

# The genus *Eupodes* Koch, 1835 (Acari: Prostigmata: Eupodidae) from southern African soil and vegetation. Part 1. Characterisation of the genus, designation of the type species and descriptions of three new species

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Based on a study of the Eupodoidea of southern Africa, the genus *Eupodes* is redefined, with the incorporation of additional features, to distinguish it from other genera. *E. striola* Koch, 1835 is conceived as type species for the genus. Three new species, *E. lutatus*, *E. indentatus* and *E. hamatus* are described and figured. Special attention is contributed to the shape and position of dorsal idiosomal setae, chaetotaxy of the palp, leg chaetotaxy and solenidiotaxy. Both species are compared with their nearest congeners.

Key words: southern African Eupodidae, *Eupodes*, *E. lutatus*, *E. indentatus*, *E. hamatus*.

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## Introduction

Representatives of the Eupodoidea are terrestrial and cosmopolitan in distribution. The greatest number (of both species and individuals) are to be found in the top layers of grassland and woodland soils, where a wide range of habitats (such as semi-arid terrestrial localities, habitats with prevailing moist conditions, intertidal coastal regions, Arctic regions and steam vents) have been exploited (Strandtmann & Goff 1978). In keeping with their ubiquity and despite of their small size and delicate form, some 480 species have been described. Unfortunately, many of the original descriptions are poor, not diagnostically clear and can often not be authenticated, as type material may be unavailable or not designated.

Other than the seven species mentioned by Meyer & Ryke (1960), the Eupodoidea was at the time, virtually unknown from southern Africa. A comprehensive study of the Eupodoidea of this region (Olivier 1992)

revealed 42 eupodoid species, representing some 22 genera. The genus *Eupodes* accommodates six of these species, three of which are described here.

Apart from conventional taxonomic methods, taxometric computer analyses were carried out for confirmation of the former. This involved the use of two software packages, viz. NTSYS-pc (Rohlf 1988) and DELTA (Dallwitz & Paine 1986). Body length of specimens was taken from the posterior margin of the idiosoma to the anterior margin of the naso, or the anterior margin of the prodorsum in cases where the naso does not reach the anterior extremity of the prodorsum. Body width was taken as the distance on a line between setae  $c_2$  to the lateral margins of the body. Seta lengths represent the distance from the setal base to the tip. Curved setae were drawn and measured with the aid of a planimeter (dimensions are given in  $\mu\text{m}$ ). Notations for setae and nomenclature used, follow that applied to eupodoids by Baker (1990).

## Genus *Eupodes* Koch

*Eupodes* Koch 1835:18; Thor & Willmann, 1941:5; Meyer & Ryke, 1960:483; Strandtmann, 1970:89; Strandtmann, 1971:78. *Egypteupodes* Abou-Awad, 1984: 329 syn. n. Type species: *Eupodes striola* Koch, 1835.

### Remarks

The diagnostic feature separating the genera *Eupodes* and *Egypteupodes* was given as the lack of seta **iv** (Abou-Awad 1984). This seta, however, is present (Olivier 1992) yet exceptionally small (maximum length 2  $\mu$ m). *Egypteupodes strandmannii* is thus an *Eupodes* species, but due to the validity of *Eupodes strandmannii* (Coineau 1976), the species name is thus regarded as *E. inguirenda* (articles 49, 65 and 70 of the International Code of Zoological Nomenclature).

Many authors give the date for establishment of the genus *Eupodes* as 1836 and the type species is traditionally quoted as *E. hiemalis* Koch, 1836. According to Sherborn (1923) the correct dates cited should be 1835 (for *Eupodes*) and 1838 (for *E. hiemalis*). In the original description of the genus, descriptions of *E. striola* and *E. signatus* are given. However, a type species was not designated. *Eupodes* is, therefore, available by indication (article 12(b)(5) of the International Code of Zoological Nomenclature) The type species should consequently be either one of the originally described species (article 69(a) of the International Code of Zoological Nomenclature). The present authors, therefore, designate *E. striola*, being the first described species of *Eupodes*, as the type.

### Diagnosis

*Eupodes* appears to be the most heterogeneous genus within the Eupodidae. Differences in solenidiotaxy and chaetotaxy of the coxae often hinder the accurate grouping of some of the known species. Furthermore, the characteristic of an enlarged femur IV, a traditional feature attrib-

uted by Koch for the genus in 1835, may be lacking in some species (e.g. *E. angardi*) and is also found in species of *Cocceupodes* and *Benoinyssus*. Hence, this rescinds the enlarged femur IV as diagnostic for the genus. Based on the results of this study, the genus *Eupodes* can be diagnosed as follows:

small to medium-sized (length 290–650  $\mu$ m); integument of idiosoma weakly striate-spiculate; prodorsal shield with more densely spiculate striae than surrounding integument; sejugal furrow prominent; naso a clearly delimited lobe, with separating suture; **iv** pinnate, situated on naso, shorter than **ev**; T filiform, pinnate, frequently longer than **sc**; **f<sub>1</sub>** variable in shape, never trichobothrial as for the genus *Benoinyssus*; with five or seven pairs of aggenital (**ag**) setae; with six pairs of genital (**g**) setae arranged vertically in line, except for **g<sub>4</sub>** always being lateral to the rest; female with six pairs of heteromorphic eugenital (**eg**) setae (male often with seven pairs); with three pairs of anal setae; subcapitulum with apical setae (**sbc<sub>2</sub>**) consistently longer than basal setae (**sbc<sub>1</sub>**); Baker (1990) mentions the presence of eupathidial adoral setae on the subcapitulum, but this was never observed in this study; movable chela edentate; fixed digit terminates in shallow fork, edentate; with one cheliceral seta, **cha**, always being smooth and unornamented; palps with four free articles - trochanter, femorogenu, tibia and tarsus; palpal tarsus with six, seven or nine setae (commonly nine according to Baker 1990); legs: rhagidial organs (ro) L-type, in tandem and in confluent pits; famuli, when present, posterolateral to rhagidial organs; tarsus I with six dorsal setae and two rhagidial organs; tarsus II with four dorsal setae and two rhagidial organs; tarsus IV with three dorsal and eight ventral setae; tibiae I and II each with one rhagidial organ; tibia II always lacking famuli, sometimes with solenidion; tibiae III and IV with one solenidion each; genu I sometimes with solenidion; coxal chaetotaxy 3–1–4/5–3.

