

CAMPHOR SCALE (PSEUDAONIDIA DUPLEX (COCKERELL))¹
(HOMOPTERA: COCCIDAE)
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INTRODUCTION: CAMPHOR SCALE PROBABLY WAS INTRODUCED INTO GRAND BAY, ALABAMA IN 1911 ON SATSUMA (CITRUS RETICULATA BLANCO) NURSERY STOCK DIRECTLY FROM JAPAN. IN 1922 THE STATE PLANT BOARD OF FLORIDA INVESTIGATED AN OUTBREAK OF THIS SCALE IN NEW ORLEANS, LOUISIANA, IN CONJUNCTION WITH THE FEDERAL HORTICULTURAL BOARD INSPECTOR AND THE LOUISIANA SUGAR EXPERIMENT STATION ENTOMOLOGIST. THE SURVEY DISCLOSED THE FOLLOWING FACTS: 4 SQUARE MILES OF THE CITY WERE INFESTED; THERE WERE OVER 100 HOST PLANTS OF THE SCALE; THE LIFE CYCLE REQUIRED ONLY 30 DAYS; THE SCALE CAUSED GREAT DAMAGE TO CAMPHOR TREES, FREQUENTLY KILLING TWIGS, LARGE LIMBS, AND BRANCHES. THE FIRST FLORIDA RECORD WAS IN 1958 FROM DELAND, VOLUSIA COUNTY, FLORIDA, ON CHINESE RICE PAPER PLANT, TETRAPANAX PAPYRIFERUS KOCH. THE SCALES WERE COLLECTED BY PLANT INSPECTORS C. R. ROBERTS AND R. J. GRIFFITH. A SECOND COLLECTION WAS MADE IN 1960 IN A GAINESVILLE, ALACHUA COUNTY, FLORIDA NURSERY BY PLANT INSPECTORS A. E. GRAHAM AND K. P. BRAGDON. FOLLOWING THE GAINESVILLE COLLECTIONS, A SURVEY FOR THIS SCALE WAS INITIATED BY P. E. FRIERSON, CHIEF PLANT INSPECTOR, DIVISION OF PLANT INDUSTRY.

DESCRIPTION AND FIELD OBSERVATIONS: THE ADULT FEMALE ARMOR IS CIRCULAR, CONVEX, THICK, BROWNISH WITH A GRAYISH CAST, OPAQUE, AND 2.5-3 MM IN DIAMETER. THE EXUVIAE IS SUBMARGINAL AND BRONZE IN COLOR (FIG. 1 AND FIG. 2). THE MALE ARMOR IS ELONGATE-OVAL, FLAT, THIN, AND BROWN WITH A PURPLISH TINGE; EXUVIAE MARGINAL OR SUBMARGINAL (FIG. 2). THE FEMALE SCALE OCCURS PRIMARILY ON THE TWIGS AND FRUIT BUT IS FREQUENTLY FOUND ON THE LEAVES. THE MALE SCALE IS FOUND ALMOST ENTIRELY ON THE LEAVES ALONG THE MIDRIB.



FIG. 1: FEMALE ARMOR OF CAMPHOR SCALE (PSEUDAONIDIA DUPLEX (CKLL.)) ON STEM OF FIG (FICUS CARICA L.). ENLARGED 5 TIMES.

