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Notes on the taxonomy of *Genista januensis* and *G. lydia* (Fabaceae)

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The relationships between the closely related Mediterranean species *Genista januensis* Viv. and *G. lydia* Boiss. (Fabaceae) are discussed. The morphological differences between them are extremely subtle and they are allopatric for the greater part of their range. After extensive field and herbarium study the rank of subspecies for *G. lydia* is deemed appropriate.

Key words: Fabaceae, *Genista januensis*, nomenclature, taxonomy

Introduction

The genus *Genista* includes 75–80, mostly Mediterranean species taxonomically grouped into three subgenera and ten sections (Gibbs 1966). The type section *Genista* comprises *G. tinctoria*, *G. januensis* and *G. lydia*. These species are characterized by non-spiny stems, simple leaves, glabrous corolla with the standard more or less equalling the wings and keel, and narrowly oblong legume with three or more seeds. *Genista tinctoria* is widespread in Europe, while *G. januensis* and *G. lydia* are Mediterranean species. *Genista tinctoria* is rather easily distinguished by the relatively long (up to 50 mm), usually more or less hairy leaflets (Gibbs 1966, 1968), while *G. januensis* and *G. lydia* with their shorter and narrower leaves appear to be very closely related and often difficult to separate from each other.

Genista januensis, described by Viviani in 1802 from Italy, occurs in the central Mediterranean region from central and northern Italy (Naples to Liguria and the SE Alps), through the northern part of the Balkan Peninsula to western Romania and Bulgaria (Fig. 1). *Genista lydia*, published by Boissier in 1843, is confined mainly to northern, western and southern Anatolia with its westernmost localities in Serbia and FYR Macedonia, NE Greece (Thrace) and the Rhodopi Mts in Bulgaria (Browicz 1991) (Fig. 1). The map provided by Gibbs (1966: p. 37) indicates that the ranges of the two taxa do not overlap.

The specific characters of *G. januensis* considered to distinguish it from *G. lydia* are the triangular, winged branchlets and leaves with a hyaline and obscurely denticulate margin. Gibbs (1966) published a revision of *Genista* and in this work also stated that distinct heterophylly is exhibited in *G. januensis* as the leaves on its

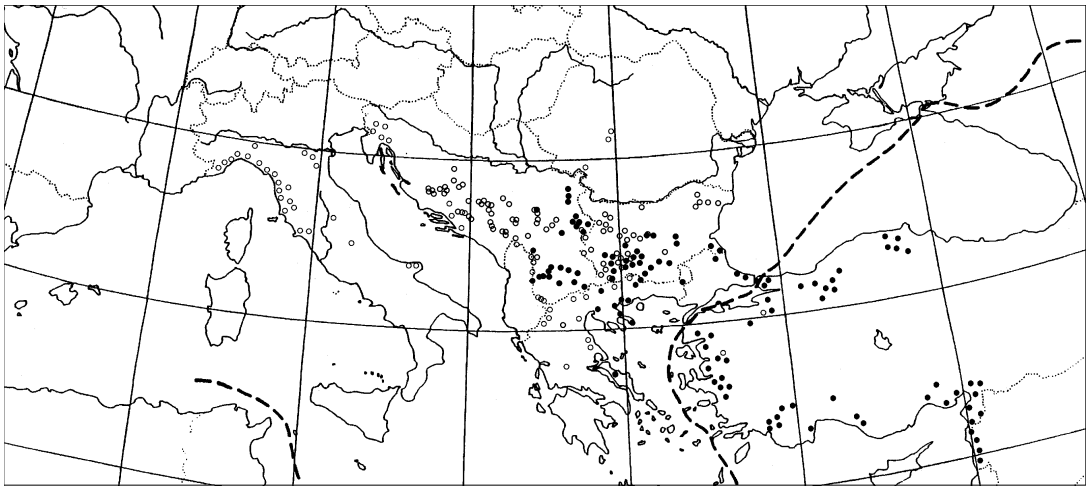

Fig. 1. Distribution map of *Genista januensis* subsp. *januensis* (○) and subsp. *lydia* (●).