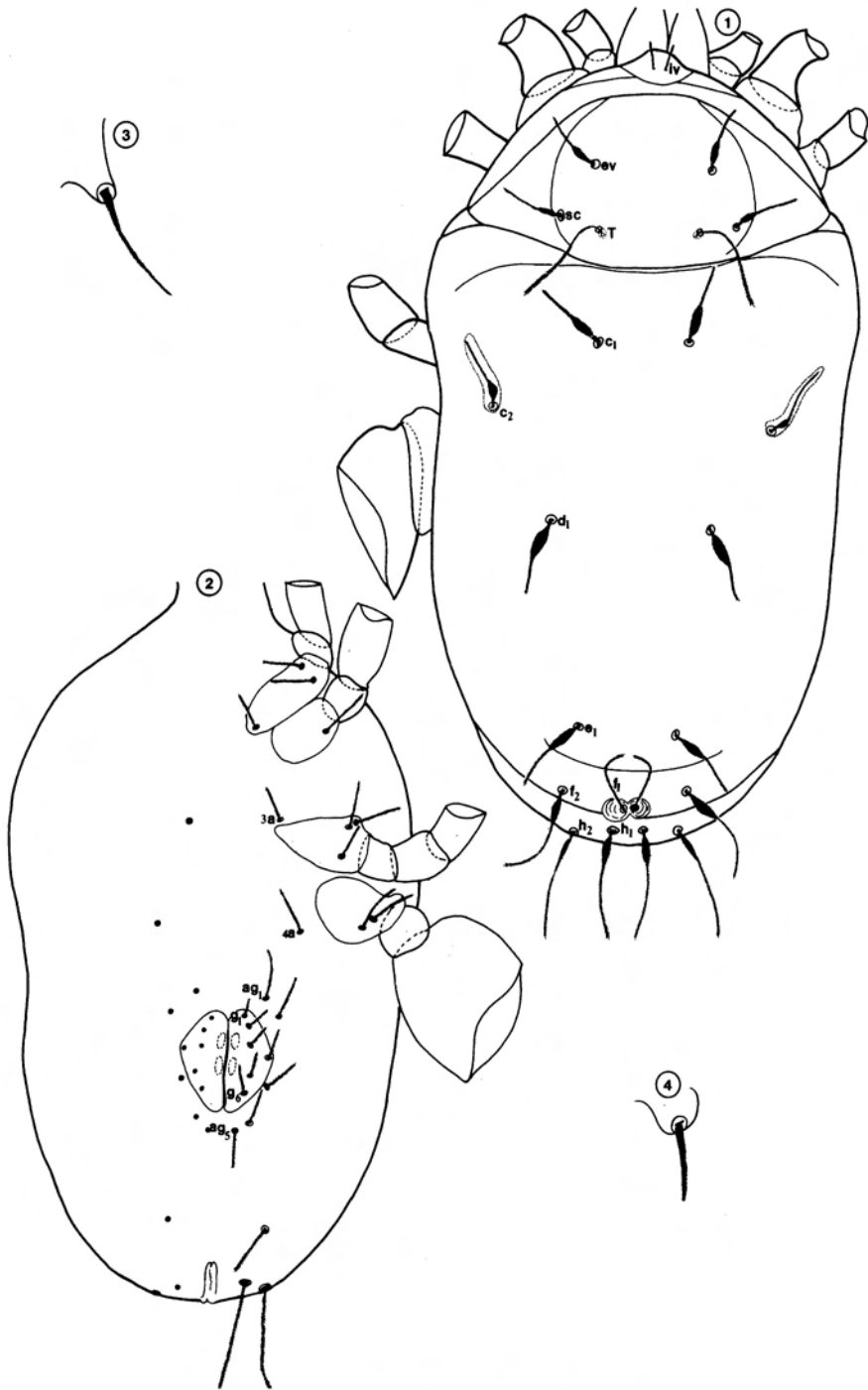


Fig. 1. *Eupodes lutatus* sp.n., dorsum, x32 (annotations as in text).

Fig. 2. *Eupodes lutatus* sp.n., venter, x25 (annotations as in text).

Fig. 3. *Eupodes lutatus* sp.n., seta *eg*<sub>1</sub>, female, x100.

Fig. 4. *Eupodes lutatus* sp.n., seta *eg*<sub>3</sub>, female, x100.

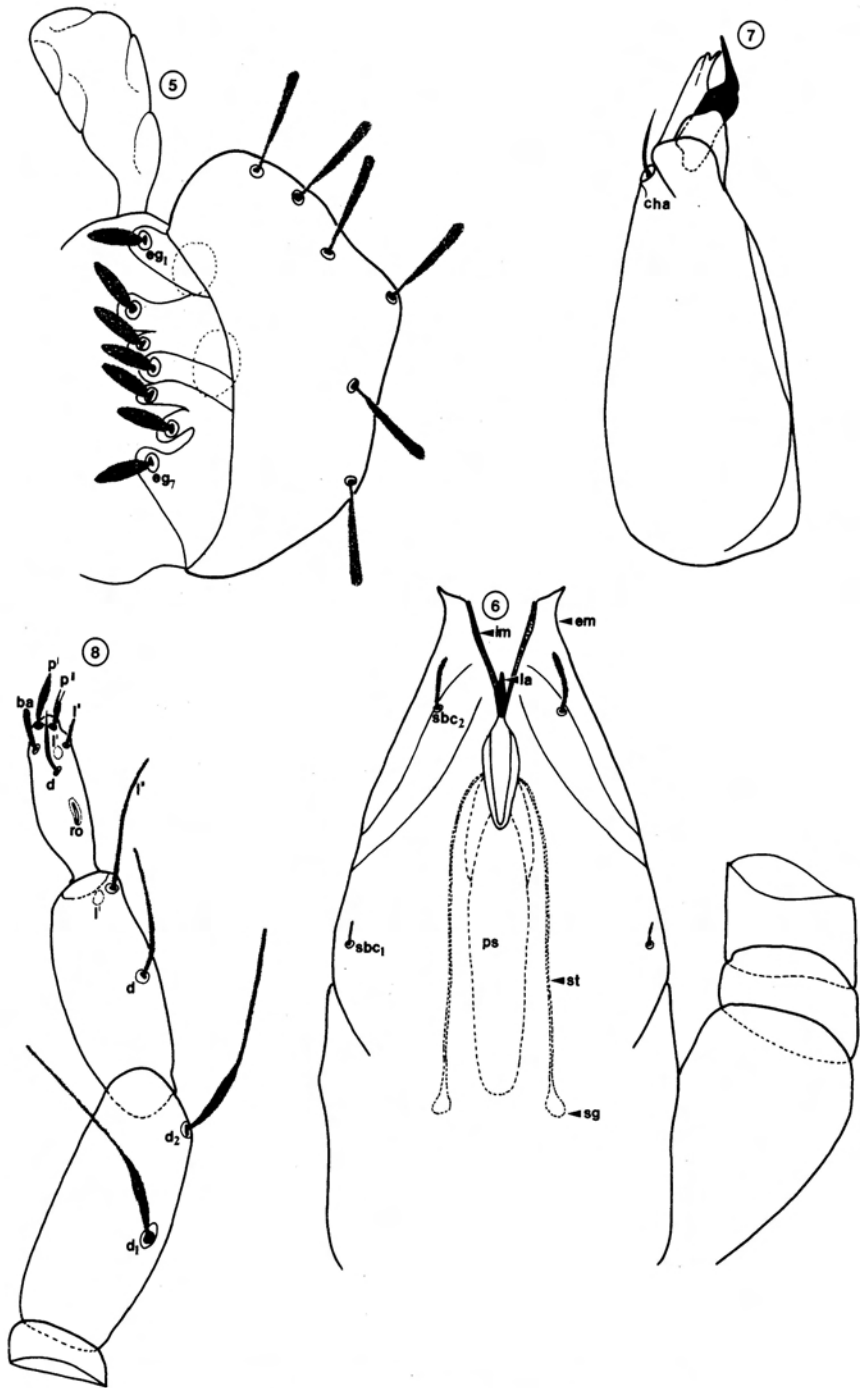


Fig. 5. *Eupodes lutatus* sp.n., genital region, male, x100 (annotations as in text).

Fig. 6. *Eupodes lutatus* sp.n., subcapitulum, x100 (annotations as in text).

Fig. 7. *Eupodes lutatus* sp.n., chelicera, x100 (annotations as in text).

Fig. 8. *Eupodes lutatus* sp.n., palp, x100 (annotations as in text).

*Eupodes lutatus*, sp.n.

Figs. 1–16.

Etymology: *Lutum* (L) = mud, refers to dark colour due to robust integumental striae.

This species is related to *E. okinoshimaensis* Shiba, 1978 and *E. strandmanni* Coineau, 1976 but can be separated by the shape of **f**<sub>1</sub>, the complement of dorsal spindle-shaped setae and tarsi I and II with four and five ventral setae respectively.

Female, Figs. 1–4 and 6–12.

Dimensions: length 515 µm; width 309 µm; leg I 309 µm; leg II 229 µm; leg III 232 µm; leg IV 356 µm; **iv** 16 µm; **ev** 47 µm; **T** 54 µm; **sc** 51 µm; **c**<sub>1</sub> 46 µm; **c**<sub>2</sub> 43 µm; **d**<sub>1</sub> 47 µm; **e**<sub>1</sub> 57 µm; **f**<sub>1</sub> 25 µm; **f**<sub>2</sub> 56 µm; **h**<sub>1</sub> 57 µm; **h**<sub>2</sub> 56 µm.

