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THE TORTOISE BEETLES OF FLORIDA IV, METRIONA BICOLOR (FAB.) (COLEOPTERA: CHRYSOMELIDAE)[1]

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INTRODUCTION: IN ENTOMOLOGY CIRCULARS 35, 155, AND 163, I TREATED 3 OTHER FLORIDA TORTOISE BEETLES (WOODRUFF, 1965, 1975, 1976). THE PRESENT SPECIES, METRIONA BICOLOR (FAB.), IS PROBABLY THE MOST COMMONLY ENCOUNTERED SPECIES IN THE STATE AND IS OFTEN OF SOME ECONOMIC IMPORTANCE ON SWEET POTATO.

DESCRIPTION: THE ADULT (FIG. 5) IS OVAL, CONVEX, TORTOISE-SHAPED, THE SURFACE SHINY AND WITH FEW DISTINCTIVE MARKINGS. THE ELYTRA ARE PUNCTATE, WITH APPROXIMATELY 10 ROWS OF SMALL, FEEBLY IMPRESSED PUNCTURES. MARGINS OF THE PRONOTUM AND ELYTRA ARE EXPLANATE OR BROADLY EXPANDED, VERY THIN, AND TRANSLUCENT. THE UNDER SURFACE AND THE LAST 4 ANTENNAL SEGMENTS ARE BLACK. EACH ELYTRON HAS A SMALL, ROUNDED, DEPRESSED SPACE ON THE DISC, AND A LARGE OBLONG ONE (OFTEN INTERRUPTED IN THE MIDDLE) NEAR THE MARGIN. THE COLOR IS EXTREMELY VARIABLE AND IS MUCH DIFFERENT IN LIFE FROM THAT IN MUSEUM SPECIMENS. THE COMMON NAME "GOLDEN TORTOISE BEETLE" SUGGESTS THE BEAUTIFUL METALLIC SHEEN PRESENT IN LIVE SPECIMENS. THIS COLOR VARIES FROM BRASSY OR GREENISH GOLD TO AN OPALESCENT PINKISH WHITE SHEEN. DEAD SPECIMENS ARE DULL YELLOW OR TAN. SHELL (1964) LISTED A PRESERVING FLUID USEFUL IN RETAINING COLOR OF LIVE BEETLES: 0.75 PINT DISTILLED WATER, 2 TEASPOONS IODIZED TABLE SALT, 0.5 TEASPOON BORIC ACID, AND 1 OR MORE TEASPOONS 70% ISOPROPYL ALCOHOL (AQUEOUS SOLUTION). THIS SOLUTION SHOULD BE USED AS A KILLING AGENT, THE AREA BETWEEN THE PROCOXAE AND THE MIDLINE OF THE METASTERNUM PUNCTURED WITH A PIN, AND THE SOLUTION SHOULD BE CHANGED AFTER 48 HOURS. WALSH AND RILEY (1869) MENTIONED THAT THESE BLACK ELYTRAL SPOTS DISAPPEAR ABOUT 1 WEEK AFTER EMERGENCE FROM THE PUPA. THE SIZE IS FAIRLY UNIFORM, VARYING FROM 5.4 TO 6.7MM LONG AND 4.2-5.8MM WIDE.

LARVAE (FIG. 2) ARE TYPICAL OF MOST TORTOISE BEETLES, HAVING SPINES ALONG THE SIDES AND A FECAL FORK (FIG. 3) WHICH USUALLY HOLDS A PROTECTIVE ACCUMULATION OF DUNG OVER THE BODY. THE COMMON NAME "PEDDLERS" (ORTON AND CHITTENDEN, 1917) REFERS TO THIS HABIT OF CARRYING THE FECES. WALSH AND RILEY (1869) REFERRED TO IT AS A "...STERCORACEOUS PARASOL." THE PUPA (FIG. 4) HAS 3 STRIPES AND RESEMBLES THAT OF SEVERAL CLOSELY RELATED SPECIES. THE EGG IS APPARENTLY DISTINCTIVE, BEING THE ONLY ONE DESCRIBED WITH 3 SPINES (FIG. 1).

