Hexabdella, a new mite genus of Bdellidae (Acari: Prostigmata) from southern Africa, with descriptions of five new species

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A new genus, *Hexabdella,* and five new species, *H. singula, H. denheyeri, H. maraugia, H. miranda* and *H. unusoculata,* of the predatory mite family Bdellidae, are described and illustrated from southern Africa. A key to distinguish between the species of *Hexabdella* is provided. *Bdella mexicana* is transferred to this new genus.

Key words: Acari, Bdellidae, *Hexabdella,* mites, southern Africa.

Members of the family Bdellidae inhabit a variety of habitats worldwide and are active predators of small arthropods. Studies by Muma (1975) indicated that *Bdella distincta* (Baker & Balock) prey on eggs and crawlers of armoured scale insects on citrus in Florida, while *Neomolgus capillatus* (Kramer) is associated with pasture pests from Scandinavia to Morocco (Wallace 1974). *Bdellodes lapidaria* (Kramer) was introduced successfully into South Africa to control lucerne flea (*Sminthurus viridis* (L.)) in the Western Cape in 1973 (Wallace & Walters 1974). Sorensen et al. (1983) showed that *Bdella longicornis* (L.) collected from vine bark in California, USA, preceded the resident phytoseiid predators and contributed to the control of vine spider mite (*Tetranychus pacificus* McGregor). *Neomolgus capillatus* (Kramer) effectively controlled autumn populations of lucerne flea, a serious pest of pastures in Tasmania (Ireson et al. 2002). Detailed accounts of the biological control status of bdellid species are provided by Gerson & Smiley (1990) and Gerson et al. (2003).

The Bdellidae consists of five subfamilies (Van der Schyff et al. 2003) and the new genus *Hexabdella* is the second genus in the subfamily Bdellinae. *Hexabdella* is clearly defined by five new species described here from southern Africa. *Hexabdella* differs from the type genus, *Bdella,* by the absence of a trichobothrium on tarsus IV. *Bdella mexicana* Baker & Balock, a species recorded from Mexico and Hawai (Swift & Goff 1987), also lacks a trichobothrium on tarsus IV. It is here transferred to the new genus as *Hexabdella mexicana* comb. nov.

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Materials and methods

The material for this study was collected by means of beating and sweeping of vegetation, as well as extraction of soil and debris samples by Berlese-Tullgren funnels. Measurements are given in micrometres. The body length of all specimens was measured from the posterior margin of the idiosoma to the apex of the hypostome, and body width across at the level of setae *c2.* Setal lengths were recorded from the setal base to the tip. Legs were measured from the ventral insertion of the coxae to the base of the pretarsi. Setal notations follow Kethley (1990). Abbreviations are as follows: propodosomal setae: internal verticals (*vi*), external verticals (*ve*), internal scapulars (*sci*), external scapulars (*sce*); opisthosomal setae: internal humeral (*c1*), external humeral (*c2*), internal dorsal (*d*), internal lumbal (*e*), internal sacral (*f1*), external sacral (*f2*), internal clunal (*h1*), external clunal (*h2*); anal region: postanal (*ps1*), anal setae (*ad, an, ps*); genital region: agenital setae (*ag*), genital setae (*g*), eugenital setae (*eg*); hypostomal setae (*vh1–vh11*); setae: solenidion (*s*), trichobothria (*tr*), tactile setae (*t*), microsetae (*micr*), ventral end setae (*VES*), dorsal end setae (*DES*), proprioceptor (*prop*).

Breaks in the striae of the dorsum vary in frequency and regularity and can be divided into four categories, namely: a) *continuous*: indicating no breaks in the striae, b) *sparsely broken*: indicating that breaks occur at long and irregular intervals, c) *coarsely broken*: divided at regular intervals with lengths of uninterrupted striae six to eight times longer than the breaks and d) *finely broken*: appearing as dotted lines.

Type material is deposited in the National Collec-

tion of Arachnida (NCA), ARC-Plant Protection Research Institute, Pretoria, South Africa.

Taxonomic account

Subfamily **Bdellinae** Grandjean, 1938

Type genus: *Bdella* Latreille, 1795 (in Hermann 1804).

To accommodate the new genus *Hexabdella* the subfamily Bdellinae must be redefined as follows: palp tibiotarsus truncated distally and clearly shorter than basifemur; distal end setae as long as or longer than femur; chelicerae normal to inflated, bearing two setae with small chelae with or without teeth; hypostome with six pairs of ventral setae longitudinally aligned; propodosoma with none, one or two pairs of eyes; lateral internal apodemes present or indistinct; genital tracheae absent; legs with three or four pairs of trichobothria.

Genus ***Hexabdella* gen.n.**

Bdella Baker & Balock, 1944 (partim).
Type species: *Hexabdella denheyeri* sp.n.

This genus shares all the characteristics of the subfamily, but differs only in bearing three trichobothria on tibiae I and IV and tarsus III. Propodosomal lateral internal apodemes can be present but are not as prominent as in *Bdella*. Eyes can be absent or one or two pairs present.

B. mexicana Baker & Balock is the only other bdellid species that also possess only three pairs of trichobothria. Atyeo (1960) commented on this unique character but kept it in the genus *Bdella*, as did Wallace & Mahon (1972) and Swift & Goff (1987). This species is transferred here to the new genus *Hexabdella*.

Key to the species of the genus *Hexabdella* gen.n.

1. Opisthosomal setae distally branched . . . 2
— Opisthosomal setae smooth or slightly plumose 3
2. Dorsal striae coarsely to sparsely broken (Fig. 4); seta ps1 smooth; coxa IV without macroseta . . . . . *H. singula* sp.n.
— Dorsal striae finely broken (Fig. 10); seta *ps1* branched; coxa IV with a serrated macroseta (Fig. 12) . . . . *H. denheyeri* sp.n.
3. Eyes present 4
— Eyes absent (Fig. 19) . . . *H. maraugia* sp.n.
4. Two pairs of eyes present; chelicerae striated (Fig. 23) 5
— One pair of eyes (Fig. 34); chelicerae smooth (Fig. 32) . . . . *H. unusoculata* sp.n.
5. Opisthosomal setae smooth (Fig. 26); movable cheliceral chela with about five small teeth (Fig. 24); solenidotaxy of tibiae I–IV 1-1-1-0 . . . . . *H. miranda* sp.n.
— Opisthosomal setae usually minutely plumose; movable cheliceral chela with one tooth; solenidotaxy of tibiae 3-2-1-0 . . . . . *H. mexicana* (Baker & Balock)