Dorsal setae stalked, spindle-shaped except for **iv**, **T** and **f**<sub>1</sub> being unstalked; all spindle-shaped setae short, robust, pinnate; **iv** pinnate; **T** pinnate, slightly more plumose on distal half; **f**<sub>1</sub> pinnate; integumental striae prominently thick and robust, resulting in cleared specimens appearing dark coloured.

Idiosoma dorsum: prodorsum (Fig. 1) with four pairs of setae; **iv** shorter than **ev**; **T** filiform, only scarcely longer than **sc**; sensory area well defined, naso elliptical; integument without reticulation, but with dome shape grooves anterolateral to sensory area and a faint transverse groove posteriad of naso; sejugal groove delicate, often poorly defined. Opisthosoma with two ill-defined posterior integumental folds; with eight pairs of setae; **c**<sub>2</sub> in a depression (Fig. 1), situated behind **c**<sub>1</sub>, shorter than **c**<sub>1</sub>; **d**<sub>1</sub> well posteriad of **c**<sub>1</sub> and shorter than **e**<sub>1</sub>; **f**<sub>1</sub> pinnate, hooked, situated on rounded integument with distinctive striae; **f**<sub>2</sub> slightly anteriad of **f**<sub>1</sub>; **h**-series terminal; lyrifissures not observed.

Idiosoma venter: genital region (Fig. 2) with five pairs of **ag**- and six pairs of **g**-setae; genital atrium with six pairs of **eg**-setae, all arranged on papillae of the ovipositor; **eg**-setae plumose, heteromorphic, with **eg**<sub>3&4</sub>

shorter (Figs. 3 & 4); anal opening (Fig. 2) ventral, with three pairs of long, slender, pinnate anal setae, all ventrally; lyrifissures not observed.

Gnathosoma (Fig. 6): external malae (**em**) flat, disk like, each terminally arcuate; internal malae (**im**) bacilliform; basal setae (**sbc**<sub>1</sub>) small, pinnate; apical setae (**sbc**<sub>2</sub>) near division of lateral lips, almost plumose, slightly swollen near tip; labrum (**la**) rod like with rounded tip, not extending past apex of lateral lips; tracheal tubes not observed; with a pair of small salivary glands (**sg**) associated with styliform tubes (**st**) posterolateral to pharyngeal sclerite (**ps**); chelicerae (Fig. 7) each with one seta (**cha**) on a tubercle, proximal to fixed digit; fixed digit poorly developed, slightly furcate, edentate; movable digit weakly hooked, edentate; palpi (Fig. 8) four-segmented; tarsus terminally rounded, with six setae (**d** simple, sharply pointed; **I'** and **I''** small, pinnate; **ba** pinnate, larger than **l**; **p'** pinnate with tapered tip; **p''** pinnate, bifurcate) and one median rhagidial organ (**ro**); tibia with both dorsal (**d**) and laterals (**I'** and **I''**) pinnate; femorogenu with **d**<sub>1</sub> and **d**<sub>2</sub> relatively large and spindle shaped; supracoxal setae not observed.

Legs (Figs. 9–12): All legs shorter than body; most leg segments enlarged, appearing somewhat swollen; tarsus I without pseudosegments, with setae **v**<sub>1</sub>, **v**<sub>3</sub> and **v**<sub>5</sub> unpaired; femur IV prominently enlarged; coxae in two groups, coxae III and IV sometimes also separated (Fig. 2), both setae **3a** and **4a** not within the limitations of the coxae; supracoxal setae not observed; leg chaetotaxy (with sensory setae in parenthesis) as follows: tarsi 27(3)–15(3)–15–15; tibiae 16(2)–9(2)–6(1)–6(1); genua 15–7–5–5; femora 18–15–8–7; trochanters 1–1–1–1; coxae 3–1–4–3. Sensory setae of different types: tarsus I (Fig. 9) with two L-type rhagidial organs in tandem and a stellate famulus proximal to rhagidial organ 2; tarsus II (Fig. 10) with two L-type rhagidial organs in tandem and a spiniform famulus proximal to rhagidial organ 2; tibiae I and II (Figs. 9 & 10) each with one distal L-type

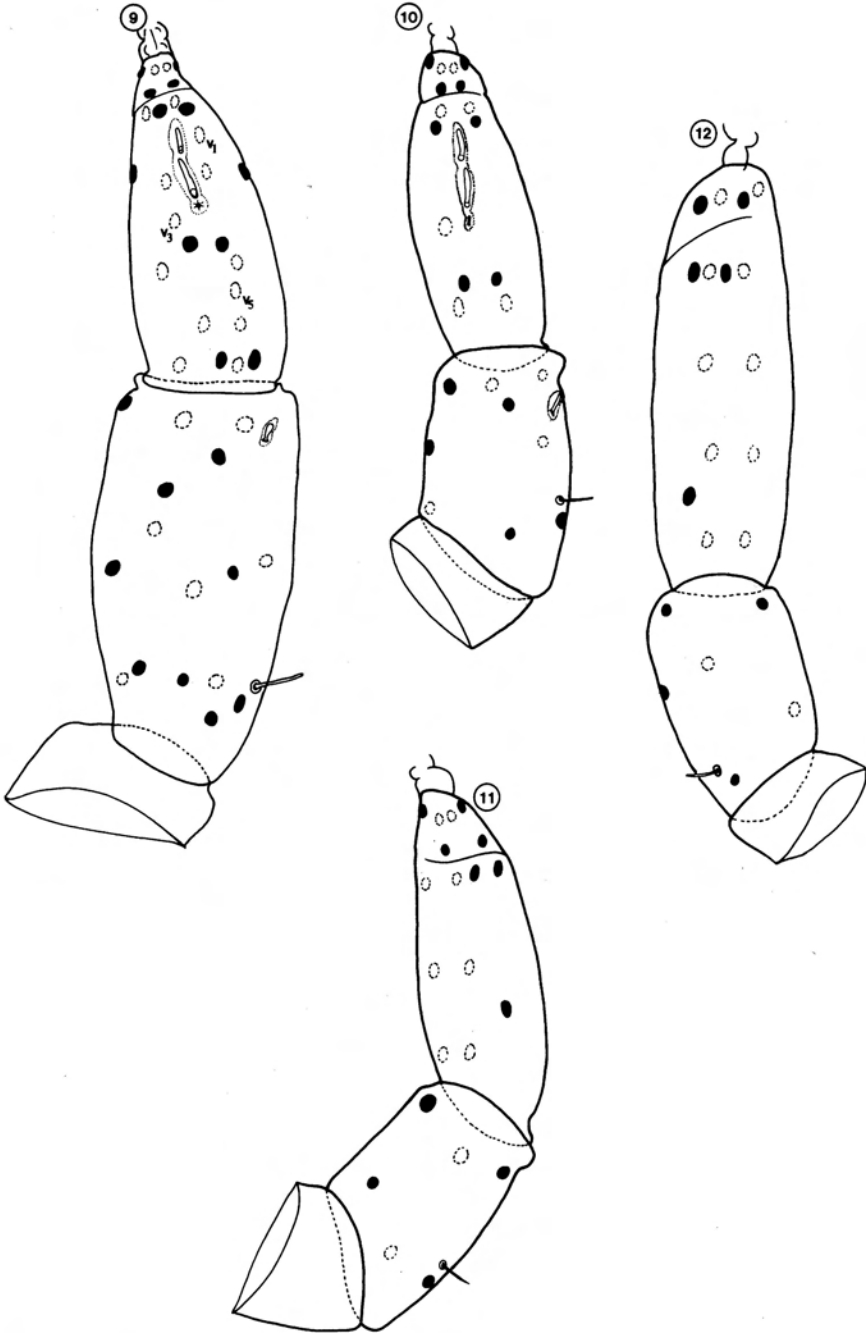


Fig. 9. *Eupodes lutatus* sp.n., tarsus & tibia I, x100.  
 Fig. 10. *Eupodes lutatus* sp.n., tarsus & tibia II, x100.  
 Fig. 11. *Eupodes lutatus* sp.n., tarsus & tibia III, x100.  
 Fig. 12. *Eupodes lutatus* sp.n., tarsus & tibia IV, x100.

