

Dactylonotus Parent, 1934 – a disjunct generic
distribution in southern Africa, New Zealand
and New Caledonia (Diptera, Dolichopodidae)

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***Dactylonotus* Parent, 1934 – a disjunct generic distribution in southern Africa, New Zealand and New Caledonia (Diptera, Dolichopodidae)**

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ABSTRACT

The genus *Dactylonotus* Parent, 1934 (Diptera, Dolichopodidae) is characterized by a finger-like projection of the antennal pedicel along the dorsal margin of the postpedicel. It comprises six species from southern Africa, *Dactylonotus formosus* (Parent, 1933) from New Zealand and *D. eurypterus* n. sp. from New Caledonia. Of morphological interest, *Dactylonotus eurypterus* n. sp. totally lacks anterior preapical setae on femora II and III, present in all congeners. The disjunct distribution of *Dactylonotus* is unusual, suggesting a relictual distribution comprising Africa, New Zealand and New Caledonia. The genus is unknown from Australia.

RÉSUMÉ

Dactylonotus Parent, 1934 – distribution générique discontinue en Afrique australe, en Nouvelle-Zélande et en Nouvelle-Calédonie (Diptera, Dolichopodidae).

Le genre *Dactylonotus* Parent, 1934 (Diptera, Dolichopodidae) se caractérise par une projection en forme de doigt du pédicelle antennaire le long de la marge dorsale du postpédicelle. Il est constitué de six espèces d'Afrique australe, *Dactylonotus formosus* (Parent, 1933) de Nouvelle-Zélande et *D. eurypterus* n. sp. de Nouvelle-Calédonie. À noter sur le plan morphologique, *Dactylonotus eurypterus* n. sp. est totalement dépourvu de soies préapicales antérieures sur les fémurs II et III, présentes chez tous ses congénères. La répartition disjointe de *Dactylonotus* est inhabituelle, suggérant une répartition relictuelle entre l'Afrique, la Nouvelle-Zélande et la Nouvelle-Calédonie. Le genre est inconnu en Australie.

KEY WORDS

Dolichopodidae,
biogéographie,
gondwanan distribution,
New Caledonia,
New Zealand,
southern Africa,
new species.

MOTS CLÉS

Dolichopodidae,
biogéographie,
répartition gondwanienne,
Nouvelle-Calédonie,
Nouvelle-Zélande,
Afrique australe,
espèce nouvelle.

INTRODUCTION

Dactylonotus Parent, 1934 (Diptera, Dolichopodidae Latreille, 1809) is a distinctive genus that was previously known only from South Africa and Zimbabwe (Grichanov 2016). However, two papers published almost simultaneously (Grichanov 1998; Bickel 1999) referred the New Zealand species *Syntoromon formosus* Parent, 1933 to *Dactylonotus*. This was based on the species description and illustrations of the male antenna, hypopygium and wing in Parent (1933), and was interpreted as a possible Gondwanan relictual distribution involving southern Africa and New Zealand. Described below is an additional species of *Dactylonotus* from New Caledonia, adding to the unusual distribution of the genus. It was discovered while sorting large undetermined institutional holdings of New Caledonian Dolichopodidae.

MATERIAL AND METHODS

Photographs were made with a Leica M205A photomontage system. In describing the hypopygium, or male genital capsule, ‘dorsal’ and ‘ventral’ refer to morphological position prior to genitalic rotation and flexion. Thus, in figures showing a lateral view of the hypopygium, the top of the page is morphologically ventral, while the bottom is dorsal. Morphological terminology follows Cumming & Wood (2017). Measurements were made on representative dry specimens. Body length of males is measured from the base of the antennae to the tip of the seventh abdominal segment. The CuAx ratio is the length of the dm-m crossvein/distal section M_4 . The position of features on elongate structures such as leg segments is given as a fraction of the total length, starting from the base. The relative lengths of the podomeres are representative ratios and not measurements, and are given for each leg in the following formula and punctuation: trochanter + femur; tibia; tarsomere 1/ 2/ 3/ 4/ 5. The wing venation system follows that in Cumming & Wood (2017).

ABBREVIATIONS

Morphology

I, II, III	pro-, meso-, metathoracic legs;
ad	anterodorsal;
av	anteroventral;
C	coxa;
dv	dorsoventral;
F	femur;
MSSC	Male secondary sexual character(s), the non-genitalic character(s) found only on male body;
pd	posterodorsal;
pv	posteroventral;
t	tarsus;
T	tibia;
t ₁₋₅	tarsomeres 1 to 5.

Wing venation

M_1	first medial vein;
R_1	first longitudinal vein;
R_{2+3}	second longitudinal vein;
R_{4+5}	third longitudinal vein.

Institutions

BPBM	Bishop Museum, Honolulu, Hawaii;
CNC	Biosystematics Research Institute, Agriculture and Agri-Food Canada, Ottawa, Ontario, Canada;
INHS	Illinois Natural History Survey, University of Illinois, Champaign;
MNHN	Muséum national d’Histoire naturelle, Paris;
NZAC	New Zealand Arthropod Collection, Landcare Research, Auckland.

