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ORANGE SPINY WHITEFLY, ALEUROCANTHUS SPINIFERUS (QUAINTANCE) (HOMOPTERA: ALEYRODIDAE)[1]

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SYNONYMY: ALEURODES SPINIFERA QUAINTANCE 1903:63.
ALEUROCANTHUS SPINIFERUS (QUAINTANCE), QUAINTANCE AND BAKER 1917:351.

INTRODUCTION: THE ORANGE SPINY WHITEFLY, ALEUROCANTHUS SPINIFERUS (QUAINTANCE), WAS RECORDED BY KUWANA (1928) AS THE MOST DESTRUCTIVE ALEYRODID ATTACKING CITRUS IN TROPICAL ASIA. EXPERTS CONSIDER IT TO BE THE MOST IMPORTANT OF 4 OR MORE SPECIES OF WHITEFLIES ATTACKING CITRUS IN JAPAN, AND IT WAS RATED BY CLAUSEN (1927) AS THE SEVENTH MOST IMPORTANT CITRUS INSECT IN JAPAN. A HEAVY OUTBREAK ON CITRUS IN THE KYUSHU AREA OF THAT COUNTRY CAUSED GREAT DAMAGE TO TREES AND LOSS OF FRUIT UNTIL IT WAS BROUGHT UNDER CONTROL IN THE 1920'S BY A PARASITIC WASP, PROSPALTELLA SMITHI SILVESTRI. CLAUSEN (1934) REPORTED THAT ANOTHER GREGARIOUS PARASITE OF A. SPINIFERUS IN TROPICAL ASIA WAS AMITUS HESPERIDUM VARIIPES SILVESTRI, WHICH OVIPOSITS IN THE YOUNG LARVAE IMMEDIATELY AFTER HATCHING AND BEFORE THEY BECOME FIXED TO THE LEAF. MORE RECENTLY, A. SPINIFERUS BECAME THE MOST SERIOUS PEST OF CITRUS ON THE ISLAND OF GUAM UNTIL BROUGHT UNDER CONTROL BY THE INTRODUCTION OF PARASITES IN 1952 (CEIR 9(17):321-322. 1959). IN 1974 SPINIFERUS WAS DISCOVERED IN HAWAII ON THE ISLAND OF OAHU WHERE IT RAPIDLY BECAME A PRINCIPAL PEST. RECENTLY, LABORATORY-REARED SHIPMENTS OF A PARASITIC WASP, AMITUS HESPERIDUM SILVESTRI, WERE INTRODUCED INTO HAWAII FROM MEXICO WHERE THIS WASP HAD BEEN CULTURED FOR THE CONTROL OF THE CITRUS BLACKFLY, ALEUROCANTHUS WOGLUMI ASHBY; AMITUS HESPERIDUM HAD BEEN INTRODUCED INTO MEXICO FROM INDIA IN 1950. THE USDA AGRICULTURAL RESEARCH SERVICE RECENTLY PREDICTED THAT SOON IT WILL BE REARING 100,000 OF THESE PARASITES A WEEK AT THEIR LABORATORY IN TAMAULIPAS, MEXICO, WITH AN EVENTUAL CAPACITY OF 1 MILLION PARASITES PER WEEK. HEAVY INFESTATIONS OF A. SPINIFERUS CAUSE A RAPID DETERIORATION OF THE TREES AND CROP FAILURE TO ALL CITRUS VARIETIES AND MAY LEAD TO TREE MORTALITY. DAMAGE IS DONE BY ADULT AND LARVAL WHITEFLIES WHICH SUCK SAP FROM THE LEAVES AND BY THE FORMATION OF SOOTY MOLD WHICH DEVELOPS ON THE HONEYDEW THEY SECRETE. SOOTY MOLD INTERFERES WITH PHOTOSYNTHESIS. A. SPINIFERUS HAS NOT BEEN INTRODUCED INTO THE WESTERN HEMISPHERE, BUT IT POSES A VERY SERIOUS POTENTIAL THREAT TO THE CITRUS INDUSTRY OF THIS REGION.