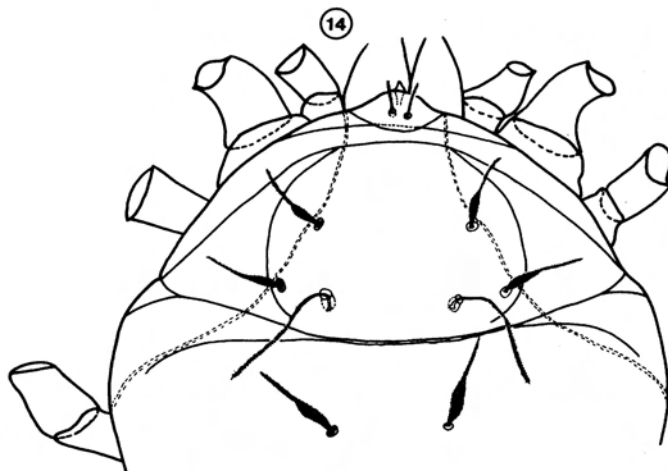
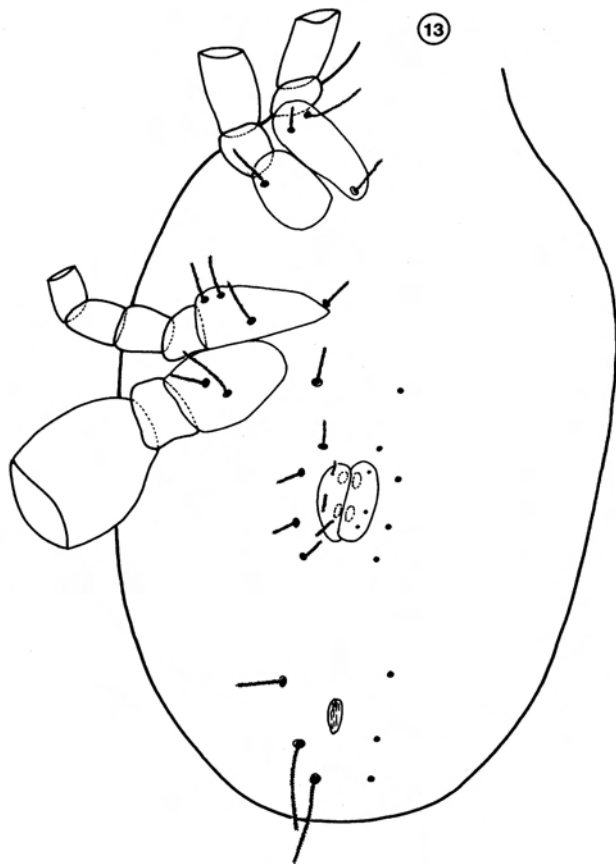


Fig. 13. *Eupodes lutatus* sp.n., venter, tritonymph, x25.  
 Fig. 14. *Eupodes lutatus* sp.n., prodorsum, tritonymph, x25.

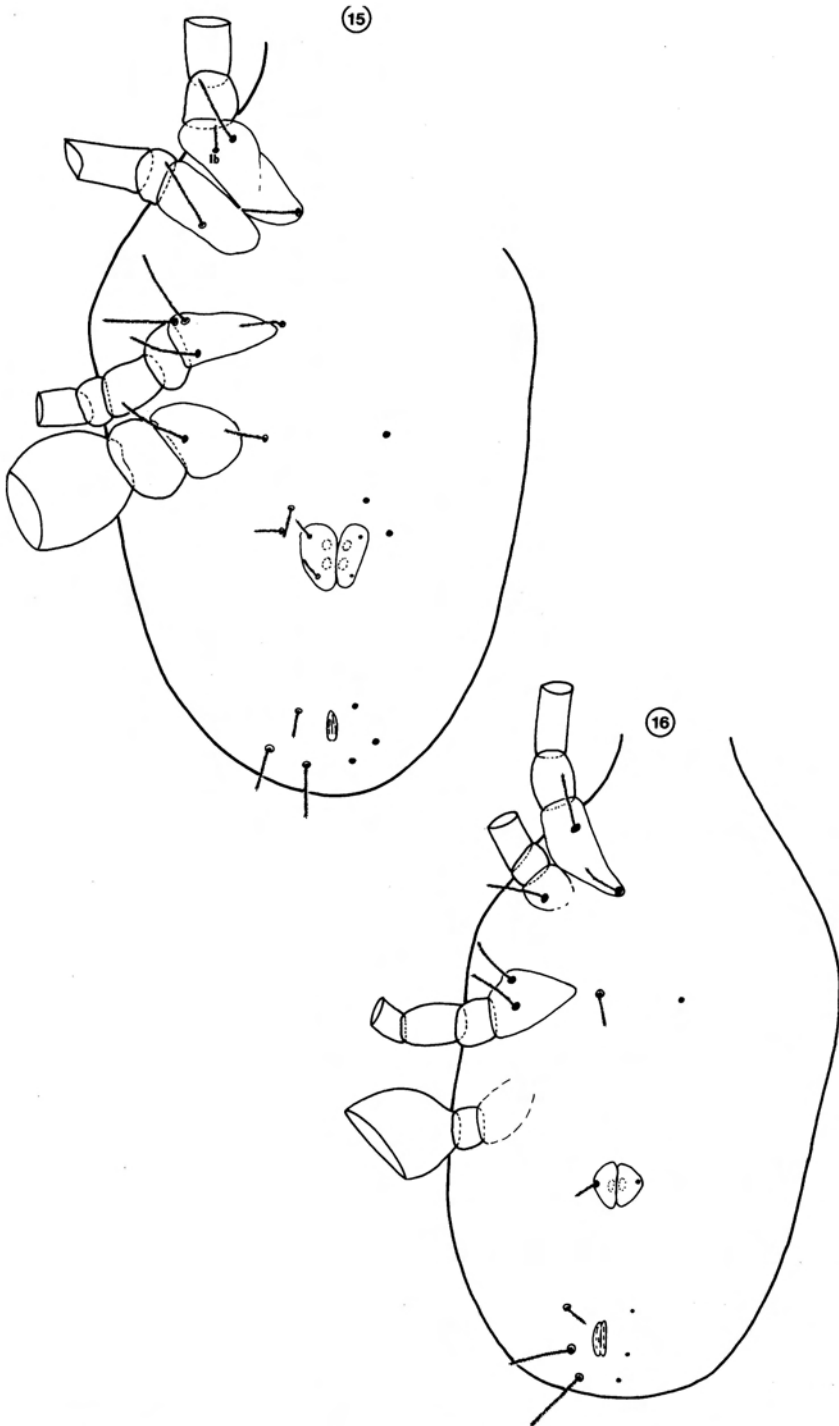


Fig. 15. *Eupodes lutatus* sp.n., venter, deutonymph, x40 (annotations as in text).  
 Fig. 16. *Eupodes lutatus* sp.n., venter, protonymph, x40.



