

On *Cryptarcha* Shuckard of North-east India (Coleoptera: Nitidulidae: Cryptarchinae) with description of a new species

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Abstract

Three species of *Cryptarcha* Shuckard (*Cryptarcha dubia* Grouvelle, 1890, *Cryptarcha maculata* Reitter, 1873 and *Cryptarcha raychaudhuri* sp. n.) have been worked out of a collection from North-east India. The genus and the species are (re)described. A key to the species of *Cryptarcha* from India is appended.

Keywords: Coleoptera, Nitidulidae, *Cryptarcha*, Northeast India, new species.

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Introduction

Sap beetles, though often seen in nature, have not been well studied in India for the past few decades. A small collection of the genus *Cryptarcha* Shuckard, 1839 from India, especially from the states of North-east India formed the basis of this study.

Cryptarcha is a moderately large genus distributed to all major biogeographic regions of the world with prevalence in the Neotropics. Shuckard (1839) erected the genus *Cryptarcha* under the family Nitidulidae for two species, *Nitidula strigata* (Fabricius, 1787) and *Nitidula imperialis* (Fabricius, 1792) on the basis of origin of antennae beneath lateral projections of the head. Grouvelle (1908) while dealing with the nitidulid fauna of the Indian subcontinent, re-characterised the genus *Cryptarcha*, added two species and provided a key to the species of *Cryptarcha* from India. Grouvelle (1913) in the "Coleopterorum Catalogus" listed 115 species under *Cryptarcha* from the world. Parsons (1938) while dealing with North American *Cryptarcha*, recognised two subgenera under *Cryptarcha*, viz., *Cryptarcha* Shuckard and *Lepiarcha* Sharp. Jelínek (1974) erected the genus *Calosphaera* on the basis of *Cryptarcha ocellaris* Reitter, 1875 and shifted several species of *Cryptarcha* to this genus. He (op. cit.)

recognised two subgenera under *Cryptarcha* (*Arhina* Murray, 1867 and *Lepiarcha* Sharp, 1891). Kirejtshuk (1981) divided the genus into five species groups, viz., 'strigata' group, 'sjoestedti' group, 'senegalensis' group, 'quadripunctata' group and 'incertae sedis' group, and gave generic status to *Arhina* Murray, 1867 which was previously recognised as a subgenus under *Cryptarcha*. Kirejtshuk (1987) dealt with the *Cryptarcha* of Indo-Malayan zone of the Oriental region and synonymised several species. Kirejtshuk (1999) while dealing with Indian nitidulidae, recorded *C. inhalita* for the first time from the Himalaya. Jelínek & Audisio (2007) in the 'Catalogue of Palearctic Coleoptera' listed five synonyms of the genus *Cryptarcha*, viz., *Africanips* Lechanteur, 1959, *Cryptarchina* Iablokoff-Khnzorian, 1966, *Cryptarchula* Ganglbauer, 1899, *Cryptarchus* Heer, 1841, and *Lepiarcha* Sharp, 1891. Kirejtshuk (2008) synonymised *Cryptarchus* Heer, 1843 and *Priatelus* Broun, 1882 with *Cryptarcha* and listed five other synonyms of *Cryptarcha* (*Lepiarcha* Sharp, 1891; *Liarcha* Sharp, 1891; *Cryptarchula* Ganglbauer, 1899; *Africanips* Lechanteur, 1959; *Cryptarchina* Iablokoff-Khnzoryan, 1966). Hisamatsu (2010) gave comparative

characteristic features of *Cryptarcha kapfereri* Reitter and *C. inhalita* Reitter.

By now, three species, viz., *Cryptarcha wallacei andrewesi* Grouvelle, 1908, *Cryptarcha dubia* Grouvelle, 1890 and *Cryptarcha maculata* Reitter, 1873 (= *Cryptarcha lesnei* Grouvelle, 1903, *Cryptarcha fraterna* Grouvelle, 1908) were recorded from India; *Cryptarcha inhalita* Reitter, 1885 has been considered as an Indian species in view of its record from Himalaya (see Kirejtshuk, 1999). Of these, only three species (*C. dubia*, *C. wallacei andrewesi* and *C. maculata*) were hitherto recorded from North-east India (Sikkim).

Materials and Methods

Materials of *Cryptarcha* Shuckard from five states of India [Sikkim, West Bengal, Assam, Pondicherry (Mahé) and Arunachal Pradesh] and some foreign countries (Thailand and Indonesia) were available to the authors for study. Some earlier collections from Sikkim and Arunachal Pradesh and collections obtained from the National Collection of ZSI formed the basis of this study. The specimens examined in this study are housed in the Zoological Survey of India, Kolkata (ZSIC).

Specimens of *Cryptarcha* were preserved in 70% ethyl alcohol. These were subsequently mounted on rectangular hard paper board and pinned with proper locality and habitat data. For detailed morphological study, slides were prepared of the dissected parts. Mounted dry specimen of *Cryptarcha raychaudhurii* sp. n. was relaxed first by laying in water for about an hour. The relaxed specimen was placed on glass slide with a drop of water and the hind wings and elytra were dissected out under a dissecting microscope. The wingless body was then placed in 10% KOH solution, after minor incision between pro- and mesothorax and metathorax and abdomen, for about 24 hours. The specimen was then washed in distilled water and mild acetic acid solution for 10 minutes respectively. The washed specimen was passed on to absolute alcohol through 30%, 50%, 70%, 90% grades of alcohol for 10 minutes in each grade. The detached elytra and wings were similarly dehydrated as above. All the parts were kept in absolute

alcohol for about 10-15 minutes for complete dehydration and then transferred to clove oil. The body parts of the specimen were then placed on a clear glass slide with a drop of clove oil and finally dissected under a WILD M5A stereoscopic binocular microscope. The dissected parts were mounted in Canada balsam by cover slips. For studying male genitalia of the other specimens, their abdomens were separated from the body. The wet/water soaked abdomens were placed in 10% KOH solution for about 24 hours and then passed on to clove oil in above manner. Each of the male genitalia was dissected out with two fine dissecting needles under the stereomicroscope and placed in a drop of Canada balsam on a piece of cover glass. The cover glass was glued on a piece of ivory paper and pinned with the respective specimen with required data for types and other specimens. External features and other structures were studied using Leica ® M205A stereoscopic microscope with magnification 7.81× to 160.1× and images were recorded, when necessary. Illustrations were made with the aid of Camera lucida; detailed features of various body parts were sketched by using the digitised images, and examination under an OLYMPUS compound microscope. The species were identified by comparison with the reference material in the collection of ZSI and the original descriptions of the species and a key by Grouvelle (1908).

Results

Altogether 3 species were recognised under *Cryptarcha* amongst the examined material (*Cryptarcha dubia* Grouvelle, 1890, *Cryptarcha maculata* Reitter, 1873 and *Cryptarcha raychaudhurii* sp. n.). Material of two Indian species viz., *C. wallacei andrewesi* Grouvelle, 1908 and *C. inhalita* Reitter, 1884 were not available for examination. The worked out species and the genus are (re)described and a key to the species of *Cryptarcha* Shuckard, 1839 of India is provided.

