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Two new species and one new subspecies of the genus *Neotetracopus* FAIN, 1969 (Glycyphagidae: Sarcoptiformes) from Old World Insectivores

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(With 15 figures)

In former studies on phoretic hypopes from mammals FAIN (1969 a, b) erected the genus *Neotetracopus* with species *tonkinensis* from *Neotetracus sinensis fulvescens* and *Hylomys suillus* and *africanus* from an unidentified *Crocidura* from the Ivory Coast. In observing alcohol preserved hosts in museal collections the senior author discovered further species of the genus, which are described here. Species of genus living pilicolous but half hidden in follicles, seem to represent a link between *Orycteroxenus* and genera of subfamily Metalabidophorinae. Genus *Neotetracopus* is probably a temporary systematical group that will be split when more new species will become discovered. A new definition, based on the known species is given here.

Neotetracopus FAIN, 1969

Neotetracopus FAIN, 1969 a: 412

Neotetracopus FAIN, 1969 b: 131

Definition: Up to now restricted to hypopes. Well developed pilicolous organ with two pairs of functional claspers. Sejugal and posterior furrow present. Lateral sides of opisthosoma with strong protrusions. Posterior edges or lateral sides of pilicolous organ with distinct lateral hooks, partly also with anterior lateral hooks. Forwards directed protrusions on trochanters III and IV. Lateral hooks of coxae IV may be present. Epimerites IV may be rising from ventral surface, clasping the

hair of host. Genital suckers with conical internal part directed outwards or backwards. Genital flaps with genital median setae dislocated to epimerites IV. Epimerae I in Y-shape partially sclerotized. Coxal fields III and IV can be closed. Two pairs of palposoma setae and short solenidia *alpha*. Legs I and II with short praetarsus and sickle-shaped claws, legs III variable, legs IV without praetarsus and short claw. Chaetotaxy: *v i*, *v e*, *sc i*, *sc e*, *h*, *sh*, dorsals 1—5, laterals 1—5, *g a*, *g m*, supracoxal setae; coxal setae not observed. Legs: tarsi 8—8—8—8, tibiae 2—2—1—1, genua 2—2—1—0, femora 1—1—0—1, trochanters 1—1—1—0. Solenidiotaxy: tarsi 2—1—0—0, tibiae 1—1—1—1, genua 1—1—0—0. Famulus present. Tibial setae III and IV and genual setae III may be specialized.

Laterals 4 in front of posterior furrow (Asian species) or on opisthosomal part (in African species), *d 2* near sejugal furrow (in African species) or near posterior furrow (Asian species). Opening of dorsal gland variable.

Key to the hypopes of genus *Neotetracopus* FAIN, 1969

1. Laterals 4 in front of posterior furrow, epimerites IV projecting from ventral surface, acting for hair claspers, dorsals 2 in posterior part of metapodosoma. Asian species. 2
 Laterals 4 behind posterior furrow, epimerites IV not projecting from ventral surface, dorsals 2 in anterior part of metapodosoma near sejugal furrow. African species. 4
2. Tibial setae III broad and smooth, genual setae III simple, dorsal glands between laterals 1 and 2. 3
 Tibial setae III dentated, genual setae III modified, dorsal glands open in front of laterals 1 near sejugal furrow
 *N. carinensis* spec. nov.
3. Trochanter setae I 8 μ , phi I 15 μ , ventral hair on tarsus I spinelike
 *N. echinosorex* spec. nov.
 Trochanter setae I 18 μ , phi I 26 μ , ventral hair on tarsus I setiform
 *N. tonkinensis* FAIN, 1969
4. Palposoma setae very short, vertical setae and anterior setae of genua and tibiae I and II simple, claw III small and one-pointed
 *N. africanus* FAIN, 1969
 Palposoma setae 8—9 μ , verticals and tibial and genual setae I and II serrated, claw III broad and two-pointed
 *N. africanus schliemannii* subsp. nov.

