

A New Record of *Rhynchosorys odontophylla* Burbidge & Richardson
(Scrophulariaceae) For Flora of Iraq

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Abstract

Rhynchosorys odontophylla Burbidge & Richardson is a new record to the Scrophulariaceae in Iraq, from Qandil mountain (north-east of Erbil) within Rowanduz district (MRO). The collected specimens differ from the two other species which present in Iraq, where *R. odontophylla* differs from *R. kurdica* Nab. in having crenate-serrate leaf margins and small corolla lower lips, while it differs from *R. elephas* (L.) Griseb. in having alternate-distichous lower leaves and the style has pilose hairs. Identification and morphological study was done, these reinforced by graphs. In addition, some characters of the pollen grains have been studied such as shapes, colors, sizes and numbers

Key words: New record, *Rhynchosorys odontophylla*, Scrophulariaceae, Rowanduz district, Iraq.

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تسجيل جديد للنوع *Rhynchospora odontophylla* Burbidge & Richardson من العائلة
حلق السبع (Scrophulariaceae) لفلورا العراق

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الخلاصة

Scrophulariaceae هو تسجيل جديد الى العائلة *Rhynchospora odontophylla* Burbidge & Richardson في العراق، حيث جمعت عيناته من جبل قنديل (شمال شرق اربيل) ضمن مقاطعة رواندوز (MRO). العينات التي جمعت تختلف عن النوعين الاخرين الموجودين في العراق، اذ يختلف النوع *R. odontophylla* عن النوع *R. kurdica* Nab. في كون حافة الاوراق مسننة مدورة – منشارية وصغر الشفاه السفلية للتويج، بينما يختلف عن النوع *R. elephas* (L.) Griseb. في امتلاكها اوراق سفلية متبادلة ثنائية الصف وكون القلم ذات شعيرات طويلة ناعمة مستقيمة. لقد تمت عملية التشخيص والدراسة المظهرية للنوع وعززت هذه بالصور. اضافة الى ذلك، فقد تمت دراسة بعض صفات حبوب اللقاح مثل اشكالها والوانها واحجامها واعدادها.

الكلمات المفتاحية: تسجيل جديد، *Rhynchospora odontophylla*، Scrophulariaceae، مقاطعة رواندوز، العراق

Introduction

Scrophulariaceae involves 1460 species throughout the world which distributed on 42 genera [1]. In Iraq involves 89 species distributed on 16 genera [2]. In Turkey, [3] mentioned 5 species of the genus involving *R. odontophylla*. [4] stated 1 species of the genus *Rhynchospora* in Europe, but [5] indicated that 4 species of the genus present in Iran. [2, 6 and 7] stated 2 species in Iraq which are *R. kurdica* and *R. elephas*, but [8 and 9] did not state any species of the genus. Each of [10, 11, 12 and 13] did not mention any species of *Rhynchospora* in Sinjar, Piramagrun, Haibat Sultan and Hawraman mountains respectively.

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Abdullah Sh. Sardar

The study aimed to fixation the presence of *R. odontophylla* in Iraq and to study the morphological characters and the geographical distribution of the species, as a new record for the Flora of Iraq.

Materials and Methods

Several scientific trips were made to the different regions of northern districts of Iraq: Amadiya district (MAM), Rowanduz district (MRO), Sulaimaniya district (MSU), Kirkuk district (FKI) and Arbil district (FAR) during Spring and Summer season of year 2016 for the collection of plant specimens, these specimens were identified by using some keys especially in Flora of Turkey, the specimens were treated herbarially to become formal specimens, and placed in herbarium of Education College - University of Salahaddin, Erbil (ESUH). The geographical distribution of the species was cleared with fixation some ecological notes, the map (figure 1) was placed. For the pollen grains, anthers fixed in FAA, then a single anther removed and placed in a drop of water or 50% glycerol (the latter to prevent the material from drying out), and dissected with a scalpel to extrude the pollen grains; the anther wall material removed and a cover slip applied. Then, the pollens stained with safranin [14]. A Sony camera has been used for photographing the different plant parts and the scientific terms that used in the study have been taken from [15, 16 and 17].

