

# Papéis Avulsos de Zoologia

PAPÉIS AVULSOS ZOOL., S. PAULO, VOL. 32 (13): 145-182

20.II.1979

## A REVISION OF THE TOXOTARSINAE (DIPTERA: CALLIPHORIDAE)

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### ABSTRACT

*The Toxotarsinae are revised. Keys are given to genera and species with illustrations of characters of diagnostic and systematic importance. All taxa are fully described. The three genera included (Neta, Sarconesia, Toxotarsus) contain ten species.*

*There are six new generic and 19 new specific synonymies and six new combinations. Eight lectotypes and four neotypes have been designated and nine previously unplaced names are included in synonymy.*

### INTRODUCTION

The Toxotarsinae are a small endemic element of the Neotropical calliphorid fauna. Although consisting of only ten species they are of a very striking appearance and the group certainly contains some of the more attractive blowflies (see colour plate 2 in Bigot, 1857). A number of the species appear sarcophagid-like and an examination of the male genitalia shows an aedeagus that is not very typical of the Calliphoridae. However, they differ from the Sarcophagidae in many respects: for example, the males have large paralobes and few processes on the aedeagus and the females have a teleopic ovipositor. This exclusion from the Sarcophagidae is supported by external morphological characters such as the presence of only two notopleural setae; usually an outer post-humeral seta is present and the stem-vein setulose. Other species in the group resemble the Phormiini and the Calliphorine genera *Cynomya* and *Calliphora* (see discussion under the separate genera). All members of the group have the stem-vein setulose above and, in eight of the species, also setulose below. The setulose dorsal surface of the stem-vein is a well-known character in the Calliphoridae, being found in several of the subfamilies, namely Chrysomyinae, Rhiniinae and some of the Mesembrinellinae. The setulose ventral surface of the stem-vein is a rare character in the Calliphoridae and to my knowledge is only found in a small group of Oriental Rhiniinae (*Isomyia dotata* Walker group). The two species

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with the stem-vein only setulose above are restricted to lowland and coastal Chile and San Ambrosio Island. Shannon (1926:121) erected the tribe Trixoneurini to accommodate one of these species (*Toxotarsus nigrocyaneus* Walker), using the bare arista as a diagnostic character, and using this character the other species would also be included in his new tribe. A third species, from Juan Fernandez Island, also appears to belong to this coastal group but has the stem-vein setulose below and the arista short plumose. These three species resemble each other in general appearance but examination of the male genitalia shows three quite different forms (Figs. 29-37). However, they seem to represent an off-shoot from the main branch of the Toxotarsinae which are of a more robust appearance and are mostly confined to the more mountainous areas. Two species, namely *Sarconesia chlorogaster* Wiedemann and *S. dichroa* Schiner inhabit both the coastal and mountainous regions and have invaded the off-shore islands; *chlorogaster* as far west as Easter Island.

Boyes & Shewell (1975) placed the genus *Toxotarsus* in the Phormiini and the rest of the toxotarsine genera in a new tribe, the Sarconesiini. At first sight *Toxotarsus* certainly resembles the Phormiini but the aedeagus of the male is unlike that of the species of Phormiini which varies little from the standard calliphorid form. Phormiini never have the protruding frons and epistome, large prominent pregenital tergite in the male or general setulosity of the type found in *Toxotarsus*. I believe therefore that *Toxotarsus* should remain in the subfamily Toxotarsinae but that it is representative of a coastal rather than a high altitude group of that subfamily.

Previously the Toxotarsinae have been divided into many monotypic genera on the basis of the male genitalia and some characters of external morphology. In the present paper I have recognised only three genera, namely *Neta*, *Sarconesia* and *Toxotarsus*. The species have been assigned to the genera using a combination of external morphology, distribution and the overall appearance of the flies.

#### SOURCES OF MATERIAL

The present revision is based on almost 100 specimens from numerous sources. Virtually all relevant type material has been examined and the necessary lectotypes and neotypes have been designated. Abbreviations for museums and institutions where material is located are:

ABC	Academia Brasileira de Ciências, Rio de Janeiro
BMNH	British Museum (Natural History), London
BRI	Biosystematics Research Institute, Ottawa
CAS	California Academy of Sciences, San Francisco
IOC	Instituto Oswaldo Cruz, Rio de Janeiro
MNHNP	Muséum National d'Histoire Naturelle, Paris
MNHU	Museum für Naturkunde der Humboldt-Universität, Berlin
MZUSP	Museu de Zoologia da Universidade de São Paulo, São Paulo
NHMV	Naturhistorisches Museum, Vienna
NMFS	Natur-Museum und Forschungs-Institut Senckenberg, Frankfurt

NRS	Naturhistoriska Riksmuseet, Stockholm
RNH	Rijksmuseum van Natuurlijke Historie, Leiden
USNM	United States National Museum, Washington
UZMC	Universitetets Zoologiske Museum, Copenhagen

For the rarer species complete data have been given but for common species only a summary of the distribution and flight-period is given.

#### KEY TO THE SUBFAMILIES OF NEOTROPICAL CALLIPHORIDAE

1. Postscutellum fairly well developed but with a membrane between it and the scutellum. Jowls below the eyes very narrow, only 1/5-1/6 the height of the eye. Anterior spiracle of characteristic shape (Fig. 2). Stem-vein with or without setulae above .....  
*Mesembrinellinae*<sup>1</sup> (now given family status by Guimarães).  
 Postscutellum not developed. Jowls below the eye 1/3-1/2 the height of the eye ..... 2
2. Stem-vein bare above ..... *Calliphorinae*  
 Stem-vein setulose above (Fig. 1) ..... 3
3. Stem-vein bare below. Arista plumose to tip. Head with characteristic profile (Fig. 4). Face and jowls bright yellow .....  
 ..... *Chrysomyinae*<sup>2</sup>  
 Stem-vein setulose below (Fig. 3). When only above then arista setulose basally or bare and *stpl* 0+1. Arista never plumose to tip. Face and jowls black. Head profile (Figs. 5 and 6).  
 ..... *Tsotarsinae*

#### ABBREVIATIONS

The abbreviations used in the key and descriptions are those most commonly used by calyptrate workers and are as follows:

Head: *ori*, inferior orbital setae; *ors*, superior orbital setae; *vti*, internal vertical setae; *vte*, external vertical setae.

Thorax: *ac*, acrostichal setae; *dc*, dorsocentral setae; *h*, humeral setae; *ph*, posthumeral setae; *ia*, intra-alar setae; *pra*, prealar setae; *sa*, supra-alar setae; *pa*, postalar setae; *stpl*, sternopleural setae.

Wing: *R5*, first posterior cell.

Abdomen: *T*, tergite; *St*, sternite.

1. Tachinidae have a well-developed postscutellum but usually lack a membrane between it and the scutellum, jowls generally much wider, spiracle never this shape (Fig. 2), and the sternites are often not visible.

2. The Phormiini would key out here. They are not yet recorded from South America but *Phormia regina* is the species most likely to occur in this region. It has a black face and jowls, arista long plumose, *stpl* 2+1. with squamae, an orange anterior spiracle and black legs.

## KEY TO GENERA AND SPECIES OF TOXOTARSINAE

1. No presutural acrostichal setae. *Stpl* 0+1, *ph* 1. Arista short plumose basally or bare. Males with long fine setulosity, females with short stout setae on all parts .....  
     ..... *Toxotarsus* ..... 3  
     Presutural acrostichal setae present, *ph* 2 ..... 2
2. Males large, robust, hairy, bright metallic green-blue flies; genitalia prominent with reduced paralobes and fused cerci; hind femur swollen and arcuated. Female fifth tergite concave with very strong marginal and discal spine-like setae (Fig. 7). Both sexes with lower squamae darkened with a white margin; silvery white dusted vittae on thorax not reaching scutellum. Acrostichal setae 2+2 (3) ..... *Neta chilensis* (Walker)  
     Smaller flies, still robust but males not exceptionally hairy and hind femora not arcuated. Female fifth tergite not concave and usually without strong spines ..... *Sarconesia* ..... 5
3. Stem-vein setulose above and below (Figs. 1 and 3). Legs yellow. Lower squamae long and slender. No acrostichal setae, *pr ia* 1, *dc* 2+3, *h2*, arista short plumose on basal third .....  
     ..... *humeralis* (Walker)  
     Stem-vein bare below. Legs black or brown ..... 4
4. Lower squamae long and slender. *R5* open at wing margin. *pr ia* 1, *dc* 2+3, *h2*. Arista bare, prevertical setae absent, thoracic spiracles creamy white ..... *ambrosianus* (Lopes)  
     Lower squamae lobulate. *R5* closed or petiolate. *pr ia* 0, *dc* 3+3, *h1*. Arista short pectinate on basal third, 1 pair of prevertical setae present, thoracic spiracles brown .....  
     ..... *nigrocyanus* (Walker)
5. Eyes densely haired ..... *roraima* (Townsend)  
     Eyes bare ..... 6
6. Thorax metallic blue-green with white or silvery dusted vittae ..... 9  
     Thorax without metallic reflections, black with grey or silvery vittae ..... 7
7. Sarcophagid-like species. Abdomen slender, metallic green or blue with a thin white dusting. Apex of scutellum yellowed. Squamae white ..... 8  
     More robust fly. Abdomen with metallic coppery violet and green reflections with a heavy shifting white dusting. Scutellum totally dark, squamae yellow ..... *versicolor* Bigot
8. Posterior acrostichal setae absent, *stpl* 1+1. Male with a pair of proclinate *ors*. Female fifth tergite with normal setulosity ..... *chlorogaster* (Wiedemann)  
     *Ac* 2+2, *stpl* 2+1. Male without *ors*. Female fifth tergite with strong spinelike discal setae ..... *dichroa* (Schiner)
9. Thorax with silvery-white vittae reaching the scutellum. *Stpl* 1 or 2+1, *pr ia* 2 with a weaker anterior one, *ac* 2+3. Squamae

- brown with a white margin. Male usually with darkened wings  
 ..... *magellanica* (Le Guillou)  
 Thorax with silvery white vittae not reaching the scutellum, *Stpl*  
 2+1, *pr ia* 3, *ac* 2+2. Male wing clear, squamae white .....  
 ..... *splendida* (Townsend)

### Genus *Neta* Shannon

*Neta* Shannon, 1926: 123.

*Callyntropus* Enderlein, 1930: 70.

Type-species of *Neta*: *Phryssopoda splendida* Macquart, 1851  
 (= *Musca chilensis* Walker, 1837) by original designation. Type-species  
 of *Callyntropus*: *Phryssopoda splendida* Macquart, 1843 (= *Musca*  
*chilensis* Walker, 1837) by original designation.

### Diagnosis

*Neta* can be distinguished from all other Toxotarsinae by the swollen and arcuated hind femora and fused cerci in the male and by the concave spined fifth tergite in the female.

### Descriptions

Head dichoptic in both sexes. Arista plumose on 2/3 of its length. Thorax, abdomen and femora metallic blue-green. Thorax with 2 *ph* setae and 2+2 or 3 *ac* setae.

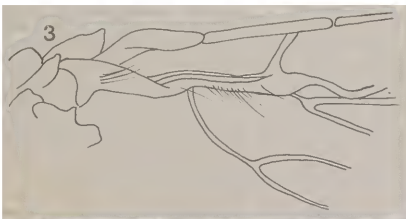
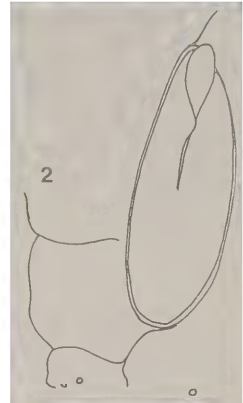
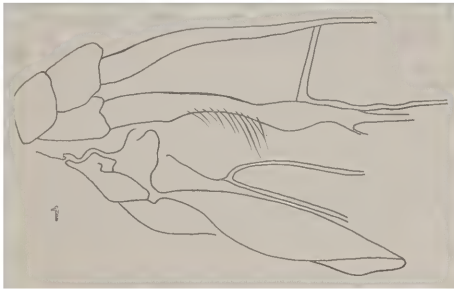


Fig. 1, Dorsal view of stem-vein of *Sarconesia versicolor*; fig. 2, Anterior thoracic spiracle of *Mesembrinella* sp.; fig. 3, Ventral view of stem-vein of *Sarconesia versicolor*.

Male: legs with fringes of long hair on the femora and tibia, hind femora swollen and arcuated. *Stpl* 0+1. Genitalia with reduced paralobes and fused cerci (Fig. 10).

Female: legs normal, *stpl* 1 or 2+1, fifth tergite concave with spine-like discal setae (Fig. 7).

#### Discussion

*Neta* is a monotypic genus and is confined to Chile and western central Argentina between the latitudes of 30°S and 45°S occurring above 500m and up to 2500m. *Neta chilensis* is a most striking fly, and appears very similar to the Holarctic genus *Cynomyia* which also has hairy legs and reduced paralobes in the male and a concave spinose fifth tergite in the female. The Oriental genus *Hypopygiopsis* is also very similar to *Neta* having in the male, hairy legs, fused cerci and even swollen, arcuated hind femora. The life history is unknown.

#### *Neta chilensis* (Walker)

*Musca chilensis* Walker, 1837: 354.