SYSTEMATIC ACCOUNT

Family NITIDULIDAE Latreille, 1802
Subfamily CRYPTARCHINAE Thomson, 1859
Tribe CRYPTARCHINI Reitter, 1884
Genus *Cryptarcha* Shuckard, 1839

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Cryptarcha Shuckard, 1839: 165 (Type species: *Nitidula strigata* Fabricius, 1787); Heer, 1841: 393, 409; Erichson, 1843: 355; Erichson, 1845: 221; Redtenbacher, 1845: 74; Redtenbacher, 1849: 19, 172; Bach, 1851: 220; Lacordaire, 1854: 326; Redtenbacher, 1858: LXXVIII, 338; Jacquelin du Val, 1858: 153, 159; Gutfleisch & Bose, 1859: 234, 247; Thomson, 1859: 69; J. Leconte, 1861: 84; Thomson, 1862: 182; Thomson, 1867: 382; Reitter, 1873: 140, 141; Redtenbacher, 1874: LXXXV, 369; Reitter, 1875: 30; Horn, 1879: 321; Everts, 1881: 13, 55; Leconte & Horn, 1883: 151; Reitter, 1884: 269; Marseul, 1885: 20, 125; Fowler, 1885: 72, 73; Fowler, 1889: 259, 260; Sharp, 1891: 374; Everts, 1898: 470, 492; Ganglbauer, 1899: 549; Stierlin, 1900: 521, 538; Lameere, 1900: 354; Grouvelle, 1908: 395; Blatchley, 1910: 648; Reitter, 1911: 37; Grouvelle, 1913: 177; Jelínek, 1974: 190; Kirejtshuk, 1981: 766.

Priateles Broun, 1881: 668 (Type species *Priateles optandus* Broun, 1881). Synonymised by Kirejtshuk, 2008.

Priates: Broun, 1882: 409. Changed spelling of generic name for *Priateles*.

Priatelus: Kirejtshuk, 2008: 112, 121. Changed generic name of *Priates* and *Priateles*.

Lepiarcha Sharp, 1891: 385 (Type species *Cryptarcha omositoides* Reitter, 1873). Synonymised by Kirejtshuk, 1981.

Liarcha Sharp, 1891: 385 (Type species *Liarcha placida* Sharp, 1891). Synonymised by Kirejtshuk, 2008.

Cryptarchula Ganglbauer, 1899: 550 (Type species: *Nitidula undata*

Olivier, 1790). Synonymised by Jelínek, 1974.

Africanips Lechanteur, 1959: 107 (Type species: *Africanips niger* Lechanteur, 1959).

Synonymised by Kirejtshuk, 1997.

Cryptarchina Iablokoff-Khinzoryan, 1966: 313 (Type species: *Cryptarchina incognita* Iablokoff-Khinzorian, 1966, by monotypy). Synonymised by Kirejtshuk, 1981.

Description

General appearance (Figs. 1-14): Oblong-ovate, moderately convex dorsally and subdepressed ventrally, rather shiny, dorsal cuticle punctate-pubescent or glabrous, colour testaceous to dark brown, labrum fused with clypeus, antenna with loosely arranged three-segmented club, pronotum and elytra somewhat explanate laterally; abdominal segments almost entirely covered by elytra dorsally, pygidium sometimes visible; adult male possesses an additional abdominal sclerite posteriorly.

Head (Fig. 1) rather large, transverse, narrower than prothorax and partly inserted within it, frons dilated over antennal insertions, mandibles almost concealed beneath the projection of frons, no fronto-clypeal suture; eyes moderately large and deeply set within the head, coarsely faceted, tempora indistinct; no marked neck constriction. Tentorium with two long tentorial arms with a short lateral process from tentorial arms near posterior third, transverse corpotentorium looped anteriorly. Antenna longer than head; antennal insertions concealed under projections of frons, scape subglobular to slightly elongate and concealed beneath dorsum, segments 2–3 narrower than scape and distinctly elongate; segments 4 to 7 short, subequal, about as broad as long or slightly elongate; segment 8 more transverse and broader than preceding segments; club 3-segmented, longer than broad, segments loosely arranged. Ventrally, antennal grooves narrow and somewhat subparallel. Mandible (Fig. 8) slightly longer than broad, tip of mandibles long and sharply pointed, mola well-developed, setosed prostheca extended like a process, no distinct mandibular cavity. Maxilla

(Fig. 9) devoid of galea; lacinia elongate, apex somewhat pointed, apex and inner margin densely hairy; palpi with palpomere 1 short; palpomere 2 longer than palpomere 1, as broad as and slightly longer than palpomere 3; palpomere 4 (apical segment) longer than preceding segments and fusiform. Labium (Fig. 10) with mentum distinctly transverse, pubescent, apical margin bi-sinuate; ligula transverse with lobes projecting and horn-like; palpi with palpomere 1 short, palpomere 2 elongate, palpomere 3 longest with rounded apex. Labrum fused with clypeus; only a faint outline of labrum visible dorsally.

Prothorax (Fig. 2): transverse, about as broad as elytra; apical margin broadly emarginate; anterior angle projecting, posterior angles sub-acute; lateral margins arcuate; pronotal disc rather convex; prosternal process slightly narrower between coxae, feebly broader near apex; front coxae contiguous internally; coxal cavities distinctly transverse, externally and internally closed, trochantins exposed; notosternal sutures subparallel and extending to border of foramen.

Meso-metathorax (Fig. 3): Mesoventral process about as wide as prosternal process. Mesocoxae slightly more widely separated than front coxae, coxal cavities open outwardly, mesosternal fitting between mesocoxae almost in a straight line. Metaventricle somewhat transverse, discrimen extending to about two-thirds of length of metaventricle from base, metacoxae about as widely separated as mesocoxae; mesocoxae bordered by coxal lines reaching at almost one-third of the distance along metaventral-metanepisternal suture, forming distinct axillary space.

Metendosternite (Fig. 11): well-developed, with a broad basal stalk bifurcated into two lateral arms, anterior tendons rather closely situated.

Elytra and hind wings: Elytra (Fig. 4) slightly elongate, apices conjointly or separately rounded, punctuation dot-like and indistinct; setae whitish, fine, short and semi-erect; epipleura moderately developed and extending almost to apex. Wing (Fig. 6) simple and venation reduced, with moderately long radial vein, cubitus vein branched, two anal veins; without subcubital fleck or radial cell.

Legs (Fig. 7): moderately long, trochanters short and simple, femora broadened; slender tibiae slightly broadened at apex with two distinct apical spurs; tarsal formula 5-5-5 in both sexes, tarsal segments bilobed and setosed apically, tarsomeres 1 to 3 dilated apically, tarsomere 4 shortest, claws simple.

Abdomen (Fig. 5): broader than long; pygidium seldom marginally exposed, usually concealed beneath elytra; intercoxal process of ventrite 1 moderately broad and its apex rounded; ventrites 2-4 short and subequal, ventrite 5 longer than preceding three ventrites. Ventrites setose. An anal sclerite (tergite VIII) present in males.

Genitalia: Aedeagus (Figs. 13-18) with elongated median lobe, dorsoventrally flattened; a single median strut running along ventral face; tegmen forming a receptacle, with a small median depression at apex, setae arises from the middle of the apex, lateral edges subparallel, tegminal struts join basally to form a ring around median lobe. Anal sclerite and spiculum gastrale (as in Fig. 12). Ovipositor not studied.

Sexual Dimorphism: Males possess an additional abdominal sclerite posteriorly.

Habitat: Most species inhabit subcorticolous habitat; presumably feed on fungi and decomposed plant sap.

