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| SPIXIANA | 16 | 1 | 5-17 | München, 30. April 1993 | ISSN 0341-8391 |
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## New genera and species of Afrotropical Canestriniidae

(Acari, Astigmata)

By Ryszard Haitlinger

Haitlinger R. (1993): New genera and species of Afrotropical Canestriniidae (Acari, Astigmata). – *Spixiana* 16/1: 5-17.

Three genera *Barbiangia*, *Sorbinophela*, *Phelliculophela* and five species: *Barbiangia alvari*, *Sorbinophela sandyi*, *Phelliculophela roaldi*, *Boetophela ephraimi* and *B. werneri* are described as new. The genus *Boetophela* Haitlinger, 1989 is redescribed. Description of male, new hosts and localities for *B. ginae* Haitlinger are given. A key for determining african genera of canestriniid mites is presented.

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### Introduction

Prior to this work, 15 genera: *Cetonicola* Coor., *Paraphagella* Coor., *Afrocanestrinia* Coor., *Diplognatophilus* Coor., *Percanestrinia* Berl., *Coleopterophagus* Berl., *Donnelafontia* Lav., *Ambilohylla* Haitl., *Athogavia* Haitl., *Diplopodocoptes* Fain, *Saniothiana* Haitl., *Olgattia* Haitl., *Irmongia* Haitl., *Chelinochroa* Summ. & Schust., *Anaspistes* Summ. & Schust., and 25 species: *Cetonicola hispidus* Coor., *C. robertsoni* Lav., *C. vatus* Haitl., *Diplognatophilus africanus* Coor., *D. ethiopicus* Haitl., *Afrocanestrinia straeleni* Coor., *Paraphagella princeps* Coor., *P. eudicellae* Coor., *P. minor* Coor., *Percanestrinia maroccana* Coor., *Diplopodocoptes transkeiensis* Fain, *Donnelafontia calostegis* Lav., *D. suatotha* (Haitl.), *Chelinochroa dictyophora* Summ. & Schust., *Anaspistes unguiculatus* Summ. & Schust., *Coleopterophagus quadrisetosus* Träg., *C. pulcher* Coor., *Ambilohylla favosa* Haitl., *Saniothiana pycnosa* Haitl., *S. barumbaica* Haitl., *Athogavia tanzanica* Haitl., *A. nosiana* Haitl., *A. gamana* Haitl., *Olgattia useguaica* Haitl., and *Irmongia helgae* Haitl. were described from Africa (Trägårdh 1904, Cooreman 1953, 1955, Lavoipierre, 1958, Summers & Schuster, 1982, Fain, 1987, Haitlinger, 1989 a, b, 1990). Genus *Boetophela* from Indonesia was described as *B. ginae* Haitl. based on one specimen. This species was described from wrongly labelled host and continent (Haitlinger, 1989b). Further specimens of *B. ginae* collected in Africa and some species described in this paper belonging to the genus *Boetophela* indicated that these mites live in Africa.

The mites were obtained from the collection of the Institute of Zoology of the Polish Academy of Sciences, Warsaw (IZPAS) and the Museum of Natural History of the Wrocław University (MNHU).

Measurements are given in Microns (µm).

### *Barbiangia*, gen. nov.

Type species: *Barbiangia alvari*, spec. nov.

Dorsal integument partly ornamented by weakly visible longitudinal lines, Setae 1<sub>2</sub> long; longer than he. Subterminal spur on tarsi I-IV very small. Setae cx III, IV long flagelliform, Bases of semilong setae vi narrowed.

Female. Below genital region 6 pairs of setae. Male. Genital apparatus very long. Below genital region two suckers and four pairs of setae,

Gender: Feminine.

Remarks. The new genus is very similar to *Canestrinia* Berl. It can be distinguished by longer setae  $l_2$  than he, bases of setae vi placed side by side, setae  $d_5$  distinctly shorter than  $l_5$ , 6 pairs of setae below genital region in females and very long genital apparatus.

***Barbiangia alvari*, spec. nov.**

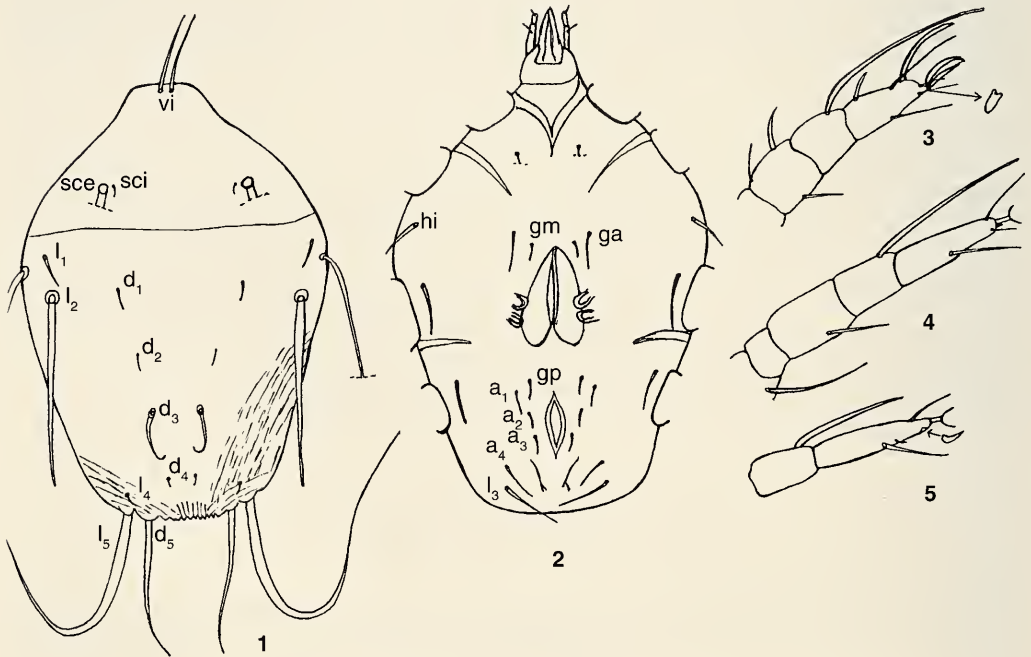
Figs 1-7

Types: Holotype ♀, Tanzania, Zanzibar, leg. Tyszkiewicz, 1891. - Paratypes: 1 ♀, 2 ♂♂, as holotype, all from undetermined Cetoniinae (Scarabaeidae), MNHWU.

