

A TAXONOMIC REVISION OF UTRICULARIA (LENTIBULARIACEAE) FOR AQUA FLORA OF IRAN

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For the preparing of aqua Flora of Iran, the appropriate materials collected from wetlands and identified. Among *Utricularia* species one new record to Iran namely *Utricularia ochroleuca* from a bog in Mazandaran was found. Other species, *Utricularia minor* collected from Gahar lake in Lorestan, *U. vulgaris* from Zarivar lake in Kurdistan and *U. australis* from Gilan. In this paper a key to the Iranian species is presented and the new record and other species are explained.

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Key words. *Utricularia*, Aquatic flora, *Lentibulariaceae*, new record, Revision, Iran.

مروری تاکسونومیک بر جنس پشه گیر (تیره لنتیبولاریاسه) از گیاهان آبی ایران

مهري دیناروند، مربی پژوهش مرکز تحقیقات کشاورزی و منابع طبیعی خوزستان و دانشجوی دکتری دانشگاه فردوسی مشهد. طی نگارش فلور تیره‌های آبی ایران و جمع‌آوری و شناسایی نمونه‌های گیاهی تالابها گونه *Utricularia ochroleuca* از ماندابی در استان مازندران برای ایران معرفی می‌شود. سه گونه دیگر از این جنس در ایران وجود دارد که طی بررسی‌های اخیر گونه *U. minor* از دریاچه گهر در استان لرستان، *U. vulgaris* از دریاچه زریوار استان کردستان و گونه *U. australis* که البته در فلور ایرانیکا *U. neglecta* معرفی شده بود از استان گیلان جمع‌آوری شد. در این گزارش کلید شناسایی گونه‌های ایران و شرح گونه‌ها ارائه می‌شود.

INTRODUCTION

The members of the family *Lentibulariaceae* are carnivorous herbs that is placed in the order *Lamiales* (Judd et al. 2008). It contains 284 species of three genera, *Pinguicula* L., *Genlisea* St. Hil. and *Utricularia* L.

Utricularia is a cosmopolitan genus with concentration on tropical and subtropical regions. It includes 214 species in two subgenera *Polypompholyx* Lehm. and *Utricularia* L. (Taylor 1989). Casper (1969) surveyed this family in Flora Iranica only with *U. neglecta* Lehm. from Mazandaran province. Parsa (1950) in *Flore de l'Iran* introduced this family with species *U. vulgaris* from same province although this might be an erroneous detection (Naqinezhad 2008).

Casper (1969) in Flora Iranica reported three species namely *U. minor*, *U. ochroleuca* and *U. vulgaris* from Afghanistan and *U. vulgaris* for Pakistan. Naqinezhad et al. (2008) reported the species *U. australis* from Tehran and *U. minor* from Tehran and Mazandaran for the first time and although they refer Tehran University Herbarium as stored but in this research, I did not find their specimens in TUH. Ali (1993) in Flora of West Pakistan explained that *U. vulgaris* does not occur in Pakistan and material belongs to *U. australis*, also other species in this region are, *U. minor* and *U. aurea*. The

family *Lentibulariaceae* have 2 genera in Turkey and Europe, *Pinguicula* and *Utricularia*. There are three species of *Utricularia* in Turkey and six in Europe, on the other hand three species (*U. minor*, *U. australis* and *U. vulgaris*) are common between Turkey, Iran and Europe. But it is important to mention that, the species of Turkey are very similar in characters with Iranian species (Davis 1978; Taylor 1972). In Flora of the U.S.S.R. (Komarov 1958) six species of *Utricularia* encountered, three of them are the same as in Iran, *U. minor*, *U. vulgaris* and *U. major*. The author has been preparing the draft of aqua Flora of Iran and therefore has been collecting and revising the genus *Utricularia* in Iran. The aim of this paper is to presenting an identification key for the Iranian species and explaining the new record to Iran.