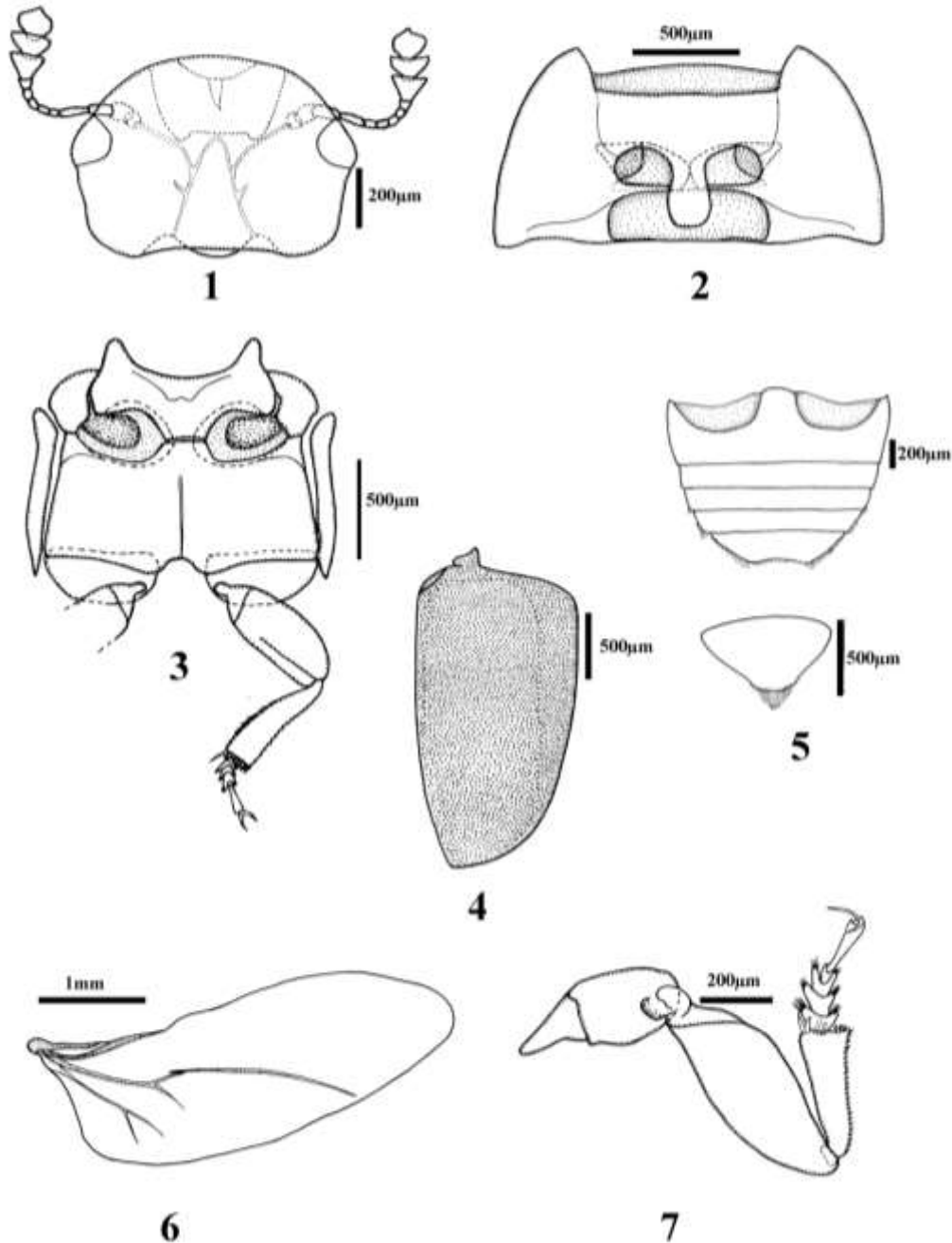
Distribution: Distributed in all the major biogeographic regions of the world.

Remarks: *Cryptarcha* is closely related to other genera of Cryptarchinae such as *Eucallosphaera* Jelínek, 1978 and *Glischrochilus* Reitter, 1873 but can be differentiated from both these genera by its distinct pubescence on dorsum, frons dilated over antennal insertions and sub-parallel antennal grooves (*vs.* dorsum glabrous, frons not dilated over antennal insertions and antennal grooves either converging or diverging in *Eucallosphaera* and *Glischrochilus*). *Cryptarcha* also shares certain resemblances with *Platyarcha* Kirejtshuk, 1987 but can be differentiated by its weakly convex body; well-developed, three-segmented, compact antennal club; anterior corners of mentum more or less rounded and not projecting anterad; relatively

less widened prosternal process before rounded or medially notched apex; apex of elytra conjointly or separately rounded (vs. dorsoventrally flattened body; relatively small, two-segmented antennal club with preceding

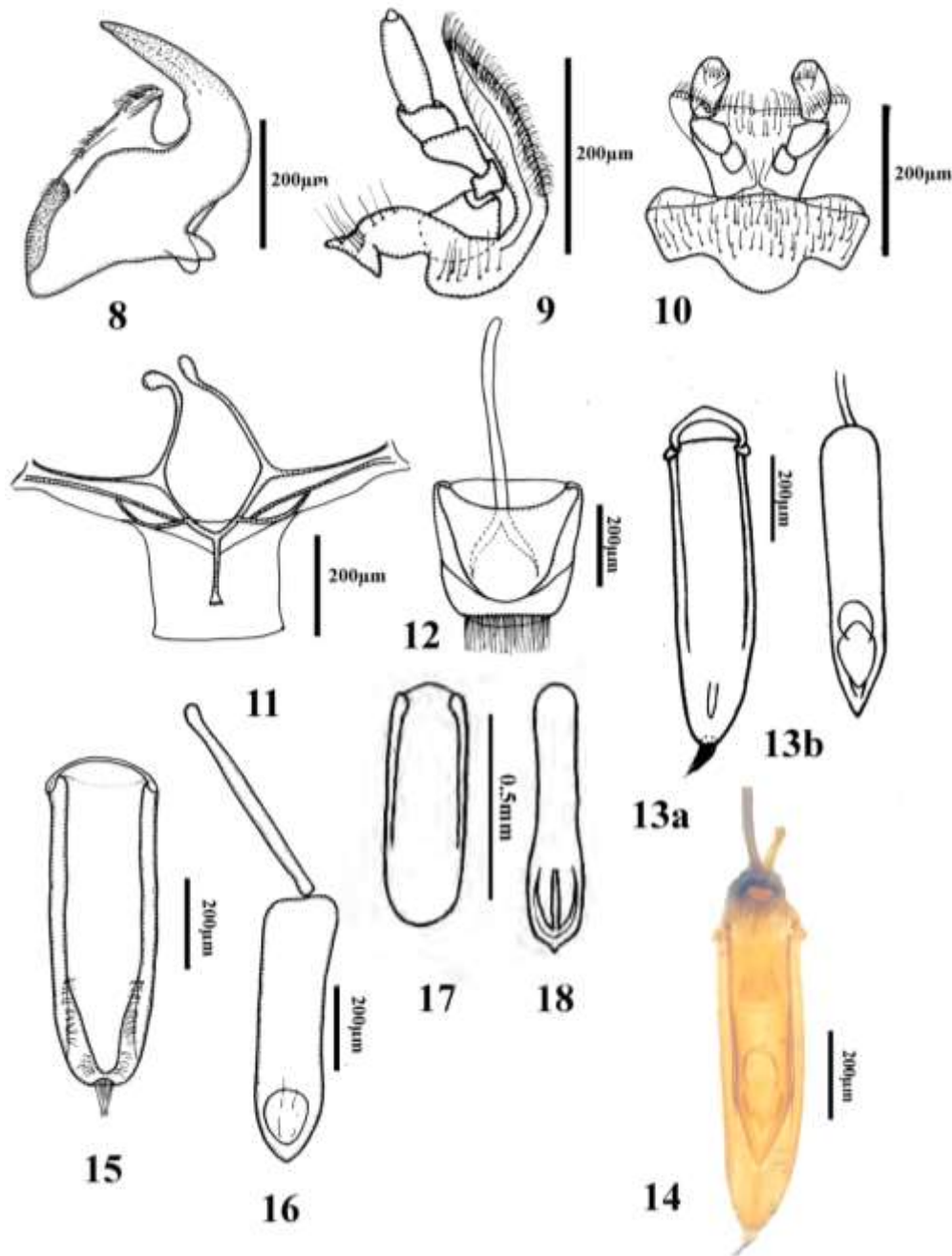
segment somewhat widened anterad; anterior corners of mentum sharply acuminate and projecting anterad; prosternal process distinctly widened before truncate apex; apex of elytra truncate in *Platyarcha*).

