

INVASION OF FLORIDA BY THE "LOVEBUG" *PLECIA NEARCTICA* (DIPTERA: BIBIONIDAE)¹

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ABSTRACT

Plecia nearctica Hardy has spread eastward from Mississippi and Louisiana since 1940. Its range expanded approximately 32 km (20 miles) per year reaching southern Florida and South Carolina by 1975. *P. americana* Hardy, a native species, occurs in spring in woodland situations, whereas *P. nearctica* occurs throughout the year but most frequently in May and September and is most common in grassy habitats.

Large populations of the bibionid fly, *Plecia nearctica* Hardy, the "lovebug", have attracted much attention in southeastern United States because they are often encountered while driving on highways and become splattered on windshields and radiators. Hetrick (1970) described the biology of this insect and reported that similar populations of lovebugs were observed in southern Louisiana in the mid 1930's. The lovebug did not gain public attention in northcentral Florida until the mid 1960's although it was thought to be native to the Southeast (Hetrick 1970). When *P. americana* Hardy was collected near Gainesville, Florida, this study was initiated to determine if *P. americana* was the native lovebug and *P. nearctica* had recently arrived in Florida.

METHODS

I examined about 500 *P. nearctica* and 50 *P. americana* loaned from insect collections at the following institutions: Philadelphia Academy of Natural Science; Louisiana State University; University of Georgia; Florida State Collection of Arthropods, Gainesville; Illinois State Natural History Survey, Urbana; Field Museum of Natural History, Chicago; Museum of Comparative Zoology, Harvard University.

The curators of insect collections at the following institutions provided information concerning the *Plecia* in their collections or reported that they did not have *Plecia* from southeastern United States collected before 1960: Archbold Biological Station; Byrd K. Dozier Collection; California Insect Survey, University of California; Cornell University; Auburn University; University of Louisville; Mississippi State University; North Carolina State University; Clemson University; Michigan State University; California Academy of Science; Indiana University; Pennsylvania State University; United State National Museum; American Mu-

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seum of Natural History; Entomology Division, North Carolina Department of Agriculture; Purdue University; Museum of Zoology, University of Michigan.

Specimens were identified using descriptions by Hardy (1940, 1945). Thompson (1975) has subsequently published additional descriptions. Data on geographic distribution and biological notes were compiled from personal observations, data on borrowed specimens, data furnished by curators when the determinations were by D. E. Hardy, and data published by Hardy (1940, 1945), who examined about 30,000 bibionids (about 200 *Plecia*) obtained from 37 insect collections of North and South America.

RESULTS

The geographic distribution of *P. americana* (Fig. 1a) extends along the coastal plain of North America from North Carolina into Mexico. This species has been collected periodically in Florida since 1888.

The geographic distribution of *P. nearctica* (Fig. 1b) in 1940 (Hardy 1940) extended along the Gulf coast from Mississippi to Costa Rica in Central America. This species was first collected in western Florida, Escambia Co., in 1949. In 1957 it occurred as far east as Leon Co., Florida, and in 1966 it was collected in Putnam Co., Fla. In 1972 it was collected in Highlands and Sarasota counties, Florida. Currently, *P. nearctica* is found throughout Florida except southern Dade and Monroe counties (Fig. 1b). To the north, *P. nearctica* was collected in Colleton Co., South Carolina, in 1975.

Habitats recorded for *P. americana* were live oak hammock, wooded ravine, and deciduous forest. *P. americana* has twice been reared from larvae collected in rotten logs (Hardy 1940, and specimens by W. G. Bradley in the Department of Entomology Collection, Louisiana State University).

The largest populations of larvae and adults of *P. nearctica* are found in grassy habitats such as Bahia grass (*Paspalum* sp.) pastures and roadsides. However, these insects fly extensively so adults can be encountered in almost any habitat.

Throughout its extensive range, *P. americana* has been collected only in April, May, and June; there is no evidence of a fall emergence. *P. nearctica* has been collected most frequently in May and September, but it has been collected in every month except November. Most of the collection dates for *P. americana* in northcentral Florida are 2 or 3 weeks earlier than similar dates for *P. nearctica*.

I observed *P. americana* flying in several compact swarms 1-2 m high and 0.3 m wide. Each swarm maintained its position over a glass quart jar inverted over a 1 m high emergence trap located under the canopy of several live oaks. When I knelt next to one swarm, they began swarming over my head and followed as I walked away. This behavior was so different from that of *P. nearctica* that I was prompted to collect the specimens which were later identified as *P. americana*.

