

A Preliminary Study on the Distribution of Fruit Tree Taxa at Ayer Hitam Forest Reserve, Selangor

P. LEPUN, I. EDHAM and I. FARIDAH HANUM

Faculty of Forestry, University Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia

Keywords : Fruit trees, distribution, Ayer Hitam Forest Reserve, Burseraceae, Meliaceae, Sapindaceae

ABSTRAK

Satu penilaian ke atas famili pokok buah-buahan Burseraceae, Sapindaceae dan Meliaceae mendapati 714 pokok daripada 10 genus dan 26 spesies dalam plot 5-ha. Enam belas pokok induk telah dikenal pasti, kesemuanya daripada famili Burseraceae dan ini menerangkan kenapa populasi Burseraceae tinggi berbanding Sapindaceae dan Meliaceae. Walaupun Hutan Simpan Ayer Hitam masih belum terpulih sepenuhnya daripada kesan pembalakan yang lepas, kepelbagaian pokok buah-buahan yang ada memadai dalam menyumbangkan makanan kepada hidupan liar yang berlainan.

ABSTRACT

An assessment on the fruit trees families Burseraceae, Sapindaceae and Meliaceae showed that 714 trees from 10 genera representing 26 species were identified in the 5-ha plot. Sixteen mother trees were identified and all are Burseraceae explaining the high populations compared to Sapindaceae and Meliaceae. Despite the Ayer Hitam Forest Reserve being not fully recovered from the effects of previous logging activities, the diversity of fruit trees present is commendable in supplying food to different wildlife.

INTRODUCTION

Fruit trees form an important part in the species diversity of the forest (Saw *et al.* 1991). Very often the diversity of fruit trees in Malaysian lowland forests is moderate and present in low abundance (Hashim 1986, Jong *et al.* 1973, Soepadmo 1979, Whitmore 1971). Wild fruit tree species may play an important role in the selection of desirable traits for the improvement of some local fruits. An earlier study on the fruit tree taxa of Ayer Hitam Forest Reserve (AHFR) found 29 edible species and 14 species considered potentially edible because they were observed eaten by birds and animals (Faridah Hanum 1999, Daud Abu Hassan 1999, Edham 2001). This paper presents some preliminary results on the distribution of three fruit tree families over an area of 5-ha in AHFR.

METHODOLOGY

This study was conducted on a 5-ha plot of Compartment 14, Ayer Hitam Forest Reserve, Selangor. Logging activities were carried out

three times in this compartment from 1936 until 1966 using Commercial Regeneration Felling System (1936-1943 and 1965-1966) and Selective Felling (1946-1954).

Three fruit tree families were selected for the study viz., Burseraceae, Meliaceae and Sapindaceae. All trees with diameter at breast height (dbh) greater than 5 cm were measured and tagged according to the quadrat and systematically numbered. The coordinates (x,y) of the tree location in the subplots (20 m × 20 m) were recorded and the information then transferred to the coordinates (x,y) on the real plot size (250 m × 200 m). Flowering or fruiting specimens were collected in duplicates of three or one only for sterile specimens. The identification process of uncertain taxa was done at the herbaria of FRIM, Kepong and UKMB, Bangi.

RESULTS AND DISCUSSION

A total of 714 trees from the families Burseraceae, Meliaceae and Sapindaceae were recorded and mapped over a 5-ha plot. Twenty

six species belonging to 10 genera of Burseraceae contributed the highest number of the fruit trees with 612 stems (86%) followed by Sapindaceae with 60 stems (8%) and Meliaceae with 42 trees (6%). Table 1 details out the composition of fruit tree taxa in the plot.

The distribution for every family investigated is shown in Figure 1 (Burseraceae), Figure 2 (Sapindaceae) and Figure 3 (Meliaceae). The populations of the two latter families are smaller compared to Burseraceae. When further investigated, it was found that no mother trees were present in the plot for Sapindaceae and Meliaceae. Mother trees are those trees having a dbh greater than 45 cm. From the data available, 16 trees or 2% of the total number of trees recorded are mother trees from the family Burseraceae, giving an average of 3 mother trees per ha. The distribution of mother trees for Burseraceae is shown in Figure 4. Nine of fifteen

Burseraceae species have mother trees present within the 5-ha plot.

