SHORT COMMUNICATION

SPERGULARIA IRAQENSIS (CARYOPHYLLACEAE), A NEW SPECIES FROM IRAQ

Ali Haloob*♦ Ali H. E. Al-Musawi** and Harb Adeel***

* National Herbarium of Iraq, Directorate of Seed Testing and Certification, Ministry of Agriculture of Iraq, Baghdad, Iraq.
** Department of Biology, College of Science, University of Baghdad, Baghdad, Iraq.
*** Directorate of Plant Protection, Ministry of Agriculture of Iraq, Baghdad, Iraq.

♦ Corresponding author: alihaloob@gmail.com

Received Date: 18 February 2021, Accepted Date: 22 April 2021, Published Date: 20 Jun 2021

ABSTRACT

Spergularia iraqensis sp. nov. is described as a new species from Iraq. This species has been collected from Diyala Province in the central east of Iraq; it is closely related to Spergularia rubra (L.) J. Presl & C. Presl, 1819 and Spergularia bocconei (Scheele) Graebn., 1919.

The distinguishing of the morphological characteristics of the new species alongside the two similar species are discussed with photographs, and an identification key is given for Spergularia iraqensis and other closely related species.

Keywords: Caryophyllaceae, Diyala, Endemic, Iraq, Spergularia.

INTRODUCTION

Spergularia (Pers.) J.Presl & C.Presl, 1819 is a cosmopolitan genus with about 40 species; some of these species are halophytes and distributed worldwide (Ghazanfar and Nasir, 1986; Townsend et al., 2016). The first revision of the genus Spergularia in Iraq was done by Handle-Mazzetti (1910); he recognized two species which are Spergularia salina J. Presl & C. Presl, 1819 and Spergularia diandra (Guss.) Heldr., 1851; later Guest (1933) reports that there are two species of the genus Spergularia, S. diandra and S. marina (L.) Besser, 1822 in Iraq. In 1935, Anthony pointed out that there are three species of the genus Spergularia in Iraq: S. rubra, S. media (L.) C. Presl, 1826 and S. diandra, then in 1948, Blacklock listed two species S. diandra and S. marginata (DC.) Kitt., 1844; Zohary (1950) listed only two species S. salina and S. diandra grow in Iraq, while Al-Rawi (1964) who collected the data of all
Spergularia iraqensis (Caryophyllaceae)

previous studies, and mentioned five species of Spergularia distribute in Iraq: S. diandra, S. marginata, S. media, S. rubra and S. salina, Rechinger (1964) in the flora of lowland Iraq reported only two species S. salina and S. diandra, Ratter (1980) in flora Iranica mentioned only two species of Spergularia collected from Iraq which are S. marina and S. diandra, however, Townsend et al. (2016) in the flora of Iraq which is the newest study for Spergularia in Iraq described four species: S. media, S. marina, S. bocconei and S. diandra.

During a plant field survey in 2019 to upper plains and foothills region in Diyala province central east of Iraq, two unusual specimens of Spergularia was collected from two different places and homed in the National Herbarium of Iraq (BAG), the specimens could not be identified by using the key provided in the flora of Iraq (Townsend et al., 2016), or by cross-checked with Spergularia accounts of the relevant literature, like flora Orientalis (Boissier, 1876), flora of Syria, Palestine, and Sinai (Post, 1933), Flora of the USSR (Gorshkova, 1936), Flora Europaea (Monnier and Ratter, 1964), flora of Turkey (Ratter, 1967), Flora of Saudi Arabia (Migahid, 1978), Flora Iranica (Ratter, 1980), Flora of Egypt (Boulos, 1999), Flora of China (Deguan and Rablet, 2001) Spergularia in Australia (Adams et al., 2008), and also cross-checked with the specimens at BAG and the University of Baghdad herbarium, College of Science (BUH). Therefore, this paper aims to describe the Spergularia iraqensis as new species for science.

Taxonomic treatment
Spergularia iraqensis sp. nov., type: Iraq, 12 km W of Mandali, clay soil with Tamarix L., 1753 and Lycium barbarum L., 1753 community, 33°44'47.30" N; 45°24'59.80" E, 21/iv/2019, A. Haloob (Holotype 60268 BAG!; Isotype 44859 BUH!).

