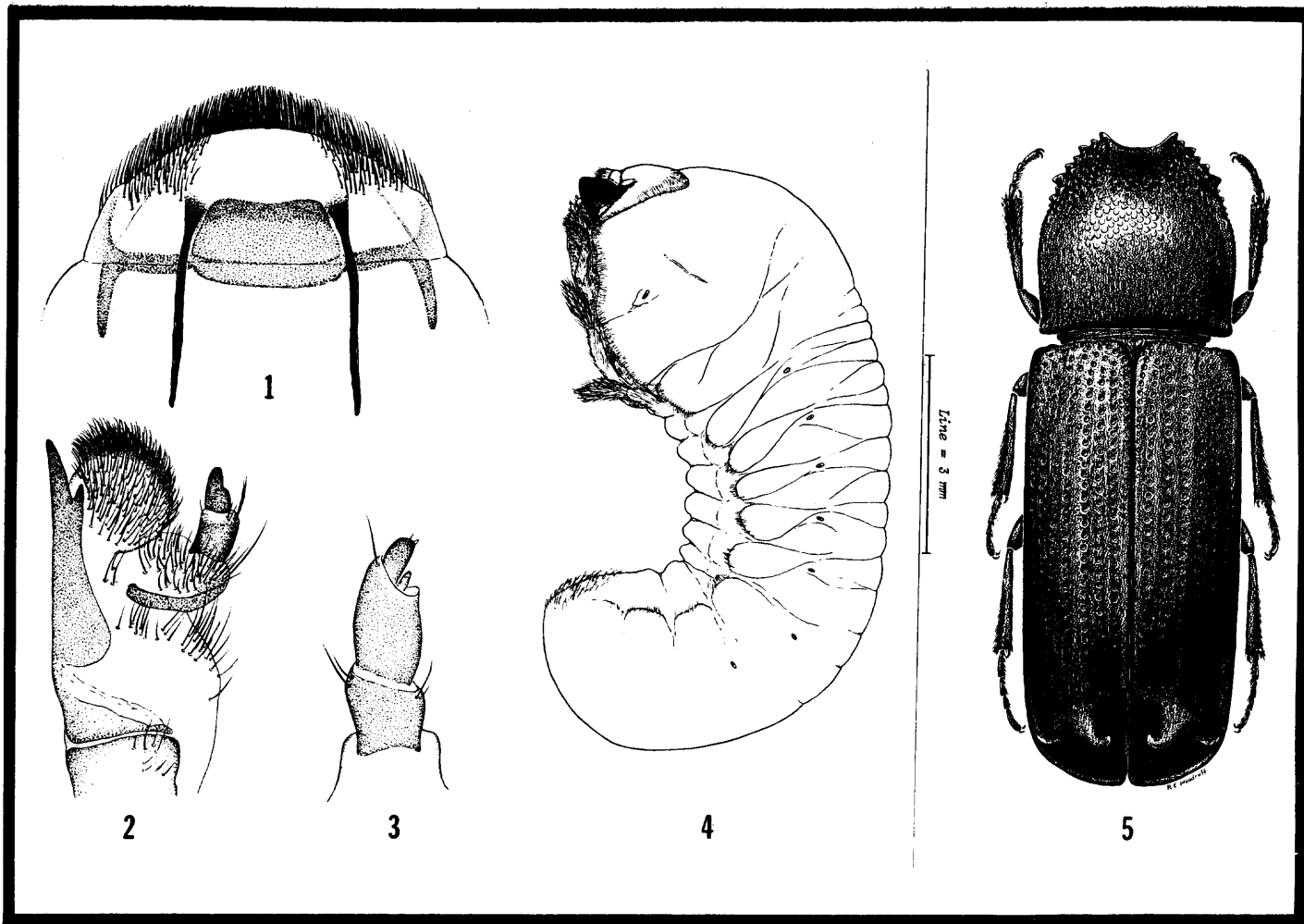


AN ORIENTAL WOOD BORER, HETEROBOSTRYCHUS AEQUALIS (WATERHOUSE),  
RECENTLY ESTABLISHED IN FLORIDA

(COLEOPTERA: BOSTRICHIDAE)<sup>1/</sup>

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**INTRODUCTION:** IN JANUARY, 1967, SPECIMENS OF A WOOD BORING BEETLE WERE COLLECTED IN OAK LUMBER AT FT. LAUDERDALE, FLORIDA, BY R. F. McGRANAHAN AND FORWARDED FOR IDENTIFICATION TO DR. L. A. HETRICK, DEPT. OF ENTOMOLOGY, UNIVERSITY OF FLORIDA. THESE WERE LATER IDENTIFIED BY THE AUTHOR AS HETEROBOSTRYCHUS AEQUALIS (WATERHOUSE), A SPECIES NOT PREVIOUSLY KNOWN TO BE ESTABLISHED IN THE UNITED STATES (FISHER, 1950). SINCE THIS SPECIES IS A SERIOUS PEST OF LUMBER AND NEARLY ALL WOOD PRODUCTS, A SURVEY WAS IMMEDIATELY CONDUCTED BY THE DIVISION OF PLANT INDUSTRY AND THE U. S. DEPARTMENT OF AGRICULTURE TO DETERMINE THE EXTENT OF THE INFESTATION. SUBSEQUENT INSPECTIONS OF LUMBER YARDS HAVE REVEALED ADDITIONAL INFESTATIONS IN THE FT. LAUDERDALE AND MIAMI AREAS. A SINGLE ADULT SPECIMEN, IDENTIFIED RECENTLY, WAS COLLECTED NEAR HALLANDALE, FLORIDA, 17-VII-62, H. V. WEEMS, JR., IN AN OAK HAMMOCK. APPARENTLY THE SPECIES IS NOW ESTABLISHED, ALTHOUGH NOT WIDELY DISTRIBUTED, IN FLORIDA.



HETEROBOSTRYCHUS AEQUALIS (WATERHOUSE). FIG. 1-4: THIRD INSTAR LARVA; FIG. 5: ADULT MALE; 1) EPIPHARYNX; 2) LEFT MAXILLA (VENTRAL); 3) LEFT ANTENNA (VENTRAL); 4) LARVA (LATERAL).

