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Cryptophagidae and Languriidae from India (Coleoptera, Clavicornia)

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Abstract

Three new species of Cryptophagidae are described from India: *Cryptophagus heteroclitus* sp. nov., *Micrambe fraudulentus* sp. nov., *Atomaria frugi* sp. nov. *Cryptophagus ceylonicus* MOTSCHULSKY, 1866 syn. nov. is considered as a synonym of *Cryptophilus integer* HEER, 1838 (Languriidae), and *Cryptophagus braminus* MOTSCHULSKY, 1858 (= *Triphyllia* comb. nov.) is removed from Cryptophagidae into the Tetratomidae. The males of *Cryptophagus atratus*, *aurovestitus*, *simulator* are described and illustrated for the first time. Some new Indian records of further *Cryptophagus*, *Atomaria* as well as *Henoticus* species are given.

Zusammenfassung

Drei neue Arten der Cryptophagidae aus Indien werden beschrieben: *Cryptophagus heteroclitus* sp. nov., *Micrambe fraudulentus* sp. nov., *Atomaria frugi* sp. nov. *Cryptophagus ceylonicus* MOTSCHULSKY, 1866 syn. nov. wird als ein Synonym von *Cryptophilus integer* HEER, 1838 (Languriidae) angesehen, und *Cryptophagus braminus* MOTSCHULSKY, 1858 (= *Triphyllia* comb. nov.) wird von den Cryptophagidae in die Tetratomidae überführt. Die Männchen von *Cryptophagus atratus*, *aurovestitus* und *simulator* werden erstmals beschrieben und abgebildet. Einige neue Nachweise für Indien aus den Gattungen *Cryptophagus*, *Atomaria* und *Henoticus* werden angefügt.

Introduction

This work is chiefly based on material lent to me by Dr. W. SCHAWALLER of the Staatliches Museum für Naturkunde in Stuttgart (SMNS), deriving from northern India (Uttar Pradesh, Himachal Pradesh). Duplicates of this material are housed in the Zoologische Staatssammlung München (ZSM). In addition, a few samples belonging to the

Zoological Museum of the Moscow State University (ZMUM) have been incorporated in the study as well. Altogether, 15 species have been found and treated in the region concerned, of which three are new to science.

The cryptophagid fauna of India is currently known to contain eight genera: *Antherophagus*, *Cryptophagus*, *Micrambe*, *Henoticus*, *Himascelis*, *Caenoscelis*, *Atomaria*, and *Curelius*. Almost all these genera are pandemic in distribution, but at the species level the fauna of the Oriental really differs considerably from the Palaearctic one. Keys to species of a few genera already exist, though of varying quality (JOHNSON 1970, SEN GUPTA 1980).

Acknowledgements

I am very grateful to Dr. W. SCHAWALLER (Stuttgart) for sending me material for study, to Dr. S. GOLOVATCH (Moscow) for the help both in locating some references and checking the English of an earlier draft, and to the International Science Foundation for awarding me a subsidiary grant (MF-4000).

Cryptophagus HERBST, 1792

The Indian fauna of *Cryptophagus* is relatively rich, with 13 acknowledged species: *anxiosus* GROUVELLE, 1916, *atratus* CHAMPION, 1922, *auropubens* GROUVELLE, 1916, *bengalensis* SEN GUPTA, 1980, *braminus* MOTSCHULSKY, 1858, *ceylonicus* MOTSCHULSKY, 1866, *clavator* CHAMPION, 1924, *himalaicus* BRUCE, 1952, *johnsoni* SEN GUPTA, 1980, *lomus* SEN GUPTA, 1980, *martensi* SEN GUPTA, 1980, *parallelicollis* GROUVELLE, 1916, *simulator* GROUVELLE, 1916. As shown by BRUCE (1938), several congeners introduced by GROUVELLE were actually junior synonyms of some others. All four species from India and Nepal proposed by SEN GUPTA (1980) are extremely difficult to recognize, for they have been described on the basis of a few specimens, some of them only from a single female holotype. Even when the males were present in the type series, their aedeagi were omitted, nor were they depicted. The differences between SEN GUPTA's species were often based on structures displaying a pronounced intraspecific variation. Thus, even without having seen/revised the types of those four formal congeners, I dare predict that at least some of SEN GUPTA's species might prove to actually represent but junior synonyms of the extremely widespread *C. laticollis* LUCAS, 1848. For the same reason, a key to Indian *Cryptophagus* species cannot be elaborated until the types of the species named both by GROUVELLE and SEN GUPTA have been reexamined. Therefore, below is only the description of a new species and several new records of Indian *Cryptophagus*.

