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THE COFFEE BEAN WEEVIL, ARAECERUS FASCICULATUS (DEGEER), A POTENTIAL NEW PEST OF CITRUS IN FLORIDA (COLEOPTERA: ANTHRIBIDAE)[1/]

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INTRODUCTION: THE COFFEE BEAN WEEVIL WAS ORIGINALLY DESCRIBED IN 1775 FROM INDIA, AND IT HAS LONG BEEN KNOWN AS A WIDELY DISTRIBUTED, MINOR PEST OF STORED PRODUCTS (COTTON, 1963:64). DURING THE FALL OF 1971 A HEAVY INFESTATION WAS FOUND IN A CITRUS GROVE IN LAKE COUNTY, FLORIDA. IT WAS ORIGINALLY THOUGHT TO BE SECONDARY IN ORANGES AND OF LITTLE CONSEQUENCE. I PERSONALLY OBSERVED WEEVILS OVIPOSITING IN NORMAL, HEALTHY LOOKING HAMLIN ORANGES ON THE TREE. THE ACCOMPANYING PHOTOS SHOW CONSIDERABLE FRUIT DROP (FIG. 9) AND LARVAE BURROWING IN THE PEEL (FIG. 6).

THERE ARE MANY QUESTIONS ABOUT WHY A LONG-ESTABLISHED, MINOR, STORED PRODUCT PEST WOULD SUDDENLY BECOME (AT LEAST IN A RELATIVELY SMALL AREA) A PRIMARY PEST OF FRESH CITRUS. AT PRESENT NO ANSWERS HAVE BEEN DETERMINED, ALTHOUGH SEVERAL POSSIBILITIES HAVE BEEN SUGGESTED: 1) NATURAL ENEMIES (E.G., PARASITES, PREDATORS, DISEASES) HAVE BEEN SUPPRESSED, CREATING POPULATION PRESSURES AND A PREMIUM ON AVAILABLE FOOD; 2) ANOTHER SPECIES (SIBLING OR CRYPTIC) MIGHT BE INVOLVED; 3) GENETIC CHANGES HAVE OCCURRED, CHANGING HOST PREFERENCES. ALTHOUGH THE EXTENT OF THE INFESTATION AND THE EXACT CAUSE MAY NEVER BE DETERMINED, THIS CIRCULAR HAS BEEN PREPARED TO ACQUAINT GROWERS AND REGULATORY PERSONNEL WITH THE PROBLEM.[2/]

