

# Morphological characterization and ecology of *Utricularia aurea* Lour

## Summary

*Utricularia aurea* Lour. (*Lentibulariaceae*) commonly known as Golden Bladderwort was observed from the urban area of Manipur, North East, India, the plant was found at 780 MSL. The morphological characteristics which describe this species are discussed together with its associated species, distribution in Imphal, Manipur and ecology. The medicinal values of the species are documented and recommended for the conservation of this plant species in Manipur, India.

**Keywords:** Imphal, Manipur, *lentibulariaceae*, *utricularia*

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## Introduction

The genus *Utricularia* L. represents about 38 species in India and about 2 species was earlier reported in Manipur.<sup>1</sup> The authors found *Utricularia aurea* (Figure 1) in an urban area (Langol) of Imphal West, Manipur. Imphal is located at 24.80°N and 93.93°E in extreme Eastern India with an average elevation of 786m having humid subtropical climate.<sup>2,3</sup> Authors collected this plant specimen during survey and exploration on dt. 3-10-2017 for the two projects namely “Orchid Bioresources of the North –East India- Conservation, database development and information networking” sanctioned by the Department of Biotechnology, Government of India and documentation of “Local available edible plants in Imphal City”. Authors found this species and performed sampling in 5 different locations of Langol village of Imphal West at about 780m. There are very less reports available regarding ecology and associate flora of this carnivorous plant for making strategies of conservation. Keeping this in view, an attempt has been made to study the morphological characters along with its ecology. The present study highlights the ecology of *Utricularia aurea* a carnivorous plant available in North-East, India.

## Materials and methods

The survey was conducted during the month of October 2017 for the collection of ground and epiphytic orchids species. During survey the authors has encountered the plant in patches throughout the urban locations of Imphal city. After confirmation of the plant species by the Dr. Sanjeet Kumar, the associated species were enumerated (Table 1) followed by Flora of Manipur and related papers. The morphological characterization (Figure 2) was done using electronic Digital Caliper (Fisher Scientific, Cert. No. 3415-2456394) and GPS readings were taken from collected sites (Table 1) & (Figure 3).

## Results

The field work and literature survey revealed that the plant mostly found near the paddy fields. There were about 20 associate species enumerated belonging to 20 genera and 15 families (Table 2). It was observed that 4 associated plant species belongs to family Asteraceae. It was noted that *U. aurea* is mostly appeared in the canal and near the rain water stream in scattered yellow patches.



Figure 1 Characterization of *U. aurea* Lour.

## Taxonomic treatment

***Utricularia aurea* Lour:** Lour. Fl. Cochinch. 26.1790; Backer, Fl. Java 2; 517. 1965. *U. flexuosa* Vahl, Enum. 1: 198. 1804; C.B. Clarke in Hook. f. Fl. Brit. India. 4: 329. 1884; Prain, Beng. Pl. 780. 1903; Heinig, Enum. 881. 1907; Manilal & Sivar., Fl. Calicut 208. 1982; Ansari, Fl. Kasaragod Div. 266. 1985; Antony, Syst. Stud. Fl. Kottayam Dist. 289. 1989; Mohanan, Fl. Quilon Dist. 290. 1984; M.K. Janarth. & Henry, Bladderworts India 30. 1992; Vajr., Fl. Palghat Dist. 329. 1990; Joseph, Aquatic Angiosp. Malabar 83. 1991; M. Mohanan

& Henry, Fl. Thiruvanthapuram 334. 1994; Anil Kumar et al., Fl. Pathanamthitta 367. 2005; Sunil & Sivadasan, Fl. Alappuzha Dist. 514. 2009; Ratheesh Narayanan, Fl. Stud. Wayanad Dist. 592. 2009; *U. columpitensis* Lianos, Frag. Filip. 11.1851; Deb, Fl. Tripura 2:304. 1983; Dash, Carn Fl. Odisha. 18.2016.

