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AFROTROPICAL ERIOPHYOIDEA:
ON SOME SPECIES OF THE SUBFAMILY NOTHOPODINAE
(ACARI: ERIOPHYIDAE)

by Magdalena K. P. SMITH MEYER* and E. A. UECKERMANN*

ABSTRACT: Mites of the subfamily Nothopodinae from the Afrotropical region are dealt with. The following five new species collected on indigenous plants in South Africa are described and illustrated: Adenocolus psydraxi from Psydrax livida (Rubiaceae); Floracarus transvaalensis from Rhoicissus tomentosa (Vitaceae) and Rhus chiridensis (Anacardiaceae); F. tiliaceus from Grewia occidentalis (Tiliaceae); F. oxyanthi from Oxyanthus speciosus (Acanthaceae); Nothopoda natalensis from Aspilia natalensis (Asteraceae). The genus Adenoculus is new to science. The relationships of each species are briefly discussed.

RESUME: Les Nothopodinae de la region afrotropicale sont ici concernes. Cinq especes nouvelles, recoltees sur des plantes indigenes de l'Afrique du Sud, sont decrites et illustrees: Adenocolus psydraxi sur Psydrax livida (Rubiaceae); Floracarus transvaalensis sur Rhoicissus tomentosa (Vitaceae) et Rhus chiridensis (Anacardiaceae); F. tiliaceus sur Grewia occidentalis (Tiliaceae); F. oxyanthi sur Oxyanthus speciosus (Acanthaceae); Nothopoda natalensis sur Aspilia natalensis (Asteraceae). Le genre Adenoculus est nouveau pour la Science. La parente de chaque espece est brievement discutee.

This paper deals with some eriophyid species belonging to the subfamily Nothopodinae from the Afrotropical region. Formerly, information on this subfamily from the Afrotropical region was largely confined to the following two species: Colopodacus africanus Keifer, 1960 from Coffea arabica in Zaire and Neofloracarus guajavae Abou-Awad & El-Banhawy, 1992 from Psidium guajava in Kenya.

The present study serves to bring together more information on some African species of this interesting subfamily.

The holotypes and paratypes of the new species are deposited in the National Collection of Arachnida, Plant Protection Research Institute, Pretoria. All the type material is preserved as slide-mounted specimens. All measurements in this paper are given in micrometers (μm).

Colopodacus Keifer

Colopodacus Keifer, 1960: 15-16.

Type-species: Colopodacus africanus Keifer

Members of this genus are readily recognised by the presence of the 1st pair of setiferous coxal tuber-
cles and the tibiae which are fused to the tarsi. According to Keifer (1960) the prodorsal tubercles are well ahead of the rear shield margin, directing the setae dorsad and centrad. However, judging from the species so far assigned to Colopodacus this genus can also include species with the prodorsal tubercles near the rear shield margin, directing the prodorsal setae convergently or divergently posteriorly or laterally. This genus further exhibits the following characters: opisthosoma with or without tergal-sternal differentiation; forecoxae weakly divided or completely fused; forefemoral setae may be present or absent; solenidion on tarsus I may be located dorsally or laterally. This genus is presently represented in the Afrotropical region only by the type species, C. africanus.

**Colopodacus africanus** Keifer

*Colopodacus africanus* Keifer, 1960: 16-17.

This species can be distinguished from the related *C. glochidionis* Keifer in that its featherclaw is 5-rayed; the femora are not granulate; the prodorsal shield is more reticulated; tergites without microtubercles; *C. africanus* further exhibits the following diagnostic characters: opisthosoma with 50-55 annuli, set with elongate microtubercles; coxae smooth and with a faint sternal line; 1st setiferous coxal tubercles slightly ahead of anterior coxal approximation and slightly closer together than 2nd tubercles; genital coverflap with a basal granular area; genitalia appressed to coxae; empodial featherclaw 5-rayed.

