

# BIOLOGY OF THE "LOVE-BUG", *PLECIA NEARCTICA* (DIPTERA: BIBIONIDAE)<sup>1</sup>

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## ABSTRACT

*Plecia nearctica* Hardy has two annual generations, with adults emerging in May and September. Eggs are laid in moist soil, and larvae feed gregariously on decaying vegetation. Pupation occurs in the locations of larval development. Pairs of mating adults feed on pollen and nectar of flowers blooming at the seasons of adult activity.

My first encounters with the "love-bugs" were in south Louisiana in the mid-1930's. Locally these insects were called "honeymoon flies". At that time we referred to the species as *Plecia bicolor* Bellardi; *P. nearctica* was not described by Hardy until 1940. In Louisiana, many larvae developed in grass clippings along highway subgrades. Flights of adults were present in May and September. Although Hardy's description of the species does not list any localities east of the Mississippi Gulf Coast, he does indicate that the species is widely distributed and extends into Mexico and Central America.

Extensive populations of *P. nearctica* have persisted over the past 4 years in north central Florida. Flights of large numbers of adults have been present each year in May and September. Adult flies are a nuisance when they spatter on automotive windshields at usual highway speeds. Driver vision is impaired and filling station attendants expend considerable time and effort removing the spattered eggs and fly remnants from the glass of windshields and headlights, and the fronts of vehicles. Large numbers of flies drawn into the cooling systems of liquid-cooled engines may cause overheating of motors, resulting in extensive damage to the parts of reciprocating engines. Flights of adults are frequent in towns as well as in the open countryside. The flies drift into freshly painted surfaces, and exterior painting of buildings is often suspended in May and September.

It is estimated that the September 1969 flight of adults extended over approximately one-fourth the land area of Florida. During this flight, Florida Highway Patrol airplane pilots and observers in Alachua County reported the adult flies at altitudes of 1000 to 1500 ft. Prevailing winds at these altitudes could carry the flies over long distances. Fishermen have reported flights of adults over the marine waters of the Gulf of Mexico and the Atlantic Ocean.

Flights of adults extend over a period of about 4 weeks in May and September. Individual flies do not live this long but are constantly being replaced by other individuals of the same generation. Male flies live for 2 or 3 days; female flies may live for a week or longer and may mate with

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more than one male. Male adults emerge slightly ahead of females and assume a hovering flight over developmental locations. Emerging females apparently are located by sight and numerous males dive at each emerging female. Copulation is effected in flight and usually continues until the male dies. The larger and stronger female controls flight and walking activity of the tandem pair (Fig. 1). Flight is restricted to the hours of