1. *Neotetracopus echinosorex* spec. nov.

Hypopus (holotype): Mites of ovoid shape with medium sclerotization of yellow-brown colour. Length 243 μ , in 10 paratypes measured average is 255 μ (240—267), with 171 μ , in paratypes average 176 μ (159—195).

Venter (fig. 1): Epimerae I fused in Y-shape, coxal fields III and IV closed, epimerites II very long, running down to genital flaps. Epimerae IV with strong sclerotized pointed lateral hooks. Palposoma with short solenidia *alpha* and two pairs of weak setae, anterior border not marked. Pilicolous organ well developed and well sclerotized. Voles with strong lateral hooks running beyond posterior border. Lateral hooks unusually situated on sides of voles, not on posterior edges. Ventral surface of voles with three distinct longitudinal striations, inner surface with 6—7 transverse striations. Inner claspers 18 μ long with 10—11 ridges, outer claspers 20 μ long with 9—10 ridges. Genital suckers long, apparently

two-segmented, directed outwards to epimerites IV. Genital flaps near epimerites IV arising from ventral surface and acting in clasping the hair of host together with epimerites IV. Large anal pore with a pair of lateral rings in front of inner claspers.

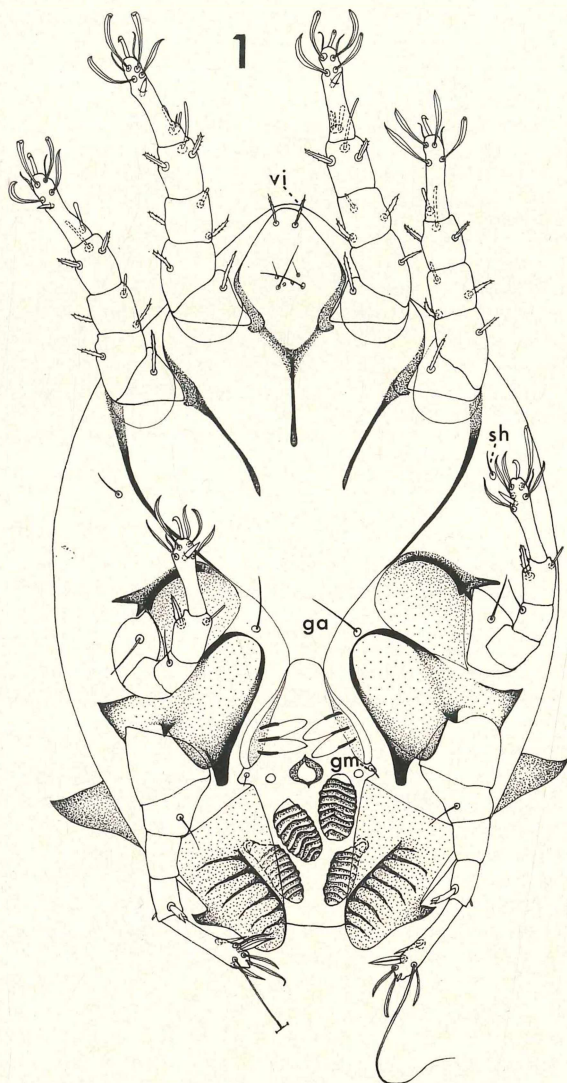
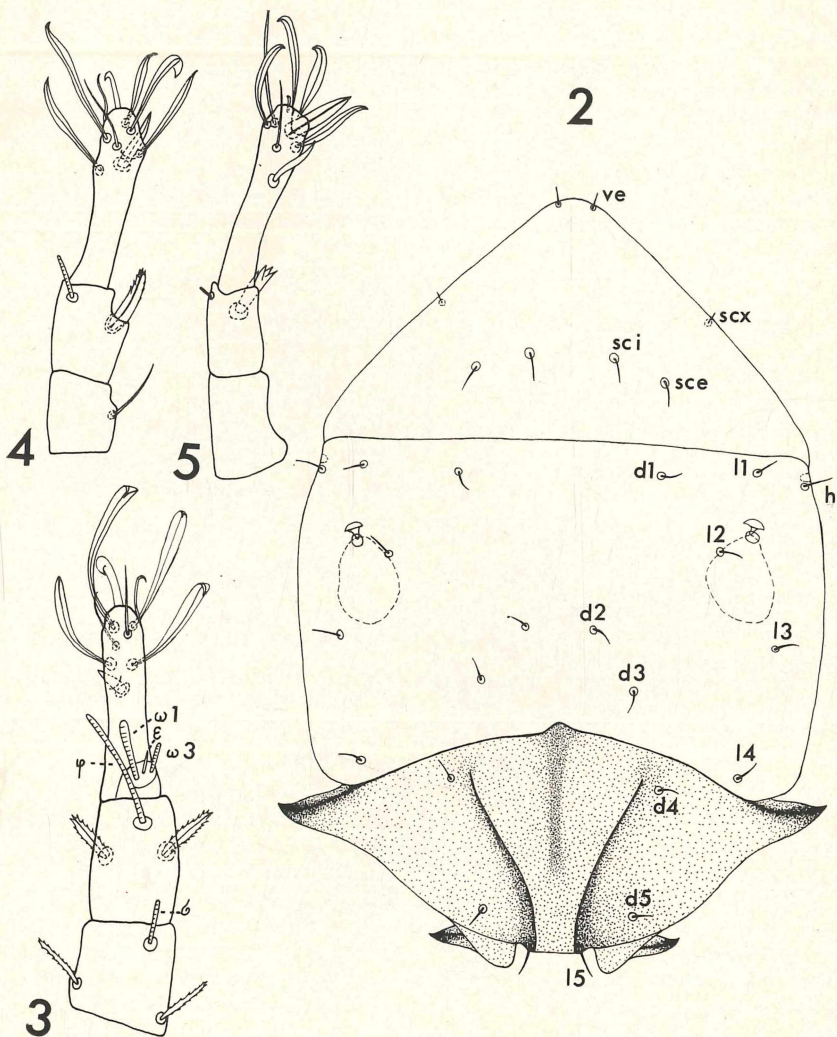


