A NEW SPECIES OF SATUREJA (LAMIACEAE) FROM IRAN

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Satureja kermanshahensis is described as a new species from Iran. It is characterized by a dense columnar spicate inflorescence, 3-10 cm long, verticillasters 2-flowered and densely glandular pubescent leaves. It grows in crevices of rocks in Kermanshah province in western Iran. It is compared with S. coerulea from Bulgaria, Romania and NW Turkey, S. bachtiarica and S. edmondi growing in western Iran.

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Key words. Lamiaceae, Satureja, new species, Iran.

Introduction

Satureja s. l. belongs to a large complex including ca. 235 species (Doroszenko, 1985). The genus has been a subject of much discussion among taxonomists and is variously treated. Bentham (1876) recognized four genera: Calamintha, Gardoquia, Micromeria and Satureja s. str. Briquet (1895-1897) recognized one: Satureja, but Doroszenko (1985) considered a narrow concept for the Satureja complex and recognized 17 genera. In Flora Europaea, Heywood & Richardson (1972) recognized 5 genera in the region including Acinos, Calamintha, Clinopodium, Micromeria and Satureja s. str. In the Flora of USSR (Shishkin, 1954), China (Lee & Hedge, 1994), Turkey (Davis, 1982) and Iranica (Rechinger, 1982) a similar classification was adopted considering to some specific genera which were included on the basis of geographical distribution. Most American authors used Briquet’s broad circumscription of Satureja (Epling & Játiva, 1964-1966; Gleason & Cronquist, 1991; Munz, 1959) but a few (Clewell, 1985; Jones, 1976) followed Bentham (1876) in assigning American species to Micromeria and Calamintha rather than Satureja (Cantino & Wagstaff, 1998). Based on chloroplast DNA restriction site analysis and morphological characters Cantino and Wagstaff (1998) divided the complex into five genera: Cyclotrichium, Obtegomeria, Gardoquia, Xenopoma (including Hesperothymus) and Clinopodium (including Calamintha, Diodeilis and Montereya). Later, more molecular phylogenetic studies elucidated the status of the genera within the Satureja complex and in tribe Mentheae (Bräuchler et al. 2005, 2006 and 2008; Trusty et al. 2004).

Satureja in its narrow concept is a genus comprising 30 species, mainly distributed in Mediterranean Region but also extended to Irano-Turanian phytogeographical Region.

Satureja species are well known medicinal plants of Lamiaceae family. Due to presence of secondary metabolites such as flavonoids, steroids, terpenoids and tannins they are known for their healing properties for a long time and have been used as traditional folk remedies to treat various ailments such as cramps, muscle pains, nausea indigestion, diarrhoea and infectious diseases (Bezić, N, et al. 2009).

Reviewing the studies on terpenoids in some genera belonging to the Satureja complex reveal that the Satureja s. str. and its closely allied genus: Gontscharovia are markedly different from the other genera in the complex by their essential oil constituents
which is characterized by carvacrol, thymol, P-cymene and \( \gamma \)-terpinene as the major constituents, due to different species (Sefidkon & Jamzad; 2000; 2004a & 2004b; 2005; 2006a; 2006b & 2006c; Sefidkon et al. 2007). The essential oil constituents show different ingredients in other genera i.e. Acinos with pulegone, menthone and germacrene D as the prominent constituents of their oils (Chalchat et al. 2004; Stojanović et al. 2009), Calamintha with piperitone oxide and Cis-piperitone oxide (Hanlidou et al. 1991 and Kitic et al. 2001); Clinopodium with cis-piperitone oxide, piperitone oxide, pulegone and isopulegone (Mohan Bikram Gewali, 2008; Castilho et al. 2006). In Micromeria \( \alpha \)-pinene, \( \beta \)-pinene, linalool, \( \beta \)-caryophyllene and \( \alpha \)-gurjunene, (Mastelic et al. 2005) are the major constituents of the oil. However terpenoids can be recognized as potential taxonomic markers at generic levels. More investigation on essential oil pattern in other genera within the Satureja complex will provide a better understanding of their phylogenetic relationships.

Satureja s. str. occurs in Iran in north, northwest, west and north east and central parts of the country. They usually appear in small populations in mountainous habitats. Rechinger (1982) reported 11 species from Iran. A few species were later described by the present author i.e. S. kallarica Jamzad (Jamzad, 1992); S. khuzistanica Jamzad (Jamzad, 1994); S. rechingeri Jamzad (Jamzad, 1996) and recently S. macrosiphonia Bornm. was recorded for the first time for the flora of Iran (Jamzad, 2009). Considering the total number of species recognized so far from Iran (16), the number of endemics is surprising. Fifty percent of the taxa (8 species) occurring in Iran are endemics. They are mainly distributed in Zagros Mountains in western Iran. Reviewing the phytogeographical distribution pattern of Satureja s. str. reveals that the Mediterranean and Irano-Turanian Regions are two centers of origin for the genus and for the latter region, Iran seems to be the centre of speciation.

