

Forest composition and structure in the mangroves at Matang, West Peninsular Malaysia, after a century of sustainable management

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Abstract

The Matang Mangrove Forest Reserve (MMFR) on the West coast of Peninsular Malaysia is managed for more than a century and is a perfect example showing that mangrove forests can be sustainably exploited for wood production. The present work was aimed at assessing silvometric parameters in forests of different ages in order to provide additional guidelines, if any, on the management of mangroves in this vicinity. Different parameters such as the diameter, height, density and biomass were thus measured in three different aged stands: fifteen (MF15), twenty (MF20) and thirty years old (MF30). In addition, the Virgin Forest Reserve (VFR) was used as a control as this forest has not been exploited for at least 80 years. Since *Bruguiera parviflora*, *B. cylindrica*, *Rhizophora mucronata* and *Excoecaria agallocha* do not constitute a significant proportion of the stand density (less than 5%); the results of this study only focus on *R. apiculata*. This study shows that the management of the MMFR can be improved by conducting the artificial thinning earlier in order to limit the losses of exploitable wood due to natural thinning. Indeed, the tree density dropped from 6726 trees ha⁻¹, the initial stocking, to 2204 trees ha⁻¹ in the MF15. Thus, there has been a loss of about 67% of the trees before the first artificial thinning. These trees, although having small diameters, could have been exploited for specific purposes. In addition, the initial density of seedlings should be reduced in order to avoid a waste of seedlings and to increase wood production. Finally, it appeared that in some scientific articles, there is a confusion between the number of trees ha⁻¹ and the number of stems ha⁻¹, considering respectively multiple-stemmed tree as a unique tree or each stem of a multiple-stemmed tree as a separate tree. This could lead to erroneous conclusions and therefore it is important that researchers wisely use these terms.

Keywords

sustainable management, Matang, Malaysia, plot-based method, density, size distribution