TAXONOMY

Family DOLICHOPODIDAE Latreille, 1809

Genus *Dactylonotus* Parent, 1934

Dactylonotus Parent, 1934: 136.

TYPE SPECIES. — *Dactylonotus grandicornis* Parent, 1934, monotypy.

DIAGNOSIS. — Body length 3.8–5.5 mm; male face wide, only slightly narrowed beneath antennae; antennal pedicel in both sexes prolonged into dorsal finger-like projection resting in dorsal groove on basal half of postpedicel; postpedicel usually enlarged, and blade-like, larger in male than female, arista basidorsal, median or subapical on postpedicel; acrostichal setae short, biseriate on anterior slope of mesonotum, and posteriorly either short and irregular, or as 4–5 uniseriate setae; median scutellar setae strong, lateral scutellar setae short; lower proepisternum with one or two projecting setae, dorsad of CI base; FII and FIII each with strong anterior preapical seta (totally absent on New Caledonian *D. eurypterus* n. sp.); male in Afrotropical species sometimes with enlarged pulvilli or other modifications of tarsus I (MSSC); vein M_1 with flexion (*bosse alaire*) between dm-m crossvein and wing apex; male sternite 8 with two strong black projecting setae on distal margin, and with additional shorter erect setae; epandrium subcylindrical; epandrial lobe short with strong projecting distal setae; surstylus divided into separate dorsal and ventral arms, sometimes clavate; male cercus often digitiform; female oviscapt with tergite 10 bearing five pairs of blade-like acanthophorites.

REMARKS

Dactylonotus Parent, 1934 is readily recognised by the diagnostic finger-like projection of the antennal pedicel that dorsally overlaps the postpedicel in both sexes (Figs 1C–D; 3B, D). The genus has a peculiar disjunct distribution, with six species in South Africa and Zimbabwe, a single species in New Zealand, and a new species from New Caledonia. I have never seen the genus among large institutional holdings of Australian Dolichopodidae.

Dactylonotus has been placed in the subfamily Diaphorinae Schiner, 1864, but a number of characters, such as the strong anterior preapical setae on femora II and III, are discordant with the traditional concept of the subfamily (however, these anterior preapical setae are totally absent on *D. eurypterus* n. sp.). Based on a preliminary cladistic analysis, Capellari (2013) suggested that a generic group comprising *Anepsiomyia* Bezzi, 1902, *Argyra* Macquart, 1834, *Dactylonotus* Parent, 1934, *Somillus* Brèthes, 1924, and *Symbolia* Becker, 1922 is monophyletic and possibly deserving of separate subfamily rank. This requires further investigation.

