

## *Pimpinella tragium* Vill. subsp. *lithophila* (Schischk.) Tutin (Apiaceae), a new taxon in Croatian flora

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A new member of the Croatian flora, *Pimpinella tragium* Vill. subsp. *lithophila* (Schischk.) Tutin (Apiaceae), was found on the island of Vis in the Central Adriatic. It grows on the calcareous rocky coast near the sea and is a member of a halophilous community within the *Crithmo-Limonion* Br.-Bl. et Molinier 1934 alliance. Morphological similarities within the *Pimpinella tragium* group are briefly discussed. A determination key is given for all Croatian *Pimpinella* taxa.

**Keywords:** *Pimpinella*, taxonomy, flora, Island of Vis, Adriatic, Croatia

### Introduction

The genus *Pimpinella* L. (Apiaceae) is represented by approximately 150 species in Europe, Asia and Africa. These are annual, biennial and perennial species, usually growing on dry rocky places rocky crevices, fields, meadows, mountain pastures and grasslands (HARTVIG 1968, TUTIN 1968 a, PIGNATTI 1982, VELAYOS 2003). In the Croatian flora according to HIRC (1908), DEGEN (1937), DOMAC (1994: 235), LUKAČ (1997:113) and *Flora Croatica database* (NIKOLIĆ 2010) the genus *Pimpinella* is represented by seven taxa. These are *P. alpina* Host, *P. anisum* L., *P. major* (L.) Huds., *P. peregrina* L., *P. saxifraga* L., *P. tragium* Vill. and *P. tragium* Vill. subsp. *polyclada* (Boiss. et Heldr.) Tutin. Among them is *P. tragium* Vill. which is distributed in the Mediterranean area from Spain to Lebanon, north-west Africa, Asia Minor, the Caucasus, and in the south of the East European Plain (YURTSEVA and TIKHOMIROV 1998). In the countries and territories around Croatia and the Adriatic basin, *P. tragium* has been noted for Italy (PIGNATTI 1982, CONTI et al. 2005), Serbia (SARIĆ and DIKLIĆ 1986), Macedonia (MATEVSKI 2005), Bosnia and Herzegovina (BECK-MANNAGETTA 1927), Montenegro (ROHLENA 1942), Albania (QOSJA et al. 1992) and Greece (HARTVIG 1968).

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*Pimpinella tragi* represents a variable group of taxa with great morphological variability and confused taxonomy (TUTIN 1968 a, b; YURTSEVA and TIKHOMIROV 1998). Some authors (TUTIN 1968 a, b; MATTHEWS 1972; ENGSTRAND 1987; BRULLO and BRULLO 2009) distinguish several subspecies within this group: *P. tragi* subsp. *lithophila* (Schischk.) Tutin distributed in Southern Europe, Crimea, Turkey and Iran, *P. tragi* subsp. *depressa* (Sieber ex Spreng.) Tutin from Crete, *P. tragi* subsp. *pseudotragium* (DC.) Matthews from Turkey, Iran, Armenia and Iraq, *P. tragi* subsp. *titanophila* (Woronow) Tutin from East Europe, *P. tragi* subsp. *polyclada* (Boiss. et Heldr.) Tutin from the Balkans and Asia Minor and *P. tragi* subsp. *glauca* (C. Presl) C. Brullo et Brullo from Sicily.

## Materials and methods

Field research on the Central Adriatic island of Vis was undertaken from 2007 to 2010. For determination of plant species we used relevant taxonomic literature (HARTVIG 1968; TUTIN 1968 a, b; PIGNATTI 1982; VELAYOS 2003; MATEVSKI 2005). All the localities from herbaria, literature data and field observations were geocoded in the *Flora Croatica database* (NIKOLIĆ 2010). The positions of the localities of *Pimpinella tragi* subsp. *lithophila* were determined by GPS Garmin eTrex Vista and a distribution map of the newly recorded taxon was produced by combined usage of ESRI GIS ArcMap 9.2 tool and the *Flora Croatica database* (NIKOLIĆ 2010). Voucher specimens of *P. tragi* subsp. *lithophila* are deposited in CNHM and ZA herbarium.

## Results

A new taxon, *Pimpinella tragi* subsp. *lithophila* (Fig. 1 a) was found within halophytic vegetation on the northern side of the island of Vis, in the vicinity of the village Oključina and of the town of Vis.

### Description

***Pimpinella tragi* Vill. subsp. *lithophila* (Schischk.) Tutin** in Feddes Repert. 79 (1–2): 62 (1968).

**Synonyms:** *Pimpinella lithophila* Schischk., Not. Syst. (Leningrad) 12: 206 (1950), *Pimpinella tragi* var. *typica* Halácsy, Concept. Fl. Graec. 1: 682 (1901).