*Phryssopoda cyanea* Le Guillou, 1842: 315. *Syn. nov.*

*Phrissopoda splendens* Macquart, 1843: 253 (reprint 96). *Syn. nov.*

*Phryssopoda cyanea* Macquart, 1843: 254 (reprint 97). *Syn. nov.*

*Cynomyia fuscipennis* Macquart, 1843: 267 (reprint 110).

*Sarcophaga ortogesa* Walker, 1849: 834.

*Phryssopoda splendens*; Macquart, 1851: 204 (reprint 231).

*Calliphora rutilans* Macquart, 1851: 214 (reprint 241). *Syn. nov.*

*Calliphora peruviana* Macquart, 1851: 216 (reprint 243). Junior homonym, proocc. *Calliphora peruviana* Robineau-Desvoidy, 1830.

*Onesia bivittata* Jaenicke, 1867: 378. *Syn. nov.*

*Onesia muscaria* Jaenicke, 1867: 378. *Syn. nov.*

*Cynomyia desvoidyi* Jaenicke, 1867: 378. *Syn. nov.*

*Somomyia castanipes* Bigot, 1877: 245.

*Somomyia calogaster* Bigot, 1877: 246.

*Calliphora phacoptera* Wulp, 1882: 88. *Syn. nov.*

*Calliphora paytensis* Townsend, 1892: 36, replacement name for *Calliphora peruviana* Macquart, 1851.

#### Types

Holotype ♀ of *Musca chilensis* Walker, Chile, in BMNH. Holotype ♂ of *Phryssopoda cyanea* Le Guillou and Macquart Taïti [error], in MNHNP. Lectotype ♂ of *Phrissopoda splendens* Macquart, Chile, in MNHNP; see designation below. Holotype ♂ of *Cynomyia fuscipennis* Macquart, Chile, in MNHNP. Holotype ♂ of *Sarcophaga ortogesa* Walker, Chile, in BMNH. Holotype ♂ of *Phryssopoda splendens* Macquart, Bolivia, in MNHNP. Holotype ♂ of *Calliphora rutilans* Macquart, New Guinea [error], in MNHNP. Holotype ♀ of *Calliphora peruviana* Macquart, Payta, Peru, in MNHNP. Holotype ♀ of *Onesia bivittata* Jaenicke, Chile, in NMFS. Holotype ♀ of *Onesia muscaria* Jaenicke, Chile, in NMFS. Holotype ♂ of *Cynomyia desvoidyi* Jaenicke, Chile, in NMFS. Holotype ♀ of *Somomyia castanipes* Bigot,

Quito, Ecuador, in BMNH. Holotype ♀ of *Somomyia calogaster* Bigot, La Plata, Argentina, in BMNH. Holotype ♀ of *Calliphora phacoptera* Wulp, in RNH [all types examined].

#### Note on the type of *cyanea*

The holotype of this species was described by both Le Guillou and Macquart and is located in Paris. It is dusty and dirty and in poor condition with the thorax and abdomen damaged and the head crushed downwards. It is labelled '64' and '7- Phryssopoda cyanea Nob. h Taïti'. Although both Le Guillou and Macquart say '(Fem.)' the type is in fact a male specimen and the descriptions certainly refer to a male as they mention the swollen, hairy hind legs. Details of the 1842 Le Guillou paper are discussed by Pont (1973: 170).

#### Lectotype designation for *Phrissopoda splendens* Macquart, 1843

Macquart described this species from the male sex from Africa and mentioned a further specimen from Chile. In Paris there was only a drawer label for this species. However, from the series in MNHNP under *splendens* Macquart 1851 I found a single male specimen from Chile with Macquart's earlier type of determination on label. This specimen I believe to be the Chile specimen mentioned in 1843. It is in fair condition and is labelled '164', 'splendens', and 'M. Gaudichaud Chili'. I have labelled and designate herewith this specimen as Lectotype.

#### Notes on holotypes

*Phryssopoda splendens* Macquart, 1851. A male with type data was found in Paris labelled 'Cobija Gaudichaud 1836' and 'Phryssopoda splendens ♂ Macq.n.sp.' A rather dirty specimen with some fungus but with all parts present. Four other specimens under the *splendens* 1851 label in Paris were without type data.

*Calliphora rutilans* Macquart, 1851. Described from the female sex from Triton Bay, a locality in New Guinea. The specimen in Paris, labelled '1992 41' and 'Calliphora rutilans ♀ Mac.n.sp.', is obviously the type. The accession number 1992 41 occurs in the middle of the entries for Durville's Triton Bay material but does not refer to Diptera. Other Diptera with Triton Bay as type data have also been found to be southern Neotropical in origin (e.g. Pont 1967: 185, 186).

*Cynomyia desvoidyi* Jaennicke, 1867. Described from the male sex from Chile collected by Mayrhofer. From Frankfurt I received two male specimens, one labelled 'typus' (recent red label), 'Chili', 'Typ' (old yellow label), 'von Heyden', 'Cynomyia Desvoidyi Jaen', 'Desvoidyi Jaen', but this is not the correct type data and so the specimen has no type status. The other specimen is labelled 'Valparaiso Chile Bayrhofer', 'Paratypoid' and I have labelled it as holotype as it bears the correct type data.

#### Description

Head. Dichoptic in both sexes, ♂ frons at the narrowest point 0.20, ♀ 0.30 of the head width. Ground colour black. Eyes bare. Inter-

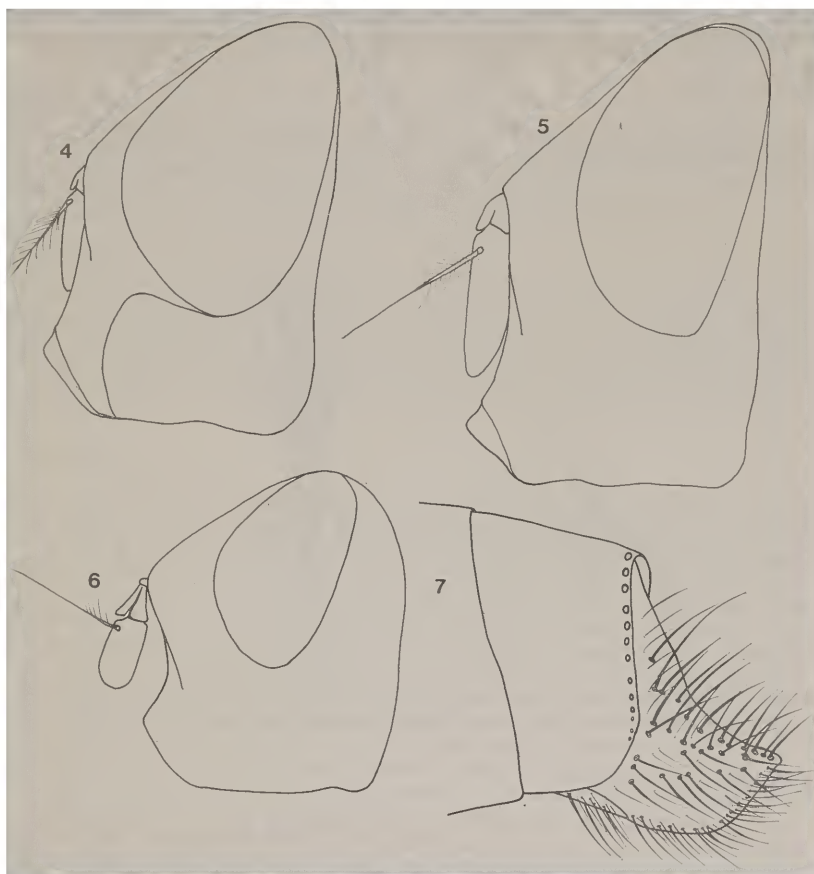
frontalia black with a slight grey dusting and many fine hairs. All other parts silvery-grey dusted but not densely. The parafacialia when viewed from the front shows shifting spots at the middle. Epistome protruding in front of the oral margin by the width of the second antennal segment. Male with 9-10 *ori* the upper one slightly reclinate, female with 7-8 *ori*. Parafrontalia, parafacialia, jowls and gular region with dense fine black setulae. Vertex with a pair of *vti* and *vte* setae, the *vte* weaker in male. Both sexes with a prevertical seta and female with two upper *ors*. Interfacial membrane bare. Vibrissae strong and crossed. Facial ridge with setulae on 1/2-1/3 of its length which are stronger in the female. Antennal segments blackish-brown, the apical edge of the second segment paler. Arista long, black, pale centrally and plumose on basal 1/2-2/3. Lunule black. Palpi black, rounded, slightly dilated apically and with long setae ventrally. Mentum glossy brown.

Thorax. Ground colour black with metallic green, blue and purple reflections. Dorsum viewed from behind shows two heavily dusted silvery-white vittae between the *ac* and *dc* rows reaching the middle of postsutural region. Humeri, notopleuron and small postsutural areas irregularly dusted silvery. Dorsum viewed from the front shows these patches and vittae tawny dusted but less distinct. Pleurae very lightly evenly dusted silvery-white. *Ac* 2+2, *dc* 3+3, 2-4 *h*, 2*ph*, *ia* 3(2)+2, *pra*1, *sa* 2, *pa* 2. Both spiracles dark brown. Prosternum lightly grey dusted with black hairs. Prostigmatal seta absent in male, present in female. Mesopleural row incomplete in male, complete in female. Pteropleuron, with hairs on the posterior half which are denser in the upper part. Infra alar bulla with pubescence. Embossed area above and in front of the infra alar bulla with dense silvery pubescence. *Stpl* 0+1 in male, 1 or 2+1 in female. Supraspiracular convexity with dense short pubescence. Scutellum with two basal pairs, one apical and one discal pair of setae.

Wings. Clear, only slightly brownish basally. Stem-vein setulose above and below. Epaulet black, basicosta black and with dense silvery pubescence. Veins dark brown. *R*5 open in the wing margin. Squamae brown, lower squama lobulate with a white margin and marginal hairs, upper squama with brown margin and marginal hairs.

Legs. Coxae dark brown, lightly dusted grey and with long setulae and the anterior surface. Trochanters reddish-brown and slightly grey dusted. Femora black with metallic blue and green reflections. Tibiae and tarsi blackish-brown. Front femur of male without *pv* and *pd* rows but with a weak dorsal row of setae, female with strong *pv*, *pd* and *d* rows of setae. Femur swollen in male and with long dense hairs on all surfaces from *av* to *pd* positions. Both sexes with *pv* bare patches on the apical 1/3. Fore tibia without distinct setae in male but with long fringes of hairs on the surfaces from the *pd* to *pv* positions, female with a row of short *pd* and *ad* setae. Mid femur in male with long fringes of hairs from the *av* to *pv* positions, female with 3-4 *a* setae and a row of *av* and *pv* setae. Apical 1/3 in both sexes with patches in a *p* and *a* position, the anterior one with setae the posterior one bare. Mid tibia of male with 2 *ad* setae and long fringes of hair on surfaces from the *av* to *pv* positions, female with 4-5 *ad*, 3-4 *pd*, 3-4 *p* and 1 *av* seta. Mid basitarsus in male with a ventral fringe and

an apical ventral tubercle. Hind femur of male swollen and arcuated and with long hairs on all surfaces, female with a row of weak *ad* setae and rows of stronger *av* and *pv* setae. Apical 1/3 with patches in the anterior and posterior positions, both with hairs. Hind tibia in male with 4-5*ad* setae and all except the *pd* surface with long hairs, female with 5-7*ad* and 3-5*av* setae. Hind basitarsus of male with an anterior fringe of long hairs.



Profile of head: 4. *Paralucilia* sp.; 5, *Sarconesia magellanica*; 6, *Toxotarsus nigrocyaneus*; 7, Fifth tergite of a female *Neta chilensis* in lateral view.

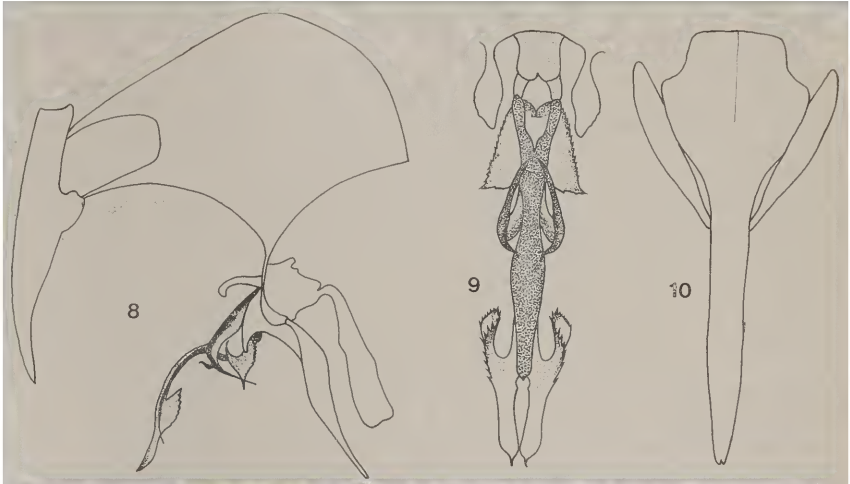
Abdomen. Ground colour black with blue-green metallic reflections without dusting. Male general setulosity on tergites one to four denser but not longer than in the female except on the ventral surface where it is longer. *T* 1+2 with a basal excavation that reaches the hind margin as a hump centrally. *T* 1+2 and 3 without marginals in the male, *T* 3 with a few fine ones in the female, both sexes with a thin

greyish-black margin to these tergites. *T*4 with marginals that are very strong in the female. *T*5 with marginals, female with strong discals and the tergite is concave in lateral view. The general setulosity is less dense in the male but is longer than on the preceding tergites. Sternites very broad, metallic green-blue and with a slight whitish dusting, and densely haired on the lateral edges in the male.