PLATE- I



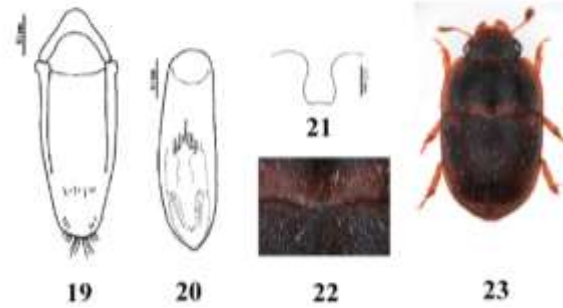
Figures 1-7. *Cryptarcha raychaudhurii* sp. n., line drawings: 1, head, dorsal view; 2, prothorax, ventral view; 3, meso-metathorax, ventral view; 4, right elytron, dorsal view; 5, abdomen, ventral view and pygidium, dorsal view; 6, wing; 7, front leg.

PLATE- II



Figures 8–12. 15–16. *Cryptarcha raychaudhurii* sp. n., line drawings: 8, mandible, dorsal view; 9, maxilla, ventral view; 10, labium, ventral view; 11, metendosternite; 12, spiculum gastrale and anal sclerite, ventral view; 15, male genitalia: tegmen, ventral view; 16, male genitalia: median lobe, ventral view; **13–14.** *Cryptarcha maculata* Reitter, 1873: 13, male genitalia, ventral view (line drawing): 13a, Tegmen; 13b, Median lobe; 14, male genitalia, ventral view (photo); **17–18.** *Cryptarcha dubia* Grouvelle, 1890: 17, male genitalia: tegmen, ventral view (adapted from Kirejtshuk, 1987); 18, male genitalia: median lobe, ventral view (adapted from Kirejtshuk, 1987).

PLATE-III



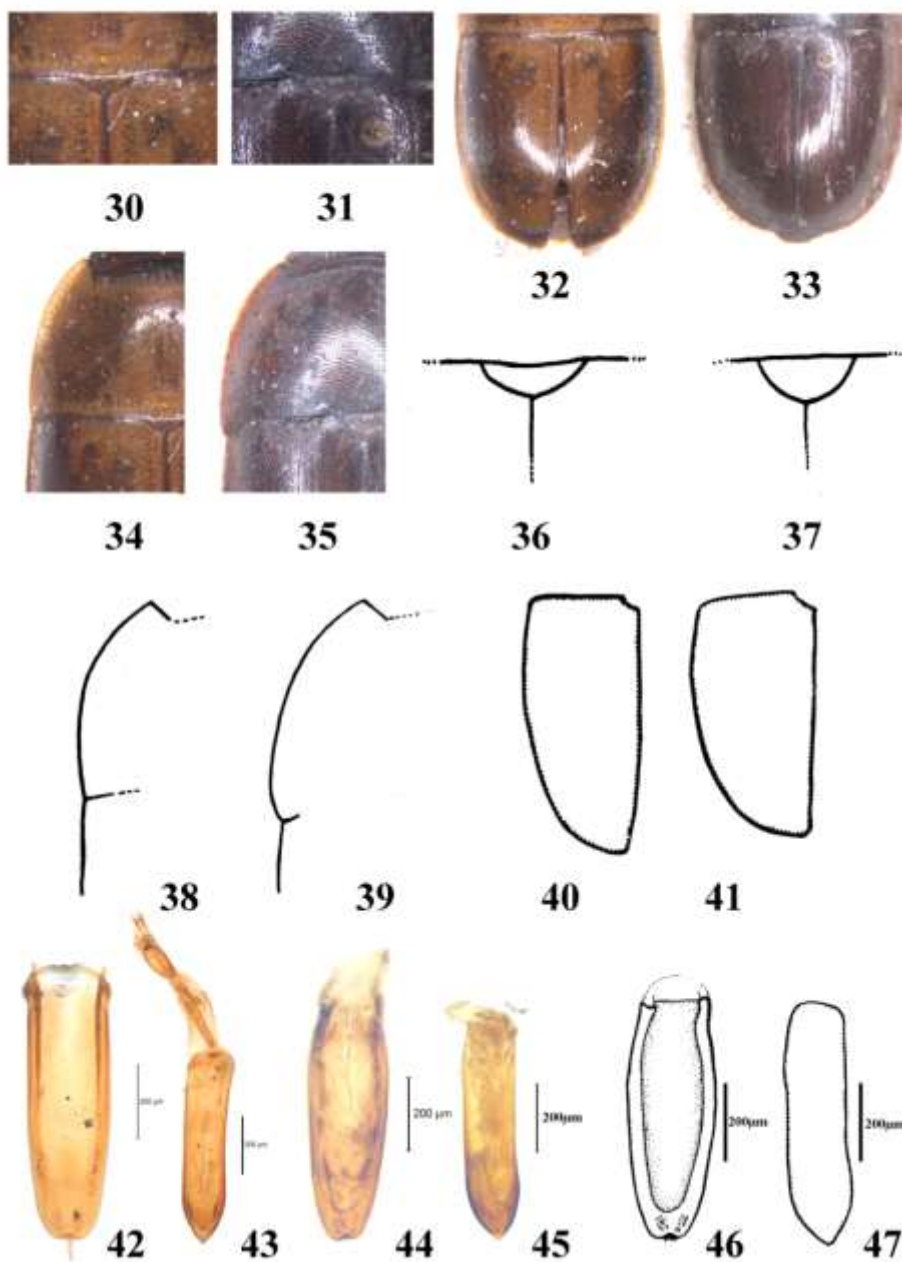
Figures 19-23. *Cryptarcha inhalita* Reitter, 1884: 19, tegmen, ventral view (line drawing adapted from Hisamatsu, 2010); 20, median lobe (line drawing adapted from Hisamatsu, 2010); 21, prosternal process (line drawing adapted from Hisamatsu, 2010); 22, scutellum (photo derived from Hisamatsu, 2010); 23, dorsal view (photo derived from Hisamatsu, 2010).

PLATE-IV



Figures 24-25. *Cryptarcha raychaudhurii* sp. n., photographs: 24, dorsal view, 25, ventral view; **26-27.** *Cryptarcha dubia* Grouvelle, 1890: 26, dorsal view, 27, ventral view; **28-29.** *Cryptarcha maculata* Reitter, 1873: 28, dorsal view, 29, ventral view.

PLATE-V



Figures 30-31. Scutellar shield (photo): 30, *C. raychaudhurii*; 31, *C. dubia*; **32-33.** Elytra (photo): 32, *C. raychaudhurii*; 33, *C. dubia*; **34-35.** Pronotum and elytral junction (photo): 34, *C. raychaudhurii*; 35, *C. dubia*; **36-37.** Scutellar shield (line drawing): 36, *C. raychaudhurii*; 37, *C. dubia*; **38-39.** Pronotum and elytral junction (line drawing): 38, *C. raychaudhurii*; 39, *C. dubia*; **40-41.** Left elytron (line drawing): 40, *C. raychaudhurii*; 41, *C. dubia*; **42-43.** *C. raychaudhurii*: Male genitalia (photo): 42, Tegmen, ventral view; 43, Median lobe, ventral view; **44-47.** *C. dubia*: Male genitalia: 44, Tegmen, ventral view (microphotograph); 45, Median lobe, ventral view (microphotograph); 46, Tegmen, ventral view (line drawing); 47, Median lobe, ventral view (line drawing).

