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DIVISION OF PLANT INDUSTRY

KEY TO THE SPECIES OF BIGEYED BUGS, GEOCORIS SPP., IN FLORIDA HEMIPTERA: LYGAEIDAE [1]

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INTRODUCTION: BIGEYED BUGS ARE SMALL INSECTS (APPROXIMATELY 1/6 INCH LONG) THAT OCCUR IN MANY PARTS OF THE WORLD. THEY ARE GENERALLY REGARDED AS BENEFICIAL BECAUSE THEY PREY UPON NUMEROUS KINDS OF INSECT AND MITE PESTS OF TURF AND AGRICULTURAL CROPS SUCH AS COTTON, SOYBEAN, VEGETABLES, SUGARBEET, ALFALFA, AND TOBACCO. BIGEYED BUGS ARE AMONG THOSE INSECTS RECEIVING RESEARCH ATTENTION IN FLORIDA (AND ELSEWHERE) FOR THEIR VALUE AS PREDATORS. TO AID IN IDENTIFICATION OF BIGEYED BUGS IN FLORIDA, THE FOLLOWING KEY IS PROVIDED.

IDENTIFICATION: BIGEYED BUGS ARE SMALL, OBLONG-OVAL LYGAEIDS HAVING THE HEAD BROADER THAN LONG AND PROMINENT EYES WHICH CURVE BACKWARD AND OVERLAP THE FRONT OF THE PRONOTUM; THE TYLUS HAS A LONGITUDINAL GROOVE. THESE FEATURES CAN BE SEEN ON NYMPHS AS WELL AS ADULTS AND SERVE TO SEPARATE BIGEYED BUGS FROM SIMILAR BUGS. A DISTINGUISHING FEATURE OF ADULT BIGEYED BUGS IS THE VERY SHORT OR ABSENT CLAVAL COMMISSURE (FIG. 1). LYGAEIDS SUCH AS CHINCH BUGS (BLISSUS SPP.), FALSE CHINCH BUGS (NYSIUS SPP.), AND PAMERAS (PACHYBRACHIUS SPP.) ARE SOMETIMES CONFUSED WITH BIGEYED BUGS, BUT THESE GENERA HAVE A CLAVAL COMMISSURE APPROXIMATELY HALF AS LONG AS THE SCUTELLUM (FIG. 2). ALSO THE HEAD HAS MORE OF A TRIANGULAR SHAPE IN THESE LYGAEIDS. CAPLAN (1968) EMPHASIZED THE NEED FOR TURF SPECIALISTS TO DISTINGUISH BETWEEN BIGEYED BUGS AND CHINCH BUGS. MISIDENTIFICATION COULD RESULT IN A CHINCH BUG SPRAY DIRECTED AGAINST GEOCORINES, RESULTING IN NEEDLESS LOSS OF MONEY AND BENEFICIAL INSECTS.

THE FOLLOWING KEY TO GEOCORINES IN FLORIDA DOES NOT INCLUDE TWO SPECIES OF HYPOGEOCORIS, WHICH HAVE BEEN REPORTED IN FLORIDA BUT APPARENTLY ARE SCARCE OR RARE. SOME MINOR VARIATIONS IN GEOCORIS BULLATUS (SAY) AND G. ULIGINOSUS (SAY) HAVE BEEN FORMALIZED AS SUBSPECIES BUT WILL NOT BE CONSIDERED IN THIS CIRCULAR.

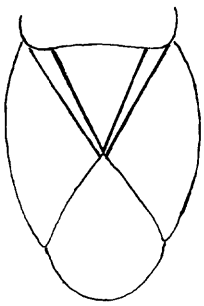

FIG. 1.
A BIGEYED BUG
GEOCORIS SP.

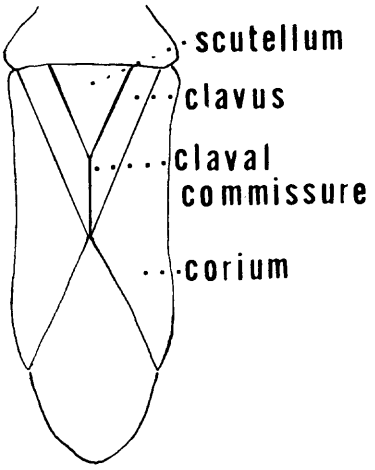

FIG. 2.
A PAMERA,
PACHYBRACHIUS SP.