Annual plant, 85-200 mm long; root tap, 17–40 × 0.6–1 mm. Stem ascending or decumbent, 65–180 × 0.5–1.3 mm, light green or purple in lower quarter and above green tinged with purple, internodes length 12-28 mm, glabrous with dense short glandular hairs on last internode below inflorescence. Stipule 2, scarious white, deltate, 3–4 × 1.2–2.5 mm, apex long acuminate, connate of 0.1–0.5 mm. Leaves 2-4, fleshy, linear, 6–32 × 0.5–2 mm, apex mucronate, green almost with purple apex, glabrous. Inflorescence cymose, 15–60 mm long, dense short glandular hair; stipules in inflorescence broadly ovate-deltate, 1.2–2.5 × 0.8–2 mm. Bracts in first node in inflorescence linear, 6–10 × 0.7–1 mm, entire ciliate or not with short glandular hair, other bracts narrowly lanceolate or subulate, 0.8–2.5 × 0.07–0.8 mm, green with reddish-purple apex, margin entire with scarious margin sometimes ciliate with short glandular hair, apex mucronate. Pedicel erect, 2–5 mm, dense glandular hair. Flower pentamerosous, 4–5 mm diameter; calyx 5 unequal-slightly unequal sepals, two sepals slightly shorter than other three longer sepals, lanceolate or ovate, shorter sepals 1.8–2.2 × 0.8–0.9 mm, longer 2–2.3 × 0.65–0.8 mm, sepals join from base about 0.1–0.15 mm, apex cucullate obtuse or acute, outer surface green with separated glandular hair, inner surface green or green turn to purple in upper part and glabrous, scarious margin white color, 0.1–0.3 mm wide, corolla with 5 equal petals, petals equal or slightly shorter than sepals, lanceolate-oblong, 1.6–2.2 × 0.8–1 mm, apex rounded, light purple-mauve, rarely with white near base. Stamens 10, arrange in 5 dimorphic pairs, each pair with one long and one short stamen,
stamens included not projected beyond corolla, filament glabrous, filaments of short stamens 0.7 - 0.9 mm long, filaments of long stamens 0.95-1.1 mm, anthers yellow, in short stamens ovate-narrowly ovate, 0.15- 0.2 × 0.1- 0.15 mm, while in long stamens oblong 0.24-0.3 × 0.15-0.23 mm. Gynoecium superior, 3-carpels, 1.3-1.4 mm long, carpopodium 0.1- 0.15 mm long, ovary ovoid-narrowly ovoid, yellow-greenish yellow, glabrous, 0.9-1 × 0.6 - 0.7 mm with 30–55 ovules, styles 0.1- 0.15 mm long, stigma yellow-greenish to yellow, 0.2-0.25 mm long, recurved, glabrous. Pedicel reaches 3-8 mm long and pendent in fruiting except first flower in inflorescence that remains erect, fruiting calyx sepals yellow-yellowish green, 2.1-2.4 × 0.6-0.9 mm, carpopodium length 0.2- 0.4 mm in fruiting. Capsule ovoid, pale yellow almost tinged with purple, 2-2.5 × 1.2-1.5 mm, as long as fruiting calyx or slightly shorter (when fruit opening recurved apex of valves slightly longer than fruiting calyx), valves 0.7-1.1 mm wide. Seeds many, brown, ovate-broadly ovate, long 0.4-0.55 × 0.3-0.4 mm, dense long tubercles (Pls 1, 2).

Plate (1): Spergularia iraensis; (A) Habitat, (B) Plant habit (in nature), (C) Plant habit (holotype 60268 BAG), (D) Inflorescence, (E) Leaves, (F) Stem node with stipules and leaves,(G) Bracts, (H) Show the stipules color (the microscope light from the upper side), (I) Show the stipules shape (the microscope light from the lower side so the upper stipules face shaded and look dark).
Spergularia iraqensis (Caryophyllaceae)

Recognition

*S. iraqensis* similar to *S. rubra* and *S. bocconei*, but differs from *S. rubra* by having deltate white stipules, not fasciculate leaves, upper bracts much shorter than leaves, shorter sepals, petals, and capsules, petals light purple-mauve and from *S. bocconei* by its stipules which have long acuminate apexes, stamens 10, and seeds brown (Tab. 1).