Results

R. odontophylla Burbidge & Richardson, in Notes R.B.G. Edinb. 30:102, f. Id (1970); Fl. Turkey, Hedge, 6: 780 (1978). Perennial herbs, villous and glandular, (45-60) cm, stems erect and ascending, green or green-yellow, (15-31)x(0.3-0.5) cm. Leaves simple, sessile, alternate-distichous below, opposite-decussate above, narrowly ovate-oblong, margin crenate-serrate, apex acute, base truncate, green, lower cauline leaves (3.2-4.5)x(1.4-2.7) cm, upper cauline leaves (3-5)x(1.4-2.5) cm. Inflorescence paniculate, peduncle costate, green-yellow, (40-50)x(1.2-2) mm. Bracts narrowly ovate, lanceolate or narrowly lanceolate, margin crenate-serrate, upper ones entire, apex acute, base obtuse, green, (9.5-35)x(3.5-15) mm. Flowers

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Abdullah Sh. Sardar

zygomorphic, (14-16.5)x(8-9) mm, pedicel teret, glandular, green-yellow, (2.5-6)x(0.4-0.6) mm, Calyx campanulate, tube (3.5-4.5)x(3.8-5.5) mm, limb 3-lobed, a folded upper lobe, 2 triangular lower lobes, margin entire, apex truncate in upper lobe, acute in lower lobes, green, (4.5-5)x(5.3-6) mm. Corolla golden yellow, bilabiate, tube (5.5-6.5)x[(2.5-2.7) mm in lower part, x(1.8-2) mm in middle part, x(2-2.3) mm in upper part], corolla upper lip with a straight beak narrow upwardly, and a swollen base (contain the anthers), the beak (6-7)x(1.5-1.8) mm, the swollen base (2-2.3)x(2.5-2.7) mm, lower lip tri-lobed, semi-circular, margin undulate, apex rounded, glabrous, (5.5-6.3)x(8-9.5) mm. Stamens 4, epipetalous, inserted on the middle part of corolla tube, black or dark brown, filaments filiform, (3.5-4)x(0.3-0.45) mm, anthers oblong, poricidal, dorsifixed attachment with the filaments, (2.2-3.1)x(1.2-1.5) mm. Pollens yellow, single, tri-colporate, spheroid in equatorial view, triangular-spheroid in polar view, small, equatorial axis (10-15) μ m, polar axis (11.25-16.25) μ m, numerous. Pistil one, ovary superior, broadly oblong or broadly oblong-very broadly ovoid, villous, black or dark brown, (2-2.5)x(2.2-2.4) mm, style terminal, filiform, narrow in the lower half, pilose, yellow, (12-14)x(0.3-0.35) mm, x(0.07-0.08) mm in the lower half, stigma capitate, exserted, yellow, (0.30-0.35)x(0.25-0.30) mm. Fruiting calyx tube (3-6)x(4-8) mm, limb (4-7.5)x(4.2-9) mm. fruit a capsule, broadly oblong, green-brown or black, (3-5)x(2.1-4.5) mm. Seeds numerous, globoid or semi-globoid, reticulate-striate., yellow-brown, (0.7-1.1)x(0.8-1.2) mm. (plates 1-6).

Type: [Turkey B9 Agri] 15 km from Eleskirt to Horasan, E. of Tahir pass, 2200 m, Davis 47131 (holo. E! iso. K!).

Selected samples from the studied specimens

MRO: ESUH/ Qandil mountain (north-east of Erbil), 1700-1800 m, 25.8.2016, A. Sardar, S. Al-Dabagh and K. Rasul, 7453.

A New Record of *Rhynchosyris odontophylla* Burbidge & Richardson
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Abdullah Sh. Sardar

Environment & Geographical Distribution

present as individuals within the area, in wet places on the rocky soils; altitude: 1700-1800 m; flowering: July-August. Found in Qandil mountain within Rowanduz district (MRO). (figure 1).



