>Orobanche hederæ</i>	5.70	38	3	2C	1	Klimopbremraap		Orobanchaceae
<i>Orobanche lutea</i>	5.59	38	1	2C	2	Rode bremraap		Orobanchaceae
<i>Orobanche lucorum</i>	8.12	38	1	2C	cu	Zuurbesbremraap	BZ	Orobanchaceae
<i>Orobanche minor</i>	6.06	38	2	2C, 4C	5	Klavervreter		Orobanchaceae
<i>Orobanche picridis</i>	5.66	38	2	2C, (4C)	4	Bitterkruidbremraap		Orobanchaceae
<i>Orobanche purpurea*</i>	14.1	24	3	2C, (4C)	4	Blauwe bremraap		Orobanchaceae
<i>Orobanche ramosa</i>		24			0	Hennepvreter (on tomato)		Orobanchaceae
<i>Orobanche rapum-genistae</i>		38			4	Grote bremraap		Orobanchaceae
<i>Orobanche reticulata</i>	6.19	38	3	2C, (4C)	4	Distelbremraap		Orobanchaceae
<i>Orthilia secunda</i>		38			0	Eenzijdig wintergroen		Ericaceae
<i>Oryzopus miliacium</i>	0.86	24	1	2C, (4C)	ad	Smilogras	FL	Poaceae
<i>Osmanthus heterophyllus</i>	1.68	46	1	2C	cu	Schijnhulst	FL	Oleaceae
<i>Osmunda regalis*</i>	28.2	44	3	2C	7	Koningsvaren		Osmundaceae
<i>Ostrya carpinifolia</i>	0.81	16	1	2C	ad	Hopbeuk	BZ	Fagaceae
<i>Oxalis acetosella</i>	5.58	22	5	2C, (4C)	7	Witte klaverzuring		Oxalidaceae
<i>Oxalis corniculata</i>	2.41	24	6	2C	6	Gehoornde klaverzuring		Oxalidaceae
<i>Oxalis debilis</i>	2.11	14, 28	1	2C, 4C	1	Stippelklaverzuring	FL	Oxalidaceae
<i>Oxalis dillenii</i>	0.57	(16) 24	1	2C, 4C, 8C	1	Knobbel klaverzuring		Oxalidaceae
<i>Oxalis stricta</i>	2.17	(18) 24	1	2C	8	Stijve klaverzuring		Oxalidaceae
<i>Pachysandra terminalis</i>	3.75	48	1	2C	cu	Dikkemanskruid		Buxaceae
<i>Panicum barbipulvinatum</i>	0.89		2	2C, 4C, 8C	ad	Fijne draadgiert	FL	Poaceae
<i>Panicum capillare</i>	0.96	18	2	2C, 4C	ad	Draadgiert		Poaceae
<i>Panicum dichotomiflorum</i>	3.01	36, 54	1	2C, 4C	ad	Kale giert		Poaceae
<i>Panicum miliaceum</i>	2.11	36	3	2C, 4C	ad	Pluimgiert, Millet		Poaceae
<i>Panicum schinzii</i>	0.99	18	1	2C, 4C, 8C, 16C	ad	Zuid-Afrikaanse giert		Poaceae
<i>Papaver argemone</i> #	7.96	(12, 28) 42	3	2C, 4C	6	Ruige klapproos		Papaveraceae
<i>Papaver atlanticum</i>	2.36	14	2	2C, 4C, 8C	cu	Donzige klapproos		Papaveraceae
<i>Papaver dubium</i>	10.6	(14, 28) 42	7	2C, 4C	9	Bleke klapproos		Papaveraceae
<i>Papaver orientale*</i>	15.2	28, 42	2	2C, (4C)	cu	Reuzenklapproos		Papaveraceae
<i>Papaver rhoeas</i>	5.20	14	7	2C, 4C, 8C	8	Grote klapproos		Papaveraceae
<i>Papaver somniferum</i>	6.82	22	2	2C, 4C, 8C	cu	Slaapbol		Papaveraceae
<i>Papaver x exspectatum</i>					1	Papaver rhoeas x dubium		Papaveraceae
<i>Paradisja liliastrum</i>	7.80	30	5			Paradijslelie	BZ	Asparagaceae
<i>Parapholis strigosa</i>	13.0	28	2	2C, 4C, 8C	5	Dunstaart		Poaceae
<i>Parentucellia viscosa</i>	2.85	48	2	2C, 4C, 8C	5	Kleverige ogentroost		Orobanchaceae
<i>Parietaria judaica</i>	1.69	26	2	2C	5	Klein glaskruid		Urticaceae
<i>Parietaria lusitanica</i>	0.80	16 (20)	1	2C, 4C		n. d.	BZ	Urticaceae
<i>Parietaria officinalis</i>	1.01	14	3	2C, 4C, 8C	5	Groot glaskruid		Urticaceae
<i>Paris quadrifolia</i> haem.	109	60	4	2C	5	Eenbes		Melanthaceae
<i>Parnassia palustris</i>	2.69	18, 36	2	2C	6	Parnassia		Parnassiaceae
<i>Parthenocissus inserta</i>	1.79	40	1	2C	6	Valse wingerd		Vitaceae
<i>Parthenocissus quinquefolia</i>	2.39	40	2	2C	1	Vijfbladige wingerd		Vitaceae
<i>Parthenocissus tricuspidata</i>	1.30	40	2	2C	3	Oosterse wingerd		Vitaceae
<i>Passiflora coerulea</i>	2.99	18	3	2C, 4C	cu	Blauwe passiebloem	FL	Passifloraceae
<i>Pastinaca sativa</i> ssp. sativa	3.49	22	3	2C	9	Pastinaak		Apiaceae
<i>Pastinaca umbrosa</i> (as ssp. urens)	3.01	22	3	2C	1	Brandpastinaak		Apiaceae
<i>Paulownia tomentosa</i>	1.24	40	1	2C	cu	Anna Paulownaboorn		Paulowniaceae
<i>Pedicularis palustris</i>	4.70	16	2	2C, 4C, 8C	5	Moeraskartelblad		Orobanchaceae
<i>Pedicularis sylvatica</i>	5.19	16	1	2C	5	Heidekartelblad		Orobanchaceae
<i>Pennisetum alopecuroides</i>	1.99	22, 36	1	2C, 4C	cu	Lampenpoetsersgras	BZ	Poaceae
<i>Pennisetum glaucum</i>	4.47	14 (BZ: 36)	1	2C, 4C	cu	n. d.	BZ	Poaceae
<i>Pennisetum advena</i> 'Rubrum'	1.64	(18) 27 (54)	1	2C, 4C	cu	n. d.	BZ	Poaceae
<i>Pentaglottis sempervirens</i>	2.17	22	3	2C, 4C, 8C	5	Overblijvende ossentong		Boraginaceae
<i>Persicaria amphibia</i>	4.28	66, 88, 96	8	2C, (4C)	9	Veenwortel		Polygonaceae
<i>Persicaria amplexicaulis</i>	4.09	40	1	2C	cu	Doorgroeide duizendknoop	BZ	Polygonaceae
<i>Persicaria bistorta</i>	6.12	48	1	2C	6	Adderwortel		Polygonaceae
<i>Persicaria capitata</i>	2.05	22, 40	3	2C, (4C)	cu	Kogelduizendknoop		Polygonaceae
<i>Persicaria hydropiper</i>	1.82	20, 22	3	2C, (4C)	8	Waterpeper		Polygonaceae
<i>Persicaria lapathifolia</i>	1.71	22	2	2C, (4C)	9	Beklierde duizendknoop		Polygonaceae
<i>Persicaria lapath. ssp. brittingeri</i>	1.77	22	1	2C, (4C)		Oeverduizendknoop	BZ	Polygonaceae
<i>Persicaria maculosa</i>	3.48	44	4	2C, 4C	9	Perzikkruid		Polygonaceae
<i>Persicaria minor</i>	3.21	40	2	2C	6	Kleine duizendknoop		Polygonaceae
<i>Persicaria mitis</i>	3.59	40	2	2C, 4C	8	Zachte duizendknoop		Polygonaceae
<i>Persicaria pensylvanica</i>		22			1	Amerikaans perzikkruid		Polygonaceae
<i>Persicaria wallichii</i>	2.50	22	1	2C, 4C	4	Afgaans duizendknoop		Polygonaceae
<i>Petasites albus</i>	6.00	60	3	2C	cu	Wit hoefblad		Asteraceae
<i>Petasites hybridus</i>	6.18	60	2	2C	8	Groot hoefblad		Asteraceae
<i>Petasites japonicus</i>	10.9	60	1	2C	cu	Japans hoefblad		Asteraceae
<i>Petasites pyrenaicus</i>		52, 60			cu	Winterheliotroop	FL	Asteraceae
<i>Petrorhagia nanteuillii</i>	3.06	60	2	2C, 4C	ad	n. d.	BZ	Caryophyllaceae
<i>Petrorhagia prolifera</i>	1.34	30	3	2C, 4C, (8C)	3	Slanke mantelanjer		Caryophyllaceae
<i>Petrorhagia saxifraga</i>	1.76	60	1	2C, 4C	cu	Kleine mantelanjer		Caryophyllaceae
<i>Petroselinum crispum</i>	4.39	22	1	2C	cu	Peterselie		Apiaceae
<i>Petroselinum segetum</i>	2.95	16	1	2C, 4C	2	Wilde peterselie		Apiaceae
<i>Petunia x punctata</i>	2.98		1	2C, 4C, (8C)	cu	Petunia	BZ	Solanaceae
<i>Peucedanum carvifolia</i>	5.93	22	1	2C	4	Karwijvarkenskervel		Apiaceae
<i>Peucedanum officinale</i>	8.44	66	2	2C	1	Varkensvenkel		Apiaceae
<i>Peucedanum palustre</i>	9.29	22	1	2C	8	Melkeppe		Apiaceae

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Species (mainly Heukels Flora)	2C	Chrom. nr.	n	Peak	Status	Dutch name	new	family
<i>Phacelia tanacetifolia</i>	1.48	22	2	2C, 4C, 8C	cu	Phacelia		Boraginaceae
<i>Phalaris arundinacea</i>	10.2	28	6	2C, 4C	9	Rietgras		Poaceae
<i>Phalaris canariensis</i>	9.61	12	1	2C, 4C, 8C	cu	Kanariezaad		Poaceae
<i>Phaseolus coccineus</i>	1.72	22	1	2C, 4C, 8C	cu	Pronkboon		Fabaceae
<i>Phaseolus vulgaris</i>	1.37	22	9	2C, 4C, 8C, 16C	cu	Bruine boon etc		Fabaceae
<i>Phegopteris connectilis*</i>	14.2	90	1	2C	4	Smalle beukvaren		Thelypteridaceae
<i>Philadelphus coronarius</i>	2.57	26	2	2C	cu	Boerenjasmijn		Hydrangeaceae
<i>Phleum arenarium</i>	3.13	14	1	2C, 4C	7	Zanddoddegras		Poaceae
<i>Phleum pratense ssp. pratense</i>	8.47	42	3	2C	9	Timoteegras		Poaceae
<i>Phleum pratense ssp. serotinum</i>	8.78	42	1	2C	8	Klein timoteegras		Poaceae
<i>Phlomis russelliana</i>	10.0		2	2C	cu	Brandkruid		Fabaceae
<i>Phoenix dactylifera</i>	1.73	36	1	3C	cu	Dadel	FL	Arecaceae
<i>Phragmites australis</i>	2.26	36-96	3	2C, 4C, 8C	9	Riet		Poaceae
<i>Phuopsis stylosa</i>	2.17	20, 22	2	2C, 4C, 8C	cu	Kruisjesbloem	FL	Rubiaceae
<i>Physalis alkekengi</i>	5.05	24	2	2C, 4C, 8C	5	Lampionplant		Solanaceae
<i>Physalis ixiocarpa</i>	5.05	24	2	2C, 4C, 8C, 16C	ad	Tomatillo	FL	Solanaceae
<i>Physalis peruviana</i>	12.4	24, 48	3	2C, 4C, 8C	cu	Goudbes		Solanaceae
<i>Physocarpus opulifolius</i>	0.53	18	1	2C	cu	Blaasjesvrucht		Rosaceae
<i>Phyteuma spicatum ssp. nigrum</i>	2.47	22	6	2C, 4C, 8C	4	Zwartblauwe rapunzel		Campanulaceae
<i>Phyteuma spicatum ssp. spicatum</i>	2.45	22	6	2C, 4C, 8C	2	Witte rapunzel		Campanulaceae
<i>Phytolacca acinosa</i>	6.24	18, 36, 72	6	2C, 4C, (8C)	5	Karmozijnbes s.l.		Phytolaccaceae
<i>Phytolacca americana</i>	2.56	36	6	2C, 4C	4	Westerse karmozijnbes		Phytolaccaceae
<i>Phytolacca esculenta</i>	5.68	36, 72	6	2C, 4C	6	Oosterse karmozijnbes		Phytolaccaceae
<i>Picea abies</i>	40.7	24	2	2C	cu	Fijnspar		Pinaceae
<i>Picea omorika</i>	37.9	24	1	2C	cu	Servische spar		Pinaceae
<i>Picea orientalis</i>	36.7	24	2	2C	cu	Kaukasische spar		Pinaceae
<i>Picea pungens</i>	42.1	24	1	2C	cu	Blauwe spar		Pinaceae
<i>Picea sitchensis</i>	38.1	24	2	2C, (4C)	cu	Sitkaspar		Pinaceae
<i>Picris echioides</i>	1.57	10	3	2C	6	Dubbelkelk		Asteraceae
<i>Picris hieracioides</i>	2.91	10	4	2C	7	Echt bitterkruid		Asteraceae
<i>Pilularia globulifera*</i>	1.91	26	3	2C	5	Pilvaren		Marsileaceae
<i>Pimpinella anisum</i>	3.18	18, 20	2	2C, 3C, 4C, 6C,	cu	Anijs		Apiaceae
<i>Pimpinella major</i>	5.57	20	7	2C, 4C	7	Grote bevernel		Apiaceae
<i>Pimpinella saxifraga</i>	7.70	40	5	2C	7	Kleine bevernel		Apiaceae
<i>Pinguicula vulgaris #</i>	1.47	64	3	2C	3	Vetblad		Lentibulariaceae
<i>Pinus banksiana</i>	45.5	24	1	2C	cu	Struikden		Pinaceae
<i>Pinus mugo</i>	45.2	24	8	2C	cu	Bergden		Pinaceae
<i>Pinus nigra var. maritima 'Laricio'</i>	51.6	24	1	2C	cu	Corsicaanse den		Pinaceae
<i>Pinus nigra var. nigra</i>	51.3	24	13	2C	cu	Oostenrijkse den		Pinaceae
<i>Pinus pinaster</i>	57.8	24	2	2C	cu	Zeeden		Pinaceae
<i>Pinus strobus</i>	59.1	24	2	2C	cu	Weymouthden		Pinaceae
<i>Pinus sylvestris</i>	48.4	24	1	2C	8	Grove den		Pinaceae
