

The Coleopterists' Bulletin

Volume VII

August, 1953

No. 4

Published bimonthly beginning with February by Ross H. Arnett, Jr., U. S. National Museum, Washington 25, D. C. Terms of subscription: \$4.00 per year, both domestic and foreign, payable in advance. Remittances should be made payable to Ross H. Arnett, Jr. Back numbers are available.

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Entered as second-class matter at the post office at Washington, D. C.

DESCRIPTIONS OF NEW EXOTIC SPECIES OF STAG-BEETLES (LUCANIDAE)

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The purpose of the present contribution is to record descriptions of a hitherto undescribed female of *Hexarthrius aduncus* Jord. & Rothsch. and a new *Figulus* from Tonkin, and to correct an erroneous synonym of two closely related Indian species of *Prosopocoilus* (*Dorcus* Arrow, not MacLeay).

Hexarthrius aduncus Jord. & Rothsch.

Figure 1.

Nov. Zool., I, 1894, p. 484, pl. 13, fig. 1 ♂.

In Arrow's posthumous contribution, The Fauna of India, Coleoptera, Lamellicornia, Volume IV, 1950, Lucanidæ and Pasalidæ, appears the statement (p. 74) that the female of the above cited species is unknown. To fill this gap in our knowledge, I submit a description of a female which was taken in association with two males and received by exchange through the kindness of Mr. Eugene Dluhy of Chicago, Illinois. One of the male specimens is, unfortunately, composite, having the head of *Prosopocoilus*¹ *giraffa* (Fab.) and the thorax and abdomen of *H. aduncus*; the specimen is being preserved for genitalic studies. The female may be characterized as follows:

¹*Cladognathus* van Roon, Coleop. Catalogus, Pars VIII, 1910, LUCANIDAE, page 21.

Head transverse, 5.3 mm. long and 8.7 mm. wide, rugose throughout; anterior margin bisinuate, antero-lateral angles obtuse, diagonal to ocular canthus; post-ocular portion of head converging towards the pronotum; front gently sloping from vertex; ocular bosses not prominent, each with an adjacent circular shallow depressoin, the latter, granulate within. Clypeus produced, basal half parallel-sided, thence obliquely convergent to apex; apex bilobate. Canthus obtusely angulate anteriorly of the eye, diagonal, parallel to the eye, apices rounded and extending well beyond the center of the eyes. Eyes large, parallel. Mandibles slender, porrect, 3.6 mm. long, feebly keeled their entire length, closely punctured; base broad, median portion straight and half as wide as the base, apical portion gently bent inwardly, apices acute; inner margin of right mandible with a strong, median, acute tooth that is directed inwardly at a right angle to mandible; left mandible similarly armed with a bicuspid tooth, the cusps one above the other. Antennæ with scape shorter than the funicle and clava combined, black, glabrous; fourth funicular segment produced anteriorly into a point, which bears a cluster of four setae; clava composed of five, opaque, oblongo-lobate, pubescent segments.

Pronotum convex, broader than long (12.6 x 7.0 mm.), punctured throughout with remote fine punctures, these progressively enlarged laterally; anterior margin bisinuate, densely fringed with short, orange-red setae; laterally thickened, and margined by an impressed line; disc simple, without sculpture. Antero-lateral angles slightly produced, broadly rounded; pronotal sides nearly parallel to postero-lateral angles, which are obtuse, thence semi-circularly excised to basal angles, the latter somewhat pointed, basal margin straight; lateral margins reflexed and crenate; basal and lateral angles, as well the base, strongly margined by an impressed line.

Scutellum triangular in outline, broader than long (1.8 x 1.4 mm.), with a median longitudinal sulcus and a basal, transverse cluster of punctures. *Elytra* nearly one and one-half times as long as broad (19.1 x 13.4 mm.); sides feebly, almost imperceptibly, divergent to basal third, thence feebly convergent to apical third, thence gently convergent and rounded; humeri right-angled, sub-acute; lateral margins feebly explanate. The punc-

turation of the elytra differs from that of the pronotum in being closer and of more uniform size, thus giving the elytra a more polished aspect.

Legs slender, femora with fine remote punctures; tibiae linearly sculptured. Anterior tibiae furcate and externally dentate, with four distant teeth and serration between; intermediate and posterior tibiae with a single, median spine.

Mentum somewhat pentagonal in outline, hollowed medially from base to the center, rugose throughout. Prosternal process produced, rounded on top, truncate posteriorly. Venter with sculpture similar to that of the dorsum, but less shining.

In comparison with allied *davisoni* Waterh. female, the two species can be tabulated as follows:

<i>aduncus</i>	<i>davisoni</i>
concolorous, black, with a faint brownish bloom	head and pronotum black, elytra dark brick-red, suture darker
canthus strongly angulate before the eyes	canthus less prominent, rounded; hiatus broader
mandibles slender; left with a bicuspid tooth	mandibles shorter and stouter, symmetrical
pronotal sides parallel	pronotum narrow anteriorly and dilated towards the rear
elytra nearly parallel	elytra distinctly ovate
mentum pentagonal	mentum parallelogrammic

Allotype: Female, Assam, without precise locality, from collection of E. Dluhy; in possession of the writer, to be incorporated eventually in the Benesh Collection in the Chicago Natural History Museum.

Prosopocoilus cardoni Didier.

Prosopocoelus Cardoni Didier, Études sur les Coléoptères Lucanides du Globe, fasc. 5, 1929, pp. 119-121, figs. 73 (♂), 74-76 (♂ genit.), 77 (♀).

