

E-3. Clarification of the Environmental Formation Mechanism of the Tropical Forest

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A 40m tower with two 30m towers and bridges were established for a microclimate monitoring, ecophysiological process studies and so on in Pasoh Forest Reserve, Malaysia. Photon flux density on the forest floor and diameter growth of key tree species were measured to estimate relations of microclimate to tropical forests. The soil formation was investigated by revealing the supply of plant litter and the organization of soil animal communities on the forest floors. Hydrological processes of tropical forest was studied based on the survey of soil physics and the monitoring of soil moisture conducted in Bukit Tarek Experimental Watershed, Malaysia.

The following findings were obtained here.

- 1) The duration and intensity of one sun fleck were influenced by the size of gaps, height of trees surrounding gaps and wind velocity. The duration of one sun fleck was quite long as compared with that determined in a dtemperate forest.
- 2) Diameter growth of trees tended to decrease in dry seasons. The growth rate of smaller trees were much lower.
- 3) The highest monthly litter fall was 4.9 ton/ha and the annual total was 12.0 ton/ha. the annual turnover rate of soil prganic matter was 2.4, indicating the rapid decomposition of plant litter on the forest floor.
- 4) soil animal communities were dominated by collembolans and oribatid mites in number, and by termites and mites in weight.
- 5) A soil mantle on a hillslope consisted of a relatively uniform surface layer and a weathered rock layer the thickness of which was wideky ranged. The soil permeability decreased with the increase of the depth from the surface.
- 6) The transmittion velocity of rain water from the soil surface into deeper soil depended on the soil moisture condition.