**Table (1):** Comparison of *Spergularia iraqensis* and its closely related species (Gorshkova, 1936; Monnier and Ratter, 1964; Ratter, 1967; Ratter, 1980; Dequan and Rabeler, 2001; Townsend et al., 2016).

<table>
<thead>
<tr>
<th>Species characters</th>
<th><em>S. iraqensis</em></th>
<th><em>S. rubra</em></th>
<th><em>S. bocconei</em></th>
</tr>
</thead>
<tbody>
<tr>
<td>Stem length (mm)</td>
<td>65–180</td>
<td>50-250</td>
<td>50-250</td>
</tr>
<tr>
<td>Stipules shape</td>
<td>deltate</td>
<td>lanceolate</td>
<td>deltate</td>
</tr>
<tr>
<td>Stipules color</td>
<td>white</td>
<td>silver</td>
<td>white</td>
</tr>
<tr>
<td>Stipules apex</td>
<td>long acuminate</td>
<td>acuminate</td>
<td>acute</td>
</tr>
<tr>
<td>Leaves habit</td>
<td>fleshy</td>
<td>not fleshy</td>
<td>fleshy</td>
</tr>
<tr>
<td>Leaves number in each node</td>
<td>2–4</td>
<td>almost more than 4</td>
<td>2–4</td>
</tr>
<tr>
<td>Leaves length (mm)</td>
<td>6–32</td>
<td>5-20 mm</td>
<td>12-30</td>
</tr>
<tr>
<td>Relation of upper bracts to leaf length</td>
<td>much shorter</td>
<td>almost equal</td>
<td>much shorter</td>
</tr>
<tr>
<td>Sepal length (mm)</td>
<td>1.8–2.3</td>
<td>3-5</td>
<td>2-3.5</td>
</tr>
<tr>
<td>Petal length (mm)</td>
<td>1.6–2.2</td>
<td>3-5</td>
<td>2-2.8</td>
</tr>
<tr>
<td>Petal color</td>
<td>light purple-mauve rarely with white near base</td>
<td>Pink</td>
<td>Pink with white base</td>
</tr>
<tr>
<td>Stamens number</td>
<td>10</td>
<td>5-10</td>
<td>(0)2-5(8)</td>
</tr>
<tr>
<td>Capsule length (mm)</td>
<td>2-2.5</td>
<td>4-5</td>
<td>2-3.5</td>
</tr>
<tr>
<td>Capsule valves color</td>
<td>pale yellow almost tinged with purple</td>
<td>pale</td>
<td>pale</td>
</tr>
<tr>
<td>Relation capsule to sepals</td>
<td>equal or slightly shorter</td>
<td>equal</td>
<td>equal or shorter</td>
</tr>
<tr>
<td>Seed color</td>
<td>brown</td>
<td>dark brown</td>
<td>light grey-brown</td>
</tr>
</tbody>
</table>

**Phenology:** Flowering March-April-(May), Fruiting April-May.

**Other specimens examined:** (Paratype) SW Hamrin Lake, clay soil in grass open area near the lake shore, 34°05’48.35” N; 45°04’06.28” E, 19/iv/2019, A. Haloob, G. Al-Taie & R. Hamshkan (60269 BAG!).

**Distribution and habitat:** This species endemic to Iraq, it was collected from two separate sites in the east of Diyala Province within the same habitat extension, which is located between the eastern foothills and the alluvial lower Mesopotamia in Iraq, and it was found...
Haloob et al.

Growing in clay soil with *Tamarix* sp. and *Lycium barbarum* L. community and also grows in clay soil in the grass open area near the Hamrin Lake bank.