***Hexabdella singula* sp.n.**, Figs 1–6

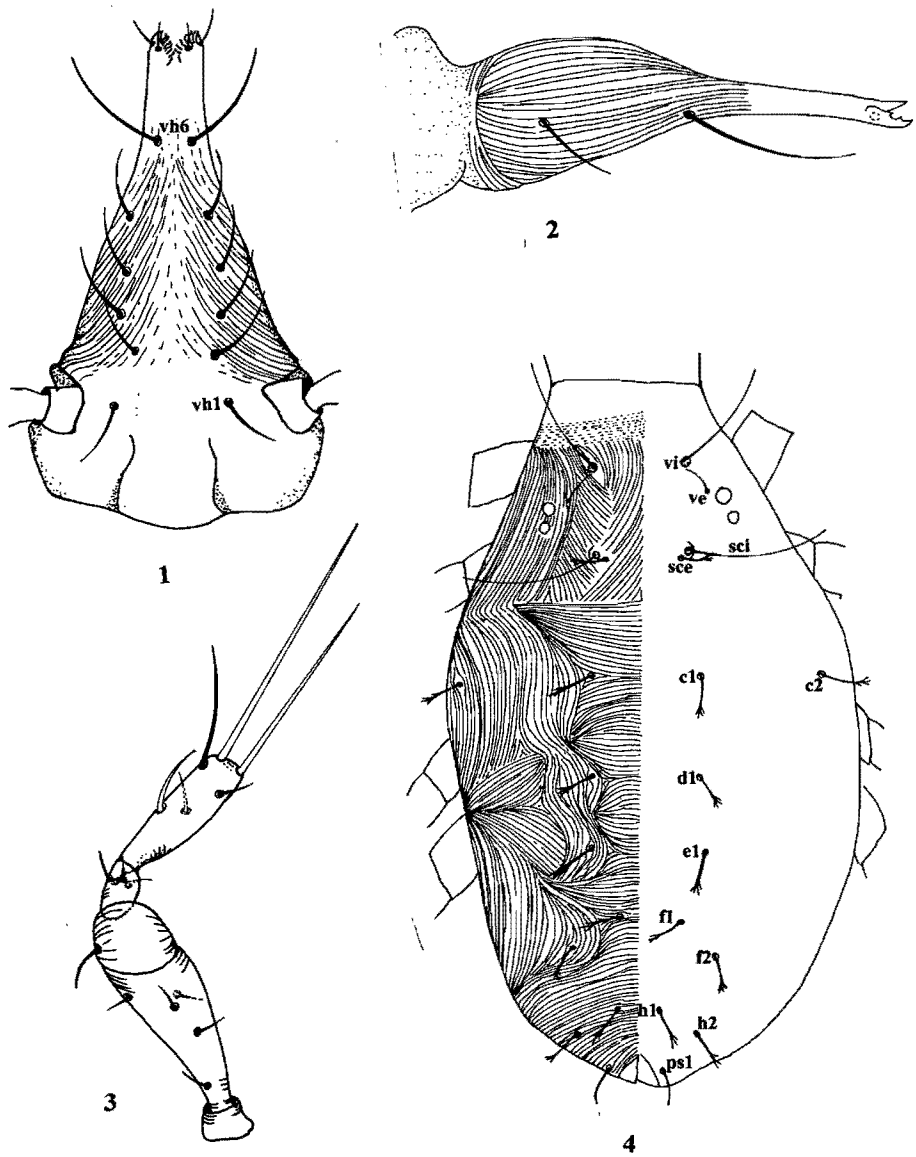
Description

Female. Dimensions: body length 770, body width 326, legs: I 286, II 259, III 305, IV 382, *VES* 86, *DES* 115, palp segments I–V: 15, 63, 29, 19, 56, *vi* 88 *ve* 37, *sci* 111, *sce* 37, *c1* 44, *c2* 50. *Gnathosoma* (Figs 1–3): six pairs of hypostomal setae longitudinally aligned (Fig. 1). Hypostome ends in two lateral lips, each bearing two adoral setae. Chelicerae with two setae each, distal one twice length of proximal seta and halfway between base of chela and proximal seta (Fig. 2). Striae on chelicerae longitudinal. Movable chela longer than fixed chela, former with two teeth. Palp chaetotaxy: coxae 1 prop; trochanter none; basifemur 5t; telofemur 1t; genu 4t; tibiotarsus 3t, 1s, 2 end setae (Fig. 3). *Dorsum* (Fig. 4): dorsal striae sparsely broken to continuous (Fig. 4). Two pairs of eyes posterolateral to *ve* with longitudinal striae between them. Setae *ve* closer to *vi* than to *sci*. Opisthosomal setae and *sce* distally branched. *Venter*: setae *ps1–ps3* present, *ps1* smooth. Six to seven *g* setae on each genital valve longitudinally aligned. Seven *ag* setae present. An eversible ovipositor present. One pair of ventral setae between coxae IV. *Legs* (Figs 5–6): leg chaetotaxy: coxae I–IV 1 prop, 5t–3t–5t–1t; trochanters I–IV 1t–1t–1t–1t; basifemora I–IV 7t–7t–7t–5t; telofemora I–IV 5t–5t–1macr (plumose), 3t–1macr (plumose), 3t; genua I–IV 1s, 4t–1s, 4t–1s, 4t–1s, 4t; tibiae I–IV 3s, 1tr, 6t–2s, 4t–6t–1tr, 6t; tarsi I–IV 4s, 1micr, 19t (9 plumose)–2s, 1micr, 16t (8 plumose)–1s, 1tr, 14t (8 plumose)–1s, 14t (8 plumose). Tarsi with dorsoterminal setae *dt1–dt2* long and smooth but *dt3* plumose.

Male. Unknown.

Remarks

This species resembles *H. denheyeri* sp.n. in the distally branched opisthosomal setae, but differs



Figs 1–4. *Hexabdella singula* female. **1**: ventral view of hypostome; **2**: chelicera; **3**: palp; **4**: dorsum.

from it in that the dorsal striae are sparsely broken or continuous instead of finely broken and *ps1,* which is smooth instead of branched distally. *H. singula* is also related to *H. mexicana,* but differs from it in that the opisthosomal setae are distally branched, as opposed to slightly plumose in the latter.

Etymology

Singula (L) means 'singular' or 'solitary'.

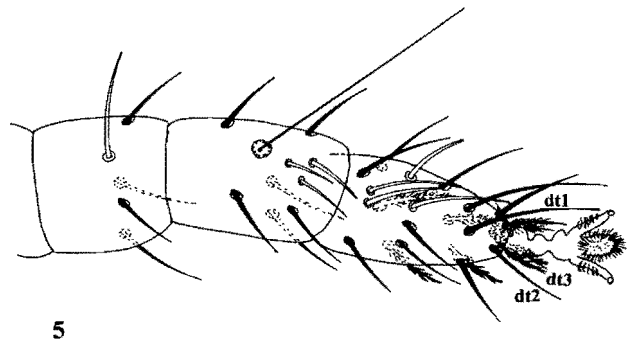
Type material

South Africa, *Western Cape Province:* holotype female from *Cassine peragua* L. (Celastraceae), Kirstenbosch, Cape Town (33.55S, 18.25E), 30.i.1967, M K P Meyer (NCA AcY 68/107).

