

CAN *Avicennia marina* PRODUCE SUBSTITUTES FOR PNEUMATOPHORES?

I.M. Ambagahaduwa and M.D. Amarasinghe

***Department of Botany, University of Kelaniya,
Kelaniya, Sri Lanka***

Avicennia marina is a true mangrove species that shows a wide distribution in mangrove areas of Sri Lanka. It is well adapted to live in the inter-tidal zone, where periodic soil anaerobic conditions prevail during times of inundation by tide, through development of pneumatophores. These are adventitious roots arising from lateral roots that grow negatively geotropically above the ground level, enabling them to continue uninterrupted air passage to underground root system even during high tides. In some *Avicennia marina* plants, particularly those of which the functioning of pneumatophores is hampered due to burial in sand/sediment or due to inundation for long periods of time, roots similar in appearance to pneumatophore arise from the stem (hence adventitious roots), between 10 and 200 cm above ground.

A preliminary investigation on the adventitious roots arising from the stem of *Avicennia marina* was carried out from May to October, 2003 at Kadolkele mangrove area in Negombo lagoon, to ascertain whether they perform the same function as the pneumatophores. Strong similarity between the structure of pneumatophores and adventitious roots on the stems in terms of presence of lenticels and relative volume of cortex tissues indicate that the latter performs the function of the pneumatophores, i.e. transportation of air in to the plant. However, the number of lenticels and the relative sizes of the cortex in adventitious roots arising from the stem are significantly greater than that of the pneumatophores indicating their greater efficiency in performing air transportation function under anoxia either during flooded conditions or buried in sand/sediment. Similarity in the anatomy too indicate that both types of roots perform a similar function i.e. facilitation of continuous air passage from atmosphere to plant tissues. Multiple cambia were observed to occur in the adventitious roots on the stems whereas only a single cambium was observed in the pneumatophores indicating greater efficiency of adventitious roots in transporting air through production of aerenchyma cells that form the air passage.