PLATE-VI



Figures 48-49. Fifth abdominal ventrite (photo): 48, *C. raychaudhurii*; 49, *C. dubia*.

Key to the species of *Cryptarcha* Shuckard of India

1. Prothorax slightly more than 2x as wide as long; elytra unicolorous, entirely black.....*C. wallacei andrewesi*
Grouvelle, 1908
- Prothorax less than 2x as wide as long; elytra often bicoloured and not entirely black, if unicolorous then reddish brown or yellowish brown.....2
2. Elytral pubescence intermixed with longer setae, longer setae arranged in longitudinal rows; elytra with dark or pale patches, prosternal apex slightly emarginate or notched in the middle.....3
- Elytral pubescence uniform, composed of short setae, setae irregular and not arranged in rows; elytra unicolourous yellowish or reddish brown; prosternal apex broadly rounded or truncate, but not notched in the middle.....4
3. Scutellar shield distinct, rather transverse. Tegminal apex of male genitalia (Figs. 13a, 14) with a tuft of setae at middle; median lobe (Fig. 13b) with subparallel sides, distinctly narrowed in apical one-fourth with acuminate tip.....*C. maculata*
Reitter, 1873
- Scutellar shield indistinct, scarcely visible from above (Fig. 22). Tegminal apex of male genitalia with scattered setae (Fig. 19), median lobe (Fig. 20) somewhat widened and slowly narrowed in apical one-fourth towards apex.....*C. inhalita*
Reitter, 1884

4. Scutellar shield (Figs. 31, 37) about 2x as broad as long; elytra slightly broader than long (Figs. 33, 41), anterior margin of elytra slightly narrower than base of prothorax thereby making a distinct obtuse angle at their junction (Figs. 35, 39); posterior edge of fifth abdominal ventrite and anal sclerite in male sparsely setose (Fig. 49), devoid of tuft of longer setae in the middle; body colour dark brown. Tegmen (Figs. 44, 46) in male genitalia somewhat inflated medially with a rounded apex with tiny sparse setae at the middle.....*C. dubia*

Grouvelle, 1890

- Scutellar shield (Figs. 30, 36) at least 3x as broad as long; elytra slightly longer than broad (Figs. 32, 40), anterior margin of elytra as wide as base of prothorax thereby not making a demonstrable angle at their junction and the junction appears like a slight sinuation of outer margin (Figs. 34, 38); posterior edge of fifth abdominal ventrite and anal sclerite (Fig. 50) in male densely setose, with a bunch of longer setae at mid-ventral region; body colour reddish-brown. Tegmen (Figs. 15, 42) in male genitalia with subparallel sides, slightly narrowed in apical third, spatula-shaped; tip of the apex somewhat truncate with a small tuft of setae.....*C. raychaudhurii* sp. n.

1. *Cryptarcha dubia* Grouvelle, 1890

Cryptarcha dubia Grouvelle, 1890: 126.

Diagnosis: Body (Figs. 26, 27) broadly oval, rather convex, dull, colour uniformly reddish-brown, dorsum finely punctate with white and closely appressed setae; posterior corners of pronotum somewhat extending posterad, thereby making an angle with the base of elytra; elytra conjointly slightly broader than long; apical margin of fifth abdominal ventrite and anal sclerite devoid of dense setae.

Head: transverse, about 1.3x as broad as long, frons feebly depressed; punctures on vertex indistinct polygonal, about 3x as large as eye facets; punctuation on frons indistinct polygonal, diameter slightly larger than those of vertex, separated by about 0.25–0.5 diameter of punctures; eyes small and non-projecting, about 0.3x as long as head, outer margin rounded,

coarsely faceted; temple indistinct; few setae present near the sides of frons, setae on vertex indistinct. Antenna about 1.1x as long as head; antennal club about 0.3x as long as antenna, about 1.7x as long as broad, club segments loosely attached.

Prothorax: transverse (1.0:1.9), anterior margin broadly emarginate; sides arcuate, posterior margin bisinuate, anterior and posterior angles somewhat projecting (Figs. 35, 39). Surface of pronotum distinctly punctate, punctures small, round, about as large as eye facets, separated on top of pronotal disc by 1–2 diameter; very fine, closely appressed setae on disc.

Scutellar shield (Figs. 31, 37): transverse, about 2x as broad as long, triangular with rounded apex; punctures and setae not visible.

Elytra: slightly broad (Figs. 33, 41), anterior margin of elytra closely fit with posterior margin of prothorax and slightly narrower than base of prothorax, humeral angles slightly obtusely rounded, sides arcuate, borders slightly explanate, apices conjointly rounded; punctures slightly larger than those on pronotum, separated by 0.5–1 diameter; setae golden, moderately thick and long, closely appressed to the surface and posteriorly directed.

Abdominal tergites partially covered by the elytra, setae golden, moderately long, densely and uniformly arranged, decumbent and posteriorly directed. Pygidium devoid of tuft of long setae.

Ventral side: dark brown with median part of prothorax and meso-metathorax blackish. Prosternal process with slightly truncate apex. Metaventricle densely setose. Posterior edge of fifth abdominal ventrite and anal sclerite in male sparsely setose (Fig. 49), devoid of any tuft of longer setae.

Aedeagus (Figs. 44–47): Tegmen (Figs. 44, 46) somewhat inflated medially with a rounded apex and tiny sparse setae at the middle. Median lobe (Figs. 45, 47) elongate, subparallel, apex acuminate.

Measurements (in mm.): Total length 3.03, width of head across eyes 0.74, length of antenna 0.70, length and width of prothorax 0.98 and 1.92, length and width of elytra together 1.74 and 1.88.

Material examined: THAILAND: Meetaw forest, West Raheng, 1500 ft. altitude, 1 ex., 03.iv.1913, C. S. Barton, ex. caught in bamboo in damp heavy jungle on slope of hill facing east (Reg. No. 3586/21).

Distribution: INDIA: Sikkim, West Bengal (Darjeeling); MYANMAR: Bhamò; LAOS; VIETNAM; THAILAND (New Record); INDONESIA.

Remarks: It has been noted that the features of tegmen and median lobe of this species show considerable variation with those of *C. dubia* presented by Kirejtshuk (1987) [See Figs. 17, 18] viz., elongated tegmen, subparallel sides with a rounded apex, U-shaped, devoid of apical tuft of setae; narrow and elongate median lobe, slightly broader in apical one-third, apex rounded with a small conical protrusion from its middle. These make a point of interest to us. We have, however, neither examined any male genitalia nor seen any photograph of the above form.

2. *Cryptarcha maculata* Reitter, 1873

Cryptarcha maculata Reitter, 1873: 151.

Cryptarcha ritsemai Olliff, 1884: 246.

(Synonymised by Kirejtshuk, 1987)

Cryptarcha lesnei Grouvelle, 1903: 118.

(Synonymised by Kirejtshuk, 1987)

Cryptarcha fraterna Grouvelle, 1908: 395.

(Synonymised by Kirejtshuk, 1987)

Cryptarcha bonyfacyi Grouvelle, 1912: 502.

(Synonymised by Kirejtshuk, 1987)

Cryptarcha longipennis Hisamatsu, 1961: 31.

(Synonymised by Kirejtshuk, 1987)

Diagnosis: Body (Figs. 28, 29) oblong-ovate, rather convex, somewhat shiny, colour dark brown with reddish patches over elytra: on apical margin at the middle of each elytron and along elytral suture; mandibles exposed; dorsum finely punctate with sparse, moderately long and thick, golden, decumbent setae.