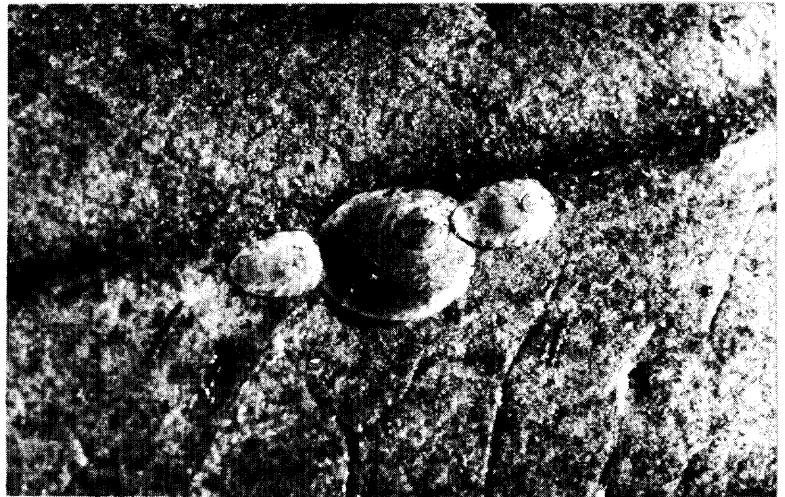


FIG. 2: FEMALE ARMOR OF CAMPHOR SCALE (PSEUDAONIDIA DUPLEX (CKLL.)) ON CITRUS LEAF BRACKETED BY MALE SCALE ARMORS. ENLARGED ABOUT 8 TIMES.

ECONOMIC IMPORTANCE: CAMPHOR SCALE HAS BEEN COLLECTED TO DATE 167 TIMES ON 51 DIFFERENT HOST PLANTS IN 15 FLORIDA COUNTIES. THE SCALE APPARENTLY HAS BEEN ESTABLISHED IN FLORIDA FOR MANY YEARS AND NO SERIOUS DAMAGE HAS RESULTED TO PLANTS FOUND INFESTED. PARASITIZED SPECIMENS ARE COMMON ON SAMPLES SUBMITTED FOR DETERMINATION TO THE ENTOMOLOGY SECTION.

CONTROL ON ORNAMENTALS: DIMETHOATE (CYGON) 43.5% EC AT 1/8 PINT TO 12 1/2 GALLONS OF WATER, OR ETHION 46% EC AT 1/8 PINT PLUS 1/2 PINT OIL EMULSION 80-90% TO 12 1/2 GALLONS OF WATER, OR MALATHION 57% EC AT 1/4 PINT TO 12 1/2 GALLONS OF WATER. CYGON HAS CAUSED INJURY TO SOME OF THE ORNAMENTALS LISTED, INCLUDING BURFORD HOLLY AND CRAPE-MYRTLE. IF CONTROL IS NEEDED FOR FRUIT TREES CONTACT YOUR COUNTY AGENT. READ AND HEED LIMITATIONS AND PRECAUTIONS GIVEN ON MANUFACTURERS' LABELS.

¹ CONTRIBUTION No. 42, ENTOMOLOGY SECTION

DISTRIBUTION IN FLORIDA: ALACHUA, BAKER, DUVAL, ESCAMBIA, HILLSBOROUGH, LAKE, LEON, MARION, ORANGE, PASCO, PINELLAS, POLK, PUTNAM, SEMINOLE, AND VOLUSIA COUNTIES (SEE FIG. 3).

HOSTS IN FLORIDA: DOG APPLE (ASIMINA), ARROWROOT (MARANTA ARUNDENACEA L.), WAFER ASH OR COMMON HOPTREE (PTELEA TRIFOLIATA L.), AVOCADO (PERSEA AMERICANA MILL.), AZALEA (RHODODENDRON), BOXWOOD (BUXUS), CAMELLIA

