

Canopy gaps and the natural regeneration of Matang mangroves

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Abstract

Canopy opening or gap creation by lightning strike is an important form of exogenous disturbance in the mangroves of Matang in Malaysia. The almost circular shaped canopy gaps consist of a group of standing dead trees which decay simultaneously with the growth of new trees. This characteristic is chiefly different with terrestrial forests where canopy gaps are normally created by tree-falls. Lightning strike disturbance in mangroves has created a means for natural regeneration whereby dormant seedlings growing underneath the canopies have had the opportunity to progress and ultimately replacing the canopies of the dead trees. Historical and recent aerial photographs of the Virgin Jungle Reserve of Pulau Kecil in Matang were analyzed to measure gap turnover rate and to calculate canopy turnover. The average (\pm SD) canopy turnover is 25.5 ± 6.9 years. This finding shows that the continuous dynamics of gap creation and closure have sustainably maintained the condition of the forest. The finding also supports the hypothesis that this disturbance prevents mangroves from reaching more senescent stage, thus, canopy gap creations are justified to be the key driver in the natural regeneration of the tropical *Rhizophora*-dominated mangroves. Curiously compared, the average turnover is almost similar to the existing 30-year rotation cycle system adopted by the Forestry Department for the management of forest compartments in Matang.

Keywords

canopy turnover, canopy gap regeneration, lightning strike disturbance, Matang