**Diagnosis:** Submerged floating herbs; rhizoids usually present at the base of the inflorescence stalk, either short or linear or elongated and inflated up to 12cm long, bearing leaf like branches. Leaves are numerous, 1.0-7.5cm long, divided from the base into 3-6 primary filiform or somewhat inflated segment, the ultimate segments capillary, usually with some bristles; stipule-like auricles usually present at the base of the primary segments. Bladder dimorphic, mostly lateral on the secondary or tertiary leaf segments, obliquely ovoid, 1.2-4.3mm long. Inflorescence stalk erect, emergent, 3-30cm long, terete, glabrous. Scales absent. Bracts basifixed, broadly ovate to circular, apex rounded, 1-2.5mm long. Flowers 5-12; the axis initially short, becoming elongated in fruit; pedicels dorsoventrally compressed, 0.5-2.5cm long. Sepals sub equal, ovate, apex rounded to subcute, 2-4mm long. Petals pale yellow with reddish-brown veins, glabrous to densely pubescent; adaxial lip broadly ovate, apex rounded, apex rounded; abaxial lip limb transversely elliptical, the base with a prominent, apex rounded and emarginated. Filaments curved, anther thecae±confluent. Capsule globose, up to 5.2mm in diameter, the wall relatively thick and fleshy. Seeds disc shaped, narrowly winged on all angles.<sup>4-6</sup>

**Flowering & fruiting:** August–February & October–February.

**Table 1** Associate species of *Utricularia aurea* Lour

Botanical name	Family	Habitat
<i>Acmella paniculata</i>	Asteraceae	Herb
<i>Alternanthera philoxeroides</i>	Amaranthaceae	Herb
<i>Azolla pinnata</i>	Salviniaceae	Aquatic herb
<i>Commelina benghalensis</i>	Commelinaceae	Herb
<i>Cyperus haspan</i>	Cyperaceae	Herb
<i>Eclipta alba</i>	Asteraceae	Herb
<i>Eichhornia crassipes</i>	Pontederiaceae	Aquatic herb
<i>Enhydra fluctuans</i>	Asteraceae	Prostrate
<i>Ipomoea aquatica</i>	Convolvulaceae	Aquatic climber
<i>Jussiaea repens</i>	Onagraceae	Herb
<i>Lemna minor</i>	Lemnaceae	Aquatic herb
<i>Limnophyton obtusifolium</i>	Alismataceae	Aquatic shrub
<i>Lindernia procumbens</i>	Linderniaceae	Herb
<i>Ludwigia adscendens</i>	Onagraceae	Herb
<i>Marsilea minuta</i>	Marsileaceae	Herb
<i>Mikania scandens</i>	Asteraceae	Climber
<i>Mimosa pudica</i>	Mimosaceae	Herb
<i>Parthenium hysterophorus</i>	Asteraceae	Shrub
<i>Pistia stratiotes</i>	Araceae	Aquatic herb
<i>Setaria spp</i>	Poaceae	Aquatic grass

