

CHECK LIST OF THE PHLEBOTOMINE SAND FLIES (DIPTERA: PSYCHODIDAE) OF PANAMA INCLUDING TWO SPECIES NOT PREVIOUSLY REPORTED¹HOWARD A. CHRISTENSEN²

ABSTRACT. A check list of the 67 species and 1 subspecies of phlebotomine sand flies known from Panama is presented including two species, *L. abbonenci* and *L. gasti*, not previously reported from this country. The former species previously

had been thought to be a variant of *L. shannoni*. Only the males of the sibling species pair *L. abbonenci* and *L. shannoni* have discernable morphological differences.

The Phlebotominae of the New World comprise ca. 250 species (Theodor, 1965). Most of the 67 species and 1 subspecies known to occur in Panama have been described in a series of papers by Fairchild and Hertig from 1947 to 1961. Species within the 4 genera which make up the subfamily in Panama are listed alphabetically.

Genus *Brumptomyia* Franca and Parrot, 1921

- avellari* (Costa Lima), 1932
- galindoi* (Fairchild & Hertig), 1947
- hamata* (Fairchild & Hertig), 1947
- leopoldoi* (Rodriguez), 1953
- travassosi* (Mangabeira), 1942

Genus *Hertigia* Fairchild, 1949

- hertigi* Fairchild, 1949
- Genus *Lutzomyia* Franca, 1924
- abonnenci* (Floch & Chassignet), 1947
 - aclydijera* (Fairchild & Hertig), 1952
 - anduzei* (Rozeboom), 1942
 - aragai* (Costa Lima), 1932
 - atroclavata* (Knab), 1913
 - barvettoi* (Mangabeira), 1942
 - olmeca bicolor* Fairchild & Theodor, 1971
 - bispinosa* (Fairchild & Hertig), 1951
 - botella* (Fairchild & Hertig), 1961
 - camposi* (Rodriguez), 1950
 - carpenteri* (Fairchild & Hertig), 1953
 - cayennensis* (Floch & Abonnenc), 1941
 - chiapanensis* (Dampf), 1947
 - cruciata* (Coquillett), 1907
 - dasymera* (Fairchild & Hertig), 1961
 - dysponeta* (Fairchild & Hertig), 1952
 - furcata* (Mangabeira), 1941
 - gasti* (Sherlock), 1962
 - geniculata* (Mangabeira), 1941
 - gomezi* (Nitzulescu), 1931
 - hansoni* (Fairchild & Hertig), 1961
 - hartmanni* (Fairchild & Hertig), 1957

- insolita* (Fairchild & Hertig), 1956
 - isovespertilionis* (Fairchild & Hertig), 1958
 - lichyi* (Floch & Abonnenc), 1950
 - longipalpis* (Lutz & Neiva), 1912
 - marajoensis* (Damasceno & Causey), 1944
 - micropyga* (Mangabeira), 1942
 - nicaraguensis* (Fairchild & Hertig), 1961
 - nordestina* (Mangabeira), 1942
 - odax* (Fairchild & Hertig), 1961
 - oreobia* (Fairchild & Hertig), 1961
 - ovallesi* (Ortiz), 1952
 - panamensis* (Shannon), 1926
 - peisoana* (Barretto), 1955
 - pia* (Fairchild & Hertig), 1961
 - pilosa* (Damasceno & Causey), 1944
 - punctigeniculata* (Floch & Abonnenc), 1944
 - reburra* (Fairchild & Hertig), 1961
 - vorotaensis* (Floch & Abonnenc), 1944
 - rosabali* (Fairchild & Hertig), 1956
 - rubidula* (Fairchild & Hertig), 1956
 - runoides* (Fairchild & Hertig), 1953
 - sanguinaria* (Fairchild & Hertig), 1957
 - saulensis* (Floch & Abonnenc), 1944
 - serrana* (Damasceno & Arouck), 1949
 - shannoni* (Dyar), 1929
 - soccula* (Fairchild & Hertig), 1961
 - spinosa* (Floch & Abonnenc), 1942
 - tintinnabula* Christensen & Fairchild, 1971
 - trapidoi* (Fairchild & Hertig), 1952
 - trinidadensis* (Newstead), 1922
 - triramula* (Fairchild & Hertig), 1952
 - tuberculata* (Mangabeira), 1941
 - undulata* (Fairchild & Hertig), 1950
 - vesicifera* (Fairchild & Hertig), 1947
 - vespertilionis* (Fairchild & Hertig), 1947
 - viriosa* (Fairchild & Hertig), 1958
 - volcanensis* (Fairchild & Hertig), 1950
 - ylephiletor* (Fairchild & Hertig), 1952
- Genus *Warleya* Hertig, 1948
- nigrosacculus* Fairchild & Hertig, 1951
 - rotundipennis* Fairchild & Hertig, 1951