Genitalia. Male hypopygium as in figures 8 to 10. Female ovipositor of the simple *Calliphora*-type but the spermathecae are primitive and consist of twisted, sclerotized extensions of the sperm duct.

#### Distribution

Southern Chile and western central Argentina between the latitudes of 30°S and 45°S.



Male hypopygium of *Neta chilensis*: 8, in lateral view; 9, aedeagus in anterior view; 10, cerci and paralobes in posterior view.

#### Material examined

I have seen 144 specimens of this species from as far north as Valparaiso, south as Bariloche and east as Neuquen. Data labels suggest an adult flight period from September through to April with a greater abundance during October and November.

#### Genus *Sarconesia* Bigot

*Sarconesia* Bigot, 1857: 300.

*Chlorobrachycoma* Townsend, 1918: 155. *Syn. nov.*

*Sarconesiopsis* Townsend, 1918: 156. *Syn. nov.*

*Roraimomusca* Townsend, 1935: 69. *Syn. nov.*

*Sarconesiomima* Lopes & Albuquerque, 1955: 104. *Syn. nov.*

Type-species of *Sarconesia*: *Sarcophaga chlorogaster* Wiedemann, 1830, by designation of Shannon (1926: 122). Type-species of *Chlorobrachycoma*: *Chlorobrachycoma splendida* Townsend, 1918, by original designation. Type-species of *Sarconesiopsis*: *Sarconesiopsis caerulea* Townsend 1918 (= *Calliphora magellanica* Le Guillou 1842), by original designation. Type-species of *Roraimomusca*: *Roraimomusca roraima* Townsend, 1935, by original designation. Type-species of *Sarconesiomima*: *Sarconesiomima bicolor* Lopes & Albuquerque, 1955 (= *Sarcophaga dichroa* Schiner, 1868), by original designation.

#### Diagnosis

*Sarconesia* can be distinguished from all other Toxotarsinae in having the arista plumose on the basal half, *stpl* 1 or 2+1, free cerci in the male and a normal convex fifth tergite in the female.

#### Description

Male head dichoptic or almost holoptic, female dichoptic. Arista plumose on basal half. Mesonotum with distinct silvery-white dusted vittae. Thorax with 2*ph*, 2 or 3 *pr ia*. *Stpl* 1 or 2+1. Abdomen bright metallic blue or green or coppery with only thin dust. Legs normal. Male cerci not fused, female fifth tergite not concave.

#### Discussion

Previously the species in this genus were placed in many monotypic genera. The assignment of the species to these genera was based on striking external morphological characters such as hairy eyes, absent posterior acrostichals and more recently the male genitalia. Although some of the species possess some peculiar characters for calliphorids and the male genitalia vary immensely between the species, I prefer to include them all within a single genus. Overall they appear very much alike and look rather like metallic sarcophagids, with strong vittae on the mesonotum. They do however fall into two types, a more robust sarcophagid-form (almost *Calliphora*-like) and a slender sarcophagid-form. The four robust species appear to be confined to the high altitude regions of South America occurring up to 4200m. The two slender species show a peculiar distribution, being confined mainly to the lowland and coastal areas of Chile and Argentina but with a few records for *chlorogaster* over 1000m. Both of these species have also invaded Chile's off-shore islands and *chlorogaster* has even reached Easter Island, approximately 3200km from the mainland.

#### *Sarconesia chlorogaster* (Wiedemann)

*Sarcophaga chlorogaster* Wiedemann, 1831: 359.

*Calliphora rufipalpis* Macquart, 1843: 289 (reprint 132). *Syn. nov.*

*Sarcophaga proerna* Walker, 1849: 835.

*Sarconesia chlorogaster* var. *minor* Enderlein, 1940: 646.

## Types

Neotype ♂ of *Sarcophaga chlorogaster* Wiedemann. La Plata, Argentina, in MNHU; see designation below. Lectotype ♀ of *calliphora rufipalpis* Macquart, Chile, in MNHNP; see designation below. Holotype ♀ of *Sarcophaga proerna* Walker, Montevideo, Uruguay, in BMNH. Lectotype ♂ of *Sarconesia chlorogaster* var. *minor* Enderlein, Juan Fernandez Island, in NRS; see designation below [all types examined].

Neotype designation for *Sarcophaga chlorogaster*

Wiedemann described this species from both sexes from Montevideo and La Plata. From Berlin I received for study a male and female specimen. The male is labelled 'La Plata Berg.', '4450', 'Type', 'chlorogaster Wied.\*' and is in good condition with the right mid tarsi missing, a hole in the right eye and a few setulae abraded from the thorax and abdomen. The female is labelled 'Argentina La Plata C. Berg. S.', 'Type' and a recent 'chlorogaster' label, and is in good condition. These specimens cannot be syntypes as the collector, Carlos Berg, was born in 1843. A specimen from Vienna also proved to have no type status. As the types must be presumed lost, it is desirable to designate a neotype for this species. I am here designating the Berlin male specimen as neotype, as it agrees with the original description and it is in good condition; I have labelled it 'Sarcophaga chlorogaster Wiedemann ♂ neotype designated by J. P. Dear 1978'.

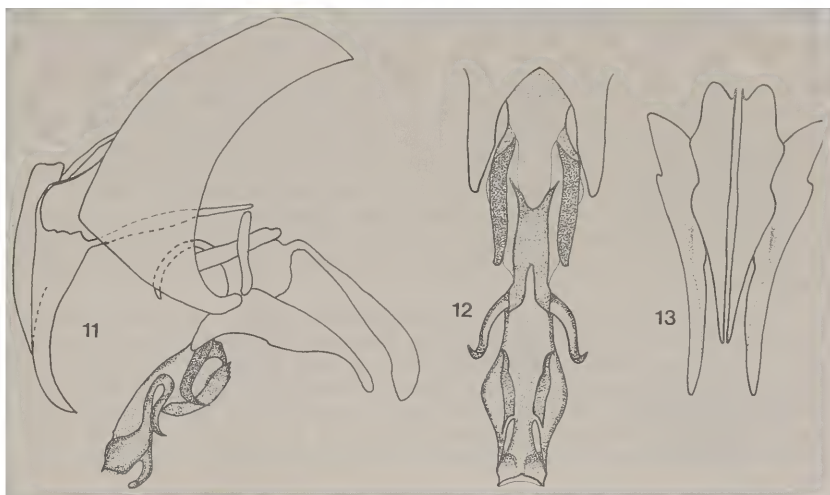
Lectotype designation for *Calliphora rufipalpis* Macquart, 1843

Macquart described this species from the female sex from material collected by Mr. Gay in Chile. From Paris I received for study four female specimens found under the drawer label of *Calliphora rufipalpis* Macquart, 1851. Two of these specimens proved to be *C. rufipalpis* 1843, the other two are discussed on page 180 under the heading, notes on species in the 'unplaced species' list in the Neotropical Catalogue (James 1970). The two females bear type data, one labelled 'Museum Paris CHILI Gay 1843', 'Calliphora rufipalpis ♂ Macq.' and with a collector's note 'Elle entre souvent dans la maison où elle bourdonne beaucoup. Elle avait des aranéides plus petits que celle du melasoma(?) demure(?)'. It is in good condition but rather dirty and dusty with a pin hole in the thorax. The other specimen is labelled with a small green disc '670.37)', 'Museum Paris CHILI Gay 670.37' and a Macquart label 'No. 46 Calliphora rufipalpis' and is in fair condition with the tarsi of the left hind and mid legs missing. I have labelled and designate herewith the specimen with the collector's note as lectotype and the other specimen as paralectotype. The lectotype agrees with the most recent interpretation of *Sarconesia chlorogaster* (e.g. Lopes & Albuquerque, 1955) and the paralectotype is a specimen of *Sarconesia dichroa* Schiner.

Lectotype designation for *Sarconesia chlorogaster* var. *minor*

Enderlein described this variety from an unspecified number of males and females from Masafuera, Juan Fernandez Is. From

Stockholm I received for study one male and one female specimen. Both specimens are labelled 'Masafuera', 'Bäkström', 'febr', 'Typus', 'Sarconesia chlorogaster (Wied.1830) var minor Enderl. Type. Dr. Enderlein det. 1936'. The male is in poor condition with the right wing damaged, the right fore leg and mid leg missing, and all the left legs missing. The female is in fair condition with the fore legs missing. The female is in fair condition with the fore legs missing and setae abraded from the thorax. I have labelled and designate herewith the male specimen as lectotype and the female as paralectotype. Both specimens agree with the most recent interpretation of *Sarconesia chlorogaster* (e.g. Lopes & Albuquerque, 1955).



Male hypopygium of *Sarconesia dichroa*: 11, in lateral view; 12, aedeagus in anterior view; 13, cerci and paralobes in posterior view.

### Description

Head. Dichoptic in both sexes, male frons at narrowest point 0.29 of head width, ♀ 0.37. Ground colour black, anterior jowls yellowed. Eyes bare. Interfrontalia reddish-brown with a silvery-yellow dusting and a few fine setulae. Parafrontalia, parafacialia, face and anterior-jowls including the interfacial membrane silvery-yellow dusted. Posterior jowls and back of head silvery-grey dusted. Epistome protruding in front of the oral margin by about the width of the third antennal segment. Male with 6-7 *ori*, female with 7. Vertex with one pair of prevertical, one pair *vti* setae and also one pair of *vte* in the female. Parafrontalia with one pair of *ors* in male and two pairs in the female. Parafrontalia, parafacialia and jowls with fine black setulae. Gular region well developed and with yellow hairs. Lower part of back of head with some yellow hairs. Interfacial membrane yellowed

and bare. Vibrissae strong and crossed. Facial ridge with short strong setulae on a third of its length. Antennal segments brown, apical part of second orangy, third orangy basally and with silvery-grey pubescence. Arista long, black, pale centrally and plumose on the basal third to half. Lunule brown. Palpi yellow, rounded, and slightly dilated apically.

Thorax. Ground colour black with a dense silvery-grey-yellow dusting. Apex of scutellum broadly yellowed. Dorsum viewed from behind shows two densely dusted vittae between the *ac* and *dc* rows and other irregular dusted areas laterally with four indistinct vittae from the humeri to the post alar setae. Areas between these vittae black and undusted. Dorsum viewed from the front shows a reverse situation with the silvery vittae black and the black areas tawny dusted. Pleura irregularly dusted silvery-grey. *Ac* 2+0, *dc* 3+3, 2-3 *h*, 2*ph*, *ia* 2+2, *pra*1, *sa*2, *pa*2. Both spiracles brown. Prosternum brown, grey dusted with pale hairs. Propleural depression densely grey dusted with pale hairs. Prostigmatal seta present. Mesopleural row with 1 or 2 setae absent in the middle. Pteropleuron setulose posteriorly, the upper part with denser stronger setae. Infra alar bulla with short pubescence. *Stpl* 1+1. Supraspiracular convexity pubescent. Scutellum with two basal pairs, one apical and one discal pair of setae.

Wings. Slightly yellowish. Stem-vein setulose above and below. Veins yellowish-brown. *R*5 open in the wing margin. Epaulet and basicosta yellow. Squamae white with white marginal hairs, lower lobe lobulate.

Legs. Reddish-brown. Coxae and femora with a greyish dusting. Coxae with setulae on the anterior surface. Fore femur with *pv*, *pd* and *d* rows of setae. Fore tibia with a row of short *ad* setae and 1*pv* seta. Mid femur with 2-3 *a* setae, a row of *av* setae on the basal half and a row of *pv* setae. Mid tibia with 2*ad*, 1 *pd*, 2*p* setae and also, 1*av* in the female. Hind femur with *av*, *pv* and *ad* rows of setae. Hind tibia with a row of *ad* setae including a few strong ones, 2*pd* and 2*av*.

Abdomen. Ground colour black with bright metallic blue-green reflections and a tessellate silvery-white dusting. Viewed from behind, shows a central line of demarcation in the shifting pattern of dusting. *T*1+2 and 3 with one lateral marginal in male which is absent in the female. *T*4 and 5 with a row of very strong marginals, in the female these are in two close-set rows. Sternites broad, dark brown, slightly grey dusted, only very slightly metallic and with longer general setulosity.