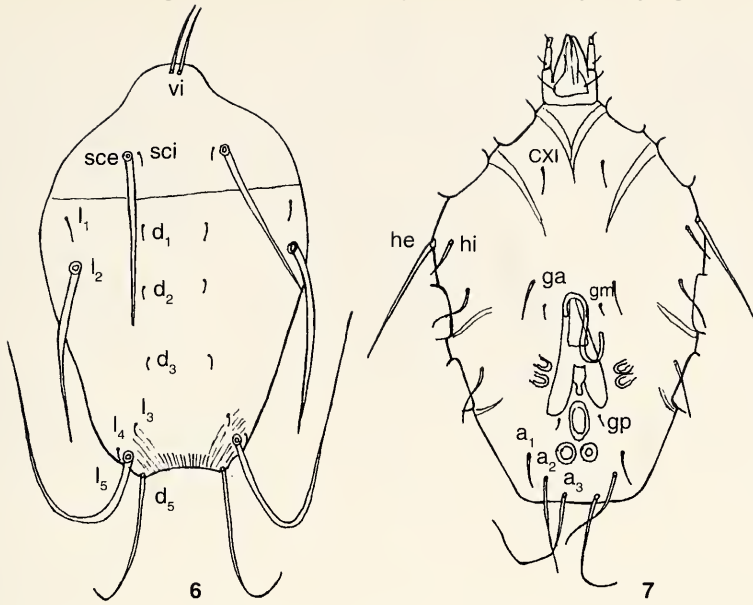
Female. Dorsum weakly ornamented by longitudinal lines only in posterior part of idiosoma. Suture separating propodosoma from hysterosoma present. Setae vi semilong. Setae  $l_2$  and  $l_5$  long, setae he and  $d_5$  distinctly shorter. Setae  $d_3$  thicker than  $l_1$ ,  $d_1$ ,  $d_2$ ,  $d_4$ ,  $l_4$  (Fig. 1), Ventral side of idiosoma bears short setae hi, two pairs of paragenital setae, and below genital region 6 pairs of setae of which  $l_3$  are longest (Fig. 2). Tarsi I-II shorter than Ta III-IV, bearing pads in which the claw exceeds the tip of each pad. All subterminal spurs on tarsi I-IV small. Setae on genu I short, subequal (gda I, gdp I), also setae sge III, st IV subequal. Seta on tibia I-IV rather short (Figs 3-5).

Measurements, Length of idiosoma 520 in holotype, 568 in paratype, width 380, 368, vi 100, 88, sci 12, -, hi 42, 42,  $d_1$  16, -,  $d_2$  20, -,  $d_3$  62, -,  $d_4$  8, -,  $l_1$  42, 40,  $l_2$  232, -,  $l_3$  70, -,  $l_4$  8, -, Ta I 46, 46, Ta II 44, Ta III 60, 58, Ta IV 64, 60, seta on Ti I 96, 84, Ti II 92, 86, Ti III 84, 80, Ti IV 60, 50, gda I 24, 22, gdp I 22, -, sge III 42, 40, st III 40, 46, st IV 50, -.

Male. Dorsal setae as in female but  $d_3$  not longer than other setae of series d (Fig. 6). Ventral side of idiosoma with two pairs of setae above genital region and four pairs of setae below this region. Setae  $a_2$ ,  $a_3$  distinctly longer than pg and  $a_1$ . Two large suckers below anal region. Setae cx III, cx IV relatively long (Fig. 7). Legs I-IV as in female.



Figs 1-5. *Barbiangia alvari*, spec. nov., ♀. 1. Idiosoma, dorsal view. 2. Idiosoma, ventral view. 3. Leg I, tarsus-genu. 4. Leg III, tarsus-femur. 5. Leg IV, tarsus-tibia.



Figs 6-7. *Barbiangia alvari*, spec. nov., ♂. 6. Idiosoma, dorsal view. 7. Idiosoma, ventral view.

Measurements. Length of idiosoma 504, 480, width 384, 332, vi 86, -, sci 10, 12, hi -, d<sub>1</sub> 16, 14, d<sub>2</sub> -, 14, l<sub>1</sub> 28, 32, l<sub>2</sub>, ~ 216, ~ 216, l<sub>3</sub> 10, -, l<sub>4</sub> 10, 10, genital region 144, 132, Ta I 46, 46, Ta II 48, 44, Ta III 58, 56, Ta IV 58, 56, seta on Ti I 80, 94, Ti II 84, 86, Ti III 84, -, Ti IV 50, 52, gda I -, 22, gdp I 16, 20, sge III 48, -, st III ~ 52, 46, st IV ~ 56, -.

***Barbiangia ethiopica* (Haitlinger, 1990), comb. nov.**

*Diplognatophilus ethiopicus* Haitlinger, 1990

Species very similar to *B. alvari*, spec. nov.. It can be distinguished by shorter idiosoma, thinner setae vi, l<sub>3</sub>, shorter d<sub>3</sub>, and especially by presence cuticular structure below anus.

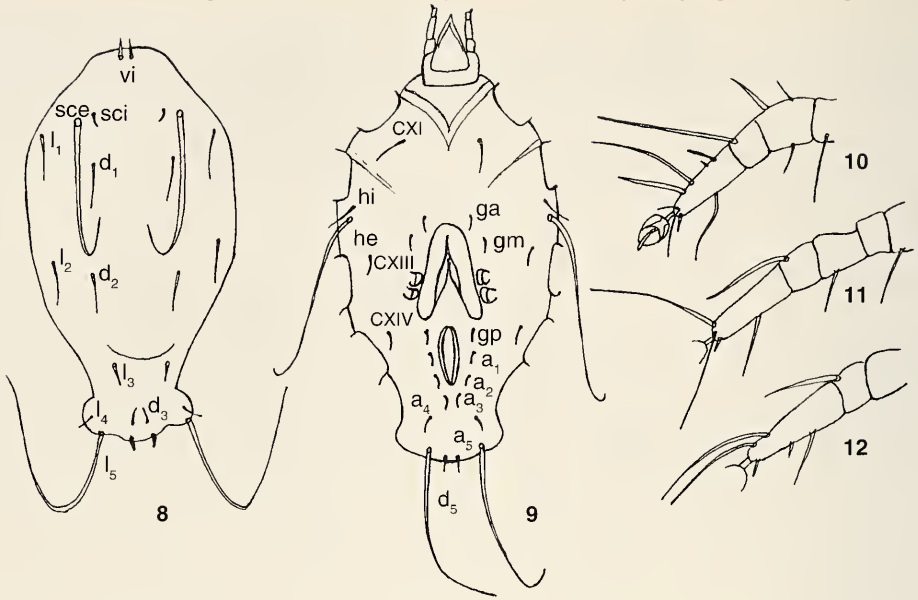
***Sorbinophela*, gen. nov.**

Type species. *Sorbinophela sandyi* n. sp.

Gender. Feminine.

Integument smooth with no ornamentation. Females with at least 6 pairs of setae below genital region, males with at least four pairs. Both sexes with very short vi, Short tarsi I-IV bear weakly developed spurlike seta distally.