<i>Pistia stratiotes</i>	0.88	28	1	2C,	ad	Watersla		Araceae
<i>Pisum sativum</i>	8.72	14	6	2C, 4C, 8C	cu	Erwt, capucijner, peultjes		Fabaceae
<i>Plantago asiatica</i>	3.43	(12) 24 (36)	3	2C, (4C)	cu	"Aziatische" weegbree	BZ	Plantaginaceae
<i>Plantago arenaria</i>	3.52	12	1	2C, (4C)	4	Zandweegbree		Plantaginaceae
<i>Plantago coronopus</i>	1.15	10	2	2C, 4C, 8C	7	Hertshoornweegbree		Plantaginaceae
<i>Plantago lanceolata</i>	2.76	12 (24)	4	2C, (4C)	9	Smalle weegbree		Plantaginaceae
<i>Plantago major ssp. intermedia</i>	1.47	12	3	2C	6	Getande weegbree		Plantaginaceae
<i>Plantago major ssp. major</i>	1.48	12	2	2C	9	Grote weegbree		Plantaginaceae
<i>Plantago maritima</i>	2.68	12 (24)	2	2C	6	Zeeweegbree		Plantaginaceae
<i>Plantago media</i>	5.51	(12) 24	3	2C	6	Ruige weegbree		Plantaginaceae
<i>Platanthera bifolia</i>	25.0	42	4	2C, 4C, 8C,	5	Welriekende nachtorchis		Orchidaceae
<i>Platanthera montana</i>	45.2		1	2C, 4C, 8C, 16C	3	Bergnachtorchis		Orchidaceae
<i>Platanus orientali</i>	4.26	42	3	2C	cu	Oosterse plataan		Platanaceae
<i>Platanus occidentalis</i>	4.18	42	1	2C	cu	Westerse plataan	BZ	Platanaceae
<i>Platanus x hispanica</i>	4.27	42	2	2C	cu	Platanus occidentalis x orientalis		Platanaceae
<i>Poa angustifolia</i>	8.27	42-72	1	2C	6	Smal beemdgras		Poaceae
<i>Poa annua (infrma x supina)</i>	4.21	28	10	2C, 4C	9	Straatgras		Poaceae
<i>Poa bulbosa</i>	7.40	28, 45	1	2C	5	Knolbeemdgras		Poaceae
<i>Poa chaixii</i>		14			2	Bergbeemdgras		Poaceae
<i>Poa compressa</i>	5.61	42	2	2C	7	Plat beemdgras		Poaceae
<i>Poa humilis</i>	10.9	54-109	3	2C, (4C)	9	Berijpt beemdgras	BZ	Poaceae
<i>Poa infirma</i>	2.84	14	9	2C, 4C, (8C)	ad	Vroeg beemdgras	BZ	Poaceae
<i>Poa nemoralis</i>	6.71	42, 56	1	2C	8	Schaduwgras		Poaceae
<i>Poa palustris</i>	3.07	14, 28, 42	1	2C	8	Moerasbeemdgras		Poaceae
<i>Poa pratensis #</i>	6.98	42-98	3	2C, 4C	9	Veldbeemdgras		Poaceae
<i>Poa trivialis</i>	3.48	14, 28	3	2C, 4C	9	Ruw beemdgras		Poaceae
<i>Polemonium coeruleum</i>	13.4	18	1	2C, (4C)	cu	Jakobs ladder		Polemoniaceae
<i>Polycarpon tetraphyllum</i>	1.44	54	6	2C, 4C	3	Kransmuur		Caryophyllaceae
<i>Polycnemon arvense</i>		18-54			1	Akkerknarkruid		Amaranthaceae
<i>Polycnemon majus</i>		54			0	Knarkruid		Amaranthaceae
<i>Polygala comosa</i>	1.05	34	4	2C, 4C, 8C	3	Kuifvleugeltjesbloem		Polygalaceae
<i>Polygala serpyllifolia</i>	0.83	34	1	2C, 4C, 8C	5	Liggende vleugeltjesbloem		Polygalaceae
<i>Polygala vulgaris</i>	1.88	68	2	2C, 4C	6	Gewone vleugeltjesbloem		Polygalaceae
<i>Polygonatum multiflorum</i>	20.5	18, 30	9	2C	8	Gewone salomonszegel		Asparagaceae
<i>Polygonatum odoratum</i>	23.2	26-30	8	2C	6	Welriekende salomonszegel		Asparagaceae
<i>Polygonatum verticillatum</i>	17.7	30, 84	2	2C, (4C)	1	Kranssalomonszegel		Asparagaceae
<i>Polygonatum x hybridum</i>		19, 28			cu	<i>Polyg. multiflorum x odoratum</i>		Asparagaceae
<i>Polygonum aviculare ssp. demersum</i>	1.73	40	24	2C, 4C	ad	n. d.	BZ	Polygonaceae
<i>Polygonum aviculare ssp. aviculare</i>	2.55	60	30	2C, 4C	9	Gewoon varkensgras		Polygonaceae
<i>Polygonum maritimum</i>		20			0	Strandvarkensgras		Polygonaceae



A	B	C	D	E	F	G	H	I
Species (mainly Heukels Flora)	2C	Chrom. nr.	n	Peak	Status	Dutch name	new	family
<i>Polygonum oxyspermum</i> ssp. raii	1.95	40	9	2C, 4C	1	Zandvarkensgras		Polygonaceae
<i>Polypodium cambriticum</i> *	16.1	74	4	2C		Zuidelijke eikvaren	BZ	Polypodiaceae
<i>Polypodium interjectum</i> *	44.5	222	39	2C	5	Brede eikvaren		Polypodiaceae
<i>Polypodium vulgare</i> *	29.0	148	33	2C	7	Gewone eikvaren		Polypodiaceae
<i>Polypodium x mantoniae</i> *	37.9	185	16	2C	6	<i>Polypodium interjectum</i> x <i>vulgare</i>		Polypodiaceae
<i>Polypodium vulgare</i> x ( <i>xmantoniae</i> )* cf	33.9	BZ: 165	7	2C	7	<i>Polyp. vulgare</i> x ( <i>interj.</i> x <i>vulg.</i> )	BZ	Polypodiaceae
<i>Polypogon fugax</i>	10.7	42	2	2C	1	n. d.	BZ	Poaceae
<i>Polypogon monspeliensis</i>	7.95	28	1	2C, 4C	ad	Baardgras		Poaceae
<i>Polypogon viridis</i>	7.08	28	7	2C, 4C	3	Kransgras		Poaceae
<i>Polystichum aculeatum</i> *	28.2	164	8	2C	4	Stijve naaldvaren		Dryopteraceae
<i>Polystichum lonchitis</i> *	13.5	82	1	2C	2	Lansvaren		Dryopteraceae
<i>Polystichum luctuosum</i> *	15.9	123	2	2C	1	n. d.	FL	Dryopteraceae
<i>Polystichum polyblepharum</i> *	35.7	164	3	2C	1	Glansschildvaren	BZ	Dryopteraceae
<i>Polystichum setiferum</i> *	15.4	82 (164)	25	2C	2	Zachte naaldvaren		Dryopteraceae
<i>Polystichum x bicknellii</i> *	21.8	123	7	2C	ad	<i>Polystichum aculeatum</i> x <i>setiferum</i>	FL	Dryopteraceae
<i>Pontederia cordata</i>	1.34	16	2	2C	cu	Moerashyacint		Pontederiaceae
<i>Populus alba</i>	0.96	38, 57	1	2C	8	Witte abeel		Salicaceae
<i>Populus balsamifera</i>	1.06	38, 76	1	2C, (4C)	cu	Ontariopopulier		Salicaceae
<i>Populus nigra</i> 'Italica'	1.00	38	1	2C	cu	Italiaanse populier		Salicaceae
<i>Populus nigra</i>	1.01	38	2	2C	6	Zwarte populier		Salicaceae
<i>Populus tremula</i>	0.96	38	8	2C, (4C)	8	Ratelpopulier		Salicaceae
<i>Populus trichocarpa</i>	1.00	38	1	2C, (4C)	cu	Zwarte balsempopulier		Salicaceae
<i>Populus x canescens</i>	1.49	38, 57	4	2C	6	Grauwe abeel <i>Pop. alba</i> x <i>tremula</i>		Salicaceae
<i>Populus x canadensis</i> 'Serotina'	1.02	38	1	2C		<i>Populus deltoides</i> x <i>nigra</i>		Salicaceae
<i>Portulaca oleracea</i>	2.72	18, 54	4	2C, 4C, 8C, 16C	6	Postelein		Portulacaceae
<i>Potamogeton acutifolius</i>	1.02	26	2	2C, 4C, 8C	6	Spits fonteinkruid		Potamogetonaceae
<i>Potamogeton alpinus</i> #	0.97	26, 52	3	2C, 4C, 8C	5	Rossig fonteinkruid		Potamogetonaceae
<i>Potamogeton berchtoldii</i>	1.08	26	1	2C, 4C, 8C	3	Klein fonteinkruid		Potamogetonaceae
<i>Potamogeton coloratus</i>		26			2	Weegbreefonteinkruid		Potamogetonaceae
<i>Potamogeton compressus</i>		26			6	Plat fonteinkruid		Potamogetonaceae
<i>Potamogeton crispus</i>	1.68	26-78	3	2C, 4C, (8C)	8	Gekroesd fonteinkruid		Potamogetonaceae
<i>Potamogeton filiformis</i>		66, 78			1	Draadfonteinkruid		Potamogetonaceae
<i>Potamogeton gramineus</i>	1.78	52	5	2C, 4C	5	Ongelijkbladig fonteinkruid		Potamogetonaceae
<i>Potamogeton lucens</i> #	1.79	52	5	2C, 4C	7	Glanzig fonteinkruid		Potamogetonaceae
<i>Potamogeton friesii</i>	0.99	26	2	2C, 4C, (8C)	6	Puntig fonteinkruid		Potamogetonaceae
<i>Potamogeton natans</i>	1.85	42, 52	2	2C, 4C, (8C)	8	Drijvend fonteinkruid		Potamogetonaceae
<i>Potamogeton nodosus</i>	1.54	52	1	2C, 4C, (8C)	4	Rivierfonteinkruid		Potamogetonaceae
<i>Potamogeton obtusifolius</i> #	0.96	26	2	2C, 4C, (8C)	6	Stomp fonteinkruid		Potamogetonaceae
<i>Potamogeton pectinatus</i>	1.94	42, 78	2	2C, 4C	8	Schedefonteinkruid		Potamogetonaceae
<i>Potamogeton perfoliatus</i>	1.76	26-78	1	2C, 4C, (8C)	7	Doorgroeid fonteinkruid		Potamogetonaceae
<i>Potamogeton polygonifolius</i>	1.00	28	3	2C, 4C, (8C)	5	Duizendknoopfonteinkruid		Potamogetonaceae
<i>Potamogeton praelongus</i>		52			3	Langstengelig fonteinkruid		Potamogetonaceae
<i>Potamogeton</i> sp.	0.93		1	2C, 4C, (8C)		n. d.	BZ	Potamogetonaceae
<i>Potamogeton pusillus</i>	0.64	26, 28	1	2C, 4C, (8C)	6	Tenger fonteinkruid		Potamogetonaceae
<i>Potamogeton trichoides</i>	1.00	26	1	2C, 4C, (8C)	8	Haarfonteinkruid		Potamogetonaceae
<i>Potamogeton x angustifolius</i> / <i>gramineus</i>	1.75		1	2C, 4C	1	<i>Potamogetum gramineus</i> x <i>lucens</i>		Potamogetonaceae
<i>Potamogeton x decipiens</i>	1.86		1	2C, 4C, (8C)	1	<i>Potam. lucens/ crispus</i> x <i>prael/perfoliata</i>		Potamogetonaceae
<i>Potamogeton x fluitans</i>		52			1	<i>Potamogetum lucens</i> x <i>natans</i>		Potamogetonaceae
<i>Potamogeton x lintonii</i> cf	2.09		2	2C, 4C, (8C)	1	<i>Potam. mucronatus</i> x <i>crispus</i>		Potamogetonaceae
<i>Potamogeton x nitens</i>	1.80	52	1	2C, 4C, (8C)		<i>Potam. pectinatus</i> x <i>crispus</i>	BZ	Potamogetonaceae
<i>Potamogeton x sparganifolius</i> cf	1.94		2	2C, 4C	1	<i>Potam. gramineus</i> x <i>natans</i>		Potamogetonaceae
<i>Potentilla alba</i>	1.59	28	1	2C	ad	n. d.	FL	Rosaceae
<i>Potentilla anglica</i>	2.10	56	1	2C, 4C	8	Kruipganzerik		Rosaceae
<i>Potentilla anserina</i> #	1.08	28 (35) 42	10	2C, 4C	9	Zilver schoon		Rosaceae
<i>Potentilla argentea</i> #	0.45	14	2	2C, 4C	7	Viltganzerik		Rosaceae
<i>Potentilla erecta</i>	1.49	28	4	2C, (4C)	8	Tormentil		Rosaceae
<i>Potentilla</i> (now <i>Dasiphora</i> ) <i>fruticosa</i>	0.92	28	1	2C	cu	Struikganzerik	FL	Rosaceae
<i>Potentilla indica</i> #	3.52	42, 84	8	2C, 4C	cu	Schijnaardbei		Rosaceae
<i>Potentilla intermedia</i>	2.15	28, 42, 56	1	2C, 4C	6	Middelste ganzerik		Rosaceae
<i>Potentilla micrantha</i> cf	0.83	12, 14	1	2C, 4C	ad	n. d.		Rosaceae
<i>Potentilla norvegica</i>	1.68	42, 56, 70	1	2C, 4C	6	Noorse ganzerik		Rosaceae
<i>Potentilla recta</i>	1.11	28, 42	3	2C, (4C)	6	Rechte ganzerik		Rosaceae
<i>Potentilla reptans</i>	1.38	28	1	2C, 4C	9	Vijfvingerkruid		Rosaceae
<i>Potentilla sterilis</i> #	0.54	(14) 28 (42)	1	2C, 4C, 8C	5	Aardbeiganzerik		Rosaceae
<i>Potentilla supina</i>	0.82	28, 42	3	2C, 4C, 8C	6	Liggende ganzerik		Rosaceae
<i>Potentilla tabernaemontani</i>	1.77	42-70	2	2C, 4C	5	Voorjaarsganzerik		Rosaceae
<i>Potentilla x suberecta</i>		42			1	<i>Potentilla anglica</i> x <i>erecta</i>		Rosaceae
<i>Pratia</i> zie <i>Lobelia</i>						n. d.		
