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THE TRICHO CERIDAE OF AUSTRALIA (DIPTERA).

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Massachusetts Agricultural College, Amherst, Massachusetts, U.S.A.
(Communicated by Dr. E. W. Ferguson.)

(Eleven Text-figures.)
[Read 28th July, 1926.]

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The genus *Trichocera* was proposed by Meigen in 1803 for a group of small crane-flies that are eminently characteristic of winter conditions, being most commonly noted in late autumn, early spring and during mild sunny days in winter. For many years the genus was placed in close relationship to the Tipulid genus *Limnophila* Macquart but is now known to be only distantly allied to this genus. Even as recently as 1924, Pierre has placed the group as a subfamily of the Tipulidae. He has, moreover, included in this group the alpine fly, *Alfredia acrobata* Bezzi, which is almost certainly a degenerate species of *Limnophila* having nothing to do with the Trichoceridae. From a study of the larva and pupa, the writer (Alexander, 1920) removed *Trichocera* from the Tipulidae and placed it as a subfamily, the Trichocerinae, of the family Anisopodidae. Still more recent work on the morphology of the adult flies has demonstrated that *Trichocera* and the allied genera are more isolated than was hitherto believed and they are now more generally conceded to represent a distinct family, the Trichoceridae (Crampton, 1924, 1925). The writer believes the superfamily Tipuloidea should include the following elements:

- Psychodidae, with the subfamilies Bruchomyiinae, Phlebotominae and Psychodinae.
- Tanyderidae.
- Ptychopteridae.
- Tipulidae, with the subfamilies Limoniinae, Cylindrotominae and Tipulinae.
- Trichoceridae.

Of these families, the Psychodidae, Tanyderidae and Ptychopteridae form a closely related group, the Tipulidae a second, and the Trichoceridae a third that leads toward the Anisopodidae.

Three genera of Trichoceridae have been described, the dominant genus of the Holarctic region being *Trichocera* (genotype, *hiemalis* De Geer) with a large number of described species whose synonymy is still badly involved. A few species occur in the higher mountains of the Oriental region and very recently Edwards (1923) has described a species, *T. antarctica* Edwards, from Campbell Island of the Subantarctic Islands of New Zealand, the first true *Trichocera* from the Southern Hemisphere. It should be noted that the European *Trichocera annulata* Meigen occurs in New Zealand and Victoria where it has presumably been carried by modern transportation, the immature stages of the various species often occurring in stored roots and tubers where they may cause some secondary injury (Rhynehart, 1925).

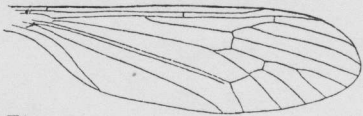


Fig. 1

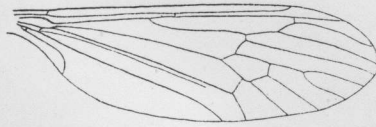


Fig. 2

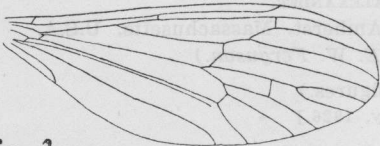


Fig. 3



Fig. 4

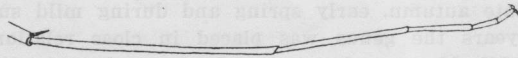


Fig. 5

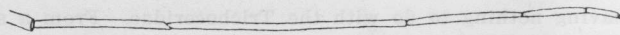


Fig. 6

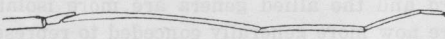


Fig. 7



Fig. 8



Fig. 10



Fig. 9



Fig. 11

- Fig. 1. Wing of *Diazosma subsinuata* Alexander.
 Fig. 2. Wing of *Trichocera hiemalis* De Geer.
 Fig. 3. Wing of *Paracladura maori* Alexander.
 Fig. 4. Wing of *Nothotrichocera cingulata*, n. sp.
 Fig. 5. Tarsus of *Trichocera hiemalis* De Geer.
 Fig. 6. Tarsus of *Nothotrichocera cingulata*, n. sp.
 Fig. 7. Tarsus of *Paracladura maori* Alexander.
 Fig. 8. Ovipositor of *Nothotrichocera tonnoiri*, n. sp.
 Fig. 9. Ovipositor of *N. cingulata*, n. sp.
 Fig. 10. Ovipositor of *N. terebrella*, n. sp.
 Fig. 11. Ovipositor of *N. tasmanica*, n. sp.

The second genus to be described, *Diazosma* Bergroth (genotype, *hirtipennis* Siebke) includes one or two Holarctic species. The flies are very rare and there is still some question as to whether the Nearctic species, *subsinnuata* Alexander, is identical with the genotype of Europe. Since the ranges of most of the other known species of the family are so very restricted, since the differentiation of species is often based on relatively slight characters of the male hypopygium, and since several species of a given genus may occupy a small area, it seems advisable to retain the two names until more data become available and a direct comparison of specimens can be made.

