Koleopterologische Rundschau	65	149 - 157	Wien, Juni 1995

Rudielmis gen.n. from South India (Coleoptera: Elmidae)

M.A. JÄCH & D.S. BOUKAL

Abstract

A new genus and two new species of Elmidae (*Rudielmis* gen.n., *Rudielmis schuhi* sp.n. and *R. concolor* sp.n.) from South India are described.

Key words: Dryopoidea, Elmidae, *Rudielmis*, new genus, new species, South India

Introduction

So far, the Elminae of South India are very poorly known. Only seven species have been described, one by GROUVELLE (1911), five by CHAMPION (1923) and one by BROWN & THOBIAS (1984). No revisions of the (South) Indian Elmidae were published so far.

This poor knowledge strongly contrasts the fact that South India and Sri Lanka harbour an unusually interesting Elmid fauna, including several endemic genera. South India and Sri Lanka are part of the old Gondwana continent and are thus geologically and zoogeographically more closely linked with Africa and Madagascar than with other parts of Asia.

Entomological surveys carried out by R. Schuh in 1991 and by the junior author in 1993 yielded ca. 2000 individuals of Elmidae from South India. These 2000 specimens belong to approximately 11 genera and about 40 species. At least 2 of these 11 genera and almost all species are new to science.

One of these unknown genera which is represented by 2 species is described herein.

Acknowledgements

Our sincere thanks are due to R.Schuh for giving his specimens to the NMW. Furthermore, we are indebted to W. Zelenka for the habitus illustration, to P. Sehnal and F.B. Brandstetter for the SEM photographs, and to Prof. W.D. Shepard (CSUS) for critically reading the manuscript.

Methods

Specimens were examined with the following microscopes: Wild M5A stereoscopic microscope with direct lighting and Wild M10 stereoscopic microscope with diffuse lighting. Aedeagi, ovipositors and mouth parts were also examined with an Olympus BH-2 transmitted light microscope and illustrated with the aid of a drawing tube attached to the Olympus BH-2. The SEM photographs were made with a Jeol 6400 at 15 kv.

Male genitalia and ovipositors were placed in concentrated lactic acid in a cavity slide for at least several days before they were examined and photographed.