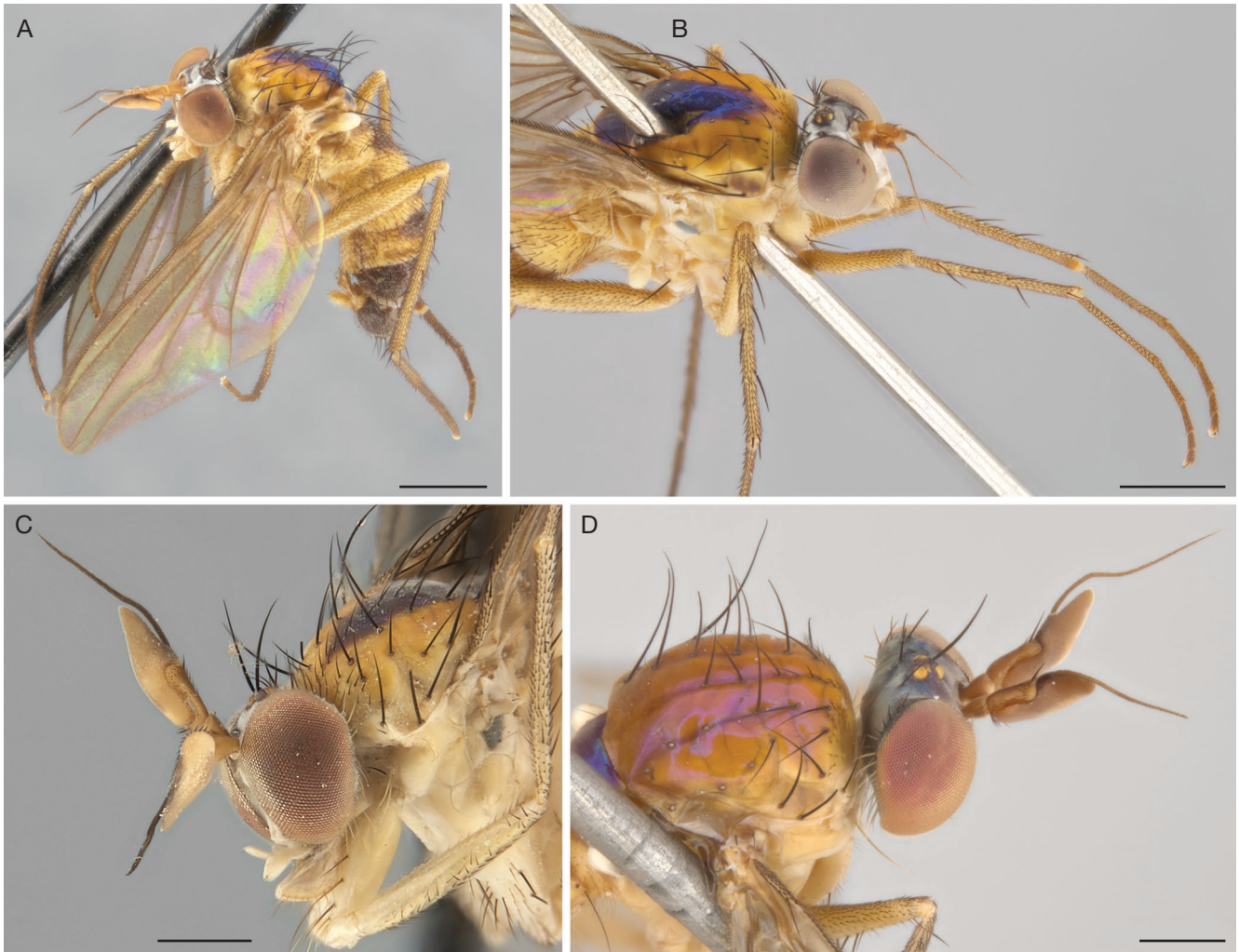


FIG. 1. — *Dactylonotus univittatus* (Loew, 1858) (South Africa): **A**, male habitus, left lateral; **B**, female, head and thorax, right laterodorsal; **C**, male, head and thorax, left dorsal. *Dactylonotus eurypterus* n. sp. (New Caledonia); **D**, male, head and thorax, right laterodorsal. Scale bars: A, B, 1.0 mm; C, D, 0.5 mm.

The genus *Dactylonotus* Parent, 1934 now comprises eight species (see Grichanov [2016] for key and treatment of the six Afrotropical species):

- *D. eurypterus* n. sp., New Caledonia;
- *D. formosus* (Parent, 1933), (*Syntormon*), New Zealand;
- *D. frater* Parent, 1939, Zimbabwe;
- *D. grandicornis* Parent, 1934, South Africa;
- *D. nigricornis* Grichanov, 2016, South Africa;
- *D. rudebecki* Vanschuytbroeck, 1960, South Africa;
- *D. meuffelsi* Grichanov, 1998, South Africa;
- *D. tsitsikamma* Grichanov, 2016, South Africa;
- *D. univittatus* (Loew, 1858), (*Saucropus*), South Africa.

COMPARATIVE MATERIAL

D. univittatus (Loew, 1858): **South Africa** • 2 ♂, 2 ♀; Natal; 75 km WSW of Eastcourt, Cathedral Peaks For. Sta.; 1500 m, 7–31. XII.1979; Peck S. & J. leg.; CNC (Fig. 1A–C)].

PACIFIC SPECIES

Two species of *Dactylonotus* from the southwest Pacific Ocean, *D. eurypterus* n. sp. from New Caledonia and *D. formosus*

from New Zealand are treated below. Both species have strong uniseriate acrostichal setae while their southern African congeners have short biseriate or irregular acrostichal setae. In other respects, the two species are morphologically distinct and probably not close sister taxa with the genus.

Dactylonotus eurypterus n. sp. (Figs 1D; 2A–C)

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TYPE MATERIAL. — **Holotype.** New Caledonia • ♂; Province Nord: Mt. Panié track; 20°33'S, 164°46'E; 25.VIII–9.XI.2000; 900 m; Malaise trap; J. Skevington & C. Burwell leg.; CNC1731377; MNHN. **Paratype.** New Caledonia • ♂; same data as holotype; CNC1731365.

OTHER MATERIAL EXAMINED. — **New Caledonia** • 1 ♂; Province Nord Yambé (as Yambi); 500–700 m; 14.X.1967; J. & M. Sedlacek leg.; BPBM • 1 ♂; Province Sud; Mt. Koghi; 500–600 m; 23–27.X.1967; J. & M. Sedlacek leg.; BPBM • 1 ♂; Mt. Koghi; 500 m; 17 km NE of Noumea; 1–3.XI.1992; Malaise trap; M. E. Irwin & D. W. Webb leg.; INHS.

