

THE TANYDERIDAE OF AUSTRALIA (DIPTERA).

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(Four Text-figures.)

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The remarkably paleogenic group of Diptera now included in the family Tanyderidae is represented by ten recent and fossil genera totalling slightly more than a score of species. Of this number, three genera with four species are herein recorded from the Australian Subregion. For many years the flies of this group were included in the family Tipulidae where they were ranked as a distinct tribe or placed with the Ptychopterini (Loew, 1851; Osten Sacken, 1859, 1869, 1880, 1886; Philippi, 1865; Hutton, 1900). More recently the various Tanyderid genera were distributed in the Ptychopteridae (Handlirsch, 1909; Enderlein, 1912; de Meijere, 1915*a*, 1915*b*). The group was finally accorded full family rank by Alexander (1919).

The first genus to be described was the only known fossil, *Macrochile* Loew (Loew, 1851; Crampton, 1926; Alexander, 1927*b*) from the Lower Oligocene Baltic Amber. The next genus to be defined was *Protoplasa* Osten Sacken (1859), soon followed by the typical genus *Tanyderus* Philippi (1865). Virtually all of the known species, including all forms described from the Southern Hemisphere, were included in *Tanyderus* until the appearance of the very important paper by Handlirsch (1909) where three new generic groups were proposed (*Protanyderus*, *Mischoderus* and *Radinoderus*). Alexander (1927*b*) recognized these three names as valid subgenera and added two subgeneric groups to *Tanyderus*, *Neoderus* for the Neotropical *Tanyderus patagonicus* Alexander (1913) and *Nothoderus* for the Australasian *Tanyderus australiensis* Alexander (1922). It now seems advisable to treat these names as was done by Handlirsch and in the present report a total of ten generic names is recognized. The most distinct group would appear to be *Péringueyomyia* Alexander (1921), although many of the other groups appear to be very well defined. In the Australasian fauna, *Mischoderus* Handlirsch is found only in New Zealand, a total of five specific names having been proposed (*forcipatus* Osten Sacken, 1880; *annuliferus* Hutton, 1900; *neptunus* Edwards, 1923*a*; *varipes* Edwards, 1923*a*; *marginatus* Edwards 1923*b*) at least one of which will probably prove to be a synonym (Handlirsch, 1909; Tillyard, 1926). *Radinoderus* Handlirsch includes six Australasian and an additional Chilean species (*gloriosus* Alexander, 1920*b*). The species of the former group have been discussed and keyed in a paper by the writer (Alexander, 1924). Two of the Australian species belong to *Radinoderus* and are the largest and most beautiful species in the local fauna. *Nothoderus* Alexander is probably the most generalized of the living Tanyderidae, its retention

of the free tip of Sc_2 being an archaic feature (Alexander, 1922, 1927a, 1927b; MacGillivray, 1923). The third Australian genus includes only the very interesting little species that is described herewith as *Eutanyderus wilsoni*, n. gen. et sp., one of the interesting captures made in Victoria by my friend, Mr. F. Erasmus Wilson.

In earlier papers, the writer (Alexander, 1920c, 1927b) had included in the Tanyderidae as a separate subfamily the Bruchomyiinae but these are now considered as being more properly referable to the Psychodidae (Alexander, Proc. LINN. SOC. NEW SOUTH WALES, liii, 1928, 291).

Nothing is known concerning the immature stages of these flies except the brief account given by Alexander (1920a) of the supposed larva of *Protoplasa fitchii* Osten Sacken. This larva lives in wet decaying logs near water and presents a curious appearance, the caudal end of the abdomen being produced into a long, stout, non-retractile breathing tube that is somewhat suggestive of the much shorter tube of the closely allied Psychodidae. At the base of this tube are two large, pinnately branched anal gills that are quite unlike those of any other known Dipterous insect.

Key to the Genera of the Tanyderidae.