Cryptophagus atratus CHAMPION, 1922 (figs 1-2)

Material: India, Himachal Pradesh, Simla, Kufri, 16.VII.1989 leg. A. RIEDEL, 15 ex. SMNS, 6 ex. ZSM, 6ex. ZMUM.

Habitus as in fig. 1.

Male genitalia: Aedeagus has hitherto not been described, as in fig. 2.

Distribution: India.

Remarks: *C. atratus* differs from the related *auropubens* GROUVELLE, 1916 in having the callosity on the pronotum pointed (blunt in *auropubens*) and by the more strongly transverse joints of the antennal club.

Cryptophagus aurovestitus BRUCE, 1945 (fig. 3)

Material: India, Uttar Pradesh, Badrinath, 3200-3600 m, 1.VIII.1989 leg. A. RIEDEL, 1 ex. SMNS.

Distribution: India, Burma.

Male genitalia: Aedeagus as in fig. 3.

***Cryptophagus ? bengalensis* SEN GUPTA, 1980**

Material: India, Uttar Pradesh, Dehra-Dun, 26.VII.1989, 2 ex.; 28.VII.1989, 1 ex.; 30.XII.1989, 6 ex., leg. A.V. KOMPANTSEV (ZMUM).

Distribution: India (West Bengal, Uttar Pradesh).

Remarks: Since SEN GUPTA's species are extremely difficult to identify (see above), I claim no confidence in my determination of this species.

***Triphyllia bramina* (MOTSCHULSKY, 1858) comb. nov.**

Cryptophagus braminus MOTSCHULSKY, 1858.

Type material: There are 9 specimens bearing this name in the MOTSCHULSKY Collection of the family Cryptophagidae. Seven of them are mounted on rectangular pieces of paper and are supplied with MOTSCHULSKY's own handwritten label "*Cryptophagus braminus* MOTSCH. Ind. Or." The eighth specimen is mounted on a rectangular, and the ninth on a triangular, piece bearing MOTSCHULSKY's own handwritten label "*braminus* m. Ind. Or."

Lectotype (present designation): Ind. Or. (? Burma), in the collection of MOTSCHULSKY (ZMUM). Paralectotypes: same data; Ind. Or. (? Burma), 8 ex. in the collection of MOTSCHULSKY (ZMUM).

Distribution: ? Burma.

Remarks: This species belongs neither to *Cryptophagus* nor to the Cryptophagidae but is a member of the family Tetratomidae, probably *Triphyllia* (N. NIKITSKY, personal communication). The generic position of this species requires further elucidation.

***Cryptophilus integer* HEER, 1838**

Cryptophagus ceylonicus MOTSCHULSKY, 1866 syn. nov.

Type material of *Cryptophagus ceylonicus*: A single specimen bearing this name is in the MOTSCHULSKY Collection of the family Cryptophagidae. This specimen is mounted on a triangular piece of paper and bears MOTSCHULSKY's own handwritten label "*Cryptophagus ceylonicus* MOTSCH. Ceylan". Lectotype: Sri Lanka (Ceylon), in the collection of MOTSCHULSKY (ZMUM).

Remarks: *Ceylonicus* belongs neither to *Cryptophagus* nor to the Cryptophagidae, being a member of the Languriidae, *Cryptophilus* (GROUVELLE, 1914). Moreover, it appears to represent a junior synonym of *Cryptophilus integer* HEER 1838.

Further material: India, Uttar Pradesh, Rishikesh, 2.-7.VII. & 6.VIII.1989 leg. A. RIEDEL, 5 ex. SMNS, 3 ex. ZSM.