TAXONOMY: THE VARIABILITY NOTED UNDER THE DESCRIPTION ABOVE, SOME OF WHICH SEEMS TO BE CORRELATED WITH GEOGRAPHY, IS RESPONSIBLE FOR SOME CONFUSION ABOUT THE EXACT STATUS OF THIS SPECIES. BARBER (1916:124-125) STATED THAT "...IT IS APPARENTLY A COMPOSITE OF ILL-EXPRESSED LOCAL FORMS DISTRIBUTED THROUGHOUT THE UNITED STATES" AND "...FURTHER NOMENCLATORIAL CHANGES WOULD BE UNWISE." HE ALSO MENTIONED THAT THE SPECIES HAD LONG BEEN FAMILIAR TO MOST WORKERS AS COPTOCYCLA AURICHALCEA FAB. LENG (1920:304) LISTED THE FOLLOWING SYNONYMY: AURICHALCEA (FAB.) 1801:397; BISTRIPUNCTATA (HERBST) 1799:275; ?MARYLANDICA (HERBST) 1799:274; PALLIDA (HERBST) 1799:262; ?BISIGNATA (BOH.) 1855:119; VAR. AURISPLENDENS (MANN.) 1843:307. LENG ALSO LISTED 4 OTHER NORTH AMERICAN SPECIES IN THE GENUS METRIONA: BIVITTATA (SAY), EMARGINATA (BOH.), PURPURATA (BOH.), AND PROFLIGATA (BOH.). IN LATER SUPPLEMENTS, LENG AND MUTCHLER (1927:46) LISTED METRIONA ORMONDENSIS BLATCHLEY (1920:71) AND (1933:47) M. FLORIDANA SCHAEFFER (1925:235), MARGINEPUNCTATA SCHAEFFER (1925:236), AND LODINGI SCHAEFFER (1925:236). THE RECENT LITERATURE DOES NOTHING TO CLARIFY THE STATUS OF MOST OF THESE NAMES AND THE SITUATION IS ESSENTIALLY THE SAME AS BARBER STATED IN 1916. THE NOMENCLATURE WILL NOT BE ON A FIRM FOUNDATION UNTIL SOMEONE IS ABLE TO STUDY AN EXTENSIVE SERIES OF SPECIMENS FROM EACH OF A LARGE NUMBER OF LOCALITIES THROUGHOUT THE ENTIRE GEOGRAPHIC RANGE. SCHAEFFER'S METRIONA BICOLOR FLORIDANA WAS DISTINGUISHED AS BEING LARGER AND WITH "...MORE BROADLY EXPANDED AND LESS STRONGLY DEFLEXED LATERAL MARGINS". ITS STATUS REMAINS QUESTIONABLE.