**Host and distribution.** *Colopodacus africanus* is described from *Coffea arabica* L. (Rubiaceae) in Zaire.

**Relation to host.** According to Keifer (1960) these mites cause russetting symptoms on the lower surfaces of leaves.

**Adenocolus** gen. nov.

*Type-species:* *Adenocolus psydraxi* gen. et sp. nov., monotypic.

This genus resembles *Colopodacus* Keifer (1960) but differs in the following characters: dorsal tubercles on rear shield margin, directing dorsal setae posteriad; sternal line absent; genitalia not appressed to coxae.

**Diagnosis:** Body robust fusiform; opisthosoma differentiated into tergites and sternites; prodorsal shield with a prominent lobe anteromedially; dorsal tubercles on posterior shield margin, directing setae posteriorly; genital coverflap of gonopore not appressed to coxae; legs with tarsi and tibiae fused, forefemoral setae absent; coxal plates with the normal 3 pairs of setiferous coxal tubercles, sternal line absent; empodial featherclaw simple; solenidia in dorsal position.

**Etymology:** The name *Adenocolus* is compounded from the Greek word “aden” meaning “gland” and the Latin word “colus” meaning “dwelling in”, referring to the gland cavities in which this mite was found.

**Adenocolus psydraxi** sp. nov. (Figs. 1-7)

The generic characters are distinctive for this species.

**Female.** Dimensions (n =7): length 192-229; breadth 69-80; body robust fusiform; rostrum 23-25 long, curved ventrad at about a right angle; prodorsal shield (Fig. 1) semicircular, with a broad, bluntly rounded, anterior lobe; shield design consists of strong lines; median and admedian shield lines complete; admedian lines sinuate, connected to median line by three transverse lines, forming a network; submedian lines produce curved lines laterad of admedian lines; lateral shield margins granulate; dorsal tubercles, about 28 apart, on rear shield margin, directing dorsal setae (26-30) divergently posteriorly; opisthosoma differentiated into 35-40 microtuberculate tergites and 49-56 microtuberculate sternites; tergal microtubercles (Fig. 2) suppressed, oval anteriorty and spinous posteriorly, projecting over annular margin; sternal microtubercles (Fig. 2) smaller, on or ahead of rear annular margins, gradually becoming elongate towards rear; lateral setae on about 9th annulus, 32-38 long; 1st ventral setae on about 20th annulus, 56-60 long; 2nd ventral setae on about 35th annulus, 47-52 long; 3rd ventral setae on about 6th annulus from rear, 19-23 long; accessory
FIGS. 1-7. *Adenoculus psydraxi* sp. nov., female.

setae minute; genital coverflap (Fig. 3) of gonopore unornamented; genital setae 16-19 long; internal genitalia as in Fig. 4.

Legs. Legs I (Fig. 5) 30-32 and legs II (Fig. 6) 25-27 long; forefemoral seta absent; tarsi and tibiae fused; coxal plates (Fig. 3) spinulate, anterior pair fused and without sternal line; 1st pair of coxal setae 9-11, 2nd pair of coxal setae 22-25 long; 1st setiferous coxal tubercles caudad of anterior coxal approximation and closer together than 2nd tubercles, which are ahead of a line through 3rd tubercles; empodial featherclaw (Fig. 7) 5 or 6-rayed, about three quarters the length of 1st and 2nd knobbed solenidia; solenidia on tarsi I shorter (8) than those on tarsi II (11).

Male. Similar to female except for 5-rayed empodial featherclaws and genitalia.

Type data. SOUTH AFRICA, Gauteng: ex *Psydrax livida* (Hiern) Bridson (Rubiaceae), Green Tree or Bushveld Rock Alder, Pretoria, 4 May 1988, S. NESER (holotype female in dorsal position together with one laterally positioned female on one slide, and 17 slides each with a number of specimens).

Relation to host. Found in gland cavities on leaves, but causes no apparent damage.

