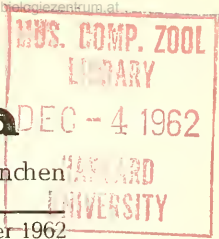


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## The Crane flies of the Galapagos Islands

(Tipulidae, Diptera)

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(Contribution from the Entomological Laboratory, University of Massachusetts.)

To the present time, the crane-flies of the Galapagos Islands have been known only from a single wide-spread Neotropical species, *Limonia (Geranomyia) tibialis* (Loew). A recent visit to the islands by the veteran Argentinian entomologist, Señor Juan Foerster, has added two further species to the still surprisingly meager list of species of these islands. The Foerster materials are preserved in the Zoologische Sammlung des Bayerischen Staates, Munich, and were sent to me for identification by Dr. Fr. Kühllhorn, to whom my thanks are extended. Types and determined specimens are contained in this museum, with other materials preserved in the writer's personal collection of *Tipulidae*.

Concerning the three species of *Tipulidae* now known from the Galapagos, one, *Erioptera (Trimicra) pilipes* (Fabricius), variety, has a virtually Cosmopolitan distribution: a second, *Limonia (Geranomyia) tibialis* (Loew) has a wide range throughout the Neotropics, while the third species, *Limonia (Dicranomyia) galapagoensis*, is described as new and evidently is indigenous to the islands.

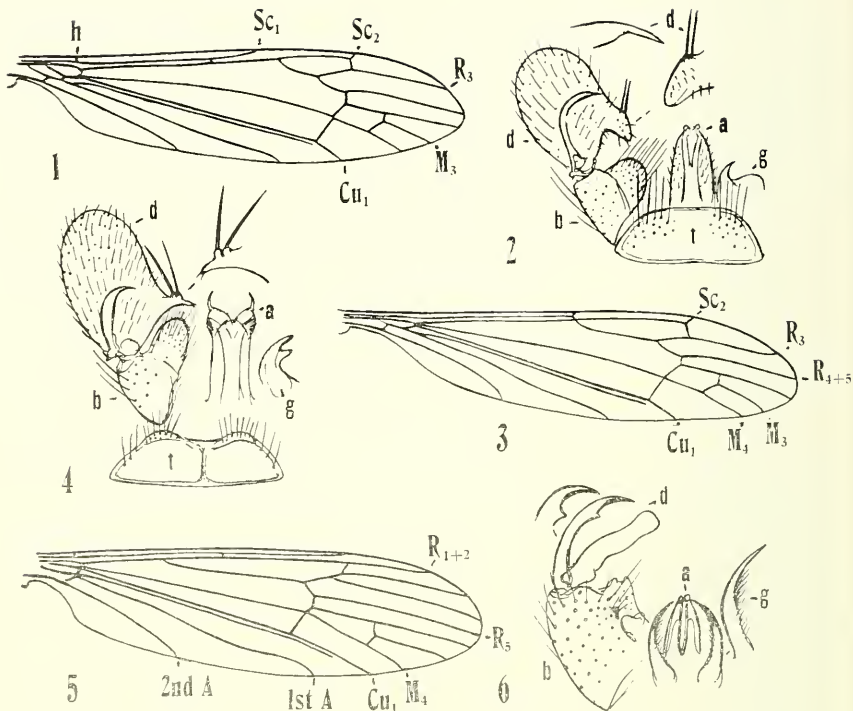
### Key to the Genera and Species

- 1. Wings with four branches of Radius (fig. 5)  
*Eriopterini* *Erioptera (Trimicra) pilipes* (Fabricius), variety  
 Wings with three branches of Radius (figs. 1, 3)  
*Limoniini* : genus *Limonia* Meigen 2
- 2. Rostrum elongate, exceeding the combined and thorax.  
*Limonia (Geranomyia) tibialis* (Loew)  
 Rostrum short, less than the remainder of the head.  
*Limonia (Dicranomyia) galapagoensis* sp. n.

### Tribe Limoniini

#### *Limonia (Dicranomyia) galapagoensis* sp. n. (figs. 1, 2)

Belongs to the *brevivena* group; general coloration of thoracic notum brownish yellow, praescutum with a brownish black central stripe; rostrum and antennae black; legs yellowish brown: wings brownish yellow, stigma oval, brown, conspicuous; cell 1st M<sub>2</sub> closed; male hypopygium with the mesal-apical lobe of the gonapophysis slender, curved gently to the acute tip; aedeagus broad, surface with numerous short pale setae.



## Explanation of figures

Fig. 1: *Limonia (Dicranomyia) galapagoensis* sp. n.: venation.

Fig. 2: *Limonia (Dicranomyia) galapagoensis* sp. n.: male hypopygium.

Fig. 3: *Limonia (Geranomyia) tibialis* (Loew); venation.