FIG. 3.
A BIGEYED BUG,
GEOCORIS
ULIGINOSUS (SAY)

FIG. 4.
A BIGEYED BUG,
GEOCORIS
PUNCTIPES (SAY)

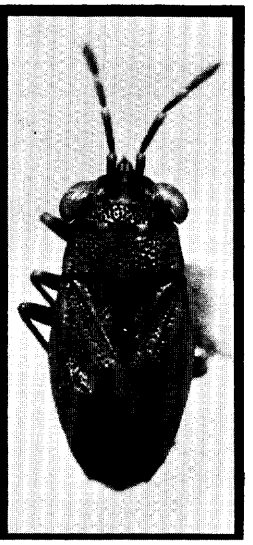

FIG. 5.
A BIGEYED BUG,
GEOCORIS
BULLATUS (SAY)

KEY TO SPECIES OF ADULT GEOCORINAE IN FLORIDA

1. BEAK WITH SEGMENT I (BASAL) LONGER THAN II; HEAD (EXCEPT IN G. PUNCTIPES) PUNCTULATE (WITH SMALL PITS) OR RUGULOSE (MINUTELY WRINKLED) ---------- (GEOCORIS) 2
1'. BEAK WITH SEGMENT I SUBEQUAL TO OR SHORTER THAN II; HEAD SMOOTH, IMPUNCTATE, SHINING ---------- (HYPOGEOCORIS)
2. NEARLY ALL BLACK ABOVE EXCEPT FOR PALE BORDER ALONG EACH SIDE; SCUTELLUM ENTIRELY BLACK (FIG. 3) ---------- G. ULIGINOSUS (SAY) 1832.
2'. MOSTLY PALE ABOVE; SCUTELLUM WITH A PAIR OF PALE AREAS OR SPOTS (FIG. 4 & 5) ---------- 3
3. SCUTELLUM WITH A PAIR OF PROMINENT, SMOOTH (IMPUNCTATE), CALLOUSED BASOLATERAL, PALE SPOTS, THE SPOTS SOMETIMES EXTENDING POSTERIORLY (EXTENSION PUNCTULATE); PRONOTUM WITH A PAIR OF SOMEWHAT LUNATE IMPUNCTATE CALLOSITIES, USUALLY SHINY BLACK BUT SOMETIMES INVADED BY VARIOUS AMOUNTS OF YELLOW; HEAD SMOOTH, POLISHED, NOT AT ALL GRANULOSE; INNER POSTERIOR MARGIN OF CORIUM NOT MARKED WITH FUSCOUS OR AT MOST WEAKLY SO; GROOVE OF TYLUS EXTENDING BACK ONTO VERTEX AND CROSSED NEAR MIDDLE BY AN ARCUATE, TRANSVERSE SULCUS (FIG. 6) LENGTH 3.5-4.2 MM (FIG.4) ---------- G. PUNCTIPES (SAY) 1832.
3'. SCUTELLUM WITH A PAIR OF PUNCTATE, NON-CALLOUSED, SUBMEDIAL, PALE-YELLOW AREAS; THE SHAPE AND EXTENT OF PALE AREAS VARIABLE BUT USUALLY OBLONG AND PARTIALLY ANGULATE; PRONOTUM WITH THE PAIR OF IMPUNCTATE CALLOSITIES NEARLY ROUND, PALE-YELLOW; HEAD GRANULOSE; INNER POSTERIOR MARGIN OF CORIUM MARKED WITH TWO FUSCOUS "SPOTS" THE POSTERIOR ONE LARGER; GROOVE OF TYLUS NOT EXTENDING BACK ONTO VERTEX; VERTEX LACKING TRANSVERSE SULCUS; LENGTH 3.0-3.5 MM; (FIG. 5) ---------- G. BULLATUS (SAY) 1832.

KEY TO LATE INSTAR NYMPHS OF FLORIDA SPECIES OF GEOCORIS

TO MAKE SURE A NYMPH IS A LYGAEID, CONSULT THE KEY BY HERRING AND ASHLOCK (1971) AND/OR THE ONE BY DECOURSEY (1971). TO KEY A LYGAEID NYMPH TO GENUS, CONSULT SWEET AND SLATER (1961).

