

## Afrotropical Asilidae (Diptera) 32. A revision of *Anypodetus* Hermann, 1907 with the description of three new species (Laphriinae)

by

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### ABSTRACT

The primarily southern African genus *Anypodetus* is reviewed. Eight species are recognised, including three new to science – i.e. *leucothrix* (South Africa and Namibia), *macroceros* (Namibia) and *phalaros* (South Africa and Namibia). A key for their identification, and notes on their distribution and seasonal occurrence, are provided. *A. rigidis* Oldroyd, 1974 is synonymised with *A. fasciatus* Hermann, 1907. Lectotypes are designated for *A. fasciatus* Hermann, 1907, *A. maculipennis* Ricardo, 1925, and *A. nigrifacies* Ricardo, 1925.

### INTRODUCTION

*Anypodetus* is a relatively small but distinctive genus of laphriine asilids. It is largely confined to southern Africa, although Oldroyd (1974) reports having seen a specimen from Zambia, and records of a species from the Kunene River suggest that the distribution probably includes Angola. An accumulation of new material in the collection of the Natal Museum, along with my intention to review all genera that are primarily southern African, prompted this study.

A brief history of systematic work on *Anypodetus*:

Hermann (1907) – Erected the genus with the description of the type species, *fasciatus*, from South Africa (Lichtenburg) and the Kalahari. Provided a photograph of a whole specimen and a drawing of the antenna.

Engel (1924) – Provided comments on the genus, notes on the type species, descriptions of two new South African species, *fascipennis* (attributed to ‘Herm. in litt.’) from Willowmore and Delarey, and *semirufus* from Willowmore.

Ricardo (1925) – Described two new species, *maculipennis* from Zimbabwe (Saw Mills & Bulawayo) and *nigrifacies* from Mozambique (Lorenzo Marques = Maputo). She mentions the type species, but was probably unaware of Engel’s 1924 paper.

Engel (1929) – Placed his species *semirufus* as a variety of *fascipennis* and synonymised *maculipennis* with *semirufus*. He also synonymised *nigrifacies* with *fascipennis* (an action nobody has commented on or accepted). He corrected an error in Ricardo’s description of the antenna and provided a drawing of the antenna of *fascipennis*.

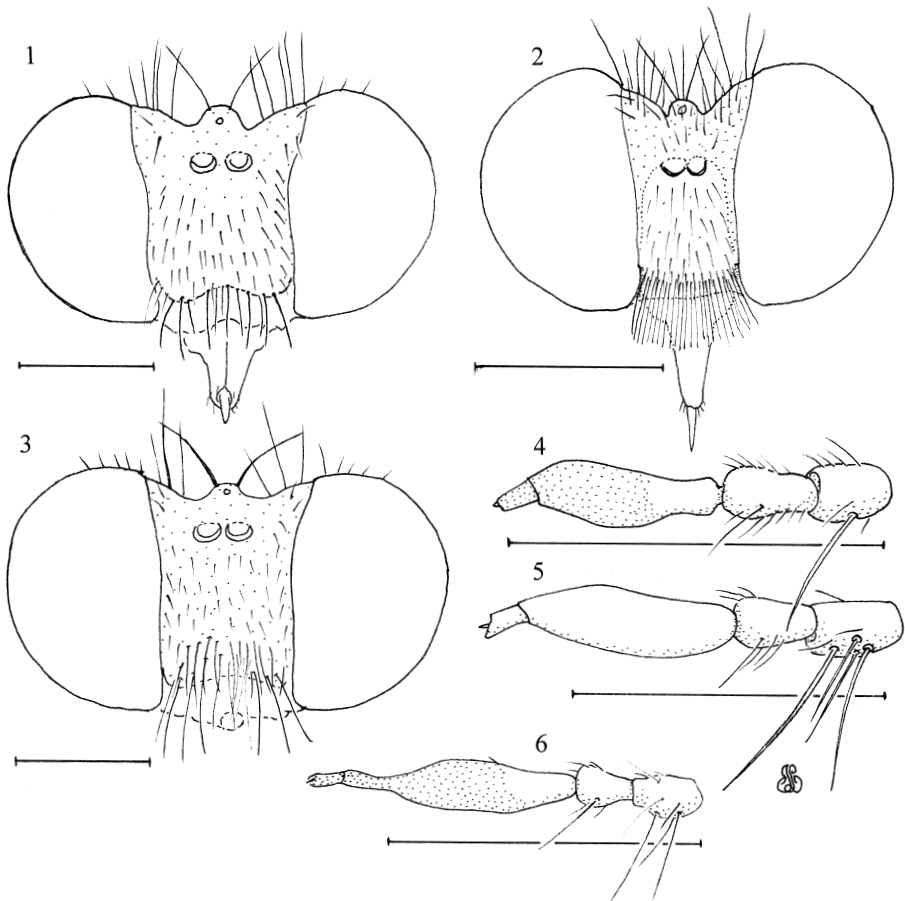
Engel & Cuthbertson (1934) – In providing notes on Zimbabwean asilids, listed *maculipennis* as a synonym of *fasciatus*. They reported that *fasciatus* was common in Matabeleland and feeds on small grasshoppers, while *fascipennis* occurred in Mopani woodland near Balla–Balla.

Hull (1962) – Keyed and provided a full description of the genus, listing the five described species. Fine illustrations were given of *nigrifacies* (antenna) and *fasciatus* (wing, head, male genitalia).

Oldroyd (1974) – Considered Engel’s species as varieties of one species (i.e. *fascipennis*) and Ricardo’s *maculipennis* also to be a synonym. To the then three valid species (*fasciatus*, *fascipennis* and *nigrifacies*) he added three new species – *arachnoides*, type from Zimbabwe (Sawmills), *rigidis*, from Zimbabwe (Sawmills), and *unicolor*, type from South Africa (Ndumu Game Reserve). Three illustrations of *fascipennis* were provided (wing, tarsus, head).

Oldroyd (1980) – Catalogued seven valid species and one synonym – *arachnoides*, *fasciatus*, *fascipennis*, *nigrifacies*, *rigidis*, *semirufus* (with *maculipennis* as synonym), *unicolor*. The inclusion of *semirufus* as a valid species is curious as he had, in 1974, accepted its long-standing synonymy with *fascipennis*; no explanation for this changed opinion was provided and it may have been a *lapsus*.

Londt (1988) – Included the genus in the most recent key to afrotropical Laphriinae.



Figs 1–6. *Anypodetus* species. 1–3. Head, anterior aspect. 1. *A. fascipennis* Engel (Willowmore ♂). 2. *A. leucothrix* sp. n. (holotype). 3. *A. nigrifacies* Ricardo (Mkuzi ♂). 4–6. Antenna, outer view of left side. 4. *A. fascipennis* Engel (Willowmore ♂). 5. *A. nigrifacies* Ricardo (Mkuzi ♂). 6. *A. macroceros* sp. n. (holotype). Scale lines = 1 mm.

## MATERIALS AND METHODS

The material studied is housed in the Natal Museum (including the holotypes of all the new species), unless otherwise indicated. Other institutions providing material are listed below, together with the abbreviations used in the text when citing repositories, and the names of people at these institutions who kindly assisted me.

- BMNH – The Natural History Museum, London, UK (J. Chainey)  
 PPRI – National Collection of Insects, Pretoria, South Africa (M. Mansell)  
 SAMC – South African Museum, Cape Town, South Africa (M. Cochrane)  
 ZMHB – Zoologisches Museum, Berlin, Germany (M. Kotrba)  
 ZSMC – Zoologische Staatssammlung, Munich, Germany (W. Schacht)

In recording label data for type material a standard format is used, where information contained on each label is demarcated by the use of single inverted commas, each line of data being separated by a slash (/). A ~ indicates that the following data are on the reverse side of the label just documented, while square brackets are used to indicate useful additional information not found on labels. When recording data for additional

TABLE 1

Character matrix to supplement descriptive details provided in key (male condition shown).