The most abundant species is *Santiria oblongifolia* with 18.1% of the total stems recorded followed by *Santiria apiculata* (13%) and *Santiria laevigata* (11.8%). Other species were less represented (< 10%), with *Pometia pinnata* being the most rare having only one stem recorded (Table 1). Thirteen species of the family Burseraceae (Kedondong) are represented in the plot and this comprises one-third the total number of species in this family in Peninsular Malaysia.

Although AHFR has been logged several times in the past, the existence of mother trees of several fruit tree species indicate that small genetic reserves of these taxa are still available in the forest. Small genetic reserves will serve as sources of seed, genetic banks and wildlife refuge from which the forest begins to recover from

TABLE 1
Composition of fruit tree taxa in 5-ha plot at Ayer Hitam Forest Reserve, Selangor

Family	Genera	Species	No. Stems	% Composition
Burseraceae	<i>Canarium</i>	<i>Canarium apertum</i> H.J. Lam.	12	1.7
		<i>C. littorale</i> Bl.	16	2.2
		<i>C. littorale</i> Bl. forma <i>tomentosum</i> Leenh.	23	3.2
		<i>C. patentinervium</i> Miq.	16	2.2
		<i>C. pilosum</i> Benn.	26	3.6
	<i>Dacryodes</i>	<i>Dacryodes costata</i> (Benn.) H.J. Lam.	48	6.7
		<i>D. longifolia</i> (King) H.J. Lam.	31	4.3
		<i>D. rostrata</i> (Bl.) H.J. Lam.	19	2.7
		<i>D. rugosa</i> (Bl.) H.J. Lam.	68	9.5
	<i>Santiria</i>	<i>Santiria apiculata</i> Benn.	93	13.0
		<i>S. laevigata</i> Bl.	84	11.8
		<i>S. oblongifolia</i> Bl.	129	18.1
		<i>S. rubiginosa</i> Bl. var. <i>nana</i> (H.J. Lam) Kalkman	20	2.8
<i>S. rubiginosa</i> var. <i>rubiginosa</i>		12	1.7	
		<i>S. tomentosa</i> Bl.	15	2.1
Meliaceae	<i>Aglaia</i>	<i>Aglaia edulis</i> (Roxb.) Wall.	9	1.3
	<i>Chisocheton</i>	<i>Chisocheton patens</i> Bl.	24	3.4
		<i>C. rubiginosus</i> King	6	0.8
	<i>Sandoricum</i>	<i>Sandoricum koetjape</i> (Burm.f) Merr.	3	0.4
Sapindaceae	<i>Mischocarpus</i>	<i>Mischocarpus sundaicus</i> Bl.	9	1.3
	<i>Nephelium</i>	<i>Nephelium glabrum</i> var. <i>sufferugineum</i> (Radlk.) Ridl.	3	0.4
		<i>N. maingayi</i> Hiern	3	0.4
		<i>N. ramboutan-ake</i> (Labill.) Leenh.	7	1.0
	<i>Pometia</i>	<i>Pometia pinnata</i> Frost.	1	0.1
	<i>Xerospermum</i>	<i>Xerospermum laevigatum</i> Radlk.	3	0.4
<i>X. noronhianum</i> Bl.		34	4.8	
			714	100