Fig. 1: *Neotetracopus echinosorex* spec. nov., holotype venter.

Legs (fig. 3—5): Chaetotaxy and solenidiotaxy like in definition of genus. Legs I—III with short praetarsus and sickle-shaped claw $10\ \mu$ in legs I and II, $9\ \mu$ in legs III. Legs IV apparently without praetarsus and $3\ \mu$ small claw. Trochanter III and IV with broad rounded protrusions.



Figs. 2—5: *Neotetracopus echinosorex* spec. nov., holotype dorsum (fig. 2) Legs I, III and IV (figs. 3—5)

Tibial seta III broadened with rounded point, tibial seta IV flattened with dentated point.

Dorsum (fig. 2): Sejugal and posterior furrow distinct. Opisthosoma with long and strong sclerotized lateral protrusions, acting as attaching organs in outermost part of hair follicle of host. Dorsal glands with marked pores between laterals 1 and 2. Idiosomatal setae setiform and short. Laterals 4 unusually in front of posterior furrow. Supracoxal setae very short. Measurements in table I.

Host and locality: *Echinosorex gymnurus*, trapped near Indragiri, Sumatra on 11 November 1916 by FRITSCHÉ. Host in collection of Forschungsinstitut und Museum Senckenberg, Frankfurt, coll. n° 32 469. Mites were found attached to hairs of host, partly with opisthosoma within hair follicle. They seem to prefer lateral sides of host.