<i>Primula elatior</i>	1.13	22	5	2C, 4C, 8C, 16C	6	Slanke sleutelbloem		Primulaceae
<i>Primula veris</i>	0.98	22	4	2C, 4C, 8C, 16C	5	Gulden sleutelbloem		Primulaceae
<i>Primula vulgaris</i>	1.01	22	2	2C, 4C, 8C, 16C	4	Stengelloze sleutelbloem		Primulaceae
<i>Prunella vulgaris</i>	1.12	28	1	2C	9	Gewone brunel		Lamiaceae
<i>Prunella grandiflora</i>	1.56	28	2	2C	ad	Grote brunel	FL	Lamiaceae
<i>Prunus avium</i> #	0.84	16	7	2C, 4C, 8C	cu	Zoete kers		Rosaceae
<i>Prunus cerasifera</i>	0.63	16	2	2C, 4C	5	Kerspruim (black leaf)		Rosaceae
<i>Prunus cerasus</i>	1.72	32	1	2C	ad	Zure kers (Morel)		Rosaceae
<i>Prunus domestica</i>	2.11	48	7	2C, 4C	cu	Pruim		Rosaceae
<i>Prunus incisa</i> 'Kojou-no-may'	0.61	16	2	2C, (4C)	cu	Fujikers	FL	Rosaceae
<i>Prunus laurocerasus</i>	7.90	144, c. 175	5	2C,	cu	Laurierkers		Rosaceae
<i>Prunus mahaleb</i>	0.68	16	3	2C, (4C)	cu	Weichselboom		Rosaceae
<i>Prunus padus</i>	1.21	32	1	2C, 4C	9	Gewone vogelkers		Rosaceae
<i>Prunus serotina</i>	1.05	32	3	2C, (4C)	9	Amerikaanse vogelkers		Rosaceae

A	B	C	D	E	F	G	H	I
Species (mainly Heukels Flora)	2C	Chrom. nr.	n	Peak	Status	Dutch name	new	family
<i>Prunus spinosa</i>	1.42	32	5	2C, 4C	8	Sleedoom		Rosaceae
<i>Prunus virginiana</i>	1.14	16	2	2C	ad	Kleine vogelkers	FL	Rosaceae
<i>Prunus x fruticans</i>		16			1	<i>Prunus domestica</i> x <i>spinosa</i>		Rosaceae
<i>Pseudofumaria alba</i>	0.77	28, 32	2	2C, 4C, 8C, 16C	2	Geelwitte helmbloem		Papaveraceae
<i>Pseudofumaria lutea</i>	1.37	28, 56	1	2C, 4C, 8C, 16C	5	Gele helmbloem		Papaveraceae
<i>Pseudorchis albida</i>		40, 42			0	Witte muggenorchis		Orchidaceae
<i>Pseudosasa japonica</i>	6.56	48	2	2C, 4C	cu	Japane bamboe		Poaceae
<i>Pseudotsuga menziesii</i>	35.2	26	1	2C	cu	Douglas spar		Pinaceae
<i>Pteridium aquilinum*</i>	16.6	104, 156	1	2C, 4C	8	Adelaarsvaren		Dennstaedtiaceae
<i>Pteris cretica* cf</i>	19.3	58-174	2	2C, 4C	cu	Lintvaren		Pteridaceae
<i>Pterocarya fraxinifolia</i>	1.39	32	2	2C	cu	Kaukasische Vleugelnoot	FL	Juglandaceae
<i>Puccinellia distans</i> ssp. <i>borealis</i>		28			3	Bleek kweldergras		Poaceae
<i>Puccinellia distans</i> ssp. <i>distans</i>	8.70	42	1	2C	7	Stomp kweldergras		Poaceae
<i>Puccinellia fasciculata</i>		28			4	Blauw kweldergras		Poaceae
<i>Puccinellia maritima</i>	10.7	56	1	2C	6	Gewoon kweldergras		Poaceae
<i>Puccinellia rupestris</i>		42			0	Dichtbloemig kweldergras		Poaceae
<i>Pulicaria dysenterica</i>	2.08	18	2	2C	8	Heelblaadjes		Asteraceae
<i>Pulicaria vulgaris</i>	1.84	18	1	2C	6	Klein vlooienkruid		Asteraceae
<i>Pulmonaria longifolia</i> 'Cebenense'	3.99	14	2	2C, (4C)	1	Langbladig longkruid	BZ	Boraginaceae
<i>Pulmonaria montana</i>	4.27	22	2	2C, 4C	1	Smal longkruid		Boraginaceae
<i>Pulmonaria obscura</i>		14			ad	Ongevekt longkruid		Boraginaceae
<i>Pulmonaria officinalis</i>	3.15	16	4	2C, 4C, 8C	6	Gevlekt longkruid		Boraginaceae
<i>Pulmonaria rubra</i>	2.45	14	1	2C, 4C, 8C	1	Rood longkruid	FL	Boraginaceae
<i>Pulsatilla vulgaris</i>	26.2	32	3	2C	0	Wildemanskruid		Ranunculaceae
<i>Puschkinia scilloides</i>	14.0	10	1		cu	Buishyacynth	HD	Asparagaceae
<i>Pyracantha coccinea</i> 'Orange Glow'	1.38	34	1	2C	cu	Vuurdoorn	HD	Rosaceae
<i>Pyrola minor</i>	8.43	46	1	2C	5	Klein wintergroen		Ericaceae
<i>Pyrola rotundifolia</i>	7.12	46	1	2C, 3C	6	Rond wintergroen		Ericaceae
<i>Pyrus communis</i>	1.24	34	17	2C	5	Peer		Rosaceae
<i>Pyrus pyraeaster</i>	1.23	34	1	2C	cu	Wilde peer	FL	Rosaceae
<i>Quercus cerris</i>	1.90	24	3	2C	cu	Moseik		Fagaceae
<i>Quercus palustris</i>	1.69	24	3	2C	cu	Moereseik		Fagaceae
<i>Quercus petraea</i>	2.05	24	2	2C	6	Wintereik		Fagaceae
<i>Quercus pubescens</i>	1.95	24	2	2C	cu	Donzige eik		Fagaceae
<i>Quercus robur</i>	2.01	24	2	2C	9	Zomereik		Fagaceae
<i>Quercus rubra</i>	1.74	24	3	2C	8	Amerikaanse eik		Fagaceae
<i>Quercus x hispanica</i>	1.73	24	1	2C		<i>Quercus cerris</i> x <i>suber</i>		Fagaceae
<i>Quercus x rosacea cf</i>	2.20	24	1	2C	cu	<i>Quercus petraea</i> x <i>robur</i>		Fagaceae
<i>Radiola linoides</i>	1.06	18	2	2C, 4C, 8C	5	Dwergglas		Linaceae
<i>Ranunculus acris</i>	9.20	14	4	2C, 4C	9	Scherpe boterbloem		Ranunculaceae
<i>Ranunculus aquatilis</i> ssp. <i>aquatilis</i>	7.19	(32) 48	3	2C,	6	Fijne waterranonkel		Ranunculaceae
<i>Ranunculus aquatilis</i> ssp. <i>diffusus</i> #	10.6	32	2	2C, 4C, 8C	2	Kleine waterranonkel	BZ	Ranunculaceae
<i>Ranunculus arvensis</i>	13.3	32	1	2C, 4C	2	Akkerboterbloem		Ranunculaceae
<i>Ranunculus auricomus</i>	14.6	32	6	2C, 4C	5	Gulden boterbloem		Ranunculaceae
<i>Ranunculus baudotii*</i>	14.8	(16) 32	2	2C,	5	Zilte waterranonkel		Ranunculaceae
<i>Ranunculus bulbosus</i> #	11.0	16	4	2C, 4C	7	Knolboterbloem		Ranunculaceae
<i>Ranunculus circinatus</i>	5.94	16	1	2C, 4C, 8C	7	Stijve waterranonkel		Ranunculaceae
<i>Ranunculus flammula</i>	12.5	32	7	2C, (4C)	9	Egelboterbloem		Ranunculaceae
<i>Ranunculus fluitans</i>		16, 32			3	Vlottende waterranonkel		Ranunculaceae
<i>Ranunculus hederaceus</i> #	4.04	16	5	2C, 4C	5	Klimopwaterranonkel		Ranunculaceae
<i>Ranunculus lingua</i>	49.8	128	3	2C,	7	Grote boterbloem		Ranunculaceae
<i>Ranunculus muricatus</i> A	26.1	48, 64	2	2C	1	Ruige boterbloem cf	BZ	Ranunculaceae
<i>Ranunculus muricatus</i> B	20.6	48, 64	4	2C	1	Ruige boterbloem cf	BZ	Ranunculaceae
<i>Ranunculus ololeucos</i>		16, 32			4	Witte waterranonkel		Ranunculaceae
<i>Ranunculus omiophyllus</i>		16, 32			0	Drijvende waterranonkel		Ranunculaceae
<i>Ranunculus parviflorus</i>	6.60	14, 28	2	2C, 4C, 8C	ad	Kleine boterbloem	FL	Ranunculaceae
<i>Ranunculus peltatus</i> ssp. <i>peltatus</i>	7.64	16, 32, 48	1	2C	6	Grote waterranonkel		Ranunculaceae
<i>Ranunculus peltatus</i> ssp. <i>heterophyllus</i>					1	Penseelbladige waterranonkel		Ranunculaceae
<i>Ranunculus polyanthemus</i> ssp. <i>memorosus</i>	18.4	16	1		0	Bosboterbloem		Ranunculaceae
<i>Ranunculus polyanthemus</i> ssp. <i>polyanthemoides</i>		16			1	Kalkboterbloem		Ranunculaceae
<i>Ranunculus repens*</i>	19.4	32	3	2C, 4C	9	Kruipende boterbloem		Ranunculaceae
<i>Ranunculus sardous</i>	6.33	16	2	2C, 4C	6	Behaarde boterbloem		Ranunculaceae
<i>Ranunculus sceleratus</i>	7.22	32	2	2C,	9	Blaartrekkende boterbloem		Ranunculaceae
<i>Ranunculus tripartitus</i>		48			0	Driedelige waterranonkel		Ranunculaceae
<i>Raphanus raphanistrum</i>	1.15	18	4	2C, 4C, 8C	8	Knopherik		Brassicaceae
<i>Raphanus sativus</i> #	1.22	18	6	2C, 4C, 8C, 16C	cu	Radijs /ramenas		Brassicaceae
<i>Rapistrum rugosum</i>	1.25	16	1	2C, (4C)	6	Bolletjesraket		Brassicaceae
<i>Reseda lutea</i>	2.06	48	2	2C, 4C, 8C	7	Wilde reseda		Resedaceae
<i>Reseda luteola</i>	1.33	26	2	2C, 3C	7	Wouw		Resedaceae
<i>Reseda odorata</i>	0.96	12	2	2C, 4C, 8C	1	n. d.	FL	Resedaceae
<i>Rhamnus cathartica</i>	0.98	24	3	2C, (4C)	7	Wegedoorn		Rhamnaceae
<i>Rhamnus frangula</i>	0.71	20	1	2C, (4C)	8	Sporkehout		Rhamnaceae
<i>Rheum x rhabarbarum</i>	9.55	44	1	2C, 4C,	cu	Tuinrabarber		Polygonaceae
<i>Rhinanthus alectorolophus</i>	2.57	22	1	2C, 4C, 8C	4	Harige ratelaar		Orobanchaceae
<i>Rhinanthus angustifolius</i>	2.70	22	2	2C, 4C, 8C	7	Grote ratelaar		Orobanchaceae
<i>Rhinanthus minor</i>	2.85	22	2	2C, 4C, 8C	6	Kleine ratelaar		Orobanchaceae
<i>Rhinanthus x fallax</i>					1	<i>Rhinanthus angustifolius</i> x <i>minor</i>		Orobanchaceae
<i>Rhododendron ponticum</i>	1.61	26	1	2C	7	Pontische rhododendron		Ericaceae
<i>Rhus radicans</i>	0.91	30	1	2C	cu	Gifsumak, poison ivy		Anacardiaceae
<i>Rhus typhina</i>	0.86	30	4	2C	7	Azijnboom, fluweelboom		Anacardiaceae
<i>Rhynchospora alba</i>	0.45	26	1	2C	6	Witte snavelbies		Cyperaceae
<i>Rhynchospora fusca</i>	0.51	26	1	2C	6	Bruine snavelbies		Cyperaceae

A	B	C	D	E	F	G	H	I
Species (mainly Heukels Flora)	2C	Chrom. nr.	n	Peak	Status	Dutch name	new	family
<i>Ribes alpinum</i>	2.00	16	2	2C	5	Alpenbes		Grossulariaceae
<i>Ribes nigrum</i>	2.04	16	1	2C	8	Zwarte bes		Grossulariaceae
<i>Ribes odoratum</i>	1.96	16	1	2C	cu	Gele ribes		Grossulariaceae
<i>Ribes rubrum</i> 'Domesticum'	2.03	16	8	2C	8	Aalbes		Grossulariaceae
<i>Ribes sanguineum</i>	1.84	16	1	2C	cu	Rode ribes		Grossulariaceae
<i>Ribes speciosum</i>	2.23		1			n. d.	BZ	Grossulariaceae
<i>Ribes spicatum</i>	1.94	16	1	2C	1	Noordse aalbes		Grossulariaceae
<i>Ribes uva-crispa</i>	1.87	16	4	2C	8	Kruisbes		Grossulariaceae
<i>Ricinus communis</i>	0.85	20	3	2C, 4C	cu	Wonderboom		Euphorbiaceae
<i>Rohdea japonica</i> haem.	95.1	38, c. 76	1	2C		Japanse lelie	BZ	Asparagaceae
<i>Robinia pseudoacacia</i>	1.58	20	1	2C, 4C	8	Robinia		Fabaceae
<i>Rorippa amphibia</i>	1.14	16, 32	3	2C, 4C	9	Gele kers		Brassicaceae
<i>Rorippa austriaca</i>	0.44	16	1	2C, 4C, 8C	6	Oostenrijkse kers		Brassicaceae
<i>Rorippa palustris</i>	1.18	32	1	2C, 4C, 8C	9	Moeraskers		Brassicaceae
<i>Rorippa sylvestris</i>	1.45	32, 48	2	2C, 4C, 8C	8	Akkerkers, kiek		Brassicaceae
<i>Rorippa islandica</i> cf	1.07	16, 32	1	2C, 4C, 8C		n. d.	BZ	Brassicaceae
<i>Rorippa x anceps</i>		32, 40			2	Rorippa amphibia x sylvestris		Brassicaceae
<i>Rorippa x armoracioides</i>		32			2	Rorippa austriaca x sylvestris		Brassicaceae
<i>Rosa agrestis</i>	3.58	35, 42	1	2C, (4C)	1	Kraagroos		Rosaceae
<i>Rosa arvensis</i>	1.14	14	1	2C, (4C)	4	Bosroos		Rosaceae
<i>Rosa balsamica</i>	3.47	35	2	2C, (4C)	2	Beklierde heggenroos		Rosaceae
<i>Rosa canina</i>	2.89	35	4	2C, (4C)	9	Hondsroos		Rosaceae
<i>Rosa corymbifera</i>	3.00	35	4	2C, (4C)	2	Heggenroos		Rosaceae
<i>Rosa dumalis</i>	2.79	35	1	2C, (4C)	2	Kale struweelroos		Rosaceae
<i>Rosa elliptica</i>	2.81	35, 42	2	2C,	1	Wigbladige roos	BZ	Rosaceae
<i>Rosa gallica officinalis</i>	2.31	28	1	2C, (4C)	cu	Franse roos		Rosaceae
<i>Rosa glauca</i> #	2.06	28	4	2C, (4C)	cu	Bergroos		Rosaceae
<i>Rosa henkeri-schulzei</i>	2.74	35 (c. 42)	1	2C, (4C)	2	Schijnegelantier		Rosaceae
<i>Rosa 'Hollandica' (x rugosa)</i>	0.99		1	2C, (4C)	cu	Hollandse rimpelroos		Rosaceae