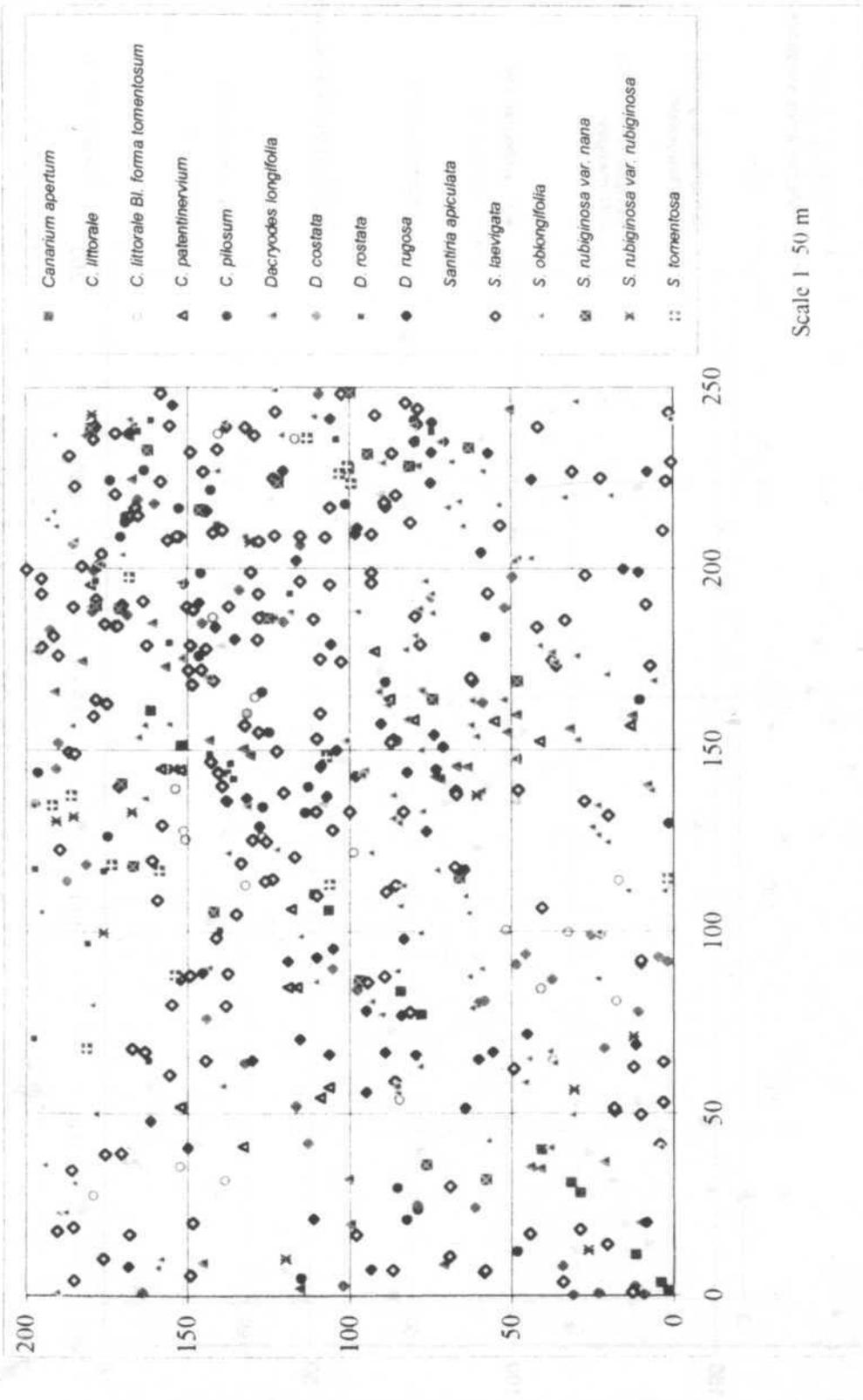