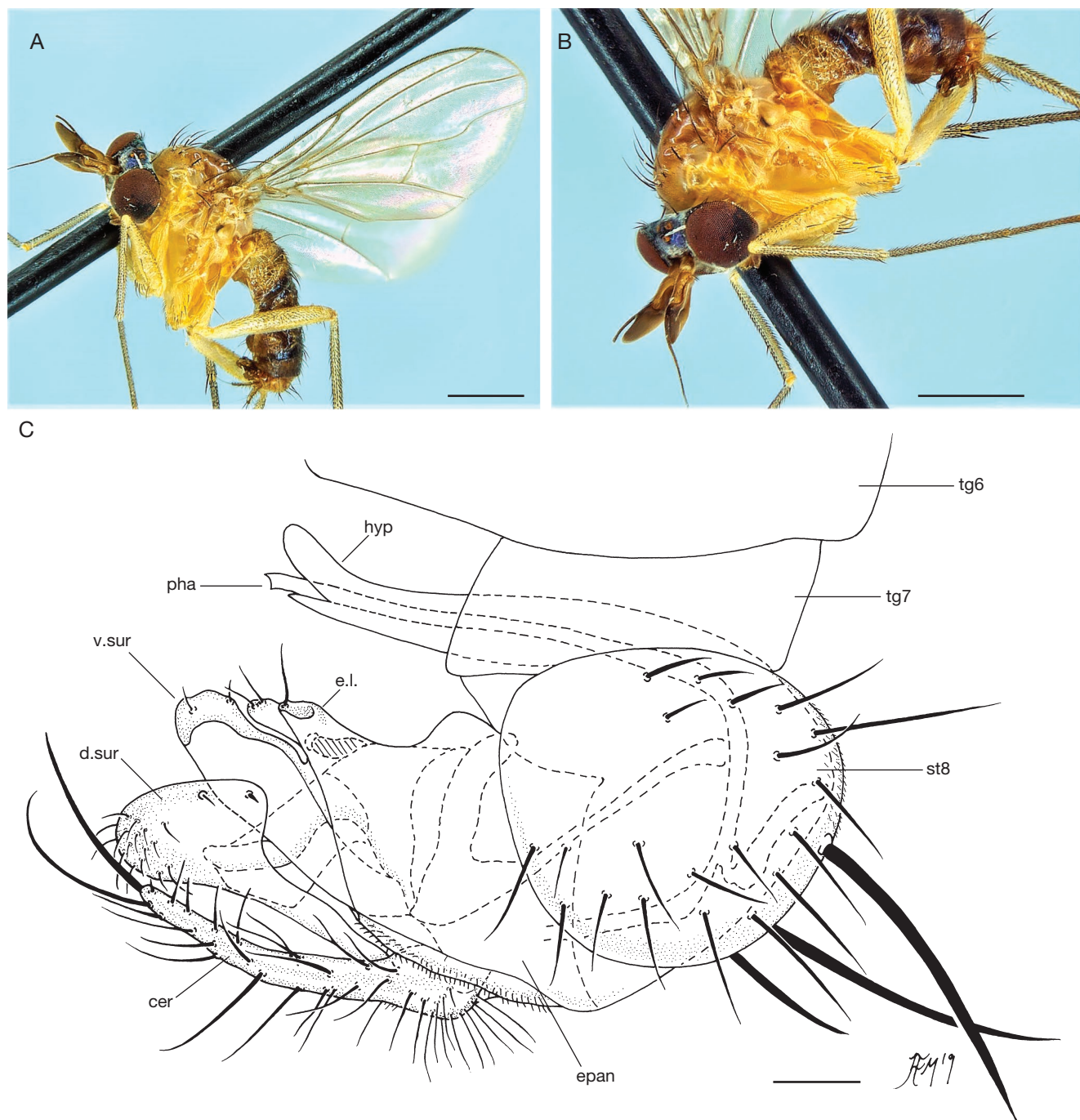


FIG. 2. — *Dactylonotus eurypterus* n. sp.: **A**, male habitus, left lateral; **B**, male habitus, left lateral, more detailed; **C**, male postabdomen, left lateral. Abbreviations: **cer**, cercus; **d.sur**, dorsal surstylus; **e.l.**, epandrial lobe; **epan**, epandrium; **hyp**, hypandrium; **pha**, phallus; **st8**, sternite 8; **tg6**, **tg7**, tergites 6, 7; **v.sur**, ventral surstylus. Scale bars: A, B, 1.0 mm; C, 0.1 mm.

ETYMOLOGY. — The specific epithet *eurypterus* is from Greek meaning “broad wing”, in reference to the broad male wing of this species.

DESCRIPTION

Male

Length: 5.0 mm; wing: 4.7×1.8 mm (Fig. 2).

Head. Subcircular in anterior view, wider than high; dorsal postcranium dark metallic blue-green and flattened; frons

metallic blue-green with grey pruinosity, one pair of strong postvertical setae displaced out line with dorsal postocular setae; pair of strong vertical setae and pair of strong diverging ocellar setae present; face wide, only slightly narrower than width of face at antennal base and covered with dense grey pruinosity; eye facets enlarged anteroventrally; palp rather small, pale yellow with short black apical seta; proboscis yellow; antenna mostly yellowish, but with postpedicel infuscated dorsally and distally; scape short, bare of setae; pedicel

prolonged dorsally with two short apical setae and resting in dorsal groove on basal half of postpedicel; postpedicel large, and halberd- or blade-shaped, dorsally excavated and attached to apex of dorsal pedicel extension, so that ventral postpedicel extends basad from attachment; arista arising dorsally at 2/3, about as long as head height, and relatively thick; ventral postcranium with field of white hairs.