<i>Rosa inodora</i>	2.84	42	4	2C, (4C)	cu	Schijnkraagroos		Rosaceae
<i>Rosa majalis</i> #	0.96	14, 21	2	2C, (4C)	3	Kaneelroos		Rosaceae
<i>Rosa micrantha</i>	2.82	35, 42	1	2C, (4C)	2	Kleinbloemige roos		Rosaceae
<i>Rosa multiflora</i> #	1.16	14	2	2C, (4C)	cu	Veelbloemige roos		Rosaceae
<i>Rosa nitida</i>		14		2C, (4C)	cu	Glanzende roos	FL	Rosaceae
<i>Rosa pseudoscabruscula</i>	2.93	35	2	2C, (4C)	2	Schijnviltroos (syn of villosa)		Rosaceae
<i>Rosa rubiginosa</i>	2.80	35	3	2C, (4C)	6	Egelantier		Rosaceae
<i>Rosa rugosa</i>	1.08	14, 28	4	2C, 4C, 8C	8	Rimpelroos		Rosaceae
<i>Rosa sherardii</i>	2.72	28, 35, 42	1	2C, (4C)	1	Berijpte viltroos (syn of villosa)		Rosaceae
<i>Rosa spinosissima</i>	1.99	28	2	2C, (4C)	6	Duinroos		Rosaceae
<i>Rosa spinosissima</i> ssp. altaica	1.97	28	1	2C, (4C)		Duinroos		Rosaceae
<i>Rosa tomentosa</i>	2.81	35	1	2C, (4C)	4	Viltroos (syn of villosa)		Rosaceae
<i>Rosa villosa</i>	2.17	28, 56	2	2C, (4C)	4	Bottelroos		Rosaceae
<i>Rosa virginiana</i>	1.99	28	1	2C,	ad	Virginische roos		Rosaceae
<i>Rosa caesia</i>	2.68	35	1	2C, (4C)		Behaarde struweelroos	BZ	Rosaceae
<i>Rosa subcanina</i>	2.81	35	1	2C, (4C)		Schijnhondsroos	BZ	Rosaceae
<i>Rosa subcollina</i>	2.81	35, 42	2	2C, (4C)		Schijnheggenroos	BZ	Rosaceae
<i>Rosmarinus officinalis</i>	2.64	24	4	2C, (4C)	cu	Rozemarijn		Lamiaceae
<i>Rostraria cristata</i>	7.49	26	1	2C	1	Klein fakkeldgras		Poaceae
<i>Rubia tinctorum</i>	3.36	22, 44	1	2C, 4C, 8C	1	Meekrap		Rubiaceae
<i>Rubus caesius</i>	1.47	28, 35	4	2C, (4C)	9	Dauwbraam		Rosaceae
<i>Rubus camtostachys</i>	1.46	28	1	2C, 4C		Bleke randbraam	HD	Rosaceae
<i>Rubus canduliger</i>	1.16	28	1	2C, 4C		Lichtende viltbraam	HD	Rosaceae
<i>Rubus dejonghii</i>	1.49	28	1	2C, 4C		Bleke contrastbraam	HD	Rosaceae
<i>Rubus drenthicus</i>	1.80	28	1	2C, 4C		Bruine bermbraam	HD	Rosaceae
<i>Rubus geniculatus</i>	1.47	28	1	2C, 4C		Knieviktbraam	HD	Rosaceae
<i>Rubus glandithyrso</i>	1.44	28	1	2C, 4C		Rode contrastbraam	HD	Rosaceae
<i>Rubus idaeus</i>	0.69	14-42	3	2C, (4C)	8	Framboos		Rosaceae
<i>Rubus luticola</i>	2.31	42	1	2C, 4C		Groene speerbraam	HD	Rosaceae
<i>Rubus macrophyllus</i>	1.51	28	1	2C		Bolle haarbraam	HD	Rosaceae
<i>Rubus mucronulatus</i>	1.55	28	1	2C		Fijne tandbraam	HD	Rosaceae
<i>Rubus nelliae</i>	1.53	28	1	2C, 4C		Hartviltbraam	HD	Rosaceae
<i>Rubus nemoralis</i>	1.46	28	1	2C, (4C)	cu	Zandhaagbraam		Rosaceae
<i>Rubus nessensis</i>	1.38	28	4	2C, 4C		Vroege roggebraam	HD	Rosaceae
<i>Rubus odoratus</i>	0.74	14	1	2C, (4C)	cu	Roodbloeiende framboos		Rosaceae
<i>Rubus phoenicolasius</i>	0.72	14	1	2C, (4C)	cu	Japanse wijnbes		Rosaceae
<i>Rubus plicatus</i>	1.47	28	1	2C, 4C		Geplooide stokbraam	HD	Rosaceae
<i>Rubus raduloides</i>	1.50	28	1	2C, 4C		Arsenaalbraam	HD	Rosaceae
<i>Rubus rosaceus</i>	1.41	28	1	2C, 4C		Rode borstelbraam	HD	Rosaceae
<i>Rubus rudis</i>	1.52	28	1	2C, 4C		Ruwe raspbraam	HD	Rosaceae
<i>Rubus saxatilis</i>	1.49	28	2	2C, (4C)	1	Steenbraam		Rosaceae
<i>Rubus scissus</i>	1.45	28	1	2C, 4C		Naaldroggebraam	HD	Rosaceae
<i>Rubus silvaticus</i>	1.40	28	1	2C		Donkere pluimbraam	HD	Rosaceae
<i>Rubus spectabilis</i>	0.57	14	2	2C, 4C, 8C	5	Prachtframboos		Rosaceae
<i>Rubus sprengelii</i>	1.49	28	1	2C		Rode grondbraam	HD	Rosaceae
<i>Rubus ulmifolius</i>	0.77	14	1	2C, 4C		Koebraam	HD	Rosaceae
<i>Rubus vestitus</i>	1.66	28	1	2C		Fraaie kambaam	HD	Rosaceae
<i>Rubus x idaeoides</i>					1	Basterd framboos	FL	Rosaceae
<i>Rudbeckia fulgida</i> * cf #	8.41	30, 38, 76	6	2C	cu	Rudbeckia	BZ	Asteraceae
<i>Rudbeckia hirta</i> * cf #	4.64	38	3	2C	cu	Ruige rudbeckia		Asteraceae
<i>Rudbeckia laciniata</i> * #	10.6	36-102	3	2C	4	Slipbladige rudbeckia		Asteraceae
<i>Rudbeckia rugosa</i> cf	2.33		2	2C	cu	n. d.	BZ	Asteraceae
<i>Rumex acetosa ambiguus</i>	6.91	BZ: 14/15	2	2C, 4C, 8C	cu	Tuinzuring	BZ	Polygonaceae

A	B	C	D	E	F	G	H	I
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<i>Rumex acetosa</i>	6.85	14/15	1	2C, 4C, 8C	9	Veldzuring		Polygonaceae
<i>Rumex acetosella</i>	5.03	28, 42	2	2C, 4C	9	Schapenzuring		Polygonaceae
<i>Rumex aquaticus</i>		140 (200)			0	Paardenzuring		Polygonaceae
<i>Rumex conglomeratus</i>	1.54	18, 20, 40	3	2C, 4C, 8C	8	Kluwenzuring		Polygonaceae
<i>Rumex crispus</i>	4.44	(40) 60	1	2C, 4C	9	Krulzuring		Polygonaceae
<i>Rumex hydrolapathum*</i>	15.2	130, 200	6	2C, 4C	9	Waterzuring		Polygonaceae
<i>Rumex longifolius</i>	8.46	60	1	2C	1	Noordse zuring		Polygonaceae
<i>Rumex maritimus</i>	2.25	40	3	2C, 4C, 8C	7	Goudzuring		Polygonaceae
<i>Rumex obtusifolius</i>	2.64	40	2	2C, 4C, 8C, 16C	9	Ridderzuring		Polygonaceae
<i>Rumex palustris</i>	3.81	(40) 60	2	2C, 4C	7	Moeraszuring		Polygonaceae
<i>Rumex patientia</i>	4.76	(40) 60	2	2C, 4C	cu	Spinaziezuring		Polygonaceae
<i>Rumex salicifolius</i>	1.38	20	3	2C, 4C, 8C	ad	Wilgzuring		Polygonaceae
<i>Rumex sanguineus</i>	1.50	20	2	2C, 4C, 8C	7	Bloedzuring		Polygonaceae
<i>Rumex scutatus</i>	2.24	20	1	2C, 4C, 8C	3	Spaanse zuring		Polygonaceae
<i>Rumex stenophyllus</i>	3.85	(20, 22) 60	4	2C, 4C	ad	n. d.		Polygonaceae
<i>Rumex thyrsoflorus female</i>	7.18	14	4	2C, 4C, 8C	6	Geoorde zuring		Polygonaceae
<i>Rumex thyrsoflorus male</i>	7.15	15	4	2C, 4C, 8C	6	Geoorde zuring		Polygonaceae
<i>Rumex x pratensis</i>	3.72		1	2C, 4C, 8C	5	<i>Rumex crispus</i> x <i>obtusifolius</i>		Polygonaceae
<i>Ruppia cirrhosa</i>	5.63	20, 40, 60	1	2C, 4C, 8C	3	Spiraalruppia		Ruppiaceae
<i>Ruppia maritima</i>	2.82	20	2	2C, 4C, 8C	3	Snavelruppia		Ruppiaceae
<i>Ruscus aculeatus</i>	22.2	40	1	2C	cu	Stekelige muizendoorn	FL	Asparagaceae
<i>Ruta graveolens</i>	1.16	72-80	2	2C,	cu	Wijnruit		Rutaceae
<i>Sagina apetala</i>	0.95	12	6	2C, 4C, 8C	5	Donkere vetmuur		Caryophyllaceae
<i>Sagina maritima #</i>	0.77	28	1	2C, 4C, 8C	5	Zeevetmuur		Caryophyllaceae
<i>Sagina micropetala</i>	0.97	12	4	2C, 4C	4	Uitstaande vetmuur		Caryophyllaceae
<i>Sagina nodosa</i>	1.13	56	3	2C, 4C	6	Sierlijke vetmuur		Caryophyllaceae
<i>Sagina procumbens</i>	0.79	22	6	2C, 4C, (8C)	9	Liggende vetmuur		Caryophyllaceae
<i>Sagina subulata</i>	0.93	22	1	2C, 4C, 8C, 16C	cu	Priemvetmuur		Caryophyllaceae
<i>Sagittaria latifolia</i>	32.4	22	1		cu	Breed pijlkruid		Alismataceae
<i>Sagittaria sagittifolia</i>	42.0	16, 20, 22	11	2C, (4C)	8	Pijlkruid		Alismataceae
<i>Salicornia europaea</i> ssp. <i>europaea</i> #	1.27	18	14	2C, 4C, 8C	6	Kortarige zeekraal		Amaranthaceae
<i>Salicornia europaea</i> ssp. <i>brachystachya</i>	2.57	36	2	2C, 4C		n. d.		Amaranthaceae
<i>Salicornia pusilla</i> (europaea?)	1.26	18	6	2C, 4C, 8C, 16C	0	Eenbloemige zeekraal		Amaranthaceae
<i>Salicornia procumbens</i>	2.51	36	14	2C, 4C, (8C)	6	Langarige zeekraal		Amaranthaceae
<i>Salicornia perennans</i>	1.95	18	4	2C, 4C, 8C	cu	import Israel/Chili	BZ	Amaranthaceae
<i>Salix alba</i>	1.74	76	2	2C	9	Schietwilg		Salicaceae
<i>Salix aurita</i> #	1.70	38, 76	2	2C, (4C)	9	Geoorde wilg		Salicaceae
<i>Salix babylonica</i> "Tortuosa"	1.71	76	2		cu	Krulwilg		Salicaceae
<i>Salix caprea</i> #	0.91	38, 76	6	2C, (4C)	9	Boswilg		Salicaceae
<i>Salix cinerea</i> ssp. <i>cinerea</i>	0.92	76	1	2C, 4C	9	Grauwe wilg		Salicaceae
<i>Salix cinerea</i> ssp. <i>oleifolia</i>		76			3	Rossige wilg		Salicaceae
<i>Salix daphnoides</i>	0.89	38	1	2C	cu	Berijpte wilg		Salicaceae
<i>Salix elaeagnos</i>	0.76	38	1	2C		n. d.		Salicaceae
<i>Salix eriocephala</i>	0.91	38	2	2C, 4C	2	n. d.		Salicaceae
<i>Salix myrsinifolia</i>	2.45	114	4	2C		n. d.		Salicaceae
<i>Salix pentandra</i>	1.83	76	1	2C	6	Laurierwilg		Salicaceae
<i>Salix purpurea</i>	0.95	38	2	2C, (4C)	7	Bittere wilg		Salicaceae
<i>Salix repens</i>	0.87	38	2	2C, (4C)	8	Kruipwilg		Salicaceae
<i>Salix repens</i> var. <i>argentea</i>	0.89	38	1	2C, (4C)	6	Kruipwilg (dunes)		Salicaceae
<i>Salix udensis</i> 'Sekka'	0.94	38	2	2C	cu	Bandwilg		Salicaceae
<i>Salix triandra</i>	0.84	38, 44, 88	1	2C, (4C)	8	Amandelwilg		Salicaceae
<i>Salix viminalis</i>	0.83	38	1	2C, (4C)	8	Katwilg		Salicaceae
<i>Salix x charrieri</i> cf	1.76		1	2C, (4C)	1	<i>Salix aurita</i> x <i>cinerea</i> <i>oleifolia</i>	FL	Salicaceae
<i>Salix x dasyclados</i>	2.24	76 (114)	1	2C	6	Duitse dot (capr. x ciner. x vimin)		Salicaceae
<i>Salix x eriocephala</i>	0.81	38	2	2C, (4C)	--	Amerikaantje	FL	Salicaceae
<i>Salix x doniana</i>	0.91		1	2C, 4C	1	<i>Salix purpurea</i> x <i>repens</i>	BZ	Salicaceae
<i>Salix x fragilis</i>	1.66	76	2	2C, 4C	8	Kraakwilg		Salicaceae
<i>Salix x friesiana</i>	0.87		1	2C, 4C	1	<i>Salix repens</i> x <i>viminalis</i>	FL	Salicaceae
<i>Salix x holoserica</i>	0.83	57	1	2C, (4C)	1	<i>Salix cinerea</i> x <i>viminalis</i>	FL	Salicaceae
<i>Salix x molissima</i> #	0.89	38	2	2C, 4C	2	<i>Salix triandra</i> x <i>viminalis</i>		Salicaceae
<i>Salix x multinervis</i>	0.87		2	2C, 4C	7	<i>Salix aurita</i> x <i>cinerea</i>		Salicaceae
<i>Salix x reichardtii</i>			2		2	<i>Salix caprea</i> x <i>cinerea</i>		Salicaceae
<i>Salix x rubens</i>	1.68	76	2	2C, (4C)	6	<i>Salix alba</i> x <i>fragilis</i>		Salicaceae
<i>Salix x rubra</i>	0.87	38	1	2C	2	<i>Salix purpurea</i> x <i>viminalis</i>		Salicaceae
<i>Salix x sepulcralis</i> 'Chrysocoma'	1.60	76	1		cu	Treurwilg	hd	Salicaceae
<i>Salix x smithiana</i>	0.88	38, 41	2	2C, 4C	3	<i>Salix caprea</i> x <i>viminalis</i>		Salicaceae
<i>Salsola kali</i>	3.31	36	4	2C, 4C, 8C	6	Stekend loogkruid		Amaranthaceae
<i>Salsola soda</i>	2.90	18 (36)	1	2C, 4C, 8C	cu	Japanse zeekraal	BZ	Amaranthaceae
<i>Salsola tragus</i>	3.02	36	4	2C, 4C, 8C	3	Zacht loogkruid		Amaranthaceae
<i>Salvia hispanica</i>	0.96	12	2	2C, 4C, (8C)	cu	Chia		Amaranthaceae
<i>Salvia nemorosa</i>	1.13	14	1	2C, 4C, 8C	cu	Bossalie		Lamiaceae
<i>Salvia officinalis</i>	1.18	14	1	2C, 4C	cu	Echte salie		Lamiaceae
<i>Salvia pratensis</i>	1.57	16, 18	1	2C, 4C,	5	Veldsalie		Lamiaceae