Plate (1): Field photograph of *R. odontophylla*



Plate (2): A part of the plant

A New Record of *Rhynchocorys odontophylla* Burbidge & Richardson
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Abdullah Sh. Sardar



Lower cauline leaves



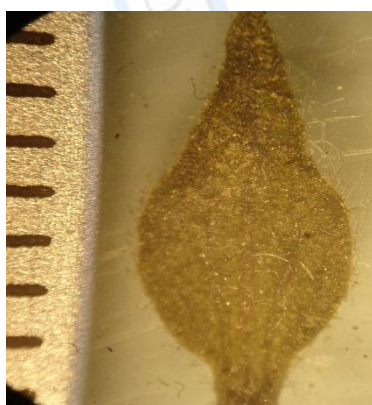
Upper cauline leaves



Lower bracts



Upper bracts



Apical bract



Part of inflorescence

Plate (3): Vegetative parts of *R. odontophylla* with inflorescence

A New Record of *Rhynchocorys odontophylla* Burbidge & Richardson
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Abdullah Sh. Sardar



Flower



Calyx

2.2 mm



Upper lobe of calyx limb

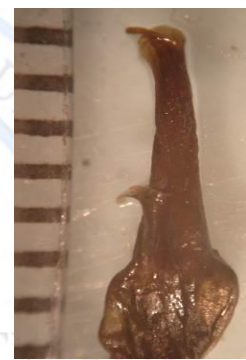


Lower lob of calyx limb

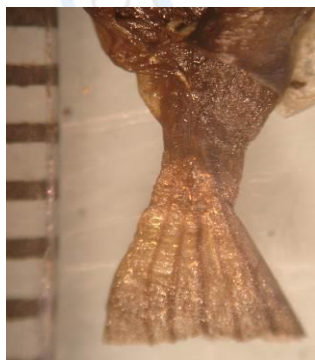


Corolla

2 mm



Upper lip of corolla limb



Corolla tube



Lower lip of corolla limb

1.3 mm

5 mm

Plate (4): Flower, Calyx and Corolla parts of *R. odontophylla*



A New Record of *Rhynchospora odontophylla* Burbidge & Richardson
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Abdullah Sh. Sardar