1. Front prolonged into a slender rostrum that is longer than the combined head and thorax, the reduced mouthparts being borne at the extreme apex; wings immaculate; male hypopygium with the styli very elongate
 (Ethiopian: Cape Colony) *Péringueyomyia* Alexander
- Front not greatly prolonged, the rostrum being relatively short, any elongation that exceeds the remainder of the head in length being due to the palpi and other mouthparts; wings pictured in all recent species; male hypopygium with the styli short 2
2. Wings immaculate (Fossil: Lower Oligocene, Baltic Amber)
 *Macrochile* Loew
- Wings pictured, the pattern usually cross-banded brown and subhyaline 3
3. Wings with the free tip of Sc_2 preserved (Australasian: Tasmania)
 *Nothoderus* Alexander
- Wings with the free tip of Sc_2 atrophied 4
4. Cervical sclerites shorter than the pronotum, the neck-region short; male hypopygium with the dististyle more or less bifid 5
- Cervical sclerites elongate, equal to or exceeding the pronotum, the two together forming a conspicuous neck-region; male hypopygium with the dististyle simple, terete 6
5. A supernumerary cross-vein in cell M_3 of the wing (Eastern Nearctic)
 *Protoplasa* Osten Sacken
- No supernumerary cross-veins in any cells of the wing
 (Western Nearctic, Palaearctic) *Protanyderus* Handlirsch
6. No supernumerary cross-veins in any cells of the wing 7
- Supernumerary cross-veins in certain of the radial cells of the wing 8
7. R_s elongate, subequal to or exceeding R_{2+3} , the latter shorter than cell R_2 ; in Australian species a short fusion of R_{2+3+4} ; antennae with 18 or more segments (Australasian, Neotropical) *Radinoderus* Handlirsch
- R_s short, about two-thirds R_{2+3} and longer than cell R_2 ; R_{4+5} distinct from R_{2+3} ; antennae with 15 segments (Australasian: Victoria)
 *Eutanyderus*, n. gen.
8. A supernumerary cross-vein in cell R_4 only (Neotropical: Chile)
 *Tanyderus* Philippi
- Supernumerary cross-veins in two radial cells 9
9. Supernumerary cross-veins in cells R_3 and R_4 (Australasian: New Zealand)
 *Mischoderus* Handlirsch
- Supernumerary cross-veins in cells R_3 and R_5 (Neotropical: Patagonia)
 *Neoderus* Alexander

NOTHODERUS Alexander.

Nothoderus Alexander, PROC. LINN. SOC. NEW SOUTH WALES, lii, 1927, 45; Alexander, *Genera Insectorum*, Fasc. 189, 1927 (Tanyderidae).

Front elongate, about twice the length of the remainder of the head, the maxillary palpi basal in position, longer than the frontal prolongation. Eyes hairy. Vertex between the eyes narrow. Antennae 15-segmented, short in both sexes, the flagellar segments in the male cylindrical, the outer segments more oval; first segment of scape only a little longer than the second. Cervical sclerites relatively short, subequal to or shorter than the pronotum which is large and massive. Legs relatively short and stout, hairy, the tibial spurs distinct; claws slender, nearly straight. Wings with the general venation of *Tanyderus*; Sc₁ atrophied; free tip of Sc₂ preserved (Text-fig. 1), the fusion of Sc₂ and R₁ subequal to or a little exceeding the free tip itself; a single supernumerary cross-vein at near two-thirds the length of cell R₄; cell 1st M₂ very long and narrow, only slightly widened distally; m-cu short, a little more than its own length beyond the fork of M₃₊₄. Veins with conspicuous macrotrichiae. Male hypopygium with the basistyle slender, only moderately clothed with setae. Dististyle terminal in position, cylindrical, gently arcuate, at the apex densely provided with erect spinous bristles; mesal face of style with scattered erect setae that are intermixed with smaller delicate setulae. What appears to represent the tergite is a bilobed structure with a microscopic glabrous lobe in the emargination, the large lateral lobes armed with stout spinous setae; more basal in position are two lobules that are provided with a group of very long slender black setae. Aedeagus apparently simple at apex, relatively short, curved.

Genotype, *Tanyderus australiensis* Alexander (Australasian Region: Tasmania).

NOTHODERUS AUSTRALIENSIS (Alexander).

Tanyderus australiensis Alexander, *Rec. South Australian Museum*, ii, 1922, 226-227; MacGillivray, *External Insect-Anatomy*, 1923, p. 322, fig. 45 (wing).—*Tanyderus* (*Nothoderus*) *australiensis* Alexander, *Genera Insectorum*, 1927, Fasc. 189, fig. 9.—*Nothoderus australiensis* Alexander, PROC. LINN. SOC. N.S.W., lii, 1927, 45, fig. 1.

