



# The Canadian Botanical Association Bulletin

## Bulletin de l'Association Botanique du Canada

Vol. 53 Number 1, March/mars 2020



*Highlights in this issue:*

2020 CBA Annual Meeting

Top Ornamental Plants:  
Cyclamen

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### The Canadian Botanical Association Bulletin

The CBA Bulletin is issued three times a year (March, September and December) and is freely available on the CBA website. Hardcopy subscriptions are available for a fee.

### Information for Contributors

All members are welcome to submit texts in the form of papers, reviews, comments, essays, requests, or anything related to botany or botanists. For detailed directives on text submission please contact the Editor (see below). For general information about the CBA, go to the web site: [www.cba-abc.ca](http://www.cba-abc.ca)

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Published in Ottawa, March 21<sup>st</sup> 2020  
ISSN 0008-3046 (paper)  
ISSN 1718-8164 (electronic)

### Next issue

Texts for the next issue, 53(2), must be received by September 1, 2020

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### Bulletin de l'Association Botanique du Canada

Le Bulletin de l'ABC paraît trois fois par année, normalement en mars, septembre et décembre. Il est envoyé à tous les membres de l'ABC.

### Soumission de textes

Tous les membres de l'Association sont invités à envoyer des textes de toute nature concernant la botanique et les botanistes (articles, revues de publication, commentaires, requêtes, essais, etc.). Tous les supports de texte sont acceptés. Pour des renseignements détaillés sur la soumission de textes, veuillez consulter le rédacteur (voir ci-dessous). Infos générales sur l'ABC à l'URL suivant: [www.cba-abc.ca](http://www.cba-abc.ca)

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Publié à Ottawa, le 21 mars 2020  
ISSN 0008-3046 (papier)  
ISSN 1718-8164 (électronique)

### Prochain numéro

La date de tombée des textes du prochain numéro, le no 53(2), est le 1 septembre 2020

## President's Message

So where are you right now? Let me guess ... at home? The last few weeks have been quite a challenge as all our lives have been upended by a new coronavirus, COVID-19. If "misery loves company" then we are quite a miserable country and planet. I have been in contact with colleagues from around the world in the last few weeks (China, USA, UK, Spain, etc.) and we are all living the same pitiful life – lockdown! With kids and cats swirling around, and a worldwide crisis continually in the back of one's mind, I cannot say that I am working from home, so much as at home, trying to work. I hope you are all focusing on your physical, mental, and emotional health more than your productivity because under these conditions it would be a bit ludicrous not to do so. I assure you, one day, a sort of normality will return, but I hope it is a better one than what we knew prior to COVID-19. If anything, I think COVID-19 has told us that the need for change in our way of life has never been clearer – look at the sky!

Just to give you a sense of how we have gone so quickly from "normal" to "crisis", my Friday March 13th fourth-year seminar course was the last in-person class given at the University of Ottawa (UofO) this spring, and Québec closed all its schools the same day. My girls, five and eight, cheered when they heard of their "holidays" ("corona-vacances!" en français), but little did they realise it would mean they would be stuck together till at least May 4th, and that shopping for junk with their grandmother would not be possible. By Wednesday the 18th all classes at the UofO were online and I have since given courses via Google Hangouts, and I have participated in PhD defences and NSF research meetings via Zoom. Besides seeing some classic rec-rooms that take me back to my high school days (brown, faux-wood panelling), I think several colleagues definitely need to improve their at-home internet speed. As we have already been told to prepare for online courses in the fall, I ask myself, "Can you teach plant identification in your living room without a laboratory?" Only the fall will tell!