Head: transverse, about 1.3x as broad as long, frons feebly depressed; punctures on vertex round, about as large as those of eye facets; punctation on frons round, distinct, diameter about as large as those of vertex, separated by

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about 1-2 diameter of punctures; eyes small and non-projecting, about 0.4x as long as head, outer margin rounded, coarsely faceted; temple indistinct; golden, rather thick, semi-erect setae on frons. Antenna about 1.2x as long as head; antennal club about 0.3x as long as antenna, about 1.6x as long as broad, club segments loosely attached.

Prothorax: transverse (1.0:1.8), anterior margin broadly emarginated, slightly bisinuate; sides arcuate, posterior margin distinctly bisinuate, anterior and posterior angles distinctly projecting. Pronotum convex, surface distinctly punctate, punctures round, dense, about as large as eye facets, separated on top of pronotal disc by 2-3 diameters; moderately thick, decumbent setae on disc.

Scutellar shield: rather short, transverse, about 2.8x as broad as long, triangular and somewhat rounded apically; punctures and setae indistinct.

Elytra: about as long as broad, anterior margin closely fit with posterior margin of prothorax, humeral angles nearly right-angled, sides arcuate, borders narrowly explanate, apices separately rounded; punctures slightly larger than those on pronotum, separated by 0.5-1 diameter; two rows of longitudinal setae: 1) fine, short, appressed, posteriorly directed and 2) moderately thick and long, semi-erect, forming striae.

Abdominal tergites fully covered by elytra.

Ventral side: uniformly chestnut-brown. Prosternal process with apex notched in the middle. Metaventricle punctate-pubescent.

Aedeagus (Figs. 13, 14): Tegmen (Figs. 13a, 14) narrow, sides subparallel and gently tapering in the apical third of its length with a dense tuft of setae at middle of apex. Median lobe (Fig. 13b) with subparallel sides, distinctly narrowed in apical one-fourth with acuminate tip.

Measurements (in mm.): Total length 2.73-2.83, width of head across eyes 0.71-0.75, length of antenna 0.60-0.76, length and width of prothorax 0.89-0.96 and 1.57-1.77, length and width of elytra together 1.53-1.61 and 1.57-1.75.

Material examined: INDIA: Calcutta, 1 ex., (Reg. No. 3771/18); Assam, Damchera, 09.viii.1957, 2 ex., ZSI Lot No. 51. 1957, Det. by T. G. Vazirani, 1957 (Reg. No. 12089/H4 and

12091/H4); Assam, Damchera, 2 ex., 09.viii.1959, *Cryptarcha fraterna* Grouvelle: Det. by T. G. Vazirani, 1957 [ZSI Reg. No. 12089/H4 & 12091/H4]; INDONESIA: N. O. Sumatra, Tandjong Morawa, Serdang, 1 ex., Dr. B. Hagen, Det. as *Cryptarcha ritsemai* Olliff [ZSI Reg. No. 1351/13].

Distribution: INDIA: Assam (New Record), West Bengal, Sikkim, Pondicherry (Mahé), Kerala, Tamil Nadu; NEPAL; CHINA; HONGKONG; MACAO; JAPAN; TAIWAN; KOREA; INDONESIA.

3. *Cryptarcha raychaudhurii* Dasgupta & Pal sp. n.

urn:lsid:zoobank.org:act:55E7C14C-40A5-4DB7-8625-98BF59900F92

Diagnosis: Body (Figs. 24, 25) broadly oval, rather convex and shiny; body colour yellowish-brown, elytra with darker periphery and narrow explanate part light yellowish, paired sub-sutural dark stripes on medial part; scutellar shield distinctly transverse; dorsum finely punctate; base of pronotum about as wide and base of elytra; elytra slightly longer than broad with sparse, tiny, white, appressed setae near lateral edges.

Head: transverse, about 1.3x as broad as long, frons feebly depressed; punctures on vertex round, about as coarse as those of eye facets; punctation on frons round, distinct, diameter about as large as those of vertex, separated by about 1-2 diameter of punctures, few short, white appressed setae on frons while vertex is nearly glabrous; eyes small and non-projecting, about 0.4x as long as head, outer margin rounded, coarsely faceted; temple indistinct. Antenna about 1.3x as long as head; antennal club about 1.8x as long as broad, about 0.3x as long as antenna, club segments loosely attached.

Prothorax: transverse (1.0:1.9), anterior margin broadly emarginate; sides arcuate, posterior margin bisinuate, anterior and posterior angles somewhat pointed. Pronotal surface distinctly punctate; punctures round, dense, about as large as those on frons, separated on top of pronotal disc by 0.5-1 diameter; very fine, appressed setae on disc.

Scutellar shield (Figs. 30, 36): rather short, transverse, about 3x as broad as long, triangular and somewhat rounded apically; punctures and setae indistinct.

Elytra: slightly longer than broad (Figs. 32, 40), anterior margin closely fit with posterior margin of prothorax, about as wide as base of prothorax (Figs. 34, 38); humeral angles nearly right-angled, sides arcuate, borders somewhat explanate, apices conjointly rounded; punctures about as large as those on pronotum, separated by 1-2 diameters; setae golden, very fine, short, appressed and posteriorly directed.

Abdominal tergites fully covered by the elytra, setae golden, moderately long, densely and uniformly arranged, decumbent and posteriorly directed. Posterior margin of pygidium (Fig. 5) bearing a tuft of setae in mid-dorsal region, setae gradually shorter anterad.

Ventral side: uniformly testaceous-brown. Prosternal process with truncate apex. Metasternum punctate. Posterior edge of fifth abdominal ventrite and anal sclerite (Fig. 48) in male densely setose, with a bunch of longer setae at mid-ventral region.

Aedeagus (Figs. 15–16, 42–43): Tegmen (Figs. 15, 42) elongated, subparallel and slightly narrowed in apical third, spatula-shaped with a small tuft of setae on middle of apex; tip of the apex somewhat truncate. Median lobe (Figs. 16, 43) elongate and narrow, apex acuminate.

Measurements (in mm.): Total length 3.38–3.52, width of head across eyes 0.74–0.81, length of antenna 0.68–0.75, length and width of prothorax 1.01–1.13 and 1.94–2.13, length and width of elytra together 2.06–2.20 and 1.94–2.13.

Material examined: Holotype ♂ INDIA: Sikkim, Cherrybagh, Bamboo Bar, 14.iv.1983, B. N. Das & party; Paratypes. 5 ex., data same as holotype; Paratype. 1 ex., Arunachal Pradesh, Abor Expedition, Rotung, 1400 ft. (427 m.), 28.xii.1911, S. W. Kemp, ex. under leaf sheath of bamboo.

Distribution: INDIA: Sikkim, Arunachal Pradesh.

Etymology: This species is named after Dr. Dinendra Raychaudhuri, Former Professor,

Department of Zoology, University of Calcutta for his untiring support and encouragement to one of the authors (JD) in her research work.