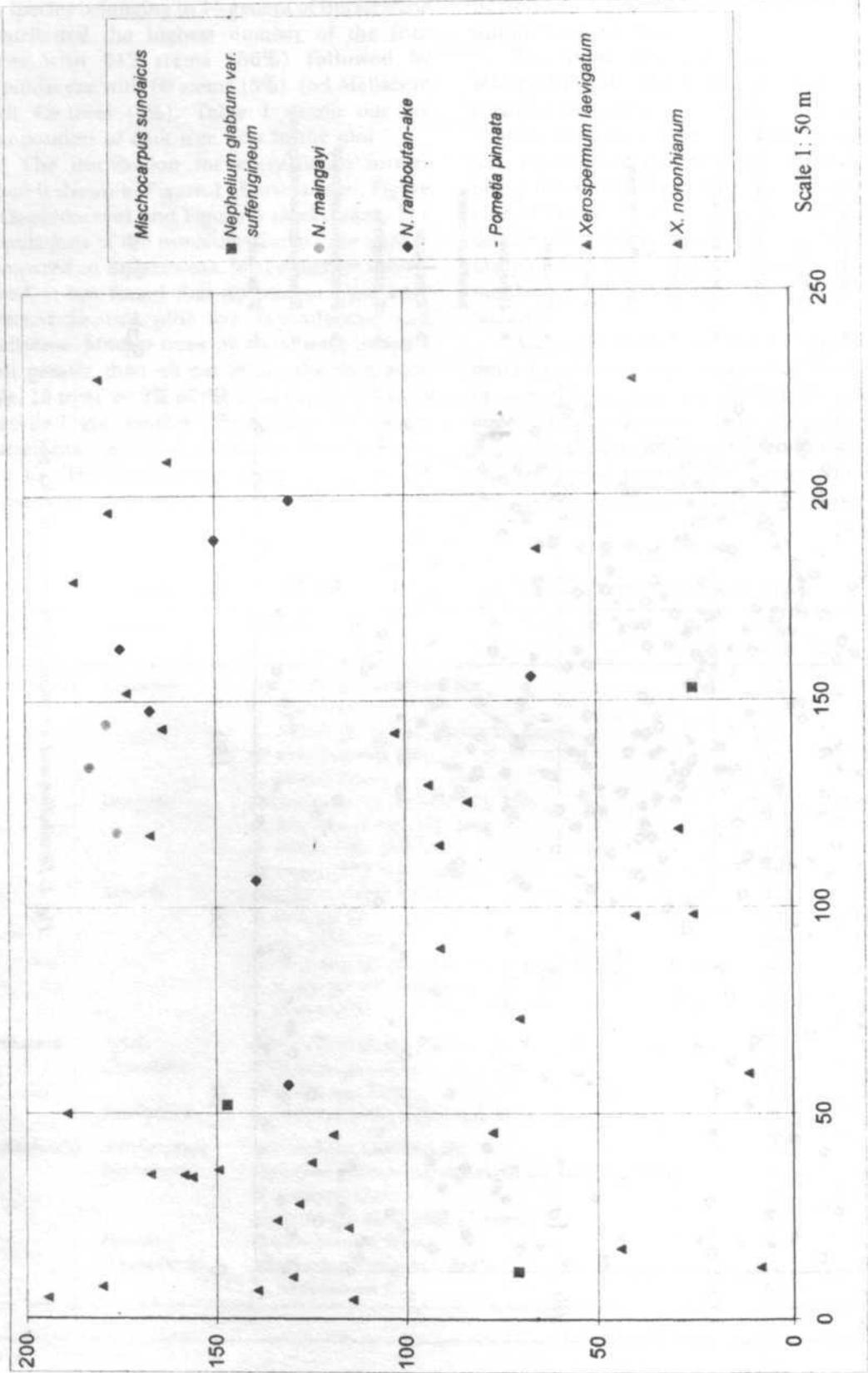