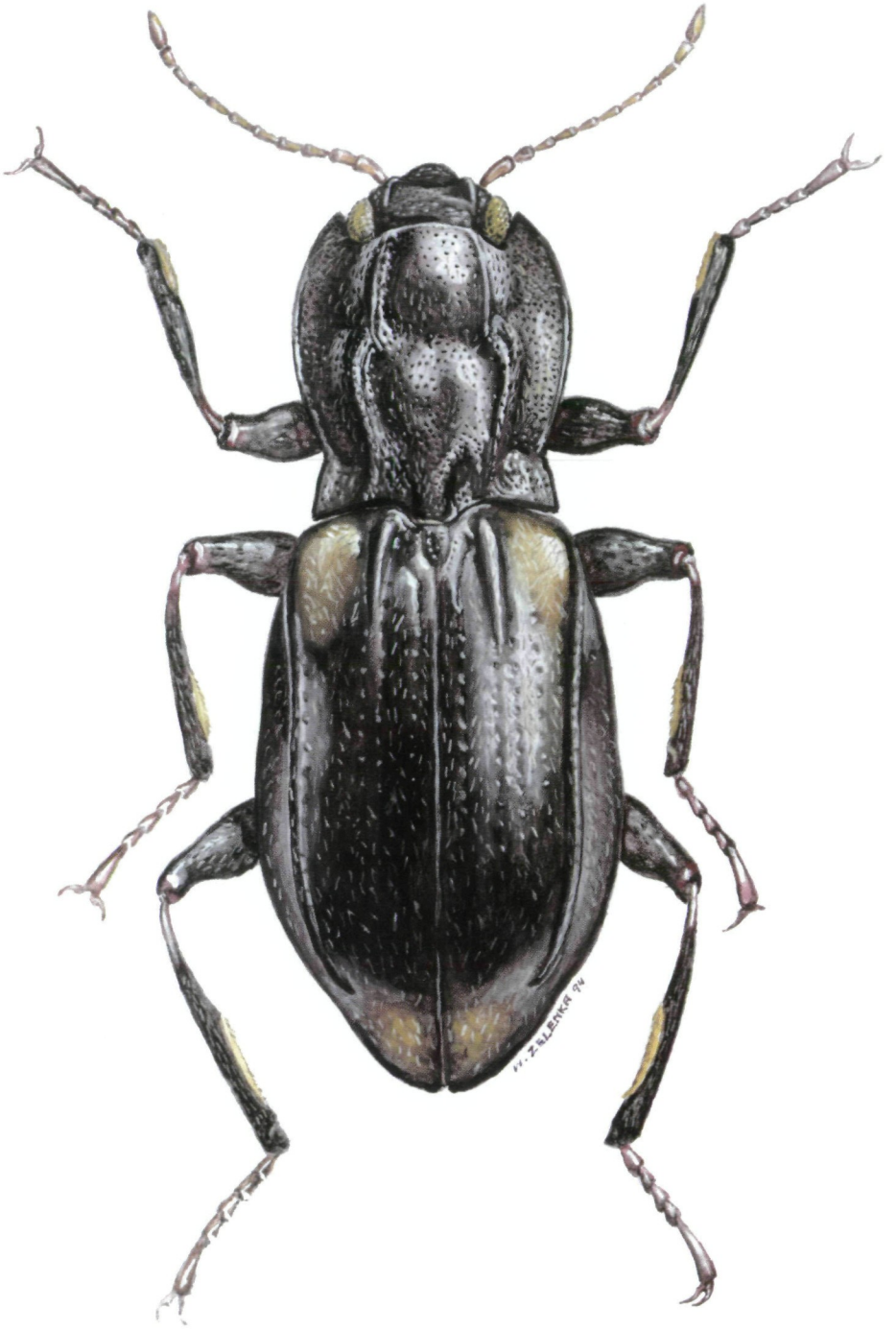


Fig. 1: *Rudielmis* gen.n. *schuhi* sp.n., habitus, paratype from Karnataka.

Acronyms

CBB	Coll. Boukal, Ceske Budejovice	NMW	Naturhistorisches Museum, Wien
CSUS	California State University, Sacramento		

Rudielmis gen.n.

TYPE SPECIES: *Rudielmis schuhi* sp.n.

DIAGNOSIS: Body form elongate. Upper surface only sparsely pubescent, plastron (Figs. 12, 13, 14, 15, 20) restricted to lower parts of head, hypomeron, lateral parts of prosternum, procoxa and profemur, metacoxa, a narrow band on the inner surface of meso- and metafemur, epipleura, metepisternum, lateral parts of metasternum and abdominal sternites.

Head partly retractable, with a short but distinct, longitudinal ridge extending from the insertion of the antennae posteriorly to at least the posterior margin of eyes (Fig. 11); antennae filiform, 11-segmented; mandible with 3 apical teeth, prostheca large and apically densely spinose (Fig. 5); maxilla as in Fig. 4, maxillary palpus short, 4-segmented, palpifer well developed; galea 2-segmented, basal segment very short, apical segment long and slender; labium as in Fig. 6, labial palpus 3-segmented, ligula very wide, more than 2 times as wide as mentum.

Pronotum approximately as wide as long, widest near middle or in anterior third; lateral margin moderately widely explanate, arcuate or nearly parallel-sided in anterior half, distinctly constricted in basal 0.2; basal margin bisinuate; anterior and posterior angles acute; disc distinctly elevated, laterally bordered by distinct sublateral carinae which are somewhat displaced near anterior 0.4; surface of disc rather uneven, with a transverse groove near anterior 0.4 and a short, longitudinal, basal, median carina.

Elytra striate punctate, ca. 2 times as long as pronotum, with 2 pairs of carinae, a short basal one on the third interval and a longer one on the seventh interval, extending from the humerus to near apex; remaining intervals flat; striae not distinctly impressed; strial punctures moderately large, becoming progressively finer toward apex; lateral margin moderately widely explanate, finely rimmed; epipleura well developed, becoming progressively narrower from base to apex. Hind wing (Fig. 7, terminology of wing venation as in BROWN 1970 and SPANGLER 1990); cubito-anal crossvein incomplete; medial vein absent before junction with radio-medial crossvein.

