Sphaeroceridae (Diptera) from Hawaii

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I have recently been able to examine about one hundred flies of the family Sphaeroceridae, all collected in the Hawaiian Islands and sent to me by Dr. D. Elmo Hardy. I have also examined in the British Museum collection the specimens which were recorded by Grimshaw in the "Fauna Hawaiiensis" (3) [1]. There are no new species in this material and it is highly probable that all the species have been introduced. One, *Limosina aequalis* Grimshaw, is not yet known elsewhere but this means little in a group of small, inconspicuous flies. The species examined are recorded below.

COPROMYZA Fallén, 1810

Copromyza (Copromyza) equina Fallén, 1820.

Hawaii, Lake Waiau, near top of Maunakea, 13,007 ft., October, 1951, 2 males, 3 females. This is a cosmopolitan, but mainly Holarctic, species.[2]

Copromyza (Borborillus) sordida Zetterstedt, 1847.

Borborus bilineatus Grimshaw, 1901. New synonym.

Besides Grimshaw's specimens from Kona, Hawaii, 4,000 ft., July, 1892, which were really two males, not a male and female, the following have been seen: Hawaii, Waipio Bay, near Kukuihaele, August 14, 1949 (D. E. Hardy); Molokai, March 21, 1907, 3 males, 6 females (D. L. Van Dine).

This is another cosmopolitan species and the specimens seem to be identical with the ordinary European form.

LIMOSINA Macquart, 1835

Duda (2, p. 14) claims that *Leptocera* Olivier, 1813, was founded on a species of chloropid. In view of the uncertainty attaching to the name *Leptocera,* it is probably best to revert to the more familiar *Limosina.*

Limosina (Limosina) brevicostata Duda, 1918 var. **rufifrons** (Duda), 1925.

The variety was originally recorded from Abyssinia, Formosa and New Guinea. Hawaiian specimens are: Oahu, April, 1951, male, female, sweeping, female on window (D. E. Hardy).

Limosina (L.) puerula Rondani, 1880.

This species has been recorded from Europe and the Seychelles. From the Hawaiian Islands: Oahu, April, 1951, male, female, on window

[1] Figures in parentheses refer to the list of papers at the end of this article.

[2] This is a new specific island record. However, the earliest record for this species from the Hawaiian group is Wirth's in 1946 ("Proceedings" 13:22, 1947).

(D. E. Hardy). Both specimens have rather more orange markings than usual, including some suffusion of the thorax. There is a second female in bad condition, with the same data; it probably belongs to this species.

There is also a female *Limosina (sen.str.)*, Oahu, Manoa Valley, March 28, 1951 (M. Adachi) which seems to belong to some species near *L. moesta* Villeneuve, 1917, but it is in bad condition.

Limosina (Poecilosomella) punctipennis (Wiedemann), 1830.
Limosina venalicia Osten-Sacken, of Grimshaw, 1901.

This species has been confused with *L. (P.) angulata* Thomson, 1868 which has R 2+3 much more sharply angled. All Grimshaw's specimens seem to belong to the present species, as do 14 males and 7 females sent by Dr. Hardy. It appears to be common, at least on Oahu, just as it is in most subtropical or tropical countries.

Limosina (Collinellula) downesi (Richards), 1944.

This species was originally obtained in large numbers in a ship in Glasgow, breeding in damp wheat from Argentina. The Hawaiian specimens are rather smaller but quite similar and have the same type of male genitalia. The curvature of R 4+5 varies somewhat and the specimen figured (4, fig. 2) has this vein straighter than usual. Normally, it is about as in *L. fuscipennis* Haliday, not more curved as stated in the original description. Specimens examined: Oahu, Ala Wai, Honolulu, April 16, 1950, near canal on weeds, male, 2 females (M. Adachi); Oahu, Hanauma Bay, March 27, 1950, 5 males, 5 females (M. Adachi); Oahu, Honolulu, February, 1951, on rocky beach, female (D. E. Hardy).