***Hexabdella denheyeri* sp.n.**, Figs 7–15

Description

Female. Dimensions (measurements of para-



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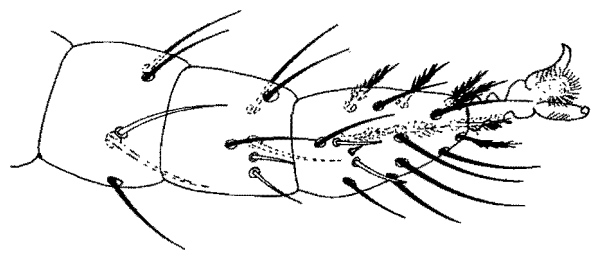

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Figs 5–6. *Hexabdella singula* female. **5**: dorsal view of leg I; **6**: dorsal view of leg II.

type in brackets): body length 676 (741), body width 288 (326), legs: I 286 (325), II 253 (277), III 286 (288), IV 346 (363), *VES* 77 (81), *DES* 96 (102), palp segments I–V: 12 (13), 67 (75), 15 (19), 19 (21), 46(52), *vi* broken off, *ve* 31 (38), *sci* broken off, *sce* 27 (30), *c1* 23 (31), *c2* 37 (38). *Gnathosoma*: six pairs of hypostomal setae longitudinally arranged in two curved rows (Fig. 7). Hypostome ends in two lateral lips, each bearing two adoral setae. Chelicerae each with two setae, distal one much longer than proximal seta and halfway between base of chela and proximal seta (Fig. 8). Striae on chelicerae longitudinal. Movable chela with two teeth, longer than fixed chela. Palp chaetotaxy: coxae 1 prop; trochanter none; basifemur 6t; telofemur 1t; genu 4t; tibiotarsus 3t, 1s, 2 end setae (Fig. 9). *Dorsum* (Fig. 10): dorsal striae finely broken (Fig. 10). Two pairs of eyes lateral of *sci* with diagonal striae between them. Opisthosomal setae and *sce* distally branched. *Venter* (Fig. 11): setae *ps1–ps3* present with *ps1* and *ps2* distally branched. Eight to nine *g* setae on each genital valve longitudinally aligned. Ten to 11 *ag* setae present. A long eversible ovipositor present with 12 subapical and six medial setae (Fig. 11). One pair of ventral setae between coxae IV. *Legs* (Figs 12–14): leg chaetotaxy: coxae I–IV 1prop, 5t–3t–5 to 6t–1macroseta, 2t; trochanters I–IV 1t, 1micr–1to 2t–2t–1t; basifemora I–IV 5 to 6t–5 to 6t–3 to 4t–2t; telofemora I–IV 5t–5t–4 to 5t (1 plumose)–4t (1 plumose); genua I–IV 1s, 4t–1s, 4t–1s, 4t–1s, 4t; tibiae I–IV 2s, 1tr, 6t–1s, 6t–1s, 6t–1tr, 6t; tarsi I–IV 4s, 1micr, 17t (10 plumose)–2s, 1micr, 15t (10 plumose)–1tr, 15t (10 plumose)–15t (10 plumose). Tarsi with dorsoterminal setae *dt1* long and smooth but *dt2–dt3* plumose.

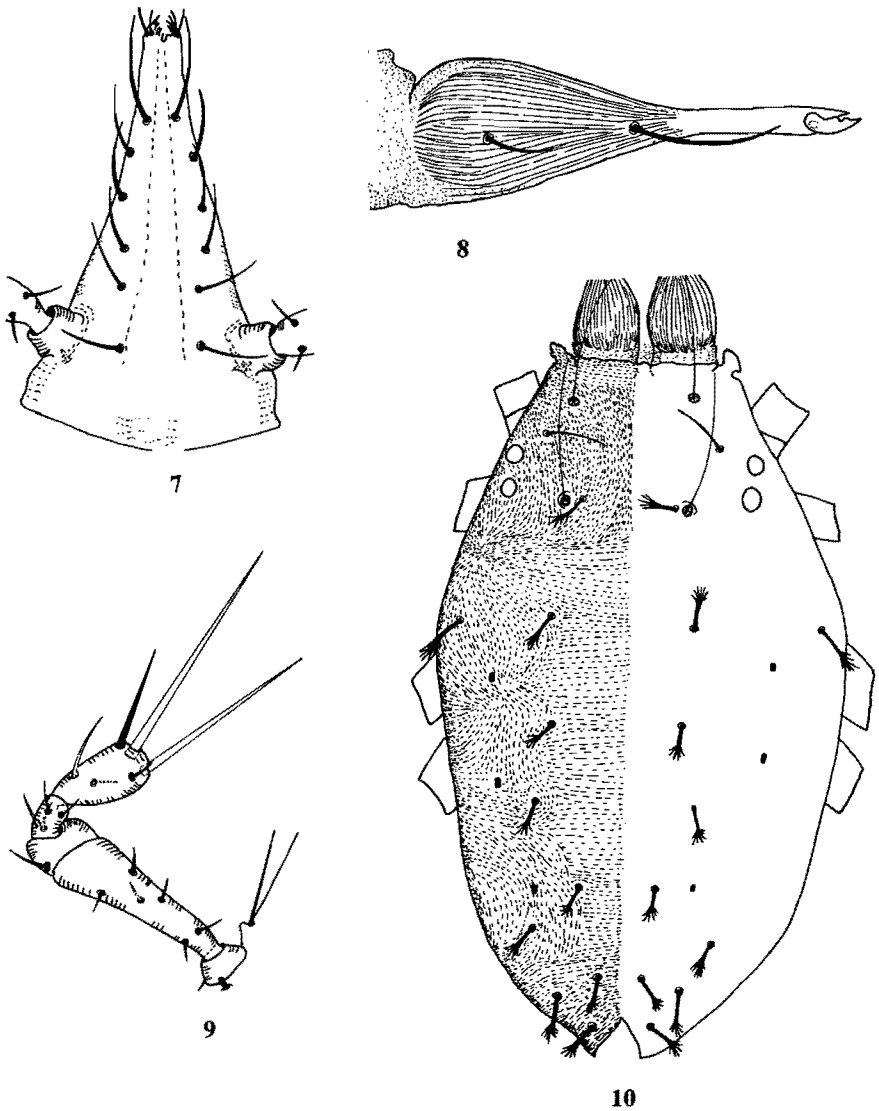
Male (Fig. 15). *Dimensions*: body length 576; width 267; *vi* 69; *sci* 86. Male smaller than female, differs in the presence of seven instead of eight to nine pairs of *g* setae. Setal formula of *eg* setae on periphery of amphioid sclerites 3-4-2 (three rows of setae from anterior to posterior).

Remarks

This species is unique in that it possesses a prominent serrated macroseta on coxae IV. Its opisthosomal setae are also distally branched as those of *H. singula* but the dorsal striae are finely broken and not sparsely broken or continuous as in the latter. Setae *ps1*, are distally branched but smooth in *H. singula*.

Etymology

Denheyeri refers to J den Heyer, retired professor and South African specialist on the Bdelloidea.