Remarks. The new genus is similar to *Anaspistes* Sum. & Schust. and *Paraphagella* Coor. From the first genus it can be distinguished by poorly developed spurs on tarsi I-IV, four pairs of paranal setae on paranal pits (males) and absence of flagelliform setae between setae d<sub>3</sub>. From *Paraphagella*, gen. nov. it can be distinguished by absence of suture separating propodosoma from hysterosoma, micropores males, dorsal ornamentation, and big subterminal spur especially on tarsi III-IV.



Figs 8-12. *Sorbiuophela sandyi*, spec. nov., ♀. 8. Idiosoma, dorsal view. 9. Idiosoma, ventral view. 10. Leg I, tarsus-femur. 11. Leg III, tarsus-trochanter. 12. Leg IV, tarsus-genu.

*Sorbiuophela sandyi*, spec. nov.

Figs 8-14

Types. Holotype: ♀, Botswana, n, Lake Ngami. - Paratypes 5 ♀♀, 3 ♂♂, as holotype, all from *Poecilophila maculatissima* Boh, (Cetoniinae), MNHWU.

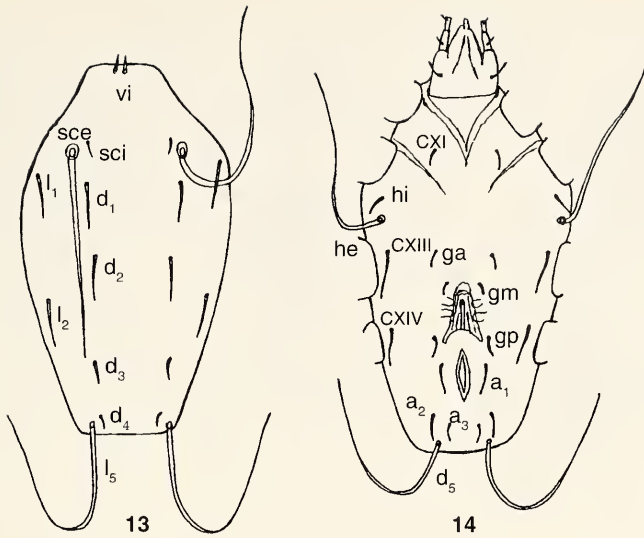
Female. Idiosoma elongated with distinctly narrowing opisthosoma. Dorsum bears two pairs of long setae sce and  $l_5$ ; setae  $l_1$ ,  $l_2$ ,  $d_1$ ,  $d_2$  longer than  $l_3$ ,  $d_3$ ,  $l_4$  and  $d_4$ . Setae  $l_3$  somewhat thicker than other dorsal short setae. Setae vi very short (Fig. 8). Ventral side of opisthosoma with two pairs of paragenital setae ga, gm, four pairs of setae in anal region, and three pairs below them,  $a_4$ ,  $a_5$ ,  $d_5$ . Moreover there are long setae he, short hi, cx I, III and IV (Fig. 9).

Tarsi I-IV with small subterminal spur, seta gda I on genu I over twice longer than gdp I. Setae on tibiae I-IV rather short, longest not longer than 80 (Figs 10-12).

Measurements. Length of idiosoma 340 in holotype, 344-376 in paratypes, width 184, 180-216, vi -, 12-16, sci 14, 12-14, hi 26, 22-28,  $d_1$  28, ~ 36 - ~ 42,  $d_2$  -, 40-42,  $d_3$  16, 16-20,  $d_4$  6, 6-8,  $l_1$  42, 46-56,  $l_2$  -, 40,  $l_3$  16, 20-24,  $l_4$  10, 8-10, Ta I 40, 42-46, Ta II 42, 42-46, Ta III 50, 52-56, Ta IV 56, 56-62, seta on Ti I 68, 70-80, Ti II 52, 52-60, Ti III 40, 42-48, Ti IV 32, 34-36, gda I 36, 36-40, gdp I 14, 12-44, sge III 32, 34-40, st III -, 28-34, st IV 28, -.

Male. Idiosoma elongated, with two pairs of long setae sce,  $l_5$ , four pairs of very short setae vi, sci,  $d_3$  and  $d_4$ ; setae  $d_1$ ,  $d_2$  and  $l_1$ ,  $l_2$  twice to four times longer than others (Fig. 13). Ventral side of idiosoma bears long setae he and  $d_5$ ; furthermore three pairs of coxal setae, setae ga distinctly above genital region, Two pairs of paragenital setae gm, gp and one pair of paranal setae  $a_1$ . Below anal region two pairs of short setae  $a_2$ ,  $a_3$  (Fig. 14). Genital apparatus short. Legs as in females.

Measurements. Length of idiosoma 320, 296, 320, width 170, 164, 188, sci 12, -, -, hi 20, 20, 22,  $d_1$  46, 32, 34,  $d_2$  36, 38, 32,  $d_3$  20, -, -,  $d_4$  12, -, -,  $l_1$  46, 34, -,  $l_2$  44, -, -, genital apparatus 46, 42, 40, Ta I 42, 40, 40, Ta III 52, 50, 50, Ta IV 52, 52, 50, seta on Ti I 66, ~ 60, ~ 68, Ti II 56, ~ 54, -, Ti III 42, 42, 42, Ti IV ~ 58, ~ 58, ~ gda I 36, 32, 32, gdp I 14, 12, 14, sge III 32, 34, -, st III 30, 22, 26, st IV, -, ~ 20, -.



Figs 13-14. *Sorbinophela sandyi*, spec. nov., ♂. 13. Idiosoma, dorsal view. 14. Idiosoma, ventral view.

***Phelliculophela*, gen. nov.**

Type species. *Phelliculophela roaldi*, n, sp.

Gender. Feminine.

Idiosoma ornamented, without suture separating propodosoma from hysterosoma. Setae vi barbed, dorsal setae except sci and vi long or semilong, Three pairs of paranal setae, Tarsi IV very long about twice longer than tarsi I-II. Seta on tibia IV very long. Seta gda I on genu I over twice times longer than gdp I. Subterminal spurs on tarsi I, II curved. Pads I-IV very small.

Remarks, The new genus differs from all other genera of canestriniid mites in the following combination of features: 1. setae  $l_1, l_2, l_4$  very long; 2. setae vi barbed; 3. very long tarsus IV (over twice longer than tarsi I-II) with long ventral spinelike seta; 4. subterminal spurs on tarsi I-II curved; 5. very long seta on tibia IV.

