Rhus chinensis var. *chinensis* (*Anacardiaceae*): a new alien record for the flora of Turkey

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Abstract. *Rhus chinensis* var. *chinensis* (*Anacardiaceae*) is reported for the first time in this paper for the flora of Turkey. This woody naturalized species was collected from Kemalpaşa (Artvin) and observed in Hazar (Rize) of NE Turkey, in a mixed broadleaved forest and thickets amongst tea plantations. The naturalized population of Kemalpaşa includes more than 250 individuals, mostly along the side slopes of forest roads. However, the population of Hazar among tea plantations includes fewer individuals. Comparison of the important morphological characters of *Rhus chinensis* var. *chinensis* and *R. coriaria*, native to Turkey, description, photographs of the natural habitat and herbarium samples of the new record are also presented in the article.

Key words: Anatolia, biodiversity, naturalized taxon, taxonomy

Introduction

The genus *Rhus* L. (*Anacardiaceae*), with approximately 250 species, is distributed in temperate, subtropical and tropical regions of the world (Min & Barford 2008). It is the largest genus of the family and consists of shrubs and trees (Miller & al. 2001; Min & Barford 2008). This genus is represented by *Rhus coriaria* L. commonly known as "sumac" in Turkey (Davis & al. 1967; Güner 2012). Sumac is important for nutrition and medicine (Shabbir 2012; Liu & al. 2015). Moreover, it can be used as a host plant of gallnut used in traditional Chinese medicine (Tian & al. 2009). This taxon is also reported as applied in the agroforestry systems (Liu & al. 2015). Depending on the trade activities between Turkey and Asian countries, many alien species such as this new record have entered from Georgia and are naturalized in Turkey. During the field study "Alien species prevention action plan in NE Anatolia" in 2015, *Rhus chinensis* var. *chinensis* was discovered in two localities of the Eastern Black Sea region of Turkey by the present authors. Here this species is reported as a new woody alien species for the flora of Turkey.

Material and methods

Plant material of this newly recorded species was collected by the authors in the autumn of 2015, during the field study "Invasive alien species prevention action of *Sicyos angulatus* L in NE Anatolia". The specimens were identified after consulting several relevant publications (Davis & al. 1967; Min & Barford 2008; Shishkin & Bobrov 1974). All characters of the specimens were surveyed by stereomicroscope in laboratory conditions and during field observations. The materials recorded here are deposited in the Herbarium of Forest Botany, Faculty of Forestry (KATO) and Department of Biology (KTUB), Faculty of Science at the Karadeniz Technical University.

Results

Rhus chinensis Mill. var. ***chinensis***, Gard. Dict., ed. 8, Rhus no. 7. 1768. (Figs. 1-2).

A shrub or small tree, up to 10 m high, branchlets pubescent, lenticellate. Leaves imparipinnately compound, alternate, petiole and rachis peculiarly winged, leaflets (5) 7–13, margin dentate-crenate, acute, hairy beneath. Inflorescence many-branched, with terminal panicle, more than 25 cm long (male flowers 30–40 cm, female flowers are shorter). Flowers dioecious, yellowish-white, unisexual, pedicel *ca.* 1 mm, calyx of male flowers *ca.* 1 mm, petals *ca.* 2 mm, those of female flowers are smaller. Styles 3, drupe globose or subglobose, slightly compressed, 4–5 mm in diameter, orange-red, covered with mixed pilose and glandular-pubescent hairs. The plant flowers in August – September.

Distribution in Turkey

A8 Artvin: Hopa-Kemalpaşa, in a mixed broadleaved forest, UTM: 0711597, 4598023; 10 m, 26.09.2014, S. Terzioğlu and K. Coşkunçelebi 1209, (KATO: 9857!, KTUB!); Rize: Hazar Mahallesi, in thickets amongst tea plantations, UTM 0613517, 4539580; 86 m, 14.09.2014, observed by the authors.

