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SURVEY OF HESPERIIDS FOUND ON *CALAMUS MANAN* IN A NATURAL FOREST AND THREE TYPES OF PLANTATION

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STEINER, H. & AMINUDDIN, M. 1997. Survey of hesperiids found on *Calamus manan* in a natural forest and three types of plantation. In order to create a database for future pest problems, the insect fauna of *Calamus manan* were studied in a natural forest and three types of plantation: a small village plantation, a trial plantation under timber trees and *C. manan* planted under rubber. Four species of hesperiids occurred regularly in low densities in all but the village plantations: *Salanoemia sala, Quedara monteithi, Erionota torus* and *Gangara thyrsis.* Their abundance was of the same magnitude in all these plantations, and only minor variations occurred over the nine months of observation. The number of tagged plants in the village plantation was probably too low to find *E. torus* and *G. thyrsis,* although the former was found once on an unmarked plant. In contrast, no hesperiids at all were found in the natural forest plot, with feeding marks of *Q. monteithi* and one encounter of *S. sala* outside the plot indicating that the species were principally present. A fifth species, *Lotongus calathus,* was found only in one plot (the trial forest plantation plot). After three months of absence, it was found restricted to a few plants, but in large numbers, showing its high potential as a pest.

Key words: *Calamus manan* - cultivation - hesperiidae - abundance

STEINER, H. & AMINUDDIN, M. 1997. Kajian mengenai hesperiids yang didapati pada *Calamus manan* di hutan asli dan di tiga jenis ladang. Untuk mencipta pangkalan data bagi masalah perosak pada masa hadapan, satu kajian mengenai fauna serangga daripada *Calamus manan* dijalankan di hutan asli dan di tiga jenis ladang: di ladang sebuah kampung kecil, di sebuah ladang percubaan di bawah pokok balak dan *C. manan* ditanam di bawah pokok getah. Empat spesies hesperiids muncul secara tetap dengan kepadatan rendah di semua jenis ladang kecuali di ladang kampung: *Salanoemia sala, Quedara monteithi, Erionota torus* dan *Gangara thyrsis.* Di semua ladang, spesies hesperiids berlebihan dalam magnitud yang sama dan muncul hanya dalam variasi yang kecil sahaja di sepanjang pemerhatian selama sembilan bulan. Bilangan pokok yang ditanda di ladang kampung mungkin terlalu sedikit untuk menemui *E. Torus* dan *G. thyrsis,* walaupun spesies yang pertama pernah didapati pada pokok

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yang tidak ditanda. Di sebaliknya hesperiids tidak didapati langsung di plot hutan asli dengan tanda makan *Q. monteithi* dan satu penemuan *S. sala* di luar plot menunjukkan bahawa spesies tersebut hadir. Spesies kelima, *Lotongus calathus,* ditemui hanya dalam satu plot iaitu plot percubaan ladang hutan. Selepas tidak muncul selama tiga bulan, ia didapati agak terhad di beberapa pokok tetapi dalam bilangan yang banyak, menunjukkan ia berpotensi sebagai perosak.

Introduction

Rattan, the most valuable forest product after timber, has for decades been extracted more or less exclusively from the natural forests. Therefore, except for a few studies, possible pest problems have largely been ignored (Maziah *et al.* 1992). With natural resources dwindling, the industry will have to rely more and more on planted material for supply. As any large scale plantation will face pest problems sooner or later, knowledge of the insect fauna associated with rattans becomes increasingly important.

The objective of this study was to monitor the insect fauna of *Calamus manan,* the most valuable furniture rattan in the natural forest and different types of plantation. In earlier studies, we have shown the situation of hesperiids in three age groups of *C. manan* planted under rubber (Steiner & Aminuddin, in press). This paper will explore the occurrence of the hesperiids found in *C. manan* of different plantation types and the situation in the natural habitat.

Material and methods

The study was conducted on six plots in three different localities. Plots 1, 2 and 3 had *C. manan* of different age groups planted under rubber in Ladang Kg. Bongsu, Pahang. The site is described in Steiner and Aminuddin (in press).