Distribution: M- and E-Europe, Caucasus, Near East, Middle Asia, Iran, India, Russian Far East, N-Korea, Formosa, Japan, N- and S-Africa, S-America.

***Cryptophagus clavator* CHAMPION, 1924**

Material: India, Himachal Pradesh, Simla, Kufri, 16.VII.1989, leg. A. RIEDEL, 1♀ SMNS.

Distribution: India.

***Cryptophagus himalaicus* BRUCE, 1952**

Material: India, Himachal Pradesh, Simla, Kufri, 16.VII.1989 leg. A. RIEDEL, 21 ex. SMNS, 6 ex. ZSM, 7 ex. ZMUM.

Remarks: This species was described as based on seven specimens. The material at hand somewhat differs from the original description. Thus, BRUCE (1952) noted an asymmetrical callosity. This character is often found in numerous species of *Cryptophagus* and it seems to have been developed in parallel many times. In the material under study, the callosity is symmetrical, weakly unciform, with a slight tooth. The facettes are large, the punctures on the pronotum are equal in size to an individual facette.

Segment 10 of antenna 2-2.3 times as broad as long, pronotum 0.65 - 0.85 times as long as broad, elytra 2.6 - 2.95 times as long as pronotum, and 1.5 - 1.6 times as long as broad combined.

Length 2.1 - 3 mm (BRUCE 1952: 2.5 - 3 mm).

Distribution: India (Uttar Pradesh: Chakrata; Himachal Pradesh: Simla).

Male genitalia: The aedeagus of *himalaicus* has been illustrated by BRUCE (1952: pl. IX, III A).

***Cryptophagus laticollis* LUCAS, 1846**

Material: India, Himachal Pradesh, Simla, Kufri, 16.VII.1989 leg. A. RIEDEL, 3 ex. SMNS; Uttar Pradesh, Mussorie, rabbit-farm, 1300m, 10.VII.1989 leg. A. RIEDEL, 1 ex. ZSM.

Distribution: Europe, Asia Minor, N-Africa, Caucasus, Middle Asia, Afghanistan, Iran, Russian Far East, N-America, ? Australia. New to the fauna of India.

***Cryptophagus simulator* GROUVELLE, 1916 (fig. 4)**

Material: India, Himachal Pradesh, Simla, Kufri, 16.VII.1989 leg. A. RIEDEL, 10 ex. SMNS, 4 ex. ZSM, 4 ex. ZMUM.

Distribution: India (Murree, Darjeeling, Simla).

Remarks: In general, GROUVELLE's description is correct. The upperside is clothed with decumbent pubescence, the callosity is large, occupying at most a quarter of the side margin, with a big, elongate-oval patch of bare surface, visible from above, the lateral tooth is at midway of the side margin.

Segment 10 of antenna 2 times as broad as long, pronotum 0.67 - 0.7 times as long as broad, elytra 2.7 - 2.9 times as long as pronotum, and 1.5 - 1.6 times as long as broad combined. Wings fully developed.

Length 2.2 - 2.9 mm.

Male genitalia: Aedeagus as in fig. 4.

This species differs from other Indian congeners by the following characters: from *anxiosus* by the pubescence, which is semi-erect in *anxiosus*; from *parallelicollis* by the structure of the prothorax (parallel-sided in *parallelicollis*, lateral tooth behind middle of lateral margin). While *aurupubens* is dark in coloration, *simulator* is light red-brown. All SEN GUPTA's species differ from *simulator* by the erect pubescence; *simulator* is similar to *robustus* BRUCE, 1959, but differs from it by the structure of the aedeagus (curved parameres); *himalaicus* sometimes differs from *simulator* by the less strongly transverse prothorax and the more transverse 10th joint of the antenna, but the size of the facettes and the structure of the aedeagus are more secure characters. The facettes of *simulator* are smaller, the punctures on the prothorax are larger than an individual facette.