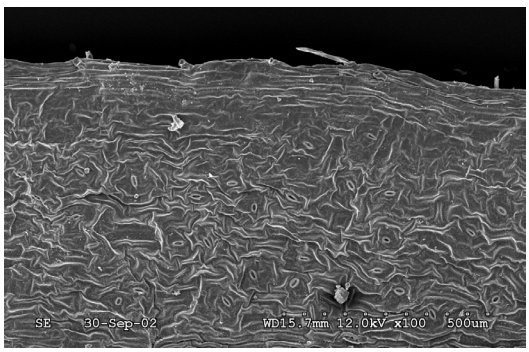

Fig. 2. *Genista januensis* subsp. *januensis* (W Turkey, Kütahya, *J. Zieliński*, KOR 25055). Leaf undersurface with marginal cilia; hyaline border easily recognized by absence of stomata (SEM micrograph).

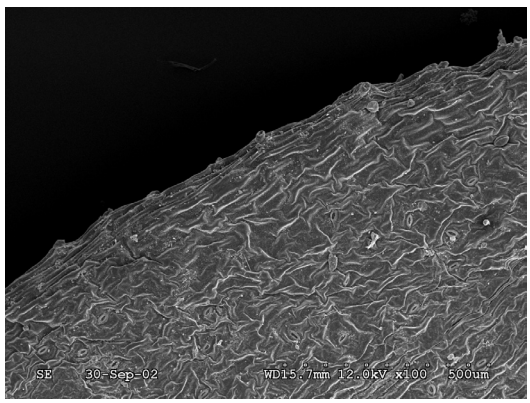

Fig. 3. *Genista januensis* subsp. *januensis* (W Turkey, Kütahya, *J. Zieliński*, KOR 25055). Leaf undersurface showing "denticulate" leaf margin (all hairs broken off) (SEM micrograph).

flowering branchlets are relatively broader than those on its sterile stems.

Observations and results

After the examination of much herbarium material (*see* Fig. 1, based on herbarium material and field observations) it appears that the character concerning the denticulate leaf margin of *G. januensis* needs some clarification as it is not apparent from literature. Denticulate leaves would indeed be unusual for the genus. The leaf margin of *G. januensis* is shortly ciliate but as entire as in the other species of *Genista*. This is clear in young leaves. The ciliae, however, often break off at an early stage and only their bases remain on the leaf margin, displayed as minute "teeth" (Figs. 2–5).

The full set of *G. januensis* characters (triangular 'winged' stems, distinct heterophylly, hyaline leaf margin with cilia bases) can only be observed in the western part of the species' range. Further east the stems of *G. januensis* become more terete (evenly 4- to 5-ridged). This fact was also noted by Gibbs (1966). The terete-stemmed plants occur mainly in Bulgaria, Romania and northern Greece. In the account of *Genista* for the *Flora of Bulgaria* (Kuzmanov 1976), *G. januensis* is keyed out twice; first, to cater for the specimens with triangular stems, and second, for those with terete stems.

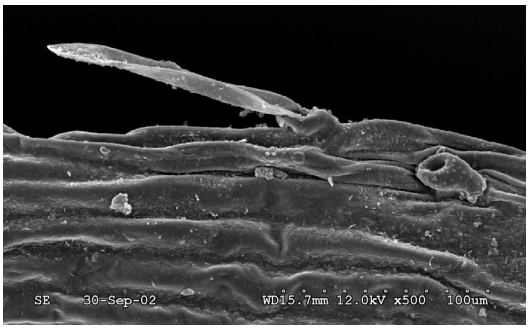

Fig. 4. *Genista januensis* subsp. *januensis* (W Turkey, Kütahya, *J. Zieliński*, KOR 25055). Hair enlarged (SEM micrograph).

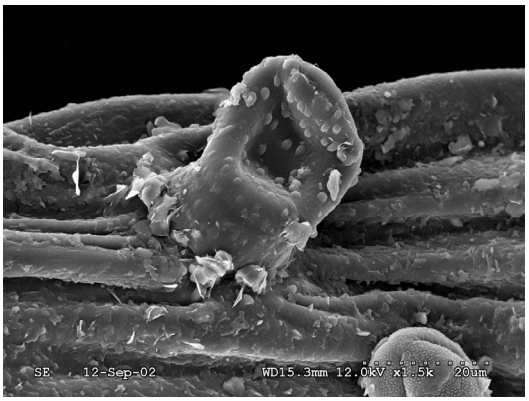

Fig. 5. *Genista januensis* subsp. *januensis* (W Turkey, Kütahya, *J. Zieliński*, KOR 25055). Base of broken hair (SEM micrograph).