Figs 7–10. *Hexabdella denheyeri*. **7**: ventral view of hypostome of female; **8**: chelicera of female; **9**: palp of female; **10**: dorsal view of female.

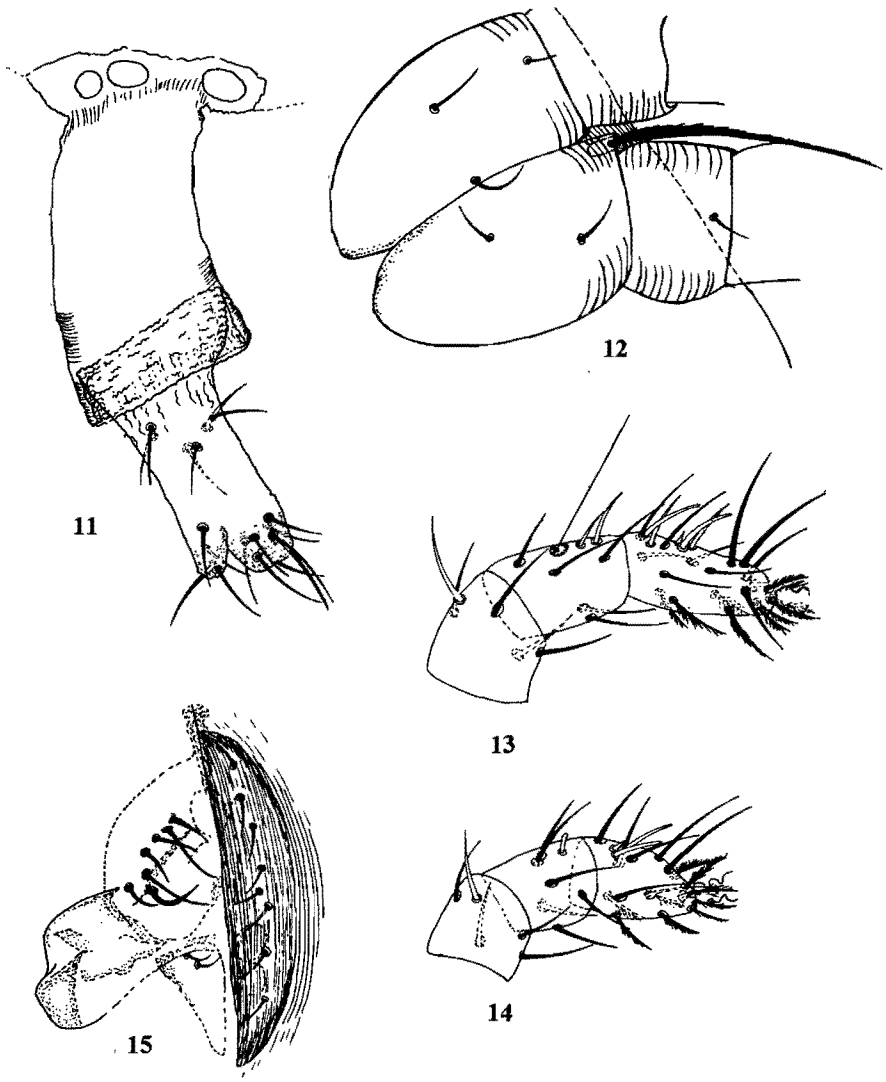
Type material

Angola: holotype female, paratype female and paratype male from *Eugenia brasiliensis* Lam. (Myrtaceae), N'Dalatando (9.18S, 14.55E), Angola, 17.v.1972, M K P Meyer (NCA AcY 72/352).

***Hexabdella maraugia* sp.n.**, Figs 16–21

Description

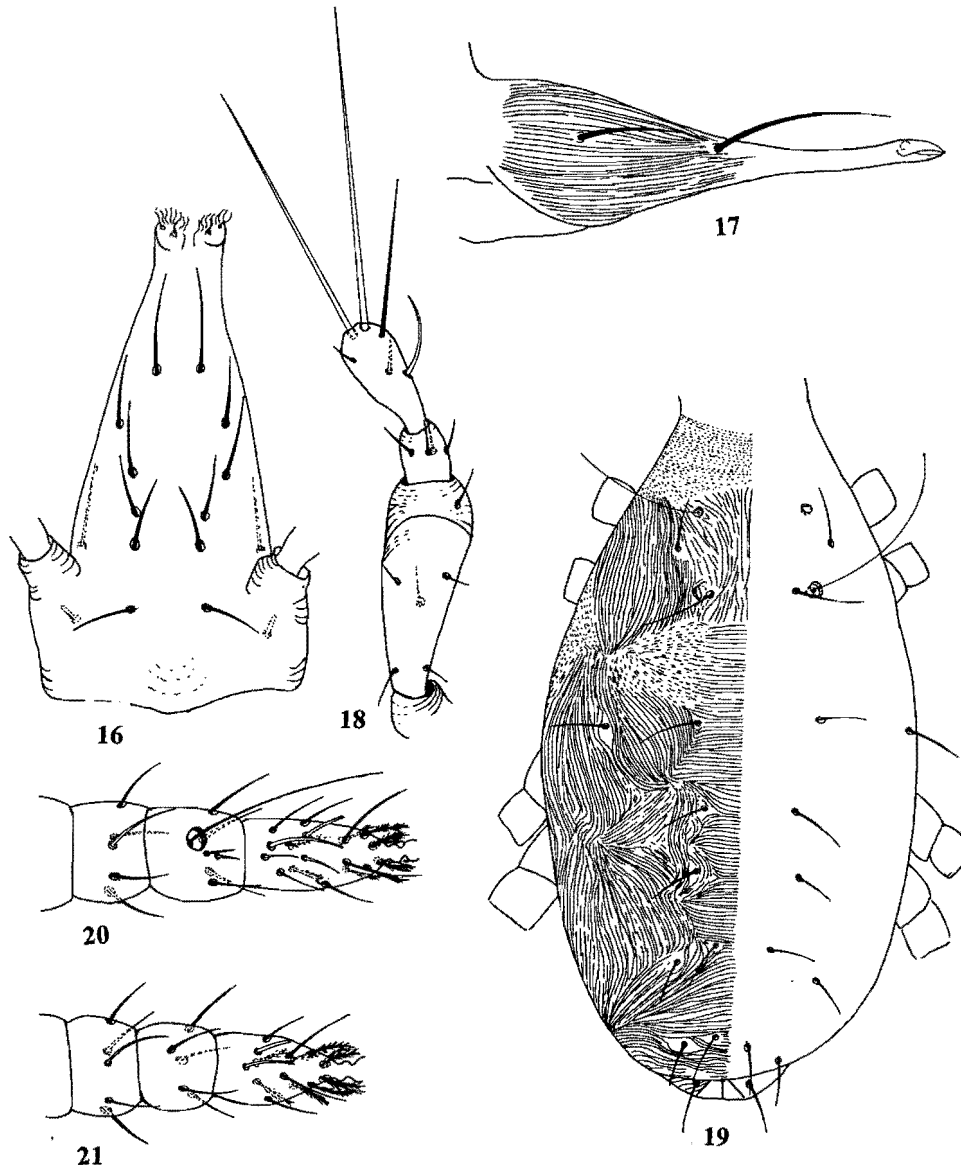
Female. Dimensions (variation in measurements of paratypes in brackets): body length 545 (449–545), body width 230 (230–234), legs: I 182, II 165 (157–165), III 196 (186–196), IV 227 (227–240), *VES* 71 (63–71), *DES* 81 (79–81), palp segments I–V: 8 (8–12), 31 (31–38), 25 (13–25), 13, 29(29–31), *vi* 77 (77–83), *ve* 31 (29–31), *sci* 111 (104–111), *sce* 52 (48–54), *c1* 37 (29–38), *c2* 35 (29–35). *Gnathosoma* (Figs 16–18): six pairs of hypostomal setae in two irregular rows with *vh1–3* and *vh6* closer together and *vh4–5* widely separated (Fig. 16). Hypostome smooth and ends in two lateral lips, each bearing two adoral setae.



