

Taxonomic identity of *Utricularia malabarica* (Lentibulariaceae), a species endemic to the lateritic plateaus of the Western Ghats, India

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Abstract: *Utricularia malabarica* Janarth. & A.N.Henry, previously considered conspecific to *U. praeterita* P.Taylor, is reinstated here based on morphological characters. The diagnostic characters to separate them include the nature of pedicel, shape and lobation of lower lip of corolla and features of spur. Details of habitat, ecology, phenology, photographic and analytical evidences and notes are presented in this paper.

Keywords: Bladderworts, Carnivorous plants, *Utricularia praeterita*.

INTRODUCTION

The genus *Utricularia* L. (Lentibulariaceae), also known as bladderworts, comprises of 220 species distributed worldwide (Mabberley, 2017). Taylor (1989) in his world monograph recorded 214 species while Janarthanam and Henry (1992) reported 35 species from India. Subsequently, four new species were added to the genus from the Western Ghats (Yadav *et al.*, 2000, 2005; Naveen Kumar *et al.*, 2018). Nayar *et al.* (2014) and Singh *et al.* (2015) reported 28 species from the Western Ghats, of which 13 are endemic to this region. One such endemic and habitat specific species, *U. malabarica* Janarth. & A.N.Henry, was described from Kerala by Janarthanam and Henry (1989). This species was also reported from Maharashtra and Goa (Janarthanam, 1994; Nayar *et al.*, 2014; Singh *et al.*, 2015) and Karnataka (Pers. observation). It is closely allied to *U. lazulina* P.Taylor (Janarthanam & Henry, 1989, 1992) and belongs to the section *Oligocista* A.DC. Recently, Fleischmann (2012) reduced *U. malabarica* as a synonym of *U. praeterita* P.Taylor by stating that they show similarity in

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“all morphological characters including fruiting pedicel pattern and seed shape”. However, a critical analysis of different populations of both taxa in the field and consultation of type specimens, enabled the authors to reinstate *U. malabarica* from the synonymy of *U. praeterita*.

Materials and methods

Fresh specimens of *U. malabarica* and *U. praeterita* were collected from Goa and Maharashtra states. Different populations along with published literature including type specimens were studied to understand their range of morphological variations, microhabitat preferences and phenological differences. Photographs were taken under Nikon Stereo Binocular Microscope (SMZ745T). Voucher specimens were prepared and deposited in the herbarium of the Department of Botany, Goa University.

Taxonomic treatment

Utricularia malabarica Janarth. & A.N.Henry, J. Bombay Nat. Hist. Soc. 86(1): 84. 1989, Bladderworts of India 69, f. 18. 1992; Janarth., J. Econ. Taxon. Bot. 18: 230. 1994. *Type*: INDIA, Kerala, Kasaragod district, Mulleriya, 21.08.1985, M.K. Janarthanam 82924 (holo CAL!).

Description & illustration: Janarthanam and Henry (1989 & 1992).

Flowering & fruiting: July–September.

Habitat: Grows on wet lateritic rocks and periphery of puddles in association with *Eriocaulon kollhapurens* Gaikwad, Sardesai & S.R.Yadav., *Rotala* spp., *Smithia* spp., *Utricularia praeterita* P.Taylor and *U. reticulata* Smith.

Distribution: Goa, Karnataka, Kerala, Maharashtra.

Specimens examined: INDIA, Goa, North Goa district, Goa University Campus, 31.08.2017, Rutuja R. Kolte RRK975; Karapur 29.07.2018, Rutuja R. Kolte RRK1594; Soccoro 27.07.2018, Rutuja R. Kolte 1574. Maharashtra, Sindhudurg district, Padel canteen titha, 27.08.2017, Rutuja R. Kolte RRK957 (Goa University Herbarium!).

Utricularia praeterita P.Taylor in K.M. Matthew, Fl. Tamilnadu Carnatic 2: 1120, t.87. 1983; P. Taylor, Gen. *Utricularia* 321. 1989; Janarth. & A.N. Henry, Bladderworts of India 81, f.23 1992; Singh *et al.*, Fl. Maharashtra, Dicot. 2: 565. 2001; S.R.Yadav & Sardesai, Fl. Kolhapur District 339. 2002. *Type:* INDIA, Maharashtra, Panchgani, *s.d.*, P. Taylor 18104 (holo K000939701 digital image!)