Comparative note: This species resembles the Indian species, *Cryptarcha dubia* Grouvelle, 1890 in shape and size but can be differentiated from the former by the following features: distinctly transverse scutellar shield (Figs. 30, 36), about 3x as broad as long; elytra together slightly longer than broad (Figs. 32, 40), anterior margin of elytra as wide as base of prothorax and prothoracic base and anterior margin of elytra make no demonstrable angle at their junction and the junction appears like a slight sinuation of outer margin (Figs. 34, 38); tegmen (Figs. 15, 42) of male genitalia with subparallel sides, slightly narrowed in apical third, tip of the apex somewhat truncate with a small tuft of setae [vs. scutellar shield (Figs. 31, 37) less transverse, about 2x as broad as long; anterior margin of elytra slightly narrower than base of prothorax (Figs. 35, 39) and these make distinct obtuse angle at their junction; elytra together slightly broader than long (Figs. 33, 41); tegmen of male genitalia (Figs. 44, 46) elongate, slightly inflated medially and bear rather short, tiny, sparse setae on its apex in *C. dubia*]. The species show resemblances with *Cryptarcha inhalita* (Fig. 23), but can be differentiated from the latter by the rounded apex of prosternal process (Fig. 2), absence of row of setae and dark patches on elytra; apical margin of tegmen (Figs. 15, 42) with a tuft of setae, median lobe (Figs. 16, 43) with sub-parallel sides [vs. slightly notched apex of prosternal process (Fig. 23), elytra bearing dark patches and row of setae (Fig. 23), tegmen of male genitalia with scattered setae on apical margin (Fig. 19), median lobe (Fig. 20) somewhat widened and slowly narrowed in apical one-fourth towards apex in *C. inhalita*]. The species also shows resemblances with another Indian species, *Cryptarcha maculata* Reitter, 1873 but can be differentiated from the latter by its uniform testaceous-brown colour, absence of coloured patches on elytra; presence of single type of setae on dorsum; prosternal process with truncate apex; median lobe of male genitalia with uniformly wide except apical region, and tegmen spatula-shaped, larger than median lobe,

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possessing apical tuft of setae in the middle [*vs.* dark brown body with pale reddish patches on elytra; presence of two types of setae on dorsum- thick, semi-erect ones, and fine, appressed ones; prosternal process with apex medially notched; median lobe of male genitalia (Fig. 13b) with subparallel sides, distinctly narrowed in apical one-fourth with acuminate tip and tegmen (Fig. 13a) narrow, sides subparallel and gently tapering (Figs. 13a, 14) in the apical third of its length with a dense tuft of setae at the apex in *C. maculata*]. *C. raychaudhurii* shares some similarities with another Indian species *Cryptarcha wallacei andrewesi* Grouvelle, 1908 but can be differentiated from the latter by the following characters: prothorax less than 2x as wide as long, elytra unicolourous yellowish brown and apex of median lobe of male genitalia sub-acuminate (*vs.* prothorax slightly more than 2x as wide as long, elytra unicolorous black and apex of median lobe of male genitalia rounded in *C. wallacei andrewesi*). *C. raychaudhurii* differs from the Indo-Malayan species *Cryptarcha bakeri* Grouvelle, 1914 in the following combination of characters: body devoid of coloured patches, tegmen of male genitalia comparatively longer with sides subparallel in the basal three-fourth and gradually narrowing towards apical fourth and apex with a tuft of setae arranged in a narrow column, median lobe with apex somewhat acuminate (*vs.* body with coloured patches on dorsum, tegmen of male genitalia with sides subparallel in basal two-third and sharply narrowing towards apical third and apex with dense tuft of setae arranged in a wider column on the apical margin, median lobe with apex rounded in *C. bakeri*). *C. raychaudhurii* differs from Burmese species *Cryptarcha aurora* Kirejtshuk, 1987 in the following combination of characters: body unicolourous yellowish brown, prosternal process with rounded apex (*vs.* body with coloured patches on dorsum and prosternal process with notched apex in *C. aurora*).

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References

- Bach, M. 1851. Käferfauna für Nord- und Mitteldeutschland, mit besonderer Berücksichtigung der preussischen Rheinlande I. Zweiter Band. Coblenz: Lieferung. J. Hölscher. 413 pp.
- Blatchley, W.S. 1910. An illustrated descriptive catalogue of the Coleoptera or beetles known to occur in Indiana. Indianapolis, Indiana: The Nature Publishing Co. 1386 pp.
- Broun, T. 1881. Manual of the New Zealand Coleoptera. Part II. Wellington: George Didsbury. viii+653-744+xxi-xxiii pp.
- Broun, T. 1882. Alternation of generic names. The Annals and Magazine of Natural History (5)9: 409.
- Erichson, W.F. 1843. Versuch einer systematischen Eintheilung der Nitidularien. Germar Zeitschrift für die Entomologie 4: 225-361.
- Erichson, W.F. 1845. Nitidulariae. In: W. F. Erichson. *Naturgeschichte der Insecten Deutschlands. Erste Abtheilung. Coleoptera. Dritter Band*, 3(1). Nicolaischen Buchhandlung, Berlin, vii + [2] + 968 pp., 1 pl.
- Everts, E. 1881. Bijdrage tot de kennis der nitidularien. Tijdschrift voor Entomologie uitgegeven door De Nederlandsche Entomologische Vereeniging 24:9-60+ pls. 2, 3, 4.
- Everts, E. 1898. Nitidulidae In: Coleoptera Neerlandica de Schildvleugelige Insecten van Neerland en het Aangrenzend Gebied. Volume I. Hague: Martinus Nijhoff 467-496.
- Fowler, W.W. 1885. The Nitidulidae of Great Britain. The Entomologist's Monthly Magazine 22: 33-36, 69-78.
- Fowler, W.W. 1889. The Coleoptera of the British Islands, A descriptive account of the families, genera, and species indigenous to

- Great Britain and Ireland, with notes as to localities, habitats, etc. Vol. III. Clavicornia (Leptinidae-Heteroceridae). London: L. Reeve. 399 pp.
- Ganglbauer, L. 1899. Die Käfer von Mitteleuropa. Die Käfer der österreichisch-ungarischen Monarchie, Deutschlands, der Schweiz, sowie des französischen und italienischen Alpengebietes. Familienreihe Clavicornia. Volume III. Wien: C. Gerald's Sohn. iii + 1046 pp.
- Grouvelle, A. 1890. Viaggio di Leonardo Fea in Birmania e regioni vicine. XXIII. Nitidulides. Premier mémoire. Annali del Museo Civico di Storia Naturale di Genova 29: 120-126.
- Grouvelle, A. 1903. Clavicornes de l'Inde septentrionale récoltés par M. Harmand. Nitidulidae.-Colydiidae.-Cucujidae.-Monotomidae.-Dryopidae. Annales de la Société Entomologique de France 72: 108-124.
- Grouvelle, A. 1908. Coléoptères de la région indienne. Rhysodidae, Trogositidae, Nitidulidae, Colydiidae, Cucujidae. (1^{er} mémoire). Nitidulidae. Annales de la Société Entomologique de France 77: 325-397.
- Grouvelle, A. 1912. Coléoptères du Tonkin récoltés par M. le colonel Bonifacy: Rhysodidae, Nitidulidae, Ostomidae. Bulletin du Museum National d'Histoire Naturelle (Paris) 18: 502-505.
- Grouvelle, A. 1913. Nitidulidae. In: Junk, W. & Schenkling, S. (Eds.). *Coleopterorum Catalogus*, pars 56. W. Junk, Berlin: 8-223.
- Grouvelle, A. 1914. Nitidulidae des Philippines récoltés par C. F. Baker. The Philippine Journal of Insect Science, Section D, General Biology, Ethnology, and Anthropology 9: 535-542.
- Gutfleisch, V. & Bose, F.C. 1859. Die Käfer Deutschlands von Valentin Gutfleisch, nach des Verfassers Tode. Darmstadt: Diehl. 661 pp.
- Heer, O. 1841. Nitidulidae. In: *Fauna Coleopterorum Helvetica, Pars I* (3). Turici: Orellii, Fuesslini et Sociorum: 393-418.
- Hisamatsu, S. 1961. Four new species of Nitidulidae from Japan (Coleoptera). Transactions of the Shikoku Entomological Society 7: 26-32.
- Hisamatsu, S. 2010. Occurrence of *Cryptarcha kapfereri* Reitter in Japan, with Notes on *Cryptarcha inhalita* Reitter (Coleoptera, Nitidulidae). Elytra 38(1): 29-34.
- Horn, G.H. 1879. Revision of the Nitidulidae of the United States. Transactions of the American Entomological Society and Proceedings of the Entomological Section of the Academy of Natural Sciences [1878-79] 7: 267-336.
- Iablokoff-Khnzoryan, S.M. 1966. Dva novykh vida zhestkokrylykh iz Armyankoy SSR [Two new species of beetles from the Armenian SSR]. Doklady Akademii Nauk Armyankoy SSR 42: 309-314.
- Jacquelin du Val, P.N.C. 1858. Famille des Nitidulides. In: Manuel Entomologique. Genera des Coléoptères d'Europe, 2. Paris: A. Deyrolle: 134-160.
- Jelínek, J. 1974. Generic reclassification of Oriental Cryptarchinae (Coleoptera: Nitidulidae). Acta entomologica Bohemoslovaca 71(3): 187-196, 10 figs.
- Jelínek, J. & Audisio, P. 2007. Nitidulidae. In: I. Löbl, & A. Smetana, (Eds.), *Catalogue of Palaearctic Coleoptera, Part 4*. Stenstrup: Apollo Books, 459-491.
- Kirejtshuk, A.G. 1981. Preliminary revision of the Cryptarchinae genera of the Afrotropical region, with descriptions of a new genus, a new subgenus, and some new species (Coleoptera: Nitidulidae). Revue de Zoologie africaine 95(4): 766-805.
- Kirejtshuk, A.G. 1987. Obzor zhukovblestyanok podsem. Cryptarchinae (Coleoptera, Nitidulidae) Indo-Malayskoy oblasti [Review of nitidulid beetle of subfamily Cryptarchinae (Coleoptera, Nitidulidae) of Indomalayan region]. Trudy Zoologicheskogo Instituta Akademii Nauk SSSR 170: 62-95.
- Kirejtshuk, A.G. 1997. New Palaearctic nitidulid beetles, with notes on synonymy and systematic position of some species (Coleoptera: Nitidulidae). Zoosystematica Rossica 6(1/2): 255-268.
- Kirejtshuk, A.G. (1999) On recent knowledge on the sap beetles (Coleoptera, Nitidulidae) of India. In: R.C. Sobti, & J.S. Yadav. Some