DISTRIBUTION: JAPAN, FORMOSA, PHILIPPINE ISLANDS, CHINA, INDIA, INDONESIA (SUMATRA, JAVA), MALAYA, GUAM, EAST AFRICA, AND HAWAII. IT HAS BEEN RECORDED BY SEVERAL AUTHORS FROM JAMAICA, BUT APPARENTLY THESE RECORDS WERE BASED ON MISIDENTIFICATIONS, ACCORDING TO LOUISE M. RUSSELL OF THE U. S. NATIONAL MUSEUM OF NATURAL HISTORY. JAMAICA RECORDS RESULTED FROM CONFUSION OF A. SPINIFERUS WITH A CLOSELY RELATED SPECIES, A. WOGLUMI, WHICH WAS FIRST DISCOVERED IN JAMAICA IN 1913 FOLLOWING ITS INTRODUCTION FROM ASIA.

HOSTS: CITRUS (CITRUS), AKEBIA (AKEBIA), PERSIMMON (DIOSPYROS), PEAR (PYRUS), ROSE (ROSA), GRAPE (VITIS), AND BALM-TREE (MYROXYLON).

LIFE HISTORY AND HABITS: "EGGS ARE LAID IN SPIRALS ON LOWER SURFACE OF LEAVES, USUALLY 12 OR 13 IN A MASS. EGGS ARE PALE-YELLOW AT FIRST, THEN GRADUALLY DARKEN. INCUBATION VARIES, DEPENDING ON TEMPERATURE, AND AVERAGES 22 DAYS IN MAY; 7 IN JULY. THERE ARE 4 IMMATURE STAGES. THERE ARE 4 BROODS A YEAR AT NAGASAKI, JAPAN. THE INSECT PASSES THROUGH THE WINTER IN THE THIRD LARVAL STAGE, REACHING THE PUPAL STAGE ABOUT THE MIDDLE OF MARCH. ADULTS EMERGE FROM MIDDLE TO THE END OF APRIL. ADULTS OF THE SECOND BROOD EMERGE THE LATTER PART OF JUNE, THE THIRD BROOD THE FIRST PART OF AUGUST AND THE FOURTH DURING THE LATTER PART OF SEPTEMBER. ADULTS ARE ACTIVE ON FINE DAYS BUT QUIET DURING CLOUDY OR RAINY WEATHER. THEY PREFER NEW LEAVES AND MAY BE FOUND ON THE UNDERSIDE OF THESE." (CEIR 9(17):321-322. 1959). THERE ARE POSSIBLY 3 TO 6 GENERATIONS PER YEAR. A FEMALE MAY LAY CONSIDERABLY MORE THAN 100 EGGS IN A LIFETIME.

IDENTIFICATION: ADULT FEMALE, APPROXIMATELY 1.35 MM LONG, ORANGE-YELLOW, SHADED WITH BROWNISH PURPLE AND SPRINKLED WITH WHITE WAXY POWDER; COLOR PATTERN OF WINGS VARIABLE (FIG. 1). MALE GENITALIA (FIG. 2) USEFUL FOR SEPARATING ADULTS OF RELATED SPECIES, BUT WHITEFLY IDENTIFICATION IS BASED PRIMARILY ON DIFFERENCES IN LARVAE AND PUPAE, ESPECIALLY THE LATTER. LARVAE AND PUPAE CHARACTERISTICALLY ALEYRODID IN SHAPE, BUT QUITE SPINY. LARVA REGULARLY ELLIPTICAL, APPEARING BROWNISH TO BLACK ON LEAF, WITH COTTONY FRINGE OF WAX ALL AROUND. PUPA TYPICALLY ALEYRODID IN SHAPE, BUT MEDIAN AREA PROMINENT ESPECIALLY AT VASIFORM ORIFICE. FEMALE PUPA ABOUT 1.23 MM LONG BY 0.88 MM WIDE, MALE PUPA SMALLER. PUPA OF A. SPINIFERUS (FIG. 3, A-D) VERY SIMILAR IN APPEARANCE TO CLOSELY RELATED SPECIES, A. WOGLUMI (FIG. 4, A-D), BUT DIFFERS IN HAVING NARROWER MARGINAL TEETH AND IN NUMBER, SIZE, AND ARRANGEMENT OF DORSAL SPINES.

