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ROOT SYSTEM OF SONNERATIA ALBA

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Mangrove roots have to survive in a highly anaerobic, saline mud. Present study is a part of a investigation on mangrove root functioning.

The root system of Sonneratia alba spreading laterally along the surface layers of mud consists of three components, namely cable roots, pneumatophores and feeder roots, each with a distinct structure and function. The cable roots and pneumatophores are covered with suberized layers making them impermeable to the outside saline water. Feeder roots, without an outer suberized layer, possess a well-developed endodermis allowing for ion selectivity. Plagiotropic cable roots have a small stele, an extensive aerenchymatous cortex where air is stored, and produce pneumatophores at places.

As the pneumatophore emerges from the flooded soil to the air it undergoes dramatic changes and develops certain stem characters. It does not possess a functional root cap, the graviperception organ in normal roots. Instead it develops a prominent starch sheath, the graviperception tissue in shoots. Vasculature also tends to change into that of a stem. The pneumatophore becomes photosynthetic and this probably assists in regulating O_2 and CO_2

levels in the air spaces. The outer protective layer resembles more a polyderm than a normal periderm. The phloem accumulates large amounts of crystals resembling calcium oxalate druses. The sodium contents in the pneumatophores are also much higher than those of the cable roots or feeder roots and are similar to the values in the leaves. In contrast to the cable root the mature pneumatophore has only a thin layer of cortical aerenchyma, more than 80% of its volume being occupied by wood/secondary xylemm the role of which is obscure.

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