So where do we as botanists fit in when our human world seems to be crashing all around us? In other words, as we focus even more scientific effort on *Homo sapiens*, where does botanical science fit it in? Although we need a vaccine, and this will involve few botanists, plants are full of bioactive molecules, secondary products extracted directly from plants or molecules modified from such products that are even now being used to treat the symptoms of COVID-19. For example, I have seen that colchicine, an extract from *Colchicum autumnale*, is currently under trials to see if it can reduce COVID-19 lung complications, and hydroxychloroquine, a derivative of quinine, a drug used to treat malaria since Incan times and extracted from *Chinchona* species, is also under trials. In the case of hydroxychloroquine, this is an essential medication used to treat many diseases, particularly auto-immune diseases like lupus and rheumatoid arthritis, and despite its unexpected promotion by anecdote, panic buying means that a shortage will affect the lives of those that absolutely need it – so wait until we know whether it even works and production ramps

up. Also, you should know, hydroxychloroquine is toxic, and colchicine is highly toxic. I know of colchicine only because it disrupts the proper division of chromosomes during cell division and it is thus useful for creating artificial polyploids. Can you imagine what it could do to your body in the wrong dosage? For medicines, sometimes even small differences in dosage can be deadly.

But let's look to the future and things much brighter. The bright side is that our new website is literally days away from appearing online. The last revisions to the French and English versions were done a few weeks ago and I expect that before our Annual Meeting in June (see below) the new website will be visible to all. At this point, I would like to thank Dr. Zoe Panchen, our dedicated and dynamic webmaster, who has been the leader on this important contribution to our Association's history. As we all know, a website is now the face and future of any organisation, and I believe that you will see by our end product, that our future looks bright. I would also like to thank Dr. Tyler Smith who has also been highly active over the years in bringing the new website to fruition and to Timothy McMillan, a freelance Web Designer, who produced the website under CBA direction.

Please remember that our Annual Meeting is still going on despite the virus, only it will now be entirely online! The 2020 Canadian Botanical Association Virtual Meeting will be hosted by the Université du Québec en Abitibi-Témiscamingue (UQAT) from 1 June to 2 June. Most of the keynote speakers have already confirmed they will participate and if you have not yet been confirmed as a speaker, please submit your abstract before 15 April ([abc-cba2020.uqat.ca/index.php?lang=en](http://abc-cba2020.uqat.ca/index.php?lang=en)). This is going to be something absolutely special and like our new website, an indication of how we are a modern scientific society with our eye on the future. Nothing can stop us, not even a pandemic! I would like to thank Dr. Nicole Fenton and her team at UQAT for taking on this challenge. When the possibility of an in-person meeting no longer seemed possible, she immediately proposed we do it online. We are all lucky that such a dynamic and able scientist will soon be our President!

In closing, I would just like to thank you for giving me the opportunity to be your President. This is my last Presidential address as Dr. Fenton will soon be taking on my role after our online Annual General Meeting in June. This has been a wonderful and challenging experience, but only because of the people that make up our society and their dedication to their fellow botanists. The CBA has supported me throughout my career, from my first Macoun Travel Bursary to the day I became President. I now move into the position of Past-President, but you can be certain that I will support the Association and its future leaders for the rest of life. You are simply a great bunch of people... and superb botanists! Cheers!

Julian Starr  
University of Ottawa

## 2020 CBA Conference Update

The organizing committee is working to prepare an online, webcast and interactive version of the conference with oral presentation and poster sessions, held over one or two days, June 1 and/or 2.

Julissa Roncal, Jennifer Baltzer and Alain Cuerrier, three of our keynote speakers, have already confirmed their participation!

Online registration is necessary for each participant and presenters to receive a username and password to access the various conferences events. Registration to the virtual conference is free for both presenters and attendees. However, we strongly encourage you to become a member of the CBA as a way to encourage our association!

Register here:  
[abc-cba2020.uqat.ca/regISTRATION/registration-form.php?lang=en](http://abc-cba2020.uqat.ca/regISTRATION/registration-form.php?lang=en)

Le comité organisateur travaille à la préparation d'une version en ligne, webcast et interactive de la conférence avec des présentations orales et des sessions d'affiches, qui se dérouleront sur un ou deux jours, les 1er et / ou 2 juin prochains.

Julissa Roncal, Jennifer Baltzer et Alain Cuerrier, trois de nos conférenciers principaux, ont déjà confirmé leur participation!

