The genus *Utricularia* in the Northern Territory

Northern Territory Herbarium
Department of Natural Resources, Environment, The Arts and Sport (NRETAS)

Utricularia (you-trick-you-lair-ee-a) or 'bladderworts' as they are commonly known, are an intriguing genus of herbs common in the Top End of the Territory. Thirty-six described species, over a half of Australia's taxa, can be found in the Darwin region. Some species are quite conspicuous due to their abundance and colourful flowers, however many are very small and cryptic. The stem and flower of a recently described species, *U. simmonsii,* is scarcely larger than a pinhead. The small stature of *Utricularia* species shrouds a deceptive and remarkable aspect of the genus; the ability to 'prey' on living organisms.

Carnivory in *Utricularia*

Tiny sacs attached to the 'roots' and stems of the plants are complex traps with the ability to catch and digest microscopic aquatic animals. A door and hinge seal the inside of the trap under negative pressure to the surrounding water (a vacuum). Trigger hairs on the outside act as levers and mechanically break the vacuum when touched, sucking in surrounding water and its prey. A few *Utricularia* species have adapted to a fully aquatic habit (six in the Territory), being free floating and capabable of vegetative reproduction, but most are found in sandy soils subject to prolonged seepage or seasonal waterlogging.

Conservation and management

U. dunstaniae and *U. singeriana* are currently listed under NT legislation as vulnerable to extinction. Several others are near threatened, data deficient or not evaluated (see identification guide below for listings). Further survey work may extend the ranges of some of these uncommon or more restricted species. The greater Darwin region lowlands extending east to Kakadu provide extensive tracts of suitable habitat for *Utricularia* species. The most significant of these areas is the Howard River sandplains, recognised as an area of conservation significance. It is not only *Utricularia* that inhabit these sandplains. Commercial, residential and recreational activities in the vicinity of Darwin are a threat to this unique habitat. Sand mining and water usage from aquifers affect hydrological processes toward which many species are thought to be particularly sensitive. Populations may be affected by trampling from livestock, recreational vehicles and machinery, and inappropriate burning as a result of arson. Introduced perennial grasses such as Mission Grass (*Cenchrus polystachios*) and Gamba Grass (*Andropogon gayanus*) can cause hotter fires while Tully Grass (*Urochloa humidicola*) both changes fire behaviour and competes with native species. Perhaps the greatest threat however, is from residential expansion.

The tiny pin-sized inflorescences of *U. simmonsii* are difficult to find (Photo: B. Stuckey)

Research is currently being undertaken by NRETAS scientists to learn more about these important areas.

Utricularia identification

Between January and May, it is possible to find up to 10 or more species growing closely

together in these habitats. Fortunately many species are quite distinctive, but a key may be required to separate some of the more similar species or confirm their identity. Note that in some species, colour and shape may vary between individuals. Also take care to observe flowers that are fresh and not overly mature or in bud. A pictorial guide to *Utricularia* terminology is presented here to assist with identification.

References

Cowie, I. (2002). Preliminary report on a survey of Utricularia (Lentibulariaceae) in the Howard River-Shoal Bay area. Unpublished report. (Parks and Wildlife Commission of the Northern Territory, Palmerston).