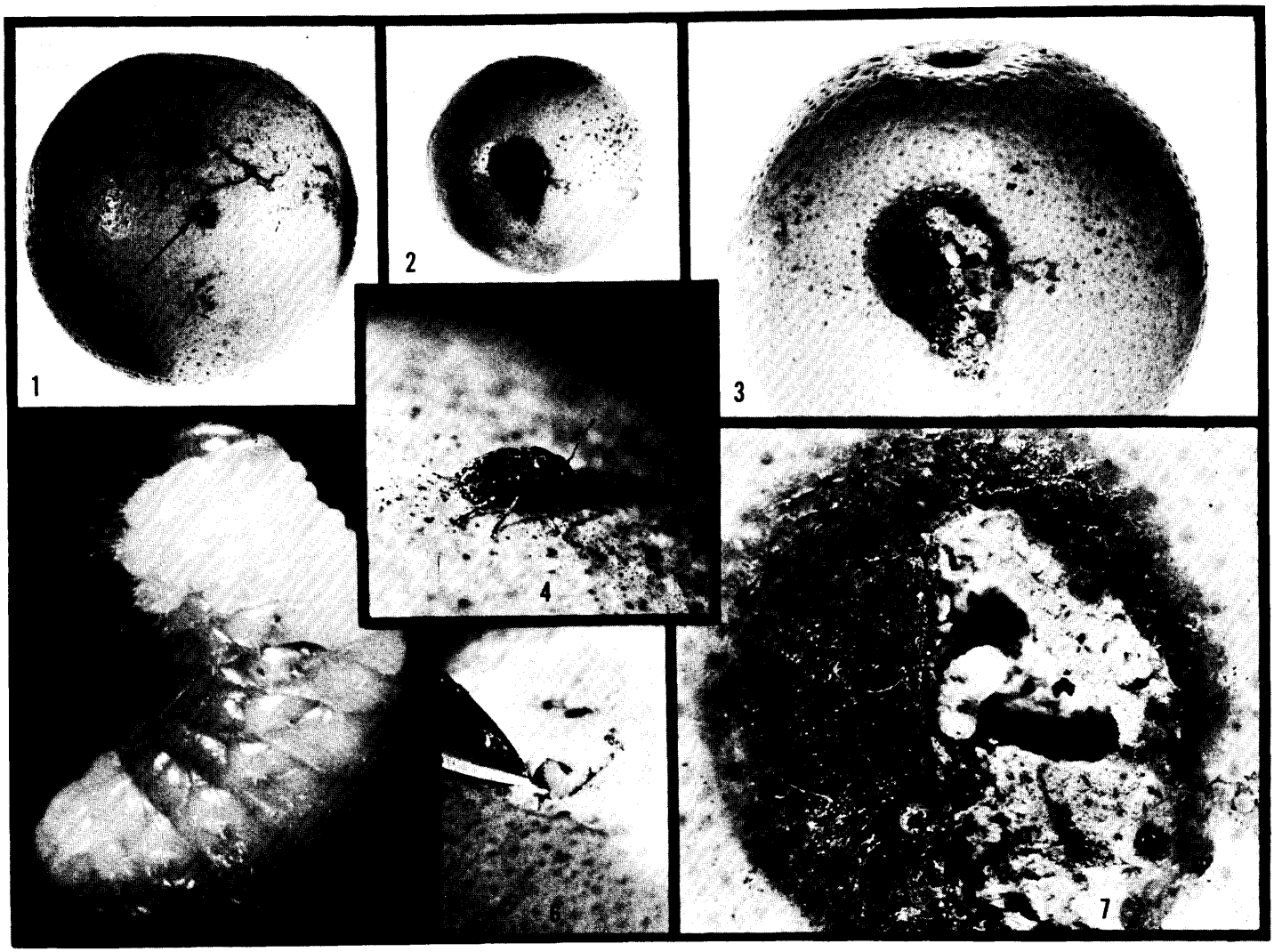

FIG. 1-7. ARAECERUS FASCICULATUS AND DAMAGE; 1) SMALL DISCOLORED AREA AROUND OVIPOSITION PUNCTURE; 2) LARGER NECROTIC AREA FROM WHICH MATURE LARVA WAS TAKEN; 3) SAME FRUIT AS FIG. 2 WITH LARVA IN SITU; 4) ADULT FEMALE OVIPOSITING ON ORANGE; 5) LATERAL VIEW OF MATURE LARVA; 6) LARVA IN TUNNEL OF PEEL; 7) ENLARGEMENT OF FIG. 3. (PHOTOS BY E. M. COLLINS, JR.)

BIOLOGY: THE LIFE CYCLE APPEARS TO BE VARIABLE, DEPENDING ON CLIMATE AND HOST, BUT IS GENERALLY COMPLETED IN ABOUT 45 DAYS. ADULTS LIVE FOR SEVERAL MONTHS, FEED ON FUNGI (E.G., PENICILLIUM MOLD, FIG. 8, 10), AND CAUSE LITTLE OR NO DAMAGE. THEY JUMP OR TUMBLE WHEN DISTURBED AND OFTEN FEIGN DEATH FOR A SHORT TIME. ON CITRUS THE EGGS ARE LAID IN FRUIT, AND THE LARVAE BURROW UNDER THE SKIN, BUT NOT AS DEEPLY AS THE FLESH (FIG. 3, 6, 7). PUPATION TAKES PLACE IN THE FRUIT, MOST COMMONLY AFTER IT HAS FALLEN FROM THE TREE. TYPICAL DAMAGE TO ORANGES IS SHOWN IN FIG. 1, 2, 3, 11.

