

UTRICULARIA AUSTRALIS R. BR. (LENTIBULARIACEAE):

AN ADDITION TO THE CARNIVOROUS PLANTS IN FLORA OF GUJARAT, INDIA

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Abstract: *Utricularia australis* R. Br. (Lentibulariaceae), a carnivorous aquatic plant species is reported as new to Gujarat from India. Details of its identification, description, distribution, and a detailed photo plate of the plant is provided.

Introduction

The members of the Lentibulariaceae are carnivorous herbs that is placed in the order *Lamiales* (Judd *et al.* 2007). The Lentibulariaceae family consists of ca. 360 species of carnivorous plants with worldwide distribution (Fleischmann & Rocchia 2018). *Utricularia* L. is the largest genus of the family Lentibulariaceae and also one of the most widely distributed. These rootless carnivorous plants, commonly known as bladderworts, have been reported on all continents except Antarctica and they occupy aquatic, terrestrial, and epiphytic habitats (Taylor 1989; Król *et al.* 2012).

In his monograph, Taylor (1989) recognized a total of 214 species in *Utricularia* worldwide species while Fleischmann (2012) reported 228 species in the world. Currently, the genus *Utricularia* is represented about 274 species (Fleischmann 2015; Delprete 2014; Kumar *et al.* 2018; Hong *et al.* 2022). Janarthanam and Henry (1992), in their taxonomic revision, reported 35 species in India. Since then, six more species were described from India (Yadav *et al.* 2000, 2005; Kumar *et al.* 2018; Sindhu *et al.* 2020., Biju *et al.* 2020).

In Gujarat, eight species (*U. arcuata* Wt., *U. aurea* Lour., *U. caerulea* L., *U. gibba* subsp. *exoleta* (R.Br.) P.Taylor, *U. janarthanamii*, *U. reticulata* Sm., *U. stellaris* L.f., *U. striatula* Sm.) are reported. (Shah 1978; Raghavan *et al.* 1981; Gadhvi *et al.* 2021).

Materials and methods

During a floristic exploration of the wetlands in Panchmahals district, Gujarat, the first author collected specimens of a species of *Utricularia* in April 2023 from Kaliakuva Pond, Panchmahals district of Gujarat, India. In April 2024, the authors expanded their search and collected additional *Utricularia* specimens from two other sites within the same district.

Results

The specimens collected exhibited distinct morphological features that set them apart from other known *Utricularia* species in the Gujarat. After critical examination and going through literature on the genus *Utricularia* (Subramanyam 1979; Taylor 1989; Janarthanam & Henry 1992; Crow 1992), herbarium specimens and opinions of experts the identity of the specimens was determined as *Utricularia australis*. In India, the species is recorded from Jammu & Kashmir, Himachal Pradesh, Punjab, Uttar Pradesh, Madhya Pradesh, Rajasthan, Maharashtra, Karnataka, Andhra Pradesh and Odisha (Kullayiswamy *et al.* 2013; Mishra *et al.* 2021).

However, in Gujarat, *Utricularia australis* is not reported previously (Bhatt 1975; Shah 1978; Raghavan *et al.* 1981). Hence, it is a new report for the flora of Gujarat State. The voucher specimens (PKP 00745; PKP & CGP 00074; CGP & PKP 00034) are deposited in CAL and Department of Botany, SPT Arts and Science College, Godhra, Gujarat, India. A detailed taxonomic description, photographs and relevant notes on habitat, phenology, and distribution of the species are provided to facilitate its easy identification in the field.

Taxonomic treatment

Utricularia australis R. Br., Prodr. 430 (1810); Saxena in Indian Forester 96: 249 (1970); Gandhi in Saldanha & Nicolson, Fl. Hassan 563 (1976); Taylor in Steenis, Fl. Males. I.8; 299 (1977) & in Kew Bull. Add. Ser. 14: 598. f. 184 (1989); Srivastava in J. Econ. Tax. Bot. 4: 188 (1983); Pandaey *et al.* in J. Econ. Tax. Bot. 5: 865 (1984); Bennet, Namechang Fl. Pl. Ind. 580 (1987); Janarthanam and Henry in Bladder worts of India 1992. *U. flexuosa* Sensus Clarke in Hook. f., Fl. Brit. India, Syn. *U. australis* R. Br., non Vahl 1804. (Fig. 1)

Description: Aquatic submerged herb, Rhizoids usually absent, stolons up to 30 cm. long, 0.5mm. thick, filiform, terete, green to greenish-yellow. Foliar organs equivalent to Leaves, Foliar organs up to 2.6 cm long, primary segment dichotomously divided, ultimate segments setulose. Bladders or Traps on nodes and foliar segments, 1-2 mm. long, obliquely obovoid, stalked; mouth lateral oblique; appendages 2, simple or branched. often setae present on lips. Inflorescence raceme, erect, emergent above water, 12-16 cm long, up to 10 flowers; flowers at regular intervals; scales 2-3 × 1.2-2.5 mm long, ovate to suborbicular, basifixed, base auriculate, apex acute to obtuse; bracts 3-3.2 × 3-3.2 mm, basifixed, ovate to suborbicular, cordate at base, acute to obtuse at apex; flowers up to 12 mm long; Pedicels 2-3 cm long, glabrous, filiform. Calyx lobes 2, slightly unequal, ovate to oblong, upper lobe 2.0-2.5 × 1.5-1.8 mm, lower lobe 1.5-2 × 1.5-2 mm, obtuse at apex. Corolla ca 11 mm long; yellow with reddish brown lines and spots on the darker lower lip; upper lip ca 5 × 3.5 mm, ovate to oblong, truncate at apex; lower lip ca 6 × 12 mm, transversely elliptic, auricled and prominently gibbous at base, truncate at apex. Spur ca 5 mm long, conical, obtuse at apex, glandular within. Stamens 2, 1-1.5 mm long; filaments dilated near anthers; sterile 1.5-1.8 mm. Ovary ca 1.2 mm long, globose, glandular; style short; stigma 2 lipped, unequal, lower lip deltoid, upper lip obovate, thin and transparent.

