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Manuscripts intended for publication should be submitted in duplicate (original and one carbon), typewritten in double or triple space with ample margins on white bond paper (8 1/2 by 11 inches); pages should be numbered consecutively. Fragmentary sheets and slips pinned or pasted on are not acceptable. Footnotes should be numbered consecutively and inserted in the manuscript immediately below the citation separated from text by lines; they should be used only where necessary. Correct names and references are the responsibility of the author and should be checked for accuracy.

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Tables and graphs should be used only where necessary and omitted if essentially the same information is given in the paper. Graphs and figures should be drawn in India ink on white paper, tracing cloth, or light blue cross-hatched paper.

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Examination of articles in this issue will help to conform to the style of presentation desired.

PROCEEDINGS

of the

Hawaiian Entomological Society

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FOR THE YEAR 1965

SEPTEMBER, 1966

11, JANUARY 1965

The 709th meeting of the Hawaiian Entomological Society was called to order by President Mitchell at 2:00 p. m. in Agee Hall, Hawaiian Sugar Planters' Assn. (HSPA) Experiment Station, Honolulu.

Members present: Ashlock, Beardsley, Bess, Bianchi, Chock, Clagg, Davidson, Davis, Ganesalingam, Harrell, Holway, Joyce, Kajiwarra, Krauss, Look, Mitchell, Nakao, Nakata, Nishida, Pemberton, Perkins, Quate, Ross, Shiroma, Suehiro, Suman, Tenorio, Thistle, Tsuda, Voss, Wilson, Woolford, and Yoshimoto.

Visitors: Stanley F. Bailey, Blair R. Bartlett, Duane Gubler, Carleton Phillips, and Ellis Traoughton.

Ronald Mau, Harry Kaya, and Mutsuo Miyatake were elected unanimously to membership in the Society.

Drs. Blair Bartlett and Stanley Bailey, visiting professors in Entomology at the University of Hawaii, spoke about their visit here. A movie, "The Sentinels of Agriculture", prepared by the Bureau of Entomology and Plant Quarantine, California State Department of Agriculture, was shown.

NOTES AND EXHIBITIONS

Rubus rogersi Linton: N. L. H. Krauss reported on this wild blackberry, identified by the Royal Botanic Gardens, Kew, England, and native to England and Ireland. It has invaded the forest around Kokee, Kauai and has become a major pest. Specimens were collected at Kalalau Lookout, Kokee, 4,000 ft, 10, March 1963. The wild blackberry at Olinda, Maui previously was identified as *Rubus lucidus* Rydberg, a southeastern United States species (P. H. E. S., 18 (1)8: 11-12, 1962). One or two additional species of introduced wild *Rubus* may occur on Hawaii.

Hypothenemus pubescens Hopkins: N. L. H. Krauss exhibited this immigrant scolytid, a new pest record for the island of Hawaii, which was recovered from Bermuda grass on the Kona Coast of Hawaii by Carl Gaddis, 16, December 1964. *H. pubescens* was reported for the first time in the state from Maui and Molokai during November, 1964 and from Oahu on 7, December 1964.

Mosquito survey of some islands of the Central Pacific:

smallest and most isolated island in the archipelago supporting endemic elaterids. It is, therefore, of extreme interest that a second species of *Itodacnus* was found there. *I. noivcornis* and *I. paradoxus* n. sp. apparently are relics which have converged on the island from a common ancestral elaterid. These species probably are not results of successive invasions because of their unique structural similarities. Together, they differ from all other congeners by having antennal segment 3 strongly reduced, with segments 2+3 much shorter than 4; they also possess distinctive parameres, each emarginate along more or less the middle 1/3 of the lateral margin.

INSECTS ASSOCIATED WITH THE FLOWERS OF THE COCONUT PALM, *Cocos nucifera* L., IN HAWAII^{1,2}

L. LANCE SHOLDT³

UNIVERSITY OF HAWAII, HONOLULU, HAWAII

INTRODUCTION

Many different species of insects are found on the coconut palm flowers (*Cocos nucifera* L.). A list of these provides a useful starting point for studies of pollination or of insect-transmitted diseases of this species. These lists are available from only a few countries where the coconut is grown. Aldaba (1921) lists 8 species found in the Philippines; Liyanage (1957) lists 13 from Ceylon; Lever (1933a, 1933b, 1934, 1935) and Pagden and Lever (1935) list 25 from the British Solomon Islands, and Furtado (1924) lists 5 found in Singapore.

