

STUDIES ON HOST PREFERENCE OF *PARASA LEPIDA* ON SOME CULTIVARS OF HYBRID COCONUT IN SWAMPY AREA

by

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ABSTRACT

A two-month field experiment to study host preference of the leaf-eating caterpillar, *Parasa lepida* Cramer, on 5 cultivars of hybrid coconut: Green Khina-1, Brown Khina-1, Nias Yellow Dwarf (NYD) x West African Tall (WAT), Malayan Red Dwarf (MRD) x WAT, and Camerun Red Dwarf (CRD x Rennel Tall (RLT), aged 2.5 years, was carried out in swampy area of South Sumatra province, in 1991.

A number of 30 palms, taken at random, from each block of the above mentioned hybrids were studied. Hence, there were 150 trees observed altogether. The population of larvae per leaf as well as their dwellings in the fronds were recorded to investigate age of leaf consumed.

Results of the study showed that none of the hybrids were resistant to *P. lepida* larvae. Cultivar of NYD x WAT was attacked more followed by Green Khina-1, NYD x WAT, CRD x RLT, and Brown Khina - 1. Leaves of half matures of all hybrids were preferred compared to those of the others.

INTRODUCTION

The slug caterpillar, *Parasa lipida* Cramer (Lepidoptera: Limacodidae), is one of the major pests on coconut palm in Indonesia (Tjoa, 1953; Lever, 1969; Kalshoven, 1981). Based on the authors' observations in many parts of the country in the last few years that the caterpillar was found attacking coconut leaves in both dry and swampy areas. Larvae of the limacodid, beginning from the first to fifth instars, consumed leaves and in heavy infestation the crown is almost in completely defoliated condition, consequently production of fruits are reduced thereafter (Sison, 1957).

The amount of injury caused by an insect pest to a crop depends on the size of the insect population and the ability of the plant to withstand injury. Pest population size is regulated by many factors, and the most important among them is the adequacy of the plant as a host for insects. Differences in the adequacy of a plant as a host for insect pests and its ability to withstand attacks and recover from injury are properties associated with the concept of hostplant resistance. Thus, resistance to insects is the inheritable property that enables a plant to inhibit the growth of insect populations or to recover from injury caused by populations that were not inhibited to grow. Inhibition of population growth generally derives from the biochemical and morphological characteristics of a plant, which affect the behavior or the metabolism of insects so as to reduce the relative degree of damage these insects can potentially cause (Kogan, 1982).

Objective of the experiment was to study host preference of the slug caterpillar, *P. lepida* on cultivars of hybrid coconut in an effort to control the pest.

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MATERIALS AND METHODS

A two-month field experiment, beginning from November until December 1991, to investigate host preference of the slug caterpillar, *P. lepidus*, on 5 cultivars of hybrid coconut: Green Khina-1, Brown Khina-1, NYD x WAT, MRD x WAT, and CRD x RLT, aged 2.5 years, was carried out in Pulau Rimau swampy area, Musi-Banyuasin regency, South Sumatera province, Indonesia.

A number of 30 palms, taken at random, from each block of the hybrids (400 trees were grown in each block; only one cultivar in a block) were studied. Therefore, a total of 150 palms were observed altogether out of 2,000 trees in the adjacent blocks. The population of larvae per leaf as well as their dwellings in the fronds were recorded to investigate age of leaf preferred.

RESULTS AND DISCUSSION

Results of the experiment showed that none of the hybrid coconut cultivars studied were resistant to the leaf-eating caterpillar, *P. lepidus* (Table 1). The highest larval population per leaf was found in MYD x WAT; i.e. 0.72 followed by Green Khina-1, NYD x WAT, CRD x RLT, and Brown Khina-1; 0.61, 0.56, 0.26 and 0.20, respectively. These data indicate that the limacodid preference on the 5 cultivars are shown in the following comparisons: 3.6 : 3.05 : 2.8 : 1.3 : 1, respectively. Kogan (1982) and Panda (1979) stated that there were 2 components belonging to the crop responsible to deter insects from consuming parts of a plant, i.e. physical and chemical factors. Certain morphological characteristics of the host plant such as succulence, the toughness of tissues, pilosity, and the presence of thorns or spines may act as barriers to normal feeding or oviposition. Other physical characteristics such as color and shape have an influence in host finding. Chemical factors: sugars, amino acids, purine and pyrimidine bases are some compounds that generate the olfactory stimuli which mediate host finding and recognition (Kogan, 1982).

