Botanical Journal of the Linnean Society Explore this journal >

View issue TOC
Volume 174, Issue 2
February 2014
Pages 257–270

Original Article

Palm snorkelling: leaf bases as aeration structures in the mangrove palm (*Nypa fruticans*)

Guillaume Chomicki FLS , Luc P. R. Bidel, William J. Baker FLS, Christian Jay-Allemand

First published:
23 December 2013 Full publication history

DOI:
10.1111/boj.12133 View/save citation

Cited by:
1 article Citation tools

Abstract

Mangrove species have evolved specialized structures, such as pneumatophores, to supply oxygen to the roots, but, in *Nypa fruticans*, the only mangrove palm, no such structure has been reported. This study aimed to determine the adaptations of *N. fruticans* to the mangal habitat with special reference to the air-supplying structure. Following senescence, the rachis is abscised at the zone of junction with the leaf base. Simultaneously, lenticels develop so that, when abscission is completed, a network of mature lenticels covers the leaf base. Expansigenous aerenchyma with increasing porosity towards the stem junction occurs in the leaf base. The first two root branching orders present a subero-lignified rhizodermis and exodermis, and the cortex consists of schizo-lysigenous aerenchyma with wide lacuna, limiting radial oxygen loss and facilitating longitudinal oxygen transport to living tissues. Lifespan estimation suggests that leaf bases can live for up to 4 years following abscission, ensuring the persistence of aeration structures. This study provides structural evidence indicating that *N. fruticans* has evolved a unique type of air-supplying structure in the mangal habitat. © 2013 The Linnean Society of London, *Botanical Journal of the Linnean Society*, 2014, **174**, 257–270.

The articles below have been selected for you based on the article you are currently viewing.

Ontogeny and distribution of cell-wall glycans during aerenchyma formation in roots of *Pistia stratiotes* (Araceae)

Denisele N. A. Flores-Borges, Alexandra A. Mastroberti, Cleusa Bona

28 January 2016

Long-distance transport of gases in plants: a perspective on internal aeration and radial oxygen loss from roots

T. D. COLMER

20 January 2003

Root anatomy of palms III. Ceroxyloideae, Nypoideae, Phytelephantoideae

E. Seubert

1996

BAC transgenic zebrafish reveal hypothalamic enhancer activity around obesity associated SNP rs9939609 within the human *FTO* gene

Silke Rinkwitz, Fan-Suo Geng, Elizabeth Manning, Maximiliano Suster, Koichi Kawakami, Thomas S. Becker

5 September 2015

Development of anatomical structure of roots of *Phragmites australis*

Aleš Soukup, Olga Votrubová, Hana Čížková

1 February 2002

Citing Literature