Thorax. Mesonotum mostly yellow, glabrous with metallic green reflections, scutellum mostly shining metallic blue with yellow at lateral margins; postscutellum and pleura mostly pale yellow; setae black; four strong uniseriate acrostichal setae with tiny biseriate setae anteriormost; six strong dorsocentral setae, slightly decreasing in size anteriorly, with posteriormost seta slightly offset laterally; one postalar seta; two postsutural supra-alar setae, one presutural intra-alar seta; two notopleural setae; one postpronotal seta; one presutural supra-alar seta, one presutural supra-alar seta; pair of median scutellar setae strong, lateral scutellar setae short; lower proepisternum with single pale yellow seta dorsad of CI base.

Legs. Coxae and remainder of legs almost entirely yellow, but apex of TIII and tarsus III light brown; CI with abundant long white anterior hairs and with longer white distolateral setae; CII with black anterior hairs and with strong anterolateral seta at 3/5 and apically; CIII with strong black lateral seta at 1/5; legs with short black vestiture; I: 5.8;5.6;5.0/2.5/2.0/1.0/0.7; FI with row of 4 projecting posterior setae, from 1/4 to 1/2, each seta about width of FI in length (MSSC?), and with preapical pv seta; TI with short dorsal seta at 1/5 and 3/5; II: 5.7; 7.3; 6.0; 2.8/1.8/1.2/0.8/0.6; FII lacking anterior preapical seta, but with short preapical av and pv seta; TII with ad-pd setal pair at 1/6, offset setal pair near 2/5, and pd seta at 3/4, and with subapical circler of pd, dorsal, ad, av and pv setae; III: 7.2; 8.5; 2.7/3.6/2.0/1.2/0.6; FIII lacking anterior preapical seta, but with short preapical av and pv setae; TIII with row of five short spaced dorsal setae along length and with subapical circler of dorsal, ad, av and pv setae.

Wing. Membrane hyaline; wing relatively broad and with long curve distal margin (MSSC?); vein R_{2+3} ending in costa near 5/6, with vein R_{4+5} joining margin just anterior of apex; vein M_1 with flexion (*bosse alaire*) one half distance between dm-m and apex, and displaced slightly anterior, becoming subparallel with R_{4+5} , and joining margin at wing apex; CuAx ratio: 0.5; anal angle developed; lower calypter yellow with dark brown rim and fan of brown setae; halter pale yellow.

Abdomen. Tergite 1 basally yellow with brown distal margin; tergites 2-4 brown but each with large rounded mediolateral translucent yellow area; tergite 5 brown; tergites 6-7 yellow; tergites 1-5 covered with short black vestiture, with some longer setae near posterior tergal margins; tergite 6 bare of setae; sternite 8 yellow, ovate with two strong setae along its distal margin and other scattered setae, and forming cap over left lateral hypopygial foramen; hypopygium (Fig. 2C) mostly yellow, and surstylus brownish; epandrium ovate; hy-

pandrium forming flat elongate cover over phallus, apically curved; epandrial lobe short, with three apical setae; surstylus with two distinct arms, ventral lobate arm with short apical setae, and dorsal clavate arm, distally expanded with setae (see Fig. 2C); cercus yellow, tapering and digitiform with strong apical setae.

Female

None associated.

REMARKS

Dactylonotus eurypterus n. sp. is known from three mid-elevational sites (500-900 m) on Grande Terre, the main island of New Caledonia. Like many of its southern African congeners, this New Caledonian species has the thorax and legs mostly yellow (cf. *D. univittatus* Loew, 1858 from South Africa, Fig. 1C, and *D. eurypterus* n. sp. from New Caledonia, Fig. 1D).

Diagnostic characters for *Dactylonotus eurypterus* n. sp. include: 1) males with a row of four erect posterior setae on the basal half of femur I, absent on other congeners (MSSC); 2) only a single long curved seta on the lower proepisternum (Fig. 1D) while other members of the genus have two setae, one long and one short; and 3) the hypandrium in lateral view being relatively straight (*hyp*, Fig. 2C) whereas in most congeners, the hypandrium appears somewhat contorted in lateral view (e.g., Grichanov 2016, figs 4, 10).

However, most importantly from a wider taxonomic viewpoint, *Dactylonotus eurypterus* n. sp. totally lacks anterior preapical setae on femora II and III, present in all other congeners. The presence of strong anterior preapical femoral setae has been used as an important character in defining dolichopodid subfamilies, so such intra-generic loss or non-expression appears rather anomalous.

Dactylonotus formosus (Parent, 1933)

(Fig. 3)

Syntormon formosus Parent, 1933: 367.

TYPE MATERIAL. — Parent described *Syntormon formosus* from specimens collected at various locales in New Zealand, but two males were designated as types, and later this was wrongly interpreted as holotype and paratype. Two males, both from Wellington, New Zealand, have been designated holotype and paratype, possibly during curation and data capture (<https://scd.landcareresearch.co.nz/Specimen/NZAC04021516>), NZAC, examined. As noted in the Introduction, this species was referred almost simultaneously to *Dactylonotus* by both Grichanov (1998) and Bickel (1999), based on the original species description and illustrations of the male antenna and hypopygium.