Figs 11–15. *Hexabdella denheyeri*. **11**: ovipositor of female; **12**: macroseta on coxa IV of both sexes; **13**: dorsal view of leg I of female; **14**: dorsal view of leg II of female; **15**: genitalia of male.

Chelicerae each with two setae, distal one much longer than proximal seta and closer to proximal seta than to chela (Fig. 17). Striae on chelicerae longitudinal. Movable chela without teeth, longer as fixed chela. Palp chaetotaxy: coxae 1 prop; trochanter none; basifemur 5t; telofemur 1t; genu 4t; tibiotarsus 3t, 1s, 2 end setae (Fig. 18). *Dorsum* (Fig. 19): dorsal striae a mixture of sparsely, coarsely and finely broken striae (Fig. 19). Eyes absent. Opisthosomal setae smooth and slender. *Venter*: setae *ps1–ps3* present. Seven to eight *g* setae on each genital valve longitudinally aligned. Eight pairs of *ag* setae present. One pair of ventral setae between coxae IV. *Legs* (Figs 20–21): leg chaetotaxy: coxae I–IV 1prop, 5t–3t–5t–2t; trochanters I–IV 1t–1t–2t–2t; basifemora I–IV 5t–5t–7t–4t; telofemora I–IV 5t–5t–4t, 1 macr.–4t 1 macr.; genua I–IV 1s, 4t–1s, 4t–1s, 4t–1s, 4t; tibiae I–IV 1s, 1tr, 5t–5t–1s, 5t–1tr, 6t; tarsi I–IV 4s, 1micr, 16t (10 plumose)–2s, 1micr, 15t (10 plumose)–1tr, 14t (10 plumose)–1s, 13t (10 plumose). Tarsi with dorsoterminal setae *dt1* long and smooth but *dt2–dt3* plumose.

Male. Unknown.



Figs 16–21. *Hexabdella maraugia* female. **16**: ventral view of hypostome; **17**: chelicera; **18**: palp; **19**: dorsal view; **20**: dorsal view of leg I; **21**: dorsal view of leg II.

Tritonymph. Dimensions: body length 422; width 192. Tritonymph can be distinguished by presence of five pairs of ventral hypostomal, five pairs of *g*, seven pairs of *ag* setae and three pairs of genital papillae. It differs from female in chaetotaxy of following leg segments: basifemora I–IV 3t–3t–3t–3t; telofemur II 4t; telofemur IV 3t; tibia I 1s, 1tr, 4t; tibia IV 1tr, 4t; tarsus I 4s, 1micr, 15t (10 plumose).

Remarks

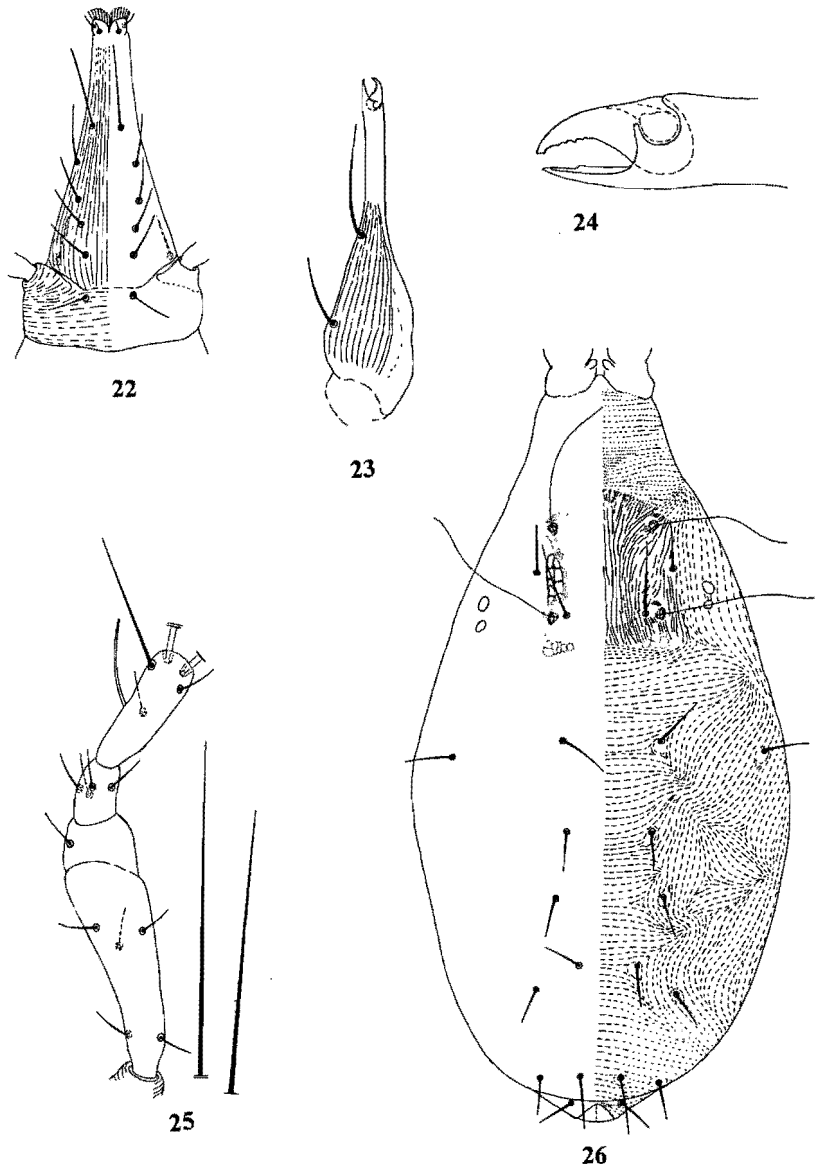
This species is unique in that it lacks eyes.

Etymology

Maraugia (L) means 'without sight (blind)' and refers to the absence of eyes in this species.