**Etymology:** The species is named after Iraq country where the plant grows and is recorded for the first time.

**Conservation status**

There are numbers of threats in the areas where the species grows, the most important of which are grazing, agriculture, tourism, and urban activities, as well as, the geographical range of *S. iraqensis* restrict to a narrow region estimated to about 2,000 km². So, based on the measurement of the species' extent of occurrence (EOO), which is less than 5,000 km², and the number of locations where plant growth is less than 5, as well as the quality of its

---

**Plate (2):** *Spergularia iraqensis*; (A) Flower, (B) Petals, (C) Sepals, (D) Stamens, (E) Gynoecium, (F) Fruiting calyx with capsule, (G) Capsule, (H) Seeds.
Spergularia iraqensis (Caryophyllaceae)

habitat, which is estimated to be declining due to human activities, the assessment of the species according to IUCN Red List categories (IUCN, 2012): Endangered, EnB1ab (iii).

**Key for identification S. iraqensis and other related species**

1- Capsules 7-9 mm long .......................................................... S. media
   - Capsules less than 6 mm long ............................................. 2

2- Stipules silver, leaves strongly fasciculate .............................. S. rubra
   - Stipules white, 2-leaves in each node or little fascicled .............. 3

3- Stipules on young shoots connate more than half their length, capsule more than 4 mm long................................................................. S. marina
   - Stipules on young shoots connate less than half their length, capsule less than 3.5 mm long................................................................. 4

4- Stipules long acuminate, Stamens 10.......................................... S. iraqensis
   - Stipules acute, Stamens less than 8 ......................................... 5

5- Petals ovate-broadly oblong, Inflorescence with bracts and with dense short glandular hair, seeds light grey-light brown, broadly ovate, with dense long tubercles................................................................. S. bocconei
   - Petals lanceolate-narrowly elliptic or oblong, Inflorescence without bracts above and with separate short glandular hair, seeds brown-black, compressed ovoid-narrowly ovoid, glabrous or dense tubercles................................................................. S. diandra

**Discussion**

The new species is annual herbs, its stipules deltate, white and long acuminate, shortly connate for base. Bracts (except for the bracts in the first inflorescence node) much shorter than leaves, with sepals less than 2.3 mm and 10 stamens. Capsule as long as fruiting calyx or slightly shorter; seed brown, unwinged; these are the most distinguishing characteristics of the new species, and these characters are not found in any other species of the genus. Interestingly, only S. media in Iraq has 10 stamens, also S. rubra which grows in Turkey has 10 stamens, however, the capsule of S. media longer than 7 mm, as well as, S. rubra has capsules longer than 4 mm which differ from the shorter capsule of S. iraqensis, S. dinandra and S. bocconei which could reach less than 2.5 mm but S. dinandra and S. bocconei have androecium with less than 8 stamens and the stipules of these species are not acuminate which differ from S. iraqensis androecium and stipules (Gorshkova, 1936; Monnier and Ratter, 1964; Ratter, 1967; Ratter, 1980; Dequan and Rabeler, 2001; Townsend et al., 2016).

**LITERATURE CITED**


Spergularia iraensis (Caryophyllaceae)


(العائلة الكرنبيه) Spergularia iraqensis

نويع جديد من العراق

علي حالوب كاظم*، علي حسين الموسوي** و حرب عادل ***

المعشب الوطني العراقي، دائرة فحص وتصديق البذور، وزارة الزراعة العراقية، بغداد، العراق

قسم علوم الحياة، كلية العلوم، جامعة بغداد، بغداد، العراق

دارة وقاية المزروعات، وزارة الزراعة العراقية، بغداد، العراق


الخلاصة

وصف خلال الدراسة النوع Spergularia iraqensis sp. nov. انة نوع جديد من العراق؛ جمعت العينات من محافظة ديالى في وسط شرق العراق؛ وهو مقارب للفنون Spergularia rubra (L.) J. Presl & C. Presl, 1819 و S. bocconeii (Scheele) Graebn., 1919

نوقشت الخصائص المظهرية المميزة للنوع الجديد والنوعين المشابهين له، مع صور توضيحية وابنضا تم وضع مفتاح تشخيصي للنوع الجديد مع الانواع الأخرى القريبة منه.