## Character states

Species	A	B	C	D	E	F	G	H	I	J	K	L	M	N
<i>A. arachnoides</i>	1	1+3	2	1	0–1	2	1	1	1	2	2	2	4	3
<i>A. fasciatus</i>	1	1+2	2	2	1–2	1	1	1	1	2	2	1	4–6	3
<i>A. fascipennis</i>	2	1 *	2	2	2–6	2	2+1	1	2	2	1	2	14–16	1
<i>A. leucothrix</i>	3	3+1	4	2	2–3	4	3	1	2	1	2	3	7	1
<i>A. macroceros</i>	1	1+3	3	2	1	1	1	2	1	2	2	1	4–5	3
<i>A. nigrifacies</i>	1	1	2	1	2–4	1	1	1	1	2	2	1	7	2
<i>A. phalaros</i>	1	1+3	2	2	2	1	1	1	1	2	1	1	5	2
<i>A. unicolor</i>	1	1+3	1	1	3–4	1+3	1	1	1	1	2	1	4–5	1

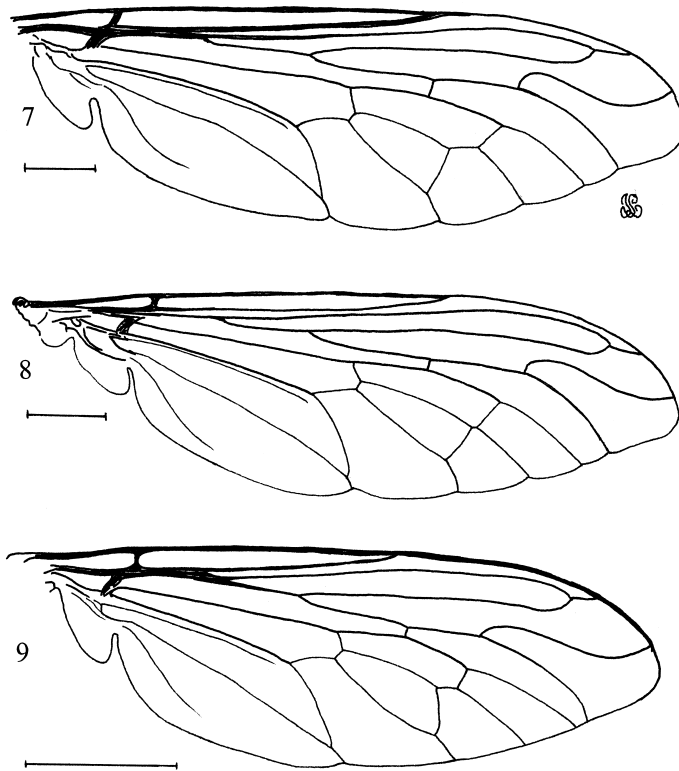
## Character states:

- A Ocellar setae colour: 1 = Dark Red–brown to Black, 2 = Orange, 3 = White.  
 B Mystacial setae colour (major medioventral setae + minor setae (lateral, medial or intermixed with macrosetae): 1 = Dark Red–brown to Black, 2 = Orange, 3 = Yellow, 4 = White. \* = individuals in the southern part of the range may have mystax extensively yellow–orange.  
 C Occipital setae colour (major dorsal setae behind eyes): 1 = Dark Red–brown to Black, 2 = Orange, 3 = Yellow, 4 = White.  
 D Postpedicel colour: 1 = Uniform orange, 2 = Dark Red–brown distally and orange proximally.  
 E Postpronotal setae number.  
 F Postpronotal setae colour: 1 = Dark Red–brown to Black, 2 = Orange, 3 = Yellow, 4 = White.  
 G Thoracic setae colour (i.e. setae of katatergite, mesonotum, terga): 1 = Dark Red–brown to Black, 2 = Orange, 3 = White.  
 H Antennal style length: 1 = shorter than pedicel, 2 = longer than pedicel.  
 I Alignment of basal portion of vein  $M_2$  with apical portion of  $M_3$ : 1 = aligned, 2 = not aligned.  
 J Marginal scutellar macrosetae: 1 = present, 2 = absent.  
 K Wing membrane staining: 1 = stained, 2 = unstained.  
 L Wing membrane setation: 1 = covered with microtrichia, 2 = some basal cells lacking microtrichia, 3 = no microtrichia.  
 M Gonocoxal macrosetae number.  
 N Abdominal tergal pruinescence: 1 = largely apruinose (small lateral areas may be weakly pruinose in *fascipennis*), 2 = two large silvery pruinose areas laterally, 3 = hind and lateral margins silvery pruinose. Note: Pruinose areas are associated with white microsetae while apruinose areas have dark microsetae.

material (i.e. specimens without type status), information is also given, where available, in a standard order (place name; grid reference or co-ordinates, altitude, date of collection (month usually indicated in roman numerals); collector; institution housing material, if not the Natal Museum. Specimens are also arranged roughly in geographical order (i.e. according to latitude and longitude) to facilitate mapping.

In all instances specimens were dry-mounted on pins. Drawings were executed with the aid of a drawing tube, male genitalia being first removed and macerated in potassium hydroxide. Genitalia were stored temporarily in glass vials containing 70% ethanol until the completion of the study, when they were sealed in polyethylene genitalia vials containing a mixture of ethanol and glycerine, and attached to the specimen pins.

Long, repetitive descriptions have been avoided by (1) placing species descriptions in keys, (2) providing illustrations, and (3) providing a tabulated character matrix (Table 1). In descriptive passages the use of standard abbreviations has also contributed to the shortening of this paper. While terminology, and abbreviations, generally follow McAlpine (1981), use of the term postpedicel for the antennal component between pedicel and style follows Stuckenberg (1999).



Figs 7–9. *Anypodetus* species, wing venation. 7. *A. fascipennis* Engel (Willowmore ♀). 8. *A. nigrifacies* Ricardo (Mkuzi ♂). 9. *A. leucothrix* sp. n. (holotype). Scale lines = 1 mm.

## TAXONOMY

Genus *Anypodetus* Hermann

*Anypodetus* Hermann, 1907: 69 [1908: 167]. Type–species: *Anypodetus fasciatus* Hermann, 1907, by original designation.

A detailed generic description was provided by Hull (1962: 345–347), based on the type species. The following notes, based on all the species, supplement Hull’s description. *A. leucothrix* is in many respects atypical, and may in time be shown to warrant another generic placement.

**Head:** Setation of antennal scape and pedicel more variable than described by Hull; shape of postpedicel (= third ‘segment’ of flagellomere) rather different in *A. macroceros*; style (= microsegment) with single pit–enclosed spine terminally; face not always uniformly pruinose (= pollinose); facial setation sometimes both intra– and interspecifically variable, especially in colour, and more extensive than suggested. No mention is made that some species have shiny, dorsoventrally flattened, scale–like setae associated with the mystax (*arachnoides*, *unicolor*).

**Thorax:** Mesonotal pruinescence sometimes largely absent and setae better developed (*leucothrix*); postpronotal lobe (= humerus) only rarely lacking stout macrosetae; lateral mesonotal macrosetae somewhat variable in number and more than 2 notopleurals, supra–anals and postalars sometimes present (especially in *fascipennis*); scutellum not always without marginal setae, which may be well developed in *leucothrix* and weakly developed in *unicolor*; scutellar disc setae may be quite well developed (*leucothrix*); pleura sometimes ventrally apruinose (*leucothrix*); katatergal (= metapleural) macrosetae variable in number.

**Legs:** Setal number and development variable.

**Wings:** The characteristic alignment of veins (Fig. 8) (considered a good synapomorphy supporting monophyly within the genus, see couplet 1 of key) is not present in two species (*fascipennis*, *leucothrix*).

**Abdomen:** Terga 2–6 with variable number of macrosetae (0–3); epandrium does not ‘merge laterally with the gonopod’, but is separate (as shown in figures).