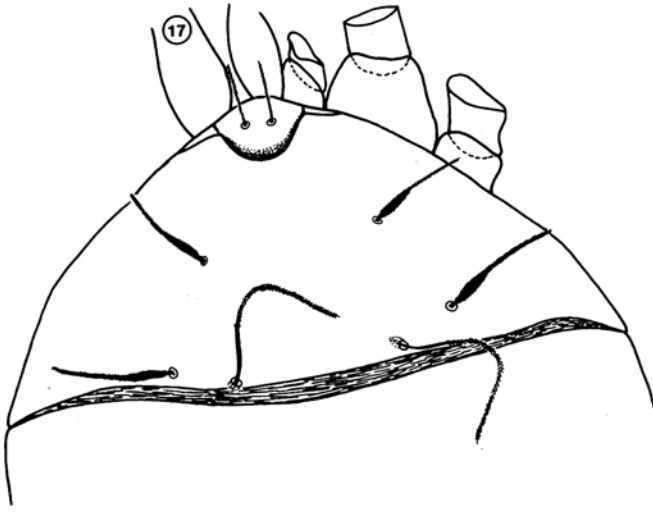


Fig. 17. *Eupodes indentatus* sp.n., prodorsum, x40.  
 Fig. 18. *Eupodes indentatus* sp.n., opisthosoma, x25.  
 Fig. 19. *Eupodes indentatus* sp.n., seta  $c_2$ , x100  
 Fig. 20. *Eupodes indentatus* sp.n., setae  $f_1$  &  $f_2$ , x100

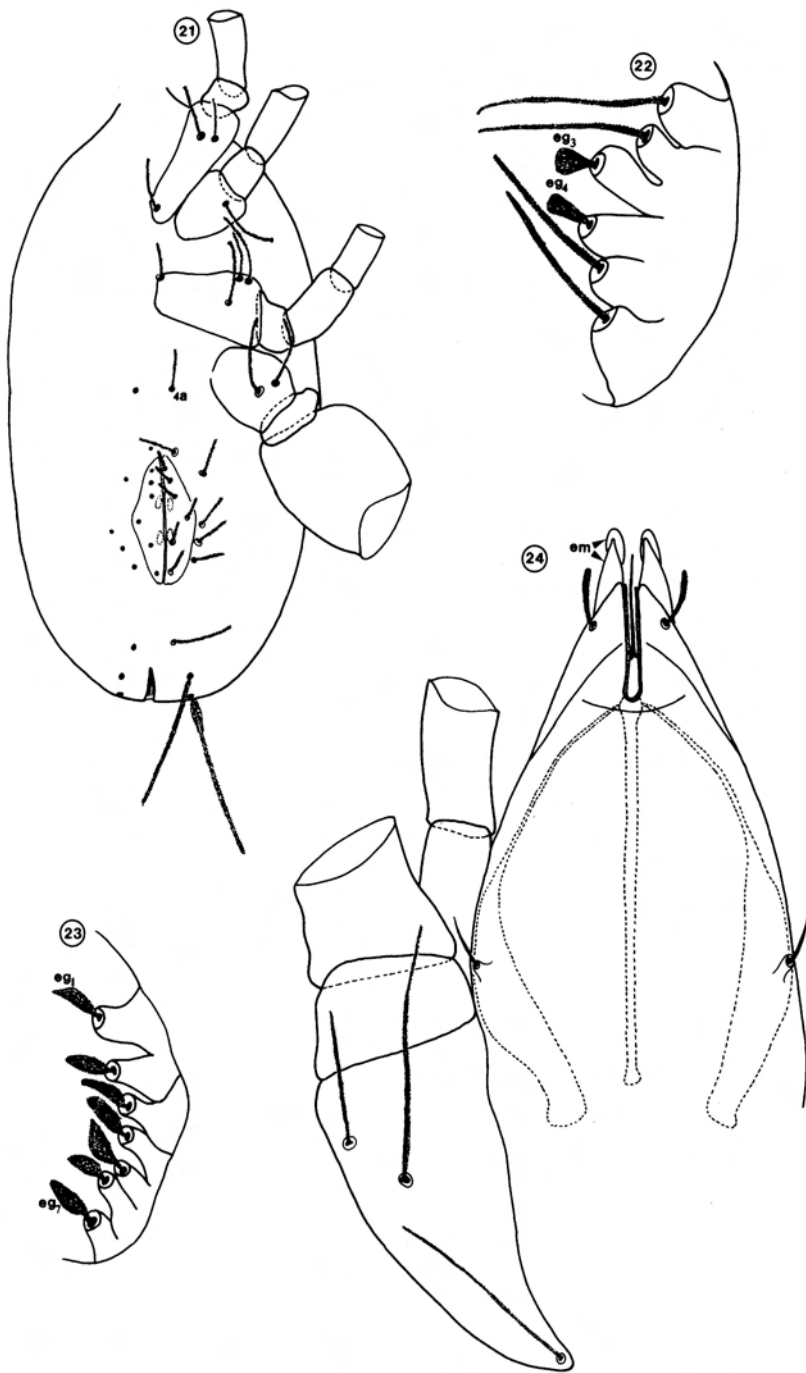


Fig. 21. *Eupodes indentatus* sp.n., venter, x25.  
 Fig. 22. *Eupodes indentatus* sp.n., genital atrium, female, x100 (annotations as in text).  
 Fig. 23. *Eupodes indentatus* sp.n., genital atrium, male, x100 (annotations as in text).  
 Fig. 24. *Eupodes indentatus* sp.n., subcapitulum, x100 (annotations as in text).

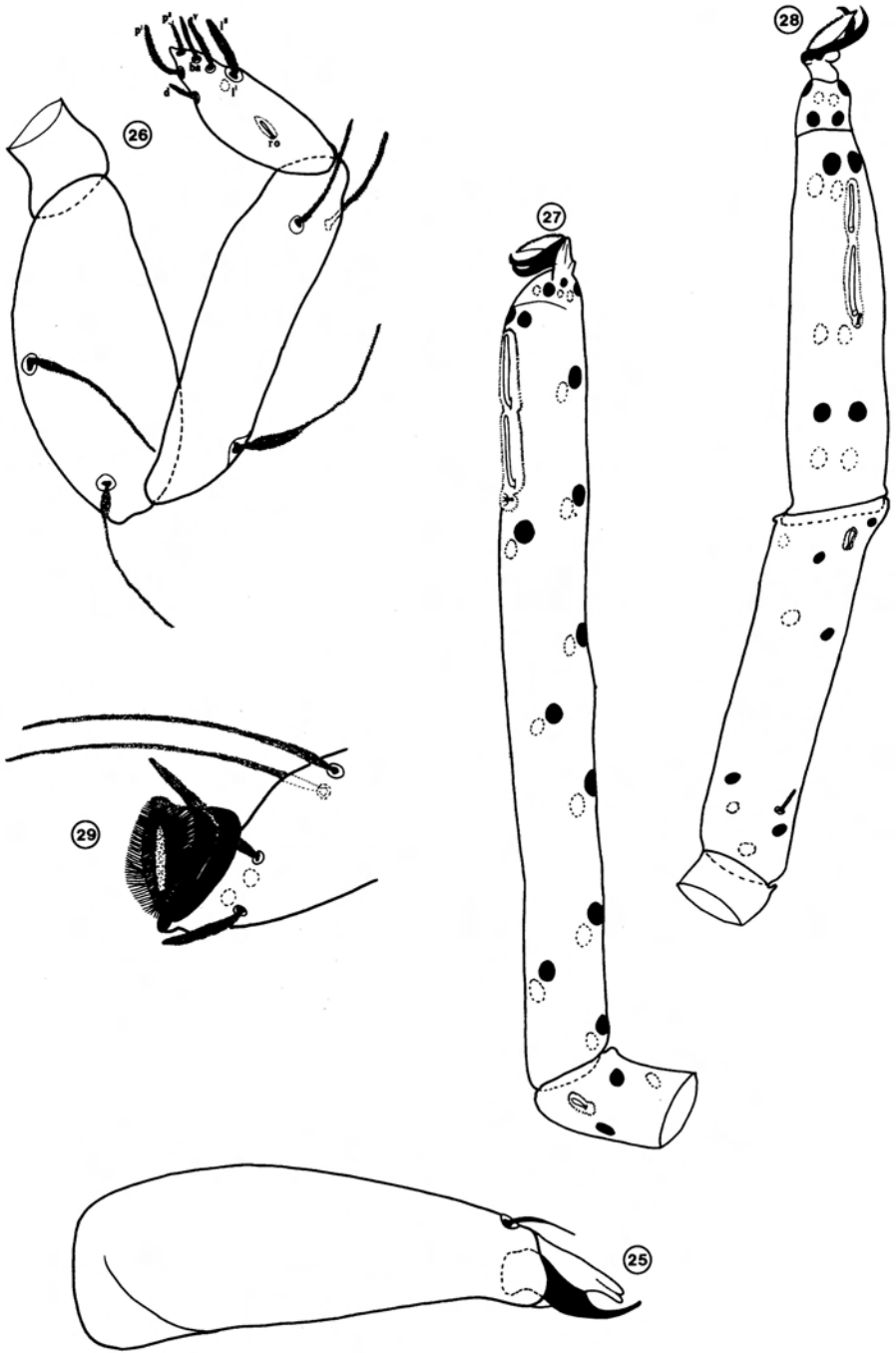


Fig. 25. *Eupodes indentatus* sp.n., chelicera, x100.  
 Fig. 26. *Eupodes indentatus* sp.n., palp, x100 (annotations as in text).  
 Fig. 27. *Eupodes indentatus* sp.n., tarsus & tibia I, x100.  
 Fig. 28. *Eupodes indentatus* sp.n., tarsus & tibia II, x100.  
 Fig. 29. *Eupodes indentatus* sp.n., apotele, leg IV, x200