RESULTS

Key to *Utricularia* species in Iran

1. Stems dimorphic, Leaves polymorphic 2
- Stems and leaves monomorphic 3
2. Leaves indistinctly denticulate or not denticulate; all segments dichotomously divided 1. *U. minor*
- Leaves distinctly denticulate; segments dichotomously and pinnately divided 4. *U. ochroleuca*
3. Leaves multipinnatifid. Internode 1-1.5 cm.

Pedicels 1-1.5 cm. Lower lip flat and spreading

2. *U. australis*

- Leaves pinnate. Internode 4-8 mm. Pedicels 0.5-1 cm.
Lower lip flat and deflexed

3. *U. vulgaris*

1. *U. minor* L., Sp. Pl. 18 (1753).

Specimen examined. Lorestan province: Doroud, Gahar lake, 2358 m, Dinarvand & Mohamadi. 8757 (TARI and Research Center of Agriculture & Natural Resources of Khuzestan Herbarium).

Submerged herbs. Stems filiform, dimorphic; green and colourless internode 4-7 mm. Leaves alternate, polymorphic, with 2 primary segments from the base, 2-10 mm long, semiorbicular in outline; secondary segments dichotomously divided into 2-5 segments, narrowly linear, 0.2-0.3 mm wide, margin entire or sparsely denticulate, apex acute. Traps on leaf segments, with short stalk, 0.2 mm, oblique ovate, 1.5-2 wide and 0.9-1 mm long. Antennae on mouth of traps much branched, 2 mm long.

2. *U. australis* R. Br., Prodr.: 430 (1810), Fig. 1.

Syn.: *U. neglecta* Lehm., Index Schol. Hambg. Gymn. Acad. 38 (1828).

Taylor (1989) in "The Genus *Utricularia*" introduced the species *U. neglecta* Lehm. as a synonym of *U. australis* R. Br.

Specimens examined. Mazandaran province: Fereydon Kenar, Azbaran village, -5 m, Dinarvand & Mohamadi. 8797 (TARI. Research Center of Agriculture & Natural Resources of Khuzestan Herbarium). Gilan province: Anzali wetland, Mobayen (Herbarium of Tehran University); Lahijan, 2 km S. Khazar, Amir Kalayeh wetland, Moradi, 1529. (Research Center of Agriculture & Natural Resources of Gilan & Khuzestan Herbarium)

Submerged herbs. Stems filiform, monomorphic, all green; internode 1-1.5 cm. Leaves alternate, monomorphic, with 2 primary segments from the base, 1-1.5 cm wide and 2.5-3.5 cm long, oblong to ovate in outline; secondary segments filiform, more than 10, multipinnately divided, margin denticulate, obviously with bristle on each tooth, oblong to ovate in outline. Traps on leaf segments, with shortly stalk, 0.2-0.4 mm, oblique ovate, 1.5 mm wide and 1.5-2 mm long. Antennae on mouth of traps much branched, 2-3 mm long. Inflorescent raceme; peduncle emerged, erect, 10-20 cm. Bracts amplexicaul, rounded at apex, 2-4 mm long. Flowers yellow, 5-7 mm long; pedicels 1-1.5 cm. Corolla bilabiate with spure; lower lip flat and spreading. Calyx with 2 dimorphic lobes, connate at base; the upper with rounded and the lower with

emarginated apex, 3.5 mm long. Capsule globose, 2-5 mm long.

3. *U. vulgaris* L., Sp. Pl. 18 (1753).

Specimen examined. Kurdistan province: Marivan, Zarivar lake, 1300 m, Dinarvand & Mohamadi 8312 (TARI and Research Center of Agriculture & Natural Resources of Khuzestan Herbarium).