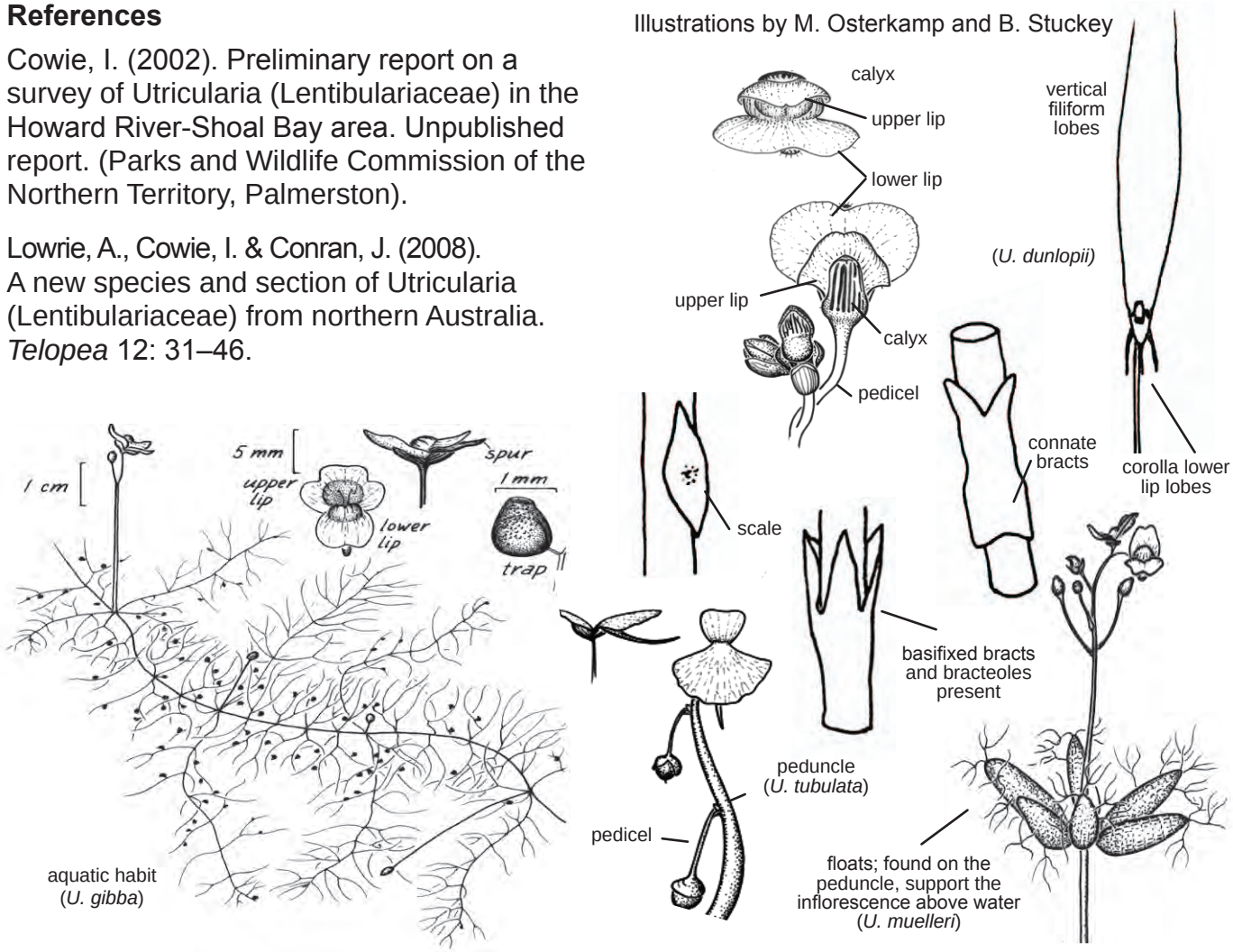
Lowrie, A., Cowie, I. & Conran, J. (2008). A new species and section of Utricularia (Lentibulariaceae) from northern Australia. *Telopea* 12: 31–46.

Taylor, P. (1989). The genus Utricularia: a taxonomic monograph. *Kew Bulletin Series XIV*. (Her Majesty's Stationery Office, London).

NRETAS Sites of Conservation Significance in the Northern Territory <http://www.nt.gov.au/nreta/environment/conservation/>.

For more information contact the NT Herbarium-ph: 8999 4516 or email: herbarium@nt.gov.au.

Illustrations by M. Osterkamp and B. Stuckey



The Howard River sand plains are recognised as an area of conservation significance by the Territory Government

Key to Northern Territory *Utricularia*

The dichotomous key to species presented here is derived from Taylor (1989). Unless indicated, taxa occur in WA, NT (in **bold**) and Qld. Some species not found in the NT are included and those endemic to a particular state or territory are indicated by an 'e' after the state or territory abbreviation.

