TAXONOMIC STUDY FOR THE NEW RECORD EPILOBIUM OBSCURUM SCHREBER (ONAGRACEAE) IN IRAQ

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Abstract
Epilobium obscurum Schreber is a new additional plant species to Onagraceae family in Iraq, present in Qandil mountain (north-east of Erbil) of Rowanduz district (MRO). The identification of the species was confirmed by using keys in the available references, morphological description was done, and some distinguishing characters are given. Some pollen grains characters have been studied such as shapes, colors, sizes and numbers. In addition, some features of the leaf venation; as well as stomatal complex characters of the leaf have been studied.

Key words: Epilobium obscurum, Onagraceae, Rowandus district, Iraq.
1- Introduction

From the families in the Flora of Iraq is Onagraceae which involves 650 species throughout the world and distributed on 24 genera [1], in Iraq contain 9 species distributed on 2 genera [2].


The present work assured the presence of *E. obscurum* in Iraq based on recent collection, as well as morphological characters, pollen grains with leaf venation and stomatal complex characters, to added extra information for supporting the identity of the species under study.

2- Materials and Methods

For plant specimen’s collection, field trips in different regions of northern districts of Iraq have been done in 2016. By using the keys especially in Flora of Iraq, Flora of Turkey and Flora Iranica, the specimens have been identified, then treated and preserved in herbarium of Education College (ESUH). Some ecological notes and the presence location as shown in the map (Figure 1) have been given. For the pollen
grains, anthers were fixed in FAA, and then a single anther removed and placed in a drop of water or 50% glycerol (the latter to prevent the material from drying out). The anther was dissected with a scalpel to extrude the pollen grains. The anther wall material was removed after crushing pollen grains. In addition, a drop of safranin was added and then a cover-slip was slid on top of the pollen. [1]. For the leaf venation, the procedure in [28] has been followed. 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 29, 30, 31 and 32]. For the stomatal complex, the procedure in [33] has been used and the information in [34 and 35] were utilized.

3- Results


Perennial, herb, perennating by elongate epigeal stolons, height 23-45 cm, stem erect or ascending, 4-costate, glabrous below, adpressed crisped hairy above, green-yellow, 8-20x0.1-0.15 cm. Leaves simple, sessile, extipulate, opposite-decussate in the lower half, alternate-spiral in the upper half, enlarge upwardly, margin entire or dentate-serrate, apex obtuse or acute, base truncate rounded or cuneate, decurrent glabrous; basal leaves narrowly ovate, oblong, green or dark brown, 5-9x2.5-4.0 mm; lower cauline leaves elliptic, elliptic-oblong, green, 7.5-13.0x3.0-6.0 mm; upper cauline leaves narrowly ovate, lanceolate, densely crisped margins and veins, green, 7-26x2-13 mm. Bracts narrowly elliptic, margin entire-crenate, apex acute, base obtuse, densely crisped margins and veins, green, 1.5-2.0x0.4-0.6 mm.

Flowers solitary and axillary, actinomorphic, 4-merous, 16.8-24.7x3-5 mm, pedicel teret, crisped-glandular, green, 1.5-3.0x0.5-0.7 mm, Calyx of 4 sepals, free, triangular, margin entire-crenate, apex acute, base truncate, crisped-glandular, rose or rose-green, 3-4x0.8-1.2 mm. Corolla of 4 petals, narrowly obovate, margin entire, apex emarginate, base truncate, rose-purple, 3.5-6.5x1.5-3.0 mm, Stamens 8, in two whorls, 4 long antisepalal, 4 shorter antipetalous; filaments filiform, yellow, long ones 2.0-3.2x0.12-0.15 mm, short ones 1.0-1.2x0.10-0.12 mm; anthers oblong, yellow, basified attachment with the filaments, 0.8-1.2x0.4-0.6 mm. Pistil 1, ovary inferior, cylindrical, 4-locular, 4-furrow and ridge, crisped-glandular,
yellow, 12-19x0.6-1.3 mm; style single, filiform, yellow, 3-5x0.20-0.35 mm; stigma entire-clavate, yellow, 0.7-1.1x0.5-0.7 mm. Fruit a capsule, cylindrical, dehiscing into 4-valves, densely crisped, green or green-yellow, 24-40x1.0-1.5 mm. Seeds numerous, narrowly obovoid, papilllose, comose, lacking endosperm, yellow-brown, 1.2-1.5x0.35-0.50 mm, coma hairs length 6-8 mm. (Plates 1-4). Pollens yellow, single (sometimes tetrads), triporate, oblate in equatorial view, triangular in polar view, medium according to [36], 2-3 thin threads project from pollens surface seen in polar view called viscin threads: acetolysis resistant threads arising from the exine ((Hesse, et al., 2009)), equatorial axis 40-42 μm, polar axis 28-31 μm, numerous. (Plate 5). The leaf venation has the following characters: Actinodromous 1º veins, acrodromous 2º veins, Increasing toward base 2º veins spacing, Random reticulate 3º veins, Sinuous 3º veins course, Opposite percurrent 4º veins, Fimbrial-no teeth marginal ultimate veins, Unbranched linear and curved freely ending ultimate veins (Plate 6). Stomatal complex anomotetracytic, in both surfaces, more in adaxial, stoma elliptic, (7-9) μm; guard cell kidney like, (14-16)x(3-4) μm. (Plate 7).

Type: Described from Germany, nr. Leipzig.

Studied samples

Environment & Presence
Present as individuals in the region, on the rocky soils; altitude: 1800 m; flowering: August. Found in Qandil Mountain within Rowanduz district (MRO). (Figure 1).
Fig (1): A map of Iraq shows the regions and districts depending on [37 and 38] ● *E. obscurum*

Plate (1): Photograph of *E. obscurum* Plate (2): Stolon of *E. obscurum*
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Plate (3): Plant parts of *E. obscurum*
Plate (4): Pistil, fruit and seed of *E. obscurum*

Plate (5): Pollens of *E. obscurum* X100 (10 X100)
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Plate (6): Leaf venation of *E. obscurum*
Plate (7): Stomatal complex of *E. obscurum* X100 (10X100)
4- Discussion
The present work dealt with a new plant record of the genus *Epilobium* which is *E. obscurum* from Onagraceae family in Iraq, the study involved some aspects as the morphological characters and the environment. Within the literature review related to the genus *Epilobium* in Iraq, including the plant 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 *E. obscurum*, therefore it will be regarded as a new plant species to the Flora of Iraq (new record in Iraq) from Qandil mountain.

*E. obscurum* has some characters differ from the near species which is *E. tetragonum* L. that found in Iraq and has the following characteristics: elongate epigeal stolons; stem glabrous below, adpressed crisped hairy above, upper cauline leaves densely crisped margins and veins, Inflorescence with some glandular hairs, especially on the calyx and ovary; petals and capsules are smaller in length. Pollens were yellow, single (sometimes tetrads), triporate, oblate in equatorial view, triangular in polar view, medium numerous and 2-3 thin threads project from pollens surface seen in the polar view. Stomatal complex was anomotetyracytic (4 cells enclosing the guard cells in an irregular and variable pattern), found in both surfaces and more in adaxial.
References


http://www.cibtech.org/jps.htm