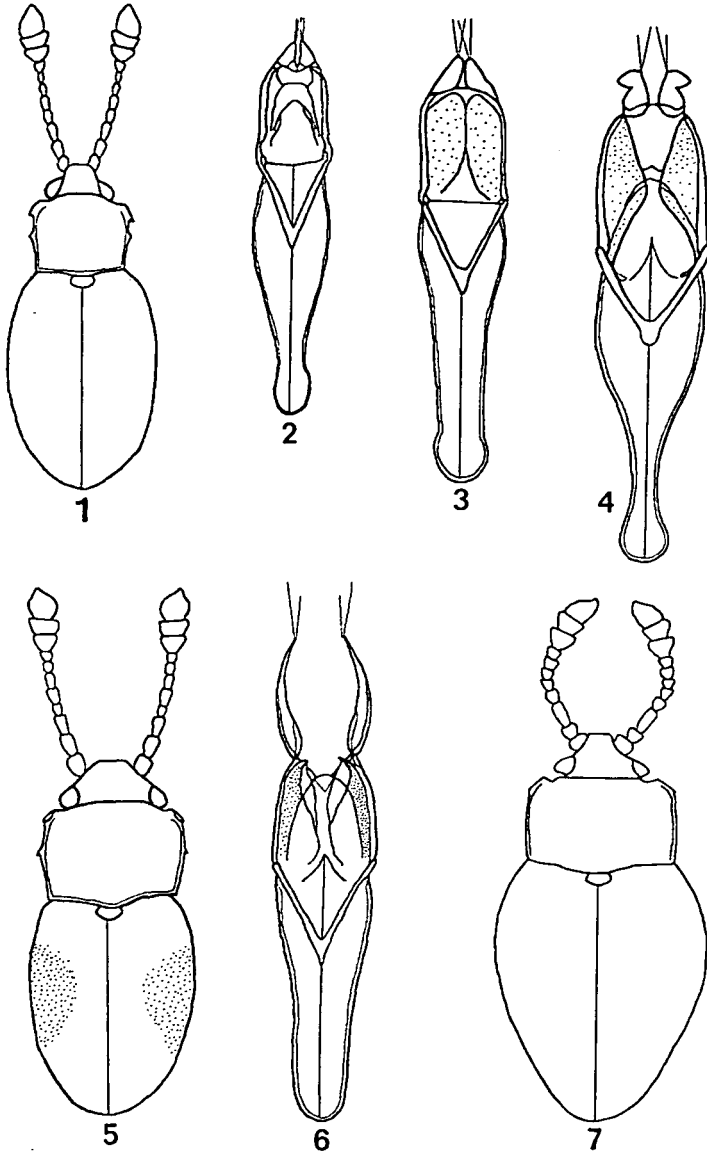
***Cryptophagus heteroclitus* sp. nov. (figs 5-6)**

Holotype ♂: India, Himachal Pradesh, Simla, Kufri, 16.VII.1989 leg. A. RIEDEL (SMNS).

Paratypes: Same data as holotype, 8 ex. SMNS, 4 ex. ZSM, 6 ex. ZMUM.

Description: Body broadly elongate (fig. 5), slightly convex; head, prothorax, and elytra reddish brown, each elytron with a black spot. Elytra slightly convex, uniform, with an almost adpressed pubescence.

Head transverse, normal in size, with prominent, hemispherical, somewhat finely faceted eyes, strongly and densely punctured. Antennae long, slender, bearing a strongly delimited club, with half-club reaching beyond base of prothorax, joints 1-3 elongated, with 3rd joint equal in length to 2nd, 5th somewhat longer than 4th, joints 6 to 8 almost equal in length, subquadrate, 9th and 10th transverse, 11th obliquely oval, joints 9-11 equal in width.



Figs 1-7. General view and male genitalia of *Cryptophagus* and *Micrambe*. 1-2) *C. atratus*; 3) *C. aurovestitus*; 4) *C. simulator*; 5-6) *C. heteroclitus* sp. nov.; 7) *M. fraudulentus* sp. nov.

Prothorax distinctly transverse, barely (0.65 - 0.75) broader than long, moderately strongly and very densely punctured, somewhat convex with slightly angular sides, tapering both towards base and apex, its sides forming an angle at a minute but distinct lateral tooth situated at or near midway of lateral side.