Habitat

In lowlands, broad-leaved forests, tea plantations, along streams and roads, in thickets. Native and naturalized/cultivated (*) taxa which shared the same habitat with *R. chinensis* var. *chinensis* were the following: *Alnus glutinosa* (L.) Gaertn. subsp. *barbata* (C.A. Mey.) Yalt., **Robinia pseudoacacia* L., *Ulmus glabra* Huds., *Ficus carica* L. subsp. *carica*, **Camellia sinensis* (L.) Kuntze, *Hedera colchica* (K. Koch) K. Koch, **Sicyos angulatus* L., **Duchesnea indica* (Andrews) Focke, **Eleusine indica* (L.) Gaertner, *Sambucus ebulus* L., **Polygonum perfoliatum* L., *Polygonum persicaria* L., *Polygonum thunbergii* Siebold & Zucc., *Lythrum salicaria* L., *Xanthium strumarium* L., **Paspalum thunbergii* Kunth ex Steud., **Artemisia verlotorum* Lamotte, **Commelina communis* L., *Lactuca serriola* L., *Myosoton aquaticum* (L.) Moench, *Calystegia silvatica* (Kit.) Griseb., **Ambrosia artemisiifolia* L., *Trachystemon orientalis* (L.) G. Don, *Carex pendula* Huds., *Physalis alkekengi* L.

Fig. 1. Voucher of *Rhus chinensis* var. *chinensis*.

Discussion

During the field study in Northeast Turkey, the authors collected some specimens of *Rhus* from Hopa-Kemalpaşa (Artvin), close to the Georgian border of Turkey. The specimens were cross-checked with the description provided by Davis & al. (1967) and the accounts of *Rhus* given in other literature (Min & Barford 2008; Shishkin & Bobrov 1974). All samples collected from the cited localities easily key out as *Rhus chinensis* Mill. native to China and its neighboring countries (Min & Barford 2008). It is represented by two varieties easily distinguished by the leaf rachis, which is broadly winged in *R. chinensis* var. *chinensis* and wingless in *R. chinensis* var. *roxburghii* (Min & Barford 2008). Our samples with a typical winged rachis are treated as *R. chinensis* var. *chinensis* (Figs. 1-2). This woody plant is often grown in the botanical gardens and parks of Georgia (Shishkin & Bobrov 1974). It has been assumed that it has escaped from the Batumi Botanical

Fig. 2. *Rhus chinensis* var. *chinensis:* in a deciduous forest (**a**), in a tea plantation (**b**), an old individual with a creeping *Hedera colchica* (**c**), a plant with pistillate flowers (**d**), a plant with staminate flowers (**e**), abaxial surface of leaflets (**f**), an imparipinnately compound leaf with distinctly winged rachis (**g**).

Garden (Georgia) and is considered to have become an exotic member of the Turkish flora at least 15 or more years ago. It is not suprising that this taxon has easily naturalized in the NE Anatolia with its characteristically high rainfalls and humidity rate. In the latter decades, several Chinese and Japanese taxa were also reported from this region (Terzioğlu & Anşin 2001). Depending on our field observations of mature individuals, it could be said that the number of male exceeds that of the female samples. Furthermore, more than 250 individuals, mature and young, occur in the Kemalpaşa population, but their number is lower in the Hazar population. The species has not been considered a natural replacement of the native taxa within the communities. However, the beekeepers are aware that it represents an important nectar source in late summer. This makes it suitable for planting in many places in the region in the future.

This newly recorded taxon is not closely related to *R. coriaria*, which is native to Turkey. However, the two species could be easily distinguished by a combination of characters given in Table 1.

Table 1. Differences between *R. chinensis* var. *chinensis* and *R. coriaria*.

	R. chinensis* var. *chinensis	***R. coriaria***
Height (m)	Up to 10 m	Up to 3 m
Leaf	Deciduous	Almost evergreen
Leaf rachis	Broadly winged throughout	Slightly winged, at least between distal leaflets
Color of petal	Yellowish-white	Greenish-white
Number of leaflets and margin	(5-)7–13; dentate-crenate	7–21;coarselycrenate-serrate
Length of inflorescence	Male 30–40 cm, female over 25 cm	Male 20–25 cm, female up to 15 cm
Length of filaments and anther length	2 mm; 0.7 mm	1.5 m; 1.5 mm
Vestiture of fruit	Mixed pilose and glandular-pubescent	Densely glandular hairy
Altitude in Turkey (m)	10–86	600–1900

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