Prosternum (Fig. 12) distinctly produced anteriorly; prosternal process distinctly longer than broad, its margin distinctly rimmed, apically rounded. Middle of mesosternal disc (Fig. 13) anteriorly grooved for reception of prosternal process; middle of posterior half and lateral parts of middle of mesosternal disc deeply impressed. Metasternum (Fig. 13) with a row of shallowly impressed punctures along margin of mesocoxae; metasternal disc with finely impressed median suture, with a moderately large puncture near hind angles, in front of metacoxae.

Legs (Figs. 17 - 22) moderately long; metacoxae with a short longitudinal ridge and a shallow depression on each side of this ridge; all femora with a few, short, semi-erect bristles on medial surface; all tibiae with cleaning fringes (consisting of moderately long, golden hairs) and rows and groups of semi-erect bristles (smoothing setae and scraping setae sensu SPANGLER & PERKINS 1989). All tarsal claws each with one subbasal tooth.

Abdomen (Figs. 14, 15) with 5 ventrites; disc of first ventrite separated from lateral, tomented area by prominent, complete carinae.

Aedeagus (Figs. 8, 9): Penis elongate; corona present; fibula and ventral sac well developed, the latter strongly plicate and telescopic; basal lateral apophyses comparatively short. Parameres distinctly shorter than penis, without apical setae; ventro-basally connected by a sclerotized band. Phallobasis moderately large, cylindrical.

Ovipositor (Fig. 10): Terminal segment long and slender. Preterminal segment long, without

prominent spines; distal sclerite distinctly longer than proximal sclerite, mesially pubescent, apically not distinctly expanded. Basal sclerite approximately as long as preterminal segment.

DIFFERENTIAL DIAGNOSIS: *Rudielmis* gen.n. can be easily distinguished from any other genus described so far by the combination of the following characters: shape of pronotum, elytral carinae, claws. In fact, we are aware of only one (superficially) similar genus, *Unguiseta* JÄCH which is easily distinguished from the new genus, among other characters, by the presence of a pair of tubercules on the pronotum, by the long carina on the 3rd elytral interval, by the outer elytral carina being on the 5th elytral interval, by the crenulate elytral and pronotal margin, by the densely denticulate legs, by the absence of tibial cleaning fringes and by the setiferous claws.

DISTRIBUTION: So far known only from South India (Karnataka, Kerala).

ETYMOLOGY: The genus and the type species are named for our friend Rudi Schuh, ambitious Austrian amateur entomologist and superb water beetle collector.

Rudielmis schuhi sp.n.

TYPE LOCALITY: Stream, ca. 5 m wide, rather shaded, with rocky-gravelly bed, flowing through degraded primary forest with cardamom plantations, draining Kallar Valley, 15 km southwest of Munnar, Cardamom Hills, Kerala, South India.

TYPE MATERIAL: **Holotype** ♂ (NMW): "S-INDIA Kerala K1, Cardamom Hills, 15km SW Munnar, Kallar Valley 1000m \ 6.-18.12. 1993, 76°58'E 10°02'N, Boukal D.+ Kejval Z. lgt." **Paratypes** (NMW, CBC, CSUS): 17 exs., same data as holotype; 3 exs.: "S-INDIA Kerala, Cardamom Hills, 10 km SW of Kumily, Vallakadavu 1000 m \ 24.12. 1993, 77°07'E 9°31'N, Boukal D. + Kejval Z. lgt."; 20 exs.: "S-INDIA Kerala, Cardamom Hills, 300 m / 50 km NW Pathanamthitta \ 27.-29.12. 1993, 77°05'E 9°25'N, Boukal D. + Kejval Z. lgt."; 3 exs.: "INDIA: Karnataka, Jog Falls (Shimoga District), 26.9. 1991, leg.R.SCHUH".

DIAGNOSIS: Length (pronotum + elytra), 2.0 - 2.2 mm; width, 0.9 - 1.0 mm. Habitus (Fig. 1). Body form obovate.

Colour dark brown to black; mouth parts, anterior margin of labrum, antennae, knees, tarsi, a humeral patch and occasionally a subapical elytral spot paler reddish or yellowish.

Dorsal surface of head finely and superficially punctate, distinctly microreticulate. Labium approximately as long as clypeus.

Pronotum more or less heart-shaped, maximum width anterior to middle; pronotal disc sparsely to moderately densely punctate, smooth or superficially microreticulate between punctures; pronotal margin moderately densely to rugulosely punctate and microreticulate in anterior half, more sparsely punctate and usually smooth and glabrous in posterior half.