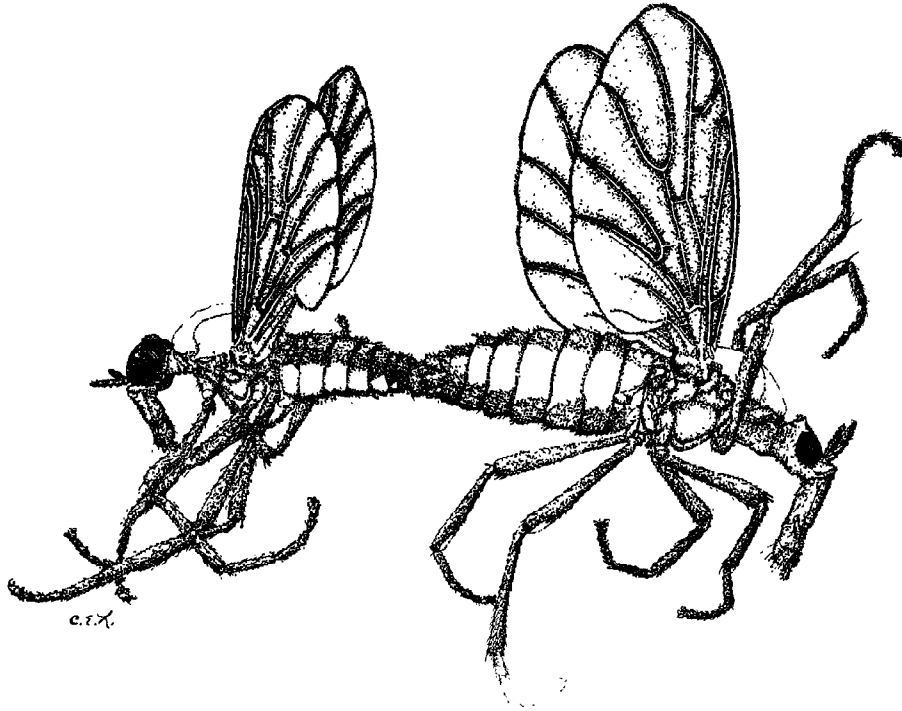


Fig. 1. Mating pair of *P. nearctica*; female on right. Color: black with red dorsal portion of thorax. Length of mating pair; 13-15 mm. Drawing by C. E. Leach.

daylight; the mating pairs rest at night, usually on low-growing vegetation. Favored food sources of the adults are blackberry and clover blossoms in May, and goldenrod and other composite blossoms in September.

Females lay grey, irregularly-shaped eggs in or on the soil under partially decayed vegetation. Mr. C. E. Leach dissected 20 randomly selected females from the May 1968 emergence. Eggs per female varied from 152 to 602 but averaged slightly less than 350 for the 20 specimens. It is not known that all of these eggs are laid prior to the natural death of females. Eggs in the soil are subject to desiccation and eggs held in the laboratory have been overgrown by an unidentified fungus.

The slate-grey larvae, with distinct and darker head capsules (Fig. 2), are found in aggregations in or on the soil under decaying vegetation where moisture is fairly constant. Larvae are found in the soil in oak hammocks and other low areas that retain moisture. Larvae feed with

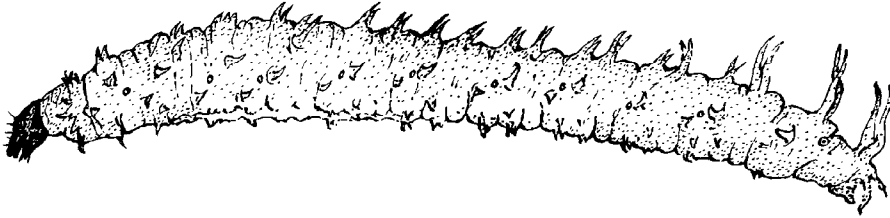


Fig. 2. Larva of *P. nearctica*; color slate grey with darker head capsule. Length of full-grown larva, 11-12 mm. Drawing by C. E. Leach.

chewing mouthparts on fallen leaves, fallen Spanish-moss, and other accumulated decaying vegetation on the soil surface. Dead leaves are often skeletonized by larval feeding (Fig. 3). On one low pasture area near Gainesville (Payne's Prairie, an old lake bottom), extensive larval development has occurred under weathered cow manure. Conditions needed for larval development are adequate moisture, partially decayed vegetation, and favorable soil temperatures. The larvae perform a useful function by converting dead vegetation into soil components.

Larval developmental locations in Florida differ somewhat from those observed in Louisiana in the 1930's. Louisiana receives more rainfall than Florida and the south Louisiana soils have better moisture retention than Florida's sandy soils. Under Louisiana conditions, extensive larval de-



Fig. 3. Dead leaves on soil surface skeletonized by feeding of larvae of *P. nearctica*. Photo by Milledge Murphey.

velopment occurred on grass clippings on highway subgrades. Examination of highway subgrades in Florida has shown them to be so well drained that they fail to provide the consistent moisture needed by the Bibionid larvae.

Diseases of the larvae have not been observed but they are subject to desiccation. Many aggregations of larvae have been observed near the nests of fire ants but they were not attacked by the ants. Predators of the larvae have not been observed. Numerous field-collected larvae failed to show parasitism when held under laboratory conditions.

Pupation occurs in the locations of larval development. Transformation from the dark grey pupa to the adult is rapid and is completed within 7 to 9 days. Diseases, predators, or parasites of the pupae have not been observed.

Although spiders catch a few of the adult flies, they are avoided by many predators. Birds, dragonflies, toads, frogs, and lizards pay no attention to the flies. Many of the pairs are killed on the highways by motor vehicles. However, this seemingly has little effect on the total population which is equally high either on or off the highways. At the present time, it is not known what ecological factors are responsible for the population explosion of this species in north central Florida.

#### LITERATURE CITED

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