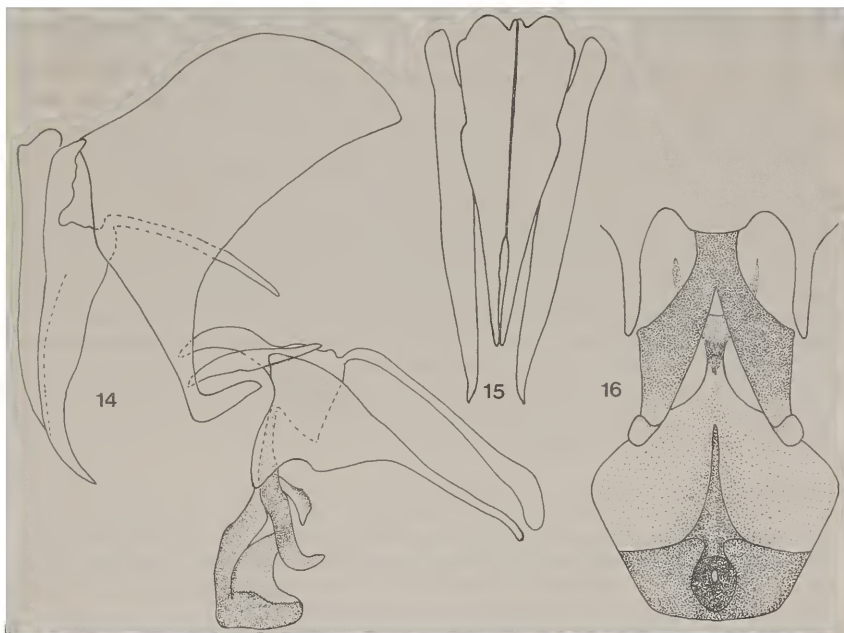
Genitalia. Male hypopygium as in figures 14-16. The male of this species has an enormous sperm pump (see Lopes & Albuquerque 1955: 103). Female ovipositor of the simple oviparous *Calliphora*-type but the spermathecae are primitive, consisting only of twisted sclerotized extensions of the sperm duct.

#### Distribution

Found between the latitudes of 10° and 40°S. Extreme southern part of Brazil, Argentina, Uruguay, Bolivia, Peru, Chile, Juan Fernandez Island and Easter Island.

## Material examined

I have seen 163 specimens of this species BMNH, BRI, CAS, MZUSF, USNM. Data labels show that adults are on the wing throughout the year but are in greater abundance from September to January.



Male hypopygium of *Sarconesia chrologaster*: 14, in lateral view; 15, aedeagus in anterior view; 16, cerci and paralobes in posterior view.

***Sarconesia dichroa* (Schiner)**

*Sarcophaga dichroa* Schiner, 1868: 313.

*Sarconesiomima bicolor* Lopes & Albuquerque, 1955: 105. *Syn. nov.*

## Types

Neotype ♀ of *Sarcophaga dichroa* Schiner, Chile, in NHMV; see designation below. Holotype ♂ of *Sarconesiomima bicolor* Lopes & Albuquerque, Santiago, Chile, in University of Chile, Valparaiso.

Neotype designation for *Sarcophaga dichroa*

Schiner described this species from Chile, and I received from Vienna a single specimen standing under this name. It had no abdomen and was found to be a sarcophagid; the labels read 'Philippi Chile 1870', 'dichroa det. B.B.'. It cannot be the type as *dichroa* was

described in 1868, two years before the capture of this specimen. Aldrich (1930: 25) also saw this specimen and came to the same conclusion. Dr. C. W. Sabrosky (USNM) has kindly checked Townsend's and Aldrich's notes for me and has found no reference to their having seen a type specimen of *dichroa*. Lopes & Albuquerque (1955: 100) have discussed the generic assignment of *dichroa* and have compared it with their new species, *bicolor*. However, they believe that it is a species distinct from *bicolor* as Schiner does not mention the strong setae on the fifth tergite. In his description Schiner compares his new species with *chlorogaster*, mentioning the darkened anterior jowls and the more silvery dusting on the head in his species. These are two good characters for distinguishing *chlorogaster* from *bicolor*. Schiner also mentions the orange tip to the scutellum and the strong ventral setae on the mid femur. It is therefore certain that *dichroa* belongs to *Sarconesia* and I believe that it is conspecific with *Sarconesiomima bicolor* Lopes & Albuquerque. It therefore seems desirable to designate a neotype to fix the identity of the name and I am here designating a ♀ as neotype that will be deposited in Vienna Museum. It has the following data, 'Cynomyia chlorogaster Wd. Chili ex Bigot Coll. BM 1960-539' and agrees with the original description. I have labelled it 'Sarcophaga dichroa Schiner ♀ neotype designated by J. P. Dear 1978'.

This species is one of the slender sarcophagid-like group and is so similar to the other species, *chlorogaster*, that I am only mentioning the distinguishing characters.

#### Description

Head. Dichoptic in both sexes, frons in male at narrowest point 0.24 of the head width, in female 0.35. Male without proclinate *ors*. General dusting of parafrontalia and parafacialia more silvery. Anterior jowls dark. Setae on facial ridge denser.

Thorax. *Ac* 2+2, *dc* 3+3, *3h*, *2ph*, *ia* 2+2, *Stpl* 2+1.

Wings. Veins brown. Hyaline. Epaulet darkened.

Legs. Darker, especially the tibiae, stronger *pv* setae on apical half of mid femur, and tibia with 1 *p* seta and hind tibia with 1 *av* seta.

Abdomen. Female with dorsal marginal setae on tergite 3 and strong discals on tergite 5. Male with a few stronger discal setae on tergite 5.

Genitalia. Male hypopygium as in figures 11-13. Female ovipositor of simple oviparous *Calliphora*-type, the spermathecae are well developed, oval and capped at the junction with the sperm duct.

#### Distribution

Central Chile between the latitudes of 30 and 35°S, and Juan Fernandez Island.

#### Material examined

CHILE: Santiago, 1942, D.M. Larain, No.8.407 Diptera Inst. Oswaldo Cruz, 1 ♂ Paratype, IOC; Estero la Jaula, Curicó, 1.1964,

L. Peña, *Nothofagus*, 1 ♂, 1 ♀, BRI; Rio Teno, Curicó, 19.i.1964, 1500 m, L.E. Peña, 1 ♀, BRI; Novara-Reise 1857-59, *chlorogaster* 51 Wd. Coll. Winthem, 1 ♂, USNM, 'ind Or' *chlorogaster* 51 Wd. Coll. Winthem, 1 ♀, USNM; 5 mi W of La Lingua, Acon., 14.xii.1950, Ross and Michelbacher Collectors, 2 ♂, CAS, 1 ♂, BMNH; Fray Jorge Rancho, Coquimbo, 10.xii.1950, Ross and Michelbacher Collectors, 1 ♀, CAS; 34km W. of Santiago, 19.xii.1950, Ross and Michelbacher Collectors, 1 ♀, BMNH.

JUAN FERNANDEZ ISLAND: no further data, P. Herbst, E.P. Reed collection, 1 ♀, CAS; Masatierra, Ba. Cumberland, 13.iii.1951, 1 ♀ paratype, IOC.

### *Sarconesia magellanica* (Le Guillou), comb. n.

*Calliphora magellanica* Le Guillou, 1842: 316.

*Calliphora magellanica* Macquart, 1843: 288 (reprint 131).

*Calliphora chilensis* Macquart, 1843: 288 (reprint 131). *Syn. nov.*

*Musca incerta* Walker, 1853: 344. *Syn. nov.*

*Cynomyia quadrivittata* Macquart, 1855: 128 (reprint 108). *Syn. nov.*

*Onesia americana* Schiner, 1868: 311. *Syn. nov.*

*Somomya nitens* Bigot, 1877: 244. *Syn. nov.*

*Sarconesiopsis caerulea* Townsend, 1918: 159. *Syn. nov.*

### Types

Holotype ♀ of *Calliphora magellanica* Le Guillou and Macquart, Magellan Strait, Chile, in MNHNP; see note below. Lectotype ♂ of *Calliphora chilensis* Macquart, Chile, in MNHP; see designation below. Holotype ♀ of *Musca incerta* Walker, Colombia, in BMNH. Holotype ♂ of *Onesia americana* Schiner, Chile, in NHMV. Holotype ♂ of *Somomya nitens* Bigot, Colombia, in BMNH. Lectotype ♀ of *Sarconesiopsis caerulea* Townsend, Oroya, Peru, in USNM; fixed by Townsend 1937: 171. [all types examined].

### Note on the type of *magellanica*

The holotype of this species was described by both Le Guillou and Macquart and is located in Paris. It is in poor condition with the apical segment of the right fore tarsus and the right mid leg missing, left mid and hind legs missing, thorax with a large central pin hole, and is rather dirty. It is labelled '30', '11-*Calliphora magellanica* N. [b] le det: Magel:' and 'Type de Leguillon [sic] 2, 3, 131, 10'. Details of the 1842 Le Guillou paper are discussed by Pont (1973: 170).

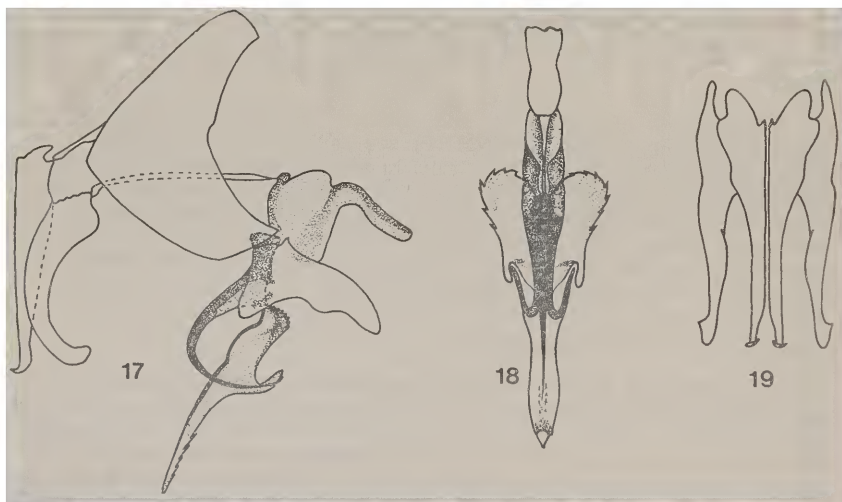
### Lectotype designation for *Calliphora chilensis*

Macquart described this species from an unspecified number of males and females collected in Chile by Gay. From Paris I received for study eight specimens found under this name, 1 ♂ and 4 ♀ in fair condition labelled '670.37', 1 ♂ and 1 ♀ labelled '15.43' in good condition and a ♀ in fair condition labelled '835.36'. In the BMNH I found a single ♀ labelled '15.43' and in fair condition (exchanged

with MNHNP in 1924). All these accession numbers relate to collections made in Chile by Gay and so all these specimens are syntypes. I have labelled and designate herewith the ♂ labelled '15.43' as lectotype and all other specimens mentioned above as paralectotypes. The specimens all conform to the interpretation of *Sarconesia magellanica* given in the present paper.

### Description

Head. Dichoptic in both sexes, male frons at the narrowest point equal to three times the width of the anterior ocellus, female frons 0.34 of the head width. Ground colour black. Eyes bare. Interfrontalia brown, lightly grey dusted and with fine setulae. Interfacial membrane in some specimens orangy. Parafrontalia, parafacialia, face, jowls and back of head silvery-grey dusted. Epistome protruding in front of the margin by the width of the third antennal segment. Male with 11-12 *ori*, female with 8-9 *ori*, the upper pair slightly reclinate. Vertex with one pair of *vii* in male, one prevertical, one pair of *vii* and *vte* in female. Parafrontalia in female with two of *ors*. Parafrontalia and parafacialia with fine setulae. Jowls and back of head



Male hypopygium of *Sarconesia magellanica*: 17, in lateral view; 18, aedeagus in anterior view; 19, cerci and paralobes in posterior view.

with numerous fine setae. Interfacial membrane bare. Vibrissae strong and crossed. Facial ridge with a row of setulae on 1/2-2/3 of its length. Antennal segments blackish-brown, apex of second paler, third densely grey dusted. Arista long, black, pale centrally and plumose on half of its length. Lunule reddish-brown. Palpi dark brown basally, brownish-yellow apically, rounded and slightly dilated apically. Mentum glossy brown.

Thorax. Ground colour black with green and blue metallic reflections and silvery dusted vittae on the dorsum. Dorsum viewed from behind shows four distinct silvery-white vittae, one pair between the *ac* and *dc*, the other pair at the lateral edges. Area between the vittae black and metallic. Scutellum dusted silvery-white but more densely laterally. Dorsum viewed from the front shows a reversed pattern with the silvery vittae black and the black vittae tawny dusted. Pleura undusted, black and with black setulae. *Ac* 2+3, *dc* 3+3, *2ph*, *4h*, *ia* 3+2, *pra1*, *sa2*, *pa2*. Both spiracles dark brown. Prosternum black with black setulae. Propleural depression undusted with black setulae. Prostigmatal seta present. Mesopleural row complete. Pteropleuron with setulae in the posterior half which are stronger in the upper part. Infra alar bulla with a silvery pubescence. Supraspiracular convexity bare. *Stpl* 1+1. Scutellum with 2 basal pairs 1 apical and 1 discal pair of setae.

Wings. In male often infuscated dark brown, female hyaline. Stem-vein setulose above and below. Epaulet and basicosta black, the latter with silvery pubescence. Veins dark brown. *R5* open in the wing margin. Lower squama lobulate, infuscated brown with a white margin and marginal hairs, upper lobe white with brown marginal hairs.

Legs. Blackish-brown. Coxae and femora with a slight greyish dusting. Coxae with numerous setae on the anterior surface. Trochanters shiny brown. Fore femur with *pd*, *pv* and an almost *d* row of setae. Fore tibia with a row of short *ad* setae and *lav*, seta. Mid femur with 1 *a* seta and *av* and *pv* rows of fine setae that are slightly stronger in the female. Mid tibia with *2ad*, *1pd*, *2p* and *1v* seta. Hind femur with an *av* row of setae, an indistinct *ad* row and a basal *pv* row of setae. Hind tibia with an *ad* row of setae including one or two stronger ones, *2pd* and *2-3av* setae.