Deposition of specimens: Holotype in Forschungsinstitut Senckenberg, Frankfurt; Paratypes (29) in US National Museum Natural History, Washington, D. C.; The Acarology Laboratory, Ohio State University, Columbus, Ohio; Field Museum of Natural History, Chicago; Museum National d' Histoire Naturelle, Paris; British Museum (Natural History), London; Zoologisches Institut und Zoologisches Museum, Hamburg; Institute of Parasitology, Academy of Sciences, Prague; Institut de Médecine Tropicale Prince Léopold, Antwerpen; Department of Zoology, Cath. Univeresity of Nijmegen.

2. *Neotetracopus carinensis* spec. nov.

The species is closely related to *N. tonkinensis*.

Hypopus (holotype): Cuticle medium sclerotized of yellow colour. Stronger sclerotized parts with white spots. Length 236 μ , in 10 paratypes measured the average is 235 μ (224—248), width 165 μ , in paratypes 172 μ (165—189).

Venter (fig. 6): Well sclerotized epimerae I fused in Y-shape, coxal fields III and IV strongly sclerotized. Palposoma without distinct anterior markation with two pairs of long setae and very short solenidia *alpha*. Pilicolous organ like in *N. echinosorex* with strong chitinized white spotted volets with posterior and lateral hooks, inner claspers 20 μ long with 9 ridges, outer claspers 7 μ long with 8 broad ridges. Genital flaps with genital median setae displaced to sides of epimerites IV. Anal pore with two pairs of small rings in front of inner claspers. Genital suckers with long cones directed lateral. Legs (fig. 13—15) with chaetotaxy and solenidiotaxy like in *N. sinensis*. Protrusions on trochanters III and IV less pointed, but well sclerotized. Specialized setae on tibiae I—IV, genua I—III and femora I and II deeply inserted, thick with few, but short and strong dentations.

Dorsum (fig. 7): Sejugal furrow distinct dorsally, not passing to venter. Opisthosomal shield strongly sclerotized with strongly pointed lateral projections. Two sickle shaped strong ridges dorsally on posterior part of this shield. All idiosomatal setae present in form of short, strong setae with tiny barbs. Dorsals 2 displaced unusually far backwards

behind level of dorsals 3. Laterals 4 in front of posterior furrow. Opening of dorsal glands near sejugal furrow. Pores behind l 4. Measurements in table I.

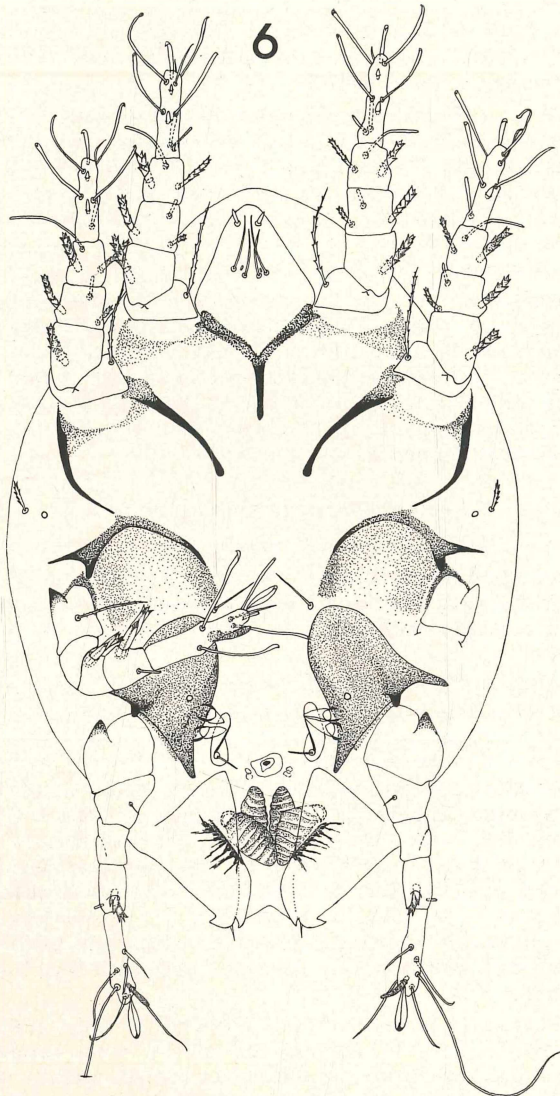


Fig. 6: *Neotetracopus carinensis* spec. nov., holotype venter.