Plants of *G. januensis* with terete stems and hyaline ciliate leaf margins occur in NW Anatolia. The description of *G. spathulata* was based on specimens originating from Uludağ (the Bithynian Olympus near Bursa) and thus characterized. Similar plants were found in 1991 by one of us between Šaphane and Alanocak in the West Anatolian province of Kütahya (JZ, KOR 25055). They exhibit the heterophylly mentioned by Gibbs (1966). In our opinion this character and, more importantly, the hyaline leaf margin are the only reliable features, which can be used to distinguish *G. januensis* and *G. lydia* to some extent within their entire range. Taking into consideration these subtle differences, the existence of intermediate forms in Greece, Bulgaria and former Yugoslavia, and the geographical distribution of both taxa, we conclude that *G. lydia* should be treated as a subspecies of *G. januensis*. Turrill (1957) had already reached the same conclusion. He commented on the difficulty of distinguishing *G. januensis* and *G. lydia*: "it is very probable that a future monographer with abundant material available will make *G. lydia* an eastern subspecies of *G. januensis*".

Taxonomic treatment

Genista januensis Viv.

Elench. Pl. Hort. Dinegro: 19. 1802 (July).

Lectotype (designated here): The illustration depicted in Viv., Fl. Ital. Fragm. tab. 8 fig. 1. 1808.

Shrub with non-spiny, slender, flexuous, glabrous branches. Leaves simple (1-foliolate), sessile, narrowly elliptic to oblanceolate-spathulate, glabrous to subglabrous. Flowers borne in 4–6 cm long racemes at the ends of short ascending branches. Bracts foliaceous; bracteoles linear, less than 1 mm. Pedicels 1–4 mm. Calyx tubular-campanulate, 3–4.5 mm, usually glabrous, rarely ciliate at lips; upper lip shorter than tube, deeply bifid with 1–1.5 mm teeth; lower lip 3-toothed. Corolla yellow, glabrous; standard broadly ovate, obtuse, equalling or slightly longer than wings and keel. Legume flattened, narrowly oblong, glabrous, 3–8-seeded.

Key to subspecies

1. Leaves on flowering stems relatively broader than those on sterile stems; leaf margin conspicuously hyaline .... subsp. *januensis*
1. Leaves on flowering stems similar to those on sterile stems; leaf margin not hyaline ..... subsp. *lydia*

Genista januensis subsp. *januensis*

G. triangularis Willd., Sp. Pl. 3(2): 939. 1802 (November). — Described from Romania, "habitat in Banatu" (B-Willd.?). This cites a reference to *G. triquetra* Waldst. & Kit., Descr. Icon. Pl. Hung. 1805.

G. triquetra Willd., Sp. Pl. 3(2): 938 (1802). — Described from Corsica.

G. scariosa Viv., Ann. Bot. (Genova) 2: 175. 1804, *nom. illeg.* — Described from Italy, "in collibus Ligusticis; Genuae, in Oregina; Pegli, sotto S. Alberto, Nell'Isola Palmaria".

G. triquetra Waldst. & Kit., Descr. Icon. Pl. Hung. 2:

165 & t. 153. 1805. — Described from "montium Domuglet and Suszti-Domuglet ad thermas Herculis". TYPE: not traced in PR.

G. spathulata Spach, Ann. Sci. Nat. Bot. ser. 3: 128. 1845. — SYNTYPES: [NW Turkey] "in Olympo Bithynico (Uludağ) et prope Byzantium", *Aucher-Eloy* (P).

Shrub with erect or decumbent branches; stems 30–100 cm, angular- or terete-striate. Leaves glabrous to subglabrous except for hyaline margin (appearing denticulate because of persistent cilia bases), narrowly elliptic and (3–)5–12 × 2–4 mm on flowering stems, elliptic to lanceolate and 8–40 × 2–5 mm (8–15 × 2–4 mm in Greece) on sterile branches. Calyx 3.5–4 mm; upper teeth ca. 1–1.25 mm. Standard 8–10 mm; wings ca. 6 mm excl. 2 mm claw; keel 5–6 mm. Legume 15–22 × 2–2.5 mm.