1 Plants free-floating or suspended in water; leaves usually much divided; bracteoles usually absent **2**
1 Plants attached to substrate; leaves entire or 1–2(3)-divided; bracteoles usually present **7**
2 Inflorescence stem with a whorl of ellipsoid floats above middle **3**
2 Inflorescence stem without a whorl of floats or with narrowly fusiform floats at, or near, the base **4**
3 Floats shortly stipitate; calyx smaller than the capsule; seeds lenticular ..... **U. muelleri**
3 Floats sessile; calyx larger than capsule; seeds prismatic, winged ..... **U. stellaris**
4 Corolla pink; spur long and slender; bracts ovate ..... **U. tubulata**
4 Corolla yellow; spur conical to narrowly conical; bracts broadly ovate to orbicular **5**
5 Ultimate leaf segments 2–8; upper corolla lip larger than lower. **U. gibba**
5 Ultimate leaf segments 20–80; upper corolla lip smaller than lower **6**
6 Primary leaf divisions more than 2; scales absent; corolla pubescent outside ..... **U. aurea**
6 Primary leaf divisions 2; scales present on peduncle; corolla glabrous outside ..... **U. australis**
7 Peduncle twining **8**
7 Peduncle erect, not twining **10**
8 Corolla pale mauve, 3–4 mm long (NT, Qld) ..... **U. foveolata**
8 Corolla yellow, c. 5–15 mm long ... **9**
9 Corolla about 5 mm long, pale yellow (NT) ..... **U. circumvoluta**
9 Corolla 10–15 mm long, bright yellow (NT) ..... **U. involvens**
10 Corolla with 2 vertical filiform lobe **11**
10 Corolla lacking 2 vertical filiform lobes **14**
11 Capillary lobes arising laterally from the corolla lower lip base; flowers solitary **12**
11 Capillary lobes arising from the corolla upper lip apex; flowers 1 or 3–5 ..... **13**
12 Corolla lower lip reduced to 3 minute teeth; apex of spur rounded (WA e) ..... U. antennifera
12 Corolla lower lip a well developed triangular lobe 1/3 or more times length of spur, lateral lobes minute or absent; spur apex emarginate (WA, NT) ..... **U. dunstaniae**
13 Corolla lower lip 5-lobed; flowers solitary (NT e) ..... **U. capilliflora**
13 Corolla lower lip 3-lobed; inflorescence 2–5-flowered (WA, NT) ..... **U. dunlopii**
14 Scales present on peduncle **15**
14 Scales absent **26**
15 Scales and bracts basifixed, bracteoles present **16**
15 Scales and bracts medifixed (or nearly so), bracteoles present or absent **22**
16 Corolla white or mauve **17**
16 Corolla yellow **19**
17 Corolla lower lip shallowly 3-lobed ..... **U. minutissima**
17 Corolla lower lip entire, rounded or retuse **18**
18 Bracts more or less equal in width to bracteoles; spur conical, apex shortly and acutely bidentate (Qld, southern Aust.) ..... U. lateriflora
18 Bracts much wider than bracteoles; spur narrowly conical, apex acute ..... **U. uliginosa**
19 Corolla spotted with dark red; upper lip with 2 broad lobes (NT e) ..... **U. fulva**
19 Corolla unspotted, but nerves may be red or brown; upper lip entire or emarginate **20**
20 Corolla lower lip 4-lobed; bracts cordate at base ..... **U. chrysantha**
20 Corolla lower lip entire or shallowly 2-lobed; bracts not cordate **21**
21 Corolla 6–10 mm long, upper lip narrower than the calyx; inflorescence 3–30 cm tall ..... U. bifida
21 Corolla 10–15 mm long, upper lip wider than the calyx; inflorescence 25–55 cm tall (NT) .. **U. odorata**
22 Corolla pale yellow; scales often ciliolate (NT) ..... **U. subulata**
22 Corolla white or blue to purple; scales glabrous **23**
23 Bracteoles present; corolla lower lip entire or obscurely lobed; leaves entire ..... ***U. caerulea**
23 Bracteoles absent; corolla lower lip with 2 well developed lobes; leaves divided **24**