***Phelliculophela roaldi*, spec. nov.**

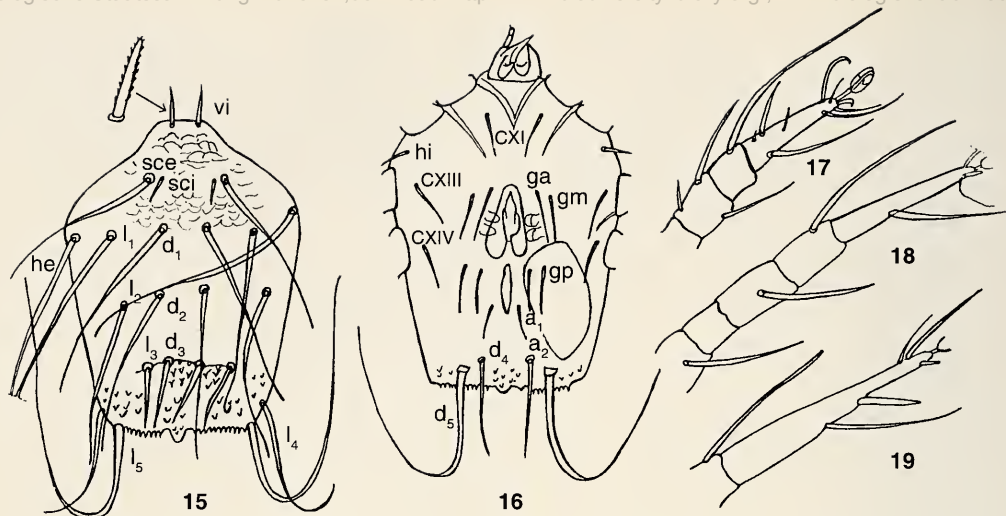
Figs 15-19

Types. Holotype: ♀, Cameroon, from *Goliathus goliathus* Dr. (Cetoniinae). IZPAS.

Female. Dorsum ornamented between vi and d1 as in Fig. 15. Setae  $d_3, l_1$  with spined area and below with cuticular structure as in Fig. 15. Posterior margin of idiosoma spined with swelling in middle part. Setae vi weakly barbed, sci short, The remaining setae long or semilong. Setae  $d_3$  and  $l_3$  placed almost on the same level. Ventral side of idiosoma bears two pairs of paragenital setae ga, gm, three pairs of setae in anal region and below them long setae  $d_3$  and semilong  $d_4$ . Setae hi short (Fig. 16).

Tarsi I-II subequal, tarsus III distinctly longer, tarsus IV over twice longer than tarsi I-II. Subterminal spurs on tarsi I-II curved; on tarsi III-IV straight. Setae gda I over twice longer times than gdp I. Setae sge III, st III and st IV long. Seta on tibiae I-IV long, Tarsus IV with spinelike seta on ventral side (Figs 17-19).

Measurements. Length of idiosoma 600, width 424, vi 64, sci 48, hi 26,  $d_1 \sim 354, d_2 \sim 322, d_3 \sim 116, d_4 \sim 140, l_1 \sim 352, l_2 \sim 312, l_3 \sim 128, l_4 \sim 254, Ta I 76, Ta II 80, Ta III 124, Ta IV 182, seta on Ti I 160, Ti II 166, Ti III 140, Ti IV 130, gda I 92, gdp I 38, sge III 72, st III 120, st IV \sim 130.$



Figs 15-19. *Phelliculophela roaldi*, spec. nov., ♀. 15. Idiosoma, dorsal view. 16. Idiosoma, ventral view. 17. Leg I, tarsus-genu. 18. Leg III, tarsus-trochanter. 19. Leg IV, tarsus-tibia.

### *Boetophela* Haitlinger, 1989

Type species. *Boetophela ginae* Haitlinger, 1989

#### Redescription

Female. Idiosoma elongate with lateral margin spined; spines are present also on some parts of dorsal and ventral area (mainly below anal region), Dorsal area not ornamented, or with spines on lateral and posterior part of idiosoma. In anal region five pairs of setae; below them one pair of short setae  $d_4$ . Suture separating propodosoma from hysterosoma absent, Claws on pads I-IV strongly developed, exceeding tip of pads (Figs 20-25).

Male. Dorsum without ornamentation. All dorsal setae, except *sce* and  $l_5$ , short or minute. Opisthosoma distinctly developed, narrow. In anal region setae absent. Below anal slit two small pits, four pairs of short setae, and one pair of long setae. Tarsi IV with strong terminal claw; pad present or not; furthermore with thick subterminal spur, two subterminal, long flagelliform setae, and two ventral setae.

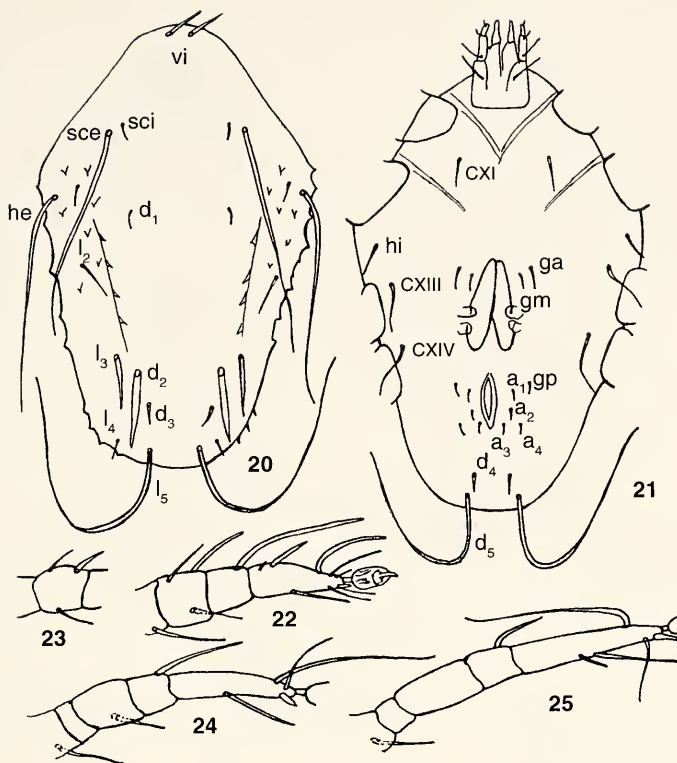
Remarks. This genus is similar to *Paraphagella* Cooreman, 1955. It can be distinguished by absence of suture separating propodosoma from hysterosoma, long setae *he*, five pairs of paranal setae (females), and subterminal spur on tarsi I-IV without concave tip.

### *Boetophela ginae* Haitlinger, 1989

Figs 20-30

This species was described as associated with *Batocera rubus* (Cerambycidae) from Sumatra only on the base of one female. Further investigations proved that this species lives in Africa. Dimensions for females and males are given below.