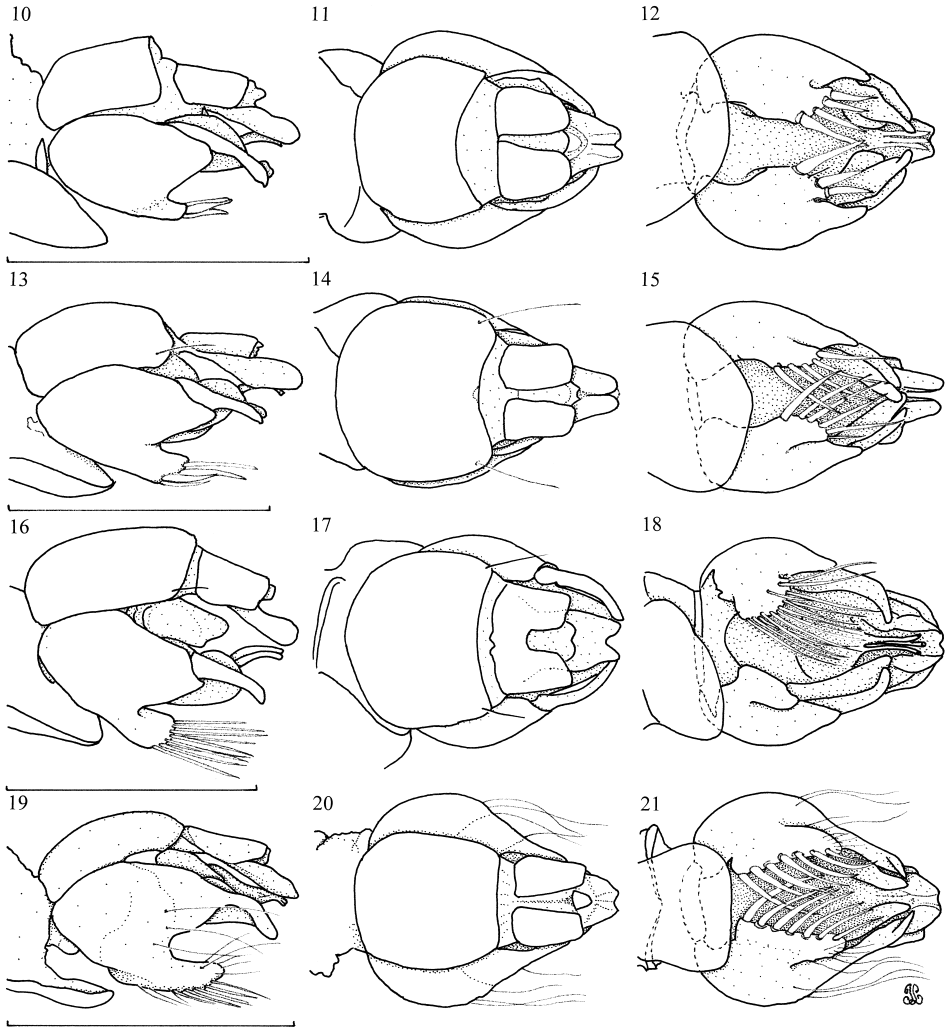
Key to species of *Anypodetus*

(Species descriptions supplemented by information in Tables 1–2)

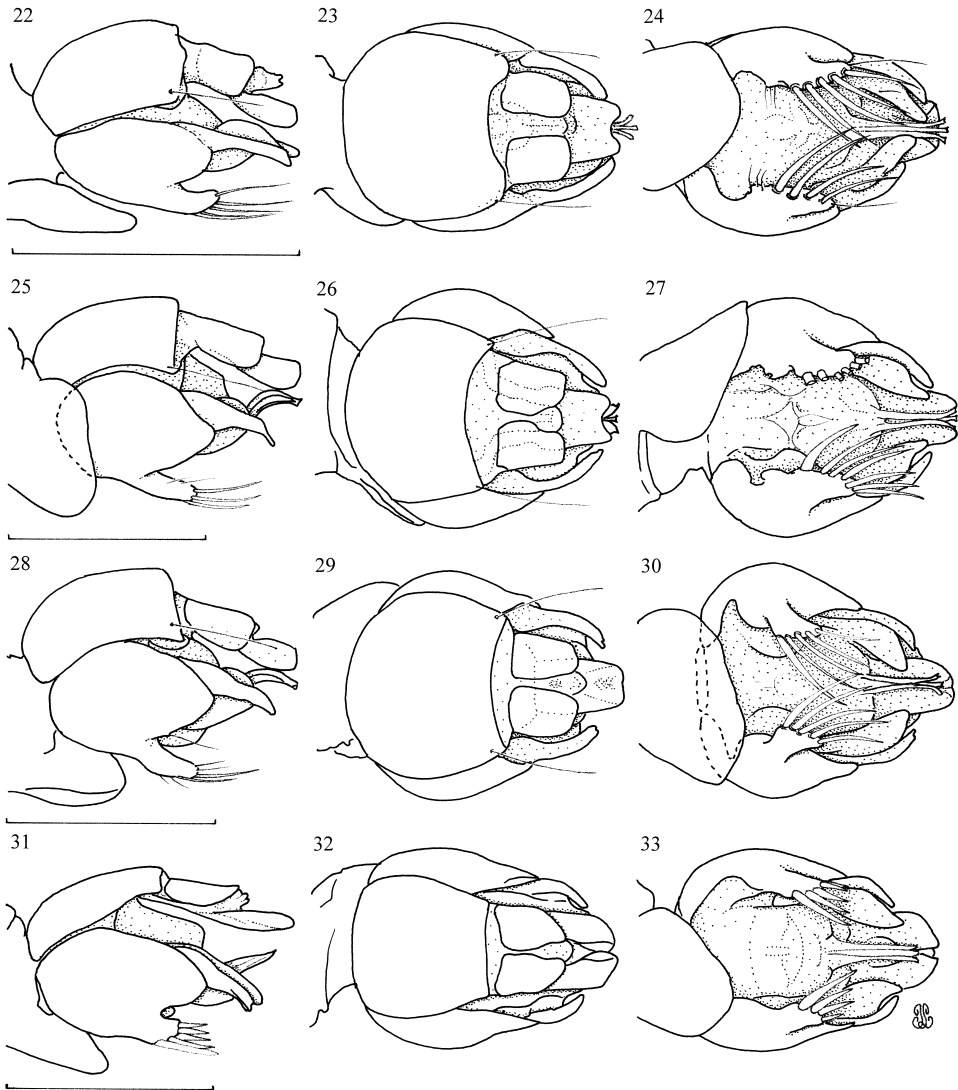
- 1a** Basal portion of  $M_2$  (that closes cell d) aligned with apical portion of  $M_3$  through reduction of m crossvein (often almost forming a straight line) (Fig. 8); ocellar macrosetae black ..... 3
- 1b** Basal portion of  $M_2$  (that closes cell d) not aligned with apical portion of  $M_3$  (Figs 7, 9); ocellar macrosetae orange or white ..... 2
- 2a** Wings banded with yellow–brown stained areas, membrane extensively covered with microtrichia; scutellar margin lacking setae; setae of prothoracic coxae and macrosetae of terga black; major mystacal macrosetae largely confined to epistomal margin. Illustrations – Head (Fig. 1), Antenna (Fig. 4), Wing (Fig. 7), Hypopygium (Figs 16–18), Ovipositor (Fig. 34), T2 (Fig. 39), Claws (Fig. 45), Distribution (Fig. 48) ..... **fascipennis** Engel

**Synonymy:** *Anypodetus fascipennis* Engel, 1924:103; *Anypodetus semirufus* Engel, 1924: 104; *Anypodetus maculipennis* Ricardo, 1925: 242.

**Material examined:** **BOTSWANA:** 3♂, Farmer's Brigade, Serowe, 22°25'S:26°44'E, 1000 m, 28.xi.1980, P Forchhammer, Malaise trap; 4♂ 15♀, Farmer's Brigade, Serowe, 2226BD, x.1985 (1♂2♀) – xii.1985 (1♀) – 8.xi.1988 (1♀) – 9.xi.1988 (1♂1♀) – x.1989 (5♀) – xi.1989 (2♂5♀), Forchhammer, Malaise trap; 1♂, Farmer's Brigade, 6 km SE Serowe, 1300 m, 26.x.1984, Forchhammer, Forestry nursery, *A. tortillis* woodland; 3♂ 1♀, Serowe, 26.xi.1982 (♂&♀) 21.xii.1982 (♂) 23.x.1982 (♂), Forchhammer, day; 1♀, Palapye [22°33'S:27°08'E], B.P., 18.x.1923, R Stevenson (SAMC); **NAMIBIA:** 1♀, SWA [= South West Africa = Namibia], iii.1923, Mus. Exp.; 1♀, Epupa Falls [16°55'S:13°10'E], Kunene, 20–22.ii.1994, F Koch (ZMHB); 1♀, Epupa Falls 17°00'S:13°15'E [use 16°55'S:13°10'E], Kunene, 19–21.ii.1994, H Schumann (ZMHB); 3♀, Ruacana Falls [17°23'S:14°15'E], Kunene, 23–24.ii.1994, F Koch (ZMHB); 1♀,



Figs 10–21. *Anypodetus* species, hypopygia. 10–12. *A. arachnoides* Oldroyd (6 km N Vivo). 13–15. *A. fasciatus* Hermann (Serowe). 16–18. *A. fascipennis* Engel (Willowmore). 19–21. *A. leucothrix* sp. n. (paratype). Scale lines = 1 mm.



Figs 22–33. *Anypodetus* species, hypopygia. 22–24. *A. macroceros* sp. n. (holotype). 25–27. *A. nigrifacies* Ricardo (Mkuzi). 28–30. *A. phalaros* sp. n. (37 km N Louis Trichardt). 31–33. *A. unicolor* Oldroyd (20 mi S Ndumu). Scale lines = 1 mm.

