

Umbilicus tropeolifolius subsp. *zalamica* SARDAR AND ALEDHARI (*Crassulaceae*) AS A NEW SUBSPECIES FROM IRAQ

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Abstract. *Umbilicus tropeolifolius* subsp. *zalamica* Sardar et Al-Edhari (Crassulaceae) is described as a subspecies to science based on the material collected from Zalam region (South East of Sulaimaniya). Morphologically it is close to the typical *U. tropeolifolius* Boiss. which is a species found in Iraq. An identification and a taxonomic description are given.

Keywords: *Umbilicus*; taxa; Zalam; Sulaimania; Iraq

INTRODUCTION

One of the families in the Flora of Iraq is Crassulaceae family which involves 1300 species throughout the world that are distributed on 33 genera [4, 8, 12], while in Iraq involves 9 species distributed on 4 genera [1].

During a field trip to Zalam region within Sulaimania district carried out in April 2017, we found some specimens of *Umbilicus* DC., the specimens were checked using the Flora of Iraq [6], Flora of Turkey [2], Flora Iranica [9], and Flora of USSR [3, 7]. After comparison with the morphologically similar taxa, we decided that the present specimens belong to a subspecies close to *U. tropeolifolius* Boiss.

The present study aimed to describe *Umbilicus tropeolifolius* subsp. *zalamica* as a subspecies in Iraq.

MATERIALS AND METHODS

Several scientific trips were made to different districts of Kurdistan region of Iraq: Amadiya (MAM), Rowanduz (MRO), Sulaimaniya (MSU), and Arbil (FAR) during the year 2017 for plant specimens' collection. Some specimens collected from Zalam

region (Figure 1) and deposited in herbarium of Education College-University of Salahaddin-Erbil and National Herbarium of Iraq were identified as a subspecies for the Flora of Iraq.

RESULTS

Taxonomic Key of *Umbilicus* species in Iraq

- 1-Plant erect ----- 2
- 2- Corolla horizontally spreading ----- *U. horizontalis*
- 2- Corolla drooping ----- *U. rupestris*
- 1- Plant prostrate ----- *U. tropeolifolius*

Taxonomic Key of *U. horizontalis* varieties in Iraq

- 1- Corolla tubular ----- var. *horizontalis*
- 1- Corolla urceolate ----- var. *intermedius*

Taxonomic Key of *U. tropeolifolius* subspecies in Iraq

- 1- Plant without a main stem ---- subsp. *tropeolifolius*
- 1- Plant with a main stem ----- subspecies *zalamica*

Umbilicus tropeolifolius Boiss. subsp. *zalamica* subsp. nov.

Holotype: [N. Iraq], Zalam (Sulaimaniya), 800 m, (7823).

Perennial, succulent herb, (21-30) cm, glabrous, stem erect, unbranched, green. Basal leaves peltate, petiolate, margin crenate, blade diameter of 2.5-3.3 cm, petiole terete, (7.0-9.3)×(0.2-0.4) cm. Lower cauline leaves orbicular, petiolate, margin sinuate, blade diameter of 2.2-2.7 cm, petiole terete, (6-8) × (0.15-0.25) cm, Upper cauline leaves peltate, petiolate, margin sinuate, blade diameter of 1.8-2.3 cm, petiole terete, (3.0-5.0)×(0.1-0.15) cm. Inflorescence a compound raceme, peduncle light green, (7-9)×(0.10-0.20) cm. Flowers hermaphrodite, pedicel (4.5-6.0)×(0.4-0.7) mm. Sepals 5, connate at the base, narrowly ovate, light green, (1.8-2.3)×(0.8-1.2) mm. Corolla obconical, light yellow, with white dots, consist of a tube and a limb with 5 equal lobes, lobes apex acute, limb (2.2-2.5)×(1.2-1.5) mm, the tube (3.5-4.0)×(2.6-3.0) mm. Stamens 10, epipetalous, 5 of them antipetalous and the others antiseptalous, filaments