Sides finely margined, anterior edge straight, weakly sinuate, turning into an obtusangular callosity, latter occupying at most one-fifth of side margin, with a small, elongate-oval patch of bare surface, invisible from above, with an obtus-angular caudolateral corner. Lateral margin between callosity and lateral tooth distinctly sinuate, basal groove narrow. Legs of male 5-5-4, of female 5-5-5.

Scutellum small, transverse. Elytra short, oval, humeral angles rounded, shoulders a little broader than prothorax at lateral tooth, 1.3 - 1.5 times longer than combined width and 2.6 times longer than prothorax, moderately convex, slightly flattened behind scutellum, with moderately strongly rounded sides and a broadly rounded apex; punctuation somewhat more strong and sparse than on prothorax. Wings fully developed.

Length 1.9 - 2.2 mm..

Male genitalia: Aedeagus as in fig. 6.

Remarks: This species differs from all Indian congeners by the black spots on the elytra. All the species with elytral black spots described by GROUVELLE have been transferred to the genus *Micrambe* by BRUCE (1938), but none of these species has a clearly visible, single, lateral tooth on the prothorax. BRUCE (1943) described *fusciclavis* and *klapperichi*, both from China, each with elytral dark spots. Yet *heteroclitus* sp. nov. differs from these species by the medial position of the lateral tooth on the prothorax and by the structure of the aedeagus (very strongly elongate parameres).

Micrambe THOMSON, 1863

The Indian fauna consists of six *Micrambe* species: *castanescens* GROUVELLE, 1916 (syn. *bimacularis* GROUVELLE, 1916, *binotatus* GROUVELLE, 1916 partim, *vicinus* GROUVELLE, 1916 partim), *monticola* GROUVELLE, 1916, *curtus* GROUVELLE, 1916, *infuscus* GROUVELLE, 1916, *pumilus* REITTER, 1874 (syn. *vicinus* GROUVELLE, 1916 partim) (Japan, India), *binotatus* GROUVELLE, 1916. In northern India, also *bimaculatus* (PANZER, 1798) (syn. *sinensis* GROUVELLE, 1910) (Palearctic, S-China) and *duclouxi* GROUVELLE, 1910 (Yunnan) may be found to occur.

Micrambe fraudulentus sp. nov. (fig. 7)

Holotype (♀): India, Himachal Pradesh, Simla, Kufri, 16.VII.1989 leg. A. RIEDEL (SMNS). - Paratypes: Same data as holotype, 1 ♀ SMNS, 1 ♀ ZSM, 2 ♀♀ ZMUM.

Description: Body broadly elongate (fig. 7), slightly convex; head, prothorax, and elytra reddish brown; elytra sometimes with a common, vague, dark spot. Elytra slightly convex, clothed with an almost adpressed pubescence.

Head transverse, of normal size, with prominent, hemispherical, somewhat coarsely faceted eyes, strongly and sparsely punctured. Antennae long, slender, with club reaching beyond base of prothorax, joints 1-2 transverse, 3rd elongate, 4rd joint equal in length to 5th, joints 6-8 almost equal in length, subquadrate, 9th elongate, 10th transverse, 11th obliquely oval, joints 9-11 equal in width.

Prothorax distinctly transverse, barely 0.61 - 0.67 times broader than long, moderately strongly and densely punctured (0.5 - 1 diameters apart), an individual puncture almost equal to facette diameter. Prothorax somewhat convex, with almost straight sides, slightly tapering both towards base and apex, without lateral tooth, sometimes crenulate behind midway of lateral side. Sides finely margined, anterior edge weakly sinuate, callosity occupying at most one-fifth of side margin, with a small, elongate-oval patch of bare

surface invisible from above; caudolateral corner obtusangular. Posterior angles obtuse, base round, slightly sinuate, basal groove narrow. Legs of female 5-5-5.

Scutellum small, transverse. Elytra short, oval, humeral angles rounded, shoulders a little broader than maximum breadth of prothorax, maximum width at 2/5 length, 1.3-1.45 times longer than combined breadth and 2.4 - 2.8 times longer than thorax, moderately convex, slightly flattened behind scutellum, with moderately strongly rounded sides and a narrowly rounded apex, punctuation as strong as, yet more sparse than, on prothorax. Wing fully developed. - Length 2.5 - 2.6 mm.