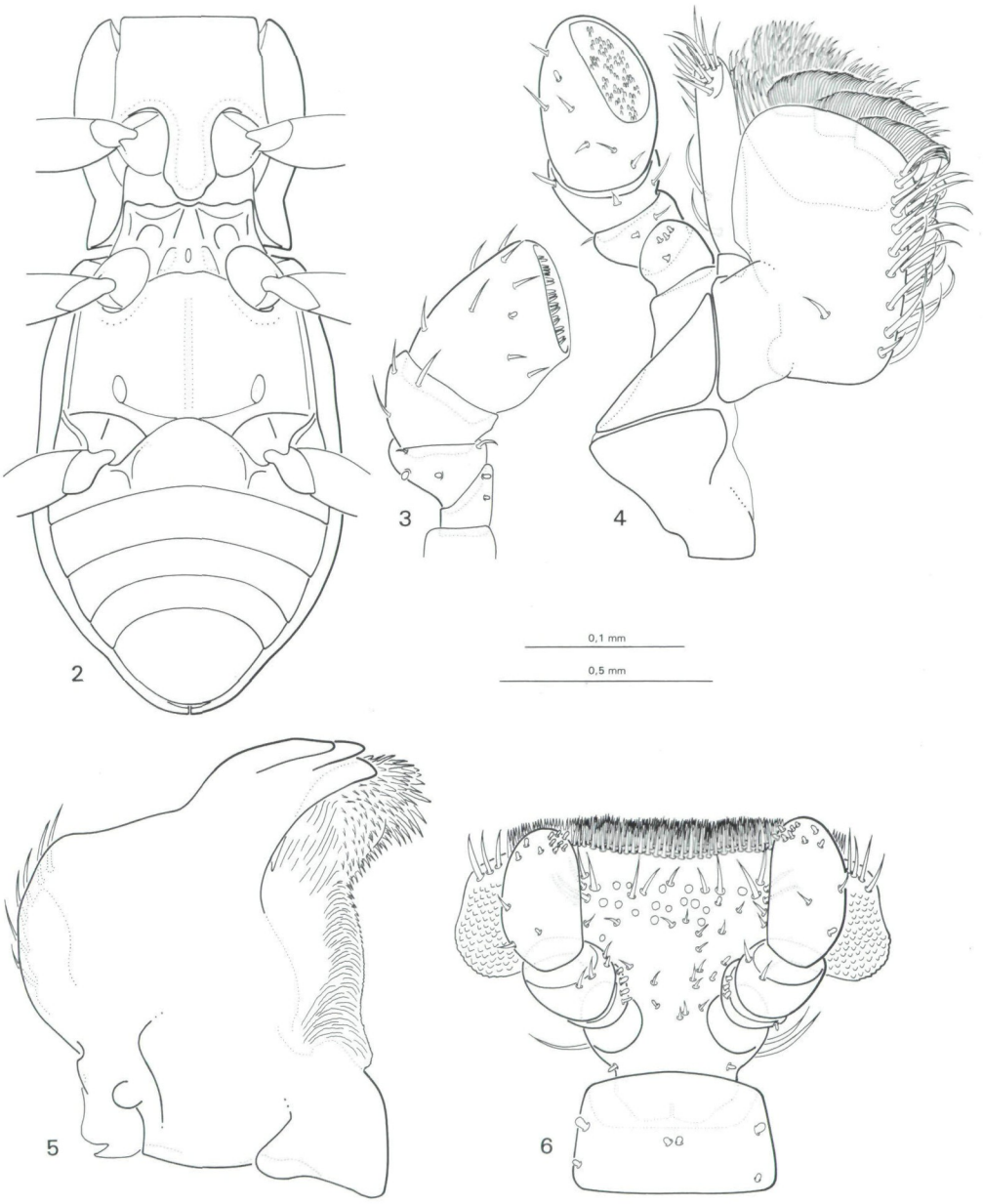
Discal elytral striae not reaching basal margin of elytra; punctures becoming gradually finer toward apex; density of strial punctures variable, but punctures of striae 1, 2 and 6 usually more closely set than punctures of remaining discal striae; intervals slightly convex (3rd) or more or less flat (remaining intervals); interval 2 being the widest, interval 6 the narrowest; all intervals smooth and glabrous, sparsely covered with fine, adpressed hairs. All specimens fully winged.