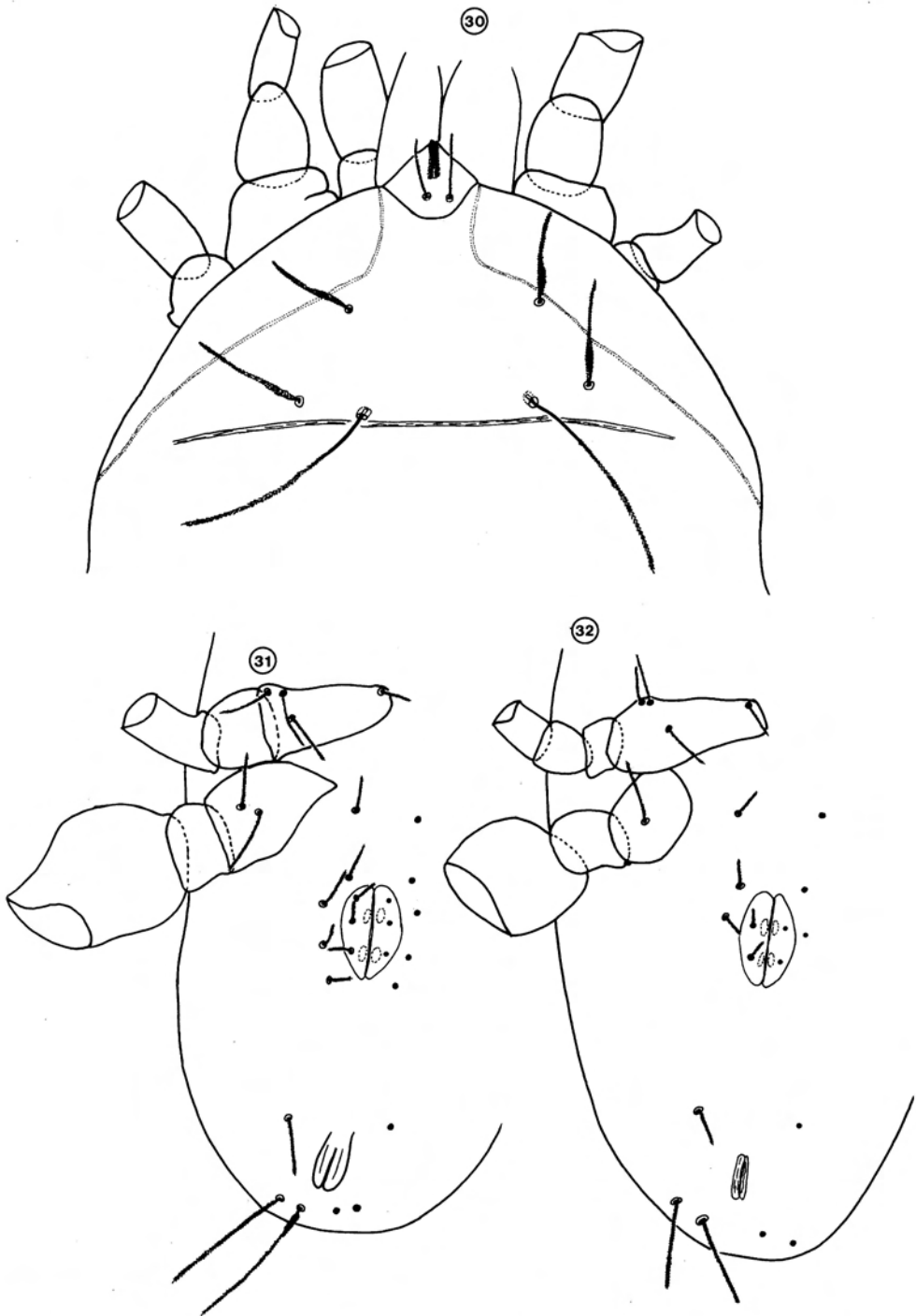


Fig. 30. *Eupodes indentatus* sp.n., prodorsum, tritonymph, x50.  
 Fig. 31. *Eupodes indentatus* sp.n., venter, tritonymph, x32.  
 Fig. 32. *Eupodes indentatus* sp.n., venter, deutonymph, x40.

rhagidial organ and one proximal solenidion; tibiae III and IV (Figs. 11 & 12) each with one proximal solenidion.

Male. Fig. 5.

Smaller (length = 497 µm; width = 290 µm) than female; genital atrium with seven pairs of plumose **eg**-setae, all similar, but shorter, broader and situated on larger papillae than in female; sperm sac large, sacciform.

Tritonymph. Figs. 13 & 14.

Genital region (Fig. 13) with four pairs of **ag**- and three pairs of **g**-setae; ecdysis line present from naso to posteriad of sejugal furrow (Fig. 14); anterior margin of naso conspicuously aciculate; leg chaetotaxy as follows: tarsi 22(3)-14(3)-14-13; tibiae 9(2)-5(2)-5(1)-5(1); genua 7-4-4-4; femora 15-11-7-5; trochanters 1-1-1-1; coxae 3-1-4-3.

Deutonymph. Fig. 15.

With two pairs of **ag**- and two pairs of **g**-setae; one seta of coxa I (**1b**) notably smaller; leg chaetotaxy as follows: tarsi 20(3)-11(3)-8-7; tibiae 5(2)-4(2)-4(1)-4(1); genua 5-4-4-4; femora 12-6-7-5; trochanters 1-1-1-1; coxae 3-1-4-2.

Protonymph. Fig. 16.

With one pair of genital papillae and one pair of **g**-setae; leg chaetotaxy as follows: tarsi 14(1)-10(1)-7-7; tibiae 5(1)-4-4-0; genua 5-4-4-0; femora 6-6-6-0; trochanters 0-0-1-0; coxae 2-1-3-0; tarsi I and II each with a single rhagidial organ, lacking famuli; tibia I with one solenidion.

#### Material examined

Holotype female, *Dalbergia melanoxylon*, St. Lucia, M.K.P. Smith Meyer, 20.viii.1980; 21 female, eight male, 12 tritonymph, two deutonymph and one protonymph paratypes, Ficus sur, Blyderivierpoort; *Buxus macowanii*, *Acacia* sp., *Viburnum tinus*, *Pittosporum tobira*, *Psidium guajava*, *Duranta repens* and unidentified plants, East

London; *Leucosidea sericea*, Golden Gate Highlands National Park; *Ficus sycomorus*, Pongola River, Golela; *Capparis sepriaria* var. *citrifolia*, Hankey Game Reserve; *Maytenus senegalensis* and *Acalypha glabrata*, Hluhluwe Game Reserve; *Lippea javanica*, Kei River mouth; *Syzygium cordatum*, *Cassine peragua*, Kirstenbosch National Botanical Gardens; *Ficus sur*, Sabie, Kruger National Park; *Diospyros lycioides*, Mountain Zebra National Park; *Coccinia palmata*, Mtubatuba; *Syzygium cordatum*, *Ficus natalensis* and *Balanites pedicellaris*, St. Lucia; *Vigna* sp. and *Rumohra adiantiformis*, Tsitsikamma National Park.

#### *Eupodes indentatus*, sp.n.

Figs. 17-32.

Etymology: *indentatus* (L) = indented, refers to indentation of **c**<sub>2</sub>.