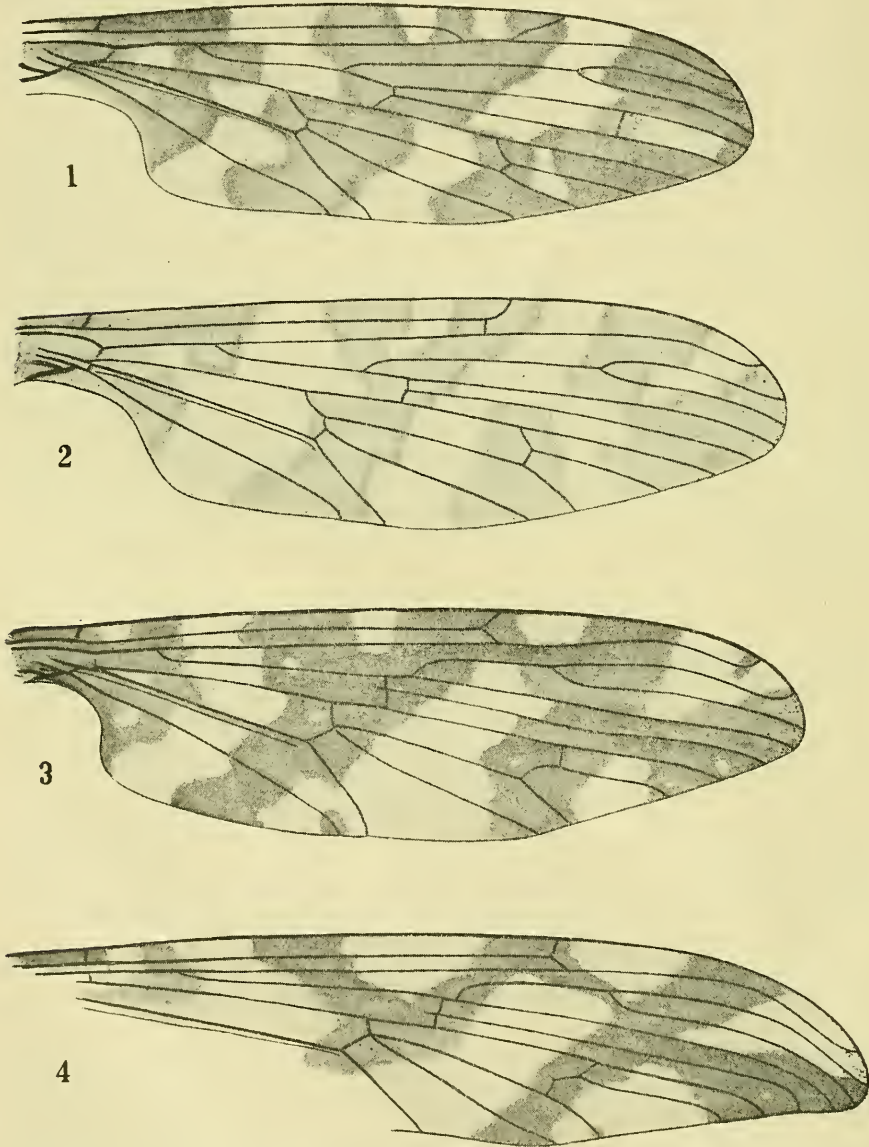
The type, a unique female, was from Southport, Tasmania, and is now preserved in the South Australian Museum. Dr. Tonnoir secured a male in the Hartz Mountains, Tasmania, altitude 3,000 feet, December 10, 1922, and a second female specimen on Mt. Wellington, November 28, 1922. These are the only records known to me and the fly is apparently confined to southern Tasmania.

Allotype, ♂. Length about 5.8-6 mm.; wing 7.5 mm.

Agreeing closely with the female except in the smaller size (♀, length, excluding rostrum, about 9 mm.; wing 10.5-11 mm.; rostrum alone 1.3-1.4 mm.) and sexual characters.

Pronotum and mesonotum reddish-brown, the prescutum with three broad blackish stripes; pronotum and mesonotum with conspicuous erect yellow setae. Wings with a pattern that is similar to the type female (Text-fig. 1) with the following exceptions: The brown spot at origin of Rs not confluent with the marking in the anal angle; as in the type, the broad fascia at the cord divides into three rays in the costal region, the second including Sc at its point of disappearance into R, the third surrounding the free tip of Sc₂.

