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THE MANGO SEED WEEVIL, STERNOCHETUS MANGIFERAE (FAB.) (COLEOPTERA: CURCULIONIDAE) 1/

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INTRODUCTION: THE MANGO SEED WEEVIL, STERNOCHETUS MANGIFERAE (FAB.), HAS NOT BEEN FOUND IN FLORIDA, BUT ITS PRESENCE IN THE MAJOR MANGO PRODUCING AREAS OF THE WORLD INDICATES THAT IT IS A POTENTIAL PEST HERE. 2/ THIS CIRCULAR IS PREPARED TO ACQUAINT PLANT SPECIALISTS IN SOUTH FLORIDA WITH THIS INSECT SO THAT IT MIGHT BE MORE READILY DETECTED IF IT SHOULD BECOME INTRODUCED.

DESCRIPTION: LENGTH 8 MM, WIDTH 4 MM. THIS IS A SHORT, COMPACT WEEVIL TYPICAL OF THE SUBFAMILY CRYPTORHYNCHINAE. WHEN DISTURBED, THE LEGS ARE COMPRESSED TO THE BODY, AND THE BEAK FITS SNUGLY INTO A VENTRAL GROOVE. THE COLOR PATTERN IS SOMEWHAT VARIABLE, DEPENDING PARTIALLY ON AGE. THE BASIC PATTERN IS MADE UP OF COLORED SCALES AND IS USUALLY SIMILAR TO THAT SHOWN IN FIG. 1. THE COLOR VARIES FROM REDDISH TO GREYISH WITH VARIABLE LIGHT MARKINGS AS SHOWN. SPECIMENS CAN BE READILY SEXED; THE FEMALE HAS AN ELEVATED RIDGE AT THE PYGIDIAL APEX WHICH IS MERELY ROUNDED IN THE MALE.

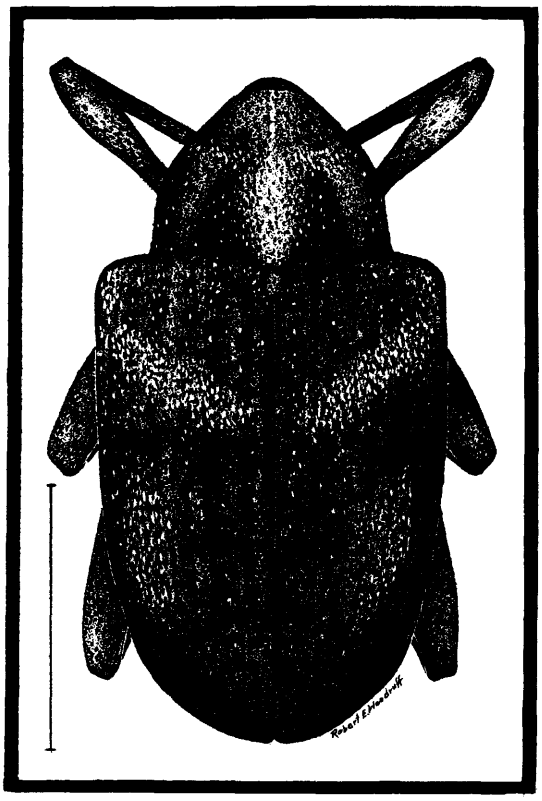

FIG. 1. ADULT STERNOCHETUS MANGIFERAE (FAB.) FROM HAWAII (LINE EQUALS 3 MM.)

BIOLOGY: THE LITERATURE ON THIS SPECIES IS CONTRADICTORY ON SEVERAL ASPECTS OF ITS BIOLOGY, POSSIBLY DUE TO CONFUSION WITH 2 OTHER SIMILAR SPECIES. THE MOST EXTENSIVE STUDY HAS BEEN IN HAWAII (BALOCK & KOZUMA, 1964), WHERE ONLY S. MANGIFERAE OCCURS. THE FOLLOWING ACCOUNT IS DRAWN PRIMARILY FROM THIS REFERENCE.

EGGS ARE LAID SINGLY ON ALL AREAS OF HALF MATURE (GREEN) TO RIPE MANGO FRUIT. OVIPOSITION HAS BEEN NOTED IN THE LABORATORY IN SUBDUED LIGHT IN EARLY MORNING AND IN EARLY EVENING AFTER DUSK. THE FEMALE COVERS EACH EGG WITH A BROWN EXUDATE AND THEN CUTS A CRESCENT SHAPED AREA (1/4 TO 1/2 MM) IN THE FRUIT NEAR THE POSTERIOR END OF THE EGG. THE WOUND CREATES A SAP FLOW, WHICH SOLIDIFIES AND COVERS THE EGG WITH A PROTECTIVE OPAQUE COATING. EGGS HATCH IN FROM 5 TO 7 DAYS, PARTLY DEPENDENT ON TEMPERATURE. ONE FEMALE MAY LAY 15 EGGS PER DAY, WITH A MAXIMUM OF 300 OVER A 3-MONTH PERIOD.

THE NEWLY HATCHED LARVA (ABOUT 1 MM LONG) BURROWS THROUGH THE PULP AND INTO THE SEED. MINIMUM TIME FROM HATCHING TO SEED PENETRATION IS ONE DAY. THERE ARE AT LEAST 5 LARVAL INSTARS IN HAWAII. LARVAE CAN PENETRATE THE SEED COAT EASIER ON YOUNGER FRUIT OF ALL VARIETIES, AND APPARENTLY FIND ENTRY IMPOSSIBLE ON MATURE SEED OF SOME VARIETIES (E.G. ITAMARACA).