Host and locality: *Talpa leucura*, trapped by FEA 1885—1889 on Mt Carin in Birma. Host in collection of Zoologisches Museum Hamburg, coll. n° 4143. Mites were found half hidden in hair follicles on venter of abdomen.

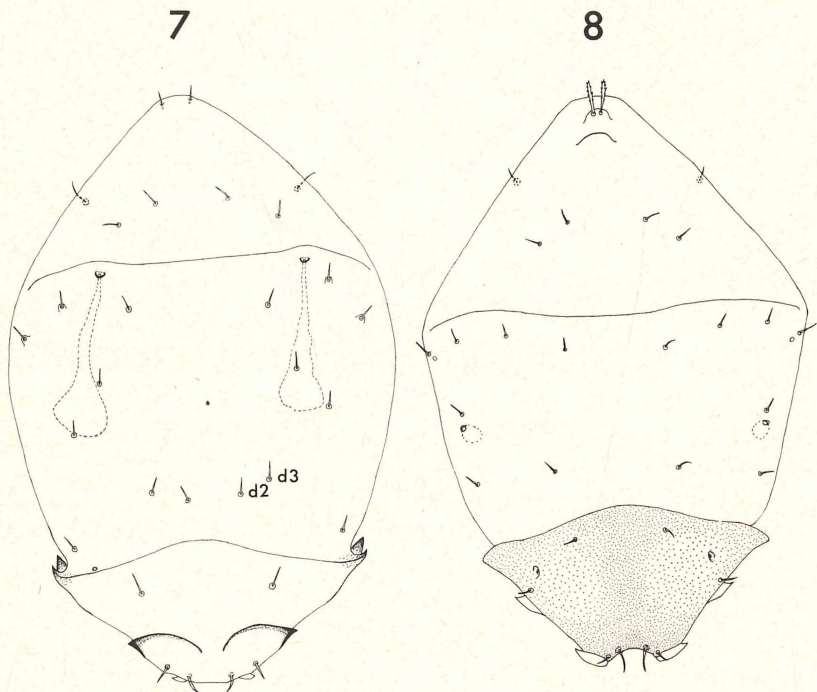
Deposition of specimens: Holotype in Zoologisches Institut und Museum Hamburg. Paratypes (10) in Washington, Antwerpen and Nijmegen.

3. *Neotetracopus africanus schliemannii* ssp. nov.

Specimens from an unidentified *Crocidura* from Blantyre, Nyasaland need separation from the nominal species, collected from an unidentified *Crocidura* from Ivory Coast.

Hypopus (holotype): length 197 μ , in 10 paratypes measured 194 μ (186—205), width 145 μ , in paratypes 140 μ (128—151). Cuticle less sclerotized than in species mentioned above. Mites of pale yellow colour.

Venter (fig. 9): Epimerae I fused in long Y-shape, only connection to trochanters and sternum part well sclerotized. Coxal fields III and IV are



Figs. 7—8: Dorsum of *Neotetracopus carinensis* spec. nov. (7) and of *Neotetracopus africanus schliemannii* ssp. nov. (8).

not closed. Palposoma not indicated, with two pairs of setiform 8–9 μ long setae and a very short solenidia *alpha*. Pilicolous organ functional and well formed. Voles with strong sclerotized pointed anterior hooks, weak posterior median and strong posterior lateral hooks. Inner claspers