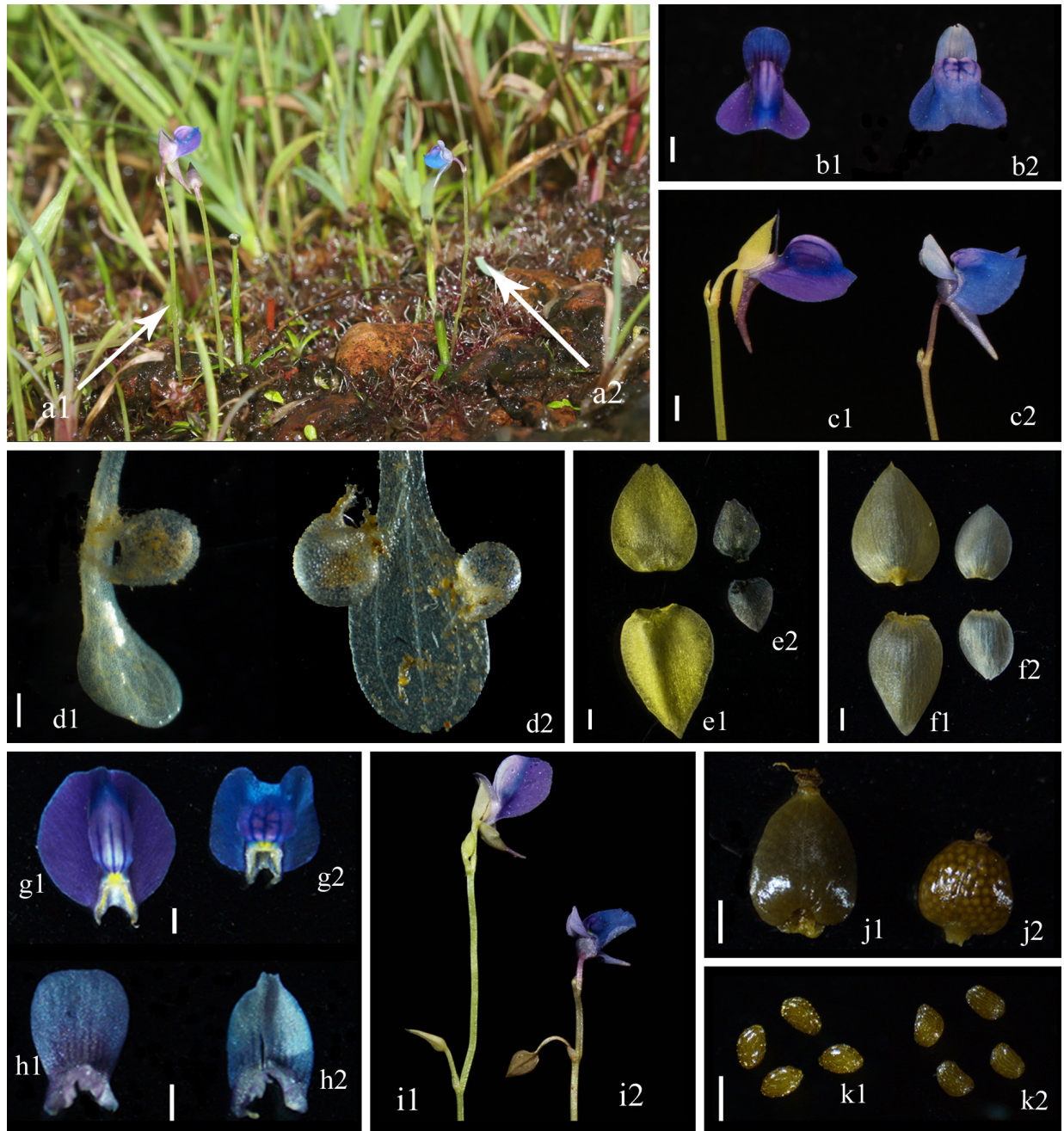


Fig. 1. *Utricularia praeterita* P.Taylor (a1–k1) and *Utricularia malabarica* Janarth. & A.N.Henry (a2–k2) comparative morphology: **a.** Habit; **b.** Flower–front view; **c.** Flower–side view; **d.** Traps along with leaf; **e.** Calyx (Flowering stage); **f.** Calyx (Fruiting stage); **g.** Corolla lower lobe; **h.** Corolla upper lobe; **i.** Fruit attached to the plant; **j.** Capsule; **k.** Seeds (Scale a–j. 1mm; k. 0.2 mm).

Table 1. Comparison of morphological characters of *U. malabarica* and *U. praeterita*

Character	<i>U. malabarica</i> Janarth. & A.N.Henry	<i>U. praeterita</i> P.Taylor
Pedicele	Erect before anthesis, recurved in fruit	Erect before anthesis and in fruit
Calyx lobes	Equal	Subequal
Corolla lower lip	Suborbicular to ovate, slightly acute or obscurely lobed at apex, bi-gibbous at base	Obovate to suborbicular, rounded or slightly 3–4-lobed at apex, gibbous at base
Spur	Straight	Curved
Capsule	Ovoid to subglobose	Ovoid, dorsiventrally compressed
Seed	Testa cells elongated, compactly arranged	Testa cells narrowly elongated, obliquely arranged

Description & illustration: Janarthanam & Henry (1992) and Taylor (1989).

Specimens examined: INDIA, Goa, North Goa district, Goa University Campus, 31.08.2017, *Rutuja R. Kolte* RRK974; Socorro, 27.07.2018, *Rutuja R. Kolte* RRK1573; Karapur, 29.07.2018, *Rutuja R. Kolte* RRK1593; South Goa district, Loliem, 01.08.2018, *Rutuja R. Kolte* RRK1610; Rivona, 12.08.2018, *Rutuja R. Kolte* RRK1638. **Maharashtra**, Ratnagiri district, Rajapur, 25.08.2018, *Rutuja R. Kolte* RRK1675; Ratnagiri, 22.07.2018, *Rutuja R. Kolte* RRK1572; Sindhudurg district, Chaukul, 17.08.2016, *Rutuja R. Kolte* RRK502; *ibid.*, 18.08.2017, *Rutuja R. Kolte* RRK933; Padel canteen titha, 27.08.2017, *Rutuja R. Kolte* RRK 956 (Goa University Herbarium!).

Notes: The study showed that both species are distinct in several characters. Though, both species belong to section *Oligocista*, they are not morphologically similar to each other (Janarthanam & Henry, 1992). They are sympatric, having same phenological pattern but easily distinguishable in the field. The main distinguishing characters are given in Table 1. Photographs of both the species are provided here for easy identification (Fig. 1).

Acknowledgements

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