**DESCRIPTION:** THE ADULT BEETLES (FIG. 5) ARE ELONGATE, CYLINDRICAL, REDDISH BROWN TO BROWNISH BLACK, MODERATELY SHINING, WITHOUT DORSAL PUBESCENCE; LENGTH 6-13MM; WIDTH 2-3.5MM. HEAD NOT VISIBLE FROM ABOVE, RECESSED BENEATH THE PRONOTUM. PRONOTUM STRONGLY CONVEX, QUADRATE, ARCUATELY EMARGINATE IN FRONT, THE SIDES WITH BROAD TOOTH-LIKE PROJECTIONS ON ANTERIOR ONE-HALF, CONVERGING TO PLATE-LIKE SCULPTURE ON THE CENTRAL AREA; STRONGLY DEFLEXED ON APICAL HALF, THE POSTERIOR ANGLES PROJECTING. THE ELYTRA ARE NEARLY TUBULAR IN SHAPE UNTIL THE POSTERIOR 1/10 WHERE THEY ABRUPTLY DESCEND TO THE ABDOMEN. THIS AREA, CALLED APICAL DECLIVITY, SOMEWHAT EXCAVATED AND VARIABLE BETWEEN THE SEXES; THE MALES (FIG. 5) POSSESS TWO INCURVED, HOOK-LIKE PROJECTIONS (NOT IN ♀) AS WELL AS AN ADDITIONAL SMALLER, HIGHLY VARIABLE, TUBERCLE NEAR THE SIDES. SURFACE DENSELY, DEEPLY PUNCTATE, THE PUNCTURES ARRANGED IN FAIRLY DISTINCT ROWS, BUT SOMEWHAT VARIABLE IN SHAPE AND EXTENT, ESPECIALLY NEAR THE APICAL DECLIVITY.

THE LARVA (FIG. 4) IS WHITE TO YELLOWISH, WITH A CHARACTERISTIC BOSTRICHID SHAPE, VARIABLE IN SIZE WITH MOST LAST INSTARS AVERAGING 10MM. THE MANDIBLES ARE BLACK, CONICAL AND THE DARKEST AREA ON THE LARVA. SETATION SPARSE AND PALE, NOT READILY VISIBLE TO THE UNAIDED EYE. THE ANTENNA IS SHOWN IN FIG. 3. THE EPIPHARYNX (FIG. 1) POSSESSING POSTERIOR PROJECTIONS AND A CHARACTERISTIC SETAL PATTERN. THE MAXILLA IS SHOWN IN FIG. 2.