Type material

South Africa, *Western Cape Province*: holotype



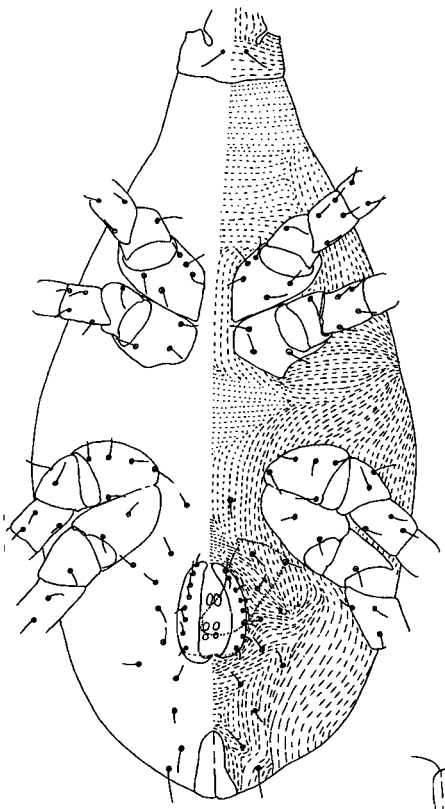
Figs 22–26. *Hexabdella miranda* female. **22**; ventral view of hypostome; **23**: chelicera; **24**: chela; **25**: palp; **26**: dorsum.

female, 2 paratype females and paratype tritonymph from soil under dune vegetation, Kleinmond (34.21S, 19.01E), 15.xii.1976, J den Heyer (NCA AcY 04/1)

***Hexabdella miranda* sp.n.**, Figs 22–30

Description

Female. Dimensions (variation in measurements of paratypes in brackets): body length 605 (449–645), body width 230 (217–277), legs: I 192(186–225), II 163 (161–190), III 277 (205–252), IV 240 (229–294), *VES* 65–77, *DES* 85–94, palp segments I–V: 8–12, 50–56, 10–15, 12–15, 31–33, *vi* 61–96, *ve* 37 (25–33), *sci* 96–125, *sce* 42 (42–73), *c1* 37 (31–40), *c2* 31 (27–37). *Gnathosoma* (Figs 22–25): six pairs of hypostomal setae; *vh1–5* longitudinally aligned and *vh6* slightly mediad to these setae (Fig. 22). Hypostome ends in two lateral lips, each bearing



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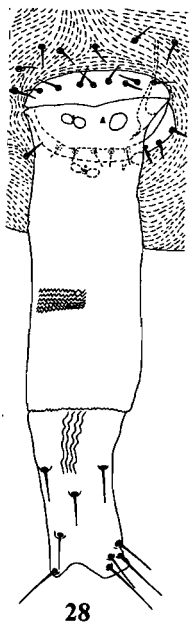

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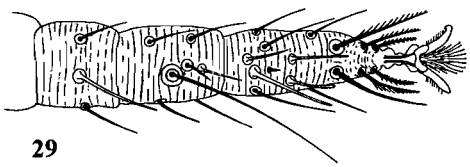

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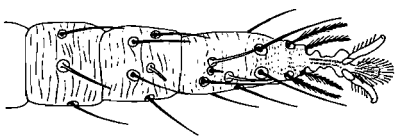

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Figs 27–30. *Hexabdella miranda* female. **27**: ventral view; **28**: ovipositor; **29**: dorsal view of leg I; **30**: dorsal view of leg II.

two adoral setae. Chelicerae each with two setae, distal one much longer than proximal seta and halfway between proximal seta and chela (Fig. 23). Striae on chelicerae longitudinal. Movable chela with about five very small teeth (Fig. 24). Palp chaetotaxy: coxae 1 prop; trochanter none; basifemur 5t; telofemur 1t; genu 4t; tibiotarsus 3t, 1s, 2 end setae (Fig. 25). *Dorsum* (Fig. 26): dorsal striae overall finely broken, except for central area of propodosoma featuring coarsely broken striae (Fig. 26). Two pairs of eyes present anterolateral of setae *sci*. Striae between eyes longitudinal. Lateral internal apodemes present (Fig. 26). Opisthosomal setae smooth and slender. *Venter* (Figs 27–28): setae *ps1–ps3* present (Fig. 27). Eight *g* setae on each genital valve longitudinally aligned. Eight to nine pairs of *ag* setae present. An ovipositor with eight medial and 10 subapical setae present (Fig. 28). One pair of ventral setae between coxae IV. *Legs*

(Figs 29–30): leg chaetotaxy: coxae I–IV 1prop, 5t–3t–5t–2t; trochanters I–IV 1t–1t–2t–1t; basifemora I–IV 7 to 8t–7 to 8t–7t–3t; telofemora I–IV 5t–5t–4t, 1 macr.–3 to 4t, 1 macr.; genua I–IV 1s, 4t–1s, 4t–1s, 4 to 5t–1s, 5t; tibiae I–IV 1s, 1tr, 5 to 6t–1s, 5 to 7t–1s, 5 to 6t–1tr, 6t; tarsi I–IV 4s, 1micr, 18t (10 plumose)–2s, 1micr, 16 to 17t (10 plumose)–1tr, 14 to 15t (10 plumose)–1s, 15t (10 plumose). Tarsi with dorsoterminal setae *dt1–3* plumose.

Male. Unknown.

Tritonymph. Dimensions: body length 432–557; width 192–242. Tritonymph distinguished by the presence of five pairs of ventral hypostomal, five pairs of *g*, seven pairs of *ag* setae and three pairs of genital papillae. It differs from female in chaetotaxy of following leg segments: trochanter IV 2t; basifemora I–IV 4 to 5t–3 to 4t–3 to 4t–2t; telofemora II–IV 4t–4t–4t; tibia IV 1tr, 4t; genua III–IV 1s, 4t–1s, 4t; tibiae I–IV 1s, 1tr, 4t–1s, 5t–1s, 5t–1tr, 4t.

Deutonymph. Dimensions: body length 371–419; width 92–109. Distinguishing features of deutonymph are presence of four pairs of ventral hypostomal setae; two pairs of *g*, five pairs of *ag* setae and two pairs of genital papillae. It differs from tritonymph in chaetotaxy of following palp and leg segments: palp basifemur 4t; legs: coxae II–III 2t–4t; trochanter IV 1t; basifemora I–IV 2t–2t–2t–1t; telofemora I–II 4t–4t; tibia III–IV 1s, 4t–1tr, 3t.

Protonymph. Dimensions: body length 323–349; width 144–173. This nymphal stage is recognised by the presence of three pairs of ventral hypostomal, one pair of *g*, one pair of *ag* setae and one pair of genital papillae distinguish tritonymph. It differs from deutonymph in chaetotaxy of following palp and leg segments: palp basifemur 3t; legs: coxa IV without setae; trochanter IV without setae; basi and telofemur fused; basifemora III1t; genu IV without setae; tibia I 1s, 6t; tibia IV without setae; tarsi III–IV 1tr, 13t–7t. Tarsi with only dt1 present.