Plot 4 was a trial plantation of the Forest Research Institute Malaysia (FRIM) at Sungai Buloh, Selangor. *Calamus manan* had been planted in between the trees of a forest plantation. Natural secondary regrowth has come up to a height of approximately 2 m. The area is flat with an altitude of about 50 m a.s.l., and surrounded by secondary forest and other trial plantations. Fifty individual plants were marked for observation.

Plot 5 was a small village plantation at the Kampong Orang Asli, Ulu Gombak. *Calamus manan* had been planted in an open area of approximately 100 m^2, together with *C. caesius,* among banana plants and a few trees. Undergrowth was up to 1 m. The area is at an altitude of 350 m a.s.l. bordering a secondary forest on one side and the cleared village area on the other . Twenty plants were tagged for observation.

Plot 6 consisted of *C. manan* growing naturally around the Field Studies Centre of the University of Malaya, located at Ulu Gombak, about 30 km north of Kuala Lumpur. The area is an old secondary hill dipterocarp forest at an altitude of 350 m a.s.l. One hundred plants, nearly all found in that area, were tagged. They were mainly small plants less than 1.5 m high, with only a few tall ones.

All plots were monitored monthly. All larvae present, feeding marks and growth in terms of new leaves added were recorded.

Results

Growth

Growth rates for all plots are shown in Table 1.

Table 1. Growth data of *Calamus manan* in the different localities based on number of leaves added

Plot	Locality	Growth (leaves/year/plant)	Range (leaves/year/plant)
Plot 1	Kg. Bongsu	6.5	2.7 - 12.0
Plot 2	Kg. Bongsu	7.1	4.0 - 10.7
Plot 3	Kg. Bongsu	10.8	5.3 - 17.3
Plot 4	Sg. Buluh	5.3	1.5 - 13.5
Plot 5	Kg. Orang Asli, Ulu Gombak	4.2	1.3 - 14.7
Plot 6	Natural stand, Ulu Gombak	1.1	0 - 2.7

Growth rate in the natural habitat was very low, nearly a tenth of that in the fastest growing plot. This was probably due to a combination of competition, lack of light and small size. A lot of them might actually be seedlings in a state of waiting for a growth opportunity. While the growth rate in this plot was rather even, that in all other plots showed a great variation which has been reported from other plantations as well (Aminuddin *et al.* 1992). Growth rates seem to increase the more artificial the system is. The reason might be competition from other plants, available light (which, however, cannot explain the rather low growth rate in the village plantation), or a combination of both.

Occurrence of hesperiids

Larvae of four different butterfly species of the family Hesperiidae were found quite regularly in Kg. Bongsu (Plots 1, 2 and 3). These were *Salanoemia sala, Quedara monteithi, Erionota torus* and *Gangara thyrsis*. Table 2 shows the mean numbers for all three plots.

The same four species were present in Plot 4 (Table 3). There was also a fifth species, *Lotongus calathus*. It is said to be a rare species, but distributed throughout the lowlands of the Peninsula (Corbet & Pendlebury 1992). Nothing has been known about its life history so far. Unlike the other four species, which are rather randomly distributed, it was found only on seven plants. *Lotongus calathus* rolls leaflets without cutting in the base, by fixing together both edges. They tend to occur in rather high numbers. For the other species, the overall numbers were of the same magnitude as for the first plots.

Table 2. Larvae of hesperiids found in Plots 1, 2 and 3 (*C. manan* under rubber) at Ladang Kg. Bongsu, Pahang (mean numbers for 50 plants)

Month	*Salanoemia sala*	*Quedara monteithi*	*Erionota torus*	*Gangara thyrsis*
Oct	4.8 (4.8)	2.0 (2.0)	0.3 (0.3)	- -
Nov	3.0 (5.0)	2.5 (3.0)	- -	- -
Dec	4.3 (4.5)	1.8 (3.0)	2.5 (2.5)	1.0 (1.3)
Jan	4.8 (6.0)	2.8 (5.0)	1.5 (2.0)	1.0 (1.3)
Feb	7.0 (9.3)	4.0 (6.8)	0.5 (1.0)	0.5 (0.8)
March	5.5 (6.3)	2.3 (2.8)	1.5 (1.8)	0.3 (0.3)
April	9.0 (12.0)	2.3 (3.8)	0.5 (0.5)	- -
May	7.5 (12.5)	2.3 (2.5)	1.3 (1.5)	- -
June	7.8 (10.5)	3.8 (4.5)	1.8 (1.8)	- -
Total	53.7 (70.9)	23.8 (33.4)	9.9 (11.4)	2.8 (3.7)