Submerged herbs. Stems filiform, monomorphic, all green; internode 4-8 mm. Leaves alternate, monomorphic, with 2 primary segments from the base, 1-2.5 cm long, oblong to ovate in outline; secondary segments filiform, 5-7, pinnately divided; margin denticulate, obviously with bristle on each tooth, rounded to ovate in outline. Traps on leaf segments, with shortly stalk, 0.1-0.2 mm, oblique ovate, 2.5 mm wide and 3 mm long. Antennae on mouth of traps much branched, 2-3 mm long. Inflorescent raceme; peduncle emerged, erect, 6-10 cm. Bracts amplexicaul, rounded at apex, 3 mm long. Flowers yellow, 5-6 mm long; pedicels 0.5-1 cm. Calyx 2 with dimorphic lobes, connate at base; the upper with rounded and the lower with emarginated apex, 3 mm long. Corolla bilabiate with spure; lower lip flat and deflexed. Stamens 2; filament curved, 2 mm. Capsule globose, 2 mm long.

4. *U. ochroleuca* R. Hartman, Bot. Not. 1857: 30 (1857), Fig. 2.

Specimen examined. Mazandaran province: Beginning of the road from Chalos to Noshahr, under metal bridge, 8 m, Dinarvand & Mohamadi. 8787 (TARI. Research Center of Agriculture & Natural Resources of Khuzestan Herbarium).

Submerged herbs. Stems filiform, dimorphic; internode 4-7 mm. green and colourless. Leaves alternate, polymorphic, with 2 primary segments from the base, 3-10 mm long, oblong, ovate or semiorbicular in outline; secondary segments dichotomously and pinnately divided, into 3-9 segments, narrowly linear, 0.1-0.6 mm wide, margin denticulate, obviously with bristle on each tooth; apex acute. Traps on leaf segments or on stems without leaf, with shortly stalk, 0.1-0.2 mm, oblique ovate, 1-2.5 wide and 1.5-2 mm long. Antennae on mouth of traps much branched, 2 mm long.

The Iranian species of the genus *Utricularia* are all non endemic aquatics with a distributed range between -5 to 2358 m altitudes in N and W Iran (Fig. 3).

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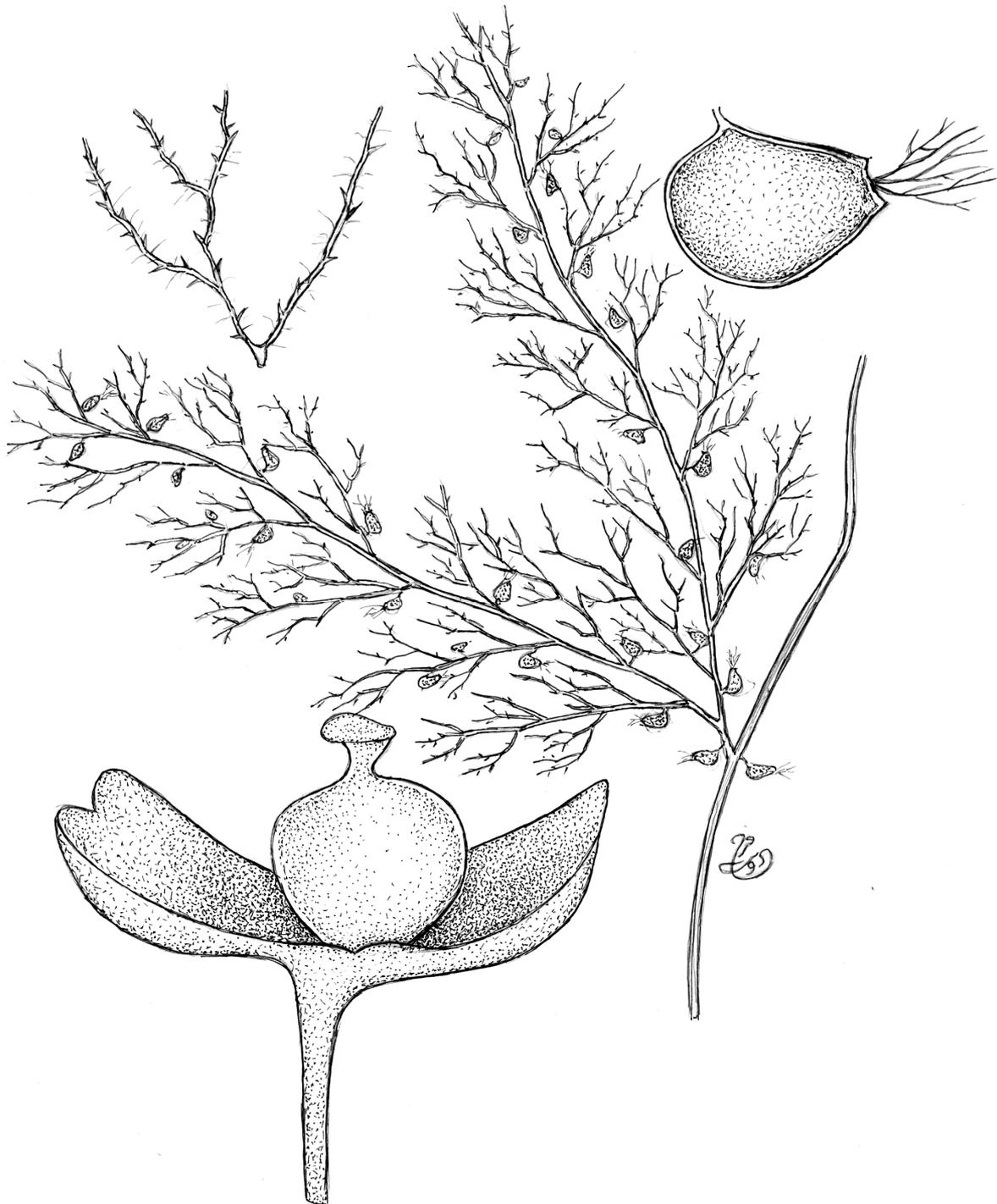