Abdomen. Ground colour black with bright metallic blue and green reflections and a thin tessellate silvery-white dusting. *T1*+*2* with one or two long lateral marginal setae. *T3* with 3-4 lateral and 5-6 dorsal marginal setae in male and only 2-3 lateral seta in female. *T4* with a row of distinct marginal setae. *T5* of male with marginal and discal setae, female without strong marginals but with some strong discals. Sternites broad, black, slightly metallic and with black setulae.

Genitalia. Male hypopygium as in figures 17-19. Female ovipositor of the simple oviparous *Calliphora*-type, spermathecae simple and oval.

#### Distribution

High altitude regions of North-eastern and Eastern South America between the latitudes of 10°N and 40°S. Colombia, Ecuador, Peru, Bolivia and Chile.

#### Material examined

I have examined 351 specimens of this species [BMNH, BRI, CAS, MZUSP, USNM]. Data labels indicate an adult flight period throughout the year with a greater abundance from September to March and that they occur up to 3250m.

***Sarconesia roraima* (Townsend), *comb. n.***

*Roraimomusca roraima* Townsend, 1935: 70.

## Type

Lectotype ♂ of *Roraimomusca roraima* Townsend, Mt. Roraima, Venezuela, in USNM; fixed by Townsend 1937: 1969. [Type examined].

Note on *roraima*

This species was overlooked by James (1970) but certainly belongs in the Toxotarsinae. It is unusual in having exceptionally hairy eyes which is rarely found in the Calliphoridae. Other calliphorids with hairy eyes are restricted to Australia and New Zealand.

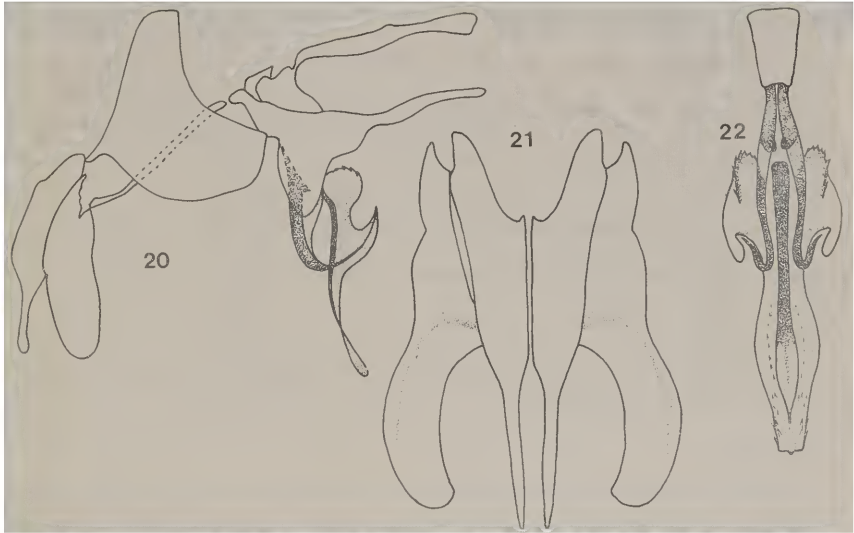
## Description

Head. Almost holoptic in male, eyes separated by the width of the anterior ocellus. Female dichoptic, eyes separated by 0.30 of the head width. Ground colour black. Eyes densely pilose. Interfrontalia blackish-brown with a silvery-grey dusting and numerous fine hairs. Parafrontalia, parafacialia, face, jowls and back of head silvery-grey dusted, slightly yellowed in places. When viewed from the front the parafrontalia appear undusted and the parafacialia with an undusted spot at about the middle. Epistome protruding in front of the oral margin as an equilateral triangle about the height of half the width of the third antennal segment. Male with 6-7 fine *ori*, female, with 7-8 stronger *ori* the upper one slightly reclinate. Vertex in male with a pair of *vti* setae, female with 1 prevertical, 1 pair of *vti* and a pair of *vte* setae. Parafacialia in female with 2 *ors* setae. Parafrontalia, parafacialia, jowls and back of head with numerous fine black setae. Gular region not prominent. Interfacial membrane bare. Vibrissae strong and crossed. Facial ridge with setulae along its whole length. First and second antennal segments brown, third segment paler in female and very orangy-yellow in male, and with a silvery pubescence. Arista long black, pale centrally and long plumose on the basal half. Lunule brown. Palpi brown. Palpi brown basally, reddish apically, flattened, dilated apically and with long setulae ventrally. Mentum glossy brown.

Thorax. Ground color black with metallic green-blue reflections on the posterior part of the dorsum. Dorsum viewed from behind shows four vittae that are silvery dusted, one pair between the *ac* and *dc* rows and the other pair from the humeri to the post alar setae. The vittae are more densely dusted anteriorly and the area between them is undusted, black anteriorly and metallic posteriorly. Dorsum viewed from the front shows a reverse effect with the black vittae dusted tawny and the silvery vittae black. Pleurae very slightly dusted tawny. *Ac* 2+3, *dc* 3+3, *2ph*, *4h*, *ia* 2+2, *pra1*, *sa2*, *pa2*. Both spiracles dark brown. Prosternum brown, grey dusted and with black hairs. Propleural depression grey dusted with black hairs. Pros-

tigmatal seta present. Mesopleural row complete. Pteropleuron setulose posteriorly, the setulae stronger and denser in the upper part. Infra alar bulla pubescent. Supraspiracular convexity bare. *Stpl* 1+1. Scutellum with 2 basal pairs, 1 apical and 1 discal pair of setae.

Wings. Brownish tinged basally and the median crossvein. Stem-vein setulose above and below. *R5* open in the wing margin. Epaulet and basicosta black. Squamae brown with brown marginal hairs.



Male hypopygium of *Sarconesia roraima*: 20, in lateral view; 21, aedeagus in anterior view; 22, cerci and paralobes in posterior view.

Legs. Totally dark brown. Coxae and femora with a slight greyish dusting. All coxae with strong setae on the anterior surface. Fore femur with *pv*, *pd* and *d* rows of setae. Fore tibia with a row of short *ad* setae and 1 *pv* seta. Mid femur with 1 *a* seta, a weak row of *av* and a slightly stronger row of *pv* setae. Mid tibia with 2 *ad*, 1 *v*, 2 *pd* setae. Hind femur with a few long *av* setae. Hind tibia with a row of weak *ad* setae including a few stronger ones and 2 *pd* setae.

Abdomen. Ground colour black with bright metallic blue and green reflections. The ventral edges of the tergites densely dusted silvery-white. *T1+2* blackish anteriorly, metallic posteriorly and with one or two lateral marginals. *T3* with lateral marginals. *T4* with 4-5 distinct lateral marginals. *T5* with less dense but longer and more erect general setulosity, without distinct marginals and slightly white dusted. Sternites dark with black setulae and a thin greyish-white dusting.

Genitalia. Male hypopygium as in figures 20-22. Female ovipositor of a simple oviparous *Calliphora*-type, spermathecae well developed and capped at the junction with the sperm duct.

## Distribution

Found in the high altitude regions of North and central South America, Venezuela, Colombia and Bolivia.

## Material examined

VENEZUELA: Mt. Roraima, J.G. Myers 1932, Pres. by J.G. Myers BM 1940-24, 1 ♀ Plt., BMNH; Mt. Roraima, 8600', J.J. Quelch, 99.68, 2 ♀, BMNH; Caracas, Sher. Humb. Hotel, 9.xii.1970, J.W. Boyes, 1 ♂, BRI.

COLOMBIA: Cerro Quemado, San Lorenzo Mt., 17.xii.1972, 1 ♂, CAS.

BOLIVIA: El Limbo, 65°36'W 17°07'S, 2200m, Nov. 63, F. Steinbach, 2 ♂, 2 ♀, BRI, 1 ♂, BMNH; Cochabamba, October 1965, F. Steinbach, 1 ♂, 1 ♀, BRI, 1 ♂, BMNH.

**Sarconesia splendida** (Townsend), *comb. n.*

*Chlorobrachycoma splendida* Townsend, 1918: 156.

## Type

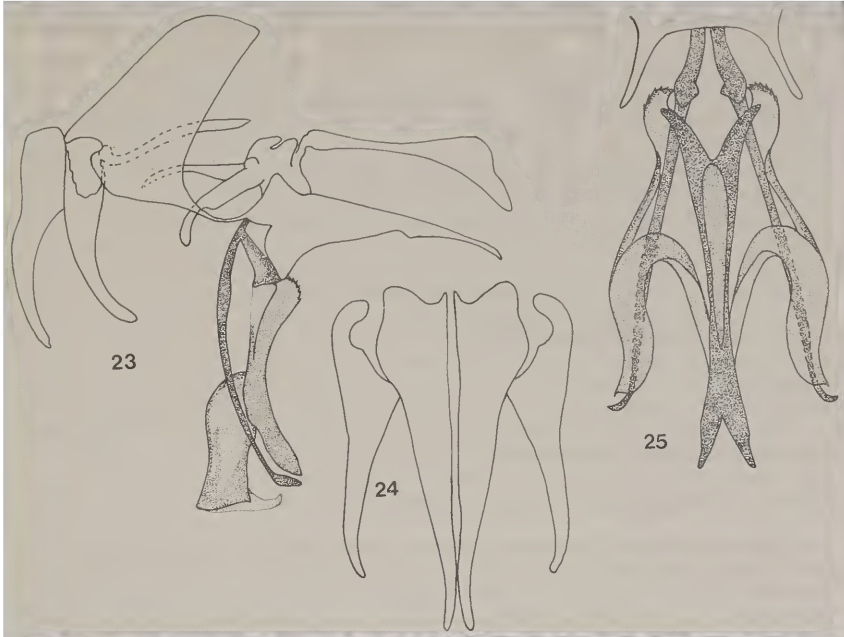
Holotype ♀ of *Chlorobrachycoma splendida* Townsend, Oroya, Peru, in USNM. [examined].

## Description

Head. Dichoptic in both sexes, eyes separated by 0.23 of the head width in the male and by 0.30 in the female. Ground colour black. Eyes bare. Interfrontalia black, silvery dusted and with numerous fine hairs. Parafrontalia, parafacialia, interfacial membrane and anterior jowls densely silvery dusted. Face, posterior jowls and back of head lightly silvery dusted. Epistome only just protruding in front of the oral margin. Parafrontalia with 7-8 *ori*, 2 *ors* and numerous fine setulae. Vertex with one pair of prevertical, 1 pair *vti* and 1 pair *vte* setae. Jowls, gular region and back of head with numerous fine black setulae. Interfacial membrane bare. Gular region prominent. Vibrissae strong and crossed. Facial ridge with a row of setulae on 2/3 of its length. Antennal segments blackish-brown. Arista long, black and plumose on the basal third. Lunule blackish-brown. Palpi black, flattened and slightly dilated apically. Mentum glossy brown.

Thorax. Ground colour black with metallic blue and green reflections. Dorsum viewed from behind shows two densely silvery dusted vittae between the *ac* and *dc* rows, presuturally. The vittae continue on to the postsutural region but are less distinct. Dorsum viewed from the front shows two spots of silvery dusting between the *ac* and *dc* rows at the scutellar suture, humeri and other small lateral patches also silvery dusted. *Ac* 2+2, *dc* 3+3, *2ph*, *3-4h*, *ia* 3+2, *1pra*, *2sa*, *2pa*. Both spiracles dark brown. Prosternum brown, slightly dusted grey with black setulae. Pleura undusted with metallic reflections and

black setulae. Propleural depression silvery dusted and with black setulae. Prostigmatal seta present. Mesopleural row complete. Pteropleuron setulose, posteriorly the setulae are stronger in the upper part. Infra allar bulla bare. *Stpl* 2+1. Supraspiracular convexity bare. Scutellum with 2 basal pairs, 1 apical and 1 discal pair of setae.



Male hypopygium of *Sarconesia splendida*: 23, in lateral view; 24, aedeagus in anterior view; 25, cerci and paralobes in posterior view.

Wings. Clear, epaulet black, basicosta pale with dense golden pubescence. Stem-vein setulose above and below. Squamae white, lower lobe lobulate and with white marginal hairs. Upper lobe with brown marginal hairs.

Legs. Dark brown. Coxae with setae on the anterior surface. Trochanters shiny brown. Fore coxae with slight metallic reflections. Fore femur with *pd*, *pv* and an almost *d* row of setae. Fore tibia with an *ad* row of short setae. 1 or 2 short *pd* setae and a *pv* seta. Mid femur with a few long *pv* and *av* setae and 1 *a* seta. Mid tibia with 3 strong *ad*, *3pd*, *1p* and *1av* seta. Hind femur with a row of *av* setae, 2 close-set rows of *ad* setae and a few basal *pv* setae. Hind tibia with *4ad* and *2av* setae.

Abdomen. Ground colour black with bright metallic blue and green reflections and with an even whitish dusting. Ventral edges of tergites with a much denser white dusting. *T1+2* and *3* with 1 or 2 lateral marginal setae. *T4* with a complete row of marginal setae. *T5* with marginals and some strong discals. Sternites black with slight metallic reflections and black setulae.

Genitalia. Male hypopygium as in figures 23-25. Female ovipositor of the simple oviparous *Calliphora*-type, spermathecae simple and oval.

#### Distribution

Found in the high altitude regions of Bolivia, Ecuador and Peru.

#### Material examined

BOLIVIA: No further data, 2♀, BHNH; La Paz, 3800-4100m, 27. x. 1968, Peña, 2♂, 1♀, BRI.

