

Observations on *Rhabdoscelus obscurus* (Boisduval) and *Rhabdoscelus asperipennis* (Fairmaire) in Micronesia (Coleoptera: Curculionidae)

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At a meeting of the Invertebrate Consultants Committee of the Pacific in March 1963, the junior author reported that in June 1958 one of his assistants had collected internally parasitized larvae of a *Rhabdoscelus* sp. on Pigue Islet, Faraulep Atoll, Central Carolines. Pursuant to the report, the senior author was directed by the Experiment Station of the Hawaiian Sugar Planters' Association to search Micronesia for the parasite. Between October 13, 1963 and March 6, 1964 he searched for it not only on Faraulep but on the islands of Koror, Babelthuap, Angaur, Peleliu, Ngemelis, Ngesebus, and Aulong in the Palau Group, on Yap and Map in the Yap Group, on Saipan and Guam in the Mariana Islands, and on the Caroline atolls of Ulithi and Fais Islands in the Western Group and Eurapik, Faraulep, and Woleai in the Central Group. In some of these islands he searched alone, but in most he worked in cooperation with the junior author or with Mr. J. A. Tenorio who, at that time, was Assistant Entomologist for the Trust Territory.

The method of searching consisted simply of digging grubs of *Rhabdoscelus* and other similar larvae out of whatever host plants they could be found in and in carefully examining them, both internally and externally, for any indication of parasites. Most of the grubs were examined in the field with a hand lens, but many, which for one reason or another seemed to warrant the effort, were killed in boiling water and preserved in alcohol for later scrutiny by microscope. No evidences of parasitism were found, however, and the only evidence to date that a parasite does exist is still the original material which was collected by N. G. Tellei on Pigue Islet on June 10, 1958. Part of this material was retained in the National Collection, Washington, but three small larvae were returned to the collection of the Trust Territory, Koror, determined as a "Braconid sp." Mr. Owen avers that these larvae were extracted by him from deformed *Rhabdoscelus* grubs which Mr. Tellei had dug out of a coconut palm and brought to Koror in alcohol. The specific identity of the host grubs was not authoritatively determined at the time, unfortunately; but it is reasonable to assume that they

must have been *obscurus* (Boisduval), which is a species well known to Mr. Owen and the only *Rhabdoscelus* we were able to collect on any of the three islets of Faraulep Atoll in 1964.



FIGURE 1. Crown of a coconut palm showing leaves and spindle heavily damaged by *Rhabdoscelus obscurus*, Guam.

Observations incidental to our search for the parasite left us no doubt that the importance of *Rhabdoscelus* to the coconut industry of Micronesia is much greater than can be judged from the more or less casual collections of these beetles that are recorded in the literature. They also convinced us that the weevils are neither equally abundant nor equally destructive to coconut on all the islands, and that in some islands the abundance of adults is not in consonance with the amount of damage shown by the palms. This discrepancy made us suspect that we might be dealing with several species of the genus, and the suspicion was strengthened by local differences apparent in the color, size, and general facies of series collected on various islands. However, all our collections have been submitted to Dr. E. C. Zimmerman, world authority on the Curculionidae, and he assures us that our many series comprise only two species, *Rhabdoscelus obscurus* (Boisduval) and *Rhabdoscelus asperipennis* (Fairmaire).

R. obscurus is a well-known pest of palms and sugar cane in many countries of the Pacific. Our collections have merely documented its presence on islands and atolls where it could have been reasonably assumed before we found it. *R. asperipennis*, a distinctly different and larger species, has not been mentioned in published literature since it was described from "Pelew" in 1878 (Fairmaire, 1878, PET. NOUV. ENT. 2:282) without reference to its host plants or importance. It is new information, therefore, that we found *asperipennis* injuring coconut palms on the islands of Ngesebus, Peleliu, Ngemelis and Aulong, in the Palau. On Ngesebus many palms were being killed by it. Ngesebus is a sandy, flat island of about 245 acres, separated from the much larger Peleliu by a channel only a few hundred yards wide. It is the location of an experimental coconut plantation in which about 9,000 palms are evenly spaced in regular rows. The fallen and seriously injured palms were all about 10 years old, and most of them were concentrated in a section of the plantation which is more densely shaded by extraneous vegetation than the rest.