Kaross [19°30'S:14°20'E], ii.1925, Mus. Exped. (SAMC); 1♂, 27 mi S Tsumeb [19°14'S:17°43'E], 10.xii.1956; 1♀, Outjo [20°07'S:16°09'E], i.1925, Mus. Exped. (SAMC); 1♂1♀, 80 mi S Gobabis [22°27'S:18°58'E], 30.xii.1960, WD Haacke; 1♀, Portsmut, Hakos Mts., 2416AB, 7.ii.1969, B Lamoral; 1♂, Warmbad [28°27'S:18°44'E], Koakoveld, ii.1925, Mus. Exped. (SAMC); **SOUTH AFRICA**: 1♂1♀, Beacon Ranch, 20 km NW Gravelotte [23°57'S:30°37'E], 17.xi.1978, Brothers & J-Guillarmod; 2♂, Moorddrift [24°17'S:28°57'E], 7–19.x.1907, CJ Swierstra; 1♂1♀, Pretoria [District 25°30'S:28°10'E], i.1919, Dr Brauns; 1♂, Kaapmuiden [25°32'S:31°19'E], 30.x.1918, RWE Tucker (SAMC); 1♀, Vryburg [26°57'S:24°44'E], Griqualand West, x.1939, Mus. Staff (SAMC); 1♂1♀, De la Rey [= Delareyville 26°42'S:25°28'E], i.1917 (♂) – 15.i.1917 (♀), Dr

Brauns; 11♂4♀, De la Rey, i.1919, Dr Brauns; 1♂1♀, 35 km WNW Upington, 2820BD, 20.iii.1980, J Londt & L Schoeman, roadside vegetation; 1♂1♀, 10 miles W Hopetown C.P. [29°37'S:24°05'E], 27.i.1930, HK Munro [SANC]; 1♀, Bloemfontein [District 29°10'S:26°00'E], 12.xii.1920, HK Munro; 1♂, 22 km SE Graaff-Reinet on Pearston Rd., 32°27'S:24°38'E, 750 m, 7.xii.1989, J&H Londt, Open Karoo scrub/flowers; 1♀, Merweville [32°40'S:21°31'E] Dist., ii.1941, H. Zinn (SAMC); 4♂6♀, Willowmore [33°17'S:23°30'E], ii.1907 (♀) – 20.i.1908 (♀) – 1.i.1909 (♂) – 10.ii.1909 (♀) – xii.1912 (♂) – 1.i.1913 (2♀) – xii.1920 (♀) – 5.i.1922 (♂) – 10.xii.1922 (♂), Dr Brauns; 1♂, Willowmore, 2.i.1913, Dr Brauns (SAMC); **ZIMBABWE**: 1♂2♀, Hillside [17°50'S:31°05'E], xi.1922 (♂) – 5.xi.1922 (♀) – 4.ii.1923 (♀), Swinburne & Stevenson; 1♂, Sawmills [19°35'S:28°02'E], 14.xi.1924, RHR Stevenson; 1♂1♀, Bulawayo [20°09'S:28°35'E], xi.1922 (♂) – 1924 (♀), RHR Stevenson; 2♂1♀, Bulawayo, 12.x. & 4.xi.1923, R. Stevenson (SAMC).

**Notes:** Type material not seen: *A. fascipennis* – 1♂, South Africa, Willowmore, 1.1.1907, Dr Brauns & 2♂1♀, Delarey, Dr Brauns, types in ZSMC; *A. semirufus* – 3♂1♀, South Africa, Willowmore, 1.1. – 5.1.1922, Dr Brauns. Engel (1924) did not indicate the type status of each specimen. If these are syntypes it will be necessary to designate lectotypes for both *fascipennis* and *semirufus*. I have seen many specimens from both Willowmore and Deleray collected by Brauns. *A. maculipennis* – 1♂1♀ **syntypes** (*maculipennis*), Zimbabwe, Saw Mills (and other material from same locality) apparently in the National Museum of Zimbabwe, Bulawayo. I have seen other material from this locality.

- 2b** Wings without staining, unpatterned, transparent and entirely lacking microtrichia; scutellum with *ca.* 6 well-developed marginal setae; setae of prothoracic coxae and macrosetae of terga white; mystax extending from antennal bases to epistomal margin. Illustrations – Head (Fig. 2), Wing (Fig. 9), Hypopygium (Figs 19–21), T2 (Fig. 40), Scutellum (Fig. 47), Distribution (Fig. 48) ..... **leucothrix** sp. n.

**Etymology:** Gr. *Leukos* = white + *thrix* = hair – refers to the many white setae possessed by this species.

**Material examined:** **NAMIBIA:** 1♀ **paratype**, 'Namibia: Ai Ais [27°55'S:17°29'E] / Fish River Canyon / 7–8.x.1993, F. Koch' (ZMHB); 1♂ **paratype**, 'Gt. Karas Mts. [27°20'S:18°45'E] / SWA' ~ 'Mus. Staff / Nov. 1936' (SAMC). **SOUTH AFRICA:** 2♀ **paratypes**, 'Nieuveld / Escarpment / Rietvlei [32°21'S:21°49'E]' ~ 'Mus. Exped. Feb. 1925' (SAMC); 1♂1♀ **paratypes**, 'S Africa: Cape #21 / 70 km E of Laingsburg / 33°06'S:21°35'E 500m / Date: 24.xi.1990 / Whittington & Londt / Dry Dwyka River area'; 1♂ **holotype**, 'Sth Africa: Cape Prov / Gamka River 40 km N / Prince Albert 3321BB / 11.xi.1986 500m / Londt & Quicquelberge / Sandy area / Acacias'.

- 3a** Antennal postpedicel apically attenuate giving the impression of an elongate style (Fig. 6). Illustrations – Antenna (Fig. 6), Hypopygium (Figs 22–24), T2 (Fig. 41), Distribution (Fig. 49) ..... **macroceros** sp. n.

**Etymology:** Gr. *Makros* = long + *keros* = horn, referring to the somewhat elongate antennae.

**Material examined:** **NAMIBIA:** 1♂ **holotype**, 'South West Africa [= Namibia] 2516Ac / Maltahöhe Dist. Aandster / Farm, 1000m. 16.II.1974 / ME Irwin, vegetated dune / and grassland'.

- 3b** Antennal postpedicel of more usual form (Figs 4–5) ..... 4
- 4a** Tergal pruinescence distributed laterally as large shiny areas (Figs 42–43); wings brownish (usually with paler areas at some forks and crossveins); generally larger species (wing length > *ca.* 5.5 mm) ..... 5
- 4b** Tergal pruinescence distributed posteriorly as a narrow strip (Figs 37–38, 44); wings more or less transparent; generally smaller species (wing length < *ca.* 5.5 mm) ..... 6
- 5a** Mystax uniformly black; antennal postpedicel uniformly orange. Illustrations – Head (Fig. 3), Antenna (Fig. 5), Wing (Fig. 8), Hypopygium (Figs 25–27), Ovipositor (Fig. 35), T2 (Fig. 42), Distribution (Fig. 48) ..... **nigrifacies** Ricardo



**Synonymy:** *Anypodetus nigrifacies* Ricardo, 1925: 244.

**Material examined:** **MOZAMBIQUE:** 1 ♀, Maputo [25°58'S:32°34'E], 15.iii.1980, HR Feijen; **SOUTH AFRICA:** 2 ♀, Ndumu Game Reserve, 2632CC, 26.x.1972, ME Irwin; 1 ♂, Ndumu Game Reserve, Rest Camp, 2632CD, 95 m, 23–9.xi.1977, Brothers & J–Guillarmod, Malaise; 2 ♀, Ndumu Game Reserve, Rest Camp, 2632CD, 95 m, 15.ii.1978, Brothers & Bampton, Malaise; 1 ♀, Ndumu Reserve Ingwavuma dist., 28.xi.1961, T Oatley; 1 ♀, Ndumu Reserve Ingwavuma dist., 1–10.xii.1963, B&P Stuckenberg; 5 ♂ 3 ♀, Mkuzi Game Reserve, ca. 27°35'S:32°13'E, 100 m, 1.ii.1988, JGH Londt, Main camp & Caravan Park area; 1 ♀, Mkuzi Game Reserve, i.1949, HK Munro [SANC]. **Type material not seen:** 1 ♂ 1 ♀ **syntypes**, Mozambique, Lorenzo Marques (= Maputo) (and another pair from same locality) in BMNH. I have seen other material from this locality as well as specimens compared with the types by Oldroyd.