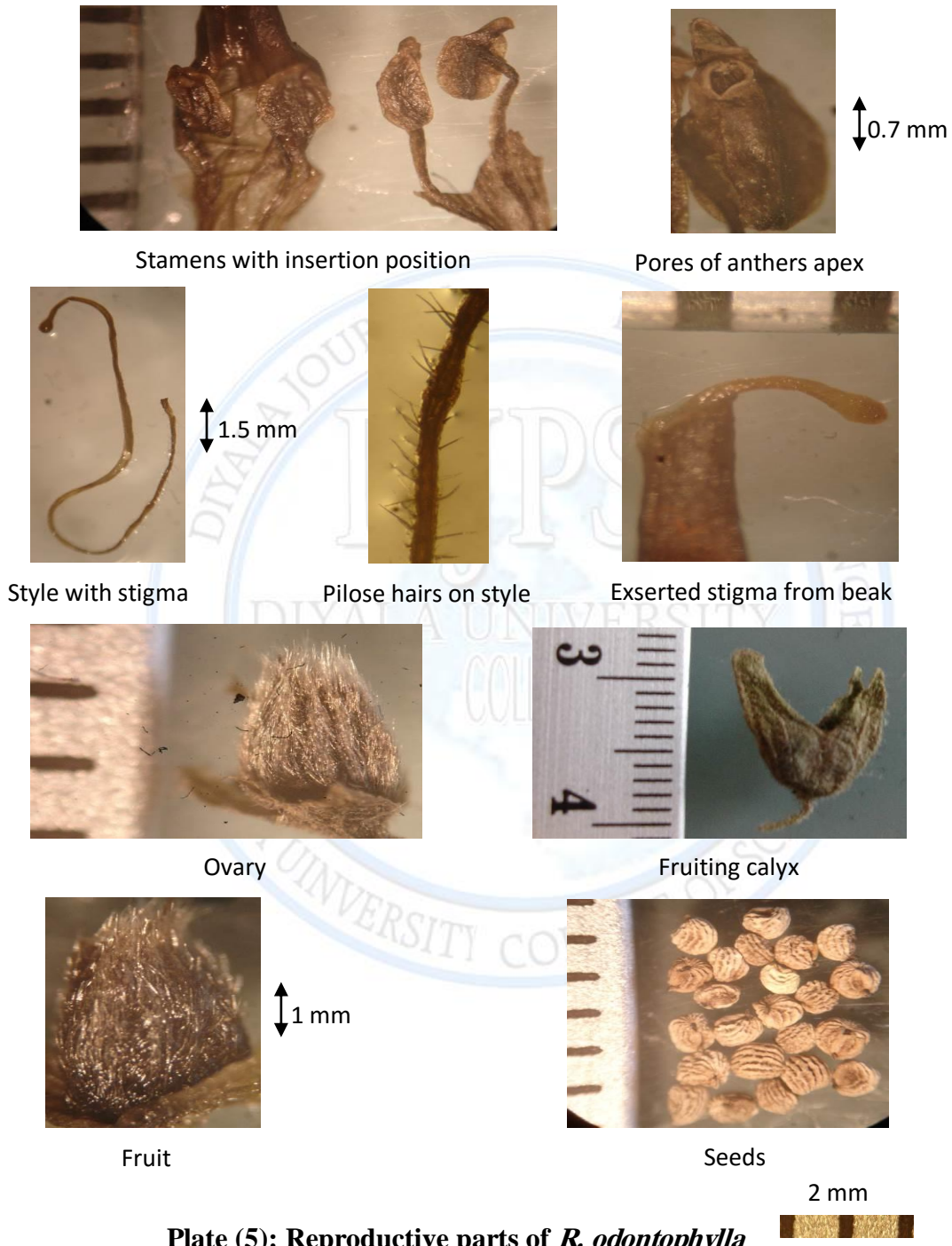
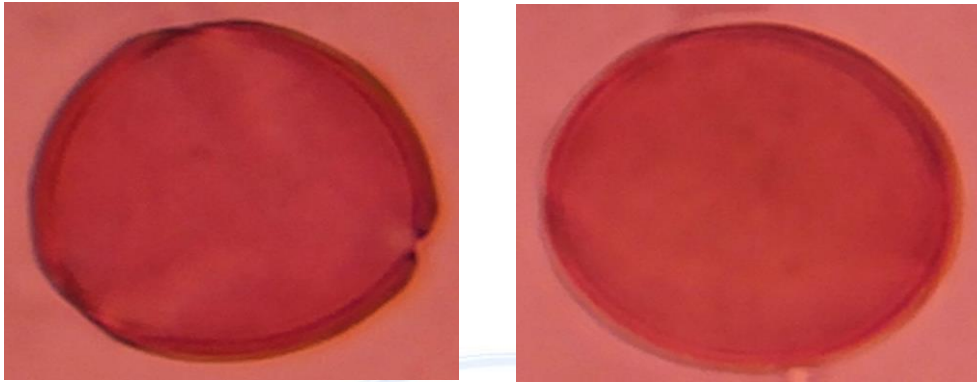


Plate (5): Reproductive parts of *R. odontophylla*

A New Record of *Rhynchochorys odontophylla* Burbidge & Richardson
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Abdullah Sh. Sardar