Note: Numbers given are the individuals encountered, numbers in parentheses are totals of encountered individuals and vanished individuals recounted by their feeding marks.

Table 3. Larvae of hesperiids found on 50 plants in Plot 4 (*C. manan* at a trial forest plantation) of Sg. Buloh, Selangor

Month	*Salanoemia sala*	*Quedara monteithi*	*Erionota torus*	*Gangara thyrsis*	*Lotongus calathus*
Nov	1 (1)	2 (2)	2 (2)	1 (1)	- -
Dec	4 (6)	1 (2)	1 (1)	- -	- -
Jan	7 (9)	2 (3)	- -	- -	- -
Feb	7 (8)	- (2)	2 (2)	- -	? (70)
March	4 (6)	- (3)	- (2)	- -	14 (62)
April	10 (28)	1 (1)	4 (6)	- -	35 (35)
May	3 (6)	1 (2)	1 (2)	1 (1)	64 (64)
June	4 (5)	2 (4)	1 (1)	- -	44 (44)
Total	40 (65)	9 (17)	11 (18)	2 (2)	> 157 (275)

Note: Numbers given are the individuals encountered, numbers in parentheses are totals of encountered individuals and vanished individuals recounted by their feeding marks.

In Plot 5, only two of the hesperiids were present on marked plants, *Salanoemia sala* and *Quedara monteithi. Erionota torus* was found once on an unmarked plant. The number of available plants was probably too low to find *E. torus* and *G. thyrsis* regularly. The numbers of the two common species fitted within the magnitudes of those previous plots, especially Plot 4, if calculated for the same number of plants, as shown in Table 4.

Table 4. Larvae of hesperiids found on 20 plants in Plot 5 (*C. manan* at a village plantation) of Kg. Orang Asli, Gombak, Selangor

Month	*Salanoemia sala*	*Quedara monteithi*
Oct	- -	- (1)
Nov	2 (2)	- -
Dec	1 (2)	- -
Jan	5 (14)	- (1)
Feb	- (3)	- -
March	- -	- (1)
April	1 (3)	- -
May	- -	- (1)
June	7 (14)	1 (2)
Total	16 (38)	1 (6)
Calc. total for 50 plants	40 (95)	2.5 (15)

Note: Numbers given are the individuals encountered, numbers in parentheses are totals of encountered individuals and vanished individuals recounted by their feeding marks.

In the natural forest (Plot 6), no hesperiids at all were found on the tagged plants. Outside the plot, however, two leaflets were found folded by *Quedara monteithi,* and on one occassion two larvae of *Salanoemia sala* were found on an unmarked plant, showing that both species were principally present.

The absence of *S. sala* in the plot might be partly caused by the fact that most of the plants were too small, as it seems to prefer bigger plants, but *Q. monteithi* were found in other plots on small plants as well.

Discussion

For the five plots of *C. manan* planted by man, though differently managed and showing different growth rates, the occurrence of the four species of hesperiids was about the same. They were found regularly in low density, randomly distributed within the plots and with only minor variations in number.

In sharp contrast to these findings, hardly any hesperiids were found in the natural habitat. This indicates that the species are not common in the natural forest, although all the species have been found in the area, either on *C. manan* or on other palms.

Lotongus calathus, found only in the trial forest plantation plot, showed a different pattern. After an absence in the first three months of observation, it occurred only on a few plants, but in high numbers (Table 3). Therefore, it possesses a far greater potential as a pest than the other species. However, as the numbers of all species were significant higher than those in the natural forest, the development of the whole situation should be monitored closely.

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