L'inscription en ligne est obligatoire pour tous les participants et les conférenciers pour recevoir un nom d'utilisateur et un mot de passe pour accéder aux différents événements en lien avec la rencontre annuelle. L'inscription à la conférence virtuelle est gratuite pour les présentateurs et les participants.

Cliquez ici:  
[abc-cba2020.uqat.ca/regISTRATION/registration-form.php?lang=fr](http://abc-cba2020.uqat.ca/regISTRATION/registration-form.php?lang=fr)



"Working" from home with a Coronavirus kid fort (constructed by Charlotte, eight, and Olivia, five)

## Top Canadian Ornamental Plants. 25. Cyclamen

Ernest Small<sup>1,2</sup>

The florists' cyclamen (*Cyclamen persicum*) is among the most popular potted plants in the world, notable for its compact size, attractively variegated foliage, and brilliantly coloured flowers in a variety of sizes, shapes, and forms. Cyclamens are petite ornamentals, easily recognized by their flowering stems (one-flowered peduncles or pedicels), bare of leaves, each topped by a solitary arched bloom with swept-back petals. Even more striking is a bizarre corkscrewing of the flowering stem, which positions the fruit at ground level where the sweet seeds can be picked up by ants. Several species of the genus are hardy enough to be grown as garden perennials in the warmest regions of Canada, but it is in the form of a houseplant and gift plant that cyclamens are best known in the country.



Figure 1: Potted plants of *Cyclamen persicum*. Left: ©Fanghong (CC BY SA 3.0). Centre: photo (public domain) by Buntysmum, pixabay.com. Right: ©Darkone (CC BY SA 2.0).

**Scientific names:** The genus *Cyclamen* is based on the Greek word *kylos* meaning circle; this has been interpreted as referring either to the typically rounded tubers or the spiralling peduncle of some species. *Cyclamen persicum* was inappropriately named, since it does not grow naturally in "Persia".

**English names:** Cyclamen; rarely Persian violet (better reserved for the ornamental houseplant *Exacum affine*), alpine violet, sowbread (synonymous with the French pain de porceau, based on the allegations that the tuberous roots are eaten by wild boar and historically fed to swine, which is unlikely as they are toxic). The principal species, *C. persicum*, and its horticultural hybrids, are best known as florists' cyclamen. The name is also spelled florist's cyclamen and florists cyclamen, which can also be considered correct. The Chicago Manual of Style, 17<sup>th</sup> edition (2017), section 7.27 recommends "if in doubt, choose the plural possessive", i.e. florists' cyclamen. As with other common names that repeat the scientific (Latin) genus name, care is necessary to interpret which sense is meant.

**French name:** Cyclamen.

### Symbolism

*Cyclamen cypricum* is the national flower of Cyprus. Cyclamen is the national flower of San Marino. Four plant species

are said to represent Greece, including cyclamen. Until 2013, *C. persicum* was the national flower of Israel, at which time it was replaced by the poppy anemone, *Anemone coronaria*. In China, cyclamen has been interpreted as a floral symbol of hospitality, the closed bud turning downward as if in a welcoming bow.

### Wild Cyclamen species

*Cyclamen* of the Primulaceae family is a genus of 23 perennial species indigenous to Europe and the Mediterranean Basin east to Iran, mostly distributed around the Mediterranean Sea and the Black Sea. One species (*C. purpurascens*) occurs in central Europe and one (*C. somalense*) is an isolated disjunct in the mountains of northeastern Somalia. Most species are adapted to a semi-arid Mediterranean climate, above-ground stems arising in autumn, growing during cool-moist winters, senescing in the spring, and remaining dormant as a storage underground stem over the dry summer. (This is an adaptive ecological pattern exhibited by numerous other Mediterranean "geophytes" to avoid summer drought). The tubers are not summer dormant in *C. purpurascens* and *C. colchicum*, which grow outside of the Mediterranean region. Most of the species occur in evergreen or deciduous woodland and shrubland. The plants inhabit rocky terrain, often under trees or shrubs. Overcollecting for the horticultural trade has endangered several species, and all of the wild species are afforded some