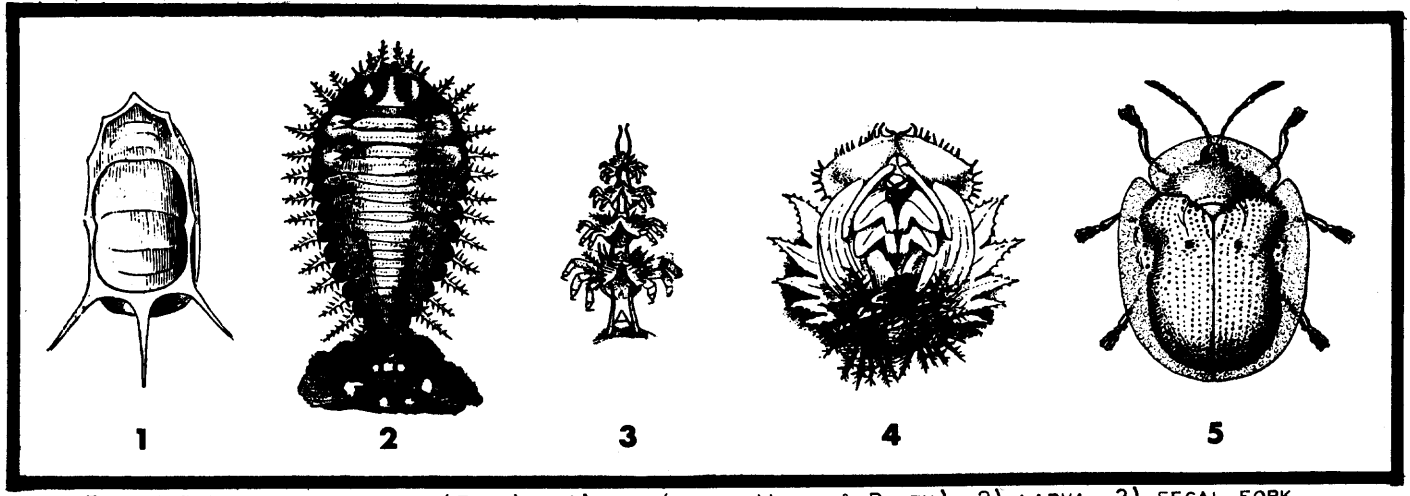

FIG. 1-5 METRIONA BICOLOR (FAB.): 1) EGG (AFTER WALSH & RILEY), 2) LARVA, 3) FECAL FORK, 4) PUPA, 5) ADULT (FIG. 2-5 AFTER ORTON & CHITTENDEN).

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BIOLOGY & LIFE HISTORY: Because of the taxonomic confusion, some generalizations in the literature may not be accurate. Smith (1950) mentioned that pupation took place in the soil in Kansas, but Walsh and Riley (1869) stated that pupae were attached under a leaf. Smith (1950) generalized that eggs were laid on the underside of leaves, where they hatch in 7-10 days. Larvae feed on leaves, molt 5 times in about 3 weeks, drop to soil, pupate, and emerge in 10-14 days. He mentioned that only 1 generation was found in northern areas, but there were 2 generations in Kansas.

HOSTS: The taxonomic confusion mentioned above is possibly responsible for some erroneous host records. Blatchley (1910:1232) listed morning-glory, bittersweet, and sweet potato vines. Balsbaugh and Kirby (1972:197) listed the hosts as Convolvulaceae. In Florida Blatchley (1924:46) stated that it hibernates in bunches of Spanish moss and beneath rubbish, and in spring it is "...beaten or swept from morning-glory, wild potato and various species of wild herbage." The Florida State Collection of Arthropods contains records of adults on the following plants, although several are doubtful hosts: Asimina parviflora (Michx.); Camellia sp.; Citrus sinensis Osbeck; Ficus sp.; Gardenia jasminoides Ellis; Hibiscus rosa-sinensis Linn.; Ipomoea arborescens Sweet; I. batatas (L.) Lam.; I. crassicaulis B. L. Robinson; I. leptophylla Torr.; Ligustrum japonicum Thunb.; Litchi chinensis Sonn.; Philodendron oxycardium Schott; P. selloum C. Koch; Pimenta officinalis Lindl.; Sapium sebiferum Roxb.; Schinus terebinthifolia Raddi.

DISTRIBUTION: Although this species is usually listed as widely distributed, some of these records may refer to distinctive local populations. In the southeast Fattig (1948) listed it from 20 localities in Georgia; Balsbaugh and Kirby (1972) recorded 56 specimens from 18 counties in Alabama; Blatchley (1924) listed it from "throughout" Florida, although he specifically recorded it from only 9 stations. Division of Plant Industry records include 45 Florida localities in 26 counties. M. bicolor floridana Schaeffer was described from "Miami; Orange Grove; Tampa."

ECONOMIC IMPORTANCE: This species is rarely of major economic concern, although, as the common name implies, it is occasionally a pest of sweet potato. However, foliage is the only part of the plant attacked, and the plant usually recovers. Watson (1917, 1919) recorded it as common on sweet potato in Florida, but stated that it was "...seldom considered a troublesome pest." Smith (1910) suggested control by dipping plants, before setting, in lead arsenate (1 lb/6-10 gal water). No modern insecticides, excluding the prohibited DDT, appear to have been tested or recommended. In Maryland, Sanderson (1899) reported that flea beetles, cutworms, and tortoise beetles so damaged newly set sweet potato plants, stunting their growth and preventing early maturity of the tubers, that the venture was unprofitable.

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