The third genus, *Paracladura* Brunetti, was proposed in 1911 (genotype, *gracilis* Brunetti) under the erroneous impression that the fly was allied to the Eriopterine Tipulid genus *Cladura*. The genus now includes 11 species from New Zealand, 1 from the Auckland Islands, 2 from Formosa and Southern Japan, 2 from the Himalayas and 1 from the western United States. *Paracladura* may be expected to occur in Eastern Australia.

Upon his recent expedition to Tasmania, Mr. A. L. Tonnoir secured specimens of Trichoceridae which were kindly submitted to me for study. The four species of these flies taken in Tasmania prove to represent a new genus, *Nothotrichocera*, that curiously combines certain features of *Trichocera* and *Paracladura*. These species of *Nothotrichocera* and the records of *Trichocera annulata* Meigen for Victoria constitute the first references to the family in Australia. The types of the new species have been returned to Mr. Tonnoir.

Key to the Genera of the Trichoceridae.

1. Wings with vein 2nd A subsinuate, not short and curved abruptly into the anal angle (Fig. 1) *Diazosma* Bergroth
- Wings with vein 2nd A short, curved abruptly into the anal angle 2
2. Tibial spurs present (Fig. 5); tarsi with the basitarsus longer than segments 2 and 3 taken together (Figs. 2, 5) *Trichocera* Meigen
- Tibial spurs lacking (Figs. 6, 7); tarsi with the basitarsus shorter than tarsal segment 2 3
3. Basitarsus very short, only about two to three times as long as wide, shorter than the third tarsal segment (Fig. 7); wings with *m-cu* on M_4 some distance beyond the origin of the latter; M_{3+4} shorter than the basal section of M_3 , the latter forming the caudal border of cell 1st M_2 (Fig. 3) *Paracladura* Brunetti
- Basitarsus long, about ten times as long as wide, longer than the third tarsal segment (Fig. 6); wings with *m-cu* on M_{3+4} close to its fork; M_{3+4} long, the basal section of M_3 correspondingly reduced and forming the outer end of cell 1st M_2 (Fig. 4) *Nothotrichocera*, n. gen.

NOTHOTRICHOCERA, n. gen.

Characters as in the family. Legs with the tibial spurs lacking; basitarsi shorter than tarsal segment 2 but longer than tarsal segment 3, the segments beyond the second gradually decreasing in length. Wings with a venation that is much as in *Trichocera* but with cell 1st M_2 narrower and the inner end more pointed; *m-cu* close to the outer end of M_{3+4} , the basal section of M_3 taking part with *m* in forming the outer end of cell 1st M_2 . Ovipositor with compressed, relatively horny, down-curved valves.

Genotype, *Nothotrichocera tonnoiri*, n. sp. (Australasian Region).

Key to the Species of Nothotrichocera.

1. Size large (wing, ♀, over 6 mm.) 2
- Size small (wing, ♀, under 5 mm.) 3

2. Pronotum dark brown; petiole of cell M_1 less than twice the length of m ; abdominal tergites dark brown, the extreme caudal margins of the segments narrowly blackened; ovipositor with the valves elongate, only gently curved to the subacute tips (Fig. 8) *tonnoiri*, n. sp.
Lateral angles of the posterior pronotum broadly fulvous-yellow; petiole of cell M_1 three or more times the length of m (Fig. 4); abdomen dark brown, the segments broadly ringed caudally with yellowish testaceous; ovipositor with the valves short, strongly curved, gradually narrowed to the acute tips (Fig. 9) *cingulata*, n. sp.
3. Wings tinged with greyish; knobs of the halteres tipped with obscure yellow; ovipositor with the valves yellowish horn-colour, very compressed, strongly curved to the needle-like points (Fig. 10) *terebrella*, n. sp.
Wings tinged with brownish; knobs of halteres entirely dark brown; ovipositor with the valves dusky horn-colour, of moderate width only, curved gently to the subacute tips (Fig. 11) *tasmanica*, n. sp.

NOTHOTRICHOCERA TONNOIRI, n. sp.

♀. Length about 5.5-3 mm.; wing 6.2-6.3 mm.

Rostrum and palpi dark brown. Antennae filiform, dark brown, the second scapal segment somewhat paler apically; flagellar segments elongate-cylindrical, the first a little longer than the second, the succeeding segments very gradually increasing in length. Head obscure brownish-yellow, the centre of the vertex darker.