Floracarus Keifer

*Floracarus* Keifer, 1953: 69

Type-species: *Floracarus calonyctionis* Keifer

According to NEWKIRK & KEIFER (1975), *Floracarus* is distinguished by the following characters: prodorsal shield with a short lobe; prodorsal tubercles on rear shield margin, directing dorsal setae divergently posteriad; forecoxae fused medially; foretibiae fused with tarsi. When describing *Floracarus*, KEIFER (1953) mentioned that this genus closely resembles *Nothopoda* KEIFER (1951). Subsequently, the distinction between *Floracarus* and *Nothopoda* has become increasingly unclear as illustrated by the following three examples: 1. KEIFER (1953) considered the location of the foreclaws on the inner side of the tarsi as a diagnostic character of *Floracarus*. However, KEIFER (1974) described *F. cyphomandrae* as having foreclaws (solenidia) in the normal dorsal position, like species of *Nothopoda*. 2. NEWKIRK & KEIFER (1975) separated *Nothopoda* and *Floracarus* on the basis of “no appreciable projection” or “a short projection” over the rostrum. However, MOHANASUNDARAM (1979, 1981) described four new species of *Floracarus* without any anterior shield lobe. 3. According to KEIFER (1951), the prodorsal shield setae of *Nothopoda* are directed caudolaterally while KEIFER (1953) described the dorsal setae of *Floracarus* as directed divergently posteriad. Later, NEWKIRK & KEIFER (1975) stated that the dorsal setae of *Nothopoda* project upwards. In the type-species, *N. rapaneae* Keifer and *N. doreste* Keifer, the dorsal setae project more posteriorly.

Judging from the above-mentioned information the true identity of these two genera is not always clear. Taking the type species of these genera in consideration the main difference between *Floracarus* and *Nothopoda* seems to be the position of the solenidion on tarsus I. In *Floracarus* this solenidion is transposed to the inner side of tarsus I, whereas in *Nothopoda* it is in the normal dorsal position. The following additional characters will serve to supplement the feature of a laterally situated solenidion on tarsus I: body vermiform or fusiform; prodorsal shield lobe absent or present; prodorsal tubercles on, near or ahead of rear shield margin, directing dorsal setae dorsad, posteriad or laterad; tergites and sternites equal or differentiated dorsoventrally; 1st coxal plates fused; 1st setiferous coxal tubercles absent; legs with tibiae absent or much reduced.

*Floracarus oxyanthi* sp. nov.

(Figs. 8-14)

A distinctive species based on its prodorsal shield design, virtually unornamented genital coverflap, absence of a forefemoral setae on leg I, 5-rayed empodial featherclaws and the presence of a few spinules around 3rd coxal tubercles and on femur I.

Female. Dimensions (n = 8): length 198-214; breadth 69-72; body fusiform; rostrum 19-22 long, curved ventrad; prodorsal shield (Fig. 8) semicircular; shield design consists of double lines; median and complete admedian lines connected by three transverse lines, forming a reticulated pattern medially;
Fig. 8-14. Floracarus oxyanthi sp. nov., female.
of dorsal tubercles, rest of shield smooth; dorsal tubercles 32-35 apart, ahead of rear shield margin, directing dorsal setae (19-22) posteriad; opisthosoma with 40-45 annuli; microtubercles (Fig. 9) on tergites faint, elongate, slightly acuminate basally and slightly extending over rear annular margins; microtubercles on sternites (Fig. 9) spinous and ahead of rear annular margins; lateral setae on about 5th annulus, 20-22 long; 1st ventral setae on about 13th annulus, 50 long; 2nd ventral setae on about 26th annulus, 41-47 long; 3rd ventral setae on about 7th annulus from rear, 16 long; accessory setae absent; coverflap (Fig. 10) of gonopore virtually smooth, except for faint granules anteriorly; genital setae 9 long; internal genitalia as depicted in Fig. 11.