Metasternal disc more or less flat.

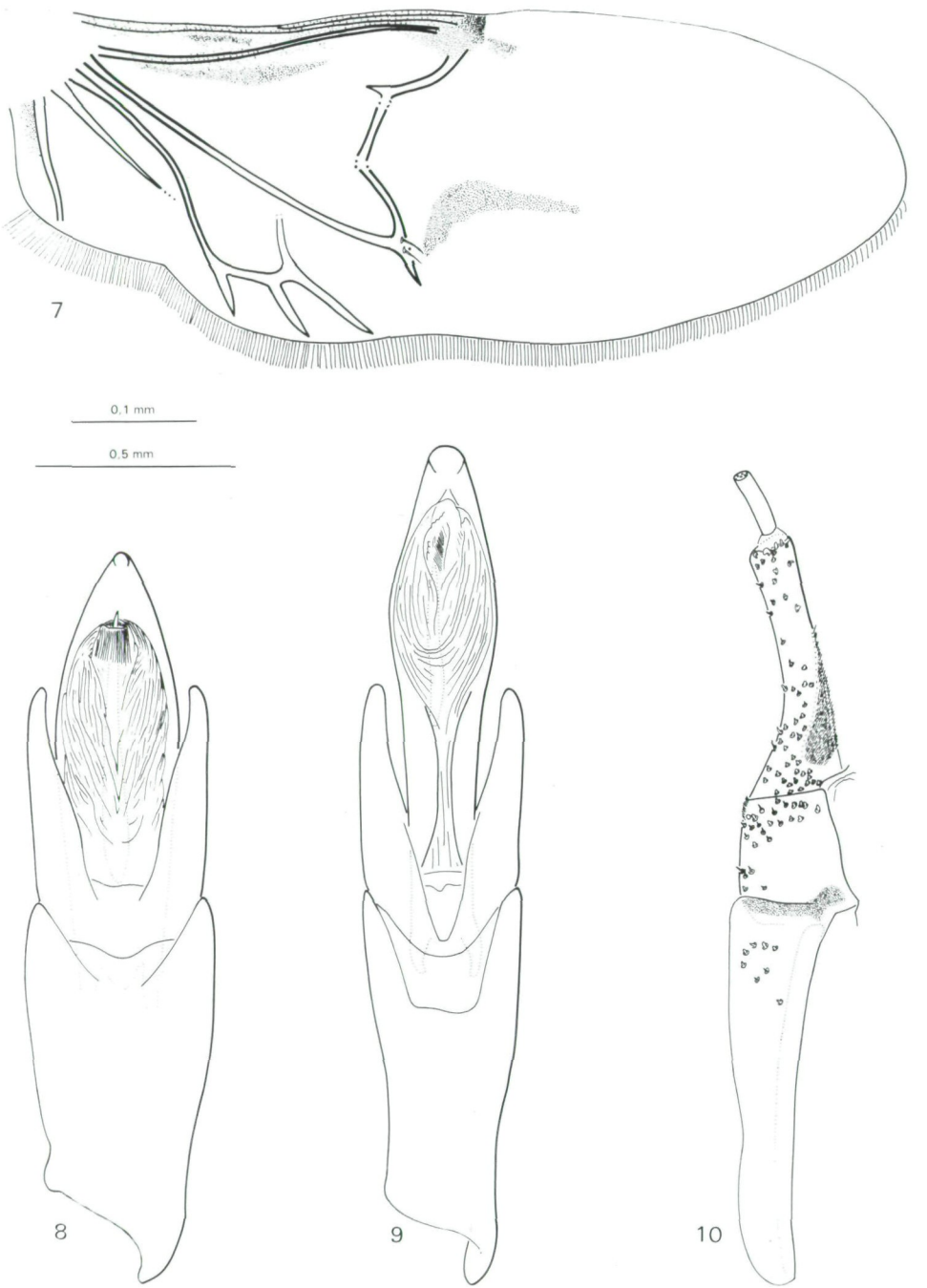
Aedeagus (Fig. 9): Penis very long and slender, its shape slightly variable, approximately twice as long as parameres and 1.3 times longer than phallobasis.

Ovipositor as in Fig. 10.

