A NEW SUBSPECIES AND A RECORD OF LINARIA (SCROPHULARIACEAE) FROM IRAN

S. M. M. Hamdi & M. Assadi


Linaria chalepensis subsp. gorganensis Hamdi & Assadi is described as a new subspecies from Gorgan in Gorgan Province. It is related to Linaria chalepensis subsp. chalepensis (L.) Miller, but differs from it in having longer inflorescence and calyx. Linaria genistifolia (L.) Miller based on herbarium specimens is recorded from NW and N Iran for the first time.

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Introduction

The genus Linaria Mill. is widely distributed throughout the northern hemisphere with its centre of distribution in the Mediterranean basin, W-South Asia, Eastern Asia and naturalized elsewhere in temperate regions (Hong 1983; Sutton 1988) and comprises annual or perennial herbs growing in a wide variety of habitats including dry and sandy soils and rocky slopes. This genus is divided to 7 sections mainly based on seed morphology. Georaphically, Linaria genistifolia is distributed in Centrăf and East Europe, Turkey and Caucasia and Linaria chalepensis in Mediterranean region and W S Asia. Sutton (1988) recognized 150 species, of which 25 occur in Iran (Boissier 1888; Parsa 1950; Sutton, 1988; Hamdi 2005; Hamdi & al. 2005 a, b & 2006, 2007 a, b). During the course of preparing a revision of the genus for the on going project of the Flora of Iran (Assadi & al. 1986-2007), many specimens preserved in Iranian herbaria (TARI, IRAN, TUH, FUMH), as well as new collections of fresh material were examined. We collected some materials of Linaria from the mountainous and subalpine regions of N, N E and NW of Iran, an interesting taxon of the genus Linaria Miller, Sec. Speciosae, and sect. Macrocentrum were found.

Material and Methods

This study was mainly based on plant materials deposited in different Iranian herbaria, namely: FUMH, IRAN, TARI, TUH (abbreviations according to Holmgren & Holmgren, 1998). Several field trips have also been conducted in different parts of Iran and the specimens collected were similarly deposited in the same herbaria as above. Measurements of vegetative and floral parts as well as from the seeds were carried out under a stereomicroscope (Olympus SZH). In the Antirrhineae seed coat features reported to have paramount importance for the establishments of the systematic relationships between taxa at different ranks and even for species delimitation (Elisens, 1985; Sutton, 1988) thus, to investigate the seed coat sculpturing, mature seeds were mounted directly on 12.5 mm diameter stubs attached with sticky tape and then coated them in a sputter coater with a layer of
approximately 25 µm thickness of gold/palladium. Morphological observations were carried out in LEO 440I Scanning Electron Microscope. The terminology used for describing the seed coat features followed Sutton (1988), Segarra & Mateu (2001). To check for the stability of the morphological characters and their putative use as taxonomically informative several specimens from the same and from different populations were examined.

New subspecies
Linaria chalepensis (L.) Miller subsp. gorganensis
Hamdi & Assadi, subsp. nov.
Planta annua, hebeacea, glauca, inflorescentia excepto glabra, erecta; caules fertiles 15-20 cm longi, supra ramosi. Folia calina fertillium 10-20×0.3-0.4 mm, alterna, supra linearia, acuta. Inflorescentia 12-17 cm longa, floribus 8-9, laxa. Bracteae 16-17 mm longae. Pedicel 5 mm longi. Calyces lobi inequales, 14-15mm longi, scariousi. Corolla 15-17mm longa, flava; tubus ad osem 1.5-2 mm latus.
Typus: Iran: Golestan, Gonbad, Kashkalan, Sharif 6157 (holo. IRAN); Gonbad, 30 km Gomishan, toward Maraveh Tapeh, 30 m, Assadi & Maassoumi 55323 (TARI); Reidl & Ershad 16159 IRAN.

Glaucous annual herb, glabrous except for the inflorescence, erect; fertile stems 15 – 20cm long, branched. Leaves of fertile stems 10 – 20 ×0.3-0.4 mm, alternate, filiform, acute, at the base opposite. Inflorescence 12-17 cm long with 8-9 flowers, lax in flowering and fruiting stage. Bracts 16×17 mm long. Pedicels 5 mm long. Calyx lobes unequal, 14-15mm long, scarious. Corolla 15 – 17mm long, yellow; tube 1.5-2 mm width at mouth; spur 9-10 mm long, 1 mm width at base, straight, longer than the rest of corolla.

The new subspecies is compared with the type subspecies L. chalepensis subsp. chalepensis in table 1.

Table 1. Morphological comparison of Linaria chalepensis subsp. chalepensis and Linaria chalepensis subsp. gorganensis.

<table>
<thead>
<tr>
<th>Characters</th>
<th>L. chalepensis subsp. chalepensis</th>
<th>L. chalepensis subsp. gorganensis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corolla [mm]</td>
<td>15-18</td>
<td>15-17</td>
</tr>
<tr>
<td>Spur [mm]</td>
<td>10</td>
<td>9-10</td>
</tr>
<tr>
<td>Pedicel [mm]</td>
<td>1.5-4</td>
<td>5</td>
</tr>
<tr>
<td>Bracts [mm]</td>
<td>6-22</td>
<td>16-17</td>
</tr>
<tr>
<td>Calyx lobes [mm]</td>
<td>2.5-11</td>
<td>14-15</td>
</tr>
<tr>
<td>Number of flowers</td>
<td>4-24</td>
<td>8-9</td>
</tr>
<tr>
<td>Inflorescence [cm]</td>
<td>2-3</td>
<td>12-17</td>
</tr>
</tbody>
</table>

New record
Linaria genistifolia (L.) Miller
Linaria genistifolia was previously recorded from Central and East Europe, Turkey and Caucasus (Sutton 1988). And from Iran, Firouzkuh, Gadouk by Islami & al. (2003) without mentioning herbarium specimen. In the course of this study it was identified from NW (Azerbaijan province) and N. (Mazandaran province) of Iran.

Mazandaran, Ramsar, Javaherdeh, western-south, 2500-2750 m, Wendelbo & Maassoumi 20889. Azerbaijan, Ardebil, Germi, Germi toward Ani, 6 km, 900-1200 m, Mozafarian & Nouroozi 34922; Germi toward Ani, 1000-1380 m, Mozafarian & Mohammadi 37733; Khalkhal toward Asalem, above Sefid Poshteh, 1900-2100 m, Wendelbo & Assadi 18547. Lorestan, Kouhrang, 2150 m, Pabou 29753. Tehran, toward Firouz-Kouh, before of Gadouk, margin of road, 2100-2400 m, Assadi & Hamdi 85667.

A short description of the species is as follows:
Bracts 4-5×1-2 mm, lanceolate, acute. Pedicels 3-4.5 mm long. Calyx lobes equal, 3.5-4×1.5-2 mm, acute, lanceolate, not scarious. Corolla 18-23 mm long, yellow; tube 5-5.5 mm broad at mouth; abaxial lip sinus 1.75-2 mm, the distance between lip tips 6-7 mm; spur 11-12 mm long, 1 mm broad at base, straight, equaling the rest of corolla.

Acknowledgment
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References
Fig. 1. *Linaria chalepensis* subsp. *chalepensis* – a: habit; b: flower; c: calyx.
Fig. *Linaria chalepensis* subsp. *gorganensis* - a: habit; b: flower; c: calyx; d: capsule.
Fig. 3. *Linaria genistifolia* – a: habit; b: flower; c: calyx; d: opened corolla; e: sterile stamen.


