



学位論文要旨

専攻名 資源循環学

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題目 Elucidation of factors affecting epiphytic orchid community in *Schima wallichii* (DC.) Korth. (Theaceae) trees in a montane forest in West Java, Indonesia
(インドネシア共和国西ジャワ州の山地帯林におけるイジュ (ツバキ科) に着生するラン群集に影響を及ぼす要因の解明)

Epiphytic orchid is known as the largest group of vascular epiphytes with about 18,000 species currently described. Epiphytes including orchids are considered as one of the most threatened plant groups because they depend on the availability of host tree. Therefore, factors such as host tree size, number of branches, canopy depth and other vascular epiphytes may influence the epiphytic orchid distribution in a host. In addition, not only host tree characters, density of surrounding trees may also affect the epiphytic orchid community, because surrounding trees would affect the host tree negatively as competitor.

Schima wallichii (DC.) Korth. (Theaceae) is one of the common mountain species native to Java Island which have role as host trees for epiphytic plants. To clarify the relation between epiphytic orchid diversity and *S. wallichii* tree as host, forty *S. wallichii* trees with diameter at breast height (DBH) more than 20 cm were chosen randomly and epiphytic orchids attached were counted and identified in a montane forest of Mt. Sanggara, West Java, Indonesia. Each epiphytic orchid grown point was divided according to the Johansson's method which divides a tree stratification into five different zones (Johansson 1974), which are numbered from zone 1 to zone 5. Johansson zone 1 was omitted from the analysis because of no orchid there.

In total of 39 epiphytic orchid species, 1,731 individuals, were identified from forty host trees at the study site. Based on the species richness of epiphytic orchid attached, *S. wallichii* trees could be considered as an important host. *S. wallichii* trees DBH showed a positive effect on epiphytic orchid abundance ($p < 0.01$), species richness ($p < 0.05$), and diversity ($p < 0.05$). There was significant difference in orchid abundance and species richness between trunk (zone 2) and canopy (zone 3, 4 and 5) while no significant difference in them within canopy zones. Tree size (DBH) and the number of branches positively affected orchid abundance and species richness in a host tree. Orchids were correlated positively in number with other vascular epiphytic plants at mid-canopy (zone 4) and outer-canopy (zone 5). Density of surrounding trees affected the number of orchids negatively. *S. wallichii* trees are essential to epiphytic orchid community because they develop many branches for epiphytic orchids to colonize. Preserving the large crowned *S. wallichii* with low density of surrounding trees is effective for conservation of epiphytic orchids.

The problems to which montane forests in West Java have been exposed were forest conversion into coffee plantation, illegal logging, and illegal collecting of valuable plants including orchids despite (the fact that) the forest status is mostly 'protected forest'. Strategic management is needed to solve these problems. This thesis explores internal and external factors by SWOT analysis to formulate management strategies. From the SWOT analysis, several strategies were proposed to optimize the strengths and opportunities for the purpose of overcoming the weaknesses and to avoid the threats. Consequently, the proposed strategies can be an alternative for stakeholder to manage this forest sustainably not only for local residents but also for the epiphytic orchid and their hosts.