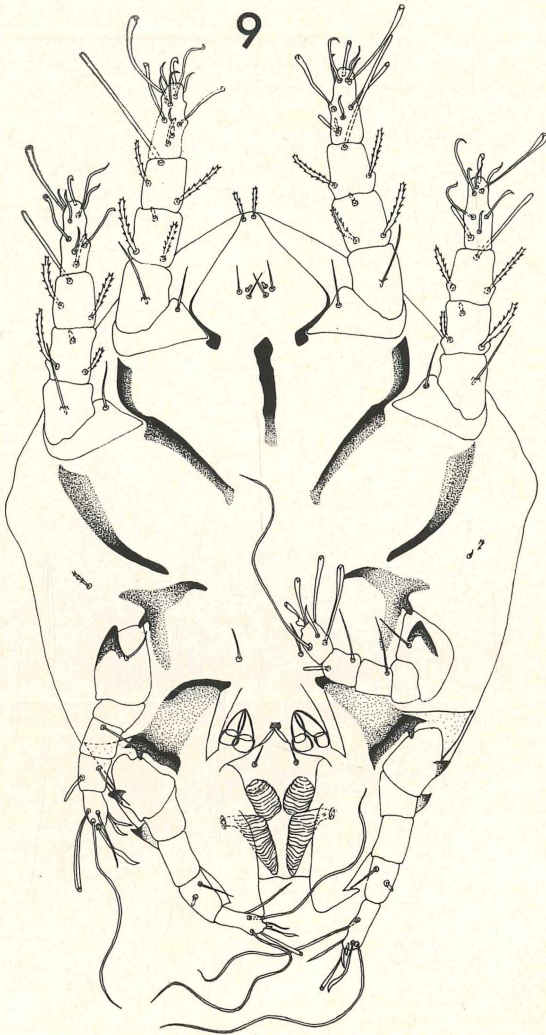
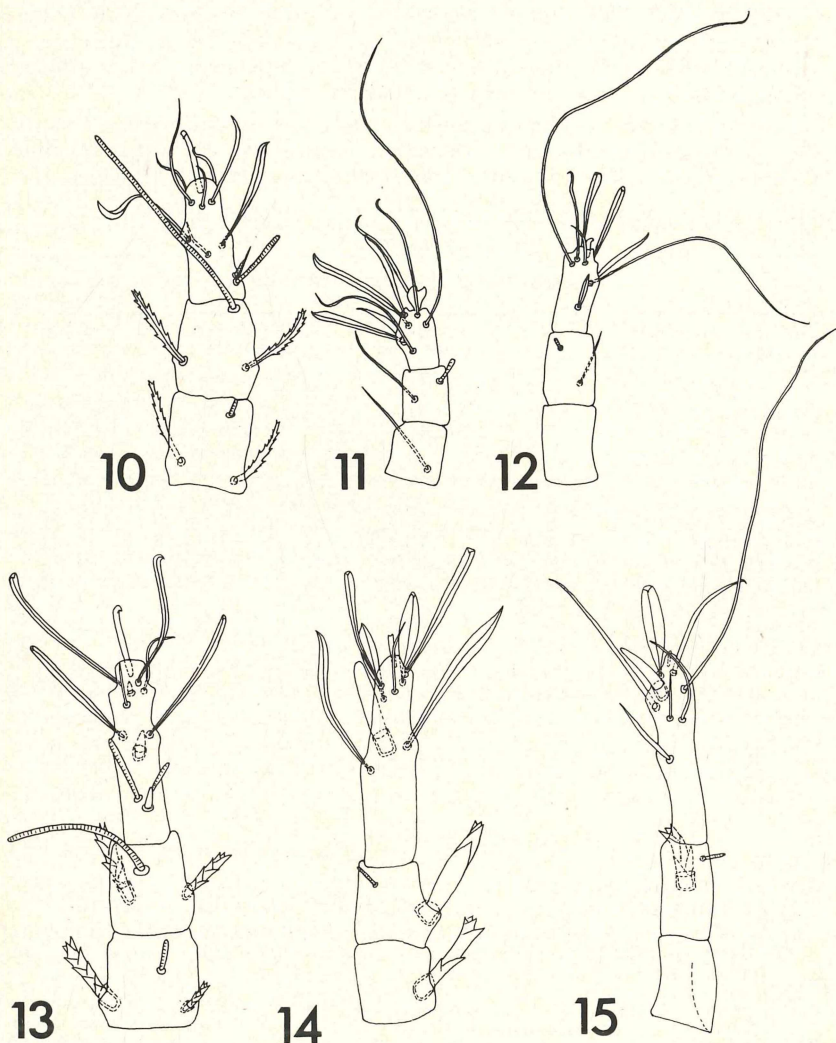