ADDITIONAL MATERIAL. — **New Zealand** • 1 ♂; Auckland: Kauri Park, North Shore; 15.XI.1973; J. Dugdale leg.; NZAC • 2 ♀; Henderson Park, Opanuku Walkway, at Border Rd.; 7.XII.2005, 16.XII.2005; S. E. Thorpe leg.; NZAC.

REDESCRIPTION

Male

Length. 5.7 mm; wing: 5.2 × 2.0 mm (Fig. 3).

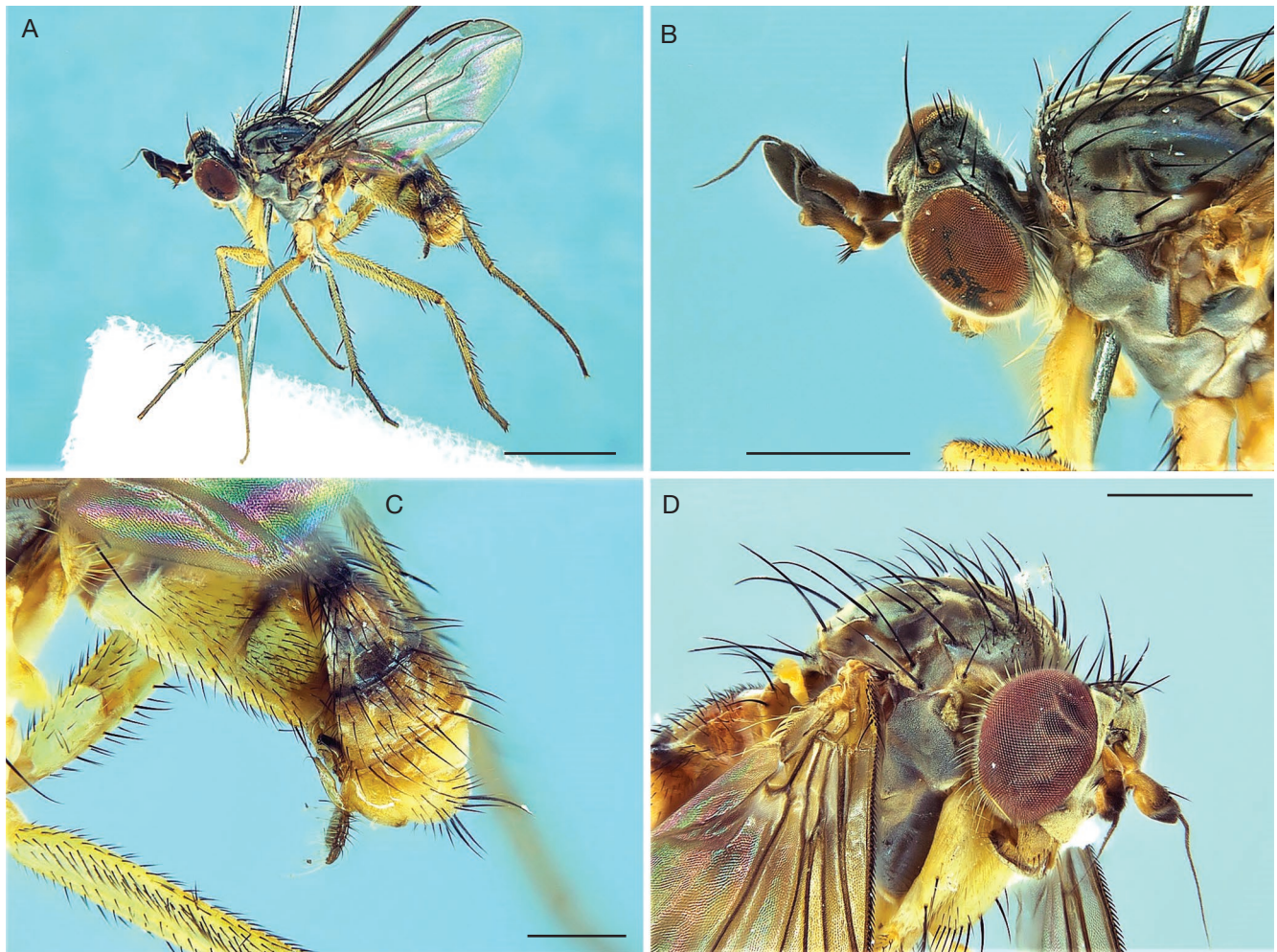


FIG. 3. — *Dactylonotus formosus* (Parent, 1933), New Zealand: **A**, male habitus, left lateral; **B**, male, head and thorax, left laterodorsal; **C**, male postabdomen, left laterodorsal; **D**, female male, head and thorax, right lateroventral. Scale bars: A, 2.0 mm; B, D, 1.0 mm; C, 0.5 mm.

Head. Frons blue-green with grey pruinosity; row of short postocular setae, white on ventral half and black on dorsal half; with dorsalmost setal pair (=postvertical setae) stronger and displaced onto surface of dorsal postcranium; palp enlarged, ovate, yellow with one short black apical seta (MSSC); antenna mostly yellow basally, with pedicel and postpedicel infuscated; pedicel prolonged dorsally and resting in dorsal groove on basal half of postpedicel; postpedicel large and blade-shaped, so that ventral postpedicel extends basad from attachment at apex of pedicel (MSSC).