Remarks

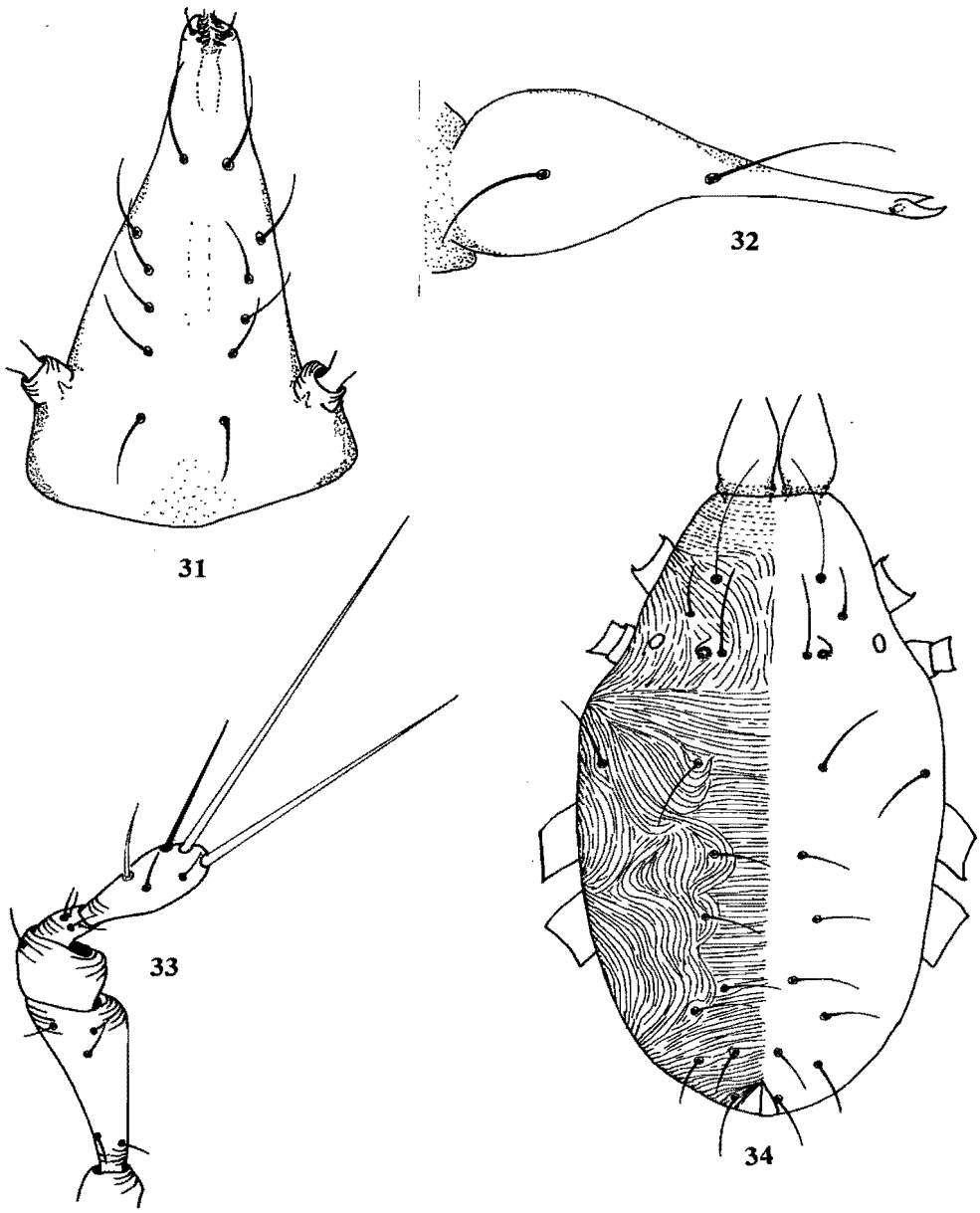
This species can easily be distinguished from the other species of this genus by the combination of smooth and slender opisthosomal setae and the presence of two pairs of eyes.

Etymology

Miranda (L) meaning 'wonderful or admirable'.

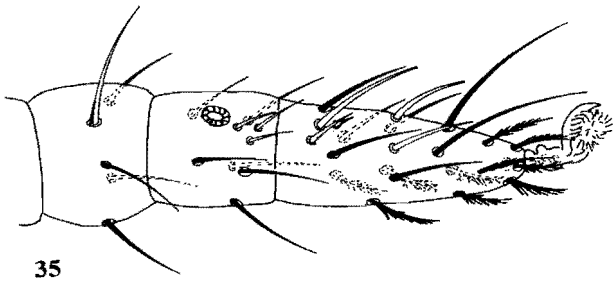
Type material

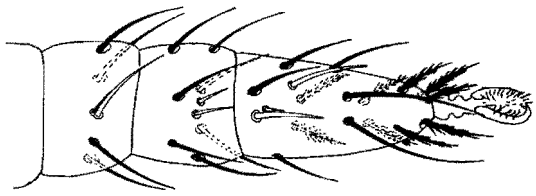
South Africa, *Limpopo Province*: holotype female, 8 paratype females, 5 paratype tritonymphs and 2 paratype deutonymphs from *Euphorbia ingens* E Mey. ex Boiss. (Euphorbiaceae), grass and legumes, near greenhouse at Botany building, University of the North, Sovenga (23.56S, 29.46E), 9.iv.1971, J den Heyer (NCA AcY 04/11); 2 paratype females from *Dombeya rotundifolia* (Hochst.) Planch. (Sterculiaceae), hill behind Botany building, University of the North, Sovenga, 19.iii.1971, J den Heyer (NCA AcY 04/10); 9 paratype females, 3 paratype tritonymphs and 1 paratype deutonymph from mixed debris, hill behind Botany building, University of the North, Sovenga, 5.xi.1970, J den Heyer (NCA AcY 04/9); 1 paratype female from *D. rotundifolia,* greenhouse, University of the North, Sovenga, 3.v.1971, J den Heyer (NCA AcY 04/13); 3 paratype females,1 paratype tritonymph from soil under *Panicum maximum* Jacq. (Poaceae), University of the North, Sovenga, 3.v.1971, J den Heyer (NCA AcY 04/14); 1 paratype female, 5 paratype tritonymphs, 1 paratype deutonymph from debris, University of the North, Sovenga, 19.ix.1980, J den Heyer (NCA AcY 04/18); 3 paratype females, 5 paratype tritonymphs, 3 paratype deutonymphs, 1 paratype protonymph, from soil and debris, Nylsvley near Naboomspruit (24.31S, 28.43E), 1975–1976, P A S Olivier (NCA AcY 04/26); 7 paratype females, 1 paratype tritonymph and 1 paratype protonymph, *Acacia rehmanniana* Schinz (Fabaceae) and *Asparagus* sp., Bloedrivier, 9 km from Polokwane (23.53S, 29.26E) to Dendron, 11.iv.1971, J den Heyer (NCA AcY 04/12); 7 paratype females,1 paratype tritonymph, 1 paratype deutonymph from *Acacia* sp., next to Chunies River, Polokwane vicinity, 24.v.1971, J den Heyer (NCA AcY 04/15); 2 paratype females from *Acacia tortilis* (Forssk.) Hayne subsp. *heteracantha* (Burch.) Brenan (Fabaceae), between Polokwane and Tzaneen (23.55S, 29.56E), 17.xi.1973, J den Heyer (NCA–AcY 04/16); 4 paratype females from *A. rehmanniana,* Polokwane (23.53S, 29.26E), 17.xii.1973, J den Heyer (NCA–AcY 04/17). *Mpumalanga Province*: 1 paratype female from soil, Malelane vicinity (25.28S, 31.31E), 4.xi.1963, T J Coates (NCA AcY 66/299); 2 paratype females, 1 paratype protonymph, from *Sclerocarya caffra* Sond. (Anacardiaceae) and *Tagetes minuta* L. (Asteraceae), Loskop Dam near Groblersdal