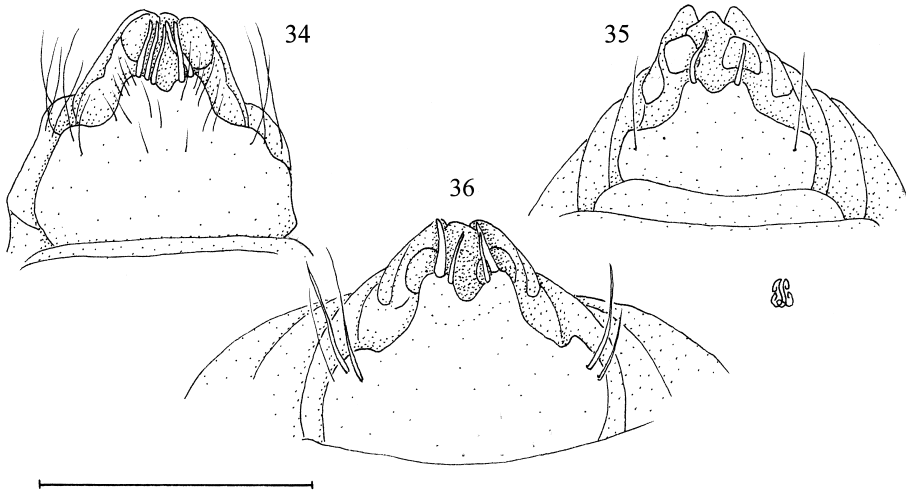
- 5b** Mystax black centrally with silvery white setae laterally; antennal postpedicel orange basally and dark red–brown distally. Illustrations – Hypopygium (Figs 28–30), T2 (Fig. 43), Distribution (Fig. 48) ..... **phalaros** sp. n.

**Etymology:** Gr. *Phalaros* = having a white patch, white–spotted – refers to the patches of silvery pruinescence on terga of this species.

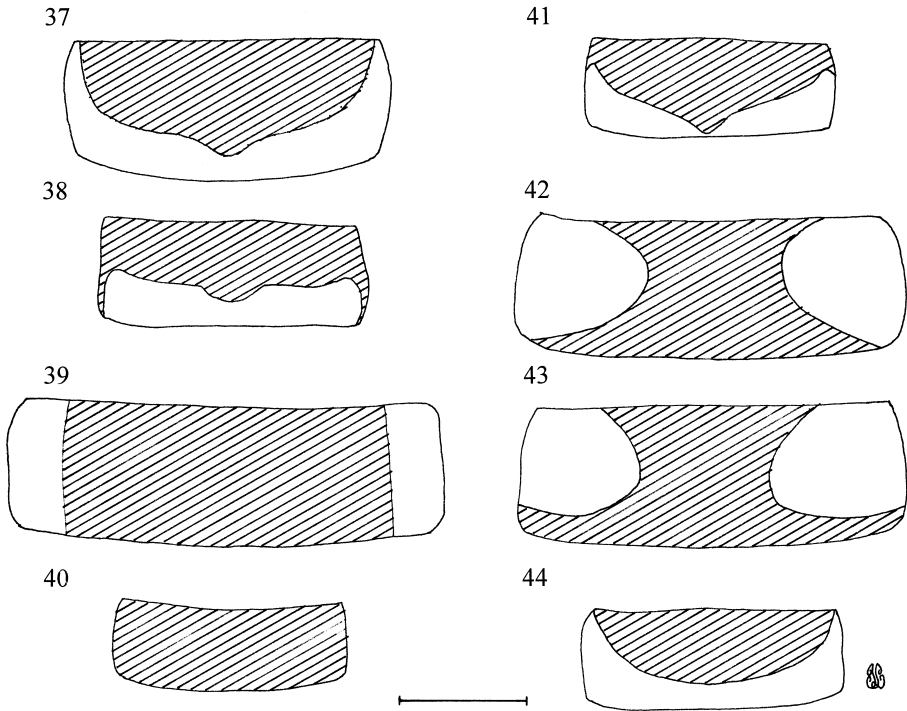
**Material examined:** **SOUTH AFRICA:** 1 ♂ **holotype** 1 ♀ **paratype**, 'S. Africa: Transvaal / 37km n. Louis Trichardt / Limpopo Val. [=Valley] 2229DD / Jan. 1975 Stuckenberg / arid bushveld'; **NAMIBIA:** 1 ♀ **paratype**, 'Brucharos [Brukkaros – 25°52'S:17°48'E] / S.W.Afr., 6:iii:1972 / H.D. Brown, E. Koster / D. Wessels' [SANC]; **UNKNOWN:** 1 ♀ **paratype**, LTT, ii.1971, BJ.

- 6a** Antennal postpedicel uniformly orange; major macrosetae of male mystax mostly black and accompanied by scale–like silvery setae laterally; female mystax with or without silvery setae laterally ..... 7

- 6b** Antennal postpedicel orange basally with terminal parts dark red–brown; major macrosetae of male mystax black (some golden–yellow ones may be present) with minor golden–yellow setae laterally; female mystax extensively golden yellow. Illustrations – Hypopygium (Figs 13–15), T2 (Fig. 38), Distribution (Fig. 49) ..... **fasciatus** Hermann



Figs 34–36. *Anypodetus* species, ovipositor, ventral aspect. 34. *A. fascipennis* Engel (Willowmore). 35. *A. nigrifacies* Ricardo (Mkuzi). 36. *A. unicolor* Oldroyd (20 mi S Ndumu). Scale line = 1 mm.



Figs 37–44. *Anypodetus* species, second abdominal tergum, distribution of pruinescence (unhatched). 37. *A. arachnoides* Oldroyd. 38. *A. fasciatus* Hermann. 39. *A. fascipennis* Engel. 40. *A. leucothrix* sp. n. 41. *A. macroceros* sp. n. 42. *A. nigrifacies* Ricardo. 43. *A. phalaros* sp. n. 44. *A. unicolor* Oldroyd. Scale line = 1 mm.

**Synonymy:** *Anypodetus fasciatus* Hermann, 1907: 70 [1908: 167]; *Anypodetus rigidis* Oldroyd, 1974: 92 [Type – BMNH. Zimbabwe] **syn. n.**

**Material examined:** **BOTSWANA:** 2♂1♀, Xugana Island, 19°04'S:23°03'E, 22–26.xi.1979, Lamoral, ex Malaise Trap; 1♂ 2♀, Serowe [22°25'S:26°44'E], Forchhammer, 24–12/82 [24.xii.1982] (1♂ 1♀) 7–1/83 [7.i.1983] (1♀); 1♂, Matokwe [unknown], 7.iii.1963, T Oatley; **NAMIBIA:** 1♂, Mafa [17°40'S:16°00'E], ii.1923, Mus. Exped. (SAMC); 1♂, Ovamboland, Ondongua [= Ondangua 17°58'S:16°01'E], ii.1921, KH Barnard (SAMC); 2♀, Kamanyab [19°38'S:14°50'E], i.1925, Mus. Exped. (SAMC); 1♂, 5 km SW Tsumeb Rd 1/9, 19°16'S:17°39'E, 22.iii.1984, Londt & Stuckenberg, Mixed woodland with sandy soil; 1♂ 1♀, Otjituo [19°40'S:18°36'E], i.1920, RW Tucker (SAMC); 1♀, Outjo [20°07'S:16°09'E], i.1925, Mus. Exped. (SAMC); 1♂1♀, Waterberg Nat. Park / Entrance, Road 2512, 20°32'S:17°20'E, 22.iii.1984, Stuckenberg & Londt, *Acacia* thornveld; 1♂, Narugas [?= Narudas Mtn. 27°21'S:18°52'E], i.1919 (SAMC); **SOUTH AFRICA:** 1♂, N Province, Blouberg Nature Reserve, 23°02'S:29°04'E, 2900ft, 22.xi.1997, Barraclough & James, Bushveld, #62; 1♀, Nylsvley, Naboomspruit, SE 2428Da, 1000 m, 12.xii.1975, D Trap 2319, E Holm, P Kirsten, C Scholtz, Savanna Ecosystem Research Project, C.S.I.R.; 1♂, Boekenhoutskloof [24°27'S:28°10'E], (30 km NE Pretoria), 5.xi.1977, G. Bernon; 1♂, Olivier [26°36'S:22°41'E], 1.iii.1980, Whitehead (SAMC); 2♂ 2♀, Vryburg [26°57'S:24°44'E], Griqualand West, x.1939, Mus. Staff (SAMC); 1♂ **Lectotype** 1♀ **paralectotype**, 'Lichtenburg [26°09'S:26°11'E] / Transvaal / Dr. Brauns', 'Sammlung / ♀. Hermann', 'Type von / *Anypodetus / fasciatus* Herm.' '*fasciatus*' [ZSMC]; 1♀, N Cape, 20 km N of Hotazel, 27°07'S:22°59', 1050 m, 14.iii.1999, Whittington & Londt, Kuruman River banks, #14; 1♂, Cape Prov. Newcastle Farm, 27°46'S:23°21'E, Kuruman Hills, 29–30.i.1979, B. Lamoral; 2♀, N Cape, 10 km W Bloubos farm, 28°07'S:20°45'E, 900 m, 17.iii.1991, Londt & Whittington,

Red dunes, N Upington, #23; 1 ♀, N. Cape, Witsand Farm, 28°32'S:22°30'E, 2–4.ii.1974, B Lamoral, I Bampton J Barnley, Malaise; 1 ♂, N Cape, 4 km SE Groblershoop, 28°57'S:22°01'E, 900 m, 18.iii.1991, Londt & Whittington, Red dune grassland, #25.