**BIOLOGY:** ALL STAGES ARE FOUND IN DRY LUMBER WHICH IS EATEN BY THE ADULTS AND LARVAE. THE LIFE CYCLE IN FLORIDA HAS NOT BEEN STUDIED, BUT IN INDIA IT IS AS FOLLOWS (BEESON & BHATIA, 1937): THE EGGS ARE DEPOSITED ON ROUGH SURFACES OF SAWED LUMBER AND LOGS, IN HOLES, CRACKS OR SHORT TUNNELS MADE BY THE FEMALE. THE LARVAL BORINGS MAY BE 1/4 INCH WIDE, WINDING FOR SEVERAL INCHES. THE TUNNELS ARE USUALLY FILLED WITH TIGHTLY PACKED, FINE, SAWDUST-LIKE MATERIAL (FIG. 6) WHICH IS CHARACTERISTIC OF THIS GENUS. TUNNELS OF MOST PINHOLE AND SHOTHOLE BORERS CONTAIN VERY LITTLE SUCH MATERIAL. PUPATION OCCURS IN A CELL AT THE END OF THE TUNNEL. THE ADULT EMERGES THROUGH AN EXIT HOLE, OFTEN AFTER CHEWING THROUGH A FEW INCHES OF WOOD. LENGTH OF DEVELOPMENT FROM EGG TO ADULT IS VARIABLE FROM ONE TO SEVERAL YEARS (UP TO 6 YEARS RECORDED). APPARENTLY THEY CAN SURVIVE UNDER DRY CONDITIONS PRESENT IN MANUFACTURED WOOD PRODUCTS AND EMERGE SEVERAL YEARS LATER, AS DO SOME OF THE CERAMBYCIDAE.

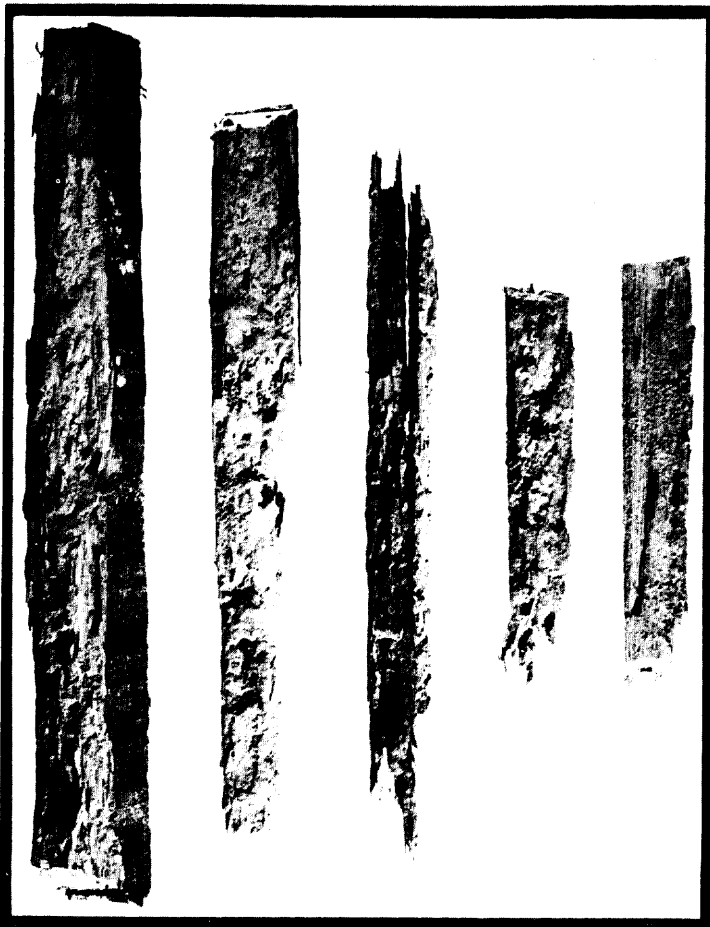


FIG. 6. DAMAGE TO MAHOGANY LUMBER, SHOWING TUNNELS PACKED WITH SAWDUST-LIKE MATERIAL.

