

NOTE

PARASITISM OF THE PALM WEEVIL *RHYNCHOPHORUS BILINEATUS* (MONTROUZIER) (COLEOPTERA: CURCULIONIDAE) BY *PRAECOCILENCHUS RHAPHIDOPHORUS* (POINAR) (NEMATODA: APHELENCHOIDEA) IN NEW BRITAIN.

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Abstract

Approximately 15% of 914 specimens of the palm weevil *Rhynchophorus bilineatus* from New Britain were parasitized by the nematode *Praecocilenchus rhabdiphorus*. Parasitized females were still capable of oogenesis and the formation of mature eggs.

Introduction

Palm weevils of the genus *Rhynchophorus* are major pests of coconut palms throughout the tropics. *Rhynchophorus bilineatus* (Montrouzier) damages palms in New Britain (Wattanapongsiri 1966), the adults depositing eggs in wounds in the stems, or in feeding holes made by the dynastid beetles *Oryctes rhinoceros* (L.) and *Scapanes australis grossepunctatus* (Sternberg). After hatching, the weevil larvae bore deeply into the palm stem, feed on the tissues, and induce a rot which frequently kills the tree.

Hoyt (1962) found nematodes in some *Rhynchophorus* specimens, and Poinar (1969) described a new genus and species of aphelenchoid nematode, *Praecocilenchus rhabdiphorus* (Poinar) from *R. bilineatus* hosts in New Britain. Hundreds of mature female nematodes, containing many intrauterine juvenile males and females, were found in the body cavities of adult male and female weevils. I examined *R. bilineatus* specimens collected from various localities in the Gazelle Peninsula during 1968 to 1970, to determine levels of *Praecocilenchus* parasitism in the field. Observations were also made on the reproductive anatomy of parasitized female weevils.

TABLE 1

PARASITISM OF *RHYNCHOPHORUS BILINEATUS* BY *PRAECOCILENCHUS RHAPHIDOPHORUS* IN VARIOUS LOCALITIES IN GAZELLE PENINSULA, NEW BRITAIN

Locality	Date	Males			Females		
		No. Parasitized	No. examined	Percent Parasitized	No. Parasitized	No. examined	Percent Parasitized
Raulawat	March 1968– Sept. 1969	12	36	33	9	34	26
Kabaira	March–Dec. 1969	12	66	18	7	40	18
	Jan.–June 1970	33	214	15	20	185	11
	Aug.–Dec. 1970	21	183	11	13	128	10
Vunapit	1968	3	5	60	3	4	75
Napapa- Vunalo	1968	1	5	20	0	4	0
Total		82	519	16	52	395	13

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Materials and methods

Samples of adult weevils were collected weekly from holes in infested palms on various plantations. The numbers of weevils collected each week varied according to abundance. Weevils were dissected in saline and scored for presence or absence of nematodes. In female weevils counts were made of the total number of large mature eggs (free of attachments to nurse cells) in the distal parts of the oviducts. When batches of weevils could not be conveniently examined immediately, they were preserved in 4% formaldehyde for later examination.

Results

Nematode parasitism of *R. bilineatus* from various localities in the Gazelle Peninsula of New Britain is summarized in Table 1. In Kabaira plantation, 18% of each sex were parasitized during March to December 1969, and 13% of males and 10.5% of females were parasitized during January to December 1970. At Raulawat plantation, 33% of males and 26% of females were parasitized, although fewer weevils were examined.

Large mature eggs were found in the distal ends of the oviducts in 32 out of 40 parasitized females studied. In 18 specimens examined in detail, there was a mean of 13 large mature eggs per female (range 1 to 26 eggs), plus smaller immature oocytes in the proximal ends of the oviducts. In a sample of 49 non-parasitized females there were 19 large eggs per female (range 8 to 42 eggs) in the oviducts, together with developing oocytes. The difference in numbers of eggs in parasitized and non-parasitized females was significant (*t* test, $p < 0.01$). Other non-parasitized females were immature, with oocytes undergoing oogenesis. With the method of examination used, it was felt no conclusion could be drawn about the effect of nematodes on testis size in parasitized male weevils.

Only 15% of 88 parasitized specimens had appreciable fat body, compared to 43% of 103 unparasitized specimens. However, in healthy specimens the amount of fat body is related to the reproductive condition of the insect, immature females having much fat body, and females with large batches of mature eggs in the oviducts having little or none.

Discussion

In a sample of 519 male and 395 female weevils of *R. bilineatus*, 16% of the males, 13% of the females, and 15% of the total, were parasitized by the nematode *P. rhaphidophorus*. Hoyt (1962) recorded 20% parasitism of *R. bilineatus* by nematodes which were probably *P. rhaphidophorus*. In a sample of 10 female and 13 male *R. bilineatus* from Raulawat, Poinar (1969) found 5 females and 3 males parasitized.

Parasitized female weevils sometimes contained hundreds of nematodes, but they were still capable of oogenesis, and apparently normal mature eggs were found, but the numbers of mature eggs were less compared to unparasitized weevils.

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