Fig. 9: *Neotetracopus africanus schliemannii* ssp. nov., holotype venter.

with 9—11, outer claspers with 11—13 ridges. Legs (fig. 10—12) in chaetotaxy and solenidiotaxy like typical species. Trochanters III and IV with strong pointed protrusions. Claws on leg III broadened and two-pointed. Specialized setae absent.



Figs. 10—15: Legs I, III and IV of *Neotetracopus africanus schliemannii* ssp. nov. (10—12) and of *Neotetracopus carinensis* spec. nov. (13—15).

Dorsum (fig. 8): Sejugal furrow present, not running to venter. Posterior furrow separates strongly sclerotized opisthosoma from weakly sclerotized podosomal part. Lateral edges of opisthosomal shield rounded. Full idiosomatal setation present; with exception of serrated verticals and subhumeral all setae are simple and short. Small dorsal gland between laterals 2 and 3, pores between dorsals and laterals 4.

Host and locality: On *Crocidura* spec., trapped by K. FRICKE on 29 September 1908 near Blantyre, Nyasaland. Host in collection of Zoologisches Museum Hamburg, coll. n° T 135. Mites were found attached to base of hairs in ventral region of abdomen of host.

Deposition of specimens: Holotype in Zoologisches Institut und Zoologisches Museum Hamburg; paratypes (60) in Columbus, Chicago, Paris, London, Prague, Frankfurt, Antwerpen and Nijmegen.

Table I. Measurements in hypopes of genus *Neotetracopus* FAIN, 1969 (in microns)

	<i>tonkinensis</i>	<i>echinosorex</i>	<i>carinensis</i>	<i>africanus</i>	<i>africanus</i> <i>schliemannii</i>
<i>ve, vi</i>	4—4	4—8	5—5	3—3	10—9
<i>sc e, sc i</i>	5—5	7—7	4—4	3—3	6—6
dorsals 1, 2, 3	5—6—6	5—5—5	5—5—6	3—3—3	5—5—5
4, 5	5—10	5—6	6—8	3—6	5—7
laterals 1, 2, 3	5—4—5	5—5—5	5—5—5	3—3—3	4—4—4
4, 5	5—5	5—5	5—6	3—3	4—4
<i>palposoma setae</i>					
intern, extern	13—14	4—8	14—20	2—2	8—9
alpha	1	1	2	1	2
trochanter setae I, II	18—13	8—9	27—26	10—10	12—12
femora I, II	8—9	7—6	14—13	14—14	17—18
omega 1, 3	9—6	8—5	11—6	8—2	9—3
phi I, II	26—20	15—13	29—23	38—27	36—19
III, IV	4—2	7—2	5—3	7—1	5—2
sigma I, II	6—6	6—6	5—8	5—5	4—4
<i>length</i>					
tarsus I, II	24—22	27—23	28—27	21—18	21—20
III, IV	19—19	23—26	33—29	12—15	12—15
clasper intern, extern	13—17	18—20	20—15	16—27	20—7
claws I, II	9—9	10—10	12—12	10—10	12—11
III, IV	4—4	9—3	6—3	3—2	4—4

References

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