**Material not seen:** Oldroyd's type of *A. rigidis* (BMNH) from Zimbabwe (Sawmills), 31 xii 1921, was posted to me, but never arrived. The postal services subsequently returned the package to BMNH and to avoid further delay John Chainey kindly undertook comparisons for me, supporting my decision to synonymise the species with *fasciatus*. Oldroyd probably did not know *fasciatus* as none of the many specimens housed in NMSA, all sent to him for study, was identified by him as *fasciatus*. Oldroyd recorded *fasciatus* from Victoria Falls (Zimbabwe), but I have not seen the material.

- 7a** Scutellum with 4–6 weak, but clearly defined, black marginal macrosetae; female face with silvery setae. Illustrations – Hypopygium (Figs 31–33), Ovipositor (Fig. 36), T2 (Fig. 44), Egg (Fig. 46), Distribution (Fig. 49) ..... **unicolor** Oldroyd  
**Synonymy:** *Anypodetus unicolor* Oldroyd, 1974: 92 [Type – NMSA. South Africa; Mozambique, Namibia, Zimbabwe].

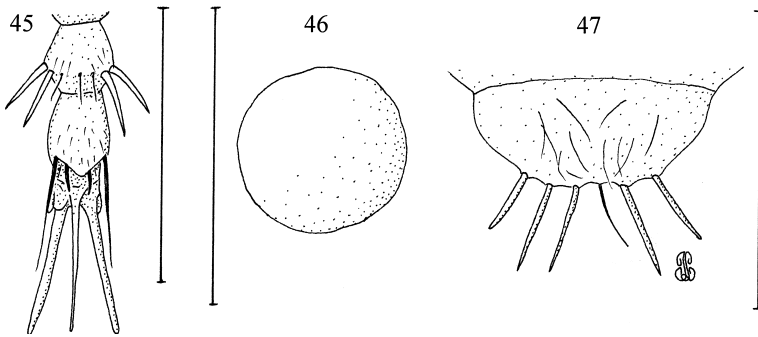
**Material examined:** **SOUTH AFRICA:** 1 ♀, Kruger Nat. Park, Lanner Gorge, 22.27S 31.08E, 402 m, 23.i.1985, MW Mansell [SANC]; 1 ♀, Naawpoort [?], Pbg [= Pietersburg – 23°54'S:29°27'E], 27.xi.1927, G. v. Son; 1 ♂, Ndumu Game Reserve, 2632CC, 26.x.1972, ME Irwin; 4 ♀, Ndumu Reserve, Ingwavuma dist., 1–10.xii.1963, B&P Stuckenberg; 1 ♀, Ndumu Reserve, Ingwavuma dist., 28.xi.1961, T Oatley; 5 ♂ 6 ♀, Kosi Bay Nat. Reserve, 2632DD, 30.xi.–2.xii.1982, Londt, Barraclough & Stuckenberg, Forest & open woodland areas; 1 ♀, Kosi Bay – Estuary, 2632DD, 16–19.iii.1982, DA Barraclough, Indigenous bush area; 1 ♂, Kosi Bay, 26.58S 32.48E, 10–11.ii.1990, CD Eardley [SANC]; 3 ♂, Makaheli For., ca. 5 km NE Mangusi, 2632DD, 30.xi.–2.xii.1982, Barraclough, Londt & Stuckenberg, Forest; 1 ♂ **Holotype** 1 ♀ **paratype** 4 ♂ 7 ♀, 'South Africa, Natal Prov. / Zululand, 20 mi S Ndumu / Game Res. Camp (2732Aa) / Nov. 29, 1971 ME&BJ Irwin / dry scrub forest; 320 ft'; 1 ♂ 1 ♀, 5 km E Makana – near Ndumu Game Reserve, 2732AB, 3.xii.1982, Londt, Stuckenberg & Barraclough, Roadside; 1 ♂, Mseleni, 2732BC, 29.xi.1982, Stuckenberg, Barraclough & Londt, Woodland / sandy area; UNKNOWN: 1 ♀ **Paratype**, 'Devuli Ranch, 13/2/71'.

**Material not seen:** Oldroyd (1974) records the species from Zimbabwe. Although I have not seen this material I doubt the accuracy of the identification. He also listed the paratype locality of 'Devuli Ranch' as in Zimbabwe, but I have not been able to verify this.

- 7b** Scutellum lacking marginal macrosetae; female face lacking silvery setae. Illustrations – Hypopygium (Figs 10–12), T2 (Fig. 37), Distribution (Fig. 49) ....  
**arachnoides** Oldroyd

**Synonymy:** *Anypodetus arachnoides* Oldroyd, 1974: 92.

**Material examined:** **BOTSWANA:** 5 ♂, Farmer's Brigade, 5 km SE Serowe, SE2226BD, 25.xi.1983 – 30.iii.1985 – 21.xi.1985 – xii.1985 – iii.1986, P Forchhammer, Malaise trap; 3 ♀, Serowe, 21.xii.1982 – 22.xii.1982 – 15.ii.1983, Forchhammer; 1 ♂, Maxwee [19°28'S:23°40'E], xi.1975, R Russell-Smith, Grassland; 2 ♀, Maxwee, 19.xii.1975, R Russell-Smith, Flood plain; **NAMIBIA:** 2 ♂ 1 ♀, Katima Mulilo [17°30'S:24°16'E], E Caprivi, 20–28.x.1970, A Strydom; 1 ♂ 1 ♀ 1?, Kaross [19°30'S:14°20'E], ii.1925, Mus. Exped. (SAMC); 1 ♂, Gr [? = Grootfontein], SWA, xii.1963, v. Teichm. [illegible]; **SOUTH AFRICA:** 5 ♂ 7 ♀, 6 km N Vivo, 2229CC, 23–24.ii.1980, Londt & Schoeman, Bushveld veget & old lands [1 ♀ – SANC]; 1 ♂, Messina Nature Res., 22.22S 30.02E, 554 m, 11–12.ii.1985, MW Mansell [SANC]; 5 ♂ 6 ♀, Soutpan, Soutpansberge, 2229CD, 23–24.ii.1980, Londt & Schoeman, Bushveld vegetation; 1 ♀, Zoutpan [23°10'S:28°25'E], Zpbg [= Zoutpansberg Mountains], 15–30.xi.1932, G van Son [Engel labeled this *fasciatus*]; 3 ♂, Nylsvley Reserve [24°39'S:28°42'E], Naboomspruit, 13.x.1976 (2 ♂) – 28.xi.1978 (♂), P. Ferrar; 1 ♂ 1 ♀, 14 km S Hotazel, 27°19'S:22°54'E, 1050 m, 14.iii.1991, Londt & Whittington, Ga–Mogara River bed; 1 ♀, 8 km W Olifantshoek, 27°56'S:22°40'E, 1550 m, 15.iii.1991, Londt & Whittington, Flat grassy plain; 1 ♂, 5 km W Olifantshoek, 27°57'S:22°42'E, 1350 m, 15.iii.1991, Londt & Whittington, *Acacia-Zizyphus* veld; 1 ♀, 45 km NE Priska, 29°33'S:23°07'E, 1050 m, 19.iii.1991, Londt & Whittington, Grassland & *Acacia*; **ZIMBABWE:** 1 ♂, Hillside [17°50'S:31°05'E], 24.xi.1922, Swinburne & Stevenson; 1 ♀,



Figs 45–47. *Anypodetus* species. 45. *A. fascipennis* Engel, tip of left hind tarsus. 46. *A. unicolor* Oldroyd, egg dissected from female abdomen. 47. *A. leucothrix* sp. n., scutellum, dorsal view. Scale lines = 1 mm.