Measurements. Length of idiosoma 496-552, width 288-336,  $vi$  36-46, *sci* 20-24, *hi* 30-36,  $d_1$  20-26,  $d_2$  82-94,  $d_3$  26-34,  $d_4$  18-20,  $l_1$  28-38,  $l_2$  40-52,  $l_3$  58-80,  $l_4$  20-24, Ta I 58-64, Ta II 60-62, Ta III 72-76, Ta IV 86-96, seta on Ti I 88-96, Ti II 84-96, Ti III 56-60, Ti IV 36-46, *gda* I ~ 46 - ~ 50, *gdp* I 22-28, *sge* III 28-36, *st* III 40-44, *st* IV 34-40.



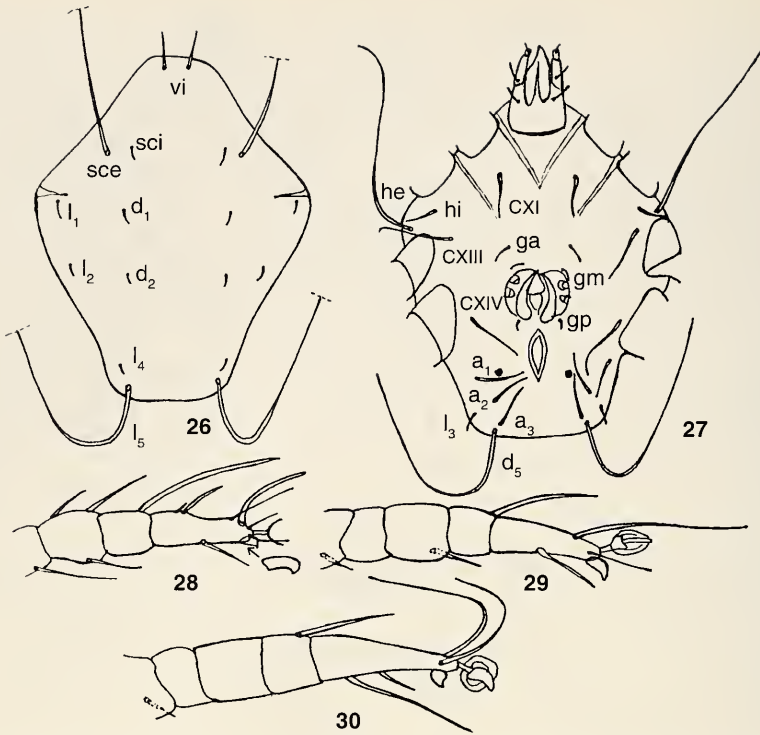
Figs 20-25. *Boetophela ginae* Haitl., ♀. 20. Idiosoma, dorsal view. 21. Idiosoma, ventral view. 22. Leg I, tarsus-femur. 23. Genu II. 24. Leg III, tarsus-trochanter. 25. Leg IV, tarsus-trochanter.

Male. Dorsum with two pairs of long setae  $sce$  and  $l_5$ , the remaining ones small but  $vi$  distinctly longer (Fig. 26). Ventral side of idiosoma with relatively long flagelliform setae of series  $cx$ , Below anal slit three pairs of setae  $a_1, a_2, a_3$ , distinctly shorter setae  $l_3$ , and long setae  $d_3$ . Setae  $he$  long, setae  $hi$  and paragenital setae short (Fig. 27). Tarsi I, III, IV as in Figs 28-30, Tarsi IV bear pads with thick claw and subterminal thick spur. Subterminal spurs I-II curved.

Measurements. Length of idiosoma 392, 400, width 328, 312,  $vi$  42, 38,  $sci$  18, -,  $hi$  24, -,  $d_1$  12, -,  $d_2$  12, -,  $l_1$  14, -,  $l_2$  12, -,  $l_3$  16, -,  $l_4$  10, -, genital apparatus 60, 58, Ta I 62, 62, Ta II 62, 64., Ta III 72, 80, Ta IV 92, 102,  $gda$  I 48, 46,  $gdp$  I 26, 22,  $sge$  III 34, -,  $st$  III 26, -, seta on Ti I 90, 110, Ti II 90, 104, Ti III -, 72, Ti IV ~ 64, 72.

Localities. South Africa, Natal, 5 ♀♀, 2 ♂♂ from *Eudicella smithi* MacLeay; Transvaal, 2 ♀♀ from undetermined Cetoniinae.

Remarks. Females of this species differ from other species by long setae  $d_2, l_3$ . Males can be distinguished by shape of opisthosoma (without enlargement in its posterior part) from *B. werneri*, spec. nov., by presence of one spur on tarsi IV - from *B. ephraimi*, spec. nov. From *B. robertsoni* (Lav.) it can be distinguished by shorter setae  $d_1$  than  $l_1$ , absence of dorsal ornamentation except for some spines, and presence of spines on lateral margins.



Figs 26-30. *Boetophela ginae* Haitl., ♂. 26. Idiosoma dorsal view. 27. Idiosoma, ventral view. 28. Leg I, tarsus-femur. 29. Leg III, tarsus-trochanter. 30. Leg IV tarsus-trochanter.

*Boetophela ephraimi*, spec. nov.

Figs 31-40

Types. Holotype. ♀, Ghana, Aschanti. - Paratypes 1 ♀, 2 ♂♂ as holotype, all from undetermined Cetoniinae. MNHWU.

Female. Dorsum with two pairs of long setae sce, he, remaining ones short but vi longer. Lateral margins of opisthosoma with about two spines each, Setae  $l_3$  near  $d_3$  (Fig. 31). Ventral side of idiosoma bears five pairs of paranal setae arranged as in Fig. 32. Below them short setae  $d_4$  and small cuticular formation, Bases of setae  $d_3$  near  $d_4$ , below them long setae  $l_5$ . Opisthosoma with some spines. Legs I, III, IV as in Figs 33-35.

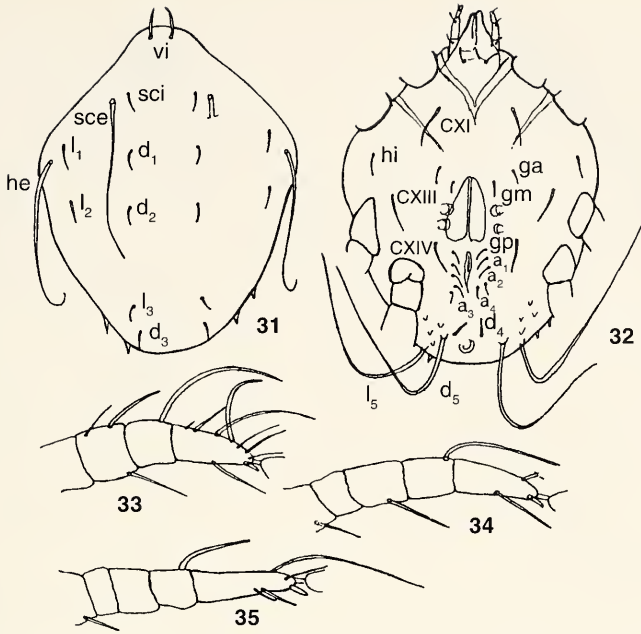
Measurements, Length of idiosoma 608 in holotype, 576 in paratype, width 472, 424, vi 62, -, sci 32, ~ 28, hi 32, 36,  $d_1$  34, 36,  $d_2$  30, -,  $d_4$  -, 30,  $l_1$  36, 38,  $l_2$  30, 36,  $l_3$  30, 32,  $l_4$  30, 36, Ta I 80, 78, Ta II 80, 78, Ta III 76, 76, Ta IV 88, 82, seta on Ti I ~ 122, ~ 132, Ti II 126, ~ 136, Ti III ~ 106, 108, Ti IV ~ 56, 76, gda I ~ 42, 48, gdp I 30, 30, sge III 42, 40, st III 28, 30, st IV -, 28.