ECUADOR: Antisana, 13000', Ed Whympfer, 1♀, BMNH; Cerro Pelado, Carchi, 25. vi. 1965, 3200m, L. Peña, 1♀, BRI.

PERU: Pachacayo, 27. v. 1934, Bishop 22867, 1♀, USNM.

### *Sarconesia versicolor* Bigot

*Sarconesia versicolor* Bigot, 1857: 302.

#### Type

Lectotype ♂ of *Sarconesia versicolor* Bigot, Chile, in BMNH; see designation below [examined].

#### Lectotype designation for *Sarconesia versicolor*

Bigot described this species from an unspecified number of male and female specimens from Chile. In the BMNH I found under the drawer label for this species name one male and eight female specimens, all in very good condition and labelled 'ex Bigot Coll: B.M. 1960-539'. The drawer label gives the locality 'Chili', and all these specimens can be considered as syntypes. The male is also labelled 'Brauer WIEN CVII (No. 129)'. I have labelled and designate herewith the male as lectotype and the females as paralectotypes. All specimens agree with the description given in the present paper.

#### Note on *versicolor*

Smart (1937: 380) saw only the specimen of this species in the BMNH from L. Nahuel Huapi. James (1970) must have thought that Smart was discussing the type and so he incorrectly gave Argentina as the type locality.

#### Description

Head. Dichoptic in both sexes. Frons at narrowest point in male 0.22 of the head width, in female 0.32. Eyes bare. Ground colour black. Interfrontalia black, densely silvery-white dusted and with fine black setulae. Parafrontalia, parafacialia and interfacial membrane with dense silvery-white dusting. Face, jowls and back of head lightly silvery dusted. Epistome only just protruding in front of the oral margin. Male with 7 *ori*, female with 5-6, the upper one slightly recl-

nate. Vertex with 1 pair of *vti*, 1 pair *vte* and a pair of prevertical setae. Parafrontalia in female with 2-3 proclinate *ors*. Parafrontalia and parafacialia with a few fine setulae. Jowls and back of head with numerous fine black setae. Interfacial membrane bare. Vibrissae strong and crossed. Facial ridge with a row of setulae on 2/3 of its length. Antennal segments blackish-brown, apex of second paler, third with a thin grey dusting. Arista long, black and plumose on the basal third. Lunule dark brown. Palpi dark brown, rounded and slightly dilated apically. Mentum glossy brown.

Thorax. Ground colour black with patches of silvery-white dusting. Dorsum viewed from behind shows a pair of densely dusted silvery-white vittae between the *ac* and *dc* rows, various patches similarly dusted laterally from the humeri to the post alar setae and two spots of silvery dusting on the lateral edges of the scutellum. Dorsum viewed from the front shows the silvery vitae totally black and the black areas silvery-tawny dusted. Pleura mostly black but with a few irregularly dusted silvery patches. *Ac* 2+2, *pc* 3+3, *2ph*, *4h*, *ia* 3+2, *pra1*, *sa2*, *pa2*. Both spiracles dark brown. Prosternum glossy brown with black setulae. Propleural depression silvery dusted and with black setulae. Mesopleural row complete. Pteropleuron with black setulae in the posterior half which are stronger in the upper part. Infra alar bulla bare. *Stpl* 2+1, supraspiracular convexity pubescent. Scutellum with 2 basal pairs, 1 apical and 1 discal pair of setae.

Wings. Slightly yellowed basally. Stem-vein setulose above and below. Epaulet black, basicosta yellow. Veins yellowish-brown. *R5* open in the wing margin. Squamae yellow with yellow marginal hairs, lower lobe lobulate.

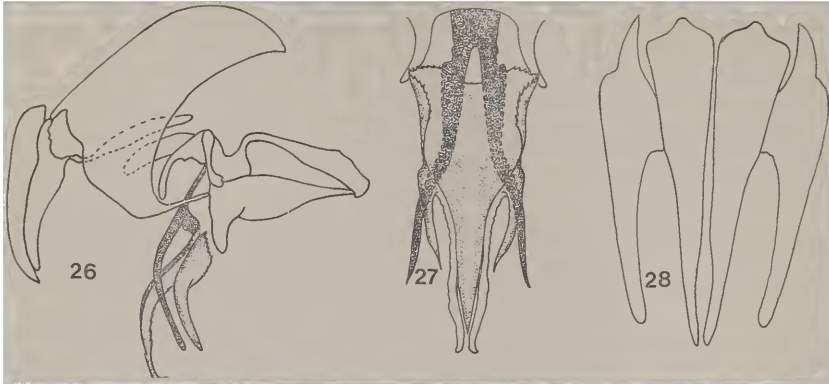
Legs. Dark brown. Coxae and femora with a slight silvery-grey dusting. Coxae with numerous setae on the anterior surface. Fore femur with an *av*, *ad* and an almost *d* row of setae. Fore tibia with an *ad* row of short setae and 1 *lav* seta. Mid femur with 7 or 2 *a* setae, a row of basal *av* and a row of *pv* setae. Mid tibia with 2-4 *ad*, *3pd*, *1p* and 1 *v* seta. Hinda femur with *av*, *pv* and two close-set rows of *ad* setae. Hind tibia with a row of *ad* setae including a few strong ones, *2pd* and *2av* setae.

Abdomen. Ground colour black with green, coppery and violet metallic reflections. Tergites 1+2 to 4 with dense silvery-white dusting in a shifting pattern, *T5* only lightly dusted. Violet reflections confined to a central dorsal area and the hind margin of the tergites. Dorsal area viewed from behind shows as undusted central vitta on *T3* and 4. *T1+2* mostly black with 2-3 lateral marginal setae. *T3* with strong lateral marginal and weak dorsal marginal setae. *T4* with a complete row of marginal setae. *T5* with marginal and a few discal setae. Sternites black with black setulae that are denser and longer in the male.

Genitalia. Male hypopygium as in figures 26-28. Female ovipositor of the simple oviparous *Calliphora*-type, spermathecae simple and oval.

#### Distribution

High altitude regions of eastern South America between the latitudes of 15° and 50°S. Eastern Argentina, Bolivia, Chile and Patagonia.



Male hypopygium of *Sarconesia versicolor*: 26, in lateral view; 27, aedeagus in anterior view; 28, cerci and paralobes in posterior view.

#### Material examined

ARGENTINA: Terr. Rio Negro, L. Nahuel Huapi, Eastern End, 17. xi. 1926, F. & M. Edwards, BM. 1927-63, 1 ♀, BMNH; Neuquén, 1907, Dr. Lendl Adolf, 4 ♀, BMNH; Múcar, xii. 1965, L. E. Peña col., 3 ♂, 7 ♀, BMNH, MZUSP.

BOLIVIA: Altiplano Pillapi, 70km E of La Paz, 3780 m, 6. v. 1964, J. L. Chudley, BM. 1964-371, 1 ♂, BMNH; El Alto-La Paz, 15. xii. 1955, Alvarenga, 1 ♂, IOC.

CHILE: Antofagasta, Tumbre, E of Atacama Salt Lk., 3600-3800m, 6-9. xii. 1965, Peña, 2 ♀, BRI, 1 ♀, USNM; Purpicar, S. E. of Quisquiro Salt Lk., 4000-4200m, 9-12. xii. 1965, Peña, 2 ♂, 1 ♀, BRI, 1 ♂, 1 ♀, BMNH, 1 ♂, 1 ♀, USNM; Múcar 23°20'S on Argentine border, 4000-4100m, 12-16. xii. 1965, 1 ♂, 5 ♀, BRI, 2 ♀, BMNH, 1 ♀, USNM.

PATAGONIA: Lago Argentina, Cristina, 1959, P. W. James, 1 ♀, BMNH; Valle del Lago Blanco, Chubut, J. Koslowsky, 104-26, 1 ♀, BMNH.

#### Genus *Toxotarsus* Macquart

*Toxotarsus* Macquart, 1851: 211 (reprint 238).

*Trixoneura* Shannon, 1926: 121.

*Callyntropyga* Enderlein, 1940: 644. *Syn. nov.*

*Kuschelomyia* Lopes, 1961: 455. *Syn. nov.*

Type-species of *Toxotarsus*: *Toxotarsus rufipalpis* Macquart, 1851 (= *Sarcophaga nigrocyanea* Walker, 1837) by monotypy. Type-species of *Trixoneura*: *Agria fuscipennis* Macquart, 1843 (= *Sarcophaga nigrocyanea* Walker, 1837), by original designation. Type-species of *Callyntropyga*: *Callyntropyga selkirki* Enderlein, 1940 (= *Stomoxys humeralis* Walker, 1837), by original designation. Type-species of *Kuschelomyia*: *Kuschelomyia ambrosiana* Lopes, 1961, by original designation.

### Diagnosis

*Toxotarsus* can be distinguished from all other Toxotarsinae by the absence of presutural acrostichal setae and the single post-humeral seta.

### Description

Slender sarcophagid-like flies. Head dichoptic in both sexes. Arista bare or with short hairs basally. Thorax metallic grey with dusted vittae. Acrostichal setae absent (small presutural pair in *nigrocyanea* sometimes), *1ph*, and *stpl* 0+1. Abdomen metallic grey or steel blue with an irregular dusting. General setulosity of head, thorax and abdomen long, fine and dense in the male, short and spine-like in the female. Confined to coastal Chile and its off-shore islands.

### Discussion

As in *Sarconesia*, the species that I have included in *Toxotarsus* were previously assigned to monotypic genera. The three included species constitute a lowland and coastal element of the Toxotarsinae with a very similar overall appearance. James (1970: 15) included two species in *Toxotarsus*, namely *fuscipennis* and *rufipalpis* but an examination of the types has shown that these are synonymous with *nigrocyanea* Walker. Shannon (1926: 121) erected the tribe Trixoneurini with the new genus *Trixoneura* for the species *fuscipennis* using the bare arista as a diagnostic character. In fact the arista in the type and all other specimens that I have identified as *nigrocyanea* have short hairs above on the basal third. The other two species, *ambrosiana* and *humeralis*, I have assigned to this genus on the basis of external morphological characters, distribution, and overall appearance. These species are also very similar in overall appearance to the subantarctic species of the genus *Xenocalliphora* which have wide jowls and reduced aristal hairing. The species *X. flavipes* Lamb even has 1 or 2 small hairs on the ventral surface of the stem-vein.

### *Toxotarsus ambrosianus* (Lopes), *comb. n.*

*Kuschelomyia ambrosiana* Lopes, 1961: 456.

### Type

Holotype ♂ of *Kuschelomyia ambrosiana* Lopes, San Ambrosio Island, Chile, in Museu Nacional, Rio de Janeiro.

### Description

Head. Dichoptic in both sexes, male 0.22, female 0.32 of the head width. Ground colour black. Interfrontalia black, slightly brownish anteriorly in some specimens. Eyes bare. Parafrontalia, parafacialia, jowls, face and back of head densely silvery-grey dusted. Lower part of face pale and not densely dusted. Parafacialia near the lunule in

in some specimens with the dusting slightly golden. Epistome slightly protruding in front of the oral margin. Male with 9-11 *ori*, female with 7-8. Parafrontalia and upper parafacialia with small fine setulae. Lower parafacialia with 1 or 2 very small setulae only. Vertex with a pair of *vti*. Interfacial membrane bare. Jowls with long fine black hairs in male and shorter stouter ones in the female. Gular region and lower part of back of head with yellow hairs. Vibrissae strong and crossed. Facial ridge with a group of fine setulae in male and short stout setulae in female just above the vibrissae. Antennal segments dark brown, apical part of second paler, arista long, black, and bare. Lunule brown. Palpi brown, rounded and slightly dilated apically. Mentum glossy pale brown.

Thorax. Ground colour blackish-brown. Dorsum evenly dusted silvery-grey with two indistinct presutural vittae when viewed from behind. The dusting slightly tawny in some specimens. Dorsum viewed from the front shows an indistinct central vitta. Pleura irregularly silvery-grey dusted. General setulosity in male much longer (i.e.  $1\frac{1}{3}$ - $1\frac{1}{2}$  the length of a *dc* seta) than in the female. *Ac* 0+0, *dc* 3+3, *2h*, *1ph*, *ia* 0 or 1+0 or 1, *pra*0, *sal*, *pa*2. Both spiracles creamy white and slightly orangy around the edges. Prosternum grey dusted with totally black hairs or with some pale yellow ones. Propleural depression silvery-grey dusted and whitish pale yellow hairs anteriorly. Prostigmatal seta present. Mesopleural row incomplete, only the upper 1 or 2 setae present. Pteropleuron setulose posteriorly. Infra alar bula bare. *Stpi* 0+1, supraspiracular convexity bare. Scutellum with 1 basal and 1 apical pair of setae.