Male unknown.

Remarks: *M. fraudulentus* sp. nov. differs from other Indian species of the genus *Micrambe* by the dark coloration, proportions and size of the prothorax and elytra. All dark colored congeners are lesser in size (1.7 - 1.8 mm).

***Henoticus* THOMSON, 1868**

The Indian fauna contains five species of *Henoticus*: *bhutanicus* SEN GUPTA & PAL, 1980, *flavipennis* JOHNSON, 1975, *indicus* GROUVELLE, 1916, *regificus* JOHNSON, 1975, and *serratus nepalensis* JOHNSON, 1975.

A key to the Indian *Henoticus* has been published by SEN GUPTA & PAL (1980).

***Henoticus indicus* GROUVELLE 1916**

Material: India, Himachal Pradesh, Simla, Kufri, 16.VII.1989 leg. A. RIEDEL, 1 ex. SMNS.

Distribution: India, Burma.

Remarks: The aedeagus has been illustrated by SEN GUPTA & PAL (1980: fig. 2).

***Antherophagus* LATREILLE, 1829**

The Indian fauna contains 2 species of *Antherophagus*: *nigricollis* CHAMPION, 1922 and *himalaicus* CHAMPION, 1922.

A key to the Palaearctic and Indian species of the genus *Antherophagus* has been published by LYUBARSKY (1991).

***Antherophagus himalaicus* CHAMPION, 1922**

Material: India, Uttar Pradesh, Badrinath, 3200-3600 m, 01.VIII.1989 leg. A. RIEDEL, 1 ex. SMNS; Himachal Pradesh, Simla, Kufri, 16.VII.1989 leg. A. RIEDEL, 1 ex. SMNS, 1 ex. ZMUM.

Distribution: India.

***Atomaria* STEPHENS, 1830**

The Indian fauna contains 15 species of *Atomaria*: *fasciata* KOLENATI, 1846, *incertula* JOHNSON, 1970, *khumbuensis* JOHNSON, 1970 (Nepal), *klapperichi* JOHNSON, 1970, *lewisi* REITTER, 1877, *munda* ERICHSON, 1846, *obliqua* JOHNSON, 1970, *peltata* KRAATZ, 1853, *pudica* JOHNSON, 1970, *pusilla* (PAYKULL, 1798), *torrida* JOHNSON, 1970, *tristis* JOHNSON, 1970 (all from the subgenus *Anchicera* THOMSON, 1863), *barani* BRISOUT, 1863, *gracilicornis* REITTER, 1887, and *prolixa* ERICHSON, 1846 (all from the subgenus *Atomaria* s. str.).

A key to the Indian species of the genus *Atomaria* has been published by JOHNSON (1970).

***Atomaria lewisi* REITTER, 1877**

Material: India, Uttar Pradesh, Mussorie, rabbit-farm, 1300 m, 10.VII.1989 leg. A. RIEDEL, 2 ex. SMNS, 1 ex. ZSM.

Distribution: Palearctic, Nearctic, Australia, New Zealand, S-Africa, S-America.

***Atomaria tristis* JOHNSON, 1970**

Material: India, Himachal Pradesh, Simla, Kufri, 16.VII.1989 leg. A. RIEDEL, 20 ex. SMNS, 6 ex. ZSM, 8 ex. ZMUM.

Distribution: India.

***Atomaria incertula* JOHNSON, 1970**

Material: India, Himachal Pradesh, Simla, Kufri, 16.VII.1989 leg. A. RIEDEL, 1 ex. ZMU M; Uttar Pradesh, Mussorie, Kampy-Falls, 1500m, 8.VII.1989 leg. A. RIEDEL, 1 ex. SMNS; Uttar Pradesh, Mussorie, rabbit-farm, 1300 m, 10.VII.1989 leg. A. Riedel, 1 ex. SMNS.

Distribution: India.