Limosina (Paracollinella) abdominiseta (Duda), 1925.

This species was described from Paraguay, Brazil, Bolivia and Chile. Although authentic specimens have not been seen, the Hawaiian flies agree perfectly with the original description. Oahu, Waianae, April 1951, male (D. E. Hardy); Oahu, Waimanalo, January 31, 1951, male, female, January 22, 1951, 3 males, 4 females (D. E. Hardy); Oahu, Honolulu, February, 1951, female, February 21, 1951, general sweeping, female (R. van den Bosch), April 21, 1951, male (K. Kutaka), May, 1951, at light, female (D. E. Hardy); Coconut Island (off Oahu), April 2, 1951, female (K. Kutaka).

Limosina (Opacifrons) aequalis Grimshaw, 1901.

This species was described from Oahu, Kawailoa Creek, April, 1893, male, female, and these specimens have been examined in the collection of the British Museum. In Duda's key (1, p. 67) it might run down to *L. parvicornis* Duda, 1918 because of its widely separated antennae, but it is larger, with dark tarsi, with the second costal sector longer than the third, and with the last tergal plates shining black and each with a stout, black, spike-like bristle. Compared with *L. maculifrons* Becker, 1907, which has similar venation, it has small silvery areas on the head, particularly between the orbits and the frontal triangle, the abdomen ends in two, not four, stout bristles, and it is a larger species (length 2.0 mm.). *Opacifrons rubrifrons* Vanschuytbroeck, 1950 and *O. ghesquiérei* Van-

schuytbroeck, differ in colour and both have the second costal sector shorter than the third.

Of the species described by Spuler (5) only *L. wheeleri* has the second costal sector longer than the third and the female without a preapical ventral bristle on the midtibia, but that species has four pairs of dorsocentral bristles and has R 4+5 much more sinuate.

The principal characters of *L. aequalis* are the following: a smaller but distinct outwardly directed bristle inside each of the two outwardly directed inferior orbitals; antennae strongly divergent, arista with moderately long pubescence, three times as long as third segment; two pairs of strong dorsocentrals and acrosticals, all minute; mid-femur in male with a weaker anteroventral and a stronger posteroventral comb-like row of about twelve short, stout bristles; mid-tibia in male with a small anterodorsal bristle at 1/4, a pair of bristles at 3/4, and a somewhat stronger anterodorsal bristle just below them, ventrally with very short, comb-like bristles on apical half, in female similar to male but ventral comb absent. Wings with second sector of costa distinctly longer than third, costa extending a very short distance beyond R 4+5 which is almost straight and ends rather nearer the wing-tip than does the fold-like extension of M 1+2; abdomen in female with no long bristles, last tergal plates strongly shining, each with a stout, spike-like bristle, in male with reflexed margins of tergites 3 and 4 with long, dense, hair-like bristles, genitalia rather large, with no long bristles, anal split rather widely oval, surrounded by close-set short bristles, genital forceps apparently short, fifth sternite asymmetrically emarginate, on left side with a projecting lobe bearing a comb of black bristles.

New record: Hawaii, Pauahi (8 miles east of Capt. Cook), August 12, 1949, 7 males, 6 females (D. E. Hardy).

Limosina (Coproica) ferruginata (Stenhammar), 1854.

This species breeds in manure and seems to have been carried to most parts of the world. I have seen one Hawaiian specimen: Oahu, Ft. Shafter, October 9, 1922, dairy, ex manure, male (J. F. Illingworth).

Limosina (C.) hirtula Rondani, 1880.

This species also is cosmopolitan and breeds in dung or in decaying vegetable matter. Specimens examined: Oahu, Honolulu, dead snails, April, 1951, male, two females (D. E. Hardy); bait trap, April, 1951, male (D. E. Hardy). January, 1951, female (D. E. Hardy).

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