From August, 1963, through June, 1964, a study concerning the pollination of the coconut palm in Hawaii was made. During that period, insects collected and their frequency of occurrence were noted.

MATERIALS AND METHODS

The occurrence of insects was determined and species were collected from coconut palms located on the University of Hawaii campus, two residences in Aina Haina and two in Waimanalo. Other studies were made at various sites around the island. Due to the difficulty in climbing the trees, collections were restricted to those less than 9 m tall.

The relative frequency of occurrence of each species on the flowers arbitrarily was rated as rare, occasional and frequent. In most cases, the species listed as rare were observed on the flowers only once or twice. Those rated as frequent were found at most observations and constituted a larger percentage of the total insect population. Those rated as occasional fell between the other two classifications. Establishment of the relative frequency of each species was difficult due to the problem in recognizing the different species on the flowers during observations (especially the small Diptera) and to the wide variation in the species and their numbers from tree to tree and site to site.

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³Present address: Department of Entomology, University of Arizona, Tucson, Arizona.

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RESULTS

The insects collected are listed in Table 1. Fifty-one different species were found: 27 Diptera; 15 Hymenoptera; 4 Coleoptera; 3 Lepidoptera and 1 each of Dermaptera and Hemiptera. *Oscinella formosa* Becker, often found in abundance on the staminate flowers, apparently has not been collected previously in Hawaii. Most of the insects listed below seldom were found on the pistillate flowers, therefore, the ratings were based mainly upon the relative frequency of occurrence on the staminate flowers. Those insects found most often on both flowers are designated by an asterisk.

Table 1. Insects observed on coconut flowers and their relative frequency of occurrence.

INSECT	RELATIVE FREQUENCY		
	Rare	Occasional	Frequent
DIPTERA			
<i>Atherigona excisa</i> (Thomson)			×
<i>Bercaea haemorrhoidalis</i> (Fall.)	×		
<i>Oscinella formosa</i> Becker			×
<i>Dacus cucurbitae</i> Coq.		×	
<i>D. dorsalis</i> Hendel		×	
<i>Desmometopa</i> spp.		×	
<i>Eristalis arvorum</i> (F.)		×	
<i>Fannia pusio</i> (Wied.)	×		
<i>Hecamede persimilis</i> Hendel	×		
<i>Helicobia morionella</i> Ald.			×
<i>Holoblagia guamensis</i> (Johannsen)	×		
<i>Lamprolonchaea aurea</i> Macq.		×	
<i>Megaselia (Aphiochaeta) setaria</i> (Mall.)	×		
<i>Milichiella lacteipennis</i> (Loew)	×		
<i>Musca domestica</i> L.		×	
<i>Parasarcophaga misera</i> (Walk.)	×		
<i>Phaenicia cuprina</i> (Wied.)	×		
<i>P. sericata</i> (Meigen)		×	
<i>Physiphora aenea</i> F.		×	
<i>Rhinia testacea</i> R. D.		×	×
<i>Sarcophaga occidua</i> (F.)		×	
<i>Scatopse fuscipes</i> Meigen			×
<i>Scholastes bimaculatus</i> Hendel		×	
<i>Sepsis biflexuosa</i> Strobl.	×		
<i>Siphunculina signata</i> Woll.	×		
<i>Trichopoda pennipes</i> F.	×		
<i>Volucella obesa</i> (F.)		×	
HYMENOPTERA			
<i>Ampulex compressa</i> (F.)	×		
* <i>Apis mellifera</i> L.			×

— continued —

Table 1 (cont.). Insects observed on coconut flowers and their relative frequency of occurrence

INSECT	RELATIVE FREQUENCY		
	Rare	Occasional	Frequent
<i>Camponotus maculatus hawaiiensis</i> For.	×		
<i>Eumenes</i> sp.	×		
<i>Eubelmus cushmani</i> (Crawford)	×		
<i>Halicetus</i> sp.	×		
<i>Monomorium</i> sp.	×		
* <i>Paratrechina (Prenolepis) longicornis</i> (Latr.)		×	
* <i>Pheidole megacephala</i> (F.)			×
<i>Plagiolepis mactavishi</i> Wheeler		×	
<i>Polistes aurifer</i> Perk.		×	
* <i>P. exclamans</i> (Vier.)			×
* <i>P. macaensis</i> (F.)			×
* <i>P. olivaceus</i> (DeGeer)			×
<i>Stomatocerus pertorvus</i> (Girault.)	×		
COLEOPTERA			
<i>Ceresium simplex</i> Gyll.	×		
<i>Diocalandra taiensis</i> (Guerin)	×		
<i>Exillis lepidus</i> Jordan	×		
<i>Trogoderma ornatum</i> (Say)	×		
LEPIDOPTERA			
<i>Mestolobes</i> sp.	×		
<i>Pyroderces rileyi</i> (Walsm.)	×		
<i>Spodoptera mauritia</i> (Boisd.)	×		
DERMAPTERA			
* <i>Chelisoches morio</i> (F.)			×
HEMIPTERA			
<i>Nezara viridula</i> (L.)	×		

