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A new Species of Phelipanche (Orobanchaceae) from Iraq

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Abstract

Phelipanche umqasrensis Al-Mayah & Al-Asadi Sp. Nov. is described for the first time as a new species for science from Um-Qasr in Basarh Southern Iraq.

The species has some morphological similarities with *Phelipanche mutelii* but clearly differs by having several distinguishable characters. The main characteristics of the new species are stout almost simple stem with thick compact dense inflorescence with a large number of white flowers and a perforate spinulose pollen surface. The species parasitizes on *Rhanterium epapposa* (Asteraceae).

Keywords: *Orobanchaceae, Phelipanche, Broomrape, Um-Qasr, Parasitic plant, Iraq.*

Introduction

Traditionally all floras include all broomrapes species in the genus Orabanche L. but divided into two sections, Sec. Trionychon Wallr. (species with 2 bracteoles) and Sec. Orobanche (species without bracteoles).

In Iraq the family Orobanchaceae includes two genera Cistanche with one species *C. tubulosa* (Schenk) Wight and Orobanche (included Phelipaea) with ten species as mentioned by Al-Rawi 1964 in his checklist. Rechinger 1964, in his Flora of Lowland Iraq mentioned two species of Cistanche and five species of Orobanche, but no one has mentioned any species of Orobanche or Phelipanche in Basrah. Phelipanche has not been recognized as a distinct genus by any Flora in our area, neither by Rechinger, 1964 in Flora Iranica nor by Davis *et al.*, 1982 in Flora of Turkey. Daoud, 1976 mentioned *O. aegyptiaca* Pers. and *O. cernua* L. in Kuwait near the borders with (Basrah) Iraq.

Recently several phylogenetic studies (Monen *et al.*, 2004 and Schneeweiss, 2004,2009) based on DNA-Sequences, revealed that Orobanche is not monophyletic, but falls into two phylogentically distinct clades that coincide with the two sections of Orobanche, this molecular evidence supports the idea of splitting the two sections of Orobanche into two distinct genera Orobanche and Phelipanche (Joel, 2009; Banifi *et al*., 2011).

Material and Methods

Specimens were collected from Um-Qasr, Safwan, Jerishan to Khadhr al-Mai in Basrah southern Iraq during 2014 and 2015while we collecting plants for the Co-author W. Al-Asadi Ph.D. program on the taxonomy of Orobanchaceae in Iraq. Herbarium specimens were prepared and deposited in Basrah University Herbarium BSRA. Observation were made on both fresh material collected from fields and herbarium specimens from BSRA, BAG and BUH.

Examination and identification of specimens and comparison between related species were made by consulting Beack, 1930; Rechinger, 1964 a , b; Tutin *et al*., 1972; Davis, 1982; Rumsey & Jury, 1991 and Orowiki, 2015. For acronyms, Holmgren & Holmgren, 1993 was consulted.

Results

Species description

***Phelipanche umqasrensis* Al-Mayah & Al-Asadi Sp. Nov.**

Parasitic herb, 10-30cm tall. Stem thick, erect, simple or occasionally branched underground sandy coulor, glandular-pubescent. Inflorescence many flowered, (34- 89) very dense, thick spike, 4-11cm long. Bracts 5-11mm long, ovate-lanceolate glandular-pilose. Bracteoles 2, 7-10 mm long, lanceolate-subulate dense glandular-pubescent. Flowers small, 14-16mm, white. Calyx 7-9.5mm long, glandular-pilose; calyx teeth, 4-5.5mm long acute-acuminate nearly equal to calyx tube, glandular-pilose. Corolla infudibuliform white, 12-15 (-16)mm long, 2-lipped, the upper lip 2-lobed, the lower lip 3-lobed variable in shape, glandular-pubescent,. Stamens 4, inserted at 3-4mm from the base; filaments glabrous-pubescent at base. Anther nearly glabrous; pollen grains with spinulose-perforate ornamentation. Ovary oblong. Style glabrous. Stigma lobed, white-yelloish. Host *Rhanterium epapposa*.

Hab.: sandy soil. Fl. & fruit Mar.-April.

Etymology: The epithet "Umqasrensis" refers to Um-Qasr Port of Basrah, southern Iraq, in the surroundings of which the species grows and collected for the first time.

Holotype: 8 km N.W. Um-Qasr, near the Iraq-Kuwait Borders, Al-Mayah & Al-Asadi, 6/4/2014, 1410 BSRA. Isotypes BSRA, BUH, BAG. (Fig. 1 and 2).

Paratypes:

1- On the road to port of Khor al-Zubair, 5- 10 km N.E. Um-Qasr, 6/4/2014, Al-Mayah & Al-Asadi, 1423 BSRA.