HOSTS: ALMOST 100 KINDS OF HOSTS HAVE BEEN RECORDED, BUT NEARLY ALL ARE DRY SEEDS, OR STORED PRODUCTS. A FEW EXAMPLES WILL SUFFICE TO SHOW THE VARIETY OF PRODUCTS INVOLVED: ZIMMERMAN (1942) RECORDED IT FROM COFFEE, COCOA, NUTMEG, CROTALARIA, BREADFRUIT, RICE, SUNFLOWER, AND FROM SEEDS OF COCCOTHRINAX(?). TUCKER (1909) STATED THAT "IT HAS NO PARTICULAR FOOD PREFERENCES.", BUT LISTED IT AS "... BREEDING IN BEANS OR ANY STORED DRY VEGETABLE PRODUCTS, INCLUDING DRIED FRUITS, AS IN DRY PITHY STALKS, AND IS COMMONLY FOUND BREEDING AS A SCAVENGER IN DRY DECAYED COTTON BOLLS." BLATCHLEY & LENG (1916) RECORDED IT IN SEEDS OF CACAO, COFFEE, POKEBERRIES, WILD INDIGO, SENNA, COTTON, AND DRIED APPLES. ARTHUR (1956:119-120) LISTED IT AS A MINOR PEST OF STORED PEANUTS. MARLOWE (1940) REPORTED REARING THIS SPECIES AND A CLOSELY RELATED ONE, A. VIEILLARDI, FROM PASSION FRUIT (PASSIFLORA LAURIFOLIA). THE LARVAE WERE FOUND "...IN GREEN IMMATURE FRUIT AS WELL AS IN THE FRUIT WHICH WAS RIPE AND BEGINNING TO DRY AND ...ADULTS WERE SEEN FEEDING ON THE SKIN OF MATURE AND DRIED FRUIT."

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2/ I AM INDEBTED TO DR. B. D. VALENTINE, OHIO STATE UNIVERSITY, FOR VERIFYING THE IDENTIFICATION.

DESCRIPTION: Adults (Fig. 4, 8, 10) are small (2-5 mm), dark brown, mottled with whitish to yellowish scale-like setae, with pattern variable; a typical member of the family Anthribidae with a short broad beak or rostrum. From other members of the family in North America it may be distinguished by the following combination of characters (Valentine 1960:48): antennae inserted on anterior surface of rostrum or head; antennal club never 4-segmented; eyes rounded, upper edges not closer together than the lower; elytra with 10 rows of punctures in addition to the scutellar one.

The larva (Fig. 5) is a white, legless grub similar in general appearance to many weevil larvae. Anderson (1947:513-514) characterized the species with diagnostic features as follows: prodorsum on abdominal segments 1-5 prominent, with a transverse row of short, longitudinal plicae; head light yellow, without flattened areas; legs replaced by clusters of setae; body setae numerous; labrum with 4 pairs of setae; mandible with 2 apical teeth.

CONTROL: Sherman & Tamashiro (1956) reported that a predaceous mite, Pyemotes (=Pediculoides) ventricosus (Newport) reduced populations of A. levipennis Jordan in Hawaii. They also reported a hymenopterous parasite, Eupelmus cushmani (Crawford), from this species. Tucker (1909:63) reported the same species (under the generic name Cerambycobius) as a parasite of A. fasciculatus in chinaberries in Texas, along with Eurytoma tylodermatis Ashm. No chemical controls have been tested on citrus.

DISTRIBUTION: The genus is a large one, centered in the Oriental and Australian regions (Valentine, 1960:50). Motschulsky (1855:77) reported an example of how this species is transported: At the exposition in New York in 1853 it was flying about the exhibits of agricultural products from Cayenne. Jordan (1906:381) reported it from Mexico, British Honduras, and Panama, but stated it was "a cosmopolitan species." Blatchley & Leng (1916:42-43) stated that it "Originated in India and recorded in the United States from Ohio, New Jersey, District of Columbia, Alabama, Mississippi and Florida...always liable to occur in seaports, but does not become acclimatized north of the cotton belt..." Zimmerman (1942:71), in discussing its occurrence in Guam, stated: "...distributed to such an extent by commerce that it is now almost cosmopolitan."

