

An Alien Species New to the Flora of Turkey: *Lysimachia japonica* Thunb. (Primulaceae)

Salih TERZİOĞLU^{1,*}, Fergan KARAER²

¹Karadeniz Technical University, Faculty of Forestry, Department of Forest Botany, Trabzon - TURKEY

²Amasya University, Faculty of Education, Department of Biology, Amasya - TURKEY

Received: 04.08.2008

Accepted: 19.03.2009

Abstract: The Japanese species, *Lysimachia japonica* Thunb. (Primulaceae) has been recorded as a new alien for the Flora of Turkey from the NE Anatolia. The detailed description of the species together with its photographs is provided.

Key Words: Adventive species, *Lysimachia japonica*, NE Anatolia

Türkiye Florası İçin Doğallaşmış Yeni Bir Tür: *Lysimachia japonica* Thunb. (Primulaceae)

Özet: Bir Japonya türü olan *Lysimachia japonica* Thunb. (Primulaceae) Türkiye florası için doğallaşmış bir tür olarak ilk kez Kuzeydoğu Anadolu'dan kaydedilmektedir. Detaylı betimi ve fotoğrafları verilmektedir.

Anahtar Sözcükler: Doğallaşmış tür, Kuzeydoğu Anadolu, *Lysimachia japonica*

Introduction

Lysimachia L. is a cosmopolitan genus more common in temperate and subtropical parts of the Northern Hemisphere. There are about 180 or possibly up to 250 species of the genus worldwide; however, a few species occur in the southern hemisphere (Kodala, 2006). The genus consists of annual or perennial herbs with the flowers axillary or in clusters, corolla 5-lobed. In Turkey, 7 native (Leblebici, 1978) and 1 adventive species occur. This genus belongs to the tribe *Lysimachieae* Rchb. and includes 6 sections (Shteinberg, 1967). According to study based on DNA sequence data from the chloroplast genes *atpB*, *ndhF*, and *rbcl* the genera *Lysimachia* L., *Anagallis* L., *Trientalis* Rupp. Ex L., *Glax* L., *Asterolinon Hoffmanns. & Link*, and *Pelletiera* A. st.-Hil. were moved

to the Myrsinaceae together with the genera *Coris Tourn. Ex L.*, *Ardisiandra*, Hook f. and *Cyclamen* L. (Källersjö et al., 2000). *Lysimachia japonica* Thunb., originated from Japan and naturalized in wet places (grassy banks, ditches, and streamside) of the Caucasus, belongs to the section *Cilicina* F.W.Klatt (Shteinberg, 1967).

While attending the 19th National Biology Congress held in Trabzon in June, 2008, during an excursion in the town, the authors came across specimens of *L. japonica* under a hazelnut plantation adjacent to the Solaklı Stream bed. This species is native to Bhutan, India (Darjeeling), Indonesia, Japan, Kashmir, and Korea (Jia, 2003). It was also recorded as an alien from Georgia (Ketskhovali, 1969).

* E-mail: sterzi@ktu.edu.tr

Results

This study is based on specimens collected from A8 Trabzon (NE Anatolia) in June 2008. The description was written with the aid of Flora of Japan (Iwatsuki et al., 1993), Flora of China (Jia, 2003), and Flora of USSR (Shteinberg, 1967). Specimens were deposited at the herbarium of the Karadeniz Technical University, Faculty of Forestry, Department of Forest Botany (KATO).

Lysimachia japonica Thunb. Fl. Jap. 83. 1784. 1784 (Figure).

Perennial herb, stems prostrate to decumbent, 10-25 (-35) cm. Leaves opposite, membranaceous; petiole 5-15 mm, narrowly winged; leaf blade broadly ovate to suborbicular, 1-2.5 X 0.7-2 cm, pubescent, transparent glandular punctate, base rounded to subtruncate, short attenuate into petiole, glabrous on both surfaces except