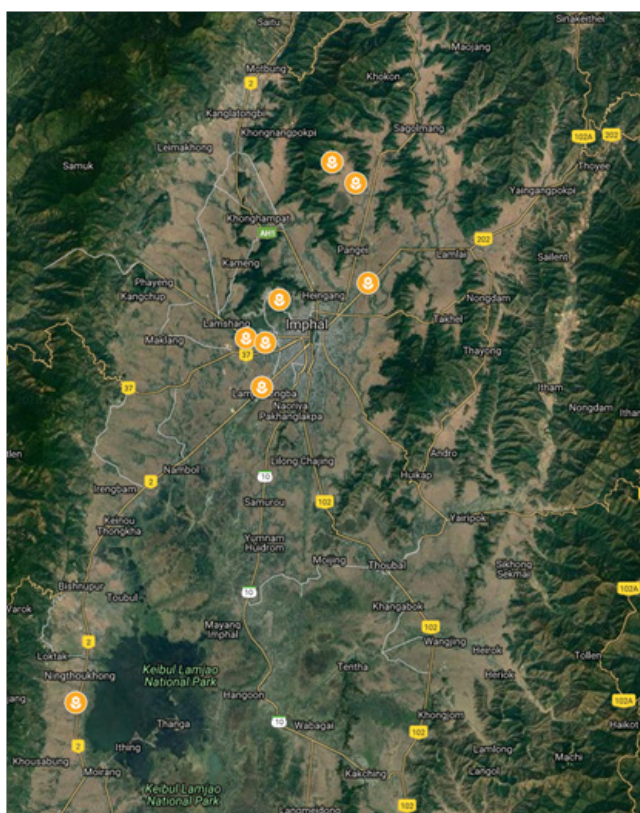


**Figure 2** Collection and characterization of *U. aurea* Lour.



**Table 2** Collection sites of *Utricularia aurea* Lour. for Morphological characterization

Date	Location	Latitude	Longitude	Altitude (m)	Richness
3.10.2017	Langol	24° 49' 52.8"	93° 54' 56.6"	781	10
3.10.2017	Langol	24° 49' 52.2"	93° 54' 56.9"	779	12
4.10.2017	Langol	24° 49' 51.5"	93° 54' 57.3"	778	8
4.10.2017	Langol	24° 49' 50.7"	93° 54' 57.8"	780	10
4.10.2017	Langol	24° 49' 48.8"	93° 54' 58.9"	780	8
10.10.2017	Hainang Khong	24° 50' 46.2"	93° 58' 12.8"	779	13
10.10.2017	Haraorou	24° 54' 51.5"	93° 58' 36.8"	799	3
14.10.2017	Moroikeikhol	24° 55' 10.3"	93° 56' 52.7"	813	2



**Figure 3** Collection sites of Plant specimen.

**Distribution:** China, Malaysia, Tropical Australia, Japan, Bangladesh, Hong Kong, Indonesia, Myanmar, Nepal, Philippines, Sri Lanka, Taiwan, Thailand, Vietnam, India, Tripura, Odisha, Kerala, Tamil Nadu, Western Ghats, Jharkhand, Manipur<sup>4</sup> (Present study).

**Ecology:** Freshwater; Grow usually in lake, near pond, slow moving stream, canal, rice fields, ditches.

**Conservation status & threats:** This species is locally common and widespread in India. Very less reports are available on the occurrence of the *U. aurea* in Manipur. The observed visible threat was removing of its vegetative parts for the fishing purposes.

**Ecology & distribution in manipur:** The identified carnivorous plant of *Utricularia* is found mainly in Langol, Hainang Khong,

Haraorou and Moroikeikhol areas of Imphal (Table 1). The most common associated species are *Acmella paniculata*, *Alternanthera philoxeroides*, *Azolla pinnata*, *Commelina benghalensis*, *Cyperus haspan*, *Eclipta alba*, *Eichhornia crassipes*, *Enhydra fluctuana*, *Ipomoea aquatica* etc. In the year 2000, Reut & Fineran<sup>7</sup> also reported the associate flora of *Utricularia*.

## Conclusion

The plant species is usually found in low pH and important bio resources of Manipur. The period of rain is almost 9 months in study areas. Hence, the landscapes and climate make suitable parameters for the rich population of this carnivorous plant. As per its morphology and ecology, it would be a plant for screening of bioactive compounds for formulation of new drugs. The paper recommends that the conservation of such insectivorous plants are needed.

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## Conflicts of interest

None.

## References

1. Verma PK, Schlauer J, Rawat KK, et al. Status of insectivorous plants in Northeast, India. *Carnivorous Plant Newsletter*. 2014;43:49–58.
2. Khan AM, Ahmad S, Khursheed S. Trends of some climatic parameters under climatic change scenario in intermontane Imphal valley, Manipur, North Eastern Himalaya. *Environmental Science*. 2010;5(4):226–231.
3. Sherjit SL, Dhar I. Floods in Imphal Valley –Causes, Effects and Preventive Measures. *International Journal of Engineering Technology, Management and Applied Sciences*. 2017;5(9):7–11.
4. Taylor P. The genus *Utricularia* – a taxonomic monograph. *Kew Bull Add Ser*. 1989;14:1–724.
5. Wu ZY, Raven PH, Hong DY. *Flora of China*. Beijing, and Missouri Botanical Garden Press, St. Louis: 2011.
6. Zhuang X. *Utricularia aurea*. The IUCN Red List of Threatened Species 2011.
7. Reut MS, Fineran BA. Ecology and vegetative morphology of the carnivorous plant *Utricularia dichotoma* (*Lentibulariaceae*) in New Zealand. *New Zealand Journal of Botany*. 2000;38(3):433–450.