In mixed *Pinus–Abies* or *Fagus* forest, summit meadows with *Juniperus* and *Buxus* scrub, rocky slopes and ridges, on limestone or serpentine scree, 1000–2260 m. Flowering April to June, fruiting till late August.

DISTRIBUTION: North and central Italy, Slovenia, Croatia, Bosnia & Hercegovina, Montenegro, FYR Macedonia, Serbia, Romania, Bulgaria, Greece, NW and W Anatolia (Fig. 1).

Genista januensis subsp. *lydia* (Boiss.) Kit Tan & Zieliński, *stat. & comb. nova*

BASIONYM: *G. lydia* Boiss., Diagn. Pl. Orient. ser. 1, 2: 8. 1843. — *G. lydia* Boiss. var. *lydia* in Flora of Turkey and the East Aegean Islands 3: 26. 1970. — LECTOTYPE (designated here): Turkey. [W Anatolia, prov. Izmir] "in montibus Lydiae, prope Smyrnam [Izmir]", *Boissier* (G-Bois).

G. leptophylla Spach, Ann. Sci. Nat., ser. 3, 3: 127. 1845. — LECTOTYPE (designated here): Turkey. [W Anatolia] "in Mysiae monte Gargara hodie Kass-Dagh", *Aucher-Eloy & de Montbret* (P).

G. antiochia Boiss., Diagn. Pl. Orient. 9: 4. 1849. — *G. patula* M. Bieb. var. *antiochia* (Boiss.) Boiss., Fl. Orient. 2: 44. 1867. — *G. lydia* Boiss. var. *antiochia* (Boiss.) P. E. Gibbs, Flora of Turkey and the East Aegean Islands 3: 26. 1970. — *G. lydia* Boiss. subsp. *antiochia* (Boiss.) Ponert, Feddes Repert. 83: 619. 1973. — TYPE: Turkey. [S Anatolia, prov. Hatay] "in summis collibus quibus ruinae aras Antiochiae incident in Syria boreale", *Boissier* (G-Bois).

G. rumelica Velen., Sitzungsber. Königl. Böhm. Ges. Wiss. Prag. Math.-Naturwiss. Cl. 1890(1): 43. 1890. — *G. lydia* Boiss. var. *rumelica* (Velen.) Bornm. in Mitt. Thüring. Bot. Ver. n.s. 24: 31.1908. — *G. lydia* Boiss. subsp. *rumelica* (Velen.) Ponert, Feddes Repert. 83: 619. 1973. — TYPE: Bulgaria. "in rupestribus aridis collis Džemdem Tepe prope Philippopolin", *Velenovsky* (PRC?).

Dwarf shrub with procumbent, less than 25 cm long branches or erect-ascending, up to 2 m tall shrub with stiff, straight, up to 1 m long branches; stems angular- or terete-striate, unwinged. Leaves entire, linear to oblanceolate-spathulate, 3–10(–15) × 1–2(–3) mm, ciliate, without conspicuous hyaline margin. Racemes 2–8-flowered, to 6 cm long at ends of branches. Calyx (3–)4–4.5 mm; upper teeth ca. 1.5 mm. Standard 10–12 mm, equalling or slightly longer than wings and keel. Legume 15–20(–25) × ca. 3 mm, 3–5(–8)-seeded.

Dry rocky slopes, in macchie, mixed deciduous or open pine forest, on gravelly schistose or calcareous ground, 300–2100 m. Flowering late April to July, fruiting till August.

DISTRIBUTION: Serbia, FYR Macedonia, Bulgaria, Greece, N, W & S Turkey, Amanus Mts. (Fig. 1).

Genista januensis subsp. *lydia* is extremely variable in habit; erect or prostrate, tall and dwarf forms often grow side by side. Dwarf shrubs with their profuse bright golden-yellow flowers on prostrate or decumbent stems have much horticultural potential and would make attractive and hardy plants for rock gardens in northern Europe. *Genista rumelica* is a tall form with the facies of an *Ephedra*; it has elongate, slender and rather stiff branches, often growing in shaded places in Bulgaria, European Turkey and western Anatolia. We regard it as an extreme morphotype of subsp. *lydia*.

Acknowledgements

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