Sawmills [19°35'S:28°02'E], 26.xii.1923, R Stevenson (SAMC); 1 ♀, Bulawayo [20°09'S:28°35'E], xii.1922, Dr Arnold; 1 ♂ 3 ♀, Bulawayo, 4.xi. & 11.xii.1923 & 3.i.1924, R Stephenson (SAMC); 1 ♂ **Paratype**, 'Sabi Valley [20°25'S:32°05'E] / Rhod / 18/11/71'.

**Type material not seen:** **Holotype** (sex not stated), Zimbabwe, Sawmills, 11.11.20, (collector unknown) BMNH. I have seen a male paratype and other material from Zimbabwe. Oldroyd (1974) also records the species from Chilanga, Zambia.

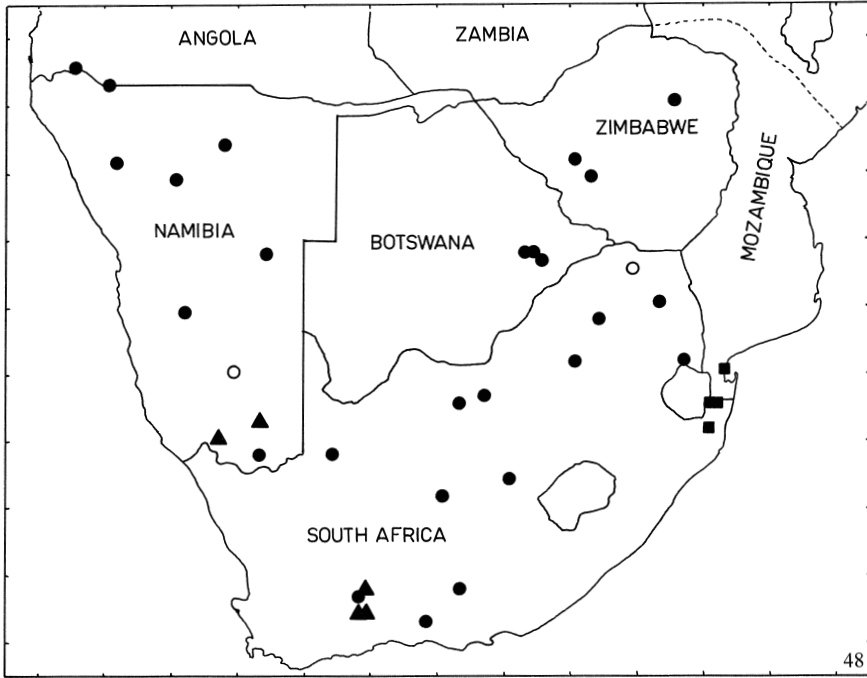
#### Taxonomic comments

- A. fasciatus:** Hermann did not designate a holotype, so all his specimens must be considered cotypes or syntypes. I hereby designate the male in ZSMC as **lectotype** and the female in the same collection as **paralectotype**. He listed 2 ♂ 2 ♀ from Lichtenburg and 1 ♂ 'aus der Kalahari'. The ZSMC has one pair from Lichtenburg. While investigating the holdings of other European museums I noted that two other collections may have syntypes from Hermann's series, i.e. Naturhistorisches Museum Wien, Vienna, and Zoologisches Museum, Berlin. This material is not included here. The only specimen in NMSA identified as *fasciatus* prior to this study (labelled by Engel) is a female *arachnoides*. This is curious as Engel had access to the types of *fasciatus*.
- A. fascipennis:** Examination of the full series of specimens at my disposal supports acceptance of the synonymy of *semirufus* Engel and *maculipennis* Ricardo as suggested by Oldroyd (1974). Although I have not seen Ricardo's syntypes of *maculipennis*, I here designate the male as **lectotype** and the female as **paralectotype**.
- A. nigrifacies:** Although I have not seen Ricardo's syntypes, I here designate the male as **lectotype** and the female as **paralectotype**.
- A. rigidis:** Oldroyd probably did not examine the types of *fasciatus*. *A. rigidis* appears to be conspecific with *fasciatus* and so I have synonymised *rigidis* (see above).

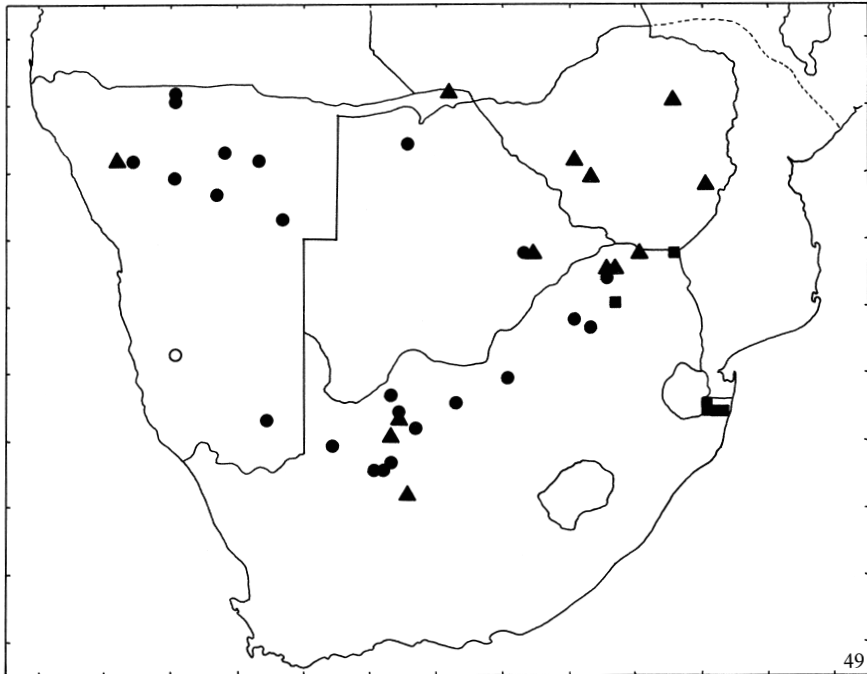
#### DISCUSSION

##### Biology

Little biological information has been published for *Anypodetus*. Engel & Cuthbertson (1934) provide brief notes on two species found in Zimbabwe. They reported that *A. fasciatus* was seen feeding on small grasshoppers and that *A. fascipennis* frequents sandy paths in Mopani woodland. My own observations (Londt 1994) confirm that the flies are found predominantly on open ground. The absence of pulvilli may also support



Figs 48–49. *Anypodetus* species distribution. 48. *A. fascipennis* Hermann (closed circles), *A. leucothrix* sp. n. (closed triangles), *A. nigrifacies* Ricardo (closed squares), *A. phalaros* sp. n. (open circles). 49. *A. arachnoides* Oldroyd (closed triangles), *A. fasciatus* Hermann (closed circles), *A. macroceros* sp. n. (open circle), *A. unicolor* Oldroyd (closed squares).



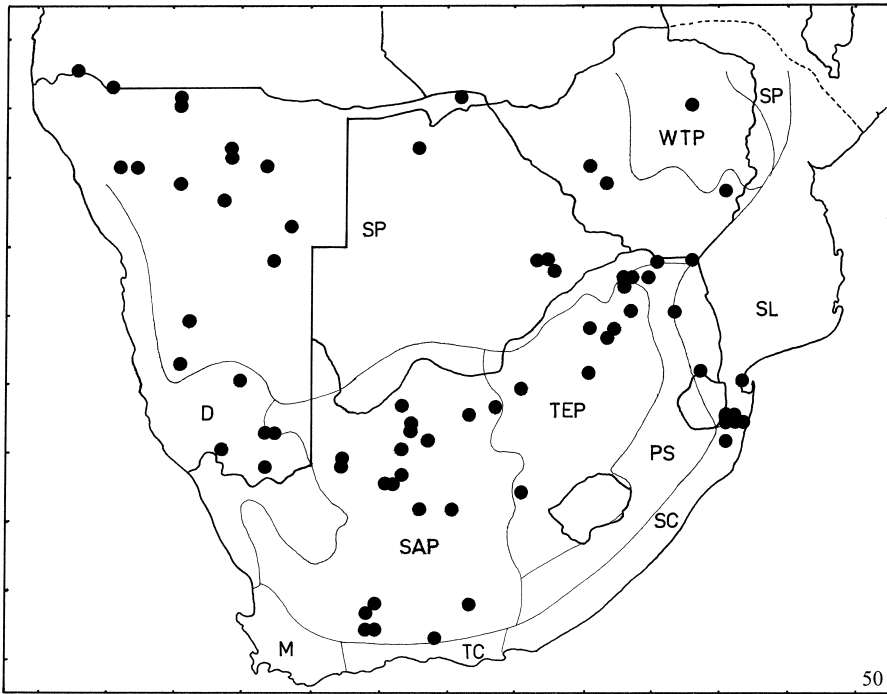


Fig. 50. *Anypodetus*, distribution of all data for genus, plotted on a map showing climatic regions. Abbreviations: D – Desert, M – Mediterranean, PS – Plateau slopes, SAP – Semi-arid plateau, SC – Subtropical coast, SL – Subtropical lowveld, SP – Subtropical plateau, TC – Temperate coast, TEP – Temperate eastern plateau, WTP – Warm temperate plateau.