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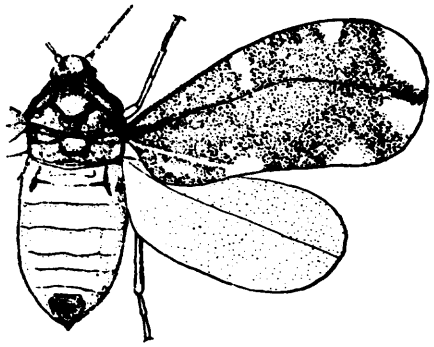

FIG. 1. ALEUROCANTHUS SPINIFERUS (QUAINTANCE), ADULT

FIG. 2. A. SPINIFERUS, MALE GENITALIA

FIG. 5. INFESTATION ON CITRUS LEAF BY A. SPINIFERUS

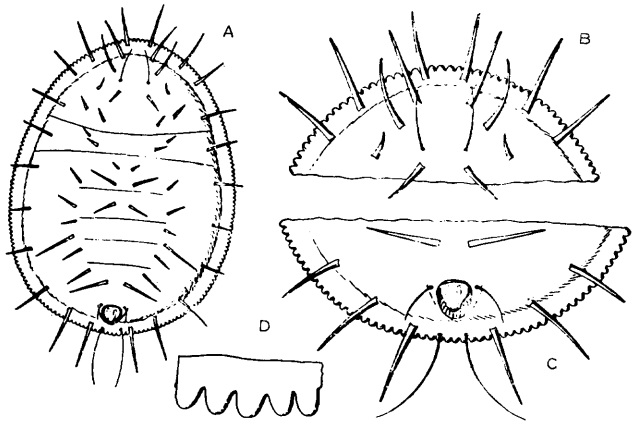

FIG. 3. ALEUROCANTHUS SPINIFERUS: A. PUPA CASE, DORSAL VIEW; B. ANTERIOR PART OF PUPA CASE; C. POSTERIOR PART OF PUPA CASE; D. LATERAL MARGIN OF PUPA, MUCH ENLARGED

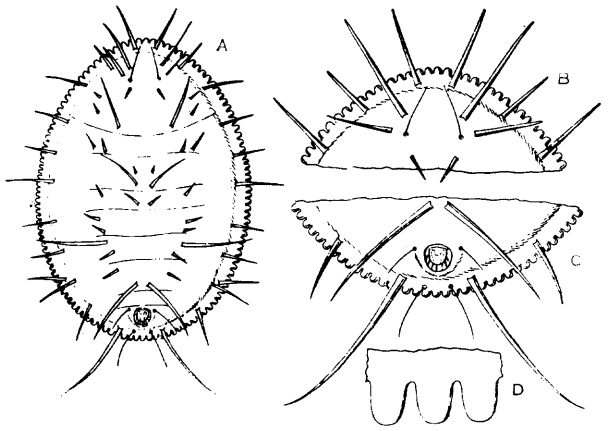

FIG. 4. ALEUROCANTHUS WOGLUMI: A. PUPA CASE, DORSAL VIEW; B. ANTERIOR PART OF PUPA CASE; C. POSTERIOR PART OF PUPA CASE; D. LATERAL MARGIN OF PUPA, MUCH ENLARGED

FIGURES (EXCEPT FIG. 5) FROM KUWANA, 1928.