DISCUSSION

The earlier conclusion that *P. nearctica* was native to Florida (Hetrick 1970) was probably based on misidentified *P. americana* specimens in the Florida State Collection of Arthropods. Reexamination of available spec-

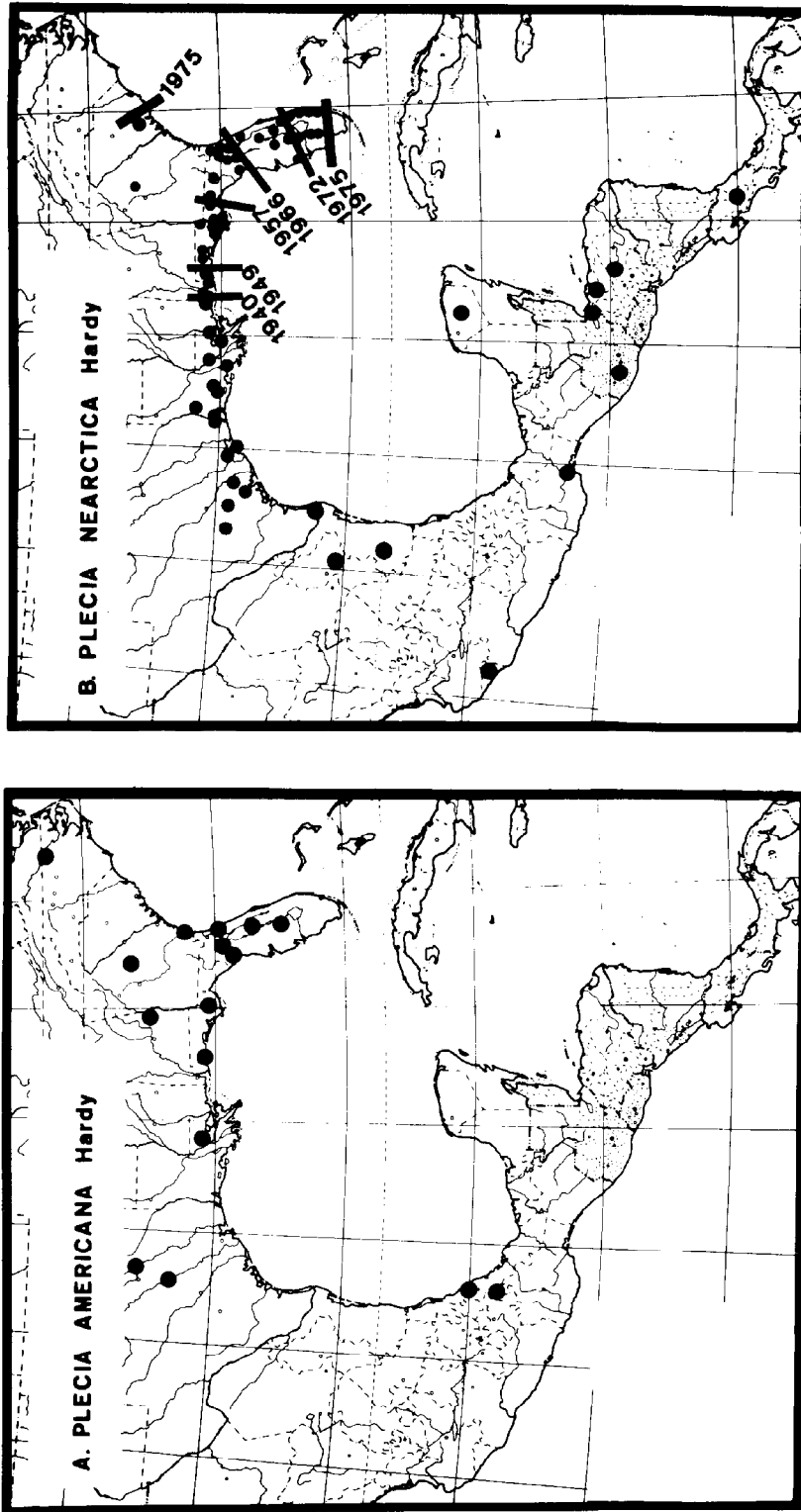


Fig. 1. Geographic distribution of lovebugs in North America, A. *Plectia americana* and B. *Plectia nearctica*. The dated lines indicate how far east *P. nearctica* had been collected as of that date.

imens indicates that *P. americana* is native to southeastern United States but *P. nearctica* has recently expanded its range into Florida. *P. nearctica* was in Louisiana as early as 1911 (Hardy 1940) but it did not reach Florida until 1949. The range of *P. nearctica* has subsequently expanded across Florida at a rate of about 32 km (20 miles) per year. Although *P. nearctica* is capable of extended cross country flight (Hetrick 1970, Sharp et al, 1974), its dispersal was undoubtedly aided by man, adults are easily transported accidentally in or on automobiles and the larvae occur in sod which is often shipped great distances.

The realization that *P. nearctica* has recently immigrated into Florida has several consequences. First, immigrant species frequently undergo population explosions in their new habitat because they are no longer subjected to the natural enemies with which they evolved (Sailer 1974). This suggests that efforts to find natural enemies in older habitats such as Louisiana and Central America could yield candidates for possible introduction into Florida as biological control agents. Second, it would be useful to study lovebug populations in older habitats to determine if populations remain at high levels or if they subside in time. Third, *P. nearctica* is still spreading and it is not clear how far south in Florida or north in the Carolinas it may eventually extend its range.

The presence of 2 species of *Plecia* in Florida which have not always been distinguished raises several points of interest. First, concerning recent publications on the lovebug, *P. nearctica* is probably the correct name since *P. americana* appears to be a woodland insect that is usually collected in small numbers. However, habitat records of *P. nearctica* larvae in hardwood leaf litter (Hetrick 1970) need to be reevaluated. Second, until we can distinguish between larvae of the two species, larval determinations will be in doubt unless representatives are reared for determination. Third, a comparative study of the biology and behavior of the 2 species would be in order.

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