Legs. Legs I (Fig. 12) 22-23 and legs II (Fig. 13) 19-22 long; coxal plates (Fig. 10) spinulate, with those on posterior plates immediately surrounding 3rd setiferous coxal tubercles; 1st coxal setae absent; 2nd coxal setae 13 long; 2nd setiferous coxal tubercles ahead of a transverse line through 3rd tubercles; sternal line absent; empodial featherclaw (Fig. 14) 5-rayed, equal in length to solenidia on tarsi; solenidion on tarsus I on inner side of tarsus, but solenidion on tarsus II in normal dorsal position; femur I without a seta, but with a few spinules; tarsus II with 2 setae; tibiae of both legs absent.

Male. Unknown.

Type data. SOUTH AFRICA, Northern Transvaal Province: ex Oxyanthus speciosus DC. (Acanthaceae), wild loquat, Sekororo, south east of Penge, 8 March 1992, S. Nesser (holotype female in dorsal position and one laterally placed paratype female on one slide plus 5 slides each with 2-3 paratype specimens).

Relation to host. Found in hairy glandular pockets, but cause no apparent damage.

**Floracarus tiliaceus** sp. nov.

(Figs. 15-19)

The prodorsal shield pattern resembles those of *F. calonyctionis* Keifer and *F. sivakumarii* Mohanasundaram but as in the latter species the prodorsal shield of *F. tiliaceus* is not granulated and an anterior shield lobe is absent. From both species *F. tiliaceus* differs in the ornamentation of the coverflap of the gonopore, which consists of granules anteriorly and 14 short longitudinal markings posteriorly. It further differs from *F. calonyctionis* in that the femora and trochanters are not granulated and from *F. sivakumarii* in that the lateral shield margins are not granulated and the 1st ventral setae are longer (57-60 long for *F. tiliaceus* as opposed to 42 long for *F. sivakumarii*).

Female. Dimensions (n = 8): length, 161-195; breadth 74-88; body fusiform; rostrum 17-22 long, curved ventrad; prodorsal shield (Fig. 15) semicircular, without an anterior lobe; shield design consists of double lines, forming a network; dorsal tubercles 32-33 apart, close to rear shield margin, directing dorsal setae (6-9) convergently to rear; opisthosoma with 51-55 microtuberculcate annuli; microtubercles (Fig. 16) elongate, on annular margins of tergites and ahead of annular margins of sternites; lateral setae on about 7th annulus, 25-28 long; 1st ventral setae on about 17th annulus, 57-60 long; 2nd ventral setae on about 29th annulus, 8-9 long; 3rd ventral setae on about 8th annulus from rear, 19 long; accessory setae absent; coverflap (Fig. 17) of gonopore granulated anteriorly and with 14 short lines caudally; genital setae 8-9 long.

Legs. Legs I (Fig. 18) 25-27 and legs II 22-25 long; coxal plates (Fig. 17) spinulate; 1st coxal plates fused medially; 1st setiferous coxal tubercles absent; 2nd coxal setae 11-13 long; 2nd setiferous coxal tubercles ahead of a transverse line through 3rd tubercles; empodial featherclaws (Fig. 19) 4-rayed, 6 long, slightly longer than solenidia (4-5) on tarsus I and slightly shorter than solenidion (8) on tarsus II; solenidion on tarsus I transposed to lateral side of tarsus II; solenidion on tarsus I transposed to lateral side of tarsus I; tibiae I and II absent.

Male. Length 170-176; breadth 63-66; dorsal setae 6 long; lateral setae 25 long; 1st ventral setae 44 long; 2nd ventral setae 6 long; 3rd ventral setae 19 long; genitalia 13-16 long and 16-17 wide; genital setae 9 long.

Type data. SOUTH AFRICA, Gauteng: ex Grewia occidentalis L. (Tiliaceae), Cross-berry, Pretoria, 17 March 1990, S. Nesser (dorsally positioned holotype, one paratype female, one paratype nympha and a specimen of another genus on one slide plus 13 slides, each with a number of paratype specimens).