Male. Dorsum as in males of *B. ginae* but are visible setae  $d_3$  (Fig. 36). Ventral side with relatively long genital apparatus, setae arranged as in *B. ginae* (Fig. 37). Tarsi I-IV equal but tarsi III, IV thicker than remaining ones. Tarsus IV without pad, with thick terminal claw; furthermore there are two small spurs (Figs 38-40).

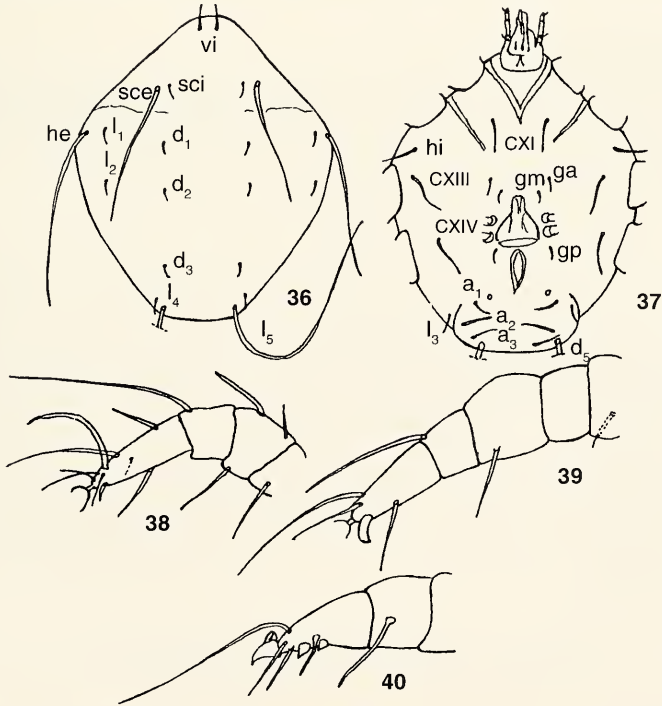
Measurements. Length of idiosoma 528, ~ 536, width 56, 54, sci 24, 24, hi 30, 34,  $d_1$  -, 20,  $l_1$  -, 26,  $l_2$  20, -, genital apparatus 92, 90, Ta I 76, 80, Ta II 76, 80, Ta III 76, -, Ta IV 76, 74, seta on Ti I ~ 132, ~ 132, Ti II 130, Ti III 130, 132, Ti III 100, -, gda I 46, -, sge III 46, -.

Remarks. The new species is similar to *B. wernerii*, spec. nov. It can be distinguished by at least twice times longer  $d_1$ ,  $d_2$ ,  $l_1$  and  $l_2$  in females, and by shape of opisthosoma, two ventral spurs on tarsi IV, and longer genital apparatus in males.

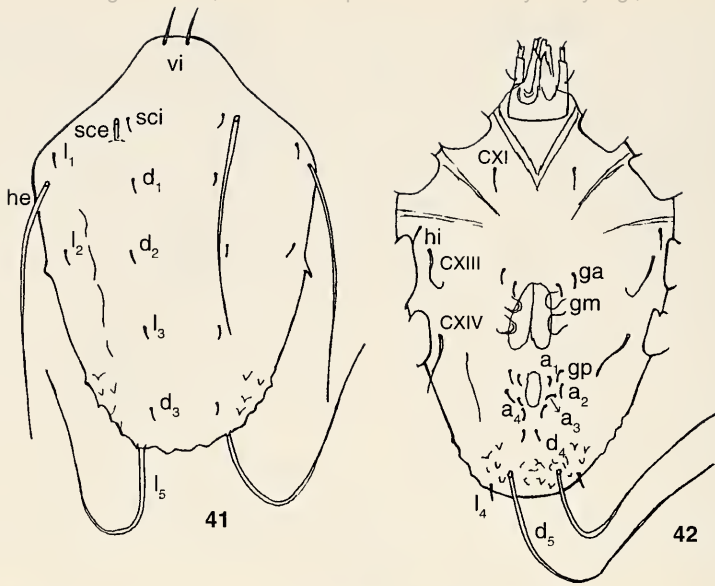




Figs 31-35. *Boetophela ephraimi*, spec. nov., ♀. 31. Idiosoma, dorsal view. 32. Idiosoma, ventral view. 33. Leg I, tarsus-femur. 34. Leg, tarsus-trochanter. 35. Leg IV, tarsus-trochanter.



Figs 36-40. *Boetophela ephraimi*, spec. nov., ♂. 36. Idiosoma, dorsal view. 37. Idiosoma, ventral view. 38. Leg I, tarsus-femur. 39. Leg III, tarsus-trochanter. 40. Leg IV, tarsus-tibia.



Figs 41-42. *Boetophela wernerii*, spec. nov., ♀. 41. Idiosoma, dorsal view. 42. Idiosoma, ventral view.

***Boetophela wernerii*, spec. nov.**

Figs 41-46

Types. Holotype: ♀, Burundi, Bujumbura (Usumbura). - Paratypes: 3 ♀♀, 3 ♂♂, as holotype, all from *Plaesiorrhina mhondana* Ab. (Cetoniinae). IZPAS.

Female. Dorsum without ornamentation except for a few spines in posterior part of Idiosoma and on margins. Two pairs of long dorsal setae sce,  $l_5$ ; the remaining ones short, but setae vi distinctly longer than the rest (Fig. 41). Ventral side of idiosoma with ornamentation below anal region. Short setae  $d_4$  near paranal setae. Bases of setae  $d_5$  relatively far from posterior margin of opisthosoma (Fig. 42). Legs as in *B. ephraimi*, spec. nov.