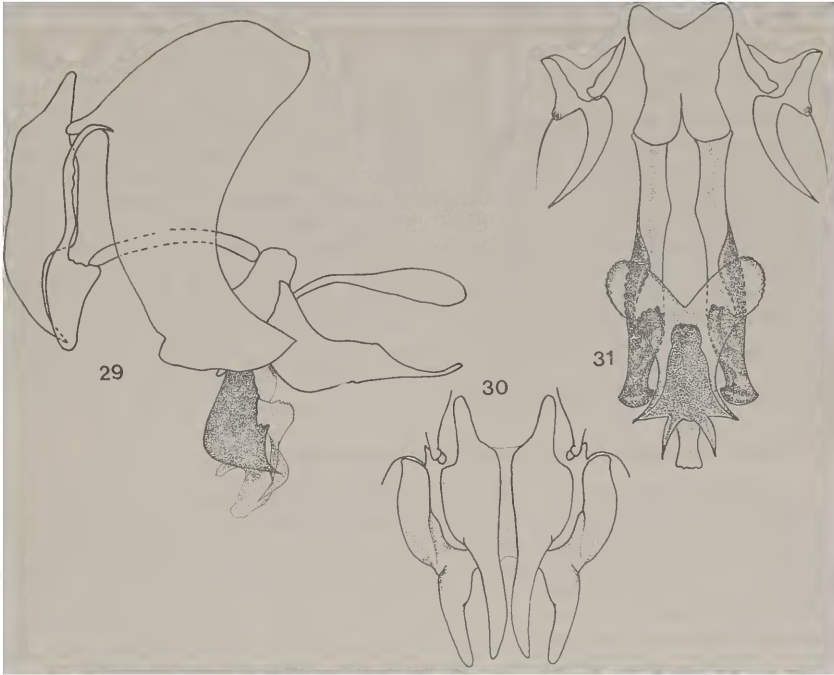
Wings. Clear. Epaulet and basicosta yellow. Veins brown, more yellowish basally. Stem-vein setulose above, bare below. *R5* open in the wing margin. Squamae creamy. Lower squama strap-like with a yellow margin and pale marginal hairs. Upper squama with a pale margin and marginal hairs.

Legs. Coxae brown and grey dusted. Trochanters orangy and undusted. Femora blackish-brown and silvery dusted in male but almost undusted in female. Tibiae and tarsi brown and lightly silvery-grey dusted in male, orangy and undusted in female. General setulosity much longer in the male. Fore coxae of female with 2-3 strong setae, male with long hairs only. Fore femur of male without distinct *pv* and *pd* rows of setae, female with a row of very short but stout setae that are almost dorsal. Fore tibia of male with *3ad* and *1pv* setae, female with *1ad* and *1pv* setae only. Mid and hind coxae in male with many long fine setulae, female with 4-5 stout setulae anteriorly. Mid femur in male with a row of short stout *pv* spines on the apical half, both sexes with 1 or 2 apical *pd* setae. Mid tibia in male with *1-2ad*, *2pd* setae, female with *1ad* seta. Hind femur of female almost bare, male with *pd*, *pv* and *ad* rows of setae. Hind tibia in male with *2-3ad*, *2-3pd*, female with 1 small *ad* seta only.

Abdomen. Ground colour blackish-grey with an evenly distributed greyish dusting. Males with much longer general setulosity than in the females. *T1+2* without distinct marginal setae, female with 1 or 2 strong lateral discal setae. *T3*, 4 and 5 marginal setae which are more robust but sparser in the female. *T5* slightly yellowed at the apex. All sternites dark with dark hairs except the first and second which have a few yellow hairs in some specimens. Lateral branches

of the fifth sternite not prominent in the male but with dense brushes of strong setae.

Genitalia. Male hypopygium as in figures 29-31. Female ovipositor of the simple oviparous *Calliphora*-type, spermathecae simple and oval.



Male hypopygium of *Toxotarsus ambrosianus*: 29, in lateral view; 30, aedeagus in anterior view; 31, cerci and paralobes in posterior view.

#### Distribution

Known only from San Ambrosio Island.

#### Material examined

CHILE: Las Moscas, San Ambrosio, G. Kuschel, 4. xi. 1960, 2♂, 2♀, paratypes presented by Dr. H. de Souza Lopes, BMNH.

#### *Toxotarsus humeralis* (Walker), *comb. n.*

*Stomoxys humeralis* Walker, 1837: 348.

*Sarcophaga rufipes* Macquart, 1843: 260 (reprint 103). Junior homonym, preocc. Wiedemann, 1803. *Syn. nov.*

*Sarcophaga fulvicrus* Rondani, 1850: 365, replacement name for *Sarcophaga rufipes* Macquart, 1843.

*Callynthropyga selkirkii* Enderlein, 1940: 645.

## Types

Holotype ♀ of *Stomoxys humeralis* Walker, Concepción, Chile, in BMNH. Neotype ♂ of *Sarcophaga rufipes* Macquart, Chile, in MNHNP; see designation below. Lectotype ♂ of *Callyntropyga selkirki* Enderlein, Juan Fernandez Island, in NRS; see designation below [all types examined].

Neotype designation for *Sarcophaga rufipes*

Macquart described this species from the male sex from material collected in Chile by M. Gaimard. In the Macquart collection in Paris I found under this name a single male specimen. It is in excellent condition and only slightly dusty, labelled 'S. rufipes', '164 bis' and, on a small green disc, 'M. Gay Chili 1833'. However, the specimen described by Macquart must have been collected by M. Gaimard during the 1818-1820 voyage of l'Uranie, and the specimen by Gay cannot be the type. The type is presumably lost, and it seems desirable to designate a neotype for this species. I am here designating the Paris male as neotype. It agrees with the original description and I have labelled it 'Sarcophaga rufipes Macquart ♂ neotype designated by J.P. Dear 1978'.

Lectotype designation for *Callyntropyga selkirki*

Enderlein described this species from an unspecified number of males from Masafuera, Juan Fernandez Island. From Stockholm I received for study three males all in good condition and labelled 'Masafuera', 'Bäckström', 'febr.', 'Typus', 'Callyntropyga rufipes Type Enderl. ♂ Dr. Enderlein det. 1936'. One of the specimens has an additional label by Hennig 'Das ist offenbar die Art, die Enderlein in der Publikation 1938 als *Callyntropyga selkirki* beschrieben hat'. I have labelled and designate herewith the male with the additional data as lectotype and the other two males as paralectotypes. All three specimens agree with the most recent interpretations of *Callyntropyga humeralis* Walker (e.g. Lopes & Albuquerque, 1955).

## Description

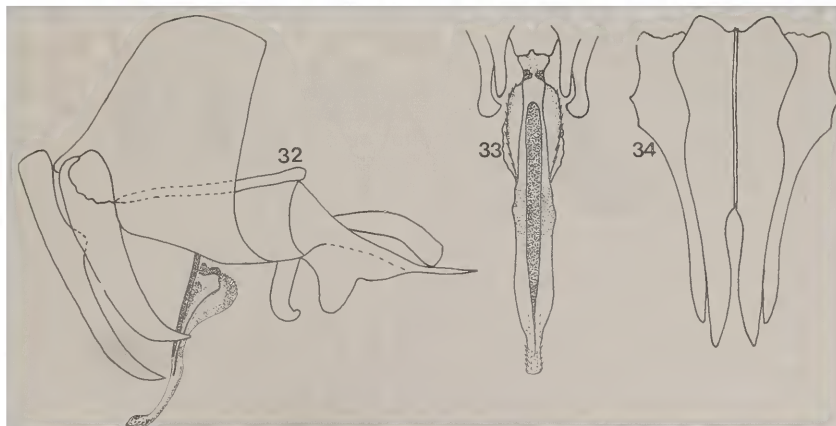
Head. Dichoptic in both sexes, male 0.14 and female 0.32 of the head width. Ground colour black. Eyes bare. Interfrontalia reddish-brown to black. Parafrontalia, parafacialia, jowls and back of the head silvery-grey dusted. Interfacialia slightly orangy in male and totally orangy in female. Face brownish-yellow. Epistome only very slightly protruding in front of the oral margin. Male with 12-14 *ori*, female with 9-10. Parafrontalia, parafacialia and jowls with numerous long fine hairs in the male, female with shorter setae. Interfacial membrane bare. Gular region well developed and with yellow hairs. Lower part of the back of the head also with yellow hairs. Male with a pair of *vti* setae, female with a pair of *vti* and *vte* and one or two pairs of upper *ors* that are small. Vibrissae strong and crossed. Facial ridge with 6-7 strong stout setae just above the vibrissae. Antennal segments brown, apical part of second sometimes orangy,

third greyish in some lights. Arista long, black, short plumose on the basal  $1/3-1/2$ . Lunule brown. Palpi yellow, rounded, slightly dilated apically and with long setae ventrally. Mentum glossy brown.

Thorax. Ground colour black. Dorsum viewed from behind shows two silvery-grey vittae on the presutural region and the humeri silvery-grey dusted. Postsutural area irregularly dusted silvery-grey. Dorsum viewed from the front shows a broad tawny dusted central vitta and irregular tawny dusting laterally. Pleura irregularly silvery-grey dusted. Apex of the scutellum and in some specimens the posterior part of the humeri yellowed. *Ac* 0+0, *dc* 3+3, *2h*, *1ph*, *ia* 1+2, *pra*0, *sa*1 or 2, *pa*2. Ground setulae in male long, fine and erect, longer on the pleurae and scutellum (i.e.  $1/3-1/2$  the length of a *dc* seta), much shorter in the female. Both spiracles orangy. Prosternum greyish dusted and with yellow hairs. Propleural depression silvery-grey dusted and with pale yellow hairs. Prostigmatal seta present. Mesopleural row almost complete in males, incomplete in females with only the upper 1 or 2 present. Pteropleuron with black hairs posteriorly which are denser in the upper part. Infra alar bulla bare. *Sptl* 0+1, suprspiracular convexity bare. Scutellum with 1 basal, 1 apical and 1 discal pair of setae.

Wings. Bases, end of subcosta and median crossvein slightly clouded in the male but clear in the female. Veins brown, more yellowish basally. Stem-vein haired above and below. *R*5 pen in the wing margin. Squamae with a yellowish tinge. Lower squama strap-like and with pale yellow marginal hairs. Upper squama with a brownish margin and pale yellow marginal hairs.

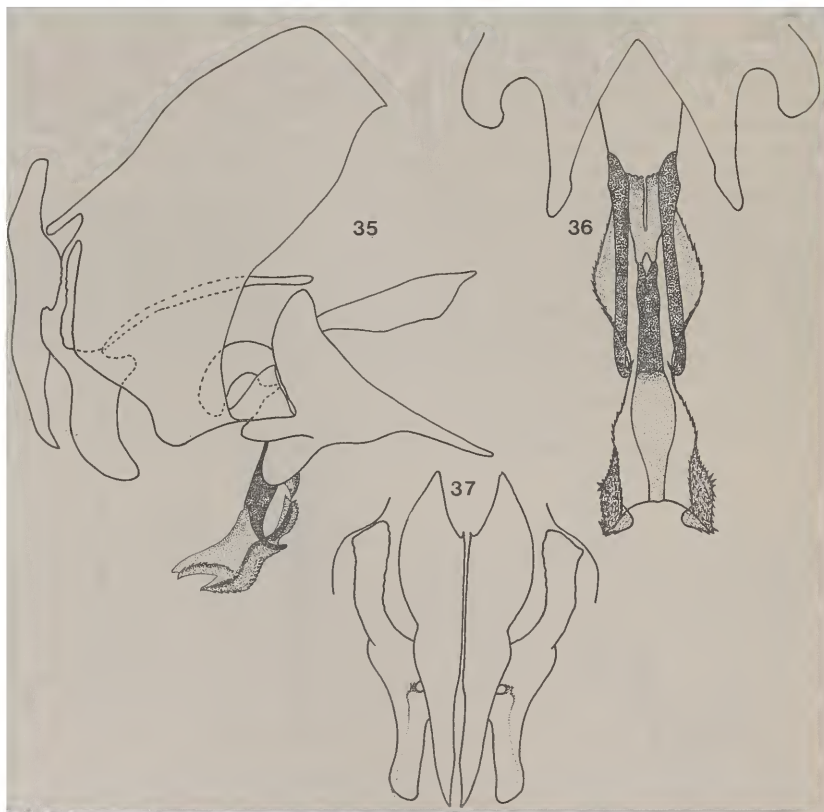
Legs. Coxae, femora and tibiae yellow, in some males the femora are darkened dorsally. Tarsi brownish-black. Coxae slightly dusted whitish-grey, more so in the male. General setulosity longer in male than in female. Fore coxae with a few irregularly arranged setae. Fore femur with *pv* and *pd* rows of setae. Fore tibia with *3ad* and *1p* setae. Male mid and hind coxae with strong bunches of setae on the anterior surface, female without strong setae. Mid femur



Male hypopygium of *Toxotarsus nigrocyaneus*: 32, in lateral view; 33, aedeagus in anterior view; 34, cerci and paralobes in posterior view.

with 2-3*a* setae in the male and 1 in the female, both sexes an arc of 4 setae above apically. Mid tibia in male with 1*ad*, 2-3*pd* setae, female with 2*ad*, 1*pd*, 2*p* and 1*v* seta. Hind femur with a strong *ad* row, a weaker *av* row and a few fine basal *pv* setae in the male, female with an *ad* row of setae only. Hind tibia with 1*a*, 3*ad*, and 3*pd* setae in male, female with 2-3*ad*, 2-3*pd* and 1*a* seta.

Abdomen. Ground colour blackish-grey with a tessellate silvery-grey dusting. A faint undusted central vitta visible when viewed from behind. Tergites 1+2, 3 and 4 with a large membranous area between them and the sternites. Males with much longer general setulosity than in the females. *T1+2* with long fine marginal setae and lateral discals in the male, female without marginals. *T3* with long fine marginals in the male and short stout one in the female. *T4* with denser stronger marginal setae in both sexes. *T5* with the dorsal tip slightly yellowed, with strong marginal setae in two rows and the female with a few strong discal setae. *St1* with yellow hairs, *St2* and 3 with yellow and black hairs, *St4* with fine black setulae. *St5*



Male hypopygium of *Toxotarsus humeralis*: 35, in lateral view; 36, aedeagus in anterior view; 37, cerci and paralobes in posterior view.

orangy, more so in the male which has very dense brushes of strong setae on the inner margins of the lateral branches.