Relation to host. A leaf vagrant.
Floracarus transvaalensis sp. nov.
(Fig. 20-25)

This species resembles *F. pollachiensis* Mohanasundaram most closely, especially in the reticulated prodorsal shield pattern and the smooth tergites on the opisthosoma. However, *F. transvaalensis* differs as follows: sternal microtubercles elongate, spinulose on lateral sides of venter but being smaller, spinulate and sparsely distributed in medioventral area between ventral setae; 2nd coxal plates spinulate immediately around 3rd setiferous coxal tubercles; cover flap of gonopore spinulate anteriad and virtually smooth posteriad; 1st ventral setae are longer (44-49 long for *F. transvaalensis* as opposed to 25 long for *F. pollachiensis*).
Figs. 20-25. *Floracarus transvaalensis* sp. nov., female.

Female. Dimension (n = 6): length 142-166; breadth 60; body fusiform; rostrum about 16 long, curved ventrad; prodorsal shield (Fig. 20) semicircular, with a small rounded lobe anteriorly; shield design a median network of strong lines, formed by complete median and admedian lines, which converged anteriorly, connected to median line by three transverse lines, submedian lines from about anterior third of admedians arcing laterad, forming incomplete reticulations anteriad of dorsal tubercles, shield otherwise smooth; dorsal tubercles, 25 apart, ahead of rear shield margin, projecting dorsal setae (9-13 long) up and laterad; opisthosoma with 43-52 annuli, with tergites smooth; sternites with elongate, and sharply pointed microtubercles laterally and with smaller, spinous microtubercles in medioventral area between ventral setae, where they are sparsely distributed; microtubercles on or slightly ahead of rear annular margins (Fig. 21); opisthosoma with a short trough dorsally, stretching from rear shield margin to about 13th tergite; lateral setae on about 5th annulus, 19-22 long; 1st ventral setae on about 15th annulus, 44-49 long; 2nd ventral setae on about 27th annulus, 6-9 long; 3rd ventral setae on about 8th annulus from rear, 16-18 long; accessory setae absent; coverflap (Fig. 22) of gonopore spinulate anteriorly; genital setae 9 long; internal genitalia as depicted in Fig. 23.

Legs. Legs I (Fig. 24) 21-22 and legs II 19-20 long; coxal plates (Fig. 22) spinulate, those on 2nd coxal plate confined to area around 3rd coxal tubercles; 1st pair of coxal setae absent; 2nd coxal setae 9 long; 2nd setiferous coxal tubercles ahead of a transverse line through 3rd tubercles; sternal line absent, 1st coxal plates fused mediadly; empodial featherclaw (Fig. 25) 4-rayed, subequal in length to solenidia on tarsi I and II; solenidion on tarsus I transposed to lateral side of tarsus; tibiae absent.

Male. Length 134-145; breadth 44-50; dorsal setae 9 long; lateral setae 16 long; 1st ventral setae 38 long; 2nd ventral setae 6 long; 3rd ventral setae 14 long; genital setae 8 long; genitalia 13 long and 19 wide.

Type data. SOUTH AFRICA, Gauteng: ex Rhoicissus tomentosa (Lam.) Wild & Drummond (Vitaceae), Common forest grape, Pretoria, 29th March 1990, S. NESER (holotype female in dorsal position and one laterally placed paratype female on one slide); Rhus chiridensis Bak. F. (Anacardiaceae), Red currant, Pretoria, 29th March 1990, S. NESER (8 slides each with a number of paratype specimens).

Relation to host. Found amongst bracts in growth tips and buds of Rhoicissus tomentosa; associated with Aculops sp. These mites were leaf vagrants on Rhus chiridensis and found in association with Calacarus sp., which caused purplish leaves.

Neofloracarus Abou-Awad & El-Banhawy


Type-species: Neofloracarus guajavae Abou-Awad & El-Banhawy.

This genus is closely related to Disella Newkirk & Keifer in having a sternal line, but is differentiated only by the circular prodorsal shield, with the dorsal setiferous tubercles about in the middle of the shield; the dorsal setae are directed dorsad; shield design and tubercles encircled by a smaller circle. However, the validity of this genus still needs to be proved by the description of more species.