24 Corolla 10–25 mm long, spur 7–15 mm long; bracts 3–4 mm long (WA, NT) ..... **U. leptoplectra**
24 Corolla 4–10 mm long; spur 3–10 mm long; bracts 2.5 mm long or less..... **25**
25 Corolla dark blue-violet, 7–10 mm long; spur about as long as lower lip; leaf segments opposite (southern Qld)..... U. biloba
25 Corolla white or pale, 3–6 mm long; spur longer than lower lip; leaf segments alternate..... **U. limosa**
26 Corolla lower lip 5-lobed **27**
26 Corolla lower lip entire, crenate or 2–4-lobed..... **30**
27 Corolla white **28**
27 Corolla pink or mauve **29**
28 Corolla 4–8 mm wide (NT e)..... **U. holtzei**
28 Corolla about 2 mm wide ... **U. quinquedentata**
29 Corolla upper lip shorter than the upper calyx lobe; base of lower lip without ridges (NT e)..... **U. cheiranthos**
29 Corolla upper lip longer than the upper calyx lobe; base of lower lip with 4 rounded ridges (NT e) ..... **U. rhododactylos**
30 Corolla 4 mm long or less **31**
30 Corolla 6 mm long or more **32**
31 Corolla c. 3 mm long, white to yellow, spur well developed and slightly longer than lower lip (Qld e) ..... U. albiflora
31 Corolla 1.5 mm long or less, dark pink to red, spur greatly reduced, apparently absent (NT, Qld)..... **U. simmonsii**
32 Bracts and bracteoles medifixed (or nearly so), connate below the point of attachment and forming a tube around peduncle **33**
32 Bracts and bracteoles medifixed or basifixed, when medifixed, free below the point of attachment and not forming a tube around peduncle **34**
33 Corolla lower lip with 3 equal, narrow oblong-obovate lobes, white to pale mauve (WA e)..... U. georgei
33 Corolla lower lip entire or obscurely 3-crenate, mauve (WA, NT) ..... **U. kimberleyensis**
34 Peduncle hairy, at least at base.... **35**
34 Peduncle glabrous, at most minutely papillose at base..... **38**
35 Bracts and bracteoles ciliate; bracts basifixed..... **U. lasiocaulis**
35 Bracts and bracteoles not ciliate; bracts basifixed or medifixed **36**
36 Corolla pale mauve, lower lip of 3 long oblong lobes; bracts medifixed (NT e) ..... **U. kamienskii**
36 Corolla mauve to purple, lower lip of .3 short rounded lobes; bracts basifixed or medifixed **37**
37 Flowers usually solitary; upper lip constricted near base, upper part elliptic, apex emarginate (WA e) ..... U. kenneallyi
37 Flowers 2–4, rarely 1; upper lip constricted in centre, upper part oblong, apex more or less deeply bifid (WA, NT)..... **U. leptorhyncha**
38 Corolla lower lip distinctly 3-lobed. **39**
38 Corolla lower lip entire or obscurely 2–4-lobed..... **40**
39 Lobes of lower lip as long as wide (WA, NT)..... **U. arnhemica**
39 Lobes of lower lip 3 times longer than wide (WA, NT)..... **U. tridactyla**
40 Corolla spur not widely divergent from lower lip, erect, broadly obloid at base tapering to a dorsally flattened, narrow apex (NT).... **U. singeriana**
40 Corolla spur diverging widely from lower lip, usually deflexed and narrow, apex acute to obtuse..... **41**
41 Spur broadly conical, obtuse, distinctly longer than lower lip; flowers 1(–3) (WA, NT) ..... **U. fistulosa**
41 Spur narrowly conical, cylindrical or cylindrical-subulate, straight or tapering gradually, equal to or shorter than lower lip; flowers 1–9..... **42**
42 Flowers 2–9, rarely 1; bracts often with the base more or less swollen, sometimes free **43**
42 Flowers always solitary; bracts membranous to herbaceous **44**
43 Palate with 2–3 prominent ridges; apex of upper lip rounded to emarginate; leaf apex rounded to acute (Qld, southern Aust.) . U. dichotoma
43 Palate ridges not prominent; apex of upper lip shortly bilobed to emarginate; leaf apex subulate (NT e)..... **U. triflora**
44 Corolla 6–12m long, usually mauve, apex of upper lip divided into two deltoid lobes, lower lip 4-angled (WA, NT) ..... **U. hamiltonii**
44 Corolla 15–20 mm long, white or very pale violet, apex of upper lip truncate to emarginate, lower lip transversely elliptic (Qld e)..... U. terrae-reginae

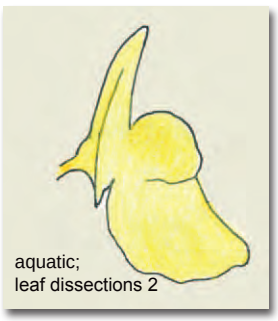
***** a distinct entity known as *Utricularia* sp. small white is tentatively recognised in the Territory. It differs from typical *U. caerulea* in its smaller stature, having fewer (1–3) flowers per inflorescence and a white corolla approximately 4 mm in length with a yellow throat.