For insects such as Lepidoptera, host selection by mobile adults is crucial in determining the fitness of their less mobile offspring (Tabashnik, 1987; Scriber, 1984; Tabashnik and Slansky, 1987). Egg laying females identify suitable plants by chemical and physical stimuli that characterize such plants (Miller and Strickler, 1984). The authors believe that physical factors or chemical compounds existed in the 5 hybrids in the swampy area are different to one another; these can create the slug caterpillars to lay their eggs on them also different in number. Miller and Strickler (1984) mentioned that female moths can recognize the exact plants for their larvae. Renwick and Radke (1981; 1985) stated that certain plants are good for the offspring but because the existence of chemical deterrent then adult females do not lay eggs on the plant. But this did not occur in the experiment on *P. lepidus* for eggs were laid in all cultivars observed even with small population as found in CRD x WAT and Brown Khina-1.

Results of the observations on leaves of each cultivar showed that Green Khina-1 leaflets consumed more were found on leaves # 10 and 7; Brown Khina-1: # 5 and 7; NYD x WAT; # 7, 5 and 10; MYD x WAT: 6 and 7; and CRD x RLT; # 4 and 7 (Table 2). Leaf 7 of all cultivars was one of the leaf position in the crown preferred by the caterpillar besides # 4, 5, 6, and 10. The data indicated that half mature leaves 4 to 10 months old were preferred more compared with those of the rest. The reason for this might be the content of chemical substances needed by the larvae were found abundant in the leaves. Table 2 also suggested that too young, # 1-3 or too old # 11-14 leaves, were attached slightly.

Table1 . Observation of *p. Lepida* attacks on 5 cultivars of hybrid coconut in swampy area, Musi - Banyuasin regency, South Sumatera province, in Nov and Dec, 1991.

Coconut cultivar	No. of trees observed	Total leves	No. of leves per tree	% of trees attacked	Total trees attacked	Invested leves Total	%	Larval population	
								Per tree	Per leaf
Green Oina-1	30	433	14.43	100.00	30	50	11.55	8.87	0.6
Brown Khina-1	30	401	13.37	60.00	18	33	8.23	2.73	0.20
NYD x AT	30	375	12.50	100.00	30	40	10.67	7.00	0.56
MYD x AT	30	406	13.53	100.00	30	84	20.69	9.73	0.72
CRD x RLT	30	391	13.03	36.67	11	15	3.84	3.40	0.26
Total	150	2,006	66.86	396.67	119	222	-	31.73	2.53
Avage	30	401.20	13.37	84.09	23.80	44.40	11.07	6.35	0.47

Table 2. Host preference of *P. lepida* on 5 cultivars of hybrid coconut in Pulau Rimau Swampy area, Musi Banyuasin regency, South Sumatera province, in November and December 1991

Leaf #	Green Khina-1		Brown Khina-1		NYD x WAT		MYD x WAT		CRD x RLT	
	No.	%	No.	%	No.	%	No.	%	No.	%
1	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
2	0	0.00	2	6.06	0	0.00	0	0.00	1	6.67
3	1	2.00	4	12.12	1	2.50	1	1.19	1	6.67
4	3	6.00	2	6.06	4	10.00	6	7.14	2	13.33
5	1	2.00	7	21.21	6	15.00	4	4.76	4	26.27
6	6	12.00	3	9.09	3	7.50	15	7.86	2	6.66
7	8	16.00	5	15.15	7	17.50	14	16.67	4	26.67
8	6	12.00	4	12.12	4	10.00	11	13.10	1	6.66
9	6	12.00	3	9.09	3	7.50	8	9.52	0	0.00
10	9	18.00	3	9.10	6	15.00	8	9.52	0	0.00
11	2	4.00	0	0.00	3	7.50	5	5.95	0	0.00
12	3	6.00	0	0.00	3	7.50	5	5.96	0	0.00
13	5	10.00	0	0.00	0	0.00	6	7.14	0	0.00
14	0	0.00	0	0.00	0	0.00	1	1.19	0	0.00
15	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Total	50	100.00	33	100.00	40	100.00	84	100.00	15	100.00
Leaf preference	10 and		5 and 7		7,5 and 10		6 and 7		4 and 7	

CONCLUSION

No cultivars of the 5 hybrid coconut palms were resistant to the slug caterpillar *P. lepida* in the swampy area. The most preferred cultivar was MYD x WAT, followed by Green Khina-1, NYD x WAT, CRD x RLT, and Brown Khina-1 with the following comparisons: 3.6 : 3.05 : 2.8 : 1.3 : 1, respectively. Half mature leaves were attacked more compared with the rest and leaf # 7 was one of the leaves of all cultivars consumed in abundant.

SUGGESTION

It is strongly recommended to control the pest by mechanical method: i.e. to collect the larvae and then burnt due to the low population of the insect.

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