Fig. 1. Distribution and abundance of Bursaceae in 5-ha plot



Scale 1: 50 m

Fig. 2. Distribution and abundance of Sapindaceae in 5-ha plot

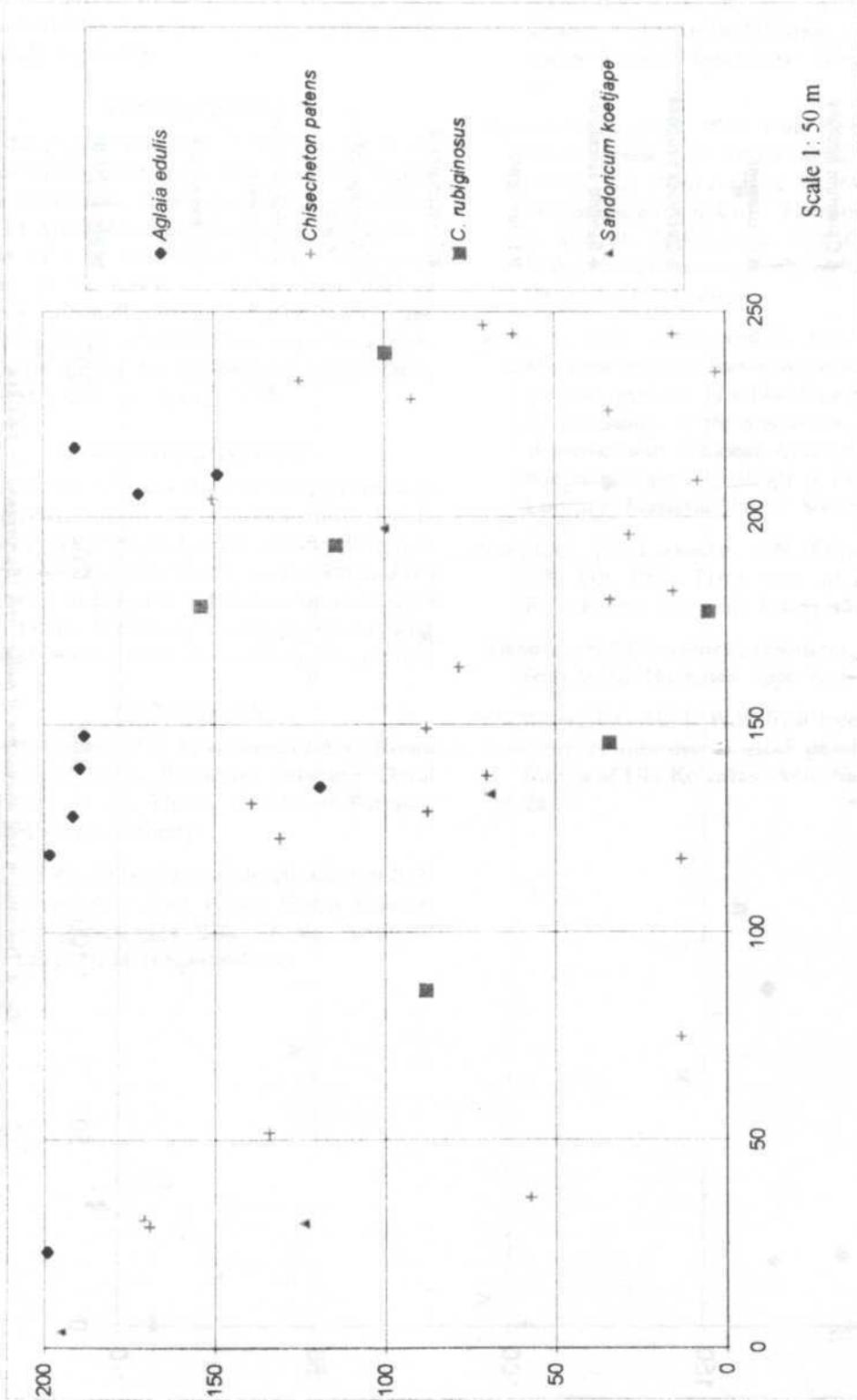


Fig. 3. Distribution and abundance of Meliaceae in 5-ha plot

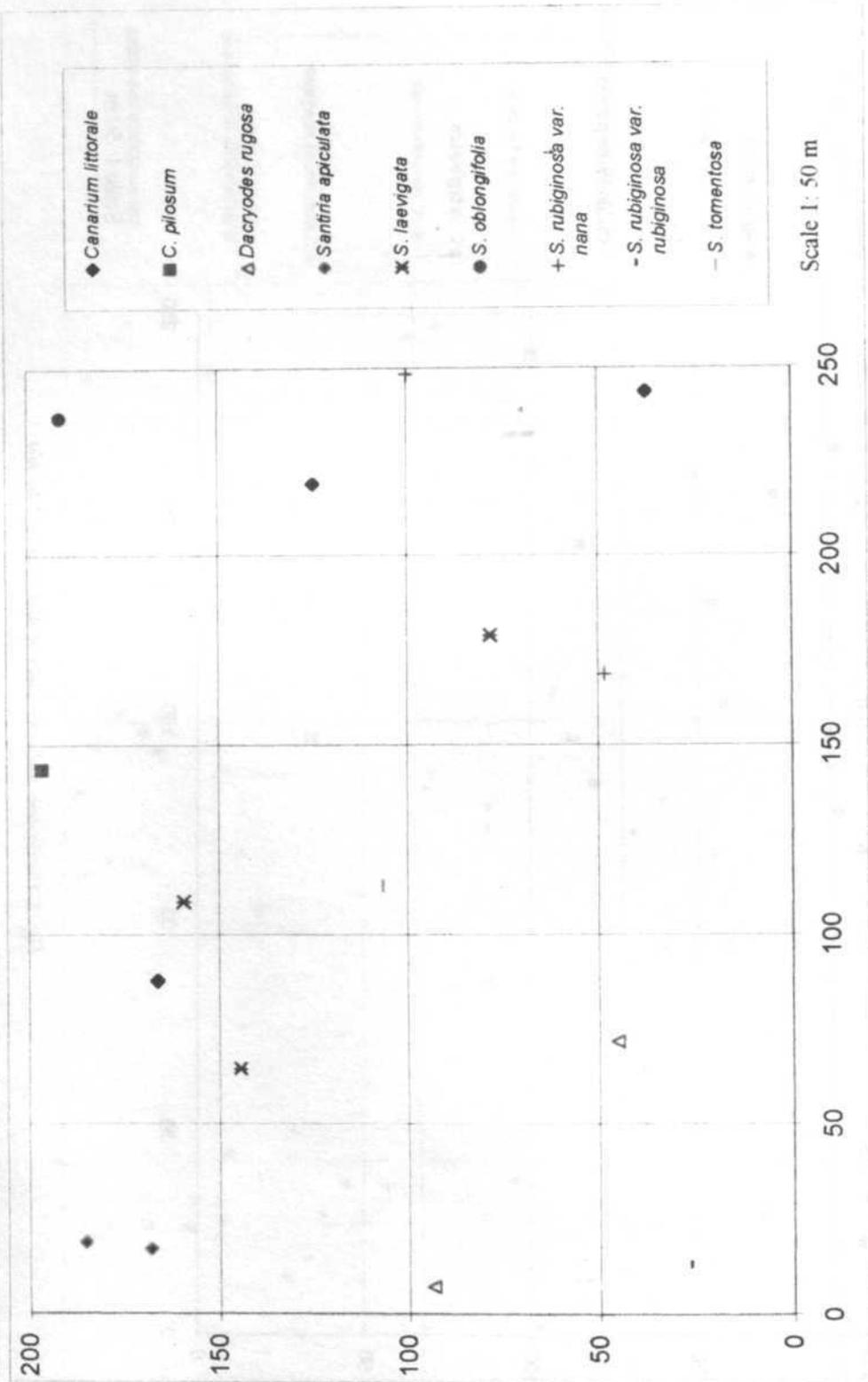


Fig. 4. Distribution and abundance of mother trees (Bursaceae) in 5-ha plot

logging damage. Fruit trees form an important part in the species diversity of the forest as they also provide food to the animals mainly birds and small mammals.

CONCLUSION

Since the population of mother trees (≥ 45 cm dbh) of fruit species is low and unevenly distributed in this forest, it is suggested that whatever is left of AHFR be maintained and not further excised as it is detrimental to the long-term stability of the forest ecosystem. An effort to preserve the small genetic reserves of fruit tree species in AHFR would ensure it as a long-term wildlife refuge in the Multimedia Super Corridor (MSC) and the Klang Valley.

ACKNOWLEDGEMENT

We would like to thank the following individuals for the contribution made in this study : Dr. L. G. Saw of FRIM who helped in the identification of uncertain taxa, Evelyn Bigcas and Ribka Alan for helping to prepare a database on fruit trees of Ayer Hitam. This study was supported by IRPA 08-02-04-0089 for which the authors are grateful.

REFERENCES