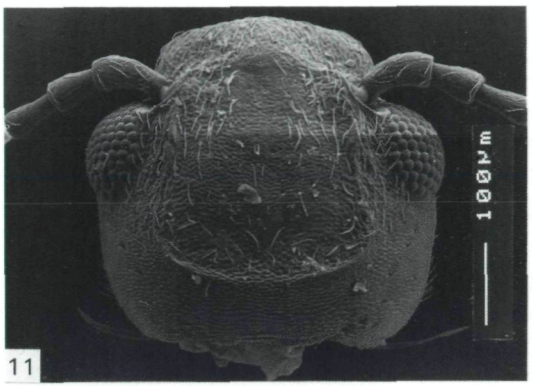
VARIABILITY: The paratypes from Karnataka (see Fig. 1) differ significantly from the Kerala specimens in the more widely arched and more distinctly heart-shaped pronotum. However, I was not able to find any significant aedeagal difference between these populations.

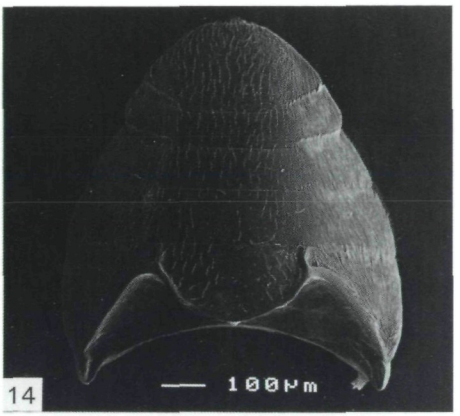


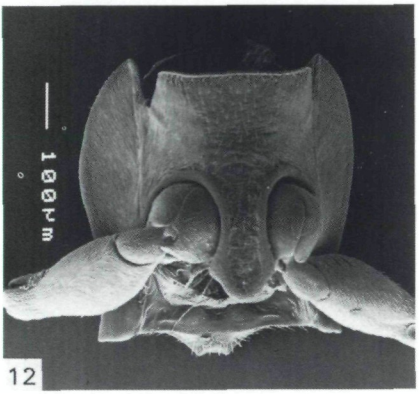
Figs. 2 - 6: *Rudielmis* gen.n. *schuhi* sp.n., 2) ventral aspect of thorax and abdomen, 3) maxillary palp, 4) maxilla, 5) mandible, 6) labium. Short scale = Figs. 3 - 6; long scale = Fig. 2.

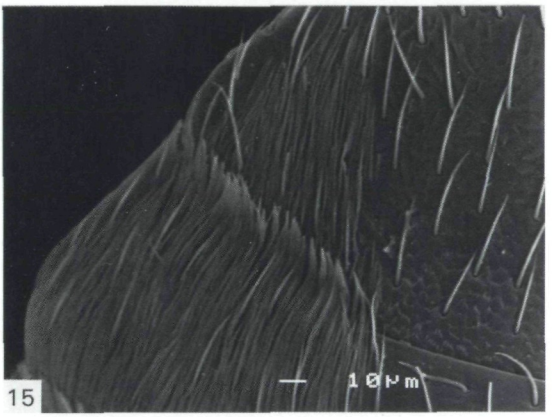


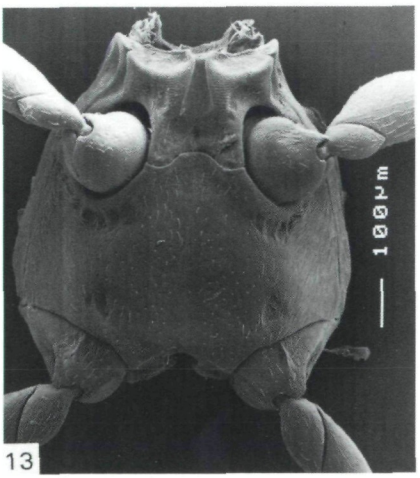
Figs. 7 - 10: *Rudielmis* gen.n., 7) hind wing of *R. schuhi* sp.n., 8) aedeagus of *R. concolor* sp.n., 9) aedeagus of *R. schuhi* sp.n., 10) ovipositor of *R. schuhi* sp.n. Short scale = Figs. 8 - 10; long scale = Fig. 7.

