



Research project of counterparts funded at IPB

Name	Counterpart	Title
Noor Farikhah Haneda, Cahyo Wibowo, Marsetyo (UNTAD), Jauhar Khabibi (UNJA)	B13	Soil animal diversity and abundance and their relationship to soil properties, soil respiration and nutrient cycling in several stands (ecosystems) of grand forest park (Jambi Tahura) of Jambi Province.

We studied four stands (ecosystems), namely secondary forest, ulin forest, oil palm, and rubber in Grand Forest Park Sultan Thaha Syaifudin (Jambi Tahura) in Jambi province (Figure 1). We investigated their soil and litter animals and soil properties in order to find specific relationships between soil animals and several soil properties (including soil respiration rate). From the four stands we obtained 23,896 individual soil and litter animals comprising 98 morphospecies, 41 families, and 21 orders. The ants (Formicidae) dominated the four stands. Ants have highly important roles in ecosystems, including roles in nutrient cycling. Most ant genera are foragers or scavenger (e.g. *Anoplolepis*, *Crematogaster*, *Dolichoderus*, *Linepithema*, *Monomorium*, *Paratrechina*, *Polyrhacis*, *Pseudolasius*, and *Tetramorium*) taking some combination of plant exudates, seed, and animal matter (alive or dead). Other genera are specialized predators (e.g. *Pheidole*, *Dolichoderus*, and *Centromyrmex*). The different amounts of environmental stress and disturbance in the four stands are likely to have different effects on ant abundance.

Table 1. Distribution and abundance of ant genera in the four stands

Genus	Secondary Forest		Oil Palm		Ulin Stand		Rubber Stand	
	Litter	Soil	Litter	Soil	Litter	Soil	Litter	Soil
<i>Anochetus</i>	-	-	-	-	5	-	-	-
<i>Anoplolepis</i>	8	43	-	2	34	11	14	20
<i>Centromyrmex</i>	-	-	-	-	-	1	-	-
<i>Componotus</i>	-	-	-	3	-	-	-	-
<i>Crematogaster</i>	28	10	-	1	3	4	25	7
<i>Diaperasticus</i>	-	10	-	-	-	-	2	-
<i>Dolichoderus</i>	1	-	-	-	-	-	2	2
<i>Hypoponera</i>	17	27	-	2	9	10	4	11
<i>Leptogenys</i>	2	-	-	-	-	-	-	-
<i>Linepithema</i>	1	-	-	-	-	-	-	-
<i>Monomorium</i>	4	40	-	97	2	69	-	-
<i>Odontomachus</i>	7	12	29	3	39	9	4	1
<i>Odontoponera</i>	5	11	22	23	19	36	4	31
<i>Pachycondyla</i>	3	5	1	2	1	-	-	-
<i>Paratrechina</i>	1	2	-	-	5	1	3	-
<i>Pheidole</i>	-	23	-	-	10	30	-	-
<i>Polydesmus</i>	-	-	-	1	-	-	-	-
<i>Polyrhacis</i>	1	-	14	-	1	-	6	2
<i>Pseudolasius</i>	26	16	1	-	6	1	-	-
<i>Rhoptromyrmex</i>	2	-	-	-	3	-	-	-
<i>Termnothorax</i>	-	-	-	-	-	-	-	3
<i>Tetramorium</i>	-	1	-	-	2	1	-	-
Total	106	200	67	134	139	173	64	77

The highest richness index, 9.214, was in secondary forest and species diversity 3.235. These values indicate that secondary forest is the least environmentally disturbed of the four stands. The soil analysis also indicated that secondary forest is the least disturbed. Typical indicators were N-total =0.207%; C-organic =2.815%; pH=3.773; CEC=12.713; soil respiration =5.03; number of animal individuals =18.9. This result indicated that secondary forest produces most plant litter. The litter presumably acts as a source of nutrients for ants to recycle. The soil analysis results showed that the rubber stand has the lowest average Ntotal, C organic, CEC and soil respiration of the four stands. There was a weak negative correlation between soil respiration and the number of soil animal individuals.