Utricularia (LENTIBULARIACEAE) of the Northern Territory

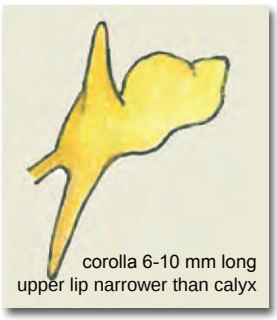
Vulnerable (v); Near Threatened (nt); Data Deficient (dd); Not Evaluated (ne); Least Concern (lc)

***U. arnhemica* (lc)**

***U. aurea* (lc)**



***U. australis* (dd)**



***U. bifida* (lc)**

***U. caerulea* (lc)**

***U. caerulea* (lc)**

***U. capilliflora* (lc)**

***U. cheiranthos* (nt)**

***U. chrysantha* (lc)**

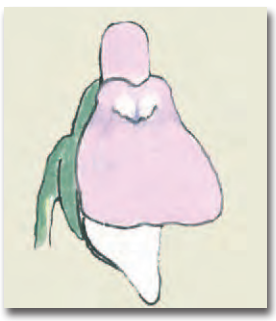
***U. chrysantha* (lc)**

***U. circumvoluta* (lc)**

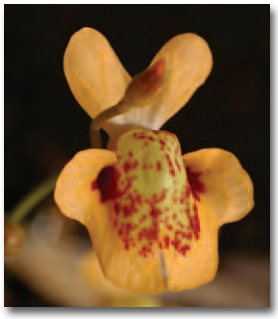
***U. dunlopii* (lc)**

***U. dunstaniae* (v)**

***U. fistulosa* (ne)**



***U. foveolata* (dd)**



***U. fulva* (lc)**

***U. gibba* (lc)**

***U. hamiltonii* (nt)**

***U. holtzei* (nt)**

***U. involvens* (lc)**

***U. kamienskii* (lc)**

***U. kimberleyensis* (lc)**

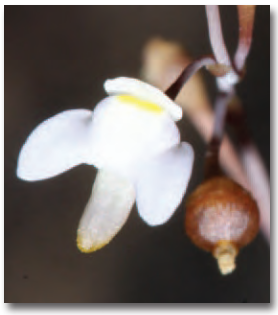
***U. lasiocaulis* (lc)**

***U. lasiocaulis* (lc)**

***U. leptoplectra* (lc)**

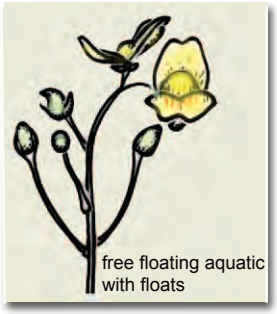
***U. leptorhyncha* (lc)**

***U. leptorhyncha* (lc)**



***U. limosa* (lc)**

***U. minutissima* (lc)**



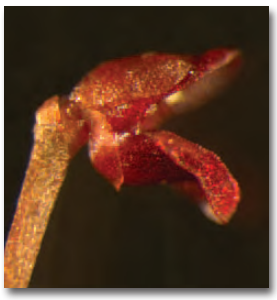
***U. muelleri* (lc)**

***U. odorata* (lc)**

***U. quinquedentata* (lc)**

***U. rhododactylos* (nt)**

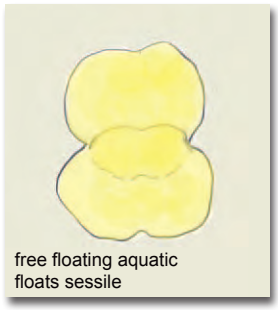
***U. singeriana* (v)**



***U. simmonsii* (dd)**

***U.* sp. small white (lc)**

***U. subulata* (nt)**



***U. stellaris* (dd)**

lower lip deeply 3-lobed; violet with darker violet markings

U. tridactyla

***U. triflora* (lc)**

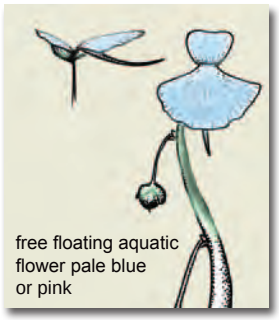
Species **below** are potential indicators of *Utricularia* habitat.
Photos: NT Herbarium

***Verticordia* spp.**

Lophostemon lactifluus

PHOTOS:
I. Cowie, B. Stuckey, R. Kerrigan, D. Liddle

ILLUSTRATIONS:
B. Stuckey and M. Osterkamp



***U. tubulata* (dd)**

***U. uliginosa* (lc)**

Dapsilanthus spathaceus

Eriachne burkitti

Grevillea pteridifolia

Melaleuca nervosa