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**Figure 2:** Painting (public domain) of *Cyclamen purpurascens*, one of the relatively cold-hardy species that can be overwintered outdoors in the warmest areas of Canada. Source: Thomé, O.W. 1885. Flora von Deutschland, Österreich und der Schweiz, vol. 4. Gera, Germany.

protection under CITES regulations. *Cyclamen hederifolium* has been listed as introduced in British Columbia ([data.canadensys.net/vascan/taxon/29037](https://data.canadensys.net/vascan/taxon/29037)).

The leaves often have long petioles, and the blades are broad, triangular or rounded, and often variegated or mottled in shades of green and silver-gray. The solitary flowers are individually subtended by a slim long pedicel (often called a peduncle, but usually called a “stem” in the horticultural trade). This is characteristically recurved back 150–180° below the flower (the pendant flowers are said to be “nodding”). While solitary flowers are the rule in *Cyclamen*, *C. coum* is known to often produce two flowers on the pedicel (which would then be appropriately called a “peduncle”). The five petals are joined to form a short tube at the base, and become curved back (reflexed) 90–180° and twisted. (In the Primulaceae, only *Dodecatheon* and a few *Primula* species share the characteristic of the corolla bending backwards, making it appear as if the flower has been turned inside-out). A few cultivars have been bred which lack petal reflexing. Auricles (ear-like projections) may be present on the top of the tube where the petals become free and reflexed. A five-segmented calyx is present. Flowers of the wild species are usually white, pink, or purple, and are sometimes fragrant but lack nectaries to attract pollinators. After fertilization, in most of the species the pedicels curl or

bend downwards to place the capsules at soil level where they mature, making the seeds available for ant distribution. However, in wild *C. persicum* the fruited pedicels haphazardly bend and twist instead of coiling back to the crown (modern cultivars often develop non-coiling pedicels). The round fruits open at maturity exposing numerous brown seeds, known to attract ants which consume their sticky covering and disperse them.

### Tubers

*Cyclamen* plants develop from subterranean tubers (Nightingale 1982 described these as “corm-like tubers.”), which are usually spherical with a flattened or concave upper surface. Depending on species, the roots arise from the top, bottom, or other locations, while leaves and flowering pedicels originate from a main meristem. “Tubers” are enlarged storage structures of plants, but so are tuberous roots, corms, bulbs, and rhizomes. These terms are separated in part by whether the new tissues originate from root or stem tissue. Some sources define tubers as organs derived from stems, others apply the word to structures derived from stems or roots. However, it appears that *Cyclamen* tubers don’t fall exactly into any of these concepts (see Grant 2012). As defined in Matthew (2013), “The tuber of cyclamen is thought to be formed in the seedling stage by the swelling of the hypocotyl, the region between the root and the stem of a young plant.” (The carrot is also illustrative of the difficulty of precise definition of anatomical terms. Although carrots are known as “roots” in common language, they arise from a combination of hypocotyl and true taproot.)

### Domesticated *Cyclamen* species

*Cyclamen persicum* appears to have been known by the classical Greeks and Romans (it was referred to as *cyclaminus* after its disk-shaped corm). Plants were recorded in gardens in Western Europe as early as the 16<sup>th</sup> century, and at that time were illustrated in guides to medicinal plants. By 1850 selection by gardeners and early breeders had produced several ornamental forms. *Cyclamen persicum*, the florists’ cyclamen, is the principal species encountered in the ornamental trade. In the latter part of the 19<sup>th</sup> century, numerous cultivars were selected, especially in Europe (particularly England and the Netherlands), with stress on increased flower size, increased range of colours, and different petal forms. Improving *C. persicum* by hybridization with the wild species of the genus is difficult because of hybrid inviability and sterility, but in the late 20<sup>th</sup> century it was shown that these problems can be overcome by embryo rescue technique and/or chromosome to produce fertile amphidiploids (allotetraploids). Modern cultivars are often the result of hybridization of *C. persicum* with *C. africanum*, *C. graecum*, *C. rohlfsianum* and other species. Cultivars may have any of numerous shades of white, pink, scarlet, red, lavender, or purple flowers (true yellow flowers are not available, although apparently yellow-flowered plants are offered by some websites). Some selections have doubled flowers. Some “picotee” forms have a thin white edge on the petals. Other floral forms have stripes or ruffled edges. Most cultivars of *C. persicum* have rounded or heart-shaped leaves which are either dark green or marbled