Fig. 4: *Limonia (Geranomyia) tibialis* (Loew); male hypopygium.

Fig. 5: *Eriopectera (Trimicra) pilipes* (Fabricius), variety; venation.

Fig. 6: *Eriopectera (Trimicra) pilipes* (Fabricius), variety; male hypopygium.

Symbols: Venation — A = Analis; Cu = Cubitus; h = humeral crossvein; M = Media; R = Radius; Sc = Subcosta.

Male hypopygium — a = aedeagus; b = basistyle; d = dististyle; g = gonapophysis; t = tergite.

Male. — Length about 5.5–6 mm.; wing 5–6 mm.

Female. — Length about 5.5–6 mm.; wing 5.5–6 mm.

Rostrum and palpi black. Antennae black; basal flagellar segments oval, the outer ones more elongate, exceeding the verticils. Head black, sparsely pruinose to produce a plumbeous appearance; anterior vertex moderately broad, slightly less than twice the diameter of the scape.

Pronotal scutum brownish black, posterior sclerites yellowed. Mesonotal praescutum brownish yellow with a brownish black central stripe, more intense in front, becoming obsolete before the suture; posterior sclerites of notum yellowed, scutal lobes infuscated anteriorly. Pleura yellow, sternopleurite more fulvous yellow. Halteres short, stem yellow, knob brownish black. Legs with the coxae and trochanters light yellow; remainder of legs yellowish brown, tarsi darker. Wings (fig. 1) weakly

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brownish yellow, prearcular field clearer yellow; stigma oval, brown, conspicuous; veins brown, more brownish yellow in the prearcular field. Longitudinal veins beyond the general level of Rs with macrotrichia, very sparse and scattered on Sc and on extreme tips of both Anal veins. Venation: Sc<sub>1</sub> ending a short distance before origin of Rs, Sc<sub>2</sub> retracted, Sc<sub>1</sub> nearly as long as Rs; cell 1st M<sub>2</sub> closed, subequal in length to the distal section of vein M<sub>3</sub>.

Abdominal tergites and hypopygium dark brown, sternites more brownish yellow with pale posterior borders. Ovipositor with cerci very slender, upcurved to the acute tips. Male hypopygium (fig. 2) with the tergite, t, transverse, posterior border virtually truncate, either side with about 18 unusually long setae. Basistyle, b, about one-half the area of the ventral dististyle; ventromesal lobe large, its apex broadly obtuse. Dorsal dististyle, d, gently curved, tip elongate, acute; ventral style with the rostral prolongation stout, the spines placed close together. Gonapophysis, g, with the mesal-apical lobe slender, gently curved to the acute tip. Aedeagus, a, broad, the surface with numerous setae from pale punctures.

**Holotype**, ♂, Santa Cruz (Indefatigable), Finca Castro, 200 meters, May 8, 1959 (Juan Foerster). **Allotopotype**, ♀, May 7, 1959. **Paratopotypes**, 1 ♂, 1 ♀, May 6—9, 1959; **paratype**, 2 ♀♀, San Cristobal (Chatham), 420 meters, April 28, 1959 (Juan Foerster).

*Limonia (Dicranomyia) galapagoensis* is quite distinct from other members of the *brevivena* group, including in Tropical America, species such as *L. (D.) ambigua* Alexander (Patagonia), *L. (D.) atrostyla* Alexander (Peru), *L. (D.) brevivena* Osten Sacken, and races (Greater Antilles, northern South America), *L. (D.) capra* Alexander (Venezuela), *L. (D.) melanocera* Alexander (Mexico), *L. (D.) subrvida* Alexander (Mexico), and some others. The present fly is readily told from all of these by the conspicuously darkened stigma of the wings and by the vestiture of the aedeagus.

### *Limonia (Geranomyia) tibialis* (Loew) (figs. 3, 4)

*Aporosa tibialis* Loew; *Linnaea Entom.*, 5: 397—398; 1851.

*Limonia (Geranomyia) tibialis* Alexander; *Rev. Ecuat. Ent. Par.*, 2: 60—61, fig. 27 (♂ hypopygium); 1954.

The type, a female, was from Brazil, taken by Sellow, who collected in that country between 1825 and 1832. The species now is known to be one of the most wide-spread members of the subgenus, ranging from the Antilles (Jamaica, Puerto Rico; Dominica, Grenada) and Mexico, south to southern Brazil, Paraguay, Argentina and Bolivia. *Limonia (Geranomyia) tibialis* is very closely allied or perhaps actually identical with *L. (G.) rufescens* (Loew), which was described at the same time and has page priority. Loew's figure of *rufescens* (l. c., pl. 2, figs 9—12; 1851) indicates that all legs were present in his material and that the fore tibiae were not enlarged and blackened at their tips, as is the case in *tibialis*. The wing venation (fig. 3) and male hypopygium (fig. 4) are illustrated. Attention is called to the very indistinct or obsolete humeral crossvein of the wing and to the long rostral spines, bidentate gonapophysis and very broad aedeagus of the hypopygium, the last having the outer apical angles produced into slender pale spines.