Figs 31–34. *Hexabdella unusoculata* female. **31**: ventral view of hypostome; **32**: chelicera; **33**: palp; **34**: dorsum.

(25.08S, 29.22E), 2.iii.1973, J A van Huyssteen (NCA AcY 04/25); 3 paratype females, 1 paratype tritonymph from *Rhus lancea* L. (Anacardiaceae), Loskop Dam near Groblersdal, 2.iii.1973, J A van Huyssteen (NCA AcY 04/24); 5 paratype females, 3 paratype tritonymphs from *A. tortilis* subsp. *heteracantha*, Loskop Dam near Groblersdal, 2.iii.1973, J A van Huyssteen (NCA AcY 04/23). *KwaZulu-Natal*: 6 paratype females, 6 paratype tritonymphs, 6 paratype deutonymphs, 3 paratype protonymphs from soil, Pongola (27.21S, 31.34E), 14.vi.–29.x.1968, N de L Genis (NCA AcY 77/84, 04/4, 04/5, 04/6); 1 paratype female, 1 paratype tritonymph from soil, experiment farm, Jozini (27.25S, 32.04E), 19.ix.1972, G C Loots (NCA AcY 04/22); 2 paratype females from soil, 20 km from





Figs 35–36. *Hexabdella unusoculata* female. **35**: dorsal view of leg I; **36**: dorsal view of leg II.

Jozini, 19.ix.1972, G C Loots (NCA AcY 04/21); 2 paratype females from soil, Mkuzi (27.37S, 32.01E), 19.ix.1972, G C Loots (NCA AcY 04/20). *Free State Province*: 1 paratype tritonymph, 1 paratype protonymph from soil, Edenville (29.16S, 21.37E), 7 vii.1969, N de L Genis (NCA AcY 04/7). *North West Province*: 1 paratype female from *Acacia* sp., Agricultural College, Potchefstroom (26. 40S, 27.04E), 27 iv.1971, P D Theron (NCA 04/19).

***Hexabdella unusoculata* sp.n.**, Figs 31–36

Description

Female. Dimensions (variation in measurements of paratypes in brackets): body length 580 (536–580), body width 288 (229–288), legs: I 205(181–205), II 182 (167–182), III 250 (211–250), IV 259 (244–259), *VES* 75, *DES* 94 (90–96), palp segments I–V: 8–10, 46 (40–46), 19 (19–23), 13 (12–15), 31 (29–33), *vi* 77, *ve* 29 (29–33), *sci* broken off, *sce* 56 (50–58), *c1* 38 (38–42), *c2* 42 (37–44). *Gnathosoma* (Figs 31–33): six pairs of hypostomal setae longitudinally aligned in two curved rows with setae *vh5* lateral of these rows (Fig.31). Hypostome smooth ending in two lateral lips, each bearing two adoral setae. Chelicerae with two setae each, distal seta much longer than proximal seta and situated halfway between proximal seta and chela (Fig. 32). Striae on chelicerae lacking. Movable chela without teeth. Palp chaetotaxy: coxae 1 prop; trochanter none; basifemur 5t; telofemur 1t; genu 4t; tibiotarsus 3t, 1s, 2 end setae (Fig. 33). *Dorsum* (Fig. 34): dorsal striae finely to coarsely broken on propodosoma and sparsely broken to continuous on opisthosoma (Fig. 34). Two small and vaguely visible eyes present anterolateral of setae *sci*. Opisthosomal setae smooth and slender. *Venter*: setae *ps1–ps3* present. Eight to nine *g* setae on each genital valve longitudinally aligned. Genital opening surrounded by nine pairs of *ag* setae. An ovipositor with approximately 19 setae present. One pair of ventral setae between coxae IV. *Legs* (Figs 35–36): leg chaetotaxy: coxae I–IV 1prop, 5t–3t–5t–2t; trochanters I–IV 1t–1t–2t–2t; basifemora I–IV 7 to 8t–7t–6 to7t–2 to 4t; telofemora I–IV 5t–5 to 7t–4t, 1 macr.–4t, 1 macr; genua I–IV 1dupl, 4t–1dupl, 4t–1dupl, 4t–1dupl, 4t; tibiae I–IV 3s, 1tr, 6t–2s, 7t–1s, 6 to 7t–1tr, 6t; tarsi I–IV 4s, 1micr, 18 to 19t (11 plumose)–2s, 1micr, 17t (10 plumose)–1tr, 15 to 16t (10 plumose)–1s, 15t (10 plumose). Tarsi with dorsoterminal setae *dt1* long and smooth but *dt2–dt3* plumose.

Male. Unknown.

Tritonymph. Dimensions: body length 440–518; width 202–253. Five pairs of ventral hypostomal, five pairs of *g*, seven pairs of *ag* setae and three pairs of genital papillae present. It differs from female in chaetotaxy of the following leg segments: trochanter IV 1t; basifemora I–IV 6t–5 to 6t–3 to 4t–1t; telofemur II–IV 4 to 5t–1macr, 3t–1

macr, 3t; tibiae I–IV 3s, 1tr, 4t–2s, 5t–1s, 4t–1tr, 4t; tarsi I–IV 4s, 1micr, 17t (10 plumose)–2s, 1micr, 14t (10 plumose)–1tr, 14t (10 plumose)–1s, 13t (10 plumose).

Remarks

This species can easily be distinguished from the other *Hexabdella* species by the smooth opisthosomal setae, the presence of duplex setae, instead of single solenidia, on genua I–IV and the presence of one pair of eyes.

Etymology

Unus (L) meaning 'one' and *oculata* meaning 'eye' refers to the presence of only one pair of eyes in this species.

Type material

South Africa, *KwaZulu-Natal*: holotype female, 3 paratype females, 4 paratype tritonymphs from soil, farm Vergeval near Pongola (27.21S, 31.34E), 14.vi-29.x.1968, N de L Genis (NCA AcY76/466, 77/57, 77/6, 77/90). *Free State Province*: 1 paratype female, 1 paratype tritonymph from soil, Edenville (29.16S, 21.37E), 7.vi.1969, N de L Genis (NCA AcY 76/464).

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