Thorax. Mesonotum mostly dark brown with iridescence and complex pruinosity: mostly grey, with narrow brown stripes between acrostichal and dorsocentral rows, and laterally over humeral region; extending posteriorly almost to edge of mesonotum acrostichal band becoming silvery white on posterior mesonotal slope, and narrow brown stripes laterad of acrostichal band becoming wider and dark brown posteriorly; scutellum metallic blue; pleura mostly brown with grey pruinosity, but with areas of yellow cuticle (Fig. 3B); metepimeron yellow; 6-7 strong uniseriate acrostichal setae;

six strong dorsocentral setae, slightly decreasing in size anteriorly, lateral scutellar seta about one third length of median seta; lower proepisternum with long and short pale yellow curved setae.

Legs. Coxae and remainder of legs almost entirely yellow; anterior face of CI basally with short white setae and distal half with short black hairs; with three strong black lateral setae along distal half and row of 4-5 short apical setae; CII with strong anterolateral seta at 1/3 and 4/5; CIII with strong black lateral seta at 2/5; I: 7.0;7.2; 4.2/2.4/1.8/1.0/0.8; TI with short ad seta at 1/4, 1/3 and 3/5, short pd seta at 1/4 and 1/2, and with short subapical dorsal, pd, and posterior setae; II: 7.7; 8.3;5.7/2.8/1.5/0.8/0.7; FII with strong anterior preapical seta, and with short subapical av and pv seta and av and pv rows of short setae in basal two-thirds; TII with offset ad-pd setal pairs at 1/5, 2/5, and 3/5, and with subapical circlet of pd, dorsal, ad, av and pv setae; III: 9.0;10.2;3.0/4.3/1.9/1.0/0.8; FIII with strong anterior preapical seta, with short preapical av and pv setae; and with short av and pv setae; TIII with ad seta at 1/8, 1/4, and 1/2, and

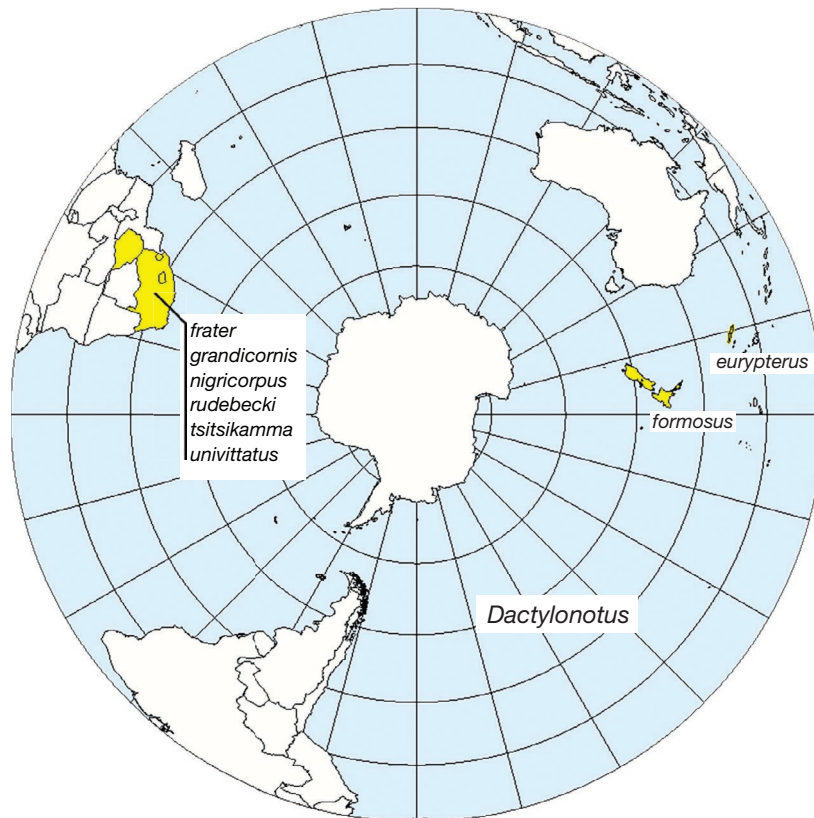


FIG. 4. — Distribution map of *Dactylonotus* Parent, 1934 species.

with five dorsal setae along basal two thirds; row of short ventral setae along entire length, and subapical circlet of dorsal, ad, av and pv setae.

Wing. Membrane hyaline; vein R_{4+5} joining margin anterior of apex; vein M_1 with flexion (*bosse alaire*) halfway between dm-m and wing apex, and distally displaced, becoming subparallel with distal R_{4+5} , and joining wing apex; CuAx ratio: 0.6; anal angle developed; lower calypter pale yellow with fan of pale yellow setae; halter pale yellow.