**HOSTS:** IT IS PROBABLY NON HOST-SPECIFIC, AND HAS BEEN RECORDED FROM 35 SPECIES OF TREES INCLUDING THE FOLLOWING GENERA: ADINA, ALBIZZIA, ANISOPTERA, BAMBUSA, BOMBAX, BOSWELLIA, CANARIUM, CASSIA, CEDRELA, DALBERGIA, DENDROCALAMUS, DIPTEROCARPUS, ENDOSPERMUM, GARUGA, KOOMPASSIA, KYDIA, LANNEA, LEUCAENA, MANGIFERA, MORUS, PARASHOREA, PARISHIA, POINCIANA, PTEROCARPUS, QUERCUS, SHOREA, STERCVLIA, TECTONA, TERMINALIA, AND ANOGEISSUS. ONLY OAK AND PHILIPPINE MAHOGANY HAVE BEEN FOUND INFESTED IN FLORIDA.

**ECONOMIC IMPORTANCE:** IT IS APPARENTLY THE MOST COMMON OF THE LARGER FALSE POWDER-POST BEETLES IN INDIA AND PARTS OF SOUTHEAST ASIA. ITS HABIT OF BORING IN PACKING CASES, BOXES, PLYWOOD, FURNITURE AND LUMBER MAKE IT A SERIOUS PEST. IN HEAVY INFESTATIONS THE WOOD IS OFTEN REDUCED TO POWDER TO A DEPTH OF 2 TO 3 INCHES. IT IS A THREAT TO NEARLY ALL WOOD PRODUCTS, AND HAS EVEN BEEN RECORDED AS BORING INTO THE LEAD LININGS OF BOXES. IN HARDWOODS THE DAMAGE IS USUALLY CONFINED TO THE SAPWOOD, BUT MAY EXTEND DEEPER IN SOFT WOODS.

**DISTRIBUTION:** THE TYPE LOCALITY IS TIMOR LAUT ISLANDS; ADDITIONAL RECORDS INCLUDE INDOCHINA, MADAGASCAR, ANDAMAN AND MARIANA ISLANDS, INDIA, CEYLON, MALAYSIA, JAVA, PHILIPPINES, NEW GUINEA, CUBA, AND SURINAM. IN THE UNITED STATES IT HAS BEEN INTERCEPTED NUMEROUS TIMES IN 14 STATES. A SINGLE ADULT WAS FOUND AT A RESIDENCE IN HOUSTON, TEXAS, IN FEBRUARY, 1956, BUT SUBSEQUENT SURVEYS WERE NEGATIVE. IN FLORIDA IT APPEARS TO BE ESTABLISHED AT TWO LUMBER COMPANIES IN FT. LAUDERDALE AND ONE LUMBER YARD IN MIAMI; IT PROBABLY ALSO OCCURS IN THE WILD BETWEEN THESE POINTS.

**TAXONOMY:** SIXTY-THREE SPECIES OF THE FAMILY ARE RECORDED FOR THE U. S., AND TWENTY-NINE ADDITIONAL SPECIES HAVE BEEN INTERCEPTED BUT THEY HAVE NOT

BECOME ESTABLISHED (FISHER, 1950). THE GENUS HETEROBOSTRYCHUS CONTAINS ONLY ONE OTHER SPECIES (BRUNNEUS (MURRAY)) THAT HAS BEEN INTERCEPTED IN THE U. S. IT DIFFERS FROM AEQUALIS IN THE LACK OF HOOK-LIKE TUBERCLES AT THE APICAL DECLIVITY IN THE MALE AND IN THE PRESENCE OF SHORT RECUMBENT PUBESCENCE ON THE DORSAL SURFACE. H. UNCIPENNIS LESNE IS LISTED AS A SYNONYM OF H. AEQUALIS (FISHER, 1950).

**CONTROL:** LITTLE INFORMATION IS AVAILABLE ON INSECTICIDES WHICH MIGHT PROVIDE CONTROL. FUMIGATION (PREFERABLY UNDER PRESSURE) OR BURNING OF INFESTED LUMBER IS PROBABLY THE MOST SATISFACTORY PROCEDURE AT PRESENT.

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