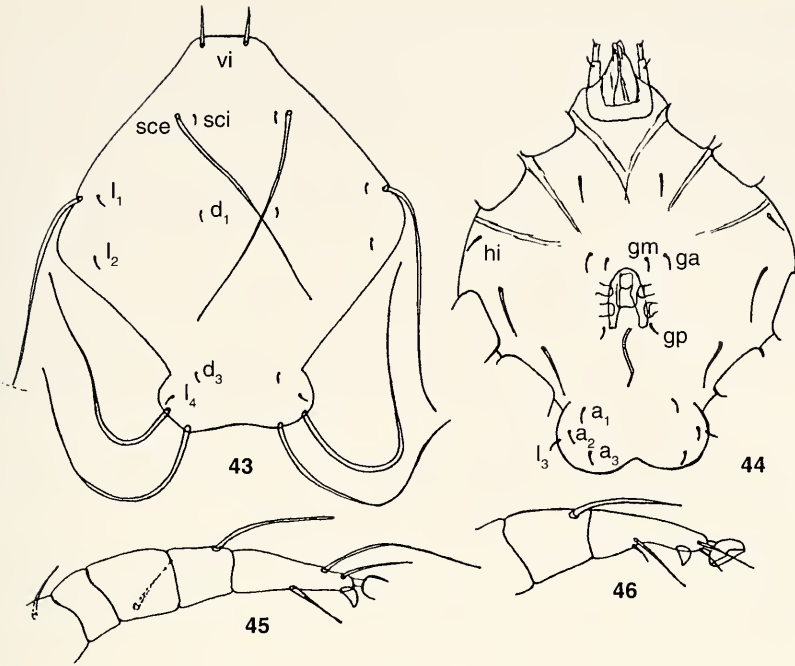
Measurements. Length of idiosoma 576 in holotype, 576, 552, 504 in paratypes, width 392, 398, 384, 320, vi 54, 50, -, 54, sci 18, 18, -, 20, hi 26, 32, -, 28,  $d_1$  -, 14, -, 10,  $d_2$  12; 14, -, -,  $d_3$  12, -, -,  $d_4$  12, -, -,  $l_1$  14, 18, -, 18,  $l_2$  12, -, -, 14,  $l_3$  14, 14, -, 12,  $l_4$  -, 22, -, 20, Ta I 62, 64, 64, 70, Ta II 64, 66, 66, 72, Ta III 86, 88, 84, 88, Ta IV 110, 108, 104, 114, seta on Ti I 112, 110, -, 114, Ti II 110, 112, ~ 106, 110, Ti III -, 70, -, Ti IV 42, 38, 32, 40, gda I 44, 52, -, 56, gdp I 28, 26, 30, 34, sge III 36, 30, 26, 58, st III 32, -, -, 34.

Male. Dorsum without ornamentation, with four pairs of long setae sce, he,  $l_5$ ,  $d_5$ , the remaining ones except vi very short. Opisthosoma in posterior part enlarged (Fig. 43). Ventral side of idiosoma with relatively long setae cx I, III, IV, the remaining setae very short. Setae  $a_1$ ,  $a_2$ ,  $a_3$  far from anal slit; genital apparatus rather short (Fig. 44). Legs III, IV as in Figs 45-46.

Measurements. Length of idiosoma 440, 440, 416, width 360, 360, - 352, vi 46, -, 52, sci 16, 18, 16, hi 22, 20, 20,  $d_1$  10, -,  $d_2$  -, -, 10,  $d_2$  -, -, 10,  $d_3$  10, -, 10,  $l_1$  14, 16, 16,  $l_2$  10, -, 14,  $l_3$  16, 16, 18,  $l_4$  -, 18, -, genital apparatus ~ 52, ~ 52, 62, Ta I 64, 72, 68, Ta II 66, 74, 70, Ta III 80, 80, Ta IV 74, 82, 80, seta on Ti I 104, ~ 108, ~ 100, Ti II 102, 110, ~ 102, Ti III 66, 70, 72, Ti IV 68, 80, 82, gdp I 48, 48, 42, gdp I 32, 28, 28, sge III 38, 32, 34, st III 34, 44, 42.

***Boetophela robertsoni* (Lavoipierre, 1958), comb. nov.**

Species described from Tanzania as *Cetonicola robertsoni* Lav. collected on *Dicronorhina oberthuri* (Cetoniinae). This species belongs to genus *Boetophela*. It is very similar to *B. ginae* Haitlinger. The last



Figs 43-46. *Boetophela wernerii*, spec. nov., ♂. 43. Idiosoma, dorsal view. 44. Idiosoma, ventral view. 45. Leg III, tarsus-trochanter. 46. Tarsus-tibia.

species differs from *B. robertsoni* in shorter setae  $d_1$  than  $l_1$ , absence of dorsal ornamentation except for some spines and present spines on lateral margins.

### Key to African genera of canestriniid mites

♂♂

- 1 (8) Near anal slit with two large suckers ..... 2
- 2 (3) Setae  $l_2$  very long, many times longer than  $l_1$ ,  $d_1$ ,  $d_2$ . Bases of setae vi narrowed ..... *Barbiangia*, gen. nov.
- 3 (2) Setae  $l_2$  shorter, never many times longer than remaining ones. .... 4
- 4 (5) Opisthosoma with two long membraneous lobes; Two pairs of tarsal suckers on legs IV .....  
..... *Diplopodocoptes* Fain, 1987.
- 5 (4) Opisthosoma without membraneous lobes. Suckers on tarsi IV absent ..... 6
- 6 (7) Opisthosoma well developed, in posterior part enlarged. Length of tarsi I-IV varied. Suckers relatively far from posterior margin of opisthosoma ..... *Percanestrinia* Berlese, 1911.
- 7 (6) Opisthosoma very short. Length of tarsi I-IV subequal. Suckers near posterior margin of opisthosoma .....  
..... *Ambilohylla* Haitlinger, 1990.
- 8 (1) Near anus without large suckers. .... 9
- 9 (10) Setae  $l_2$  very long, many times longer than  $l_1$ ,  $d_1$  ..... *Donnelafontia* Lavoipierre, 1958.
- 10 (9) Setae  $l_2$  short, never many times longer than  $l_1$ ,  $d_1$ . .... 11
- 11 (12) Tarsi IV terminal with very thick claw ..... *Boetophela* Haitlinger, 1989.
- 12 (11) Tarsi IV with normally shaped terminal claw ..... 13
- 13 (14) Epimera I free ..... *Afrocanestrinia* Cooreman, 1955.