<i>Salvia verbenaca</i> #	3.23	14-64	3	2C, 4C, 8C	1	Kleinbloemige salie		Lamiaceae
<i>Salvia verticillata</i> #	2.83	16 (32)	5	2C, 4C,	3	Kranssalie		Lamiaceae
<i>Salvinia auriculata*</i>	4.53	45	2	2C	cu	Grote vlotvaren		Salviniaceae
<i>Salvinia natans*</i>	2.77	18, 36	1	2C	cu	Kleine vlotvaren		Salviniaceae
<i>Salvinia natans</i> x <i>auriculata*</i> cf	3.67	BZ: 31	1	2C		n. d.		Salviniaceae
<i>Sambucus canadensis</i>	24.7	36	2	2C	cu	Canadese vlier		Adoxaceae
<i>Sambucus ebulus</i>	24.7	36	2	2C	4	Kruidvlier		Adoxaceae
<i>Sambucus nigra</i> (incl. 'Laciniata')	26.5	36	6	2C, (4C)	9	Gewone vlier		Adoxaceae
<i>Sambucus racemosa</i>	24.9	36	3	2C	8	Trosvlier		Adoxaceae

A	B	C	D	E	F	G	H	I
Species (mainly Heukels Flora)	2C	Chrom. nr.	n	Peak	Status	Dutch name	new	family
<i>Samolus valerandi</i>	1.29	26	3	2C, (4C)	7	Waterpunge		Primulaceae
<i>Sanguisorba minor</i> ssp. <i>balearica</i>		28			ex	Moespimpernel		Rosaceae
<i>Sanguisorba minor</i> ssp. <i>minor</i>	1.20	28	3	2C, 4C	5	Kleine pimpernel		Rosaceae
<i>Sanguisorba officinalis</i> #	2.38	28, 56	5	2C, 4C	7	Grote pimpernel		Rosaceae
<i>Sanicula europaea</i>	2.65	16	4	2C	4	Heelkruid		Apiaceae
<i>Sanvitalia procumbens</i>	2.91	16	1	2C	cu	Huzarenknoop	FL	Asteraceae
<i>Saponaria ocymoides</i>	4.28	28	2	2C, 3C	cu	Muurzeepkruid		Caryophyllaceae
<i>Saponaria officinalis</i>	4.58	28	2	2C, (4C)	7	Zeepekkruid		Caryophyllaceae
<i>Satureja hortensis</i>	3.47	48	1	2C, (4C)	cu	Bonekruid		Lamiaceae
<i>Sauromatum venosum</i>	11.7	26 (52, 104)	1	2C, 4C, 8C	cu	n. d.	FL	Araceae
<i>Saxifraga granulata</i>	4.97	32, 48	2	2C, (4C)	5	Knolsteenbreek		Saxifragaceae
<i>Saxifraga hirculus</i>		16, 28, 32			0	Bokjessteenbreek		Saxifragaceae
<i>Saxifraga tridactylites</i>	1.34	22	7	2C	6	Kandelartaarje		Saxifragaceae
<i>Scabiosa columbaria</i>	2.51	16	2	2C, 4C, 8C	4	Duifkruid		Caprifoliaceae
<i>Scandix pecten-veneris</i>	1.41	16	1	2C	2	Naaldenkervel		Apiaceae
<i>Scheuchzeria palustris</i>		22			1	Veenbloembies		Scheuchzeriaceae
<i>Schoenoplectus lacustris</i>	1.23	42	2	2C	8	Mattenbies		Cyperaceae
<i>Schoenoplectus mucronatus</i>		44			1	Ribbelbies		Cyperaceae
<i>Schoenoplectus pungens</i>	1.07	74, 78	1	2C	2	Stekende bies		Cyperaceae
<i>Schoenoplectus tabernaemontani</i>	1.24	42	2	2C	7	Ruwe bies		Cyperaceae
<i>Schoenoplectus triquetet</i>	1.17	40, 42	1	2C	4	Driekantige bies		Cyperaceae
<i>Schoenoplectus x carinatus</i>					1	<i>Schoenoplectus lacustris</i> x <i>triqueter</i>		Cyperaceae
<i>Schoenoplectus x kueckenthalianus</i>	1.28		1	2C	1	<i>Schoenoplectus tabern.</i> x <i>triqueter</i>		Cyperaceae
<i>Schoenus nigricans</i>	1.80	44	1	2C, 4C	5	Knopbies		Cyperaceae
<i>Scilla bifolia</i>	9.60	'6, 18, 36, 5-	1	2C	5	Vroege sterhyacint		Asparagaceae
<i>Scilla mischtschenkoana</i>	51.6	12	2	2C	cu	Streephyacint	FL	Asparagaceae
<i>Scilla siberica</i>	75.4	12, 18	2	2C	5	Oosterse sterhyacint		Asparagaceae
<i>Scirpoides holoschoenus</i>	0.55	164, 168	2	2C	1	Kogelbies		Cyperaceae
<i>Scirpus sylvaticus</i>	0.75	62	2	2C	8	Bosbies		Cyperaceae
<i>Scleranthus annuus</i> ssp. <i>annuus</i>	4.07	44	3	2C, (4C)	8	Eenjarige hardbloem s.s.		Caryophyllaceae
<i>Scleranthus annuus</i> ssp. <i>polycarpus</i>	3.97	44	1	2C, 4C	2	Kleine hardbloem		Caryophyllaceae
<i>Scleranthus perennis</i>	2.02	22	1	2C, 4C, 8C	4	Overblijvende hardbloem		Caryophyllaceae
<i>Scorzonera hispanica</i>	4.96	14 (28)	1	2C	ad	Grote schorseneer		Asteraceae
<i>Scorzonera humilis</i> cf	11.8	14	3	2C	3	Kleine schorseneer		Asteraceae
<i>Scrophularia auriculata</i>	3.27	78, 80	4	2C, (4C)	5	Geoord helmkruid		Scrophulariaceae
<i>Scrophularia canina</i>	1.30	26	1	2C, (4C)	0	Hondshelmkruid		Scrophulariaceae
<i>Scrophularia nodosa</i>	1.54	36	1	2C	8	Knopig helmkruid		Scrophulariaceae
<i>Scrophularia umbrosa</i>	2.84	26, 52	1	2C,	5	Gevleugeld helmkruid		Scrophulariaceae
<i>Scrophularia vernalis</i> #	1.74	28, 40	2	2C, 4C	5	Voorjaarshelmkruid		Scrophulariaceae
<i>Scutellaria altissima</i>	0.83	34	2	2C, 3C	ad	Groot glidkruid	FL	Lamiaceae
<i>Scutellaria columnae</i>	0.68	34	1	2C,	3	Trosglidkruid		Lamiaceae
<i>Scutellaria galericulata</i>	0.78	30, 32	3	2C	9	Blauw glidkruid		Lamiaceae
<i>Scutellaria minor</i>		c32			4	Klein glidkruid		Lamiaceae
<i>Scutellaria x hybrida</i>					1	<i>Scutellaria galericulata</i> x <i>minor</i>		Lamiaceae
<i>Secale cereale</i> 'Petkuss Spring'*	15.5	14	1	2C	cu	Rogge		Poaceae
<i>Securigera varia</i>	3.33	24	2	2C, 4C	5	Bont kroonkruid		Fabaceae
<i>Sedum acre</i>	2.91	80	10	2C, 4C, 8C,	8	Muurpeper		Crassulaceae
<i>Sedum album</i> #	1.11	32-136	12	2C, 4C, 8C,	7	Wit vetkruid		Crassulaceae
<i>Sedum cepaea</i>	0.91	20, 22	1	2C, 4C, 8C, 16C	cu	Omgebogen vetkruid		Crassulaceae
<i>Sedum dasylphyllum</i> 'Mesatlanticum'	0.57	28, 42, 56	1	2C, 4C, 8C, 16C	ad	Dik vetkruid		Crassulaceae
<i>Sedum forsterianum</i>	4.96	24-84	2	2C, 4C	0	Sierlijk vetkruid		Crassulaceae
<i>Sedum hispanicum</i>	0.93	14-42	4	2C, 4C, 8C, 16C	cu	Spaans vetkruid	FL	Crassulaceae
<i>Sedum hybridum</i> cf #	2.96	64	1	2C, 4C, 8C		Kruipend vetkruid	HD	Crassulaceae
<i>Sedum kamschaticum</i>		32, 48, 64				Kamtsjatka-vetkruid	HD	Crassulaceae
<i>Sedum rupestre</i>	4.04	34-112	3	2C, 4C, 8C,	5	Tripmadam		Crassulaceae
<i>Sedum sarmentosum</i>	1.30	58	1	2C, 4C, 8C, 16C	cu	Driebladvetkruid		Crassulaceae
<i>Sedum sediforme</i>	4.39	32, 64, 96	1	2C, 4C, 8C, 16C	cu	n. d.	BZ	Crassulaceae
<i>Sedum sexangulare</i>	1.90	72, 74, 108	1	2C, 4C, 8C	6	Zacht vetkruid		Crassulaceae
<i>Sedum spectabile</i>	3.60	50, 51	5	2C, 4C, 8C	cu	Roze hemelsleutel		Crassulaceae
<i>Sedum spurium</i>	4.38	28	3	2C, 4C, 8C	cu	Roze vetkruid		Crassulaceae
<i>Sedum stoloniferum</i>	1.76	14, 28	2	2C, 4C, 8C	cu	n. d.	BZ	Crassulaceae
<i>Sedum telephium</i> #	2.28	24, 26	8	2C, 4C, 8C	8	Hemelsleutel		Crassulaceae
<i>Sedum</i> 'Herbstfreude'	3.49		1	2C, 4C, 8C, 16C	cu	<i>Sedum spectabile</i> x <i>telephium</i>		Crassulaceae
<i>Selaginella kraussiana</i>	0.40	20	1	2C, (4C)	ad	Gazonmosvarentje	FL	Selaginellaceae
<i>Selinum carvifolia</i>		22			2	Karwijselie		Apiaceae
<i>Sempervivum arachnoideum</i>	0.65	32, 48, 64	1	2C, 4C, 8C	cu	Spinnewebhuislook	BZ	Crassulaceae
<i>Sempervivum montanum</i> #	0.62	42, 84	3	2C, 4C, 8C		Berghuislook		Crassulaceae
<i>Sempervivum montanum</i> ssp. <i>burnatii</i>	1.01	BZ: 57	3	2C, 4C, 8C		Grote berghuislook	BZ	Crassulaceae
<i>Sempervivum tectorum</i>	1.52	72	5	2C, 4C, 8C	cu	Huislook		Crassulaceae
<i>Sempervivum x barbulatum</i>		BZ: 37				<i>Semp. arachnoideum.</i> x <i>montanum</i>	BZ	Crassulaceae
<i>Senecio inaequidens</i>	3.05	40	5	2C, (4C)	8	Bezemkruid		Asteraceae
<i>Senecio nemorensis</i>	10.7	40	4	2C	5	Schaduwkruid		Asteraceae
<i>Senecio sarracenicus</i>	13.0	40	1	2C	5	Rivierkruid		Asteraceae
<i>Senecio squalidus</i>	1.00	20	1	2C, 4C, (8C)	ad	Glanzend kruiskruid		Asteraceae
<i>Senecio sylvaticus</i>	4.35	40	1	2C	5	Boskruid		Asteraceae
<i>Senecio vernalis</i>		20, 40			5	Oostelijk kruiskruid		Asteraceae
<i>Senecio viscosus</i>	4.75	40	1	2C	8	Kleverig kruiskruid		Asteraceae
<i>Senecio vulgaris</i>	3.47	40	5	2C	9	Klein kruiskruid		Asteraceae
<i>Senecio vulgaris</i> var. <i>hibernicus</i>		40			ad	n. d.		Asteraceae
<i>Senecio x helwingii</i>					0	<i>Senecio vernalis</i> x <i>vulgaris</i>		Asteraceae
<i>Serratula tinctoria</i>	3.33	22	1	2C	0	Zaagblad		Asteraceae
<i>Seseli montanum</i>	2.73	22	1	2C	0	Bergseselie		Apiaceae

A	B	C	D	E	F	G	H	I
Species (mainly Heukels Flora)	2C	Chrom. nr.	n	Peak	Status	Dutch name	new	family
<i>Seseli libanotis</i>	5.60	18, 22	1	2C	ad	Hertswortel	FL	Apiaceae
<i>Sesleria albicans</i>	9.55	28	1	2C	0	Blauwgras		Poaceae
<i>Setaria faberi</i>	2.59	36	1	2C, 4C, 8C	7	Chinese naalbaar		Poaceae
<i>Setaria italica</i>	1.17	18	4	2C, 4C, 8C	ad	Trosgierst		Poaceae
<i>Setaria pumila</i>	2.57	36, 72	2	2C, 4C	6	Geelrode naalbaar		Poaceae
<i>Setaria verticilliformis</i>	1.86	36	1	2C, 4C	ad	Gladde kransnaalbaar	FL	Poaceae
<i>Setaria verticillata</i>	1.92	18, 36, 54	2	2C, 4C	7	Kransnaalbaar		Poaceae
<i>Setaria viridis</i>	1.05	18, 36	2	2C, (4C)	8	Groene naalbaar		Poaceae
<i>Sherardia arvensis</i>	1.16	22	2	2C, 4C, 8C, 16C	6	Blauw walstro		Rubiaceae
<i>Sigesbeckia orientalis</i>	5.51	30	1	2C	ad	n. d.	BZ	Asteraceae
<i>Silaum silaus</i>	6.68	22	1	2C	4	Weidekervel		Apiaceae
<i>Silene armeria</i>	2.91	24	5	2C, 4C, 8C	ad	Pekbloem		Caryophyllaceae
<i>Silene baccifera* #</i>	14.3	24	5	2C, (4C)	3	Besanjelier		Caryophyllaceae
<i>Silene coeli-rosa</i>	1.89	24	1	2C, 4C, 8C	cu	Hemelroosje		Caryophyllaceae
<i>Silene conica</i>	1.93	20, 24	2	2C, 4C	5	Kegelsilene		Caryophyllaceae
<i>Silene coronaria</i>	6.36	24	1	2C, 4C, 8C	cu	Prikneus		Caryophyllaceae
<i>Silene dichotoma</i>	2.96	24, 48	2	2C, 4C	ad	Gaffelsilene		Caryophyllaceae
<i>Silene dioica</i>	5.54	24 (48)	5	2C, 4C, 8C	9	Dagkoekoeksbloem		Caryophyllaceae
<i>Silene flos-cuculi</i>	5.38	24	1	2C, 4C, 8C	8	Echte koekoeksbloem		Caryophyllaceae
<i>Silene gallica</i>	2.15	24	4	2C, 4C, 8C	1	Franse silene		Caryophyllaceae
<i>Silene latifolia</i> ssp. alba	5.55	24	7	2C, 4C, 8C, 16C	8	Avondkoekoeksbloem		Caryophyllaceae
<i>Silene noctiflora</i>	4.75	24	2	2C, 4C, 8C	2	Nachtkoekoeksbloem		Caryophyllaceae
<i>Silene nutans</i>	5.31	24	5	2C, 4C, 8C	4	Nachtsilene		Caryophyllaceae
<i>Silene otites</i>	5.23	24	1	2C, 4C, 8C	4	Oorsilene		Caryophyllaceae
<i>Silene viscaria</i>	4.54	24	1	2C, 3C	cu	Rode pekanjer		Caryophyllaceae
<i>Silene vulgaris</i>	2.28	24	1	2C, 4C, 8C	6	Blaasilene		Caryophyllaceae
<i>Silene vulgaris</i> on zink	2.35	24	1	2C, 4C, 8C	1	Blaasilene		Caryophyllaceae
<i>Silene x hampeana</i>	8.02	BZ: 36	1	2C, 4C	2	Silene dioica x latifolia		Caryophyllaceae
<i>Silphium asteriscus</i> *var. latifolius	16.5	14	1	2C		n. d.	BZ	Asteraceae
<i>Silybum marianum</i>	1.71	34	2	2C	ad	Mariadistel		Asteraceae