This species shows morphological similarities with *E. littoralis* Shiba, 1978 but can be distinguished by the form of **f**<sub>1</sub>, the number of spindle shape setae on the dorsum and legs; leg I being longer than the body and tarsus I bearing 12 ventral setae.

Female. Figs. 17-22 & 24-29.

Dimensions: length 491 µm; breadth 284 µm; leg I 785 µm; leg II 359 µm; leg III 302 µm; leg IV 440 µm; **iv** 29 µm; **ev** 42 µm; **T** 83 µm; **sc** 59 µm; **c**<sub>1</sub> 96 µm; **c**<sub>2</sub> 67 µm; **d**<sub>1</sub> 136 µm; **e**<sub>1</sub> 130 µm; **f**<sub>1</sub> 52 µm; **f**<sub>2</sub> 126 µm; **h**<sub>1</sub> 124 µm; **h**<sub>2</sub> 125 µm.

Dorsal integument with two ill-defined transverse folds (one posterior to **f**<sub>2</sub>, one posterior to **f**<sub>1</sub>); dorsal setae spindle-shaped, moderately stalked, except **iv**, **T** and **f**<sub>1</sub> being pinnate and unstalked.

Idiosoma dorsum: prodorsum (Fig. 17) with four pairs of setae; **iv** shorter than **ev**, situated on large, spherical naso; **T** filiform, conspicuously longer than **sc**; sejugal furrow prominent; no sensory area differentiated. Opisthosoma (Fig. 18) with eight pairs of

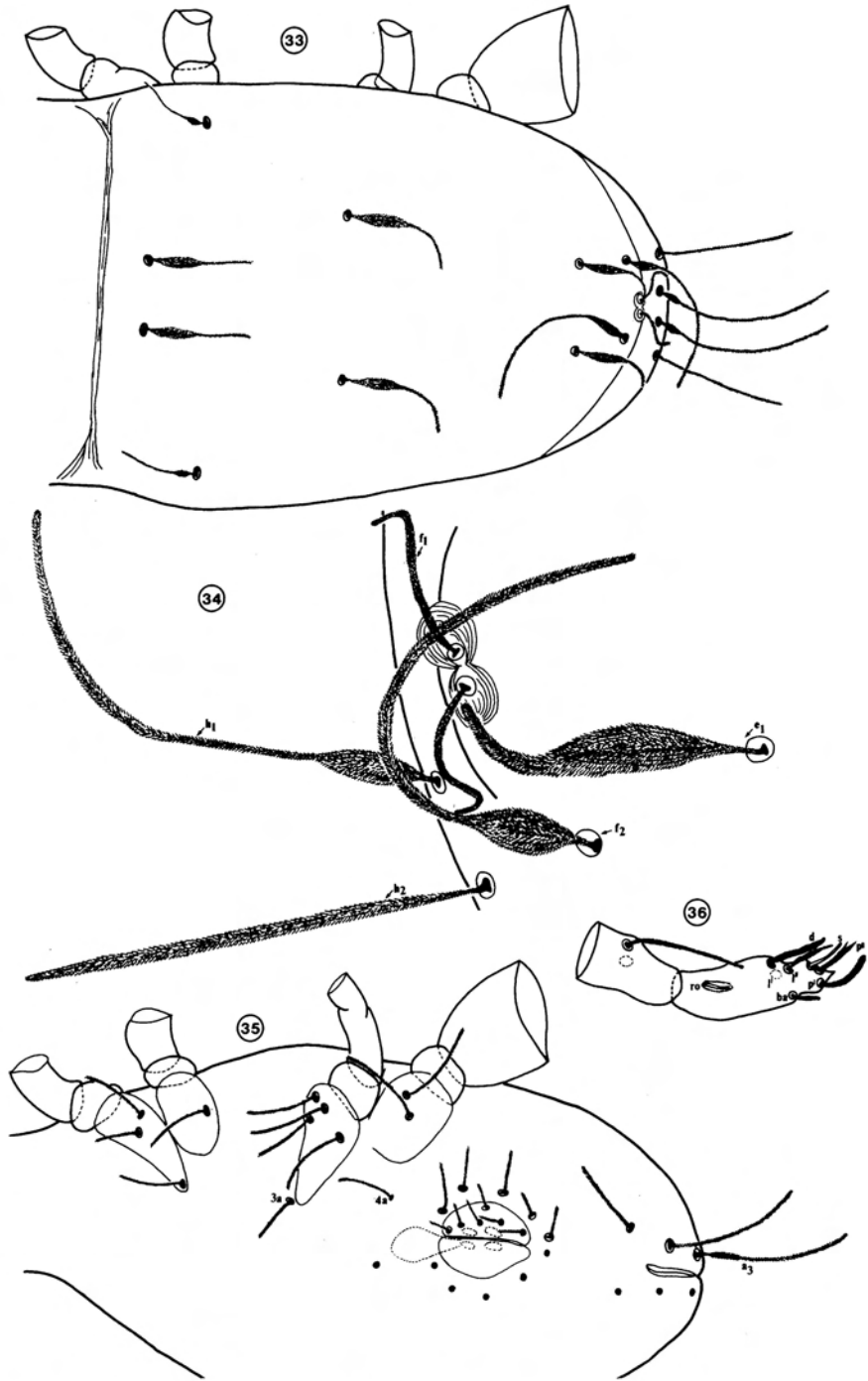


Fig. 33. *Eupodes hamatus* sp.n., opisthosoma, male, x25.  
 Fig. 34. *Eupodes hamatus* sp.n., setae e, f and h, x100.  
 Fig. 35. *Eupodes hamatus* sp.n., venter, male, x25.  
 Fig. 36. *Eupodes hamatus* sp.n., palp, male, x100

setae; **c**<sub>1</sub> anterior to and shorter than **c**<sub>2</sub>; **c**<sub>2</sub> small, delicate and situated in distinct integumental depression (Fig. 19); **d**<sub>1</sub> longer than and anterior to **e**<sub>1</sub>; **f**<sub>1</sub> (Fig. 20) pinnate, anterior half somewhat expanded, always peculiarly curved; **f**<sub>2</sub> spindle-shaped, situated prominently anterior to **f**<sub>1</sub>; lyrifissures not observed.

Idiosoma venter: genital region (Fig. 21) with five pairs of **ag**- and six pairs of **g**-setae; genital atrium with six pairs of **eg**-setae, pinnate to plumose, heteromorphic with two pairs (**eg**<sub>3&4</sub>) shorter and flabellate (Fig. 22); anal opening (Fig. 21) ventroterminal, with three pairs of setae (one pair spindle-shaped); lyrifissures not observed.

Gnathosoma: external malae (**em**) with one large triangular lobe and a smaller spherical lobe partly covering the former terminally (Fig. 24); internal malae rod-like; apical setae (**sbc**<sub>2</sub>) pinnate, slightly broadened; basal setae (**sbc**<sub>1</sub>) simple and smooth, on tubercles; labrum bacilliform, reaching past apex of the lateral lips but not past anterior margin of external malae; tracheal tubes not observed; salivary glands large, saccate, associated with styliform lateral tubes; chelicerae (Fig. 25) relatively small, elongate; with one simple seta (**cha**) proximal to movable digit; fixed digit poorly developed, forked with rounded tips, edentate; movable digit curved, edentate; palpi four-segmented; tarsus (Fig. 26) acicular, with seven setae (**d** small, pinnate; **l'** and **l''** relatively broad, pinnate; **p'** pinnate, slightly bifurcate; **p''** pinnate, curved; **v** pinnate; **ba** simple) and a proximal rhagidial organ (**ro**); tibia with **l'** and **l''** pinnate and **d** spindle-shaped; femorogenu noticeably enlarged, with both setae spindle-shaped; supracoxal setae not observed.