Pronotum dark brown. Mesonotal praescutum gibbous, dark brown, broadly paler laterally; scutal lobes dark brown, the median area and the parascutella paler; scutellum darker brown; postnotum obscure brownish-yellow. Pleura obscure yellow, variegated with brown, especially on the sternopleurite, anepisternum and the meron. Halteres relatively elongate, pale, the knobs dark brown. Legs with the coxae brownish testaceous, the outer faces somewhat darker; trochanters brownish-yellow; femora brown, their bases paler; tibiae and tarsi dark brown; basitarsus about two-thirds the length of tarsal segment 2 and about one-half longer than tarsal segment 3; tarsal segment 4 two-thirds or less of segment 3; segment 5 shortest, a little less than one-third segment 4. Wings with a strong brownish tinge, the stigmal region slightly darker brown, oval; veins dark brown. Venation: Sc_2 shortly before midlength of R_s ; Sc_1 ending some distance before r ; basal section of R_2 and terminal section of R_1 subequal; inner end of cell 1st M_2 acutely pointed; petiole of cell M_1 short, only a little longer than m ; $m-cu$ close to the outer end of cell 1st M_2 ; vein 2nd A short, only gently curved to the margin.

Abdominal tergites dark brown, the extreme caudal margins of the segments narrowly blackened; sternites paler brown. Ovipositor (Fig. 8) horn-coloured, with the valves elongate, only gently curved to the subacute tips.

Hab.—Tasmania.

Holotype, ♀, Mt. Wellington, November 25, 1922 (A. Tonnoir).

Named in honour of the distinguished student of the Diptera of Australia and New Zealand, André L. Tonnoir, to whom I am indebted for many kind favours.

NOTHOTRICHOCERA CINGULATA, n. sp.

Very similar in size and general appearance to *N. tonnoiri*, n. sp., differing as follows.

Lateral angles of the posterior pronotum broadly fulvous-yellow. Wings with the basal section of R_2 about one-third shorter than the terminal section of R_1 ; petiole of cell M_1 about three or more times the length of

m; vein 2nd A rather strongly incurved to the margin (Fig. 4). Abdomen dark brownish-black, the segments broadly ringed caudally with obscure yellowish testaceous. Ovipositor (Fig. 9) with the valves shorter, gradually narrowed, strongly curved to the acute tips.

Hab.—Tasmania.

Holotype, ♀, Mt. Wellington, November 23, 1922 (A. Tonnoir).

NOTHOTRICHOCERA TEREBRELLA, n. sp.

♀. Length about 3.6 mm.; wing 4.6 mm.

Rostrum and palpi dark brown. Antennae dark brown, with the second scapal segment pale apically. Head obscure yellow, slightly darker dorsomedially.

Pronotum dark brown, the anterolateral pretergites paler. Mesonotum relatively uniformly dark brown, the praescutum scarcely paler laterally; scutellum more yellowish testaceous, with a small median spot at base. Pleura pale brown, variegated with darker brown on the mesopleura and meron. Halteres with the apices of the knobs obscure yellow. Legs brown, relatively slender; basitarsus relatively short, only about one-half the second segment which is longer than the segments beyond it taken together; third tarsal segment nearly twice the length of the fourth. Wings with a greyish tinge, the veins dark brown. Venation: Almost as in typical *Trichocera*; petiole of cell M_1 fully three times *m*.

Abdomen dark brown, the genital segment paler. Ovipositor (Fig. 10) with the valves yellowish horn-colour, very compressed, strongly curved to the needle-like tips.

Hab.—Tasmania.

Holotype, ♀, St. Patrick's River, altitude 1,200 feet, November 1, 1922 (A. Tonnoir).

NOTHOTRICHOCERA TASMANICA, n. sp.

♀. Length about 3.3 mm.; wing about 4.5 mm.

Generally similar to *N. terebrella*, n. sp.

Praescutum and scutum dark brown medially, paler laterally. Pleura testaceous, scarcely variegated with darker. Knobs of the halteres entirely dark. Wings with a brownish tinge. Venation: Sc_2 shortly beyond one-third the length of R_s ; basal section of R_2 longer than the terminal section of R_1 ; petiole of cell M_1 nearly three times *m*.

Abdomen dark brown. Ovipositor (Fig. 11) with the valves dusky horn-coloured, compressed, of moderate width only, very gently curved to the subacute tips.

Hab.—Tasmania.

Holotype, ♀, King River, altitude 500 feet, February 4, 1923 (A. Tonnoir).

Trichocera annulata Meigen.

(*Trichocera annulata* Meigen, *Syst. Beschreib.*, 1, 1818, 215.)

Victoria: Melbourne, 11th August, 1918, 28th June, 1925 (G. F. Hill). Tyers, 24th May, 1925 (Miss Galbraith).

In the collection of the National Museum, Victoria.

As stated above, this European species was probably introduced in stored vegetable products or, possibly, in manure.

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