Phenology: Flowering occurs from April to September.

Habitat: In still waters, ponds, and lakes.

Distribution: Western Europe to China and Japan, tropical and South Africa, Sri Lanka, India to southeast Australia; in India Jammu & Kashmir, Himachal Pradesh, Punjab, Uttar Pradesh, Madhya Pradesh, Rajasthan, Maharashtra, Karnataka, Andhra Pradesh, Odisha and Gujarat (Present study).

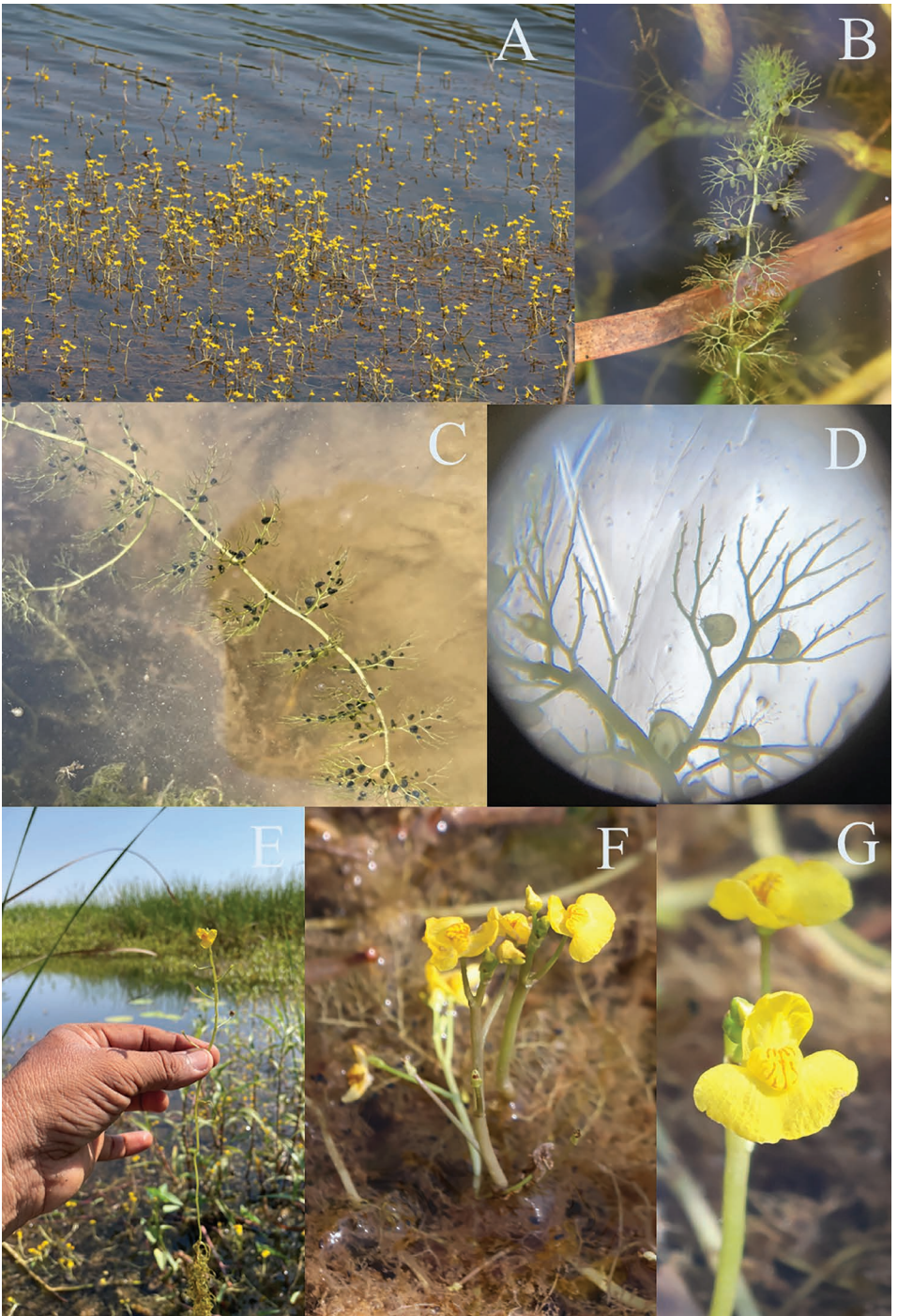


Figure 1: *Utricularia australis* R. Br. (A) Habitat, (B-C) Habit, (D) Foliar organ with traps, (E) Habit with inflorescence, (F) Inflorescences, (G) Flower. Photographs by P. K. Patel.

Specimens examined: INDIA, Gujarat, Panchmahals district, Kaliyakuva, 23°44.794'N, 73°43.334'E, 164 m, 11.04.2023, PKP00745; Navagam, 23°36.231'N, 73°37.730'E, 110 m, 19.04.2024, PKP & CGP 00074; Hirapur, 22°24.452'N, 73°43.211'E, 125 m, 24.04.2024, CGP & PKP 00034; (Department of Botany Herbarium, SPT Arts & Science College, Godhra, Gujarat).

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