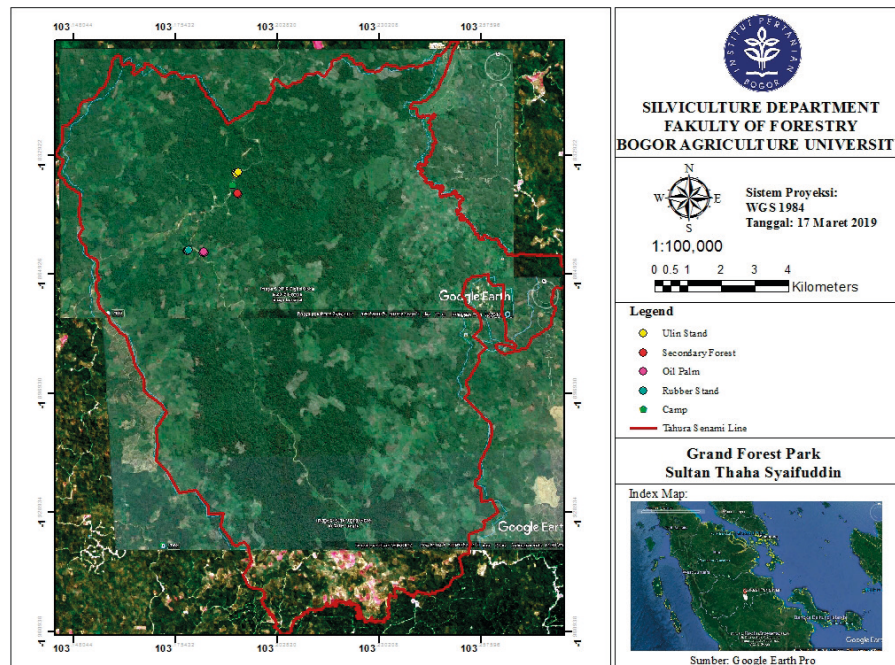


Figure 1. Map of study site in Grand Forest Park Sultan Thaha Syaifuddin

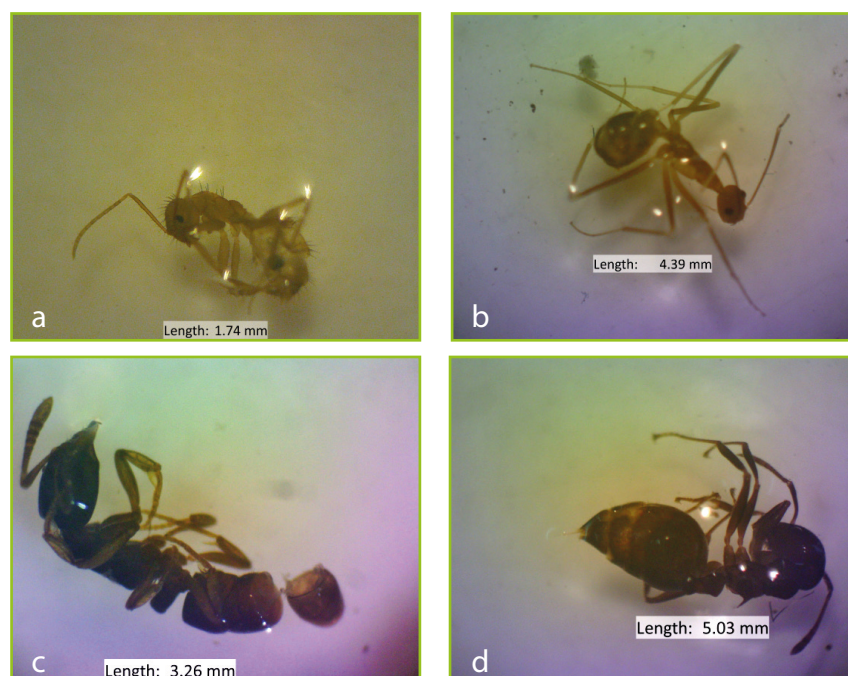


Figure 2. Morphospecies of Formicidae (ants) found in the four stands. (a) *Paratrechina* sp.; (b) *Anoplolepis* sp.; (c) *Centromyrmex* sp.; (d) *Crematogaster* sp.