

## Notes on *Utricularia* sect. *Phyllaria* (Kurz) Kamięski (Lentibulariaceae) in Arunachal Pradesh, India

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### Abstract

The article provided field observations, photo-documentation and discriminative characters for *Utricularia* section *Phyllaria* (Kurz) Kamięski, gathered during two recent expeditions to high altitudes of Arunachal Pradesh (India). Four species, *U. brachiata*, *U. christopheri*, *U. multicaulis* and *U. striatula* has been enumerated along with brief discussion on their partly challenging taxonomy.

**Key words:** *Utricularia*, Alpine habitat, Arunachal Pradesh

### INTRODUCTION

In his monumental and exceedingly thorough monograph of *Utricularia* Linnaeus, Taylor (1989) gives no certain reference to Arunachal Pradesh (India) for any species of sect. *Phyllaria* (Kurz) Kamięski. This does not reflect a rarity of these plants, but rather the lack of collections made in alpine parts of Arunachal Pradesh. During two trips (in search for *Corydalis* and *Dactylicapnos*) in Kameng/Tawang (2010) and Mechuka (2014), we have observed four species (of which three are alpine) of this section of *Utricularia*. As they are poorly distinguished in current local floras - in Materials for a Flora of Arunachal Pradesh (Hajra *et al.* 1996) only *U. brachiata* is mentioned - and as there are no good reference photos easily available, we believe it could be of interest to share our observations of live plants in the field. We emphasize that we have *not* checked recent collections in CAL, ARUN or ASSAM.

### DESCRIPTIONS

The section *Phyllaria* (Kurz) Kamięski is a natural and easily recognisable entity, characterised by small entire fleshy petiolate leaves, "basisolute" bracts and bracteoles (i.e. not basifixed, but with a free basal portion) and white or pink flowers with a small yellow papillose-hairy palate. They grow among bryophytes on trees, vertical rocks or wet soil.

*U. brachiata* Oliver, J. Proc. Linn. Soc., Bot. 3: 187. 1859. [Fig. 1]

This species has a small tuber basal to the leaves; the upper calyx lobe has a truncate apex and is purplish, sometimes with a paler margin; the corolla lip is 5-lobed with a pair of prominent outward-projecting rather narrow lobes at base, white (or very pale pink) with



**PLATE - I:** **Fig. 1.** *Utricularia brachiata* Oliver (inset left: basal tuber, leaves & bladder; inset right: flower in close-up); **Fig. 2.** *Utricularia christopheri* P. Taylor (inset: flower in front view); **Fig. 3.** *Utricularia multicaulis* Oliver: **A.** plants in the habitat; **B.** close-up of the plant; **Fig. 4.** *Utricularia striatula* J.E. Smith (inset: flower in close-up).

yellow palate and two yellow dots. The spur is white to pale pink, twice as long as upper calyx lobe, narrowly cylindrical, curved forward under the lip.

While ascending from Mechuka up to Domjee La NE of the valley, we encountered this species growing here and there on mossy tree trunks and on wet mossy vertical cliff faces from 3700 to 3800 m.

**Exsiccatae:** West Siang, Domjee La NW Mechuka, 3800 m., 24/8 2014. *P. Bharali & M. Lidén 6* (Dpt. of Botany, RGU).

*Utricularia brachiata* is widespread in the Himalayas from Nepal to SW China (Yunnan, Sichuan). It is pictured on <http://frps.eflora.cn> (China, Sichuan, Emei Shan) mis-determined as *U. salwinensis* Handel-Mazzetti.

*U. christopheri* P. Taylor, Kew Bull. 41: 12 1986. [Fig. 2]

This species is similar to the above in size and in having a tiny tuber, but the flowers are quite different. The upper calyx lobe is larger, deeply and narrowly bifid to one third with rounded lobes, reddish purple with broad pale margin; spur reddish purple, equaling or slightly exceeding upper calyx lobe, straight, conical, directed downwards; lower corolla lip obtusely ob-triangular, obscurely 5-lobed in the broad apical half, white with small yellow palate, without the two yellow dots that are usually seen in *U. brachiata*.

