

NEW DATA AND A REDESCRIPTION FOR *MELITTIA OEDIPUS*, AN AFRICAN VINE BORER (LEPIDOPTERA: SESIIDAE)

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ABSTRACT.— A species of clearwing moth from Kenya, *Melittia oedipus* Oberthür is redescribed and illustrated. New information on this species is provided. Its host plant in Kenya, a cucurbit (*Coccinia grandis*), is a weed pest introduced into Hawaii. The vine borer is being evaluated as a potential biocontrol agent against this weed.

KEY WORDS: Africa, Argentina, Australia, biocontrol, *Carmentis*, Chile, Cucurbitaceae, Ethiopian, Hawaii, Honduras, Kenya, Leguminosae, Mexico, Tanzania, Thailand, USA, Zanzibar.

The Sesiidae are obligate internal feeders (borers) and are relatively host specific. If a sesiid's weed host becomes a pest in regions outside the host plant's normal range, the sesiid species is a prime candidate for use as a biocontrol agent. For example, *Carmentis haematica* (Ureta), a native of Argentina and Chile, was recommended for biological control of broomweed, *Gutierrezia* sp. (DeLoach, 1980). Additionally, *C. mimosa* Eichlin and Passoa, occurring from Mexico to Argentina, was described to provide a name for a publication on insects injurious to *Mimosa pigra* L. (Fabaceae) in Honduras (Eichlin and Passoa, 1983). The borer was being considered as a control agent for this serious weed pest introduced into northern Australia and Thailand.

While attempting to find potential biocontrol agents to combat the weed pest *Coccinia grandis* (L.) ivy gourd (Cucurbitaceae) (Fig. 11-12), an introduction into Hawaii, entomologists with the Hawaii Dept. of Agriculture, Honolulu discovered a vine borer (Sesiidae) in this plant along the coast of Kenya (M. Chun, pers. comm.). A series of the moths was successfully reared in the laboratory in Hawaii. Chun reports (pers. comm.) that preliminary data indicate this species is host specific to *C. grandis*. "If allowed to grow unchecked, the plant forms thick ropey vines which you can see hanging from tall trees," according to Chun. Fig. 8-9 (growth habit of ivy gourd) show why the Hawaiians are anxious to find a suitable control agent. Their laboratory is continuing host range testing on various cucurbits including, watermelon, cucumber, wax gourd, bottle gourd, luffa, three Hawaiian endemics of the genus *Sicyos*, and more to be selected.

Fortunately, Dr. Yutaka Arita (Meijo University, Nagoya, Japan) was able to identify the species as *Melittia oedipus* Oberthür. He compared it to the type from Zanzibar, East Africa, in the Paris Museum, based on his color photos and type labels (pers. comm.). The following is an updated description.

Melittia oedipus Oberthür

Melittia oedipus Oberthür, 1878:30

Diagnosis.— Wing length 10-15mm. The wide white band dorsally on the abdomen and the red scaling on the forewing will help distinguish this *Melittia*.

Description.— MALE (Fig. 1-2).— Head with vertex brown black above and between antennae with some white mixed, pale yellow posteriorly and surrounding prominent ocelli, with long setaceous scales on dark area mesad between ocelli curving laterad; front white; occipital fringe brown black, some white mixed, much longer setaceous scales dorsally; labial palpus thick, venter somewhat flattened, white, laterally and mesally with line of brown-black scales; antenna ciliate ventrally, white segmental spots on mesal surface, pale white on lateral surface with pale yellow on apical third. Thorax brown, thin white subdorsal stripe often visible; ventrally brown black strongly overlaid with white; metathorax brown, white tufts laterally, some brown black mixed subdorsally. Abdomen dorsally brown black, each segment edged posteriorly with white, white becoming wider laterally; segment 5 mostly white; segment 2 much like metathorax; ventrally white. Foreleg and midleg mostly white, narrowly brown black medially; hindleg strongly tufted, brown black with femur strongly white laterally and with white tufts dorsally, tibia and tarsi brown black with some white mixed in tibial tuft dorsolaterally; lateral spurs of tibial spur pairs tufted white. Forewing hyaline but with broad discal spot and broad apical margin; discal cell and apical cell strongly outlined with rust-red scales, rust-red scales covering anal margin, white scales powdered elsewhere but strongest on apical margin; ventrally unpowdered or a few orange and white scales scattered. Hindwing hyaline, veins and narrow margins brown black; anal area powdered blue white; fringe scales of fore- and hindwings gray black. Male genitalia as shown (Fig. 5).

FEMALE (Figs. 3-4).— Same as for male except average size larger, wing margins broader, and antennae without cilia ventrally. Female genitalia as shown (Fig. 6)

EGG (Fig. 7).— Much like eggs of Western Hemisphere *Melittia* species, which were generally described by Friedlander (1986) as,



Fig. 1-4. *Melittia oedipus*: 1-2. Male (dorsal and ventral views, wing length 13mm). 3-4. Female (dorsal and ventral views, wing length 15mm).