1. DORSAL GROUND COLOR OF HEAD AND THORAX DARK BROWN (FIG. 7) ---------- G. ULIGINOSUS (SAY)
1'. DORSAL GROUND COLOR OF HEAD AND THORAX PALE (IRREGULAR DARK SPOTS OFTEN PRESENT) ---------- 2
2. MESOTHORACIC WING PADS (DEVELOPING FOREWINGS) EITHER UNMARKED OR WITH ONLY 1 APICAL BROWN SPOT; SCUTELLUM WITH 2 PAIRS OF LINEAR BROWN MARKS, SOMETIMES COALESCED INTO 1 LARGE PAIR, THESE MARKS BASOLATERAD; PRONOTUM USUALLY WITH 3 PAIRS OF BROWN SPOTS, VARIABLE IN SHAPE AND DEGREE OF PIGMENTATION, OFTEN INCONSPICUOUS; ANTENNAL SEGMENTS I-III EACH WITH PROMINENT DORSOAPICAL PALE SPOT (FIG. 8) ---------- G. BULLATUS (SAY)
2'. MESOTHORACIC WING PADS EACH WITH 4 OR 5 BROWN MARKS (USUALLY 3 BASAL STREAKS, 1 MIDDLE DOT, AND 1 PROMINENT APICAL SPOT); SCUTELLUM WITH 3-5 PAIRS OF DARK BROWN MARKS (USUALLY 4 PAIRS), THE MOST PROMINENT PAIR NEAR MIDDLE; PRONOTUM WITH 5-6 PAIRS OF CONSPICUOUS DARK BROWN IRREGULAR SPOTS; ANTENNAL SEGMENTS I-III EACH WITHOUT DORSOAPICAL PALE SPOT (FIG. 9) ---------- G. PUNCTIPES (SAY)

DISTRIBUTION: GEOCORIS BULLATUS IS WIDELY DISTRIBUTED IN THE UNITED STATES AND CANADA, FROM COAST TO COAST. THERE ARE NUMEROUS FLORIDA RECORDS FROM THE NORTHER BORDER SOUTH TO KEY WEST. G. PUNCTIPES IS PRIMARILY AN AUSTRORIPARIAN SPECIES COMMON THROUGHOUT FLORIDA AND RANGING FROM NEW JERSERY WEST TO SOUTHERN INDIANA AND COLORADO SOUTH AND SOUTHWEST TO TEXAS, ARIZONA, CALIFORNIA, AND MEXICO. OTHER LOCALITIES INCLUDE GUATAMALA, PANAMA, AND HAWAII. G. ULIGINOSUS RANGES OVER MOST OF THE UNITED STATES AND SOUTHERN