|         |  |   |
|---------|--|---|
| 14 (13) | Epimera I fused .....  | 15  |
| 15 (16) | Subterminal spurs on tarsi I-IV with concave tip .....   | <i>Paraphagella</i> Cooreman, 1955.           |
| 16 (15) | Subterminal spurs on tarsi I-IV without such shaped tips. ....   | 17  |
| 17 (18) | Tarsi IV in addition to subterminal spur, with two thick ventral spinelike setae .....                       | <i>Athogavia</i> Haitlinger, 1989.            |
| 18 (17) | Tarsi IV with thin ventral setae or with only one thick seta. ....   | 19  |
| 19 (20) | Tarsi III-IV with large subterminal spur. Below genital region at least 5 pairs of setae .....               | <i>Anaspistes</i> Summers & Schuster, 1982.   |
| 20 (19) | Tarsi III-IV with relatively small subterminal spur. Below genital region fewer than 5 pairs of setae. ....  | 21  |
| 21 (24) | Dorsum without ornamentation. ....   | 22  |
| 22 (23) | Setae vi very short (below 20 u). Anal region without anal pits. Below genital region 4 pairs of setae ..... | <i>Sorbinophela</i> , gen. nov.               |
| 23 (22) | Setae vi rather long (over 50 u). Anal region with anal pits. Below genital region 2 pairs of setae .....    | <i>Saniothiana</i> Haitlinger, 1990.          |
| 24 (21) | Dorsum weakly or distinctly ornamented. ....   | 25  |
| 25 (26) | Dorsum weakly ornamented, paranal pits present .....   | <i>Coleopterophagus</i> Berlese, 1882.        |
| 26 (25) | Dorsum distinctly ornamented, paranal pits absent. ....  | 27  |
| 27 (28) | Suture separating propodosoma from hysterosoma present. Dorsum with ornamentation in various patterns .....  | <i>Chelinochroa</i> Summers & Schuster, 1982. |
| 28 (27) | Suture separating propodosoma from hysterosoma absent. Dorsum with ornamentation cellular in shape .....     | <i>Cetonicola</i> Cooreman, 1955.             |

♀ ♀

|         |   |   |
|---------|---|---|
| 1 (4)   | Setae $l_2$ very long, many times longer than $l_1$ , $d_1$ , $d_2$ .....   | 2                                       |
| 2 (3)   | Bases of setae vi narrowed. Two pairs of long or semilong caudal setae .....  | <i>Barbiangia</i> , gen. nov.           |
| 3 (2)   | Bases of setae vi not narrowed; caudal setae very short .....   | <i>Donnelafontia</i> Lavoipierre, 1958. |
| 4 (1)   | Setae $l_2$ as long as length as setae $l_1$ , $d_1$ , $d_2$ .....  | 5                                       |
| 5 (6)   | Tarsi IV with two thick ventral spinelike setae .....   | <i>Athogavia</i> Haitlinger, 1989.      |
| 6 (5)   | Tarsi IV without ventral spinelike setae or with only one such seta. ....   | 7                                       |
| 7 (8)   | Tarsi IV very long, over twice times longer than tarsi I, with one relatively long spinelike ventral seta .....                                   | <i>Phelliculophela</i> , gen. nov.      |
| 8 (7)   | Tarsi IV not very long, never twice longer than tarsi, without spinelike ventral seta. ....   | 9                                       |
| 9 (12)  | Lateral margins spined. ....  | 10                                      |
| 10 (11) | Below genital region 3 pairs of setae. Postanal fossa present .....   | <i>Olgattia</i> Haitlinger, 1990.       |
| 11 (10) | Below genital region at least 6 pairs of setae. Postanal fossa absent .....   | <i>Boetophela</i> Haitlinger, 1989.     |
| 12 (9)  | Lateral margins without spines. ....  | 13                                      |
| 13 (14) | Tarsi III-IV with subterminal spur with concave tip .....   | <i>Paraphagella</i> Cooreman, 1955.     |
| 14 (13) | Tarsi III-IV with subterminal spur without concave tip. ....  | 15                                      |
| 15 (16) | Dorsum ornamentation consisting of longitudinal or transverse lines .....   | <i>Saniothiana</i> Haitlinger, 1990.    |
| 16 (15) | Dorsum without ornamentation, or ornamented otherwise. ....   | 17                                      |
| 17 (18) | Cuticule almost completely mamillate, Gnathosoma containing 2 large triangular projections lying on the anteroventral surface of gnathosoma ..... | <i>Diplopodocoptes</i> Fain, 1987.      |
| 18 (17) | Cuticule not mamillate. Gnathosoma without such projections. ....   | 19                                      |
| 19 (22) | Setae sci and hi long, never minute or very short .....   | 20                                      |
| 20 (21) | Four pairs of paranal setae .....   | <i>Percanestrinia</i> Berlese, 1911.    |
| 21 (20) | Three pairs of paranal setae .....  | <i>Coleopterophagus</i> Berlese, 1882.  |
| 22 (19) | Setae sci and hi short or minute. ....  | 23                                      |
| 23 (28) | Dorsal surface entire or partly ornamented. ....  | 24                                      |

|         |  |  |
|---------|--|--|
| 24 (25) | Dorsal integument entire with ornamentation cellular in shape, without suture separating propodosoma from hysterosoma .....          | <i>Cetonicola</i> Cooreman, 1955.            |
| 25 (24) | Dorsal integument with different ornamentation. ....   | 26   |
| 26 (27) | Dorsal integument with ornamentation only in posterior part of idiosoma. Suture separating propodosoma from hysterosoma absent ..... | <i>Irmongia</i> Haitlinger, 1990.            |
| 27 (26) | Dorsal integument completely ornamented. Suture separating propodosoma from hysterosoma present .....                                | <i>Chelinocroa</i> Summers & Schuster, 1982. |
| 28 (23) | Dorsal integument without ornamentation. ....  | 29   |
| 29 (30) | Epimera I free .....   | <i>Afrocanestrinia</i> Cooreman, 1955.       |
| 30 (29) | Epimera I fused .....  | 31   |
| 31 (32) | Suture separating propodosoma from hysterosoma absent. Opisthosoma enlarged in its posterior part .....                              | <i>Sorbinophela</i> , gen. nov.              |
| 32 (31) | Suture separating propodosoma from hysterosoma present. Opisthosoma not enlarged in posterior part .....                             | 33   |
| 33 (34) | Dorsal hysterosomal setae subequal. Tarsi I-IV with a strong spur-like seta distally .....   | <i>Anaspistes</i> Summers & Schuster, 1982   |
| 34 (33) | Dorsal hysterosomal setae not subequal. Tarsi I-IV without strong spur-like seta distally .....                                      | <i>Diplognatophilus</i> Cooreman, 1955.      |

#### Acknowledgements

I would like to express my sincere thanks to Dr. A. Slipinski (IZPAS) and Dr. M. Kak (MNHWU) for the loan of the specimens.

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Jahr/Year: 1993

Band/Volume: [016](#)

Autor(en)/Author(s): Haitlinger Ryszard

Artikel/Article: [New genera and species of Afrotropical Canestriniidae \(Acari, Astigmata\) 5-17](#)