- DAUD ABU HASAN. 1999. Fruit trees of Ayer Hitam Forest Reserve, Puchong, Selangor Darul Ehsan. B. Sc. Thesis, Faculty of Forestry, UPM (unpublished).
- EDHAM, I. 2001. Diversity and distribution of fruit tree species in Ayer Hitam Forest Reserve, Puchong, Selangor. B.Sc. Thesis, Faculty of Forestry, UPM (unpublished).
- FARIDAH HANUM, I. 1999. Plant diversity and conservation value of Ayer Hitam Forest, Selangor, Peninsular Malaysia. *Pertanika Journal of Tropical Agricultural Science* 22(2):73-83.
- HASHIM, M.N. 1986. Wild fruit tree species: A lesser-known and under-utilized forest resource. In *Proceedings of the National Fruit Symposium*, ed. Y.K. Chan, Raveendranathan, P. and M. Zabedah. p. 154-169. Serdang, Malaysia: Malaysia Agriculture Research and Development Institute.
- JONG, K., B.C. STONE, and E. SOEPADMO. 1973. Malaysia tropical forest: An underexploited genetic reservoir of edible-fruit tree species. In *Proceedings of the Symposium on Biological Resources and National Development*, ed. E. Soepadmo and K.G. Singh. p. 113-121. Kuala Lumpur: Malaysia Nature Society.
- SAW, L.G., J.V. LAFRANKIE, K.M. KOCHUMMEN and S.K. YAP. 1991. Fruit trees in a Malaysian Rain Forest. *Economic Botany* 45: 120-138.
- SOEPADMO, E. 1979. Genetic resources of Malaysian fruit trees. *Malaysian Appl. Biol.* 8(1): 33-42.
- WHITMORE, T.C. 1971. Wild fruit trees and some trees of pharmacological potential in the forests of Ulu Kelantan. *Mal. Nat. J.* 24: 222-224.