**Figure 3:** *Cyclamen hederifolium*, the most cold-hardy ornamental species of *Cyclamen*. **Left:** Painting (public domain) from Baxter (1843). **Centre:** Flowering plant. ©Vulkano (CC BY 3.0). **Right:** Corms. ©Frank Vincentz (CC BY SA 3.0).

with white or silver, while the leaf margins of some cultivars are slightly toothed or lobed, and the lower leaf surfaces may be purplish. Some miniature cultivars have standard size leaves, but tiny flowers. Some kinds are lightly scented. Traditionally *C. persicum* and its hybrids have been sold in winter, as the plants are naturally summer-dormant, but today production can be year-round, depending on market demand, because many of the commercial cultivars do not require a resting period, or at least can be forced to grow continuously by providing favourable conditions. Commercial cultivars have often been selected for very fast growth and minimal needs for removing older yellowed leaves.

Other than *C. persicum*, domesticated species tend to have been selected for interesting leaf colouration and patterning rather than for floral features. *Cyclamen hederifolium*, appears to be the hardiest species (capable of surviving  $-18^{\circ}\text{C}$ , occasionally claimed to tolerate even lower winter temperatures), and as noted earlier it has been recorded as naturalized in B.C. *Cyclamen coum*, *C. parviflorum*, and *C. purpurascens* are also relatively cold hardy, and can also be grown as a perennial garden plant in the warmest areas of Canada (or more reliably in pots).

### Economic value

Cyclamens, especially *C. persicum* cultivars, are grown for use primarily as potted plants. Much less frequently, the flowering stems are marketed as cut flowers. Some species such as *C. hederifolium* are grown as outdoor perennials in mild climates such as coastal British Columbia. Many of the species are ideal in rock gardens, where their small size is not obscured by taller garden ornamentals. However, all species except *C. purpurascens* (one of the few woodland species) are summer dormant, limiting attractiveness during the summer.

### Toxicity and Medicinal Usage

*Cyclamen* species, especially the tubers, contain toxic saponins (it is uncertain if the foliage and flowers are significantly toxic). However, despite the widespread occurrence in Europe of woodland plants, as well as the common use as houseplants, there has been very little concern

about toxic potential. According to the ASPCA, cyclamen tubers and roots are poisonous to both cats and dogs. The fresh tuber of *C. hederifolium* is a drastic purgative, and has (unadvisedly) been employed in traditional herbal medicine for the purpose. The Greek philosopher Theophrastus (ca. 371–287 BCE) recommended cyclamen bulbs as an aphrodisiac, and its reputation for this purpose persists to this day. There is interest in researching the toxic compounds for possible medicinal applications.



**Figure 4:** An imaginative painting (public domain) of *Cyclamen persicum*. Source: Thornton, R.J. (editor) and Pether, A. (artist). 1804. The Temple of Flora. T. Bensley, London.



**Figure 5:** A clump of *Cyclamen coum*, one of the hardier species of *Cyclamen*, growing in a park in the U.K. © Ian Kirk (CC BY 2.0).



**Figure 6:** Commercial cyclamen greenhouse. ©Jonathan Billinger (CC BY SA 2.0).

There are some rare occurrences of the (very inadvisable) culinary usage of cyclamen tubers. In Lebanese cooking, cyclamen leaves are valued (even more than grapevine and Swiss chard leaves) for stuffing with vegetables and meat dishes, but the supply of cyclamen foliage is much more limited, and they might be toxic.