Allotype, ♂, Hartz Mts., Tasmania, altitude 3,000 feet, December 10, 1922 (A. L. Tonnoir). The allotype and the female specimen taken by Dr. Tonnoir have been returned to him. His female agrees closely with the type (Text-fig. 1) except that the third apical dark area at outer end of cell 1st M_2 is barely



Text-fig. 1.—Wing of *Nolhoderus australiensis* (Alexander); holotype ♀.

Text-fig. 2.—Wing of *Eutanyderus wilsoni*, n. gen. et sp.; allotype ♀.

Text-fig. 3.—Wing of *Radinoderus terrae-reginae* (Alexander); holotype, sex ?

Text-fig. 4.—Wing of *Radinoderus occidentalis* (Alexander); holotype ♀.

contiguous with the second apical spot, but broadly connected with the wide central fascia by rays in cells R_5 and M_3 , leaving an oval white spot in cell 1st M_4 and the adjoining part of cell M_3 .

EUTANYDERUS, n. gen.

Frontal prolongation of the head short, less than one-half the remainder of the head; both labial and maxillary palpi elongate, slightly exceeding the entire remainder of the head, the maxillary palpi a little longer than the labial palpi; terminal two segments of maxillary palpi relatively short, subequal to the antepenultimate. Antennae 15-segmented, relatively short, only a little longer than the combined front and mouthparts; flagellar segments cylindrical or nearly so, with basal verticils that are shorter than the segments. Eyes hairy. Cervical sclerites equal to or longer than the pronotum, the two together producing a conspicuous elongate neck-region as in this group of genera. Legs with conspicuous, nearly erect setae on the tibiae and less conspicuous setae on the femora; tibial spurs distinct; tarsal segments one to four with paired spinous setae. Wings (Text-fig. 2) pictured, more heavily so in the female than in the male; Sc relatively short, Sc_1 ending about opposite one-half to three-fifths the length of R_{2+3} , Sc_2 a short distance from its tip; Rs relatively short, gently arcuated at origin; R_{2+3} longer than either R_2 or R_3 ; R_{4+5} more than one-fourth Rs ; basal section of M_4 nearly equal to m-cu; no supernumerary cross-veins in any cells of the wing. Male hypopygium with the dististyle cylindrical, gently arcuated, a little longer than the basistyle. Ovipositor with small fleshy valves.

Genotype, *Eutanyderus wilsoni*, n. sp. (Australasian Region: Victoria).

Despite the points of divergence offered by the structure of the neck region and the venation, I believe that *Eutanyderus* is most closely allied to *Nothoderus* Alexander.

EUTANYDERUS WILSONI, n. sp.

Size small (wing less than 10 mm.); mesonotal prescutum with four brown stripes; fore coxae paler than the other coxae; femora tipped with black; wings nearly hyaline with a conspicuous banded pattern, very pale in the male, darker in the female, the areas narrowly margined with still darker brown.

♂. Length (excluding rostrum) about 7 mm.; wing 8.5 mm.; rostrum about 1.5 mm.

♀. Length (excluding rostrum) about 7 mm.; wing 8.5 mm.; rostrum about 1.4 mm.

♂. Rostrum and palpi black. Antennae with the scapal segments brown, the first flagellar segment yellow; second flagellar segment pale brown, brighter at the sutures; remaining segments brownish-black, the third and fourth segments a trifle brightened at the sutures. Head dark grey.

Cervical sclerites brownish-grey. Pronotum dark grey, with conspicuous erect white setae. Mesonotal prescutum light fulvous, with conspicuous white setae and four dark brown stripes, the intermediate pair longer and weakly separated by a pale vitta; scutum obscure yellow medially, the lobes dark brown, the lateral margins fulvous; scutellum broad, light yellow, with pale setae; postnotal mediotergite reddish-brown with a darker brown median line. Pleura grey with a reddish cast, the dorsal region darker. Halteres pale yellow, the knobs dark brown. Legs with the fore coxae and trochanters yellow, the remaining coxae concolorous

with the pleura; middle and posterior trochanters obscure brownish-yellow; femora yellow, the tips narrowly blackened; tibiae brown; tarsi passing into brownish-black; hind legs broken. Wings nearly hyaline, with a pale pattern that is only a trifle darker than the ground-colour, these areas narrowly margined with darker brown; these pale fasciae are distributed as follows: Origin of Rs; an irregularly oblique fascia completely crossing the wing at the cord, sending two rays to the costal margin, the outer at the tip of Sc; three extensive apical areas, the first surrounding the fork of R_{2+3} , the second apical in position, the third including the outer end of cell 1st M_2 and thence to the caudal margin; the first and second areas are contiguous basally, separated by a narrow arm of the ground colour; the third ray is distinctly separated from both of the others; an axillary area in both anal cells. This arrangement of pattern is exactly as in the female, as figured (Text-fig. 2).