JAPONICA L. AND C. SASANQUA THUNB., CAMPHOR TREE (CINNAMOMUM), CHERRYLAUREL (PRUNUS), CRAPE-MYRTLE (LAGERSTROEMIA INDICA L.), CHINESE ELM (ULMUS PARVIFOLIA JACQ.), FIG (FICUS CARICA L.), FIRETHORN (PYRACANTHA COCCINEA ROEM.), GRAPE (VITIS), GRAPEFRUIT (CITRUS PARADISI MACF.), GUAVA (PSIDIUM), HOLLY (ILEX), IVY (HEDERA), JASMINE (JASMINUM GRACILLIMUM HOOK. F.), CONFEDERATE JASMINE (TRACHELOSPERMUM JASMINOIDES LEM.), JERUSALEM THORN (PARKINSONIA ACULEATA L.), JUDAS TREE (CERCIS CANADENSIS L.), KUDZU-VINE (PUERARIA THUNBERGIANA BENTH.), LIGUSTRUM, LOQUAT (ERIOBOTRYA JAPONICA THUNB.), MAHONIA, OAK (QUERCUS), AUSTRALIAN SILKOAK (GREVILLEA), OLEANDER (NERIUM), OLIVE (OSMANTHUS), SOUR ORANGE (CITRUS AURANTIUM L.), SWEET ORANGE (CITRUS SINENSIS OSBECK), PEACH (PRUNUS PERSICA BATSCH), PEAR (PYRUS), PHOTINIA SERRULATA LINDL., AUSTRALIAN PINE (CASUARINA), GOLDEN RAIN TREE (KOELREUTERIA PANICULATA LAXM.), SATSUMA (CITRUS RETICULATA BLANCO), SUMAC (RHUS), COMMON TEA (THEA SINENSIS L.), VIBURNUM SUSPENSUM LINDL., WHITE HONEYSUCKLE (LONICERA), AND WISTERIA.

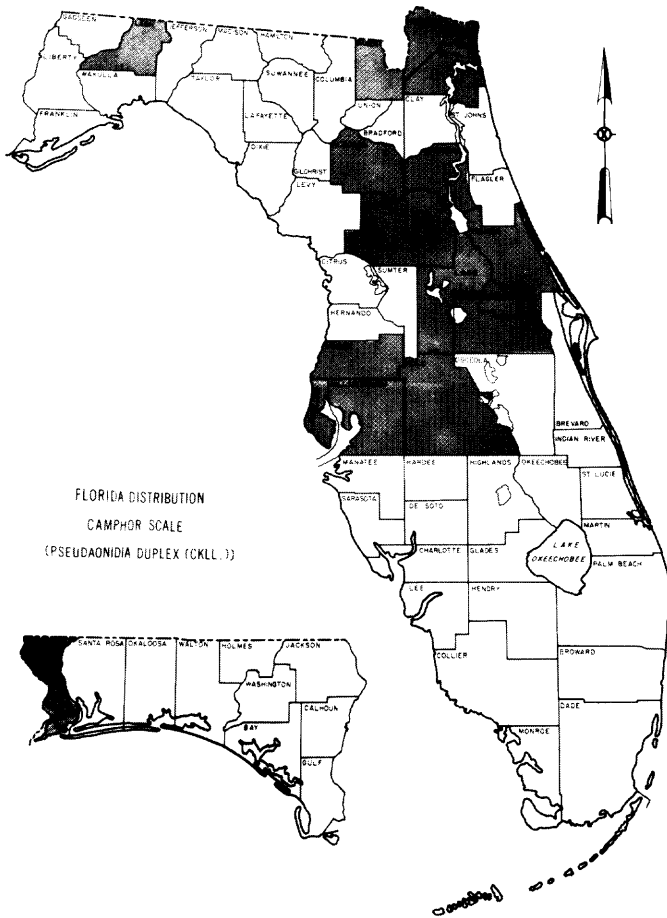


FIG. 3: FLORIDA DISTRIBUTION OF CAMPHOR SCALE (PSEUDAONIDIA DUPLEX (CKLL.))

LITERATURE CITED:

- DOZIER, H. L. - REPORT ON CAMPHOR SCALE SITUATION AT GRAND BAY, ALABAMA. UNPUBLISHED. MANUSCRIPT FILE, FLORIDA DEPT. OF AGR., DIV. OF PLANT IND.
- O'BYRNE, F. M. 1922. JAPANESE CAMPHOR SCALE REPORT. UNPUBLISHED. MANUSCRIPT FILE, FLORIDA DEPT. OF AGR., DIV. OF PLANT IND.