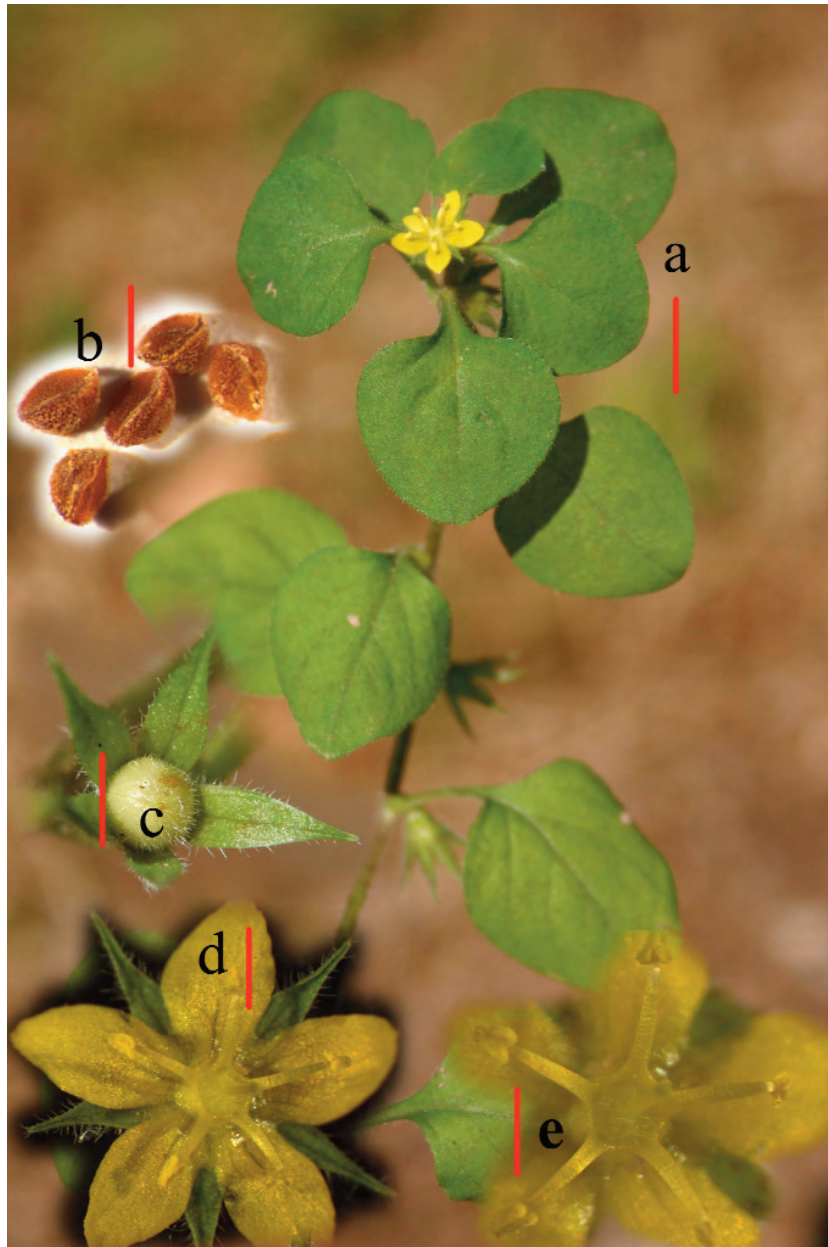


Figure. *Lysimachia japonica*. a-Stem; b- Seeds; c-Fruit; d-Flower; e-Pistil and stamens (Scale bars: a:1 cm, b: 0.8 mm, c: 3 mm; d: 1.4 mm; e: 3 mm).

sparsely pilose on nerves on lower surface, sparsely glandular-spotted; apex acute to obtuse; veins 2 or 3 pairs; ciliate-margined. Pedicel recurved in fruit, 2-8 mm. Flowers solitary or 1-2(-3) in the axils. Calyx lobes lanceolate, 3-4 mm, enlarging to 7-8 mm in fruit, pubescent. Corolla rotate, yellow, deeply parted, ca. as long as calyx, 5-8 mm in diam.; lobes triangular-ovate, transparent glandular punctate. Stamens 5, ca. 3 mm long, filaments connate basally into a ca. 1 mm high ring, about half the length of corolla. Ovary globose, pubescent; style filiform, ca. 2 mm. Capsule subglobose, ca. 3 mm in diam., glabrous, dehiscent with 5 ovate valves, much shorter than persistent calyx, many-seeded. Fl. May-July.

Collected Specimen: A8 Trabzon: Of, Ballica Village, adjacent to the Solaklı Stream bed, 9 km South of Black Sea, 24 vi 2008, 53 m, KATO 16078. UTM European 50 datum 37 zone, 0608091 E, 4526514 N.

Discussion

Many of the adventive species, especially from Japan and China, have easily naturalized in the Caucasus as well as NE Anatolia due to the high rainfall throughout the year (Terzioğlu & Anşın, 2001). Many aliens have been recently recorded from the East Black Sea region of Turkey (Tan & Baytop, 1995; Duman & Güner, 1996; Byfield & Baytop, 1998; Coşkunçelebi et al, 2007). Because of the distribution of *L. japonica* in the Caucasus as an alien, the distribution in Turkish Caucasus is not surprising. A new key for *Lysimachia* taxa in Turkey was developed based on Leblebici (1978):