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The most recent additions to the list of Panamanian sand flies include *L. abbonenci* and *L. gasti*. For many years the former species was thought to be a variant of *L. shannoni* (Fairchild and

Hertig, 1950). The number of setae along the dorsal aspect of the male parameres appears to be the sole distinguishing taxonomic character separating the two species. Females are indistinguishable. The dorsal parameric setae of *L. shannoni* occupy the distal half of that structure, whereas those of *L. abonnenci* are restricted to the area of the distal fourth. *L. shannoni* is known to occur from the U. S. A. to Paraguay. *L. abonnenci* has been reported from Brazil and French Guiana. In addition, workers at Gorgas Memorial Laboratory have collected this species in Colombia and throughout Panama to the Costa Rican border, showing that an extensive zone of sympatry exists between the two species.

To support the view that *L. abonnenci* is a variant of *L. shannoni* one might ex-

pect to find, (1) an intergradation of parameric setation between the two forms, or (2) the density of each form to be relatively stable throughout a substantial portion of the species distribution, and (3) both forms, or intergradations thereof, to occur among the progeny of a single female. No clear intergradations of parameric setation have been observed among hundreds of males examined. The density of males in different areas is far from stable as shown in Table 1. The possibility that both forms may occur in the progeny from a single female was ruled out by the following study. The progeny from 44 isolated gravid females of "*shannoni*" collected in Madden Forest and Achiote were reared. From these a total

of 300 male and 309 female adults were secured. All 32 males reared from 7 of the wild-caught females were clearly *L. abonnenci*. The 268 male progeny from the remaining 37 females were all distinctly *L. shannoni*. The 39 female *L. abonnenci* adults reared from the progeny of the 7 wild-caught females already mentioned, proved to be indistinguishable from reared female progeny of *L. shannoni*.

Two male *L. abonnenci* specimens received from the Pasteur Institute in Cayenne, French Guiana agree with our material in all respects. It is clear, from the foregoing data, that *L. shannoni* and *L. abonnenci* are sibling species. A comparable situation exists for another sibling species pair known from Panama, *L. vespertilionis* and *L. iso-*

TABLE 1.—Density relationships of *L. shannoni* and *L. abonnenci* males collected in tree buttresses from six localities in Panama during 1968-1970.

Locality	No. <i>L. shannoni</i>	No. <i>L. abonnenci</i>	% <i>L. abonnenci</i>
Sasardi, San Blas Territory	241	2	0.8
Madden Forest, Canal Zone	550	84	13.2
Aguardiente, Canal Zone	28	3	9.7
Achiote, Colon Province	89	25	21.9
Quebrada Bonita, Colon Province	44	2	4.3
Cerro Quia, Darien Province	6	2	25.0

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Two male *L. gastii* were collected in a light trap from Cerro Guia, Darien Province, less than ½ mile from the Colombian border in March 1970. This species has never been reported previously from Panama, and it appears likely that the border region of this country and Colombia represents the northernmost extension of its present distribution.

Literature Cited

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