Figure 1. A map of Iraq showing with regions and districts; • The red dot indicates the location of *U. tropeolifolius* subsp. *zalamica*

filiform, light yellow, (1.0-2.0)×(0.10-0.15) mm, anthers spherical-semi spherical, yellow, basifixed with the filaments, (0.3-0.4) × (0.35-0.45) mm. Pistils 5, united at the base, ovary superior, with white dots, unilocular, multi-ovules, narrowly lanceolate or narrowly ovoid, light yellow, (3.5-4.4)×(0.7-1.8) mm, style terete, terminal attachment with the ovary, light yellow, (0.30-0.45 ×(0.2-0.25) mm, stigma spherical, light yellow, (0.15-0.25)×(0.12-0.20) mm. 5 equal nectar glands at the base of the ovaries (from the outer side), oblong or narrowly oblong, green with red dots, apex slightly concave, (0.5-1.0)×(0.30-0.45) mm. Fruit an aggregate follicles, dehiscent, follicles like ovaries in the shape, brown, (4.2-5.0)×(1.0-1.2) mm. Seeds numerous, narrowly oblong or narrowly obovoid, dark brown, (0.3-0.5)×(0.12-0.20) mm. MSU: ESUH/ Zalam region (South East of Sulaimaniya), 800 m, 20. 4. 2017. Grow as individuals in the region, on rocky clay soils; flowering: April (Figures 2 and 3).



