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Notes on Two Herbivorous Palm Weevil Species Associated with Sago Palms (*Metroxylon sagu* Rottb.) in the Philippines

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Weevils under the genus *Rhynchophorus* (Coleoptera: Curculionidae) have long been reported to attack coconut (Loyola, 1994; Abad, 1983; Lever, 1969; Menon and Pandalai 1960) and sago (Leong, 1987; Flach, 1983; Kimura, 1979). They are large insects (imagos up to 50 mm long x 20 mm wide; larvae up to 64 mm long x 25 mm wide), and recognizable by the adult's elongated rostrum with small mandibles at the distal end (Giblin-Davis, 2001). There are ten species of *Rhynchophorus* distributed worldwide, mostly in tropical regions (Giblin-Davis, 2001). In the Philippines, although larvae of palm weevils are collected by natives from sago in the wetlands of Agusan del Sur for culinary purposes, the species associated with this palm in the area or elsewhere in the country have remained undocumented.

Our several expeditions to sago stands in Agusan del Sur from May 2002 to January 2004 revealed two species of curculionid beetle that infest the palm. These are *Rhynchophorus schach* Olivier and *Rhynchophorus ferrugineus* Olivier. *R. schach* [= *R. vulneratus* (Panzer)] is shiny black with orange-red median stripe on the dorsal side of the thorax and club-like antennae (Figure 1) hence, the common name "red stripe weevil" (Sivapragasam et al., 1990). *R. ferrugineus* (Figure 1b) is reddish brown with four black dots on the thorax (Menon and Pandalai, 1960). Both of these insect species are known to be lethal pests of coconut palms.

A **B**

Figure 1. Images of *Rhynchophorus schach* (A) and *Rhynchophorus ferrugineus* (B)

More *R. schach* adults were encountered than *R. ferrugineus* imagos during our visits to the area. A study by Pacumbaba (1972) on *R. schach* in coconut revealed that a female may lay an average of 239 eggs and the average period to adulthood is 82 days for females and 80 days for males. The entire juvenile stages of the insect are spent inside the trunk of the palm: egg

incubation period varies from 3 to 5 days, the larval stage is 50 days on the average, while the prepupal and pupal stages, 3 and 19 days, respectively.

Presumably, these life history figures could be similar for *R. ferrugineus*. Lever (1969) reported the adult life span of *R. ferrugineus* as 3 months, which may hold true for *R. schach* (Pacumbaba, 1972). The imagos were rarely found and the sizes of a few field-collected *R. schach* adults averaged 35.2 mm long and 15.3 mm wide. The three *R. ferrugineus* adults collected averaged 40.7 mm long and 18 mm wide. Laboratory-emerged imagos of *R. schach* averaged 31.5 mm long and 11.5 mm wide while *R. ferrugineus* adults measured 30.7 mm long and 11.3 mm wide (Table 1). Perez et al. (1993) reported the lack of apparent differences between pheromones of the two species and suggested that "synonomy of both curculionids should be considered unless other pre- or post-zygotic reproductive isolating mechanisms are disclosed in future studies".

Table 1. Average sizes of palm weevil adults collected from sago areas in Agusan del Sur

Measurement (mm)	*Rhynchophorus schach*		*Rhynchophorus ferrugineus*	
	Field-collected (n=6)	Laboratory-emerged (n=3)	Field-collected (n=3)	Laboratory-emerged (n=3)
Body Length	35.2 (±3.7)	31.5 (±0.6)	40.7 (± 6.0)	30.67 (±0.6)
Body Width	15.3 (±2.1)	11.5 (±0.6)	18.0 (± 2.0)	11.33 (±1.2)
Snout Length	11.3 (±1.6)	10.25 (±0.5)	15.7 (± 3.1)	9.67 (±0.6)

As with coconut, the eggs may be laid on trunk wounds, inside the crevices, or leaf axils. After incubation, the emerging larvae tunnel into and live entirely in the tissues of the palm by feeding only on the tissues and rejecting the fibers (Figure 2). The presence of larvae inside cannot be easily detected since the epidermis is often left intact. The infestation is recognized later only when the younger leaves droop. Pupation to adulthood takes place inside the trunk,

sometimes just beneath the epidermis of the palm in a cocoon made up of rejected fibers (Pacumbaba, 1972; Crop Protection Division, 1976; Abad and Gallego, 1977) as shown in Fig. 3.

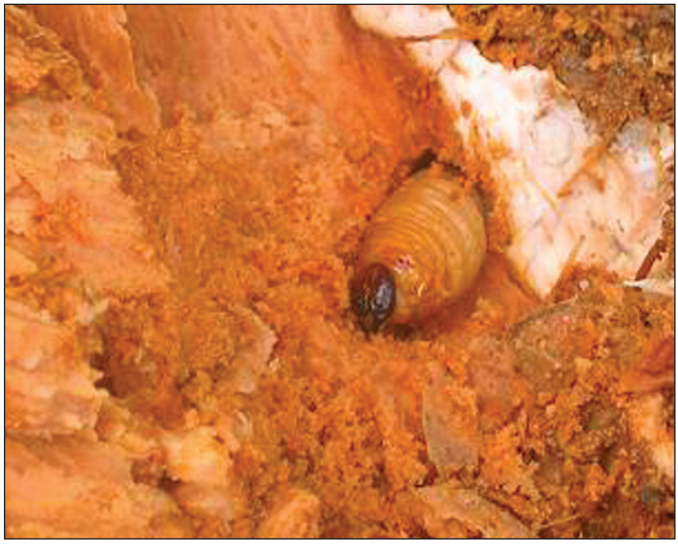

Figure 2. A palm weevil larva feeding inside tissues of sago trunk

Figure 3. Cocoons of palm weevil inside the trunk of sago palm

Interestingly, some natives of Agusan sel Sur inflict wounds on the sago palms on purpose to attract palm weevils to breed into these palms. The larvae are harvested when they are mature enough for consumption. Entomophagy appears to be a biological control practice that will continue to thrive in this part of the country. Consequently, this practice can also serve as a pest management strategy, since this confines the palm weevil infestation to only one sucker in a hill of the soboliferous sago, thus the other suckers can grow to maturity for starch yield.

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