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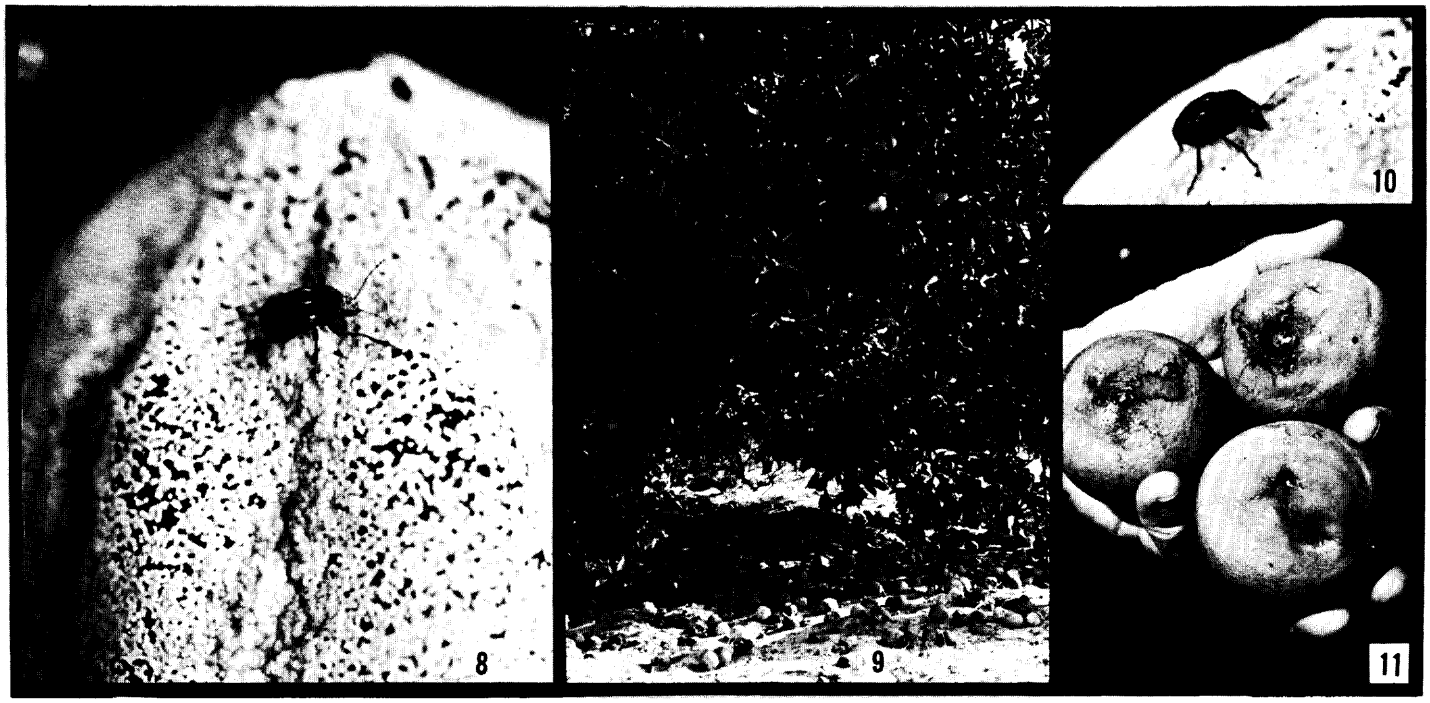

Fig. 8-11: 8) Adult feeding on Penicillium mold on mummified orange; 9) fallen fruit as a result of a heavy infestation (other fruit still on the tree were also infested); 10) adult feeding on Penicillium; 11) late stages of decay in oranges, often invaded at this stage by secondary organisms such as sap-feeding beetles (Nitidulidae). (Photos by E. M. Collins, Jr.)