PUPATION USUALLY OCCURS WITHIN THE SEED, ALTHOUGH THIS SOMETIMES HAPPENS IN THE FLESH (BALOCK, 1961). DURATION OF THE PUPAL STAGE IS ABOUT 7 DAYS. NEWLY FORMED PUPAE ARE NEARLY WHITE, BUT CHANGE TO A VERY LIGHT RED SHORTLY BEFORE THE ADULT ECLOSES.

OFTEN ONLY ONE ADULT WILL MATURE IN EACH SEED, BUT AS MANY AS 6 HAVE RARELY BEEN RECORDED. THE WEEVILS ARE NOCTURNAL, BUT HAVE ONLY INFREQUENTLY BEEN COLLECTED SINGLY IN ULTRAVIOLET LIGHT TRAPS. FLIGHT HAS NOT BEEN OBSERVED, BUT WELL DEVELOPED WINGS ARE PRESENT, AND SPECIMENS HAVE BEEN TAKEN IN INVAGINATED (MCPHAIL) FRUIT FLY TRAPS. WHEN DISTURBED THEY DROP TO THE GROUND AND REMAIN MOTIONLESS. ADULTS HAVE SURVIVED IN A CORK-STOPPERED VIAL WITHOUT FOOD FOR 40 DAYS AND FOR 21 MONTHS WITH FOOD AND WATER. ADULTS HYBERNATE BY THE HUNDREDS DURING NON-FRUITING PERIODS. IN HAWAII THERE APPEARS TO BE A PRE-OVIPOSITION DIAPAUSE FOR ADULTS EMERGING IN MAY, OR LATER, WHICH IS BROKEN ABOUT THE FIRST OF THE YEAR (COINCIDING WITH ONSET OF REGULAR MANGO FRUITING). ONSET OF DIAPAUSE SEEMS TO BE ASSOCIATED WITH LONG-DAY PHOTOPERIOD, AND THE BREAK WITH SHORT-DAY PHOTOPERIOD (BALOCK & KOZUMA).

HOSTS: THIS SPECIES HAS NOT BEEN REPORTED DEVELOPING IN ANY HOST EXCEPT MANGO, MANGIFERA INDICA L. IN THE LABORATORY, OVIPOSITION HAS BEEN OBTAINED ON POTATOES, PEACH, LITCHI, PLUM, STRING BEANS, AND SEVERAL VARIETIES OF APPLE. HOWEVER, NONE OF THE RESULTING LARVAE REACHED MATURITY.

TAXONOMY: THE GENERIC NAME USED IN MUCH OF THE OLDER LITERATURE IS CRYPTORHYNCHUS, BUT BUCHANAN (1939) DESIGNATED C. MANGIFERAE F. AS THE GENOTYPE OF STERNOCHETUS PIERCE. WARNER (1956) USED STERNOCHETUS,

1/ CONTRIBUTION NO. 175, BUREAU OF ENTOMOLOGY

2/ APPRECIATION IS EXPRESSED TO THE HAWAIIAN DEPT. AGR. FOR FURNISHING SPECIMENS.

BUT THERE IS STILL SOME QUESTION AS TO THE PROPER NAME TO USE UNTIL THE INTERNATIONAL COMMISSION ON ZOOLOGICAL NOMENCLATURE ACTS ON AN APPLICATION (KISSINGER, 1964).

CONTROL: THE FOLLOWING INFORMATION IS TAKEN FROM BALOCK & KOZUMA (1964) ON CONTROL IN HAWAII: GAMMA RADIATION IS THE MOST EFFECTIVE METHOD FOR KILLING OR STERILIZING WEEVILS WITHIN FRUIT. METHYL BROMIDE FUMIGATION AT THE RATE OF 2 POUNDS PER 1000 CU. FT. FOR 8 HOURS AT 70 F. GAVE COMPLETE KILL OF ALL STAGES BUT INJURED THE FRUIT. LOW TEMPERATURE STORAGE AT 10 F. FOR 5 DAYS OR AT 20 F. FOR 24 DAYS KILLED ALL STAGES BUT INJURED THE FRUIT. BIWEEKLY SPRAYS, APPLIED DURING RIPENING, OF DDT, EPN, DILAN, PARATHION, AND PARATHION PLUS HYDROLYZED PROTEIN WERE INEFFECTIVE IN REDUCING WEEVIL INFESTATION.

DISTRIBUTION: IT IS FOUND IN ALL THE MAJOR MANGO PRODUCING AREAS OF THE WORLD (EXCEPT NORTH, CENTRAL, AND SOUTH AMERICA AND THE WEST INDIES): AUSTRALIA (QUEENSLAND), BURMA, CEYLON, CHAGOS ISLANDS, GABON, INDIA, JAVA, KENYA, LABUAN, MADAGASCAR, MAURITIUS, MALAYA, MOZAMBIQUE, NEW CALEDONIA, PAKISTAN, PHILIPPINES, REUNION, SEYCHELLES, SOUTH AFRICA, TANGANYIKA, UGANDA, VIETNAM, WALLIS ISLAND, ZANZIBAR, AND WAS INTRODUCED INTO HAWAII ABOUT 1905 (COMMONWEALTH INST. ENT., 1964).

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