Neofloracarus guajavae Abou-Awad & El-Banhawy


This species can be recognised by its circular dorsal shield with the dorsal tubercles situating in the middle, directing dorsal setae upwards and mediad, the latter and the median and admedian lines, transversely connected by two lines, are encircled. Other diagnostic characters are: sternal line present; 1st setiferous coxal tubercles absent; opisthosoma with the normal compliment of setae; legs without tibiae; tarsus II with only one seta; solenidion on tarsus I in normal dorsal position.

Host and distribution. ABOU-AWAD & EL-BANHA (1992) described this species from Psidium guajava L. (Myrtaceae), Nairobi, Kenya.

Relation to host. Vagrants on lower surfaces of leaves, causing russeting.
Figs. 26-30. *Notopoda natalensis* sp. nov., female.

Nothopoda Keifer

Nothopoda Keifer, 1951: 96.

Type-species: Nothopoda rapaneae Keifer.

Nothopoda is very similar to Floracarus, but as pointed out under the latter genus Nothopoda can be separated from Floracarus by the solenidion on tarsus I which is situated in the normal dorsal position. Additional characters of Nothopoda are: body vermiform or fusiform; prodorsal shield lobe present or absent; dorsal tubercles near or ahead of shield margin, directing dorsal setae up, laterad, posteriad or anteriad; opisthosoma with tergites and sternites subequal dorsoventrally; sternalline absent; 1st setiferous coxal tubercles absent.

Nothopoda natalensis sp. nov.
(Figs. 26-30)

The genital coverflap which is granulate anteriorly and with longitudinal markings posteriorly should serve to distinguish N. natalensis.

Female. Dimensions (n =6): length 169-186; breadth 49-57; body fusiform; rostrum 19-21 long, projecting ventrad at a slight obtuse angle; prodorsal shield (Fig. 26) subsemicircular, with a short, broadly rounded, anterior lobe; median and admedian lines complete; admedians sinuate, diverging at rear shield margin; diagonal lines present between main lines at middle and anterior and posterior quarter of shield; 1st and 2nd submedian lines united at about anterior quarter of shield forming a fork anteriorly and posteriorly; shield also covered with granules; dorsal tubercles, about 16 apart, slightly ahead of rear shield margin, directing dorsal setae (9-12) posteriad; opisthosoma with 65-71 microtuberculate annuli; microtubercles (Fig. 27) rectangular, slightly acuminate basally, on or slightly ahead of rear annular margins; lateral setae on about 8th annulus, 13-17 long; 1st ventral setae on about 22nd annulus, 36-40 long; 2nd ventral setae on about 37th annulus, 4-6 long; 3rd ventral setae on about 6th annulus from rear, 14-20 long; accessory setae minute; genital coverflap (Fig. 28) of gonopore with 10-13 longitudinal markings and area immediately anterior to it granulate; genital setae 6-9 long.

Legs. Legs I (Fig. 29) 25-27 and legs II 22-25 long; femora of both legs with minute spinules; coxae (Fig. 28) granulate; 1st setiferous coxal tubercles absent; 2nd pair of tubercles well ahead of a line through 3rd pair of tubercles; 2nd pair of coxal setae 17-19 long; empodial featherclaw (Fig. 30) 4-rayed, slightly shorter than 1st and 2nd knobbed claws.

Male. Similar to female, except for genitalia.

Type data. SOUTH AFRICA, Kwazulu/Natal: ex Aspilia natalensis (Sond.) Wild (Asteraceae), Amatikulu Nature Reserve, near Gingindluvu, 27 November 1986, C. CRAEMER (holotype female in dorsal position together with a number of paratype specimens on one slide, and 10 slides each with a number of paratype specimens.

Relation to host. Found in pale, adaxial, domeshaped leaf galls in vein axils, being hairy underneath.

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References