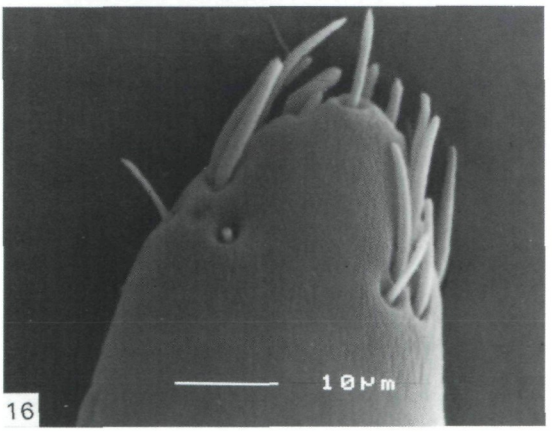




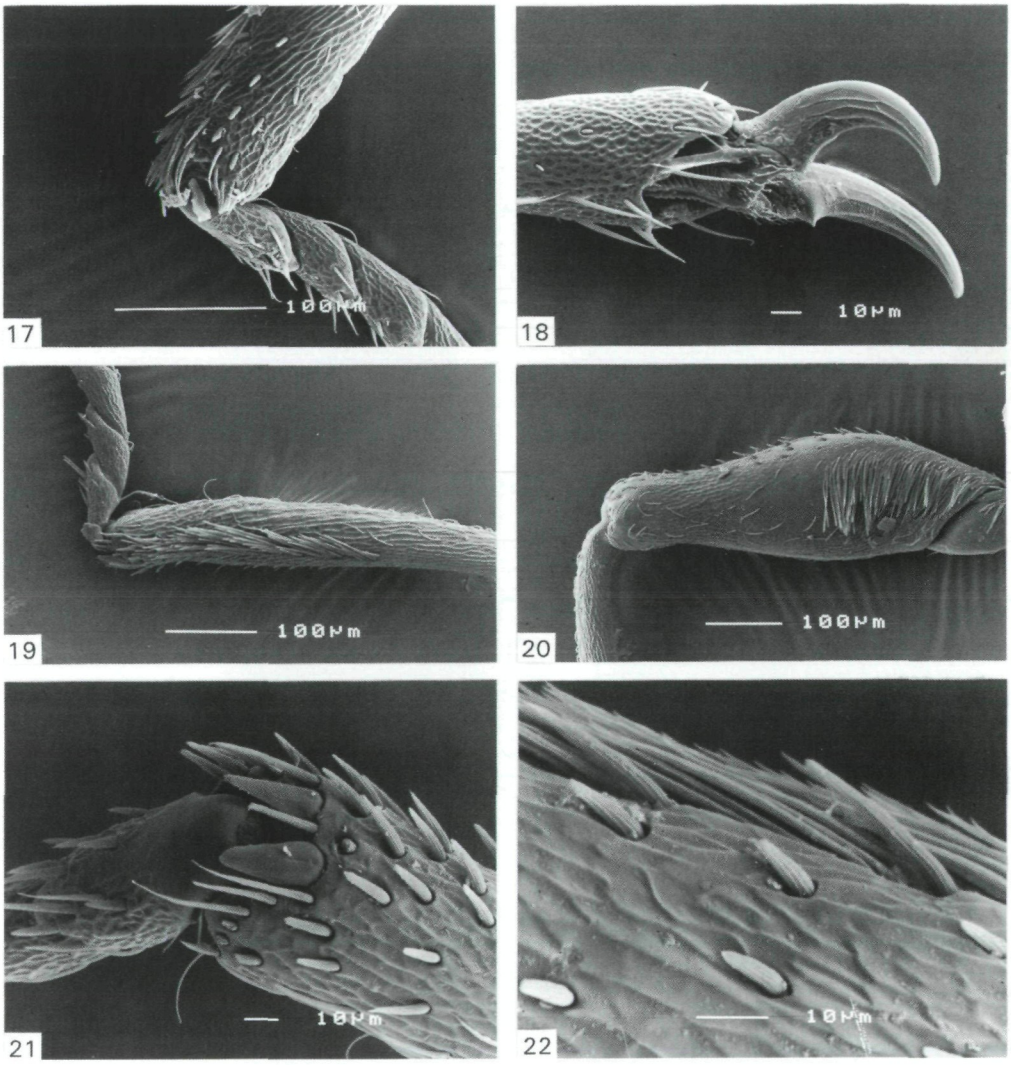








Figs. 11 - 16: *Rudielmis* gen.n. *concolor* sp.n., SEM photographs, 11) head, dorsal view, 12) prothorax, ventral view, 13) meso- and metasternum, 14) abdomen, ventral view, 15) same, lateral parts of ventrites IV and V, enlarged, 16) apex of terminal antennal segment.