Polar view

Equatorial view

Plate (6): pollen grain of *R. odontophylla* X100

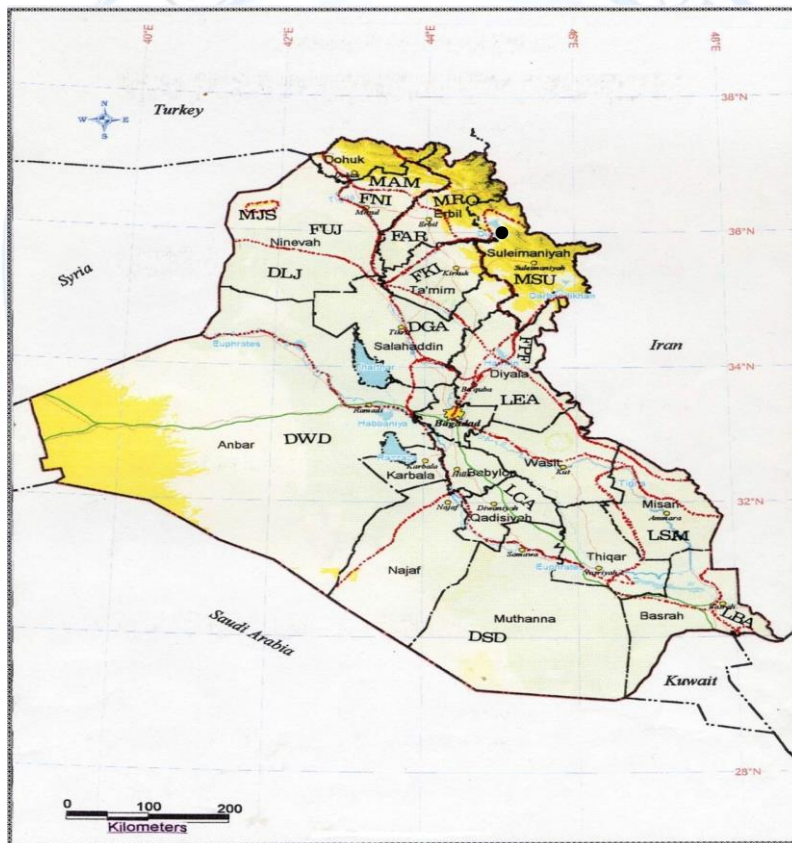


Fig (1): A map of Iraq shows the regions and districts according to [18 and 19] • *R. odontophylla*

A New Record of *Rhynchospora odontophylla* Burbidge & Richardson
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Abdullah Sh. Sardar

Discussion

The present study dealt with *R. odontophylla* as a new record for Scrophulariaceae in Iraq, the study involved limited aspects, such as the morphological characters and the environment with the distribution of the species. Within literature review related to the genus *Rhynchospora*, involving the specimens of National Herbarium of Iraq (BAG), College of Science Herbarium, University of Salahaddin - Erbil, Iraq (ARB) and College of Education Herbarium, University of Salahaddin - Erbil, Iraq (ESUH), the researcher did not find any specimens belongs to *R. odontophylla*, therefore it will be regarded as a new record for the Flora of Iraq from Qandil mountain. *R. odontophylla* has some characters differ from the related species *R. kurdica* Nab., that present in Iraq, these characters include that *R. odontophylla* has villous and glandular hairs, leaves with crenate-serrate margin, bracts narrowly ovate, lanceolate or narrowly lanceolate, upper ones entire, calyx campanulate, upper lobe with truncate apex, corolla smaller in dimensions, also the capsule smaller and with villous-glandular hairs, and seeds lesser in number. In addition, pollen grains were yellow, single, tri-colporate, spheroid in equatorial view, triangular-spheroid in polar view, small according to [20] and numerous.

Conclusions

The present study confirmed the presence of the plant *R. odontophylla* as a new record in Iraq, therefore, it will be addition to the Iraqi plants. According to the literature review used in the study, species number of the genus *Rhynchospora* become three species, all of them found in the mountain regions of Iraq.

A New Record of *Rhynchosorys odontophylla* Burbidge & Richardson
(Scrophulariaceae) For Flora of Iraq

Abdullah Sh. Sardar

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**A New Record of *Rhynchocorys odontophylla* Burbidge & Richardson
(Scrophulariaceae) For Flora of Iraq**

Abdullah Sh. Sardar

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