Abdominal tergites obscure yellow, the lateral margins narrowly darker; hypopygium dark brown; sternites more yellowish-brown, the lateral margins infuscated, the caudal margins of the individual segments narrowly pale.

♀. Generally similar to the male, differing in details of coloration. Ground colour of the prescutum and scutum duller, more testaceous; scutellum somewhat testaceous brown. The posterior tarsi are much paler yellow than the other tarsi. Wings (Text-fig. 2) with the pattern heavier than the male, the central portions of the various fasciae being only a little paler than the margins; prearcular region and bases of cells C, Sc, R, M, Cu and the anal cells darkened. Abdominal tergites pale brown, the caudal margins of the segments narrowly darker brown.

Hab.—Victoria.

Holotype, ♂, Mountains near Millgrove, altitude 2,000 feet, October 23, 1927 (F. E. Wilson); returned to Mr. Wilson, to be placed eventually in the National Museum, Melbourne.

Allotype, ♀, with the male, at 2,300 feet; in the author's collection.

This striking addition to the Victorian fauna is named in honour of the collector, Mr. F. Erasmus Wilson, to whom I am greatly indebted for many kind favours.

RADINODERUS Handlirsch.

Ann. k.-k. Naturhist. Hofmus. Wien, xxiii, 1909, 270.

The genotype of *Radinoderus*, *ornatissimus* (Doleschall) is known only from the islands of Amboina and Obi (Osten Sacken, 1886; Enderlein, 1912). Two other species, *mirabilis* (de Meijere) and *oculatus* (Riedel), are from New Guinea, while a fourth, *solomonis* (Alexander), is from the Solomon Islands. The other Australasian species are from Australia and may be separated by means of the following key:

1. Wings broad with a heavy brown pattern, the costal rays much more extensive than the interspaces; all femora yellow with the tips broadly blackened (South Queensland) *terrae-reginae* (Alexander)
- Wings narrow with a more restricted brown pattern, the pale costal interspaces being more extensive than the dark rays; at least one of the femora (probably the fore pair) has a broad and conspicuous blackened ring at near midlength, in addition to the blackened tips .. (Western Australia) .. *occidentalis* (Alexander)

No further data have become available concerning these two species and their descriptions are briefly summarized here only to complete the subject.

RADINODERUS TERRAE-REGINAE (Alexander).

Tanyderus (Radinoderus) terrae-reginae Alexander, *Insec. Inscit. Menst.*, xii, 1924, 141-142.

Antennae 24-segmented; scape black, the flagellum entirely light yellow. Mesonotum pale brown with three darker brown stripes; scutellum yellow, the caudal margin and a median line dark brown; pleura dark brown, variegated with paler. Halteres yellow, the knobs dark brown. Legs yellow, the tips of the femora broadly blackened, the bases of the tibiae similarly and subequally blackened; tarsi yellow. Wings (Text-fig. 3) whitish subhyaline, the pattern brown. Abdomen dark brown, the tergites with an oval whitish marking on either side.

Brisbane, October 10, J. A. Kershaw. Type in the National Museum, Melbourne.

RADINODERUS OCCIDENTALIS (Alexander).

Tanyderus (Radinoderus) occidentalis Alexander, *Insec. Inscit. Menst.*, xiii, 1925, 32-34.

Allied to *terrae-reginae*, differing in the following regards:

Femora yellow, the fore femora (presumably) conspicuously blackened at near midlength; on the middle femora (presumably) this region is merely infuscated. Wings (Text-fig. 4) relatively narrow, the tips subfalcate; membrane whitish subhyaline, the brown pattern narrow and restricted in amount, with a Y-shaped marking at the cord, the outer arm, at tip of Sc, confluent with an X-shaped area that occupies the distal third of the wing.

Swan River, Western Australia (J. Clark).

The unique type was sent to me by my friend, the late Dr. Eustace W. Ferguson. The drawing provided herewith was made from the badly folded wing of the type and the basal portions could not be accurately figured. The type was returned to Dr. Ferguson.

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