this observation, as it appears that many taxa lacking pulvilli, or possessing reduced pulvilli, inhabit open ground. Although many Laphriinae pass their larval stages in decomposing wood, the fact that the ovipositor of *Anypodetus* lacks obvious adaptation, apart from being equipped with a few stout macrosetae on the distal margin of S8 (Figs 34–36), may indicate that oviposition takes place directly onto or into the soil surface. Eggs dissected from the abdomen of a pinned specimen are spherical (Fig. 46), thus resembling those of *Damalís femoralis* Ricardo, 1925, which merely drops its eggs to the ground from a perch in long grass (Londt 1991). The following prey records are available from Natal Museum material: *A. arachnoides*: 1♂ feeding on a fly (Diptera: Platystomatidae: *Lule* sp.), 1♀ feeding on an alate ant (Hymenoptera: Formicidae; Formicinae); *A. unicolor*: 1♀ feeding on a water midge (Diptera: Chironomidae). There are too few prey records to suggest any particular predilection.

#### Distribution

The distribution of the genus and each species covered in this paper is plotted in Figs 48–50. The distribution of species appears to be correlated with the basic climatic regions of southern Africa (Reader's Digest 1988). Table 2 summarises the findings in this regard. The genus is not known from either the Mediterranean or Temperate Coast regions (Fig. 50). The following comments may be made about each species:

*A. arachnoides*: Widespread, known from three climatic zones experiencing moderate to high temperatures and low to moderate summer rainfall.

TABLE 2  
Distribution of *Anypodetus* species in terms of climatic regions. ? = doubtful record.

Species	Climatic Region (see below)									
	SP	D	M	SAP	TC	TEP	PS	SC	WTP	SL
<i>A. arachnoides</i>	●	–	–	●	–	–	–	–	●	–
<i>A. fasciatus</i>	●	–	–	●	–	●	–	–	–	–
<i>A. fascipennis</i>	●	●	–	●	–	●	●	–	●	–
<i>A. leucothrix</i>	–	●	–	●	–	–	–	–	–	–
<i>A. macroceros</i>	●	–	–	–	–	–	–	–	–	–
<i>A. nigrifacies</i>	–	–	–	–	–	–	–	●	–	●
<i>A. phalaros</i>	–	●	–	–	–	–	●	–	–	–
<i>A. unicolor</i>	–	–	–	–	–	●?	–	–	–	●
Records	4	3	0	4	0	2?3	2	1	2	2

Abbreviations:

SP – Subtropical plateau.

D – Desert.

M – Mediterranean.

SAP – Semi-arid plateau.

TC – Temperate coast.

TEP – Temperate eastern plateau.

PS – Plateau slopes.

SC – Subtropical coast.

WTP – Warm temperate plateau.

SL – Subtropical lowveld.

*A. fasciatus*: Fairly widespread, with a similar distribution to *arachnoides*.

*A. fascipennis*: The most widely distributed species, known from six climatic regions.

Not reported from the higher rainfall areas of the eastern parts of the subcontinent.

*A. leucothrix*: Known only from a few localities situated within the semi-arid plateau and desert climatic regions characterised by cool dry winters and hot summers with low rainfall.

*A. macroceros*: The unique holotype was collected in the subtropical plateau climatic region with its warm, dry winters and hot summers with low rainfall.

*A. nigrifacies*: Unlike most species, except *unicolor*, this species inhabits the warm, high rainfall climatic regions adjacent to the east coast of southern Africa.

*A. phalaros*: The limited distribution data suggests a widespread species enjoying conditions similar to those inhabited by *arachnoides* and *fasciatus*.

TABLE 3  
Seasonal incidence of *Anypodetus* species.

Species	Months											
	J	A	S	O	N	D	J	F	M	A	M	J
<i>A. arachnoides</i>	–	–	–	●	●	●	–	●	●	–	–	–
<i>A. fasciatus</i>	–	–	–	●	●	●	●	●	●	–	–	–
<i>A. fascipennis</i>	–	–	–	●	●	●	●	●	●	–	–	–
<i>A. leucothrix</i>	–	–	–	●	●	–	●	–	–	–	–	–
<i>A. macroceros</i>	–	–	–	–	–	–	–	●	–	–	–	–
<i>A. nigrifacies</i>	–	–	–	●	●	●	●	●	●	–	–	–
<i>A. phalaros</i>	–	–	–	–	–	–	●	●	●	–	–	–
<i>A. unicolor</i>	–	–	–	●	●	●	●	●	●	–	–	–
Total records	0	0	0	14	29	23	20	25	18	0	0	0

*A. unicolor*: Apart from a single, doubtful record (Naawpoort), this species appears to inhabit the subtropical lowveld climatic region with its mild dry winters and hot, high-rainfall summers.

#### Seasonal incidence

The adult stages of *Anypodetus* species are clearly summer-active (Table 3). Most species are first encountered in October and are common during November, December and January. Activity tapers off during March and no adults have been found between April and September. Data are limited for the newly described species as few specimens are available.

#### ACKNOWLEDGEMENTS

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#### REFERENCES

- ENGEL, E. O. 1924. Studien über afrikanische Dipteren (Asiliden). *Wiener Entomologische Zeitung* **41**: 100–110.
- 1929. New or little known Asilidae from South Africa. *Annals of the Transvaal Museum* **13**: 154–171.
- ENGEL, E. O. & CUTHBERTSON, A. 1934. Systematic and biological notes on some Asilidae (Diptera) of Southern Rhodesia with a description of a species new to science. *Proceedings of the Rhodesia Scientific Association* **34** (1): 35–47.
- HERMANN, F. 1907. Beitrag zur Kenntnis der Asiliden (III). (Dipt.). *Zeitschrift für Hymenopterologie und Dipterologie* **7**: 1–16, 65–78.
- HULL, F. M. 1962. Robber flies of the World. The genera of the family Asilidae. *Bulletin of the United States National Museum* **224** (1): 1–430, (2): 431–907.
- LONDT, J. G. H. 1988. Afrotropical Asilidae (Diptera) 16. An illustrated key to the genera of the subfamily Laphriinae, a revision of *Gerrolasius* Hermann, 1920 and the description of a new genus *Pilophoneus*. *Annals of the Natal Museum* **29** (2): 509–521.
- 1991. Afrotropical Asilidae (Diptera) 21. Notes on the biology and immature stages of *Damalis femoralis* Ricardo, 1925 (Trigonomiminae). *Annals of the Natal Museum* **32**: 149–162.
- 1994. Afrotropical Asilidae (Diptera) 26. Ethological observations, and a possible ecological classification based on habitats. *Annals of the Natal Museum* **35**: 97–122.
- MCALPINE, J. F. 1981. Morphology and terminology – Adults. In: McAlpine, J. F. et. al., *Manual of Nearctic Diptera*. Volume 1. Hull (Quebec): Agriculture Canada, Research Branch (Monograph; No. 27) pp. 9–63.
- OLDROYD, H. 1974. An introduction to the robber flies (Diptera: Asilidae) of southern Africa. *Annals of the Natal Museum* **22** (1): 1–171.
- 1980. Family Asilidae. In: Crosskey, R. W. ed., *Catalogue of the Diptera of the Afrotropical Region*. London: British Museum (Natural History) pp. 334–373.
- STUCKENBERG, B. R. 1999. Antennal evolution in the Brachycera (Diptera), with a reassessment of terminology relating to the flagellum. *Studia Dipterologica* **6** (1): 33–48.
- READER'S DIGEST ATLAS OF SOUTHERN AFRICA 1988. Reader's Digest Association of South Africa (Pty) Ltd. 256p.
- RICARDO, G. 1925. New species of Asilidae from South Africa. *The Annals and Magazine of Natural History, Zoology, Botany and Geology*. (9) **15**: 234–282.