Figure 2. Field photograph of *U. tropaeolifolius* subsp. *zalamica*

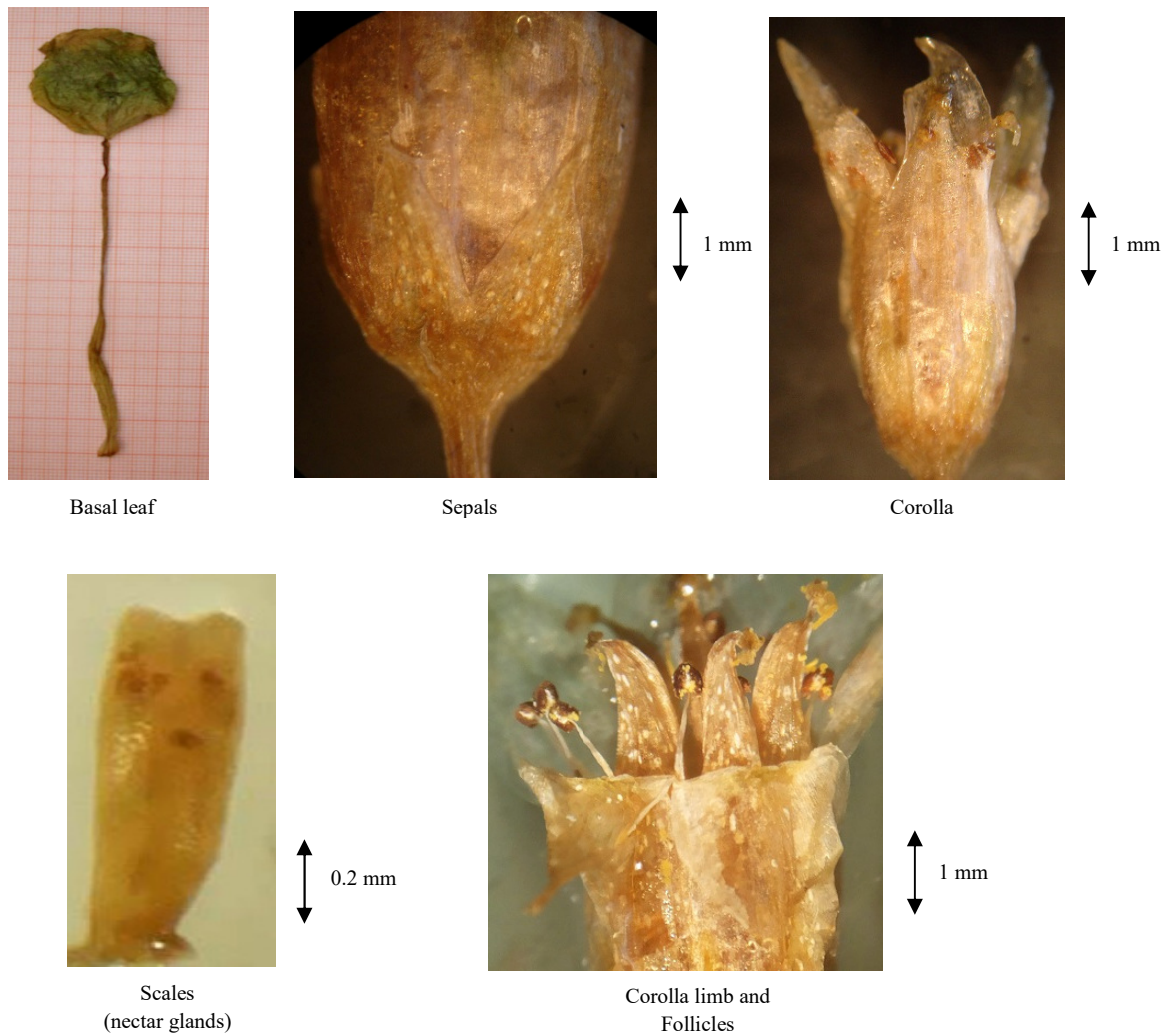


Figure 3. Plant parts of *U. tropaeolifolius* subsp. *zalamica*

DISCUSSION

From the present study, appeared that *Umbilicus* species distributed as individuals in the region, on rocky clay soils, in different regions, mountain (usually in the clefts), road sides, valleys, near rivers, water sources and streams, in *Quercus* and *Pinus* forests. The Crassulaceae is the scientific taxonomy of the genus *Umbilicus*.

U. tropaeolifolius subsp. *zalamica* is closely related to the typical *U. tropaeolifolius* because they have the following characters: perennial succulent herbs, glabrous; leaves peltate (lower cauline leaves orbicular), petiolate; inflorescence a compound raceme, bracts minute, obovate, narrowly oblong-narrowly elliptic; flowers hermaphrodite, pedicellate, sepals 5,

connate at the base, corolla obconical, stamens 10, epipetalous, 5 of them antipetalous and the others antiseptalous, filaments filiform, anthers spherical-semi spherical, basifixed with the filaments; pistils 5, united at the base, ovary superior, stigma spherical; 5 equal nectar glands at the base of the ovaries, oblong or narrowly oblong, yellow, apex slightly concave; fruit an aggregate of follicles, dehiscent, follicles; seeds numerous, narrowly oblong or narrowly obovoid. Differentiating characters are given in the Table 1.

The present study fixed the presence of the plant *U. tropaeolifolius* subsp. *zalamica* as a subspecies from Iraq. According to the literature review used in the study, taxa number of the genus *Umbilicus* become five taxa all of them found in the mountain regions of Iraq [5, 10-14].

Table 1. Morphological comparison between *U. tropaeolifolius* subsp. *zalamica* and the typical *U. tropaeolifolius*

<i>U. tropaeolifolius</i> subsp. <i>zalamica</i>	<i>U. tropaeolifolius</i>
Plant with a main stem	Plant without a main stem (in Iraq)
Stem erect, unbranched	Stem ascending or procumbent, branched
Cauline leaves thicker and larger	Cauline leaves thin and small
Calyx light green, and the corolla also light green in the lower surface	Calyx light green, and the corolla light yellow
Corolla tube long (3.5-4.0) mm	Corolla tube short (1.0-1.5) mm
Scales (nectar glands) green with red dots	Scales (nectar glands) yellow without red dots
Ovaries and petals with white dots	Ovaries and petals without white dots

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