2- On road of Safwan-Um-Qasr 15 km N.W. Um-Qasr near the Kuwait borders, 6 /4 / 2014, Al-Mayah & Al-Asadi, 1414 BSRA.

3-Jarishan-Khadhar al-Mai road, about 15 km before Khidhr al-Mai, 21/4/2014, Al-Mayah & Al-Asadi, 1446 BSRA.

Ecology and Distribution

Phelipanche umqasrensis grows on sandy or compact sandy or sandy gravelly soils in shrubby communities of (ARFAJ) *Rhanterium epapposa* or *Rhanterium epapposa-Haloxylon salicornicum* association. Always parasitizes on Arfaj, *Rhanterium epapposa* (Asteraceae).

Phelipanche umqasrensis is distributed only in southern Iraq near the Iraq-Kuwait frontier, it many extend inside Kuwait. The species collected from several localities in the southern desert of Iraq in Basrah province these localities are Khor Al-Zubair, Um-Qasr Safwan, Jarishan -Khadhar al-Mai towards the Kuwait-Saudi Arabia-Iraq frontier.

Recently, after a rainy seasons in winter the species became abundant, widely spread and an obvious natural populations in the areas between Jarishan and Khadhar al-Mai where the host Arfaj is densely grown were seen. Usually the climate in these areas is characterized by a long very hot dry summer and a very short cold winter with very little rains. The plant known locally as 'HALUK' by the Arab people, which means in english killer or destroyer. (Fig. 4).

Discussion

The new species *Phelipanche umqasrensis* is distinguished by a number of characteristics, mentioned in the description, not present together in any species of Phelipanche.

The new species has some resemblances with *P. mutelii* Schultz. but differs by having thick stem, very dense many-flowered thick inflorescence, smaller flowers (14- 16) mm with white corolla, and the spinulose perforate pollen surface ornamentation, the pollen surface sculpturing (spinulose perforate) can be considered as the most obvious and diagnostic character on which the new species can be easily separated from all other species of Phelipanche which have reticulate pollen surface. (Fig. 3).

Phelipanche umqasrensis can be considered close to *P. nana* Noë due to having same size of corolla. However it can be easily separated by its stout stem, dense many-flowered inflorescence with white flower and the specific plant host *Rhanterium epapposa*, and pollen surface spinulose perforate.

The main differences between *P. umqasrensis* and *P. mutelii* are shown in table 1. below:

Table 1: The differences between *P. umqasrensis* and *P. mutelii*.

Character	***P. umqasrensis***	***P. mutelii***
Plant high (cm)	10- 30	3. 5-8
Stem diameter (mm)	4- 10	3.5- 6
Stem branching	Simple or ramified under ground	Stem branching above ground
Inflorescence length (cm)	4- 11	2.5-7
Number of flowers	34- 89	4- 25
Corolla length (mm)	14- 16	15- 20
Corolla colour	White	Bluish-lavender
Corolla lower lobes	Acute or rounded	Rounded
Style length (mm)	5- 7	8.5- 10
Style hairs	Glabrous	With few glands near the top
Pollen ornamentation (SEM)	Perforate & Spinulose	Reticulate
Host plant	Rhanterium only	Vicia, various legumes

Regarding the relationships of *P. umqasrensis* with other species of Phelipanche not present in Iraq, the new species has morphological similarity with *P. portoilicitana* A. Pajadas & Crespo from S.E. Spain but its differs by its pollen type, specific host and smaller always white flowers. Also the new species is closely related to *Orobanche muteliformis* M.J.Y. Foley endemic to Saudi Arabia, but it differs by having specific pollen type spinulose perforate, higher number of flowers (reached to 84 flowers) in the compact inflorescence, the stamen insertion near to the corolla base, and the stem never branched above the ground. However *P. mutiliformis* considered as taxonomically synonym to *P. mutelii* F.W. Schuitz by many authors.

Fig.1: Holotype

Fig.2: *P. umqasrensis* Al-Mayah & Al-Asadi, 8km N.W. Um-Qasr BSRA, 1410 Holotype: a, Plant; b, Scale; c, Bract; d, Bracteole; e, Calyx; f, Flower side view; g, Corolla front view; h, Gynoecium; i, Stamen; j, Host.