Genitalia. Male hypopygium as in figures 35-37. Female ovipositor of the simple oviparous *Calliphora*-type, spermathecae oval, striated and capped with a spined ring at the junction with the sperm duct.

#### Distribution

Found only in coastal Chile and Juan Fernandez Island.

#### Material examined

CHILE: no further data, ex Bigot Collection, 14 ♀, BMNH.

JUAN FERNANDEZ ISLAND: Masaguera, Quebrada de las Casas, 6. iii. 1968, Lois B. O'Brien, 1 ♂, 2 ♀, IOC, 1 ♂, BMNH; Mesatierra, N. side, Yungue, 1-9. ii. 1973, L. E. Peña, 2 ♂, 1 ♀, BRI.

#### *Toxotarsus nigrocyaneus* (Walker)

*Sarcophaga nigrocyanea* Walker, 1837: 354.

*Agria fuscipennis* Macquart, 1843: 266 (reprint 109). *Syn. n.*

*Tachina planiventris* Macquart, 1851: 178 (reprint 205). *Syn. n.*

*Toxotarsus rufipalpis* Macquart, 1851: 211 (reprint 238). *Syn. n.*

#### Types

Neotype ♂ of *Sarcophaga nigrocyanea* Walker, Chile, in BMNH; see designation below. Holotype ♀ of *Agria fuscipennis* Macquart, Chile, in MNHNP. Lectotype ♀ of *Tachina planiventris* Macquart, South America, in MNHNP; see designation below. Lectotype ♂ of *Toxotarsus rufipalpis* Macquart, Chile, in MNHNP; see designation below [all types examined].

#### Neotype designation for *Sarcophaga nigrocyanea*

Walker described this species from Chile without specifying number or sex. It seems most likely that the description refers to a male specimen, as he mentions the pilose body and legs and such pilosity is not found in females of *Toxotarsus* species. Unfortunately the specimen has been destroyed. The labels and mount are still intact in the BMNH and are as follow; '63.43', 'Chili', 'S. nigrocyanea Wlk.' and 'Chile S. America Capt. P.P. King 63.43'. In the Museum's reprint of Walker's paper and in the tray originally holding the specimen there is a note by Austen implying that he had seen the specimen: 'Not a *Sarcophaga* . . . Genus?' 'E.E. Austen 2.ix.04'. By 1937 the type had been destroyed (Smart, 1937: 383). This species has previously been placed as a synonym of *Sarconesia chlorogaster* (James, 1970: 14), but the description refers to a grey fly with a bluish-grey metallic abdomen. I therefore agree with Lynch Arribalzaga (1881: ix) and Lopes (1962: 422) in believing this species to be conspecific with *Agria fuscipennis* Macquart. It therefore seems desirable to designate a neotype to fix the identity of this name, and I am here designating a specimen in the BMNH as neotype. Walker describes *nigrocyanea* as 'taken in Chili' and so the neotype is from that country and has the following additional data: 'Mocha, Nov.

1932', 'D.S. Bullock', 'David G. Hall Coll'. It agrees completely with the original description, particularly the 'nigro cyaneum'. I have labelled the neotype 'Sarcophaga nigrocyanea Walker ♂ neotype designated by J.P. Dear 1978'.

Lectotype designation for *Toxotarsus rufipalpis*

Macquart described this species from an unspecified number of males from material collected in Chile by Gay. From Paris I received for study seven specimens found under this name in the museum's collection. Five of these specimens did not have the correct type data. Two males were found to have the type data: one is in poor condition with all the left legs and the left wing missing, and the thorax with pin damage, and it is labelled '19.43' and 'Toxotarsus rufipalpis ♂ n.g.n.sp.' by Macquart. The other male is in poor condition labelled '15.43'. Both accession numbers refer to material collected by Gay in Chile. I have labelled and designate herewith the specimen labelled '19.43' as lectotype and the one labelled '15.43' as paralectotype. Both specimens conform to the description of *Toxotarsus nigrocyaneus* given in the present paper.

Lectotype designation for *Tachina planiventris*

Macquart described this species from an unspecified number of males collected in South America. Although he gives the sex as male, his description refers to a female. From Paris I received for study three female specimens, two found under the drawer label *Tachina planiventris* and one under the label *Toxotarsus planiventris*. All three specimens agree with the description and are obviously syntypes. They are all labelled '3125.40' and '76' which refers to a collection made by Pissis in Chile. One specimen without a head is also labelled 'Tachina planiventris ♂ Macq. n.sp.'; it is rather dusty and has the right mid leg and the apical four tarsal segments of the right hind leg missing. The second specimen is in good condition, rather dusty with the right mid tibia and the apical four tarsal segments of the hind leg missing. The third specimen is in good condition with only the thorax partly damaged by the pin. I have labelled and designate herewith the specimen with all legs present as lectotype and the other specimens as paralectotypes. All three specimens conform to the description of *Toxotarsus nigrocyaneus* given in the present paper.

Note on *rufipalpis*

Although Macquart described this species from the male sex only, in his diagnosis of the genus he says 'Front saillant, large ♂ ♀'. However, this is likely to be an assumption made by Macquart without having seen a female specimen. In the BMNH there is a female specimen of this species exchanged with Paris in 1924 labelled '15.43' but I do not consider this to be part of Macquart's type series. Macquart gives two figures of *Toxotarsus* (plate 22, fig. 3), one of which is a profile of the head erroneously showing a long plumose arista.

Note on the holotype of *Agria fuscipennis*

Macquart described this species from the female from Brazil or Chile from material collected by Gaudichaud. From Paris I received a single female found under this name in the collection. It is in poor condition, dirty, with the right wing damaged and the thorax with pin damage, labelled with a recent 'Valparaiso' label, '283.33', 'Museum Paris Chili Gaudichaud 1833', '189' and 'fuscipennis'. The accession number refers to a collection made by Gaudichaud in Brazil and Chile so I consider this specimen to be the holotype.

## Description

Head. Dichoptic in both sexes. Frons of male at narrowest point equal to 0.29 of the head width, female equal to 0.36. Ground colour black. Eyes bare. Interfrontalia blackish with grey dusting. Parafrontalia, parafacialia, face, jowls and back of head all lightly grey dusted. Interfacial membrane reddish-brown and undusted. Epistome only very slightly protruding in front of the oral margin. Male with 12 *ori*, female with 8. Parafrontalia, parafacialia, jows and back of the head with numerous fine setulae in male and short stout spines in the female. Some of the spines near the lunule almost as long as the *ori* setae. Gular region slightly developed and with black setulae. Parafrontalia with a pair of prevertical setae. Vertex with a pair of *vtt*. Interfacial membrane bare. Vibrissae strong and crossed. Facial ridge with 4-5 strong setae just above the vibrissae. First, second and basal part of third antennal segments orangy brown, apical 2/3 of third segment dark brown. Arista long and pectinate on the basal third. Lunule reddish-brown. Palpi pale brown, rounded, slightly dilated apically and with 3-4 long setae ventrally. Mentum glossy brown.

Thorax. Ground colour black with an irregular silvery-grey dusting. Dorsum viewed from behind shows two vittae reaching the middle of the postsutural area and the humeri silvery-grey dusted. Dorsum viewed from the front shows a broad tawny-silvery-grey dusted central vitta flanked by two thinner undusted vittae. Pleura evenly dusted silvery-grey. *Ac* 0+0 (1), *dc* 3+3, *lh*, *lph*, *ia* 0+2, *pra1*, *sa2*, *pa2*. Ground setulae in male longer (i.e. 1/3-1/2 the length of a *dc* seta) than in the female. Both spiracles brown. Prosternum greyish dusted with black setulae. Propleural depression greyish dusted with black setulae. Prostigmatal seta present. Mesopleural row complete. Pteropleuron with a group of black setulae in the upper part and 1 or 2 hairs posteriorly. Infra alar bulla bare, *stpl* 0+1, supraspiracular convexity bare. Scutellum with 2 basal, 1 apical and 1 discal pair of setae.

Wings. Yellowish. Veins yellowish-brown. Epaulet black, basicosta yellow. *R5* closed in the wing margin or with a short petiole. Stem-vein setulose above, bare below. Squamae yellowed, lower squama lobulate with pale marginal hairs. Upper squama with brown marginal hairs.

Legs. Coxae brown with grey dusting. Trochanters yellowish-brown with a slight grey dusting. Femora, tibiae and tarsi blackish-brown with a grey dusting. The general setulosity is much longer in the male than in the female. Fore coxa with 6-7 strong setae. Fore femur in male with a *pv* row on the apical half only, the *pd* row

indistinct, female with *pv* and *pd* rows of setae. Fore tibia with 4 *ad* and 1 *pv* seta. Mid and hind coxae with groups of long setae on the anterior surface which are shorter and stouter in the female. Mid femur with a few longer apical *pv* setae in the male and only 2 apical *pd* setae in the female. Mid tibia with 2*ad*, 1*pd*, 2 *p*, and female with also 1 *av* seta. Hind femur without distinct rows of setae but with 1 or 2 longer setae in an apical *ad* and *av* position, female with 3 apical *av* setae and 2 apical *ad* setae. Hind tibia with 4*ad*, 2*pd* setae, female also with an *av* seta. Hind basitarsus slightly arcuate in the male.

Abdomen. Ground colour black with metallic blue-grey reflections and a tessellate silvery-grey dusting that is denser in the female. Males with much longer general setulosity than in the females. *T1+2* and 3 without distinct marginal setae. *T4* and 5 with distinct marginals which are stouter but sparser in the female, female also with a few strong discals on *T5*. All sternites with a grey dusting and black setulae that are spine-like in the female. Male fifth sternite with long lateral lobes.

Genitalia. Male hypopygium as in figures 32-34: Female ovipositor of the simple oviparous *Calliphora*-type, spermathecae simple and pear shaped.

#### Distribution

Found in the coastal and lowland regions of Chile

#### Material examined

CHILE: Santiago, El Tabo, 1.vii.1961, 1♂, 1♀, ABC; Chiloé I., Ancud, 17-19.xii.1926, F. & M. Edwards, BM, 1927-63, 1♀, BMNH, 1♀, USNM; Tocopilla, sea beach, 10.iv.1931, D.S. Bullock, 6♀, USNM, 3♀, BMNH; Ancud, Chilcé I., 13.xii.1926, Shannon & Snn., 3♂, 1♀, USNM, 2♂, BMNH; Ensenada, 14.xii.1926, Pr. Llano, 1♀, USNM; Mocha, xi.1932, D.S. Bullock, David G. Hall Coll., 1♂, 1♀, USNM; Puerto Montt, xii.1926, R. C. Shannon, 1♂, USNM; Antofagasta, 7.viii., by shore, Cockerell, 1♀, USNM.

As all the specimens above were collected from coastal and lowland localities I believe that a single specimen in the USNM labelled Chile, Lago Nahuel Huapi, 20.xi.1926, Shannon, has been mis-labelled. According to the introduction to the Diptera of Patagonia and South Chile, Shannon was at this time collecting in Argentina on the northern branch of Lake Nahuel Huapi, above 250m.

NOTES ON THE SPECIES INCLUDED IN THE 'UNPLACED SPECIES' LIST IN THE NEOTROPICAL CATALOGUE (JAMES, 1970: 15)

Under the label *Calliphora rufipalpis* Macquart, 1851, in Paris were four female specimens, two of which I found to be syntypes of *C. rufipalpis* Macquart, 1843 (see page 156). The other two specimens are obviously the ones used by Macquart for his description of *C. rufipalpis* 1851 from 'Amérique'. These two females are in fact specimens of the New Zealand genus *Xenocalliphora* Malloch, so the name *Calliphora rufipalpis* Macquart, 1851, can be removed from the Neotropical literature.

From Paris I received for study a specimen found under the name *Rhynchomyia limbipennis* Macquart, 1843, another species in the unplaced list. Although the specimen is labelled 'Rhynchomyia limbipennis Macq. n.sp.', it cannot be the type. It is a female specimen of *Rhynchomyia cyanescens* Loew [Palaeartic] which has a yellow face. Macquart's description of *limbipennis* refers to a male with a black face.

#### ACKNOWLEDGEMENTS

I am very grateful to the following colleagues who have lent me material for study from the collections in their care: Dr. H. de Souza Lopes (ABC), Dr. G. E. Shewell (BRI), Dr. P. Arnaud (CAS), Mr. L. Matile (MNHN), Dr. H. Schumann (MNHU), Dr. J. H. Guimarães (MZUSP), Dr. R. Lichtenberg (NHMV), Dr. W. Tobias (MNFS), Dr. P. J. van Helsdingen (RNH), Dr. R. J. Gagné (USNM), Mr. P. I. Persson (NRS), and Dr. L. Lyneborg (UZMC).

I am especially grateful to Mr. L. Matile for providing me with much information on accession numbers and data of Macquart types in Paris and to my friend and colleague Adrian Pont who has helped me in many ways in the preparation of this paper.

Finally I thank Dr. N. Papavero for reading the MS and his useful suggestions and corrections.

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