1. Calyx c. 5 × as long as corolla; small annual
7. *linum-stellatum*
1. Calyx shorter than or as long as corolla; perennial or annual
 2. Annual; flowers pink or purple in a terminal spike or raceme
 3. Flowers and capsule pedicellate; stamen shorter than corolla
4. *dubia*

3. Flowers and capsules sessile; stamens much longer than corolla
5. *atropurpurea*
2. Perennial; flowers yellow, paniculate, whorled or axillary
 4. Plant creeping; flowers 1-2 (-3) in axils of median leaves
 4. a. Plant glabrous; petiole 2-4 (-6) mm; pedicel 7-30 mm
6. *nummularia*
 4. b. Plant with hairy; petiole 5-15 mm; pedicel 2-8 mm
8. *japonica*
 4. Plant erect; flowers paniculate or whorled
 5. Inflorescence paniculate; calyx margin brownish-red
1. *vulgaris*
 5. Inflorescence whorled; calyx margin green
 6. Petiole 0-2 mm; lamina narrowly ovate
2. *punctata*
 6. Petiole (3-)5-19 (-21) mm; lamina ovate-oblong
3. *verticillaris*

The following taxa grow in association with the *L. japonica* at its site where naturalized in Trabzon (while the other naturalized or cultivated taxa denoted with asterisk and the native ones are the rest):

**Corylus maxima* Miller, *Opismenus undulatifolius* (Ard.) Beauv., **Microstegium vimineum* (Trin.) A.Camus, *Stachys sylvatica* L., **Hydrocotyle ramiflora* Maximow, **Polygonum thunbergii* Sieb. et Zucc., *Polygonum persicaria* L., *Plantago major* L., **Oxalis corniculata* L. *Trachystemon orientalis* (L.) G.Don, **Camellia sinensis* (L.) O.Kuntze, **Galium aparine* L., *Holchus lanatus* L., *Thelypteris limbosperma* (All.) Fuchs, *Daucus carota* L., **Duchesnea indica* (Andrews) Focke, *Rubus platyphyllos* C.Koch, *Castanea sativa* Mill., *Alnus glutinosa* Gaertn subsp. *barbata* (C.A. Mey.) Yalt., **Conyza albida* Willd. ex Sprengel, *Bidens tripartita* L., *Lysimachia vulgaris* L., *Geum urbanum* L., *Smilax excelsa* L., *Sisymbrium officinale* (L.) Scop., *Lycopus europaeus* L., *Pteridium aquilinum* (L.) Kuhn., **Sicyos angulatus* L., *Calystegia sylvatica* (Kit.) Griseb., **Commelina communis* L., **Phytolacca americana* L.

References

- Byfield AJ & Baytop A (1998). Three Alien Species New to Flora of Turkey. *Turk J Bot* 22: 205-208.
- Coşkunçelebi K, Terzioğlu S & Vilademirov V (2007). A New Alien Species for the Flora of Turkey: *Bidens frondosa* L. (Asteraceae). *Turk J Bot* 31: 1-3.
- Duman H & Güner A (1996). A new record for the Flora of Turkey. *Turk J Bot* 20: 383-384.
- Iwatsuki K, Yamazaki T, Boufford DE & H. Ohba H (eds.) (1993). Flora of Japan. Volume IIIa, Angiospermae, Dicotyledoneae, Sympetalae, Kodansha, Ltd., Tokyo.
- Jia X (2003). *Lysimachia* L. In: Wu ZY & Raven PH (eds.) *Flora of China (Myrsinaceae through Loganiaceae)* 15: 39-189. Science Press, Beijing, and Missouri Botanical Garden Press, St. Louis.
- Källersjö M, Bergqvist G & Anderberg AA (2000). Generic realignment in Primuloid families of the Ericales s.l.: a phylogenetic analysis based on DNA sequences from three chloroplast genes and morphology. *Am J Bot* 87: 1325-1341.
- Ketskhovali N (1969). *Identification Key to Georgian Plants*. Vol. II, Tbilisi: Publishing House "Metsniereba".
- Kodala PG (2006). *Lysimachia* (Myrsinaceae) in New South Wales. *Telopea* 11: 147-154.
- Leblebici E (1978). *Lysimachia* L. In: Davis PH (ed.) *Flora of Turkey and the East Aegean Islands* 6: 135-138. Edinburgh: Edinburgh University Press.
- Shteinberg EA (1967). *Lysimachia* L. In: Komarov VL (ed.) *Flora of USSR*, 18: 83-215. Jerusalem: Israel Program for Scientific Translation.
- Tan K & Baytop A (1995). *Polygonum nepalense* Meissn. in Turkey. *Turk J Bot* 19: 601-602.
- Terzioğlu S & Anşın R (2001). A chorological study on the taxa naturalized in the Eastern Black Sea Region. *Turk J Agric For* 25: 305-309.