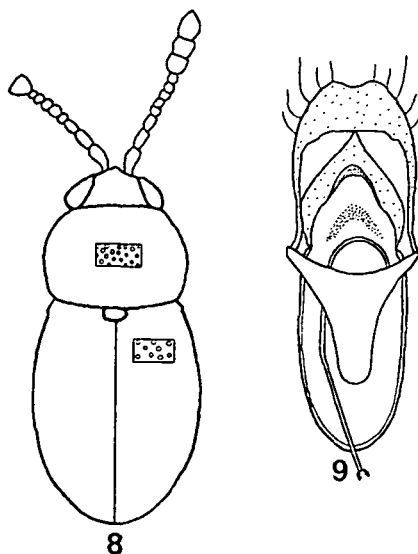
***Atomaria (Anchicera) frugi* sp. nov. (figs 8-9)**

Holotype ♂: India, Uttar Pradesh, Joshimat, Pulna, 2300 m, 4.VIII.1989 leg. A. RIEDEL (SMNS).

Description: Body moderately strongly convex, oblong-oval, covered with a decumbent pale pubescence, elytral hairs ca. 0.03 - 0.035 mm in length.

Body, antennae and femora unicolorous, yellowish-brown; head brown, tibiae and tarsi a little paler; elytra with rows a little dark spots.

Antennal structure as in fig. 8, segment I elongate, twice as long as broad, clearly longer than 2nd, 8th transverse, 9th subquadrate, 10th weakly transverse, club therefore about 1.5 times as broad as stem.



Figs 8-9. General view and male genitalia of *Atomaria frugi* sp. nov.

Prothorax transverse, broadest at middle where it is 1.33 times as broad as long, rounded laterally, slightly more strongly converging anteriorly than basally, its base narrower than base of elytra; side borders almost entirely visible from above (except for anterior angles); pronotal surface shining, densely covered with moderately large punctures, latter on the average 1/2-1 diameter apart from their lateral neighbours; surface not shagreened; hind angles very obtuse; pronotal disk convex; base of prothorax with a feebly transverse depression, hind margin of prothorax finely bordered, not produced caudally in middle part.

Elytra moderately strongly convex, weakly curved laterally, broadest near middle, 2.26 times as long as prothorax and ca. 1.27 times as long as broad combined, breadth 0.7 mm; surface somewhat shining, feebly shagreened, punctures in basal part equal to those on pronotal disk and ca. 1 - 1.5 diameters apart from their lateral neighbours on the average. Wings fully developed.

Length 1.4 mm..

Male genitalia: Aedeagus as in fig. 9. Tip similar to that of *lateralis* REITTER, 1887, paramere plate as in *mongolica* JOHNSON, 1970 and *lederi* JOHNSON, 1970.

Remarks: *Atomaria frugi* sp. nov. is somewhat similar to *lateralis*, from Mongolia, and *khumbuensis* JOHNSON, 1971, from Nepal. However, *khumbuensis* is apterous. Both species can be distinguished by the punctuation, antennal structure, and peculiar male genitalia. None of the species described by JOHNSON from India are similar to *frugi* sp. nov. in peripheral or genital characters. The new species is similar to *atricapilla* STEPHENS, 1830 by the rows of dark spotlets on the elytra, but the 1st antennomere of *frugi* sp. nov. is longer than that of *atricapilla*. The male genitalia of these species are also very different.

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Literaturbesprechung

ROBENECK, H. (Hrsg.) 1995: Mikroskopie in Forschung und Praxis. - GIT Verlag Darmstadt, 399 Seiten.

In den letzten Jahren wurden viele neue mikroskopische Methoden entwickelt, die zum Teil ganz neue Einsichten und Forschungsmöglichkeiten ergeben. Insbesondere die vielen Raster-Techniken haben in letzter Zeit sogar für Schlagzeilen in der Tagespresse gesorgt. Dieses aktuelle Buch beschreibt die Theorie und Praxis der verschiedenen mikroskopischen Techniken, vom klassischen Licht- und Stereomikroskop über die konfokale Mikroskopie bis zu den verschiedenen Rastertechniken, den akustischen und elektronenmikroskopischen Methoden. Das Buch gibt nicht nur einen Überblick über die verschiedenen Methoden und Anwendungsbereiche sondern führt auch in die Präparationstechniken ein. Die Lektüre des Buches ermöglicht die Deutung der mit den verschiedenen Methoden gewonnenen Bilder und das Verständnis der entsprechenden Ergebnisse. Sehr interessant ist auch das Kapitel über die automatische Bildanalyse. Viele Abbildungen, teils in Farbe, tragen zum Verständnis bei und helfen auch dem technisch nicht so versierten Leser die komplizierten Techniken zu verstehen. Ein sehr empfehlenswertes Kompendium für alle, die mit Mikroskopie zu tun haben.