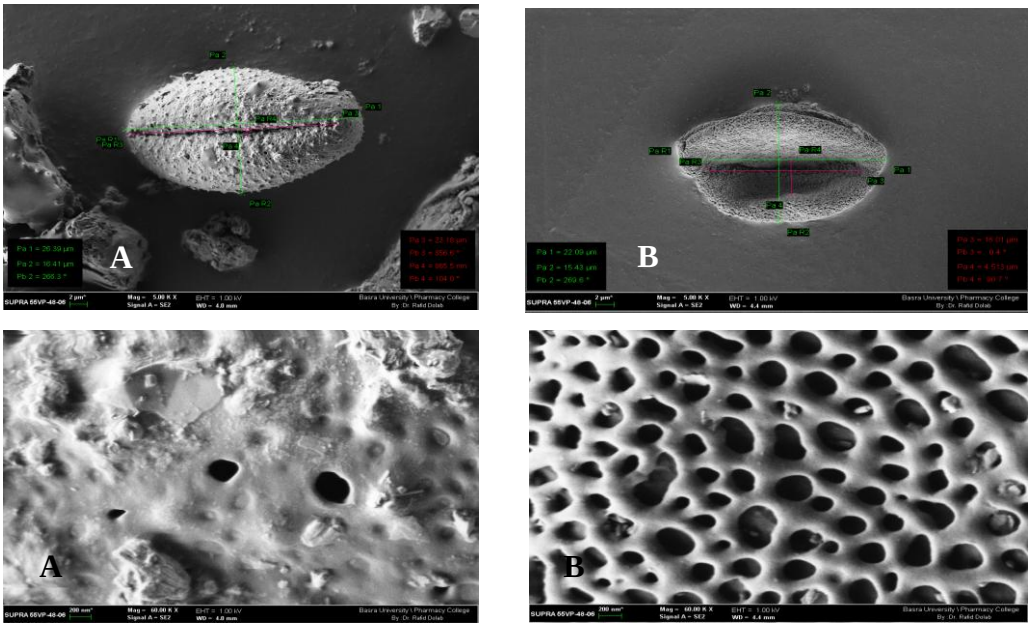

Fig. 3: SEM micrographs of the pollen of *P. umqasrensis* (A) and *P. mutelii* (B).

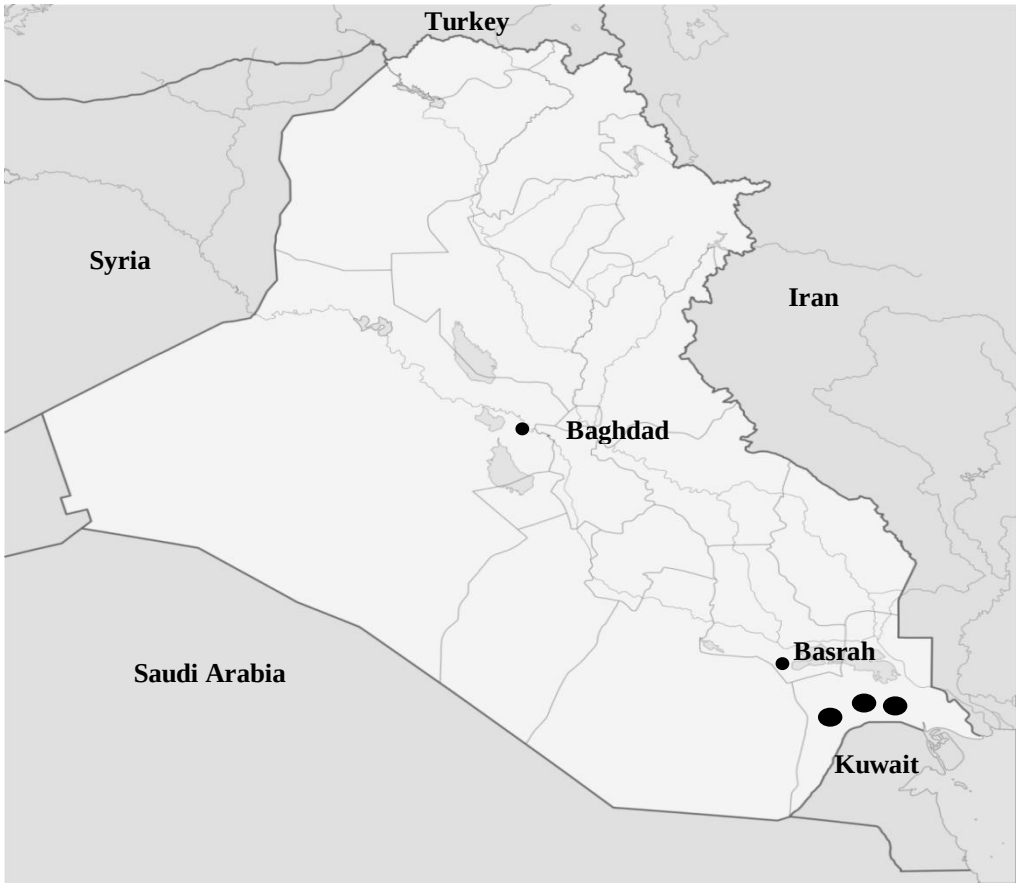

Fig. 4: Distribution in Iraq of *Phelipanche umqasrensis*

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