Opinion
Volume 6:6, 2022

Journal of Morphology and Anatomy

ISSN: 2684-4265 Open Access

Utricularia Neottioides Anatomy and Morphology

Lubomír Adamec*

Department of Anatomical sciences, St. George's University Grenada, West Indies FZ818, Grenada

Introduction

Rheophytism is extremely rare in the genus Utricularia. Utricularia neottioides is an aquatic rheophytic species that grows exclusively on bedrocks in South American streams. Some authors considered Utricularia neottioides to be trap-free, implying that it had given up carnivory due to its unique habitat. Our goal was to compare the anatomy of rheophytic Utricularia neottioides to that of an aquatic Utricularia species with a typical linear monomorphic shoot from the section Utricularia, Utricularia reflexa, which grows in standing or slowly flowing African waters. We also compared immunodetection of cell wall components in both species. To achieve our goals, we used light microscopy, histochemistry, scanning, and transmission electron microscopy. There are two organ systems in U. neottioides: those with sclerenchyma and thus resistant to water currents, and those without [1].

Only two South American aquatic or partly amphibious rheophytic species are found in the small generic section Avesicaria of the genus Utricularia L.: Utricularia neottioides A.St.-Hil. & Girard and Utricularia oliveriana Steyerm. These are only found attached to rocks in shallow flowing or seeping waters. While the latter species is morphologically similar to the typical, smaller terrestrial Utricularia species with spatulate leaves, Utricularia neottioides is one of the most modified and remarkable Utricularia species. It is specialised for growth in fast-flowing waters by forming two types of shoots; attached anchor stolons,which fix the plant to the rocky substrate by adhesive rhizoids, and long running stolons flowing freely in the streams and bearing 1-4 cm long filamentous "leaves" [2].

Description

The inflorescence scape can grow up to 30 cm long from anchor stolons and bears several whitish and sweet-scented flowers. The pollinators of U. neottioides are unknown, but the soft and sweet fragrance of the opened flowers may attract small insects. Long debates have raged over the abundance of traps in this species, as only a few traps have been collected from field sites and discovered in herbaria. Furthermore, neither the aseptic in vitro culture nor the terrestrially grown plants on brown peat produced a single trap. Rheophytes are plants that are typically confined and adapted to streambeds and/or below the level of flooding, and the plants are susceptible to temporary overflowing [3].

Unlike the rheophytic Utricularia neottioides, typical aquatic Utricularia species from the section Utricularia grow in standing or very slowly flowing waters and have a very different habit. Their shoot structure is linear and modular, with leaf nodes with finely pinnate, filamentous leaves and narrow tubular internodes. The majority of linear shoot species have monomorphic green shoots with traps. Several species, however, have dimorphic shoots that differentiate between pale carnivorous shoots with all or the majority of traps and green photosynthetic shoots with no or few traps. All aquatic Utricularia species with linear shoots form regular branches, allowing for quick propagation. Furthermore, adult individuals typically exhibit rapid apical shoot growth of 1-4.2 new leaf nodes per day, but their basal shoot segments die at about the same rate [4].

In a sterile in vitro culture in a half-strength Gamborg B5 medium with 2.5% sucrose, the plant grows very vigorously and quickly. The plant grew very thin stolons with 2-5 cm long finely filamentous leaves. Ex vivo growth in humic waters in aquaria was, however, impossible for unknown reasons. The plant, on the other hand, could rapidly grow in a terrestrial form with 8-18 mm long filamentous leaves (diam. ca. 100-120 m) that survived on the brown peat for 5-6 months but did not reproduce further. The primary goal of this paper is to characterise the shoot morphology and anatomy of rheophytic U. neottiodes in detail. In addition, we compare it to the characteristics of a typical member of the section Utricularia, namely aquatic U. reflexa Oliv., a species from the genus Utricularia.

In Podostemaceae, adhesive trichomes have been described; these trichomes are said to secrete a superglue-like substance that binds plants to the rock surface. Some authors, however, noted that sticky extracellular polymeric substances produced by cyanobacteria are required for plant anchoring. We discovered that secretion produced by U. neottioides adhesive trichomes stained positively with MB/AII. Microorganisms are also attached to this secretion. Further research is needed to determine the role of cyanobacteria biofilms in U. neottioides anchoring, as well as the composition of the adhesive trichome secretions. The adhesive plant secretion can be lipid or pectic. In parasitic plants, for example, an adhesive epithelium develops and secretes lipidic glue (Viscum) or pectin-rich polysaccharides (Cuscuta, Cassytha) to keep the parasite and host together [5].

Conclusion

Because of its life in a turbulent environment, U. neottioides evolved specific characteristics such as an anchor system with asymmetric stolons, sclerenchyma, and adhesive trichomes on the ventral side. This anchor stolon system is responsible for photosynthesis, nutrient storage, vegetative reproduction, and anchorage. In contrast to the typical aquatic Utricularia species from the section Utricularia, Utricularia reflexa, which grows freely in standing or slowly flowing waters and forms monomorphic shoots, Utricularia neottioides has a well-developed sclerenchyma system but no large aerenchyma. Because the plants produce traps, U. neottioides should be considered a carnivorous plant.

Acknowledgement

None.

Conflict of Interest

There are no conflicts of interest by author.

References

1. Leibovici, Dan, H. Barton Grossman, Colin P. Dinney and Randal E. Millikan,

***Address for Correspondence:** Lubomír Adamec, Department of Anatomical sciences, St. George's University Grenada, West Indies FZ818, Grenada, E-mail: lubomiradamec@gmail.com*

Received: 02 November, 2022, Manuscript No. jma-23-88314; **Editor Assigned:** 05 November, 2022, PreQC No. P-88314; **Reviewed:** 16 November, 2022, QC No. Q-88314; **Revised:** 22 November, 2022, Manuscript No. R-88314; **Published:** 28 November, 2022, DOI: 10.37421/2684-4265.2022.6.256

et al. "Polymorphisms in inflammation genes and bladder cancer: from initiation to recurrence, progression, and survival." *J Clin Oncol* 23 (2005): 5746-5756.

2. Ngabire, Daniel and Gun-Do Kim. "Autophagy and inflammatory response in the tumor microenvironment." *Int. J Mol Sci* 18 (2017): 2016.
3. Porta, Chiara, Paola Larghi, Monica Rimoldi and Maria Grazia Totaro, et al. "Cellular and molecular pathways linking inflammation and cancer." Immunobiology 214 (2009): 761-777.
4. Cai, Tommaso, Raffaella Santi, Irene Tamanini and Ilaria Camilla Galli, et al. "Current knowledge of the potential links between inflammation and prostate cancer." *Int JMol Sci* 20 (2019): 3833.
5. Modena, Alessandra, Roberto Iacovelli, Aldo Scarpa and Matteo Brunelli, et al. "Investigating BRCA mutations: a breakthrough in precision medicine of castration-resistant prostate cancer." *Target Oncol* 11 (2016): 569-577.

How to cite this article: Adamec, Lubomír. "*Utricularia Neottioides* Anatomy and Morphology." Morphol Anat 6 (2022): 256.