In general, the activity of *asperipennis* resembles that of *obscurus*. Eggs are laid in small punctures which the adult makes with its proboscis on any part of the plant. On hatching, the larvae bore into the plant tissue and injure it in accordance with the importance of the tissues affected. Larvae which develop entirely within the rachises of individual leaves or in the outermost tissues of the bole cause leaves to break off and weaken the plant without necessarily killing it; but those which bore into the unrolled spindle, especially if they reach the growing point, cause the quick death of the plant. Some of the palms at Ngesebus had been killed in this manner. A larger number had apparently been felled by the wind while still alive and, in some cases, seemingly healthy. Upon dissection, two of these were found riddled by tunnels which had penetrated deep into the tissues and had practically cut across the bole on a horizontal plane, a few inches above the root zone. Other boles had been reduced in large part to frass, among which could be found dozens of weevils, their grubs, and the large cocoons in which they pupate. The cocoons were generally formed near the periphery of the bole, presumably to facilitate the exit of the adults.

With limited time, we failed to make certain that *asperipennis* is the only *Rhabdoscelus* established on the four islands where we found it. This may be the case, as *obscurus* does not appear in our collections from these localities, although it is well represented from every other island we visited. *R. obscurus* was relatively scarce only on the large island of Babelthup, where few, if any, coconut palms were visibly injured by it, and where we collected it only from sugar cane and, in one instance, from a decapitated betel nut palm. It was particularly abundant on Guam and Fais.

On Saipan, surprisingly, *obscurus* was not found on palms of any kind, but it was abundant in abandoned sugar cane of an extensive prewar plantation. On the neighboring island of Guam, however, the infestation of coconut had reached unequivocally catastrophic proportions, and in three days of searching (December 10, 11, and 12, 1963) we saw not a single completely undamaged palm nor one with a full complement of healthy fruit. Residents of the island informed

us, in fact, that only imported fruits had been available on Guam for several months.

The statement was easy to believe, as all the palms were obviously in distress and a large percentage was reduced to dead boles. Some of these dead boles were left over from recent typhoons, and a disease of ambiguous symptoms may have been the cause of others; but in our opinion the prevalent and most important factor in the situation was *Rhabdoscelus obscurus*. The work of this insect was easily distinguished from a distance, and we found no coconut palm certainly free of it.



FIGURE 2. Coconut grove near College of Guam, showing every palm injured and many killed by *Rhabdoscelus obscurus*.

Two palms, 20 or 30 years old, which we felled in a particularly affected grove on the campus of the College of Guam yielded dozens of adult beetles lodged in the crown and leaf axils, and hundreds of larvae boring into the spindle, the bole, the leaf stems and, peculiarly, at the bases of individual leaflets. In some leaves a third or more of the leaflets had dried up and fallen in consequence of these basal borings, which apparently originated from eggs laid in the angle between the two blades of the leaflet. In many cases the larvae from these eggs had apparently failed to develop and had eventually died in situ, but sometimes they had attained full size and had tunneled across the rachis, causing it to break. We saw many palms with most leaves thus reduced to partly or wholly naked stems, or to broken stumps.

A striking difference between the damage of *obscurus* in Guam and that of *asperipennis* in Ngesebus was that none of the boles in Guam had been weak-

ened enough to break near the ground. The palms in Guam had apparently died erect, gradually exhausted by attrition of their vital tissues. The dead boles usually retained dry portions of the crown after death, and were thus easily distinguished from the irregular, jagged boles broken by hurricanes.

Our over-all impression of Guam was that in a few years no coconut palms will be left on the island. Such a pessimistic expectation may prove fallacious, however, for *R. obscurus* is known to have destroyed many palms on Saipan during the 1930's (Yohena 1936) and on various islands of Hawaii during the 1890's (Koebele 1896), but is today restricted on these islands, certainly in Hawaii, at least, to sugar cane, on which it is a ubiquitous pest.¹

LITERATURE CITED

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¹ During April 1965, after this paper had gone to press, the junior author visited Guam and reported strong indications that the population of *R. obscurus* was greatly diminished. Most coconut palms had recovered their normal appearance and many were again in fruit. This suggests that the excessive abundance of the insect described in the paper may have been originally related to damage or weakening of the palms because of preceding typhoons.

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