[1] CONTRIBUTION NO. 231, BUREAU OF ENTOMOLOGY

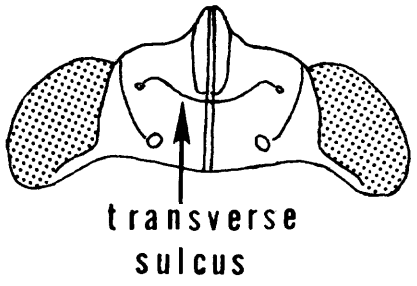

FIG. 6.
HEAD OF ADULT G. PUNCTIPES
DORSAL ASPECT

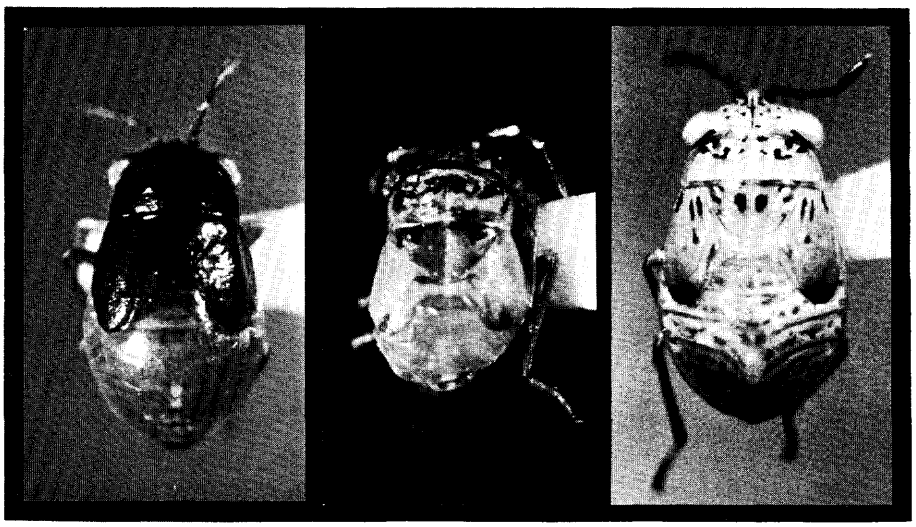

FIG. 7.
G. ULIGINOSUS
NYMPH

FIG. 8.
G. BULLATUS
NYMPH

FIG. 9.
G. PUNCTIPES
NYMPH

CANADA. IN FLORIDA, G. ULIGINOSUS IS KNOWN AT LEAST AS FAR SOUTH AT FT. MYERS.

BIONOMICS: THE LITERATURE ON THE FOOD HABITS AND LIFE HISTORIES OF GEOCORIS SPP. IS TOO EXTENSIVE FOR MORE THAN A TOKEN REVIEW HERE. THE MOST ABUNDANT BIGEYED BUG IN FLORIDA AND THE SOUTHEASTERN UNITED STATES IS GEOCORIS PUNCTIPES (SAY). MCGREGOR AND MCDONOUGH (1917) REPORTED THE LIFE HISTORY OF G. PUNCTIPES AT BATESBURG, SOUTH CAROLINA, FINDING THE AVERAGE DEVELOPMENT TIME FROM EGG TO ADULT WAS 30 DAYS. NYMPHS CONSUMED AN AVERAGE OF 47 MITES, AND ADULTS AN AVERAGE OF 83 "RED SPIDER" MITES ON COTTON PER DAY. YORK (1944) REPORTED THAT ADULT GEOCORIS REQUIRED EITHER FREE MOISTURE OR PLANT MOISTURE AS WELL AS INSECT PREY. SWEET (1960) FOUND THAT GEOCORIS ADULTS CAN SURVIVE ON SUNFLOWER SEEDS AND WATER, WITHOUT INSECT FOOD. DUMAS ET AL. (1962) FOUND MORE G. PUNCTIPES IN THE MORNING THAN AT MIDDAY OR EVENING, EITHER BY SWEEP NET SAMPLING OR COMPLETE PLANT EXAMINATION IN ARKANSAS SOYBEAN FIELDS. BELL & WHITCOMB (1964) REPORTED THAT IN ARKANSAS G. PUNCTIPES AND G. ULIGINOSUS WERE AMONG THE MOST ABUNDANT AND IMPORTANT PREDATORS OF BOLLWORM EGGS, HELIOTHIS ZEA (BODDIE) ON COTTON FROM MID-JUNE UNTIL SEPTEMBER. WHITCOMB & BELL (1964) REPORTED THAT BIGEYED BUGS PREYED UPON APHIDS, PLANT BUGS, EGGS, AND YOUNG LARVAE OF THE BOLLWORM AND COTTON LEAFWORM IN ARKANSAS COTTON FIELDS. ON THE NEGATIVE SIDE, HOWEVER, THE PREY OCCASIONALLY WERE BENEFICIAL SPECIES (ORIUS SPP.). CHAMPLAIN & SHOLDT (1967) REPORTED ON THE LIFE HISTORY OF G. PUNCTIPES IN THE LABORATORY. LINGREN ET AL. (1968) REPORTED G. PUNCTIPES WAS A MORE EFFECTIVE PREDATOR THAN G. ULIGINOSUS AGAINST HELIOTHIS SPP. STONER (1970) FOUND THAT G. PUNCTIPES APPARENTLY NEEDED PREY FOR PROPER DEVELOPMENT AND FECUNDITY. ORPHANIDES ET. AL. (1971) REPORTED THAT G. PUNCTIPES WAS AN EFFECTIVE PREDATOR OF THE PINK BOLLWORM, PECTINOPHORA GOSSYPIELLA (SAUNDERS) IN SOUTHERN CALIFORNIA COTTON FIELDS. TAMAKI & WEEKS (1972) LISTED 46 REFERENCES, ITEMIZED FROM THE LITERATURE THE PREY LIST OF GEOCORIS SPP., AND PRESENTED EXTENSIVE RESEARCH RESULTS FROM A 5-YEAR PROJECT ON GEOCORIS IN THE YAKIMA VALLEY OF WASHINGTON, INCLUDING DATA ON G. BULLATUS.

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