Fig. 1. *Urticularia australis* ($\times 2.64$); trap ($\times 26.4$); fruit ($\times 7$).



Fig. 2. *Utricularia ochroleuca*. Green stem ($\times 5.3$); colorless stem ($\times 13.2$); expanded turion leaf ($\times 44$); trap ($\times 12$).

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REFERENCES

Ali, T. 1993: Lentibulariaceae in Nasir and Ali, Flora of Pakistan, no. 196.- Karachi.
 Casper, S. J. 1969: Lentibulariaceae in K. H. Rechinger, Flora Iranica, no. 58.- Graz.

Davis, P. H. 1978: Lentibulariaceae in Flora of Turkey and the East Aegean Islands vol. 6: 109-111 Edinburgh.

Judd, W. S., Campbell, C. S., Kellogg, E. A. & Stevens, P. F. 2007: Plant Systematics, a phylogentic approach, 3rd. edition. -Houghton Miffilm C., Buston.

Komarov, V. L. 1958: Urticulariaceae in Schischkin, B. K. Flora of the U. S. S. R. vol. 23:152-159. - Moskva & Leningrad

Naqinezhad, A., Rice, B. A., Attar, F. & Jalili, A. 2008:

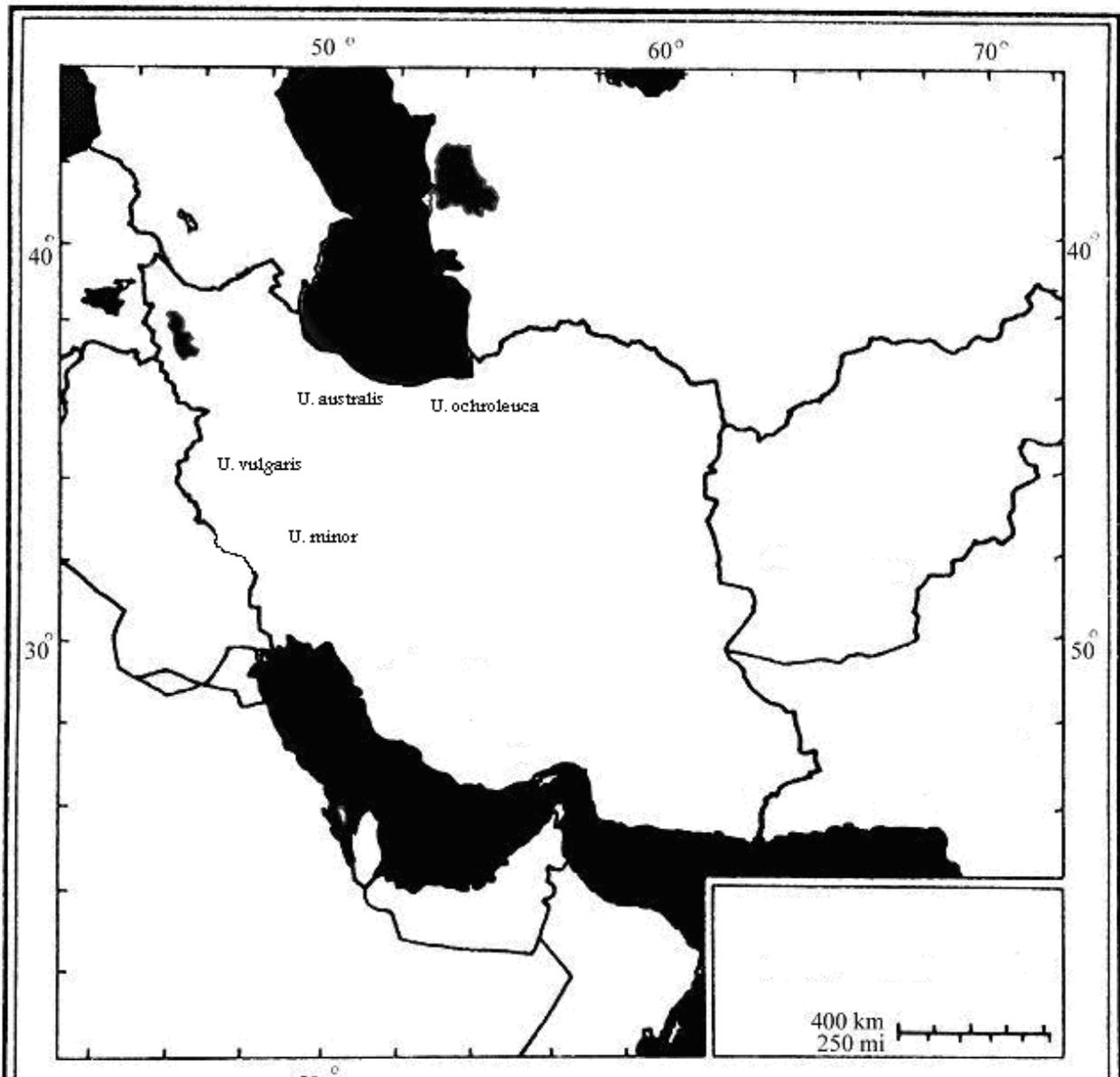


Fig. 3. Distribution map of *Utricularia* species in Iran.

Utricularia (Lentibulariaceae) of Iran. Carnivorous Plant Newsletter, Journal of International Carnivorous Plant Society. vol. 37, no. 1

Parsa, A. 1950: Lentibulariaceae in Flore de l'Iran vol. 4. 3-5. -Ministre de l'Education, Tehran.

Taylor, P. 1972: *Utricularia* in Tutin, T. G., Hywood,

V. H., Burges, N. A., Moore, D. M., Valentine, D. H., Walters, S. M. & Webb, D. A., Flora Europaea 3: 296-297. Cambridge University Press.

Taylor, P. 1989: The Genus *Utricularia*. -Kew Bulletin Additional Series XIV. London: HMSO.