In 2010 it was seen by ML at Se La on a W-facing wet mossy cliff slimy from algae. This is a substantial Eastward extension of its known range.

**Exsiccatae:** Tawang, Se La, NE side, 4280 m., 15.08.2010, *M. Lidén* (photo).

From Nepal Eastwards at least to Tawang district in Arunachal Pradesh, very rare judging from the few records published (Nepal and Sikkim, Taylor 1989, Noltie 2001). The BSI website on carnivorous plants treats this as a synonym of *U. brachiata*, but we hope it is obvious from our photos that the differences are substantial. In floral characters, *U. christopheri* is in fact more similar to *U. multicaulis*. Further, both species seem to be uniform throughout their distribution area and there are no intermediates reported.

*U. multicaulis* Oliver, J. Linn. Soc., Bot. 3: 188 – 189. 1859. [Fig. 3A & B]

This annual terrestrial dwarf is only half the size of the two previous, and lacks a tuber. It is similar to *U. christopheri* in floral morphology (deeply and narrowly bifid upper calyx lobe, comparatively short lower calyx lobe, short straight dark spur) but easily distinguished on its small size and the lower corolla lip with emarginate midlobe. The corolla is usually pink and the calyx and spur purplish red. In the center of the lip there is a yellowish oblong spot.

We saw it at Domjee La in alpine meadow, on wet slightly sloping bryophyte-covered open patches. At least in this place, we get the impression that this species and *U. brachiata* may have different habitat requirements.

**Exsiccatae:** West Siang, Domjee La NW Mechuka, 3800 m, 24.08.2014, *P. Bharali & M. Lidén 7* (Dpt. of Botany, RGU).

*Utricularia multicaulis* is distributed from Nepal to S Tibet and W Yunnan. The specific epithet is misleading, as usually there is a single flowering stem per plant. There is an element of doubt whether our find really corresponds to this species in the strict sense. According to Andreas Fleischmann (in mail) *U. multicaulis* usually has several flowers per stem, whereas ours are invariably one-flowered. The testa of *U. multicaulis* is very

characteristic with long-papillose cells in distinct lines, and we believe our plant may differ also in this respect. It may thus represent an undescribed species, but for a definitive judgment will have to await further investigation. In the most recent compilation of carnivorous plants of India at the BSI website (2014), it is claimed that *U. multicaulis* is partly misunderstood by Taylor (1989).

*U. striatula* J.E. Smith, Cycl. 37: no. 17. 1818. [Fig. 4]

This species is rarely found above 3000 m. It is *usually* a more robust plant, stoloniferous, forming clones. The leaves are numerous, larger and comparatively less fleshy, in rosettes, but also scattered along the stolons. In large-flowered forms (like ours) the flowering scapes are about a dm, bearing 2 – 5 flowers. The lower corolla lip is regularly 5-lobed, pale rosy pink with a large oblong yellow central patch. The spur is about as long as the lip, straight and acute. The bladder-appendages are long and more finely divided than in the alpine species.

ML photographed this plant in 2010 in West Kameng, South of Bomdila on a steep stony road side slope with seepage water, growing with liverworts and cyanophytes.

**Exsiccatae:** West Kameng, S. Bomdila, ca 2000 m, 16.08.2010, M. Lidén (photo).

This is an extremely variable species, with some cleistogamous forms barely exceeding a cm in height, while others can be 10 cm tall or more. The flowers vary accordingly, with corolla of cleistogamous flowers 2 mm long, whereas it may be 10 mm or more in chasmogamic forms. Details of bladder appendages or seed coat differ little, however, and the extremes are connected by intermediates (Taylor 1989). It is very widespread in wet sub-tropical parts of Africa and India.

Andreas Fleischmann (personal communication), who is currently looking into the systematics of this complex, has discovered that part of what has been called *U. striatula* (including plants in cultivation) have a chain of tubers and a long upper corolla lip, very much like *U. moniliformis* P.Taylor from Sri Lanka, whereas *U. striatula sensu stricto* is tuberless and has the upper corolla lobe shorter than the upper calyx lobe. The species boundaries in this complex thus may need reconsideration. In our photos (we have no herbarium specimen of this) underground organs are not seen, but the upper corolla lobe seems rather short.

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