Klaus SCHÖNITZER

SCHAEFER, H. 1996: Die fantastische Welt der exotischen Wanzen und Zikaden. Vielfalt der Formen und Farben. Morphologie - Biologie - Verbreitung. (Mit einem Vorwort von Prof. E. J. FITTKAU, zweisprachig, deutsch und englisch). - Eigenverlag, München. 350 S. mit 760 farbigen Abbildungen, handgemalt. ISBN 3-00-000064-X.

Der vorliegende Prachtband ist das Werk eines Insektenliebhabers, im besten Sinne des Wortes. Das Buch spiegelt die Liebe zum Objekt und die Freude an schönen Formen wider. Mit einer großen Anzahl von hervorragenden farbigen Abbildungen führt uns der Autor die mannigfaltige Formenfülle tropischer Wanzen und Zikaden vor Augen. Beim Schmökern in diesem Buch - wozu es einen einlädt - muß man immer wieder über die bizarren Formen und Farben staunen. Im Text sind interessante Hinweise zu Biologie, Vorkommen und Systematik der verschiedenen Arten zu finden. Das Werk enthält eine Einführung zur Morphologie und Biologie der Wanzen und Zikaden. Außerdem enthält das Buch eine systematische Übersicht der besprochenen Arten. Es wird abgerundet durch eine Erklärung von Fachausdrücken, ein Literaturverzeichnis und einen farbigen Stammbaum der Insektenordnungen.

Dieses Werk kann jedem Insektenliebhaber empfohlen werden. Es enthält die Mahnung, sich für die Erhaltung dieser interessanten Tiere einzusetzen. Der Rezensent wünscht dem Werk große Verbreitung. Es kann direkt beim Autor bestellt werden: H. Schaefer, Hagenauerstr. 4, D-81479 München.

Klaus SCHÖNITZER

AMIET, F. 1996: Hymenoptera, Apidae, 1. Teil. Allgemeiner Teil, Gattungsschlüssel, die Gattungen Apis, Bombus und Psithyrus. - Insecta Helvetica Band 12. Herausgegeben von der Schweizerischen Entomologischen Gesellschaft. ISBN 2-940150-01-X; 98 Seiten.

Der vorliegende Band ist der erste Teil einer geplanten Reihe über die Bienen in der Schweiz. Für die Schweiz sind derzeit 585 Arten von Bienen bekannt. Obwohl durch gezielte Aufsammlungen immer wieder Arten gefunden werden, die für das Gebiet "neu" sind, muß man doch auch betonen, daß viele Arten durch Biotopzerstörung akut gefährdet sind. 60 Arten konnten trotz intensiver Nachforschungen in den letzten Jahren nicht mehr aufgefunden werden. Dies zeigt wieder einmal, wie wichtig zusammenfassende faunistische Bearbeitungen - wie die vorliegende - als Grundlage für den Naturschutz sind.

In diesem Band ist ein illustrierter Bestimmungsschlüssel zu den Gattungen der in der Schweiz vorkommenden Bienen, sowie Bestimmungsschlüssel zu den Arten der Hummeln

und Schmarotzerhummeln. Es werden auch Arten berücksichtigt, die zwar (noch) nicht für die Schweiz nachgewiesen wurden, die aber möglicherweise dort vorkommen. Für die Hummeln wird in Farbtafeln die Variationsbreite der Färbungsmuster der in der Schweiz vorkommenden Erscheinungsformen illustriert. Für jede behandelte Art wird neben verschiedenen Angaben zu Vorkommen, Lebensraum und Biologie eine Verbreitungskarte gegeben. Man darf davon ausgehen, daß dieser Band ein wichtiger Impuls für die faunistische Bearbeitung der Bienen in der Schweiz sein wird.

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