<i>Sinapis alba</i>	1.12	24	6	2C, 4C, 8C	cu	Witte mosterd		Brassicaceae
<i>Sinapis arvensis</i>	2.21	18	1	2C, 4C, 8C	8	Herik		Brassicaceae
<i>Sisymbrium altissimum</i>	0.55	14	1	2C, 4C, 8C	8	Hongaarse raket		Brassicaceae
<i>Sisymbrium austriacum</i> ssp. chrysanthum	0.65	14	1	2C, 4C, 8C	5	Maasraket		Brassicaceae
<i>Sisymbrium irio</i>	0.68	14-56	2	2C, 4C, 8C, 16C	ad	Brede raket		Brassicaceae
<i>Sisymbrium loeselii</i>	0.53	14	1	2C, 4C, 8C, 16C	ad	Spiesraket		Brassicaceae
<i>Sisymbrium officinale</i>	0.65	14	2	2C, 4C, 8C	9	Gewone raket		Brassicaceae
<i>Sisymbrium orientale</i>	0.61	14	2	2C, 4C, 8C, 16C	5	Oosterse raket		Brassicaceae
<i>Sisymbrium strictissimum</i>	1.59	14, 28	2	2C, 4C, 8C, 16C	ad	n. d.	BZ	Brassicaceae
<i>Sisymbrium supinum</i>		42			0	Liggende raket		Brassicaceae
<i>Sisymbrium volgense</i>	0.65	14	1	2C, 4C, 8C, 16C	4	Spiesraket	FL	Brassicaceae
<i>Sisyrinchium bermudiana</i>	2.21	64, 88, 96	4	2C, 4C	cu	Ruslelie		Iridaceae
<i>Sisyrinchium californicum</i>	9.80	32	4	2C, 4C, 8C	cu	Gele bieslelie	FL	Iridaceae
<i>Sium latifolium</i>	5.38	20	1	2C	8	Grote waterpeppe		Apiaceae
<i>Skimmia japonica</i>	5.18	30 (60)	4	2C	cu	n. d.	HD	Rutaceae
<i>Smyrniolum olusatrum</i>	7.51	22	1	2C	1	Zwartmoeskervel		Apiaceae
<i>Smyrniolum perfoliatum</i>	5.45	22	2	2C	1	Doorwaskervel		Apiaceae
<i>Solanum americanum</i>	2.56	24	2	2C, 4C, 8C	1	n. d.	BZ	Solanaceae
<i>Solanum dulcamara</i>	2.32	24	2	2C, 4C, 8C	9	Bitterzoet		Solanaceae
<i>Solanum lycopersicum</i>	1.99	24	9	2C, 4C, 8C	cu	Tomaat+Roma		Solanaceae
<i>Solanum nigrum</i> ssp. nigrum	7.08	24-72	4	2C, 4C, 8C	9	Zwarte nachtschade		Solanaceae
<i>Solanum nigrum</i> ssp. schultesii	6.99	72	2	2C	4	Beklierde nachtschade		Solanaceae
<i>Solanum physalifolium</i>	3.66	16	2	2C, 4C	4	Glansbesnachtschade		Solanaceae
<i>Solanum pseudocapsicum</i>	2.71	24	2	2C, 4C	cu	Oranjeboompje		Solanaceae
<i>Solanum sarrachoides</i>	3.25	24	2	2C, 4C, 8C	1	Kleverige nachtschade		Solanaceae
<i>Solanum triflorum</i>	3.41	24	3	2C, 4C, 8C	5	Driebloemige nachtschade		Solanaceae
<i>Solanum tuberosum</i>	3.82	48	6	2C, 4C, 8C	cu	Aardappel		Solanaceae
<i>Solanum villosum</i>	4.83	48	1	2C, 4C	1	Donsnachtschade	BZ	Solanaceae
<i>Soleirolia soleirolii</i>	1.15	20	1	2C, (4C)	cu	Slaapkamergeluk		Urticaceae
<i>Solidago canadensis</i> ssp. altissima	5.61	54	1	2C	--	n. d.	BZ	Asteraceae
<i>Solidago canadensis</i>	2.14	18, 36, 54	4	2C, (4C)	7	Canadese guldenroede		Asteraceae
<i>Solidago gigantea</i>	3.81	18, 36, 54	6	2C	8	Late guldenroede		Asteraceae
<i>Solidago virgaurea</i>	1.92	18	3	2C	6	Echte guldenroede		Asteraceae
<i>Soliva sessilis</i>	3.81	110	2	2C	ad	Naalzaadbloem	BZ	Asteraceae
<i>Sonchus arvensis</i>	9.29	54	3	2C	9	Aktermelkdistel		Asteraceae
<i>Sonchus arvensis</i> var. maritimus	9.23	54	3	2C	7	Aktermelkdistel (duin)		Asteraceae
<i>Sonchus asper</i>	1.58	18	2	2C, (4C)	9	Gekroesde melkdistel		Asteraceae
<i>Sonchus oleraceus</i> #	3.29	32	2	2C	9	Gewone melkdistel		Asteraceae
<i>Sonchus palustris</i>	3.79	18 (54)	2	2C	7	Moerasmelkdistel		Asteraceae
<i>Sorbaria sorbifolia</i>	1.05	36	1	2C, (4C)	cu	Lijsterbesspiraea		Rosaceae
<i>Sorbaria tomentosa</i> ssp. angustifolia cf	1.11		1	2C, (4C)	cu	Harige sorbaria		Rosaceae
<i>Sorbus aria</i>	2.24	34	1	2C, (4C)	cu	Meelbes		Rosaceae
<i>Sorbus aucuparia</i>	1.54	34	1	2C	9	Wilde lijsterbes		Rosaceae
<i>Sorbus domestica</i>	1.65	34	1	2C	ad	Tamme lijsterbes	FL	Rosaceae
<i>Sorbus torminalis</i>	1.74	34	1	2C	cu	Elsbes	FL	Rosaceae
<i>Sorbus intermedia</i>	2.91	68	2	2C,	cu	Zweedse meelbes		Rosaceae
<i>Sorbus x thuringiaca</i> cf	1.41	34	1	2C, (4C)	cu	Gedeelde meelbes		Rosaceae
<i>Sorghum bicolor</i>	1.80	20	7	2C, 4C, 8C	ad	Sorgo, Kafferkoorn		Poaceae
<i>Sorghum halepense</i>	3.72	20, 40	1	2C, 4C	4	Wilde sorgo		Poaceae
<i>Sparganium angustifolium</i>	1.35	30	5	2C	3	Drijvende egelskop		Sparganiaceae
<i>Sparganium emersum</i>	1.16	30	1	2C	8	Kleine egelskop		Sparganiaceae
<i>Sparganium erectum</i>	1.07	30	3	2C	9	Grote egelskop		Sparganiaceae

A	B	C	D	E	F	G	H	I
Species (mainly Heukels Flora)	2C	Chrom. nr.	n	Peak	Status	Dutch name	new	family
<i>Sparganium natans</i>	1.04	30	1	2C	4	Kleinste egelskop		Sparganiaceae
<i>Spartina x anglica</i>	7.95	120-124	7	2C	6	Engels slijkgras		Poaceae
<i>Spartina maritima</i>		6=60			1	Klein slijkgras		Poaceae
<i>Spartina x townsendii</i>	4.02	62 (49-66)	2	2C, 4C	6	<i>Spartina alterniflora</i> x <i>maritima</i>		Poaceae
<i>Spartium junceum</i>	2.63	48, 52, 54	1	2C	cu	Spaanse brem	FL	Fabaceae
<i>Spergula arvensis</i>	0.91	18	1	2C, 4C, 8C, 16C	9	Gewone spurrie		Caryophyllaceae
<i>Spergula morisonii</i>	0.40	18	1	2C, (4C)	7	Heidespurrie		Caryophyllaceae
<i>Spergularia media</i>	0.58	18	4	2C, 4C, 8C	6	Gerande schijnspurrie		Caryophyllaceae
<i>Spergularia rubra</i>	1.17	36	3	2C, 4C, 8C	8	Rode schijnspurrie		Caryophyllaceae
<i>Spergularia salina</i>	0.62	36	2	2C, 4C, 8C	8	Zilte schijnspurrie		Caryophyllaceae
<i>Spergularia segetalis</i>		18			0	Korenschijnspurrie		Caryophyllaceae
<i>Spinacea oleracea</i>	2.08	12	2	2C, 4C, 8C, 16C	cu	Spinazie wild		Amaranthaceae
<i>Spiraea chamaedryfolia</i>		18, 32, 36			cu	Struikspiraea		Rosaceae
<i>Spiraea douglasii</i>	1.09	36	2	2C	cu	Douglasspirea		Rosaceae
<i>Spiraea japonica</i>	0.85	14, 18, 34	1	2C, (4C)	cu	Japane spiraea	FL	Rosaceae
<i>Spiraea salicifolia</i>	1.18	36	2	2C	cu	Theeboompje	FL	Rosaceae
<i>Spiraea tomentosa cf</i>	1.49	36	1	2C	cu	Viltige spirea		Rosaceae
<i>Spiraea x billardii cf</i>	1.18		2	2C	ex	<i>Spiraea salicifolia</i> x <i>douglasii</i>		Rosaceae
<i>Spiranthes aestivalis</i>		30			0	Zomerschroeforchis		Orchidaceae
<i>Spiranthes spiralis*</i>	16.2	30	1	2C, 4C, 8C	1	Herfstschroeforchis		Orchidaceae
<i>Spirodela polyrhiza</i>	0.37	40	12	2C	9	Veelwortelig kroos		Araceae
<i>Sporobolus indicus ssp. indicus</i>	3.44	36	1	2C, 4C	ad	Rattenstaartgras	FL	Poaceae
<i>Stachys alpina</i>		30			1	Alpenandoorn		Lamiaceae
<i>Stachys annua</i>		34			ad	Zomerandoorn		Lamiaceae
<i>Stachys arvensis</i>	0.92	10	3	2C	6	Akkerandoorn		Lamiaceae
<i>Stachys byzantina</i>	1.78	30	1	2C, 4C	ad	Wollige andoorn	FL	Lamiaceae
<i>Stachys officinalis cf</i>	9.36	16	1	2C	3	Betonie		Lamiaceae
<i>Stachys palustris</i>	3.82	64 (96, 102)	7	2C, (4C)	9	Moerasandoorn		Lamiaceae
<i>Stachys recta zlg</i>	1.83	(32) 34 (48)	2	2C, 4C	1	Bergandoorn		Lamiaceae
<i>Stachys sylvatica</i>	2.55	64	1	2C, 4C	8	Bosandoorn		Lamiaceae
<i>Stachys x ambigua</i>		83			6	<i>Stachys palustris</i> x <i>sylvatica</i>		Lamiaceae
<i>Staphylea pinnata</i>	3.63	24, 26	2	2C, 4C	cu	Pimpernoot		Staphyleaceae
<i>Stellaria graminea</i>	1.94	26	3	2C, 4C, (8C)	8	Grasmuur		Caryophyllaceae
<i>Stellaria holostea</i>	2.44	26	2	2C, 4C, 8C, 16C	8	Grote muur		Caryophyllaceae
<i>Stellaria media</i>	2.06	44	6	2C, 4C, 8C	9	Vogelmuur		Caryophyllaceae
<i>Stellaria neglecta</i>	2.67	22	3	2C, 4C, 8C	3	Heggenvogelmuur		Caryophyllaceae
<i>Stellaria nemorum ssp. nemorum</i>	1.91	26	2	2C, (4C)	4	Bosmuur		Caryophyllaceae
<i>Stellaria nemorum ssp. montana</i>					1	n. d.	BZ	Caryophyllaceae
<i>Stellaria pallida #</i>	0.95	22 (40)	6	2C, 4C, 8C, 16C	5	Duinvogelmuur		Caryophyllaceae
<i>Stellaria palustris</i>	7.71	c130	2	2C, 4C, 8C	7	Zeegroene muur		Caryophyllaceae
<i>Stellaria uliginosa</i>	1.52	24	1	2C, 4C	8	Moerasmuur		Caryophyllaceae
<i>Stratiotes aloides</i>	10.5	24	15	2C, 4C, 8C	7	Krabbenscheer		Hydrocharitaceae
<i>Suaeda maritima</i>	1.95	36	4	2C, 4C, 8C	6	Schorrenkruid		Amaranthaceae
<i>Subularia aquatica</i>		28, 36			0	Priemkruid		Brassicaceae
<i>Succisa pratensis</i>	3.96	20	1	2C	7	Blauwe knoop		Caprifoliaceae
<i>Sutera cordata #</i>	1.50		6	2C, (4C)	cu	Tapijtbloem		Scrophulariaceae
<i>Symphoricarpos albus</i>	5.87	36, 54, 72	2	2C	7	Sneeuwbes		Caprifoliaceae
<i>Symphoricarpos x chenaultii</i>	1.46	18	2	2C	cu	Rose sneeuwbes	BZ	Caprifoliaceae
<i>Symphyotricum lateriflorum cf</i>	5.81	c. 143	20	2C	ad	n. d.	HD	Asteraceae
<i>Symphyotrichum ontarionis</i>	2.90	32	11	2C	ad	Ontario-aster	HD	Asteraceae
<i>Symphyotrichum lanceolatus</i>	4.03	32-64	2	2C	4	Smalle aster	BZ	Asteraceae
<i>Symphyotrichum squamatus</i>	3.07	20	2	2C, 4C, 8C	ad	n. d.	BZ	Asteraceae
<i>Symphytum asperum</i>	4.21	32	1	2C, 4C	1	Ruwe smeewortel		Boraginaceae
<i>Symphytum caucasicum 'Azereum'</i>	1.81	24, 36, 48	2	2C, 4C, 8C	cu	Kaukasische smeewortel	BZ	Boraginaceae
<i>Symphytum ibericum</i>	7.79	60	2	2C	ad	Kruipende smeewortel	FL	Boraginaceae
<i>Symphytum officinale</i>	4.54	24, 48	4	2C, 4C, 8C	9	Gewone smeewortel		Boraginaceae
<i>Symphytum orientale</i>	0.98	32	2	2C, 4C, 8C	cu	Witte smeewortel	BZ	Boraginaceae
<i>Symphytum x uplandicum</i>	4.13	36, 40, 44	1	2C, 4C, 8C, 16C	ad	<i>Symphytum officinale</i> x <i>asperum</i>		Boraginaceae
<i>Symphytum x hidkotentse</i>	5.67	52	1	2C, 4C, 8C	cu	<i>Sym. grandiflorum</i> x (x <i>uplandicum</i> )	BZ	Boraginaceae
<i>Syringa vulgaris</i>	2.45	44, 46, 48	2	2C, (4C)	cu	Sering		Oleaceae
<i>Tagetes minuta</i>	2.08	48	3	2C, (4C)	ad	Geelgroen afrikaantje		Asteraceae
<i>Tagetes patula</i>	3.79	(20-24) 48	3	2C	cu	Tuinafrikaantje	BZ	Asteraceae
<i>Tagetes erecta</i>	2.00		1	2C	cu	large flower		Asteraceae
<i>Tagetes tenuifolia</i>	1.96	24	1	2C	cu	small flower		Asteraceae
<i>Tamarix gallica</i>	3.17	24	1	2C	cu	Franse tamarisk		Tamaricaceae
<i>Tanacetum parthenium</i>	4.98	18 (36)	2	2C	8	Moederkruid		Asteraceae
<i>Tanacetum vulgare</i>	10.1	18	2	2C	9	Boerenwormkruid		Asteraceae
<i>Tanacetum x coccineum</i>	11.0		3	2C,	cu	n. d.	BZ	Asteraceae
<i>Taraxacum officinale</i> Aggregate #	2.84	24-48	10	2C, (4C)	9	Paardenbloem		Asteraceae
<i>Taraxacum laevigatum</i> Aggregate #	4.00	24	3	2C	3	Duinpaardenbloem	BZ	Asteraceae
<i>Taxus baccata</i>	23.3	24	4	2C	7	Taxus		Pinaceae