"... flat, laying on their sides, anterior pole with micropylar region facing laterally along long axis; oval in shape as viewed from above, having a rim around base" *Melittia oedipus* has the thickened basal rim known to be present on eggs of certain New World species: *M. grandis* (Strecker), *M. snowii* (H. Edwards), *M. eichlini* Freidlander, *M. cucurbitae* (Harris), *M. pulchripes* Walker, *M. calabaza* Duckworth & Eichlin, but I have observed that the rim is lacking on *M. gloriosa* H. Edwards, *M. faulkneri* Eichlin, and *M. gilberti* Eichlin.

Type Locality.—Zanzibar, Africa (Holotype: Paris Museum).

Host Plant.—*Coccinia grandis* (Cucurbitaceae) (scarlet fruited gourd or ivy gourd).

Distribution.—Originally described from Zanzibar, the recent series was reared from the host plant in unspecified locations along the coast of Kenya, between the city of Mombasa and areas in neighboring Tanzania.

Remarks.—According to Chun (pers. comm.), the life cycle from egg to adult requires about 70 days, depending on temperature and under their lab conditions. She remarks that a certain percentage go into diapause, emerging as much as seven months later. Perhaps, diapause is a mechanism employed to deal with the distinct wet and dry seasons in the hot Kenyan coastal region (Chun, pers. comm.). Females oviposit on any part of the host plant but seem to prefer the tendrils. Hatching larvae can enter the plant at any point, including the thick stems; however, they

usually enter the green, narrow shoots, working their way down into the thicker stems where they complete development. The larvae feed in the host plant's vines, in certain instances, causing the formation of gall-like thickenings. These swellings (apparently not true galls) may superficially look similar to those caused by *Melittia snowii* on *Cucurbita foetidissima* von Humbolt, Bonpland, and Kunth, growing in the arid and subarid regions of the southwestern United States and Mexico (Duckworth and Eichlin, 1978). However, larvae of *M. snowii* and the Western Hemisphere species of squash-vine (*Cucurbita* spp.) borers, *M. cucurbitae*, *M. calabaza*, *M. pulchripes*, and *M. pauper* LeClerc, exit the galls or vines and pupate in the soil (Eichlin and Duckworth, 1988), but larvae of *M. oedipus* remain and pupate inside the vines (Fig. 10), a previously unreported behavior for species of *Melittia*.

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Fig. 5-6. *Melittia oedipus*, genitalia: 5. Male (ventral view, left valve removed, aedeagus separated); 6. Female (ventral view).

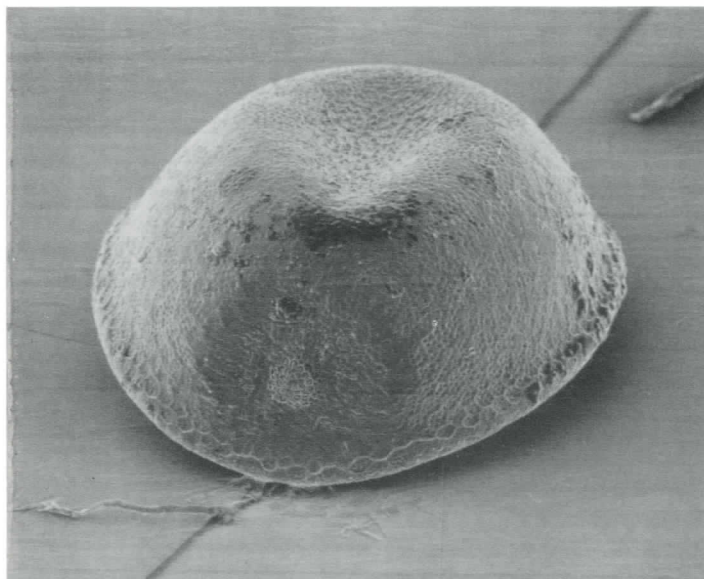


Fig. 7. Scanning electron micrograph, egg of *Melittia oedipus* (micropylar end view, 15 KV, 94x).

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Fig. 8-10. Ivy gourd (*Coccinia grandis*) host of *Melittia oedipus*: 8. Rampant host growth, Oahu, Hawaii. 9. Thick vines of ivy gourd. 10. Pupal exuviae of *M. oedipus* protruding from stems of ivy gourd (photographs courtesy of Hawaii Dept. of Agriculture, Honolulu).



Fig. 11-12. Ivy gourd (*Coccinia grandis*) hostplant of *Melittia oedipus*: 11. Flowering vines. 12. Fruiting vines (photographs courtesy of Hawaii Dept. of Agriculture, Honolulu).