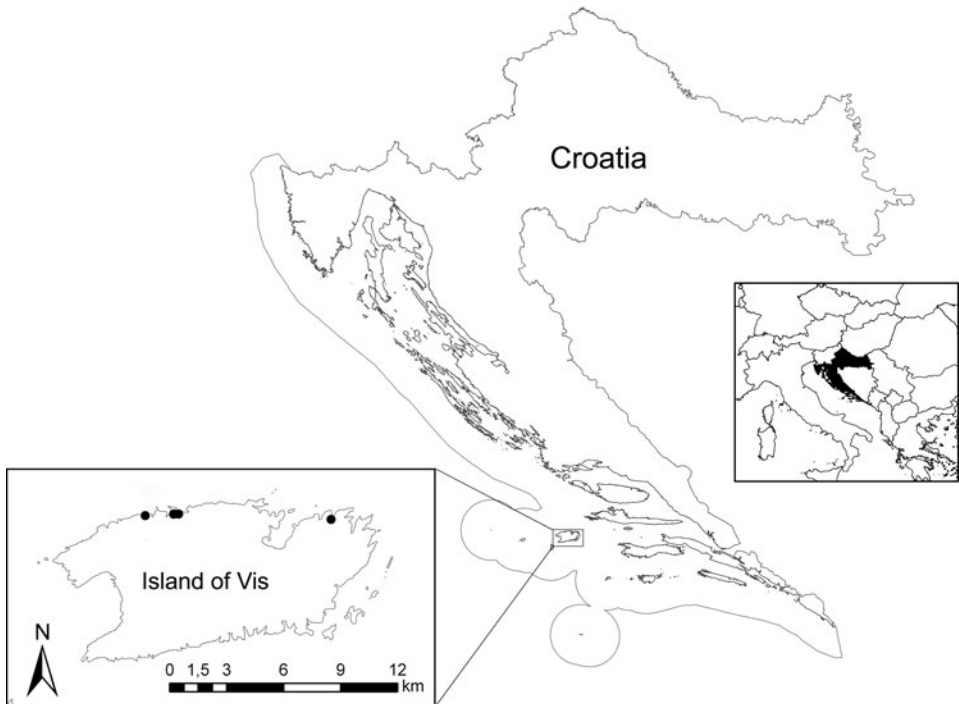
Plant perennial, up to 60(–100) cm high, pubescent or crisped-tomentose, rarely glabrescent or glabrous. Stems erect, basal parts form rhizomes covered by numerous scale-like remains of petioles. Rosette leaves numerous, basal leaves 5–25 cm long, long petiolate, oblong, ovate in outline, pinnatisect or bipinnatisect, with 3–7 pairs of segments, segments cuneate, ovate or orbiculate, crenate to deeply dentate. Upper cauline leaves vaginate with small sessile reduced lamina, usually reduced to a sheath. Umbels with 5–15(–20) unequal rays, densely or sparsely pubescent. Bracts and bracteoles absent or 1–2. Umbellula with 10–20 white flowers, sometimes pinkish; petals to 1 mm long, hairy on dorsal surface. Fruit 2–3 mm long, ovoid, densely tomentose, hairs short (Fig. 1 b). Stylopodium cushion-shaped, hemispherical, stylopodium 1–2.5 mm long. Flowering time from Jun to August. Chromosome number:  $2n = 20$ . Life form: Chamaephyte.



**Fig. 1.** *Pimpinella tragium* subsp. *lithophila*. a – habit on the island of Vis, b – tomentose ovaries (young fruits) (Photo by S. Bogdanović).

**Distribution in Croatia:** Central Adriatic, Dalmatia, Island of Vis (Fig. 2).

**SPECIMINA VISA:** CROATIA: Island of Vis, Tiha Inlet, Slatina Inlet rocky shore, May 18, 2008, *Ruščić s.n.* (ZA); Island Vis, Tiha Inlet rocky shore near Oključina, June 15, 2008, *Bogdanović and Ruščić, s.n.* (CNHM, ZA); Island of Vis, Dobra Inlet shore, June 15, 2008, *Bogdanović and Ruščić, s.n.* (CNHM, ZA); Island of Vis, Mala Travna Inlet rocky shore near Oključine, June 12, 2010, *Bogdanović and Boršić s.n.* (ZA).



**Fig. 2.** Distribution of *Pimpinella tragium* subsp. *lithophila* in Croatia.

## Discussion

For the Croatian flora, the species *Pimpinella tragium* at a specific level was cited by VISIANI (1842:34) in his *Flora Dalmatica* he wrote »*Hab. ad rupes maritimas insulae Lissa*«. Afterwards, HIRC (1908) and DOMAC (1955) reported this finding for the island of Vis, but without any precise locality. TRINAJSTIĆ (1998) also cited VISIANI's (1842) and PETTER's (1852) localities for the island of Vis. It is clearly evident that neither Domac nor Trinajstić had found *P. tragium* in the flora of the island of Vis. For the island of Svetac, *P. tragium* has been recorded by PAVLETIĆ (1978). According to HIRC (1908:69), potential localities of the species *P. tragium* could be found on the island of Krk and around Rijeka. On these sites *P. tragium* was never confirmed and remain dubious. In ZA and ZAHO herbaria there were no herbarium specimens of this taxon.