Abdomen. Tergite 1 yellow with long posterior setae; tergites 2-5 mostly yellow, with dark brown posterior margin; tergites 2-5 with short black vestiture, with longer setae near posterior tergal margins; tergites 6-7 mostly yellow; sternite 8 yellow, ovate with two strong setae along its distal margin and other scattered setae; hypopygium (Fig. 3C) mostly yellow, epandrium ovate; surstylus with two subparallel arms, with ventral arm truncate and dorsal arm tapering with pale curve hairs; cercus brown, digitiform with fine whitish hairs.

Female (Fig. 3D)

Similar to male except as noted: postpedicel also bladelike but much shorter and basally yellowish; FII and FIII without rows of short av and pv setae; female oviscapt with epiproct (tergites 9+10) bearing five pairs of blade-like acanthophorites.

REMARKS

Dactylonotus formosus (Parent, 1933) is known from scattered locales on the North Island and the Banks Peninsula on the South Island of New Zealand. The complex thoracic pruinosity pattern is distinctive. Photos of live specimens have been posted on <https://www.inaturalist.org/taxa/380089-Dactylonotus-formosus>.

DISCUSSION

The historical biogeography of the unusually rich New Caledonian flora and fauna has been the subject of considerable discussion (e.g., Holloway 1979; Grandcolas *et al.* 2008; Heads 2023; Malem *et al.* 2023). Previously, the main island (Grande Terre) was regarded as a Gondwanan fragment supporting a unique biota of vicariant origin. However, geological evidence suggests that New Caledonia was submerged during the Palaeocene and without subaerial exposure until the late Eocene-early Oligocene when its ultramafic lithosphere was uplifted. Thus, many workers now consider the New Caledonian biota to be the result of post-Eocene transoceanic dispersal following geological emergence, and this view is supported by various taxonomic studies. Even so, Giribet & Baker (2019) discuss the problem of limited salt-water dispersal capability in many New Caledonian “paleoendemic” ground-dwelling invertebrates.

In this scenario, *Dactylonotus* would have dispersed to an emergent New Caledonia during or after the Oligocene. Trans-oceanic waif dispersal is not uncommon in the family Dolichopodidae – in Micronesia, for example, some species occur across vast areas of ocean, including both high islands and isolated atolls (Bickel 1994). Although there are strong biotic connections between eastern Australia and New Caledonia for terrestrial invertebrates (see Williams 2020), including uniquely shared dolichopodid genera (Bickel & Martin 2025), *Dactylonotus* remains unknown from Australia.

A single species, *Dactylonotus formosus* (Parent, 1933), occurs in New Zealand, providing a possible link with New Caledonia. The two island groups, New Caledonia in the north and New Zealand in the south, form the largest current subaerial landmasses of Zealandia, variously described as a submerged continent or microcontinent, a section of continental crust in Oceania that subsided after breaking away from Gondwana some 83–79 mya (Mortimer *et al.* 2017). A number of New Zealand insect lineages have New Caledonian sister taxa, and submerged volcanic island arcs might have facilitated Cenozoic dispersal via island hopping between the two land masses (Buckley *et al.* 2015). In the Dolichopodidae, some general Gondwanan faunal associations exist among the New Zealand and New Caledonia faunas, such as radiations of the genera *Chrysotimus* Loew, 1857 (unpublished) and *Parentia* Hardy, 1935 (Bickel 2002). As well, a strong relationship is found in the genus *Paraclius* Loew, 1864 (Dolichopodinae), where *P. aeotearoa* Bickel, 2008 from northernmost New Zealand is regarded as the sister species of the common New Caledonian *P. xanthurus* Bickel, 2008 sharing distinct similarities in coloration, setation, and male genitalia (Bickel 2008). Since eleven species of *Paraclius* occur in New Caledonia, possibly the ancestor of *P. aeotearoa* managed to disperse into New Zealand while both landmasses were in closer proximity, speciated and became isolated.

Although congeneric, the New Caledonian *Dactylonotus eurypterus* n. sp. and the New Zealand *D. formosus* (Parent, 1933) are not morphologically close in general body colouration or leg setation (Figs 1D; 2A–D and Fig. 3A–D), and are unlikely close sister taxa within their genus. Quite notably, *D. eurypterus* n. sp. lacks the taxonomically important character of strong anterior preapical setae on femora II and III. Possibly these two insular *Dactylonotus* species are the surviving relicts of a southwestern Pacific radiation that might have included Australia.

The connection of these two Pacific species with their southern African congeners is a more difficult biogeographical problem (Fig. 4). World paleogeographic maps of the early Eocene show ancestral Zealandia and Australia entirely south of 30°S and near Antarctica (see Markwick 2021). At that time, Australia was close to South America *via* an ice-free Antarctica and climatic conditions were much different than today, especially during the Palaeocene-Eocene Thermal Maximum (PETM) around 55 mya. This relatively brief period (some 200 000 years) of intense warming produced a “greenhouse Earth”, with a 5–8°C average global temperature rise and massive input of carbon into the ocean and atmosphere

(McInerney & Wing 2011). The PETM may have facilitated widespread dispersal of insect taxa such as *Dactylonotus* *via* a more temperate and hospitable Antarctica.

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