<i>Teesdalia nudicaulis</i>	1.15	36	2	2C, 4C, 8C, 16C	8	Klein tasjeskruid		Brassicaceae
<i>Tellima grandiflora</i>	1.30	14	1	2C	cu	Franjekelk		Saxifragaceae
<i>Tephrosia palustris</i>	9.90	48	2	2C	7	Moerasandjvie		Asteraceae
<i>Tetragonolobus maritimus</i>	1.58	14	2	2C, (4C)	2	Hauwklaver		Fabaceae
<i>Teucrium botrys</i>	0.55	32	2	2C, (4C)	1	Trosgamander		Lamiaceae
<i>Teucrium chamaedrys</i>	3.60	32-96	1	2C, 4C	1	Echte gamander		Lamiaceae
<i>Teucrium montanum</i>	1.09	13-60	1	2C, 4C	1	Berggamander		Lamiaceae
<i>Teucrium scordium</i>	1.46	32	1	2C	1	Moerasgamander		Lamiaceae
<i>Teucrium scorodonia</i>	2.21	32	2	2C, (4C)	7	Valse salie		Lamiaceae
<i>Thalictrum aquilegifolium</i>	1.54	14 (28)	3	2C	cu	Akeleiruit		Ranunculaceae
<i>Thalictrum flavum #</i>	4.17	84	3	2C	8	Poelruit		Ranunculaceae

A	B	C	D	E	F	G	H	I
Species (mainly Heukels Flora)	2C	Chrom. nr.	n	Peak	Status	Dutch name	new	family
<i>Thalictrum minus</i> #	2.38	42	4	2C, 4C, 8C	5	Kleine ruit		Ranunculaceae
<i>Thelypteris palustris</i> *	16.0	70	1	2C	6	Moerasvaren		Thelypteridaceae
<i>Thesium humifusum</i>	1.71	c26	2	2C	1	Liggend bergglas		Santalaceae
<i>Thesium pyrenaicum</i>	0.52	14	1	2C	0	Weidebergglas		Santalaceae
<i>Thesium</i> sp	0.67		1	2C		n. d.	BZ	Santalaceae
<i>Thlaspi arvense</i>	1.12	14	2	2C	8	Witte krodde		Brassicaceae
<i>Thlaspi caerulescens</i>	0.61	14	2	2C, 4C, 8C	1	Zinkboerenkers		Brassicaceae
<i>Thlaspi perfoliatum</i>	1.30	14) 42 (c. 70	3	2C, 4C	4	Doorgroeide boerenkers		Brassicaceae
<i>Thuja orientalis</i>	20.4	19-44	3	2C	cu	Oosterse levensboom		Cupressaceae
<i>Thuja occidentalis</i>	23.2	22	1	2C	cu	Westerse levensboom	BZ	Cupressaceae
<i>Thuja plicata</i>	22.6	22	1	2C	cu	Reuzenlevensboom		Cupressaceae
<i>Thymus praecox</i>	2.38	24, 56	2	2C	1	Kruiptijm		Lamiaceae
<i>Thymus pulegioides</i>	1.52	28	1	2C	6	Grote tijm		Lamiaceae
<i>Thymus serpyllum</i>	1.51	24	2	2C	5	Kleine tijm		Lamiaceae
<i>Thymus vulgaris</i>	1.67	30	1	2C	cu	Echte tijm		Lamiaceae
<i>Thymus x citrodorus</i>	2.52		1	2C, (4C)	cu	Citroentijm, T. vulgaris x pulegioides	BZ	Lamiaceae
<i>Tilia cordata</i>	2.14	82, 86	2	2C, (4C)	4	Winterlinde		Malvaceae
<i>Tilia platyphyllos</i> ssp. <i>platyphyllos</i>	2.09	82	2	2C, (4C)	5	Zomerlinde		Malvaceae
<i>Tilia platyphyllos</i> ssp. <i>cordifolia</i>	2.03	82	1	2C		Zomerlinde	BZ	Malvaceae
<i>Tilia tomentosa</i>	2.16	82	2	2C	cu	Zilverlinde	BZ	Malvaceae
<i>Tilia x vulgaris</i>	2.04	82	1	2C	cu	Holl. linde, Tilia cord. X platyphyllos		Malvaceae
<i>Torilis arvensis</i>	2.91	12	3	2C	2	Akkerdoornzaad		Apiaceae
<i>Torilis japonica</i>	1.37	(12) 16	4	2C	7	Heggendoornzaad		Apiaceae
<i>Torilis nodosa</i>	1.83	24	1	2C	6	Knopig doornzaad		Apiaceae
<i>Trachelium coeruleum</i>	2.05	34	1	2C, 3C	1	Halsbloem		Campanulaceae
<i>Trachycarpus fortunei</i>	8.04	36	1	2C	1	Henneppalm	BZ	Arecaceae
<i>Tradescantia virginiana</i>	81.2	12, 24	2	2C	cu	Eendagsbloem		Commelinaceae
<i>Tradescantia fluminensis</i> variegatum*	16.2	60	2	2C, 4C	cu	Vaderplant	FL	Commelinaceae
<i>Tragopogon dubius</i>	4.68	12, 24, 36	1	2C	4	Bleke morgenster		Asteraceae
<i>Tragopogon porrifolius</i>	5.92	12	3	2C	5	Paarse morgenster		Asteraceae
<i>Tragopogon pratensis</i> ssp. <i>orientalis</i>	5.20	12	8	2C, (4C)	4	Oosterse morgenster		Asteraceae
<i>Tragopogon pratensis</i> ssp. <i>pratensis</i>	4.91	12	1	2C	8	Gele morgenster		Asteraceae
<i>Tragopogon x mirabilis</i>		12			1	Tragopogon porrifolius x pratensis		Asteraceae
<i>Tragus racemosus</i>	1.82	40	1	2C, 4C	ad	Klitgras	FL	Poaceae
<i>Trapa natans</i>	1.22	44-90	1	2C	0	Watermoot		Lythraceae
<i>Trichophorum caespitosum</i> ssp. <i>germanicum</i>	0.65	104	1	2C	6	Veenbies		Cyperaceae
<i>Torientalis europaea</i>	6.01	c. 160	2	2C, (4C)	5	Zevenster		Primulaceae
<i>Trifolium alexandrinum</i>	1.24	16	1	2C, 4C	ad	Alexandrijnse klaver		Fabaceae
<i>Trifolium arvense</i>	0.94	14	2	2C, 4C, 8C	8	Hazenpootje		Fabaceae
<i>Trifolium campestre</i> #	0.79	14	1	2C, 4C, (8C)	8	Liggende klaver		Fabaceae
<i>Trifolium diffusum</i>		16			ad	Wijdvertakte klaver		Fabaceae
<i>Trifolium dubium</i>	1.58	32	3	2C, 4C	9	Kleine klaver		Fabaceae
<i>Trifolium fragiferum</i>	1.17	16	1	2C, 4C, 8C	7	Aardbeiklaver		Fabaceae
<i>Trifolium hybridum</i>	0.99	16	1	2C, 4C, 8C	8	Basterdklaver		Fabaceae
<i>Trifolium incarnatum</i>	1.21	14	1	2C, 4C, 8C	ad	Incarnaatklaver		Fabaceae
<i>Trifolium medium</i>	8.43	80	1	2C	6	Bochtige klaver		Fabaceae
<i>Trifolium micranthum</i>	0.77	16	1	2C, 4C	5	Draadklaver		Fabaceae
<i>Trifolium nigrescens</i>	0.88	16	1		ad	n. d.	BZ	Fabaceae
<i>Trifolium ornithopodioides</i>		18			3	Vogelpootklaver		Fabaceae
<i>Trifolium pratense</i>	1.14	14	2	2C, 4C	9	Rode klaver		Fabaceae
<i>Trifolium repens</i>	2.23	16	3	2C, 4C, 8C	9	Witte klaver		Fabaceae
<i>Trifolium rubens</i>	2.25	16	5	2C, 4C	ad	Purpere klaver	BZ	Fabaceae
<i>Trifolium resupinatum</i>	0.87	14, 16, 32	1	2C, 4C, 8C	ad	Perzische klaver		Fabaceae
<i>Trifolium scabrum</i>	1.00	10	1	2C, 4C	4	Ruwe klaver		Fabaceae
<i>Trifolium striatum</i>	0.85	14	1	2C, 4C, 8C	5	Gestreepte klaver		Fabaceae
<i>Trifolium subterraneum</i>	1.31	16	1	2C, 4C, 8C	3	Onderaardse klaver		Fabaceae
<i>Trifolium suffocatum</i> #	0.87	16	2	2C	2	Gedrongen klaver		Fabaceae
<i>Triglochin maritima</i>	3.67	48	1	2C, 4C, 8C	7	Schorrenzoutgras		Juncaginaceae
<i>Triglochin palustris</i> #	1.01	24	2	2C, 4C, 8C, 16C	8	Moeraszoutgras		Juncaginaceae
<i>Triglochin maritima</i> x <i>palustris</i>	2.35	BZ: 36	2	2C, 4C, 8C, 16C	9	Moeras- x Schorrenzoutgras	BZ	Juncaginaceae
<i>Trigonella foenum-graecum</i>	6.02	16	3	2C, 4C, (8C)	ad	Fenegriek		Fabaceae
<i>Tripleurospermum inodorum</i> #	5.89	18, 36	10	2C, 4C	9	Reukloze kamille	BZ	Asteraceae
<i>Tripleurospermum maritimum</i> #	9.85	18 (36)	9	2C, 4C	6	Reukloze kamille		Asteraceae
<i>Trisetum flavescens</i>	5.53	28	1	2C, 4C	7	Goudhaver		Poaceae
<i>Triteleia laxa</i>	23.4	16, 28, 42	1		cu			Asparagaceae
<i>Triticosecale</i> X		42, 56			cu	Triticale: Secale x Triticum		Poaceae
<i>Triticordeum</i> X					cu	Triticum x Hordeum		Poaceae
<i>Triticum aestivum</i>	34.9	42	5	2C	cu	Broodtarwe		Poaceae
<i>Triticum aestivum</i> 'Spelta'	33.8	42	3	2C, 4C	cu	Spelt		Poaceae
<i>Triticum durum</i>		28			cu	Pasta, gries, couscous	BZ	Poaceae
<i>Tropaeolum majus</i>	2.36	28	2	(2C), 4C, 8C, 16C	cu	Oost-Indische kers	FL	Tropaeolaceae
<i>Tsuga canadensis</i>	37.2	24	2	2C	cu	Oostenlijke hemlockspar		Pinaceae
<i>Tsuga heterophylla</i>	34.4	24	1	2C	cu	Westelijke hemlockspar		Pinaceae
<i>Tuberaria guttata</i>	7.60	36	5		2	Gevlekt zonneroosje		Cistaceae
<i>Tulipa kaufmanniana</i>	53.2	24	5	2C	cu	Kaufmann's tulp		Liliaceae
<i>Tulipa suaveolens</i>	61.7	24	5	2C	cu	Schrenk's tulp		Liliaceae
<i>Tulipa sylvestris</i> #	116	24, 36, 48	9	2C	4	Bostulp		Liliaceae
<i>Tulipa x gesneriana</i>	68.6	24, 36, 48	5	2C	cu	Gesner's tulp		Liliaceae
<i>Tussilago farfara</i>	3.70	60	2	2C,	9	Klein hoefblad		Asteraceae
<i>Typha angustifolia</i>	0.52	30, 60	5	2C	8	Kleine lisdodde		Typhaceae
<i>Typha latifolia</i>	0.57	30	2	2C	9	Grote lisdodde		Typhaceae
<i>Typha laxmannii</i>	0.85	30	2	2C	cu	n. d.	FL	Typhaceae



A	B	C	D	E	F	G	H	I
Species (mainly Heukels Flora)	2C	Chrom. nr.	n	Peak	Status	Dutch name	new	family
<i>Typha minima</i>	0.79	30	2	2C	cu	Kleinste lisodde		Typhaceae
<i>Typha x glauca</i>					ad	<i>Typha angustifolia</i> .x <i>latifolia</i>		Typhaceae
<i>Ulex europaeus</i>	6.61	96 (32, 64)	1	2C	5	Gaspeldoorn		Fabaceae
<i>Umbilicus rupestris</i>	0.88	48	4	2C, 4C, 8C	1	Muurnavel	FL	Crassulaceae
<i>Ulmus glabra</i> s.s.	4.17	28	1	2C	6	Ruwe iep		Ulmaceae
<i>Ulmus laevis</i>	3.18	28	1	2C	4	Fladderiep		Ulmaceae
<i>Ulmus minor</i>	3.93	28	1	2C, (4C)	7	Gladde iep		Ulmaceae
<i>Ulmus x hollandica</i>	3.84	28	1	2C	7	Hollandse iep, <i>Ulmus glabra</i> x <i>minor</i>		Ulmaceae
<i>Urtica dioica</i> ssp. <i>dioica</i> #	2.41	(26) 48, 52	10	2C, 4C, 8C	9	Grote brandnetel		Urticaceae
<i>Urtica dioica</i> ssp. <i>subinermis</i> #	1.38	24 (26) 48	14	2C, 4C, 8C		Ooibos brandnetel'	BZ	Urticaceae
<i>Urtica membranacea</i>	1.75	22	2	2C, 4C, 8C	ad	Zuidelijke brandnetel	FL	Urticaceae
<i>Urtica urens</i>	0.94	24	1	2C, 4C, 8C, 16C	9	Kleine brandnetel		Urticaceae
<i>Utricularia australis</i>	0.48	44	1	2C, (4C)	4	Loos blaasjeskruid		Lentibulariaceae
<i>Utricularia intermedia</i>		44			4	Plat blaasjeskruid		Lentibulariaceae
<i>Utricularia minor</i>	0.60	36	1	2C, 4C	5	Klein blaasjeskruid		Lentibulariaceae
<i>Utricularia ochroleuca</i>		44			0	Bleekgeel blaasjeskruid		Lentibulariaceae
<i>Utricularia vulgaris</i>	0.49	44	4	2C, 4C,	6	Groot blaasjeskruid		Lentibulariaceae
<i>Vaccaria hispanica</i>	2.93	30	1	2C, 4C, 8C, 16C	cu	Koekruid		Caryophyllaceae
<i>Vaccinium angustifolium</i>		48				n. d.		Ericaceae
<i>Vaccinium corymbosum</i>	2.71	48	3	2C	4	Trosbosbes (cory. x angustif.?)		Ericaceae
<i>Vaccinium macrocarpon</i>	1.19	24	3	2C	5	Cranberry		Ericaceae
<i>Vaccinium myrtillus</i>	1.23	24	2	2C	8	Blauwe bosbes		Ericaceae
<i>Vaccinium oxycoccos</i>	1.18	(24) 48, 72	1	2C	6	Kleine veenbes		Ericaceae
<i>Vaccinium uliginosum</i> #	2.94	39, 48	1	2C	3	Rijsbes		Ericaceae
<i>Vaccinium vitis-idaea</i>	1.26	24	1	2C	7	Rode bosbes		Ericaceae
<i>Vaccinium x intermedium</i>		24			1	<i>Vaccinium myrtillus</i> x <i>vitis-idaea</i>		Ericaceae
<i>Valeriana dioica</i> male	3.17	16	4	2C, 4C	6	Kleine valeriaan		Caprifoliaceae
<i>Valeriana dioica</i> female	3.42	16	3	2C, 4C	7	Kleine valeriaan		Caprifoliaceae
<i>Valeriana officinalis</i>	9.29	14, 28	2	2C, 4C	9	Echte valeriaan		Caprifoliaceae
<i>Valerianella carinata</i>	0.53	14, 16, 18	1	2C, 4C	3	Gegroefde veldsla		Caprifoliaceae
<i>Valerianella dentata</i> cf	0.46	14, 16	1	2C, (4C)	2	Getande veldsla		Caprifoliaceae
<i>Valerianella locusta</i>	0.42	14, 16, 18	14	2C, 4C	9	Veldsla		Caprifoliaceae