The ambiguous scientific name *C. europaeum* L. has been applied particularly to *C. purpurascens*, but also to *C. hederifolium*, *C. repandum* and *C. persicum*. The phrase “cyclamen europaeum” has frequently been employed in traditional herbal medicine but also in more modern publications concerned with the medicinal properties of extracts of *Cyclamen*, and unfortunately the identity of the species cannot usually be reliably determined.

## Care of Potted Plants

### Purchasing

*Cyclamen persicum* cultivars can be propagated by seed, and are to a considerable extent in the horticultural trade. However, it requires a year to produce plants of a reasonable size. Vegetative division is also possible, notable by dividing corms, but this is also an activity mainly conducted by professional horticulturalists. For most people, it is advisable to simply purchase a potted plant of the florists’ cyclamen. When buying, select a plant with many buds that are just starting to open. The foliage should be sturdy and succulent. The cold-hardy species of *Cyclamen* are relatively difficult to obtain in Canada, and if potted plants can’t be obtained, it may be necessary to locate an online seed source, or preferably a source of mature tubers.

### Soil & Moisture Conditions

Cyclamens should be watered well when the soil is quite dry. Wilting foliage, of course, is the plant’s way of requesting water. Both excess and insufficient moisture may cause the foliage to yellow, and hot dry conditions may induce bud drop. Some plant guides warn against pouring water over the corm in the centre of the pot to avoid its rotting. Another irrigation recommendation is that it is best to water a cyclamen plant from the bottom rather than from the top (by placing the pot in a saucer of water, long enough for the soil to become moist). The low humidity in houses during winter is undesirable, and to increase humidity the pot may be set on a tray of wet gravel. A low-nitrogen fertilizer or houseplant food for blooming plants, applied every 2

weeks, is recommended when the plants are actively growing, but excess fertilization may promote lush growth susceptible to disease.

### Location

Houseplant cyclamens prefer bright indirect light. During Canadian winters, the sunniest windows are usually suitable. The plants should be kept away from warm drafts from heat vents or cold drafts from open windows. In the warmest areas of Canada, the “hardy cyclamens” may be treated as garden perennials, best arranged as mass plantings, positioned so that these low-growing species are not blocked from view by taller plants.

### Temperature

The common florists’ cyclamen is too frost intolerant to grow as a garden plant in temperate countries. While potted plants can be kept outdoors during warm weather, they require indoor protection at other times, and cyclamen is grown primarily as a house plant. Cyclamens do best in cool temperatures. Flowering plants are best maintained at about 20°C (68°F), with the night temperatures preferably between 6.5–15°C (44–59.0°F). Temperatures above 20°C (68°F) may induce dormancy. However, many modern hybrids can be maintained over a wider temperature range.

### Pests

Cyclamens are relatively free of pests, but can be attacked by aphids, mealybugs, spider mites, or thrips. Control measures include insecticidal soap or (less desirably) pesticides recommended for use on houseplants. Plants infested with cyclamen mite are preferably discarded because it is extremely difficult to eradicate.

### Reblooming

The florists’ cyclamen is typically marketed as a winter flowering houseplant, and most cultivars go dormant during the heat of the summer (or when exposed indoors to excessive heat or other stresses). Attempting to keep a houseplant continuously in flower is misguided, since cyclamens are naturally adapted to require a period of dormancy. The plant is considered to be fairly easy to grow, and often flowers for as long as 3 months. Cooler temperatures and removing spent flowers prolong flowering. However, it is difficult to provide appropriate conditions for reblooming, and consequently most plants are discarded after they flower.

In late spring, overwintered cyclamen houseplants stop blooming, the leaves fade and drop off, and most plants go



into dormancy for 2 to 3 months. For those who wish to attempt to resurrect their plants, the following steps have been recommended. Reduce watering and fertilization, and keep the dormant plant outdoors for the summer, preventing the pot from being more than slightly moist. Alternatively, gradually withhold water and when the leaves are withered, remove the tuber from the soil and store it in dry vermiculite at about 10°C (50°F) for 6–12 weeks. Then repot the tuber in well-draining soil mix, placing the tuber so the upper half is above the surface. If a larger pot is needed, this is best done during the dormant period. Water when the tuber starts produces new leaves, and fertilize until flower buds form. Unless strong light is provided during growth, the plants are unlikely to regain their former beauty.