On *Cryptarcha* Shuckard of North-east India with description of a new species

- aspects on the insight of insect biology (Papers celebrating the 60th birthday of R.C. Sobti). Punjab University, Chandigarh: 21-32.
- Kirejtshuk, A.G. 2008. A current generic classification of sap beetles (Coleoptera, Nitidulidae). *Zoosystematica Rossica* 17(1): 107-122.
- Lacordaire, T. 1854. Histoire Naturelle des Insectes. Genera des Coléoptères ou posé méthodique et critique de tous les genres proposés jusqu'ici dans cet ordre d'insectes, Tome deuxième. Paris: Librairie Encyclopédique de Roret. 548pp.
- Lameere, A. 1900. Manuel de la Faune de Belgique II. Bruxelles: H. Lamortin. 858 pp.
- Latreille, P.A. 1802. Histoire naturelle, générale et particuliere des crustacés et des insectes. Ouvrage faisant suite aux oeuvres de Leclerc de Buffon, et partie du Cours complet d'Histoire naturelle rédigé par C. S.Sonnini, membre de plusieurs Sociétés savantes. Tome troisième. Paris: F. Dufart. $\chi + 467 + [1]$ pp.
- Lechanteur, F. 1959. Un genre nouveau de coléoptères Nitidulidae d'Afrique. *Bulletin et Annales de la Société Entomologique Belgique* 95: 107-110.
- Leconte, J.L. 1861. Classification of the Coleoptera of North America part. I. Smithsonian Miscellaneous Collection. Washington: Smithsonian Institution. 285 pp.
- Leconte, J.L. and Horn, G.H. 1883. Classification of the Coleoptera of North America. Smithsonian Miscellaneous Collection 26: 148-152.
- Marseul, S. 1885. Précis des genres et espèces de la tribus Nitidulides de l'Ancien Monde. *L'Abeille* 23: 19-142.
- Murray, A. 1867. List of Coleoptera received from Old Calabar, on the West Coast of Africa. *The Annals and magazine of Natural History* 19(3): 167-179; sep. (1868), 2(4): 91-111.
- Olliff, A.S. 1884. Descriptions of two new species of Nitidulidae from Sumatra. *Notes from the Leyden Museum* 6: 245-247.
- Parsons, C.T. 1938. Notes on North American Nitidulidae, II: *Cryptarcha* Shuckard. *Psyche*. 45: 96-100.
- Redtenbacher, L. 1845. Die Gattungen der deutschen Käfer-Fauna nach der analytischen Methode bearbeitet. Wien: Ueberreuter. 177 pp. + 2 pls.
- Redtenbacher, L. 1849. Fauna Austriaca- Die Käfer, nach der analytischen Methode bearbeitet ed. I. Wien: C. Gerold. XXVII+883 pp.
- Redtenbacher, L. 1858. Fauna Austriaca- Die Käfer, nach der analytischen Methode bearbeitet ed. II. Wien: C. Gerold's Sohn. CXXXVI+1017pp.+2 pl.
- Redtenbacher, L. 1874. Fauna Austriaca. Die Käfer, nach der analytischen Methode bearbeitet. Dritte, gänzlich umgearbeitete und bedeutend vermehrte Auflage. Wien: C. Gerold's Sohn. 571 pp.+ 2 pls.
- Reitter, E. 1873. Systematische Einteilung der Nitidularien. *Verhandlungen des naturforschenden Vereines in Brünn* 12(1): 5-194.
- Reitter, E. 1875. Die europäischen Nitidularien mit kurzer Charakteristik der Gattungen und Bemerkungen über schwierige Arten verzeichnet. *Deutsche Entomologische Zeitschrift* 19(3): 1-30.
- Reitter, E. 1884. Die Nitiduliden Japans. *Wiener Entomologische Zeitung* 3: 257-302, 299-302 and 4: 15-18, 39-44, 75-80, 101-104, 141-142, 173-175.
- Reitter, E. 1911. Fauna Germanica. Die Käfer des Deutschen Reiches. Nach der analytischen Methode bearbeitet. III. Band. Stuttgart: K. G. Lutz. 436 pp.+ 81-128 pls.
- Sharp, D. 1891. Nitidulidae In: Godman, F. D. & Salvin, O. (Eds). *Biologia Centrali-Americana. Insecta, Coleoptera II. Part 1*. London: Dulau and Co. 265-388.
- Shuckard, W.E. 1839. Elements of British Entomology. Containing a general introduction to the science, a systematic description of all the genera, and a list of all the species of British Insects, with a history of their transformation, habits, economy, and distribution, with outline figures of the families and their larvae and

- pupae, an explanation of the technical terms, and full directions for collecting. Vol. 1. London: Hippolyte Baillière. 240pp.
- Stierlin, W.G. 1900. Fauna coleopterorum helvetica. Die Käfer-Fauna der Schweiz nach analytischen Methode bearbeitet. I. Theil. Schaffhausen: Balli & Böcherer. 667pp.
- Thomson, C.G. 1859. Skandinaviens Coleoptera, synoptiskt bearbetade. Tom. I. Lund: Berlingska. [6] + 290 pp.
- Thomson, C.G. 1862. Skandinaviens Coleoptera, synoptiskt bearbetade. Tom. IV. Lund: Lundbergska Boktryckeriet. 268 pp.
- Thomson, C.G. 1867. Skandinaviens Coleoptera, synoptiskt bearbetade. Tom IX. Lund : Lundbergska Boktryckeriet. 407 pp.