San Cristobal (Chatham): April 18, 1932 (M. Willows, Jr.), April 28, 1959, altitude 420 meters (Juan Foerster).

Santa Cruz (Indefatigable): Finca Castro, 200 meters, May 6—9, 1959 (Juan Foerster).

## Tribe Eriopterini

**Erioptera (Trimicra) pilipes (Fabricius), variety**

*Tipula pilipes* Fabricius; Mantissa Ins., 2: 324; 1787.

*Trimicra pilipes* Osten Sacken; Mon. Dipt. N. Amer., 4: 167; 1869.

*Erioptera (Trimicra) pilipes* Edwards; Trans. Soc. Brit. Ent., 5: 129; 1933.

San Cristobal (Chatham): April 28, 1959, altitude 420 meters (Juan Foerster).

The wing venation (fig. 5) and male hypopygium (fig. 6) are illustrated.

*Erioptera (Trimicra) pilipes* is the most widely distributed species of crane-fly. Its range, as known at present, includes all continents and likewise certain of the more remote oceanic islands, including in addition to the present report of occurrence in the Galapagoes, also Juan Fernandez, Hawaii, the Subantarctic Islands of New Zealand, and Saint Paul Island, in the Indian Ocean. It formerly was considered that this wide distribution might have been produced in part through human agencies, such as by whaling vessels, the immature stages in discarded ballast, and in similar manner. It now seems more probable that most or perhaps all such spread has been through natural agencies, including in part wind dispersal.

In series of specimens from any given part of the range there is found a surprising range in physical size, hairiness of the legs, degree of intensity of wing pattern, and the course and length of vein 2nd Anal. This great variation, in conjunction with the vast range and the finding of specimens in inaccessible places, has been instrumental in producing an extensive synonymy for the species. It now appears that the majority of the specific names proposed in the subgenus are synonyms of *pilipes* but further study may show that certain of these represent geographical races or clines.

I The following names apparently fall in the synonymy of *E. (T.) pilipes*.

*andalusiaca* (Strobl) — Europe (Spain)

*andensis* (Alexander) — Ecuador, Peru

*annuliplena* (Bezzi) — Eritrea

*anomala* (Osten Sacken) — United States

*antarctica* (Schiner) — Saint Paul Island, Indian Ocean

*apocila* (Philippi) — Chile

*brunnipennis* (Macquart) — Europe (France)

? *capensis* (Macquart) — South Africa

*fimbriata* (Meigen) — Europe

*haligæna* (Wollaston) — Madeira

*hirsutipes* (Macquart) — Canary Islands; Central Sahara (Vaillant)

*hirtipes* (Walker) — Australia

*inconspicua* (Loew) — South Africa

*inconstans* (Alexander) — New Zealand

*lanuginipes* (Walker) — South Africa

*lateralis* (Grimshaw) — Hawaii

*marina* (Pierre), as *Psiloconopa* — France

*microcephala* (Thomson) — Australia

*obscurata* (Blanchard) — Chile

*omissa* (Lackschewitz, 1939) a chirographic name of Wiedemann  
— Europe

*pauliani* (Séguy), as *Motophilus* — Europe

*pilipes* (Fabricius) — Europe

- reciproca* (Walker) — Uruguay, Argentina  
*sancti-paulii* (Schiner) — Saint Paul Island, Indian Ocean  
*sidneyensis* (Schiner) — Australia  
*strasseni* (Enderlein) — Saint Paul Island, Indian Ocean  
*trichopus* (Philippi) — Chile  
*umbripennis* (Schummel) — Europe
- II The following may represent valid species or subspecies.  
*antipodarum* Alexander — New Zealand, Antipodes Island (subapterous)  
*brachyptera* Alexander — New Zealand, Campbell Island (subapterous and with the halteres greatly reduced)  
*confluens* (Alexander) — New Zealand (wings with cell  $M_2$  open)
- III The following were originally assigned to *Trimicra*.  
*Trimicra angularis* Alexander — Western United States —  
*Erioptera (Symplecta) stictica angularis* (Alexander)  
*Trimicra (Trichotrimicra) hirtipennis* Alexander — South Africa  
— *Erioptera (Trichotrimicra) hirtipennis* (Alexander)  
*Trimicra minuta* Meunier — Baltic Amber (Upper Eocene) —  
*Gnophomyia minuta* (Alexander, 1931)  
*Trimicra pygmaea* Alexander — Eastern United States — *Ormosia*  
(*Ormosia*) *pygmaea* (Alexander)

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