TERMITES SURVEY IN SECONDARY DRY DIPTEROCARP FOREST AT SRINAKARIN DAM NATIONAL PARK, KANCHANABURI PROVINCE, WESTERN THAILAND

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Abstract

Sixty out of one hundred plots (10 m X 10 m each) of secondary dry dipterocarp forest (SDDF) at Srinakarin Dam National Park, Kanchanaburi Province, western Thailand were randomly surveyed in July 2001. 300 samples of termites were collected from soil and all possible collected habitats. From morphological identification, 2 families, 5 subfamilies, 13 genera, and 35 species were recorded. Fungus growing termites; Macrotermitinae was the highest dominant group investigated and *Ancistrotermes pakistanicus* and *Odontotermes proformosanus* were the first and second dominant species of this group. *Euhamitermes hamatus* of subfamily Apicotermitinae; (the soil feeding termites) was found as second dominant termite group followed by *Microcerotermes annandalei;* the wood feeding termites as the third dominant group.

Introduction

Level of overall biodiversity are thought to be highest in tropical forest ecosystems (Marshell, 1992). However, these ecosystems are among the most threatened by changes in land use (Harcourt, 1992). Conservationists and other biologists are concerned both to monitor and conserve this diversity for a number of reasons. These include the preservation of potentially valuable organisms and genes, the maintenance of ecosystem stability and the protection of environments from the consequence of forest clearance on global climate change (Groombridge, 1992).

Termites are extremely important components of tropical ecosystems (Lee and Wood, 1971; Wood and Sands, 1978; Swift, 1979; Wilson, 1990), they have a premier role as decomposers of organic material and through this contribute significantly to carbon fluxes (Collin, 1981, 1983; Matsumoto and Abe, 1997; Mimura and Matsumoto,1997). They are also a biotic constituent (Higashi *et al.* 1992), thus forming the basis for a large food web (Lapage, 1981; Deligne *et al*. 1981).

The objective of this survey is to study on species diversity, taxonomic group composition, feeding habit or functional group composition of termites in secondary dry dipterocarp forest ecosystem at Srinakarin Dam National Park, Kanchanaburi Province, Western, Thailand.

Survey Method

Sixty percents of 100 sub-plots (10 m x 10 m each) used for the study of termite diversity and other ecological data were randomly surveyed for termites in July 2001. Intensive observation were made in soil under or near dead wood, and dead stumps for presence of termites. Tunnels, foraging trials on ground, tree or under leaves and debris were also investigated.

Study sites

Secondary Dry Dipterocarp Forest (SDDF) at Srinakarin Dam National Park (320 MSL), Kanchanaburi province, western Thailand.

Result and Discussion

Termite genera and species classified by their morphological characteristic using the systematic keys of Ahmad, 1965; Morimoto, 1973; Tho, 1992). Results showed in Table 1 and Figure 1-3 revealed that totally 35 species belong to 2 families 5 subfamilies and 13 genera. Termite nests or habitats were classified into 4 types; nests with in wood (IW), arboreal nests (A), epigeous nests (E) and subterranean nests (S). Termite in subterranean nests were dominant in the number of species in the secondary dry dipterocarp forest at Srinakarin Dam National Park, Kanchanaburi Province, but no arboreal nests was observed in this area.

Taxonomic group composition of termites were classified into 5 groups; Macrotermitinae showed the highest in species composition (19 sp.), though Termitinae (8 sp.), Nasutitermitinae (4 sp.), Apicotermitinae (3 sp.) and Coptotermitinae (1sp.) were conspicuous (Figure 1). The structure of termite community is influenced not only by present environmental factors but also vegetation types and geological history (Eggleton, 2000).

Functional group composition of termites showed in Figure 2 were classified into 3 groups; wood and leave or fungus feeder (W&L); soil and humus feeder (S&H); wood feeder (W). The abundance of each feeding group provides useful information on the function of termites in an ecosystem. Three major groups (W&L; S&H; W) seem to play different roles in decomposition processes (Wood and Sand 1978; Tayasu et al., 1997; Tayasu et al., 1998; Sugimoto et al., 1998). A unique symbiotic association with prokaryotic and eukaryotic microorganisms in termite gut is one of the powerful candidates for screening the interesting or novel enzymes, which involve in the degradation of lignocellulosic compounds. In SDDF ecosystem at Srinakarin National Park the wood and leave or fungus feeder (19 sp.) found to be the dominant feeding group recorded in this area, they are the most important termite groups which play an important role in the process of litter decomposition with higher weight specific consumption rates than other termite groups (Collin, 1981, 1983). They also play an important role in turnover of organic matter and improvement of soil fertility (Krishna and Weesner, 1969,1970).

Among 4 genera in Macrotermitinae or the fungus growing termites which can produce termitomyces mushroom, *Ancistrotermes* showed the highest frequency recorded (54.5%) followed by *Odontotermes* (25.3%) *Macrotermes* (10.3 %) and *Microtermes* (9.9 %), respectively (Figure 3).

TABLE 1 Termite genera and species from Srinakarin Dam National Park classified by their food and habitat.