Figs. 17 - 22: *Rudielmis* gen.n. SEM photographs, 17) tibial apex and first 3 tarsal segments of front leg of *R. concolor* sp.n., 18) front claws of *R. concolor* sp.n., 19) tibia and first 3 tarsal segments of middle leg of *R. schuhi* sp.n., medial surface, 20) middle femur of *R. schuhi* sp.n., medial surface, 21) tibial apex and first tarsal segment of hind leg of *R. concolor* sp.n., 22) distal part of tibial apex of hind leg of *R. concolor* sp.n., enlarged.

DISTRIBUTION: So far known only from South India (Karnataka, Kerala).

Rudielmis concolor sp.n.

TYPE LOCALITY: As in *Rudielmis schuhi* (see above).

TYPE MATERIAL: **Holotype** ♂ (NMW): "S-INDIA Kerala K1, Cardamom Hills, 15km SW Munnar, Kallar Valley

1000m \ 6.-18.12. 1993, 76°58'E 10°02'N, Boukal D.+ Kejval Z. lgt." **Paratypes** (NMW, CBC, CSUS): 38 exs., same data as holotype; 2 exs., same data as holotype except K2; 1 ex., same data as holotype except K5.

DIAGNOSIS: This species is distinguished from *Rudielmis schuhi* sp.n. by a number of external characters: length (pronotum + elytra), 2.3 - 2.4 mm; width, 1.0 - 1.1 mm; elytra usually unicoloured black (caution: occasionally, especially in teneral specimens, the humeri and the elytral apices can be somewhat reddish pale); pronotum less distinctly heart-shaped, lateral margin sinuous or almost parallel-sided in anterior half; metasternal disc more convex; apodeme of female sternum VIII ca. 1.2 times as long as in *R. schuhi*.

Aedeagus (Fig. 8): Penis ca. 1.7 times longer than parameres and ca. 1.2 times longer than phallobasis.

DISTRIBUTION: So far known only from South India (Kerala).

ETYMOLOGY: Named in reference to the unicoloured elytra.

Zusammenfassung

Eine neue Gattung und 2 neue Arten der Familie Elmidae (*Rudielmis* gen.n., *Rudielmis schuhi* sp.n. und *R. concolor* sp.n.) werden von Südindien beschrieben. Die neue Gattung zeigt oberflächliche Ähnlichkeit mit *Unguiseta* JÄCH aus Ceylon, unterscheidet sich jedoch von dieser und allen anderen bisher beschriebenen Gattungen der Familie durch zahlreiche Merkmale.

References

BROWN, H.P. 1970: 3.0001 *Neocylloepus*, a new genus from Texas and Central America (Coleoptera: Dryopoidea: Elmidae). - The Coleopterists Bulletin 24(1): 1-28.

BROWN, H.P., & M.P. THOBIAS, 1984: World synopsis of the riffle beetle genus *Leptelmis* Sharp, 1888, with a key to Asiatic species and description of a new species from India (Coleoptera, Dryopoidea, Elmidae). - Pan-Pacific Entomologist 60(1): 23-29.

CHAMPION, G.C. 1923: Some Indian Coleoptera (11). - The Entomologist's Monthly Magazine LIX: 165-179.

GROUVELLE, A., 1911: XIX. Descriptions of five new Indian species of Clavicorn Coleoptera. - Records of the Indian Museum VI (V, 19): 315-317.

SPANGLER, P. 1990: A revision of the Neotropical aquatic beetle genus *Stegoelmis* (Coleoptera: Elmidae). - Smithsonian contributions to Zoology no 502: 1-52.

SPANGLER, P., & P. PERKINS 1989: A revision of the Neotropical aquatic beetle genus *Stenhelmoides* (Coleoptera: Elmidae). - Smithsonian contributions to Zoology 479: 1-63.

Dr. Manfred A. JÄCH
Naturhistorisches Museum, Burgring 7, A - 1014 Wien, Austria

David S. BOUKAL
Skroupova 1, CZ - 370 06 Ceske Budejovice, Czech Republic