### Curiosities of Science and Technology

- An old superstition held that a pregnant woman should not step over a cyclamen, for fear of terminating her pregnancy. This may trace to knowledge that ingesting the toxic tubers could lead to an abortion. In medieval herb books it was believed that simply wearing the tuber around the neck could trigger a miscarriage.
- The classical Greeks and Romans recorded that cyclamen tubers were put into streams to stun fish so that they could be easily collected, presumably a result of the toxic saponins poisoning the fish.
- In mediaeval Europe, cyclamen, referred to as the “bleeding nun” (since early times, it was consecrated to the Virgin Mary) was often used as a charm against bad weather.
- During and in the decades following the First World War, there was a trend to name new allied warships after plants (e.g. Amaryllis, Buttercup, Crocus, Gladiolus, Hydrangea, Lupin, Pansy, Poppy). At least two British ships were named HMS Cyclamen (these were non-contemporary), as well as a French warship. Italy and Britain were allies during the First World War, but in 1917 the HMS Cyclamen accidentally sank an Italian submarine after mistaking it for a German U-boat.



Figure 7: Outdoor display of cyclamen around an ornamental pool in Madrid. Public domain photo from Pixabay.

- Only the most popular flowers have colours named after them (e.g. lilac, lavender, fuchsia, rose, violet, wisteria). The colour “cyclamen” has been described as “a very dark reddish purple” (Webster’s Third New International Dictionary).
- A “fairy garden” is a miniature garden with small plants such as cyclamens, and miniature gardening furnishings, typically created in a container or very small segregated outdoor area. These became very popular in Victorian England, and fairy garden kits remain popular. “Flower fairies” for most familiar garden plants were illustrated in the 19<sup>th</sup> and early 20<sup>th</sup> centuries, and to this day porcelain figurines and prints of them have been a mainstay of the collector’s trade. Especially popular are “cyclamen fairies”, profusely decorated with the flowers.

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Figure 8: Outdoor display of cyclamen around an ornamental pool in Madrid. Public domain photo from

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### Key websites

- Lonsdale, J. and Edgewood Gardens. 2020. The magic of cyclamen – [edgewoodgardens.net/the-magic-of-cyclamen/](http://edgewoodgardens.net/the-magic-of-cyclamen/) (A good horticultural overview)
- Minter, B. 2019. Cold-hardy cyclamen offer explosion of ground-cover colour. *Vancouver Sun* – [vancouver.sun.com/homes/gardening/brian-minter-cold-hardy-cyclamen-offer-explosion-of-ground-cover-colour](http://vancouver.sun.com/homes/gardening/brian-minter-cold-hardy-cyclamen-offer-explosion-of-ground-cover-colour) (A guide to the “hardy,” i.e. most cold-tolerant species, suitable for coastal British Columbia)
- Stefen, R. 2008. *Cyclamen* for winter and spring. *Pacific Horticulture Society*, Oct. issue – [www.pacifichorticulture.org/articles/cyclamen-for-winter-and-spring/](http://www.pacifichorticulture.org/articles/cyclamen-for-winter-and-spring/) (Another guide to the “hardy,” i.e. most cold-tolerant species)
- The Cyclamen Society – [www.cyclamen.org/](http://www.cyclamen.org/) (Based in the U.K., the best website for botanical and horticultural information)
- University of Manitoba Faculty of Agricultural and Food Sciences. 2020. *Cyclamen mites* – [www.umanitoba.ca/faculties/afs/hort\\_inquiries/812.html](http://www.umanitoba.ca/faculties/afs/hort_inquiries/812.html) (Identification information for the most significant pest of cyclamen)

### Acknowledgements

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