Termite Genus and Species (2F, 5SF, 13G, 35SP)	habitat				Food		
	IW	A	E	S	W	W&L	S/H
1. F Rhinotermitidae (1G, 1SP)							
1.1 SF Coptotermitinae (1G, 1SP)							
1. *Coptotermes havilandi*				✪	✪		
2. F Termitidae (12G, 34SP)							
2.1 SF Macrotermitinae (4G, 19SP)							
2. *Macrotermes gilvus*			✪			✪	
3. *Macrotermes chaiglomi*			✪			✪	
4. *Microtermes obesi*				✪		✪	
5. *Ancistrotermes pakestanicus*				✪		✪	
6. *Odontotermes proformosanus*				✪		✪	
7. *Odontotermes formosanus*				✪		✪	
8. *Odontotermes longignathus*				✪		✪	
9. *Odontotermes feae*				✪		✪	
10. *Odontotermes takensis*				✪		✪	
11. *Odontotermes maesodensis*				✪		✪	
12. *Odontotermes* sp.2				✪		✪	
13. *Odontotermes* sp.3				✪		✪	
14. *Odontotermes* sp. 5				✪		✪	
15. *Odontotermes* sp. 8				✪		✪	
16. *Odontotermes* sp. 10				✪		✪	
17. *Odontotermes* sp. 11				✪		✪	
18. *Odontotermes* sp. 12				✪		✪	
19. *Odontotermes* sp. 13				✪		✪	
20. *Odontotermes* sp. 16				✪		✪	
2.2 SF Apicotermitinae (2G, 3SP)							
21. *Euhamitermes* sp.				✪			✪
22. *Speculitermes macrodentatus*				✪			✪
23. *Speculitermes* sp.				✪			✪
2.3 SF Termitinae (4G, 8SP)							
24. *Globitermes sulphureus*	✪		✪		✪		
25. *Microcerotermes minutus*	✪		✪		✪		
26. *Microcerotermes annandalei*	✪		✪		✪		
27. *Microcerotermes* sp.1	✪		✪		✪		
28. *Dicuspiditermes garthwaitei*			✪	✪			✪
29. *Pericapritermes* sp.E				✪			✪
30. *Pericapritermes* sp.F				✪			✪
31. *Pericapritermes* sp.G				✪			✪
2.4 SF Nasutitermitinae (2G, 4SP)							
32. *Nasutitermes dimorphus*	✪			✪	✪		
33. *Nasutitermes perpavus*				✪			✪
34. *Bulbitermes prabhae*				✪	??		??
35. *Bulbitermes* sp.				✪	??		??

Habitat : IW = In wood, A = Arboreal, E = Epigeal, S = Subterranean
Food : W = Wood, W&L = Wood and Leave, S/H = Soil or humus

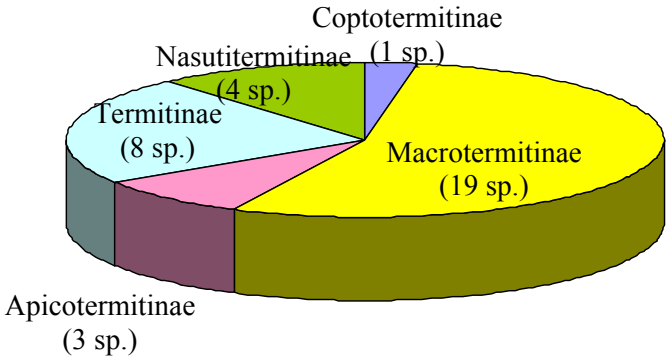

Figure 1 Taxonomic group composition of termites (number of species) in secondary dry dipterocarp forest at Srinakarin Dam National Park.

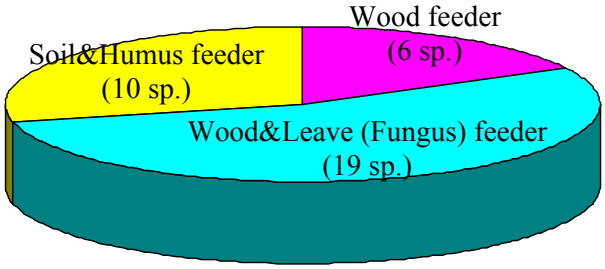

Figure 2 Functional group composition of termites (number of species) in secondary dry dipterocarp forest at Srinakarin Dam National Park

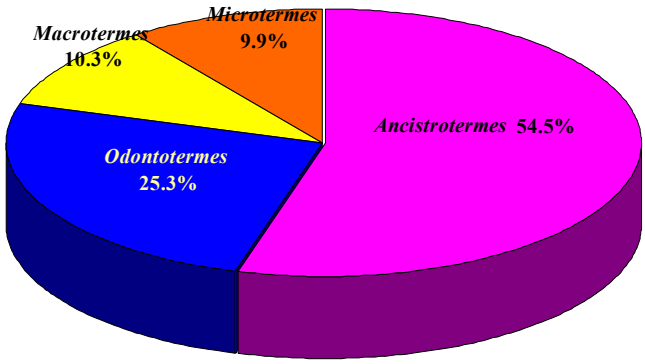

Figure 3 Frequency of termite genera in Macrotermitinae group recorded in secondary dry dipterocarp forest at Srinakarin Dam National Park.

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