In the course of identification of the plant materials collected from West Iran, for the Flora of Iran project a specimen collected from Kermanshah province was identified as new Satureja species. It is described here, its relationship with its allies discussed and an illustration is presented.

Satureja kermanshahensis Jamzad, sp. nov.


Caespitose perennial, woody at base. Stems many, 12 - 20 cm high, covered with white short retrorse hairs. Cauline leaves 3-6.5 mm long, 1-2 mm wide, oblong-linear, \( \pm \) flat to conduplicate with whorls of small leaves in the axis, covered with short stiff hairs and red sessile glands on both surfaces; floral leaves 2.5 x 1 mm, oblong, shorter or equal to the calyx, covered with short hispid hairs and sessile glands. Inflorescence spicate, 3-10 cm long. 0.5-0.6 cm wide; verticillasters two-flowered, all close to each other. Flowers sessile. Calyx 2.5-3 mm long, campanulate, purple, covered by white hispid retrorse hairs and red sessile glands; upper teeth 0.5 mm long, triangular-lanceolate; lower teeth 1 mm long. Corolla 5-6 mm long, pink-purple, suddenly expanded at the throat; upper lip rounded, shortly cleft in the middle; lower lip with three equal oblong-ovate lobes. The upper stamens \( \pm \) exerted from the corolla. Nutlets 1.1x 0.6 mm, oblong-triangular (Fig. 1.).

The new species grows in crevices of rocks in Kermanshah province in western Iran. It is a late flowering species (October) like the other Iranian Satureja species and is characterized by a dense columnar spicate inflorescence and 2-flowered verticillasters. It is easily recognized from the other native Iranian species by the above mentioned characters.

Satureja kermanshahensis seems to be most closely related to S. coerulea Janka described from Bulgaria and with its closest locality to Iran so far reported being N.W Turkey. It is recorded as a rare in Turkey (Davis, 1982) and differs from it in longer leaf and calyx and leaves glabrous except in the margin with scattered glands and calyx teeth glabrous in S. coerulea. The new species differs from S. edmondii Briq. which is an Iranian endemic growing in Kermanshah province, in leaf shape and size, the lower ones with flat surface; verticillasters 4-6 flowered, lowers distant and calyx glabrous in S. edmondii. The new species differs from S. bachtiarica Bunge which is also distributed in Kermanshah province in habit which is erect subshrub, inflorescence many flowered verticillasters, lowers distant and smaller calyx in S. bachtiarica.

The morphological features of the above mentioned species are compared in table 1.
Fig. 1. *Satureja kermanshahensis* (×0.83); details (×8.3).
Table 1. A comparison of morphological characters of *Satureja kermanshahensis* with the other close species.

<table>
<thead>
<tr>
<th>Species</th>
<th>Habit</th>
<th>Leaf size &amp; shape</th>
<th>Leaf indumentum</th>
<th>Verticillasters</th>
<th>Calyx</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>S. kermanshahensis</em></td>
<td>ascending</td>
<td>3-6.5 x 1-2 mm oblong-linear, ± flat conduplicate</td>
<td>short white hairs and dense glands on both sides</td>
<td>2-flowered</td>
<td>2.5-3 mm, teeth triangular-lanceolate, hairy</td>
</tr>
<tr>
<td><em>S. coerula</em></td>
<td>procumbent or ascending</td>
<td>7-22 x 1.5-2 mm oblong-linear, recurved-conduplicate</td>
<td>glabrous except for the ciliate margin, sparsely gland dotted</td>
<td>2-flowered</td>
<td>4-5 mm, teeth lanceolate, glabrous</td>
</tr>
<tr>
<td><em>S. edmondii</em></td>
<td>arcuate-erect</td>
<td>10-15 x 3-6 mm oblong-lanceolate, lower flat, upper conduplicate</td>
<td>simple hairs and dense sessile glands on both sides</td>
<td>4-6 flowered</td>
<td>4-6 mm, teeth triangular, glabrous</td>
</tr>
<tr>
<td><em>S. bachtiarica</em></td>
<td>erect</td>
<td>5-10 x 1.5-3.5 mm oblong-spathulate, oblong-linear, recurved conduplicate</td>
<td>dense sessile glands on both sides and short white stiff hairs</td>
<td>many-flowered</td>
<td>1.5 mm teeth triangular-lanceolate, hairy with sessile glands</td>
</tr>
</tbody>
</table>

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