The large numbers of insects associated with coconut palm flowers may be due to the presence of nectar and pollen, or both. Since both kinds of flowers produce nectar, the presence of most of the insects on staminate flowers may be attributed to preference for pollen as food. Also, the staminate flowers are more abundant than the pistillate flowers.

SUMMARY

Fifty-one different species of insects were collected from the flowers of the coconut palm. The insects found most often on both flowers were the honey bee *Apis mellifera* L.; black earwig *Chelisoches morio* (F.); wasps *Polistes exclamans* (Vier.), *P. olivaceus* (DeGeer) and *P. macaensis* (F.); ants *Paratrechina (Prenolepis) longicornis* (Latr.) and *Pheidole megacephala* (F.). The chloropid fly, *Oscinella formosa* Becker, is reported from Hawaii for the first time.

ACKNOWLEDGMENTS

The author expresses his sincere appreciation to Drs. Toshiyuki Nishida and Wallace Mitchell for their assistance and advice. I am grateful also to Drs. D. Elmo Hardy and John Beardsley for identification of the insects collected.

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LARVA AND PUPA OF AMARYGMUS MORIO FROM HAWAII (COLEOPTERA: TENEBRIONIDAE)

T. J. SPILMAN^{1,2}

Larvae of a tenebrionid were found in a decayed mango tree trunk at Hilo, Hawaii, by E. B. Fryer, 22, V, 53. Some were reared to pupae and adult; then all three stages were sent to the U. S. National Museum. I have identified the adults as *Amarygmus morio* (F.). The immature stages are described below for the first time.

This species was reported twice from the Hawaiian Islands as *Amarygmus* near *morio*. Maehler (1952:367) reported that specimens were found at Kuhio Wharf, Hilo, 1, XI. 51 in aerial prop-roots of pandanus and added that this might be the same as that taken at Pearl Harbor on Oahu two years earlier. Swezey (1953:11) reported specimens found near the fruit fly insectary at Hilo, 22, VI. 52. Undoubtedly *Amarygmus morio* was introduced accidentally into Hawaii. The species had been reported previously from Australia, Tasmania, New Guinea, Ceram, Aru, New Britain, and New Ireland.

THE LARVA

Body elongate, cylindrical, wireworm-like; length, 20-24 mm; surface shiny, strongly chitinized and pigmented, mostly yellow-brown; with a few long, slender setae on most body areas.

Head is globular, bent downward (Fig. 1). Coarse, sparse punctures dorsally and laterally; small setae laterally on border just behind clypeus; long, sparse setae on lateral areas. *Frontal sulcus* with basal part of moderate length, then strongly bifurcating, each branch angled anteriorly, then again bifurcating with one branch to lateral area of clypeofrontal suture and one branch to lateral border of head capsule just posterior to antenna. *Eye spots* paired on each side; dorsal spot larger than ventral and farther from base of antenna. *Clypeus* smooth, impunctate, with 4 long setae. *Labrum* smooth, impunctate, length subequal to length of clypeus; with pair of widely separated, long setae on disc, anterior border with 2 shorter setae medially and 3 long setae laterally. *Labrum* with ventral surface (Fig. 4) having anterior border with 4 long, coarse setae laterally and 2 coarse setae medially, with papilla just lateral to base of each medial seta; central area with 3 rows of papillae, 2 in first row, 2 in second row, and 4 smaller papillae in posterior row then in order posteriorly, with 2 widely spaced rows of dense, coarse, medioposteriorly directed setae, between which are

¹Entomology Research Division, Agricultural Research Service, U.S. Department of Agriculture.

²I thank Dr. Nodoka Hayashi of Yokohama, Japan, for providing larvae of *Plesiophthalmus nigrocyaneus* for this study.