<i>Valerianella rimosa</i>		14, 16			1	Geoorde veldsla		Caprifoliaceae
<i>Vallisneria spiralis</i>	21.7	20, 30, 40	1	2C, 4C	1	Vallisneria		Hydrocharitaceae
<i>Verbascum blattaria</i>	0.72	30, 32	1	2C, 4C	3	Mottenkruid		Scrophulariaceae
<i>Verbascum densiflorum</i> cf	1.04	32, 34, 36	2	2C, (4C)	5	Stalkaars		Scrophulariaceae
<i>Verbascum lychnitis</i> cf	0.82	26, 32, 34	1	2C, 4C	4	Melige toorts		Scrophulariaceae
<i>Verbascum nigrum</i>	0.81	30	2	2C, 4C	7	Zwarte toorts		Scrophulariaceae
<i>Verbascum phlomoides</i>	1.00	32, 34	2	2C, (4C)	6	Keizerskaars		Scrophulariaceae
<i>Verbascum phoeniceum</i>	0.91	32 (36)	1	2C, (4C)	cu	Paarse toorts	HD	Scrophulariaceae
<i>Verbascum pulverulentum</i>	0.94	32	1	2C, (4C)	1	Vlokkige toorts		Scrophulariaceae
<i>Verbascum speciosum</i>	1.12	30	1	2C, 4C	ad	Kandelaartoorts	FL	Scrophulariaceae
<i>Verbascum thapsus</i> cf	0.87	36	3	2C, (4C)	7	Koningskaars		Scrophulariaceae
<i>Verbascum virgatum</i>	1.42	32, 64, 66	2	2C, 3C	ad	Beklied mottekruid	FL	Scrophulariaceae
<i>Verbena bonariensis</i>	1.69	28	1	2C, 4C	cu	Stijf ijzerhard		Verbenaceae
<i>Verbena hastata</i> cf	1.04	14	3	2C, (4C)	ex	Blauwe verbena	BZ	Verbenaceae
<i>Verbena officinalis</i>	0.66	14	1	2C, (4C)	6	IJzerhard		Verbenaceae
<i>Verbena rigida</i>	2.41	42	1	2C	ad	Hoofsjesverbena	BZ	Verbenaceae
<i>Verbena rigida</i> Venosa	2.42	42	1	2C	ad	n. d.	BZ	Verbenaceae
<i>Verbesina alternifolia</i>	7.82	68	2	2C, (3C)	ad	n. d.	FL	Asteraceae
<i>Veronica acinifolia</i>		14, 16			1	Stentijmeprijs		Plantaginaceae
<i>Veronica agrestis</i>	1.42	28	2	2C	7	Akkerereprijs		Plantaginaceae
<i>Veronica anagallis-aquatica</i>	2.66	36	1	2C, (4C)	6	Blauwe waterereprijs		Plantaginaceae
<i>Veronica arvensis</i>	0.90	16	4	2C, (4C)	9	Veldereprijs		Plantaginaceae
<i>Veronica austriaca</i> ssp. <i>teucrium</i>	4.59	64 (68)	4	2C, (4C)	4	Brede ereprijs		Plantaginaceae
<i>Veronica beccabunga</i>	1.61	18	4	2C, (4C)	8	Beekpunge		Plantaginaceae
<i>Veronica catenata</i>	2.47	36	4	2C, (4C)	8	Rode waterereprijs		Plantaginaceae
<i>Veronica chamaedrys</i> #	3.86	32	3	2C	9	Gewone ereprijs		Plantaginaceae
<i>Veronica cymbalaria</i>	2.74	(18) 36, 54	2	2C, 4C, 8C	ad	Schijnklimopereprijs	FL	Plantaginaceae
<i>Veronica filiformis</i>	0.78	14	2	2C, 4C	8	Draadereprijs		Plantaginaceae
<i>Veronica hederifolia</i> #	3.01	36, 54	10	2C, 4C, 8C	9	Akkerklimopereprijs		Plantaginaceae
<i>Veronica hederifolia</i> ssp. <i>lucorum</i> #	4.12	36	8	2C, 4C	3	Bosklimopereprijs		Plantaginaceae
<i>Veronica longifolia</i>	3.72	34, 68	1	2C, (4C)	6	Lange ereprijs		Plantaginaceae
<i>Veronica montana</i>	1.46	18	2	2C	5	Bosereprijs		Plantaginaceae
<i>Veronica officinalis</i>	2.13	36	3	2C, (4C)	7	Mannetjesereprijs		Plantaginaceae
<i>Veronica opaca</i>		28	1		5	Doffe ereprijs		Plantaginaceae
<i>Veronica peregrina</i> #	2.06	52	5	2C	6	Vreemde ereprijs		Plantaginaceae
<i>Veronica persica</i>	1.57	28	1	2C, (4C)	8	Grote ereprijs		Plantaginaceae
<i>Veronica polita</i>	0.86	14	3	2C	6	Gladde ereprijs		Plantaginaceae
<i>Veronica praecox</i>	1.17	18	1	2C	1	Vroege ereprijs		Plantaginaceae
<i>Veronica prostrata</i> cf	4.95	18	3	2C	1	Liggende ereprijs		Plantaginaceae
<i>Veronica</i> (x?) <i>prostrata</i> 'Christy'	1.17	16	1	2C	2	Liggende ereprijs ?	BZ	Plantaginaceae
<i>Veronica scutellata</i>	1.77	18	1	2C	7	Schildereprijs		Plantaginaceae
<i>Veronica serpyllifolia</i>	0.90	14	2	2C	8	Tijmeprijs		Plantaginaceae
<i>Veronica spicata</i>	3.08	34, 68	3	2C	cu	Aarereprijs		Plantaginaceae
<i>Veronica triphyllos</i> #	0.97	14	1	2C, 4C, 8C	4	Handjesereprijs		Plantaginaceae
<i>Veronica verna</i>		16		2C, 4C	1	Kleine ereprijs		Plantaginaceae
<i>Veronica x lackschewitzii</i>		36		2C, 4C	1	<i>V.anagallis-aquatica</i> x <i>catenata</i>		Plantaginaceae
<i>Viburnum lantana</i>	8.68	18	2	2C, (4C)	5	Wollige sneeuwbal		Adoxaceae
<i>Viburnum opulus</i>	8.62	18	2	2C	8	Gelderse roos		Adoxaceae
<i>Viburnum rhytidophyllum</i>	9.24	18	1	2C	cu	Sneeuwbal	FL	Adoxaceae
<i>Vicia bithynica</i>	7.31	14	1	2C	ad	Bithynische wikke	FL	Fabaceae

A	B	C	D	E	F	G	H	I
Species (mainly Heukels Flora)	2C	Chrom. nr.	n	Peak	Status	Dutch name	new	family
<i>Vicia cracca</i>	11.3	28	2	2C, 4C	9	Vogelwikke		Fabaceae
<i>Vicia faba</i>	26.3	12	2	2C, 4C	cu	Tuinboon		Fabaceae
<i>Vicia hirsuta</i>	7.79	14	1	2C	9	Ringelwikke		Fabaceae
<i>Vicia lathyroides</i>	4.36	10, 12	1	2C, 4C	6	Lathyruswikke		Fabaceae
<i>Vicia lutea</i>		14			4	Gele wikke		Fabaceae
<i>Vicia sativa</i> ssp. <i>nigra</i>	3.87	12	5	2C, 4C		Smalle wikke		Fabaceae
<i>Vicia sativa</i> ssp. <i>sativa</i>	3.88	12	1	2C, 4C, 8C	cu	Voederwikke		Fabaceae
<i>Vicia sativa</i> ssp. <i>segetalis</i> cf	3.91	12	1	2C, 4C, 8C		Vergeten wikke		Fabaceae
<i>Vicia sepium</i>	7.58	14	2	2C, 4C, 8C	8	Heggenwikke		Fabaceae
<i>Vicia tenuifolia</i>		24			3	Stijve wikke		Fabaceae
<i>Vicia tetrasperma</i> ssp. <i>gracilis</i>		14			1	Slanke wikke		Fabaceae
<i>Vicia tetrasperma</i> ssp. <i>tetrasperma</i>	5.96	14	2	2C, 4C, 8C	6	Vierzadige wikke		Fabaceae
<i>Vicia villosa</i>	3.58	14	2	2C, 4C	6	Bonte wikke		Fabaceae
<i>Vinca major</i>	4.07	92	1	2C	cu	Grote maagdenpalm	FL	Apocynaceae
<i>Vinca minor</i>	1.53	46	1	2C	7	Kleine maagdenpalm		Apocynaceae
<i>Vincetoxicum hirundinaria</i>	0.69	22	3	2C, 4C, 8C	2	Witte engbloem		Apocynaceae
<i>Vincetoxicum nigrum</i>	0.66	22, 44	1	2C, 4C, 8C	1	Zwarte engbloem		Apocynaceae
<i>Viola alba</i>	1.71	20	2	2C, 4C, 8C	ad	Wit viooltje	BZ	Violaceae
<i>Viola arvensis</i>	5.20	34	2	2C, 4C	9	Akkerviooltje		Violaceae
<i>Viola canina</i>	2.45	40	3	2C, 4C	7	Hondsviooltje		Violaceae
<i>Viola cornuta</i>	3.93	22 (44)	3		cu	Hoorviooltje	BZ	Violaceae
<i>Viola cornuta</i> x <i>hortensis</i> cf	3.60	26	1		cu	Tuinviooltje, Orange	BZ	Violaceae
<i>Viola hirta</i>	1.48	20	4	2C, 4C	6	Ruig viooltje		Violaceae
<i>Viola lutea</i> ssp. <i>calaminaria</i>	6.23	48, 50	1	2C	1	Zinkviooltje		Violaceae
<i>Viola odorata</i>	1.57	20	4	2C, 4C, 8C	7	Maarts viooltje		Violaceae
<i>Viola palustris</i>	4.24	48	1	2C, 4C	7	Moerasviooltje		Violaceae
<i>Viola reichenbachiana</i>	1.39	20	3	2C, 4C, 8C	4	Donkersporig bosviooltje		Violaceae
<i>Viola riviniana</i>	2.49	40	8	2C, (4C)	6	Bleeksporig bosviooltje		Violaceae
<i>Viola rupestris</i>	1.14	20	1	2C, 4C, 8C	4	Zandviooltje		Violaceae
<i>Viola sororia</i> 'Albiflora'	3.01	54	1	2C, 4C, 8C	cu	n. d.	BZ	Violaceae
<i>Viola stagnina</i> var. <i>lacteaoides</i>	e1.12	20	1	2C	4	Heidemelkviooltje		Violaceae
<i>Viola stagnina</i> var. <i>stagnina</i>	1.34	20	1	2C, 4C	4	Veenmelkviooltje		Violaceae
<i>Viola tricolor</i> ssp. <i>curtisii</i>	4.47	26	3	2C, (4C)	6	Duinviooltje		Violaceae
<i>Viola tricolor</i> ssp. <i>tricolor</i>	4.12	26	4	2C, 4C	7	Driekleurig viooltje		Violaceae
<i>Viola x bavarica</i>			1		1	<i>Viola reichenbachiana</i> x <i>riviniana</i>		Violaceae
<i>Viola x contempta</i>		26, 28, 30	2		2	<i>Viola arvensis</i> x <i>tricolor</i>		Violaceae
<i>Viola x intersita</i>			1		1	<i>Viola canina</i> x <i>riviniana</i>		Violaceae
<i>Viola x ritschliana</i>			1		1	<i>Viola canina</i> x <i>persicifolia</i>		Violaceae
<i>Viola x scabra</i>			1		1	<i>Viola hirta</i> x <i>odorata</i>		Violaceae
<i>Viola x wittrockiana</i>	6.59	48-50	2	2C	cu	Tuinviol	BZ	Violaceae
<i>Viscum album</i> Haem72	177	20	11	2C, (4C)	4	Maretak		Santalaceae
<i>Vitis vinifera</i>	1.33	38, 76	6	2C, 4C	cu	Druif		Vitaceae
<i>Vulpia bromoides</i>	5.12	14	1	2C, 4C	6	Eekhoorngras		Poaceae
<i>Vulpia ciliata</i> ssp. <i>ambigua</i>	8.81	28	1	2C	1	Duinlangbaardgras		Poaceae
<i>Vulpia ciliata</i> ssp. <i>ciliata</i>	8.99	28	1	2C, 3C	1	Gewimperd langbaardgras		Poaceae
<i>Vulpia fasciculata</i> cf	12.7	28	1	2C	3	Dicht langbaardgras		Poaceae
<i>Vulpia membranacea</i>		28			3	Zandlangbaardgras		Poaceae
<i>Vulpia myuros</i>	13.3	14 (28) 42	4	2C	8	Gewoon langbaardgras		Poaceae
<i>Wahlenbergia hederacea</i> #	1.99	36	3	2C, 4C, (8C)	1	Klimopklokje		Campanulaceae
<i>Waldsteinia ternata</i>	3.38	42	1	2C, 4C, 8C	1	n. d.		Rosaceae
<i>Weigelia florida</i> 'Nana Purpurea'	2.03	36	1	2C	cu	Weigelia	HD	Caprifoliaceae
<i>Wisteria sinensis</i>	1.69	32	2	2C, (4C)	cu	Chinese blauwe regen	HD	Fabaceae
<i>Wolffia arrhiza</i> (de echte)	4.65	30-80	3	2C	7	Wortelloos kroos		Araceae
<i>Wolffia australiana</i>	0.95	20, 40	1	2C	1	Smalle wolffia	FL	Araceae
<i>Wolffia columbiana</i> (oude arrhiza)	2.55	30-70	11	2C	2	Columbiaanse wolffia	FL	Araceae
<i>Wolffia globosa</i>	3.50	29-60	2	2C		n. d.	BZ	Araceae
<i>Wolffia minigibba</i> /Wolffiella	1.61		1	2C		n. d.		Araceae
<i>Xanthium spinosum</i>		36		2C	ad	Stekende stekelnoot		Asteraceae
<i>Xanthium strumarium</i>	4.96	36	4	2C	6	Late stekelnoot		Asteraceae
<i>Xanthium orientale</i>	5.37	36	1	2C	1	Grote stekelnoot	FL	Asteraceae
<i>Yucca flaccida</i>	5.65	60	1	2C	cu	n. d.	HD	Asparagaceae
<i>Yucca gloriosa</i> L.	6.13	50, 60	1			n. d.	HD	Asparagaceae
<i>Zannichellia palustris</i> ssp. <i>major</i>		24, 36			0	Brede zannichellia		Potamogetonaceae
<i>Zannichellia palustris</i> ssp. <i>palustris</i>	1.23	24, 36	2	2C, 4C, 8C	8	Zittende zannichellia		Potamogetonaceae
<i>Zannichellia palustris</i> ssp. <i>pedicellata</i>	1.83	24, 36	1	2C, 4C, (8C)	5	Gesteelde zannichellia		Potamogetonaceae
<i>Zea mays</i>	5.55	20	3	2C, 4C	cu	Mais		Poaceae
<i>Zinnia elegans</i>	5.09	24	1	2C	ad	Zinnia	BZ	Asteraceae
<i>Zostera marina</i>	1.37	12	3	2C, 4C, 8C,	4	Groot zee gras		Zosteraceae
<i>Zostera noltei</i>	1.71	12	2	2C, 4C, 8C,	3	Klein zee gras		Zosteraceae

For further details, see Table 5 in Electronic Supplement

[http://www.forum-geobotanicum.net/articles/vol\\_8-2018/zonneveld\\_flora-of-the-netherlands/zonneveld\\_flora-of-the-netherlands\\_supplement.pdf](http://www.forum-geobotanicum.net/articles/vol_8-2018/zonneveld_flora-of-the-netherlands/zonneveld_flora-of-the-netherlands_supplement.pdf)