*Pimpinella tragium* subsp. *lithophila* in Croatia was found along the northern coast of the island of Vis, near the village of Oključina, in the bays of Tiha, Slatina, Mala Travna and Dobra near the town of Vis. These are all littoral localities influenced by the sea spray, where *P. tragium* subsp. *lithophila* was found on the calcareous rocky places near the sea. A new taxon grows in the narrow belt along the coast, as a member of halophilous vegetation within *Crithmo-Limonion* Br.-Bl. et Molinier 1934 alliance. On those sites *P. tragium* subsp. *lithophila* grows together with *Lotus cytisoides* L., *Crithmum maritimum* L., *Limonium subanfractum* Trinajstić, *Reichardia picroides* (L.) Roth, *Parapholis incurva* (L.) C. E. Hubb., *Anthyllis vulneraria* (L.) subsp. *praepropera* (A. Kern.) Bornm., *Centaureum erythrea* Rafn, *Desmazeria rigida* (L.) Tutin, *D. marina* (L.) Druce, *Blackstonia perfoliata* (L.) Huds., *Valantia muralis* L., *Silene sedoides* Poir., *Scorpiurus muricatus* L., *Trifolium angustifolium* L., *Centaurea issaea* Lovrić, *Brassica incana* Ten., *Allium commutatum* Guss., *Helichrysum italicum* (Roth) G. Don and others. Those rocky littorals of the bays Tiha, Slatina, Mala Travna and Dobra are the only known localities of this taxon in Croatia. Recently, the Island of Vis has become an Important Plant Area (IPA) where those sites are included (BOGDANOVIĆ and VUKOVIĆ 2010).

Morphological variability and density of leaf indumentum, as well as leaf incision and geographical pattern of those morphological characters along the whole geographic area of the *P. tragium*, make the taxonomy of the *P. tragium* group difficult. Based on anatomical and morphological study of the *P. tragium* group, two types of plants differing mainly in the hair length on leaves and on the lower part of the stem can be distinguished. *P. tragium* with hairs 0.05–0.2 mm long and *P. polyclada* 0.3–1 mm long (YURTSEVA and TIKHOMIROV 1998). Although the taxonomy of the *P. tragium* group has been studied by YURTSEVA and TIKHOMIROV (1998), it still remains unclear and unresolved. YURTSEVA and TIKHOMIROV (1998) suggest including *P. tragium* subsp. *lithophila* and some other subspecific taxa (*P. tragium* subsp. *depressa* and *P. tragium* subsp. *titanophila*) of this group under the name of *P. tragium*, while suggesting treating *P. tragium* subsp. *polyclada* at the specific level as *P. polyclada* Boiss. et Heldr. From a morphological point of view, *P. tragium* subsp. *lithophila* has smaller leaf lobes that are 5–10(12) mm long with a deeply serrate margin, while *P. tragium* subsp. *polyclada* has bigger leaf lobes that are 10–15(20) mm long and a margin that is not deeply serrate (HARTVIG 1968; TUTIN 1968 a, b; VELAYOS 2003; MATEVSKI 2005). Here we adopt the opinion of TUTIN (1968 a, b), VELAYOS (2003) and MATEVSKI (2005) and treat this new taxon for the Croatian flora at the subspecific level.

**Determination key for Croatian *Pimpinella* taxa**

Morphological characters and description of the taxon *Pimpinella tragi* subsp. *lithophila* were compared with those of *P. tragi* subsp. *polyclada*, since it is the only known subspecies of this group in Croatian flora. Here we give determination key for the Croatian taxa of the genus *Pimpinella*:

- 1 Ovary and fruit glabrous . . . . . 2
- Ovary and fruit pubescent. . . . . 4
- 2 Stem usually sharply angled, hollow; ridges of fruit prominent, whitish. . . . . *P. major*
- Stem usually cylindrical, nearly or quite solid; ridges of fruit inconspicuous . . . . . 3
- 3 Petals on abaxial side pubescent, stem cylindrical, glabrous, hairy only in basal part . . . . . *P. saxifraga*
- Petals on abaxial side glabrous, stem slightly angled, completely glabrous, shiny . . . . . *P. alpina*
- 4 Plants perennial, stem ligneous at base; with fibres and scale-like leaf bases *P. tragi* 5
- Plants annual or biannual; without fibres or scale-like leaf bases . . . . . 6
- 5 Plant slender; leaf lobes 5–10(12) mm long, margin incise-serrate . . . . . subsp. *lithophila*
- Plant stout; leaf lobes 10–15(20) mm long, margin not deeply serrate subsp. *polyclada*
- 6 Fruit with long patent hairs; umbel with more than 15 rays . . . . . *P. peregrina*
- Fruits with short appressed hairs; umbel with 2–12 rays . . . . . *P. anisum*

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