Research Article

Roots Morphology of *Rhizophora apiculata* Blume as an Adaptation Strategy of Waterlogging and Sediment

Sitta Amaliyah, Sucipto Hariyanto and Hery Purnobasuki

Department of Biology, Faculty of Sciences and Technology, Airlangga University, Jl. Mulyorejo (Kampus C Unair), 60115 Surabaya, Indonesia

Abstract

Background: The waterlogging and sediments condition in coastal area of mangroves effect a significant ($\alpha = 0.05$) adaptation strategy in mangrove roots characterization. **Objective:** The aim of the study was to know the structure of the submerged root morphology of the *Rhizophora apiculata* seedlings especially to incorporate into the flooding and sediment thickness. **Materials and Methods:** The field data from 40 sample trees in Wonorejo Mangrove Conservation of Surabaya ($07^{\circ}18'32.7''S$ and $112^{\circ}48'59.1''U$) were measured. The total number of primary roots, the root length and the root-spread distance, the root diameter, the vertical root angle from trunk and the architecture of roots were measured. Observational method was used and measurement of environmental factors consists of parameters air temperature, groundwater salinity and the acidity level of sediment. The quantitative data were analyzed by statistical test. Data of root length and number of branches were analyzed by two way analysis of variance (ANOVA) by factorial test. **Results:** The results of this study indicated that an adaption of the treatment condition waterlogging seemed apparent in the presence of root hairs at the base of the stem. Rooting of this species had also very different architecture, where the soil conditions were not inundated direction of root growth seemed to lead down (perpendicular). While on land conditions with waterlogging indicated the direction of growth more broad or sideways. The change of color is more brown or reddish brown on the morphology of the roots with the treatment of extreme thickness indicated adaptation to environmental stress. **Conclusion:** It is concluded that stress inundation and sediment thickness affects the morphology of the roots. In waterlogged soil conditions, root growth leads down (perpendicular). While on land that is not waterlogged conditions, root growth more broad direction or sideways.

Key words: *Rhizophora apiculata*, different sediment thickness, waterlogging, root morphology, roots architecture

Received: February 07, 2017

Accepted: March 08, 2017

Published: March 15, 2017

Citation: Sitta Amaliyah, Sucipto Hariyanto and Hery Purnobasuki, 2017. Roots morphology of *Rhizophora apiculata* blume as an adaptation strategy of waterlogging and sediment. J. Biol. Sci., 17: 118-126.

Corresponding Author: Hery Purnobasuki, Department of Biology, Faculty of Sciences and Technology, Airlangga University, Jl. Mulyorejo (Kampus C Unair), 60115 Surabaya, Indonesia Tel: 62-031-5936502

Copyright: © 2017 Sitta Amaliyah *et al.* This is an open access article distributed under the terms of the creative commons attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.

Competing Interest: The authors have declared that no competing interest exists.

Data Availability: All relevant data are within the paper and its supporting information files.