Legs (Figs. 27–29): All legs slender, with prominent claws and empodia (Fig. 29) progressively increasing in size from leg I; leg I longer than body (but never more than 1.5x body length); tarsus I (Fig. 27) without pseudosegments, but often arched or folded with the illusion of sub-divisions; femur IV enlarged; coxae separated in two groups; coxae I and III elongate, coxae II and IV

rounded; coxa IV with one seta (**4a**) not within the coxal limitations (Fig. 21); supra-coxal setae not observed; formulae for leg chaetotaxy as follows (sensory setae in parenthesis): tarsi 25/26(3)–16(3)–15/16–15; tibiae 19/20(2)–9(2)–6(1)–6(1); genua 15–6/7–5–4/5; femora 20/21–15–8–7; trochanters 1–1–1–1; coxae 3–1–4–3. Sensory setae of different types as follows: tarsus I with two L-type rhagidial organs in tandem and a stellate famulus proximal to rhagidial organ 2; tarsus II with two L-type rhagidial organs in tandem and one spiniform famulus proximal to rhagidial organ 2; tibiae I and II each with one L-type rhagidial organ and one solenidion; tibiae III and IV each with a solenidion.

Male. Fig. 23.

Smaller than female (length = 491 µm; width = 249 µm); with seven pairs of **eg**-setae, all plumose, fan-shaped, tapering terminally, shorter and broader than in female (Fig. 23); leg chaetotaxy of ordinary setae as follows (sensory setae as for female): tarsi 25/26–16–15–15; tibiae 17 to 20–9–6–6; genua 15–7–5–4/5; femora 20/21–15–8–7; trochanters 1–1–1–1; coxae 3–1–4–3.

Tritonymph. Figs. 30–31.

With four pairs of **ag**- and three pairs of **g**-setae (Fig. 31); naso prominently acuminate (Fig. 30); prodorsum with distinct ecdysis line; leg chaetotaxy of ordinary setae as follows (sensory setae as for female): tarsi 20/21–13–13–13; tibiae 10–5–5–5; genua 8–4–4–4; femora 15–10/11–8–6; trochanters 1–1–1–1; coxae 3–1–4–3.

Deutonymph. Fig. 32.

With two pairs of **ag**- and two pairs of **g**-setae; all anal setae feathered; leg chaetotaxy of ordinary setae as follows (sensory setae as for female): tarsi 20–13–12–11; tibiae 5–5–5–5; genua 4–4–4–4; femora 11–7–6–4; trochanters 1–1–1–1; coxae 3–1–4–3.

### Material examined

Holotype female, soil under *Pinus* sp., Mt. Inn Hotel, Soutpansberg, P.A.S. Olivier, 20.xi.1983; 16 female, 11 male, seven tritonymph and three deutonymph paratypes, *Helichrysum reflexum*, Blyderivierpoort; *Cynanchum natalitium*, *Zanthoxylum capensis* and *Dryopteris* sp., East London; *Gunnera perpensa*, Gaint's Castle Nature Reserve; *Cliffortia linearifolia* and *Dryopteris* sp., Golden Gate Highlands National Park; moss under *Pinus* sp. and grass, Graskop; *Ptaeroxylon obliquum*, Katberg; *Maytenus heterophylla*, Gamtoos Valley, Patensie; *Acacia karroo*, Port Elizabeth; soil 1 km west on Bluegums road, Soutpansberg; soil, St. Lucia; leaf litter and *Trichocladus crinitus*, Tsitsikamma National Park; soil under *Acacia mearnsii*, Laingsnek, Volksrust.

### *Eupodes hamatus*, sp. n.

Figs. 33–36.

Etymology: *hamatus* (L.) = hooked at the tip, refers to the shape of **f**<sub>1</sub>. This species can easily be distinguished from other species by the presence of rounded plate-like striae at the bases of **f**<sub>1</sub> and a solenidion present on the palp tarsus.

Male. (Figs. 33 – 36).

Dimensions: Length 550 µm; breadth 285 µm; leg I 567 µm; leg II 321 µm; leg III 301 µm; leg IV 496 µm; **iv** 29 µm; **ev** 62 µm; **T** 82 µm; **sc** 67 µm; **c**<sub>1</sub> 93 µm; **c**<sub>2</sub> 60 µm; **d**<sub>1</sub> 97 µm; **e**<sub>1</sub> 72 µm; **f**<sub>1</sub> 35 µm; **f**<sub>2</sub> 114 µm; **h**<sub>1</sub> 133 µm; **h**<sub>2</sub> 123 µm.

Dorsal integument with a single transverse fold just posterior to **f**<sub>1</sub>; dorsal setae spindle-shaped, unstalked, except **iv**, **T**, **f**<sub>1</sub> and **h**<sub>2</sub> which are delicate, pinnate and unstalked.

Idiosoma dorsum: prodorsum with four pairs of setae; **iv** shorter than **ev**, situated on naso; **T** filiform, longer than **sc**; sejugal furrow prominent, with delicate transverse striae; no sensory area differentiated.

Opisthosoma (Fig. 33) with eight pairs of setae; **c**<sub>2</sub> clearly smaller than the other setae, posterior to **c**<sub>1</sub>, not situated in an integumental depression; **d**<sub>1</sub> longer than, and anterior to, **e**<sub>1</sub>; **f**<sub>1</sub> (Fig. 34) pinnate, with peculiarly curved tip, situated on integument with different striae, resembling round plates; **f**<sub>2</sub> noticeably longer than **f**<sub>1</sub>, slightly anterior to **f**<sub>1</sub>; **h**<sub>1</sub> and **h**<sub>2</sub> relatively long, but more delicate than the **d**-, **e**- and **f**-series, **h**<sub>1</sub> spindle-shaped; lyrifissures not observed.

Idiosoma venter: genital region (Fig. 35) with five pairs of **ag**-setae, six pairs of **g**-setae and six pairs of homomorphic **eg**-setae; sperm sac relatively large, sacciform; with three pairs of anal setae, **a**<sub>3</sub> slightly spindle-shaped; lyrifissures not observed.

Gnathosoma: Apical and basal setae pinnate; cheliceral seta (**cha**) proximal to fixed digit; fixed digit poorly developed, forked, edentate; palpi four-segmented; tarsus (Fig. 36) terminally acicular, with six setae (ba small, pinnate; **p**' relatively large, pinnate, slightly swollen terminally; **p**'' pinnate, furcate; **l**', **l**'' and **d** pinnate with **l**'' sharply pointed), one distal solenidion (**s**) situated between **p**'' and **l**'' and a proximal rhagidial organ (**ro**); tibia and femorogenu with three and two setae respectively, all relatively long, pinnate; supracoxal setae not observed.

Legs: Leg I not much longer than body, tarsus I noticeable longer than other segments, without pseudosegments; femur IV enlarged; coxae separated into two groups; all coxal setae relatively long; coxae III and IV each with one seta (**3a** and **4a** respectively) not within the coxal limitations (Fig. 35); supra-coxal setae not observed; formulae for leg chaetotaxy as follows (sensory setae in parenthesis): tarsi 26(3)–16(2)–15–15; tibiae 17(2)–9(2)–6(1)–6(1); genua 14–7–5–5; femora 20–15–8–7; trochanters 1–1–1–1; coxae 3–1–5–3. Sensory setae of different types as follows: tarsus I with 2 L-type rhagidial organs in tandem and a stellate famulus proximal to rhagidial organ 2; tarsus II with 2 L-type rhagidial organs in tandem, without famulus; tibiae I and II each



with 1 L-type rhagidial organ and 1 solenidion; tibiae III and IV each with 1 solenidion.

### Material examined

Holotype male and 1 male paratype, fungal material, Lamberts Bay, Western Cape, M.K.P. Smith Meyer, 29.ix.1982.

### Discussion

The three species described are morphologically considerably similar. They can, nevertheless, be distinguished on leg I being shorter than the body in *E. lutatus*, ca. equal to body length in *E. hamatus* and longer than the body in *E. indentatus*; all dorsal setae being relatively short in *E. lutatus*, longer but ca. equal in *E. indentatus* and *E. hamatus* with  $d_1$ ,  $e_1$  and  $f_1$  prominently longer in *E. indentatus*; the position of  $f_2$  relative to  $f_1$ ; different complements of spindle-shaped setae; shape of the external malae; number of setae and solidiotaxy of the palp tarsus; different types of **eg**-setae in the female and differences in leg chaetotaxy.

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