In 1943² the late Dr. Gilbert J. Arrow announced the synony-

²Proc. Roy. Ent. Soc. London, Ser. B, vol. 12, p. 138, 1943.

my of *P. cardoni* with *P. buddha*, indicating that a cotype of *P. cardoni* in the British Museum (Nat. Hist.) had been used in the comparison and found to be conspecific with *buddha*; this record, without alteration, appears again in the Fauna of British India.³ In the latter publication, the two insects are photographically reproduced and figured, alongside each other, on plate XV; figure 8 depicts *P. buddha* (Hope) ♂, figure 9 *P. cardoni* Didier, and figure 10 what is purported to be a female *P. buddha*.

A cursory examination of the excellent figures, represented to be in natural size, will suffice to convince any student that the two insects are distinct, the two male forms indicating maximum development of the two species in question. Precise measuring of the figures discloses so many characters, at variance with variation known to occur in the plastic Lucanidæ, that one is compelled to deny the validity of Arrow's opinion; the synonymy is untenable. Comparative measurements, in millimeters, obtained from the figures,⁴ give us the following data:

	<i>buddha</i>	<i>cardoni</i>
	length x width	
head	6.0 x 12.5	7.5 x 11.0
mandibles ⁵		
right	16	15.5
left	17	16
pronotum	8.0 x 15.0	6.5 x 12.25
elytra	19.0 x 8.5	19.0 x 7.5

The figures and their measurements indicate and prove that: *Cardoni* is smaller and more slender. The anterior margin of the head is semicircularly excised in *buddha*, in *cardoni* the mar-

³Fauna of British India, Coleoptera, Lamellicornia, vol. IV, p. 141. 1950. [It should be noted here that the foregoing title appears only on the back of the volume, the title page bears simply Fauna of India.]

⁴It must be emphasized here the measurements apply only to the figures, and may or may not be the actual measurements of the two insects in question.

⁵Measured from base (outer margin) to tip of mandibles.

gin is straight and laminate, with a small median notch.⁶ The head of *buddha* is broadest behind the eyes, in *cardoni* anterior to the eyes, with canthi more prominent. The pronotum in *buddha* is dilated to posterior angles, thence diagonally truncate to base; the pronotal sides in *cardoni* are parallel, the posterior angles nearly square. Base of pronotum, straight in *cardoni*, is medially produced in *buddha*. The elytra are distinctly more parallel and longer in *cardoni*, in proportion to the size of the

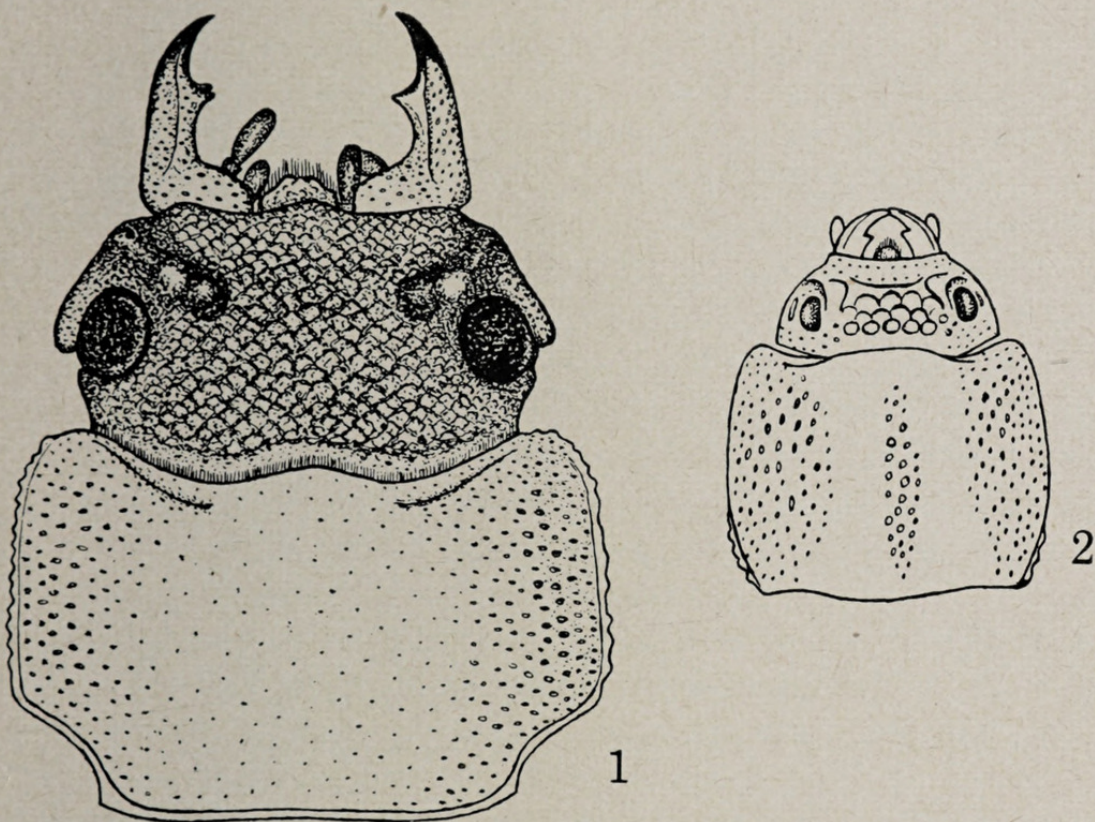


Fig. 1. *Hexarthrius aduncus* Jord. & Rothsch.

Fig. 2. *Figulus delislei* n.sp.

insects. A female of *buddha*, in the writer's collection, that was determined by Dr. Arrow appears to be more elongate than the female which Arrow portrays; the latter, however, seems to agree

⁶The notch occurs in several species of *Prosopocoilus*. Sometimes it is prolonged into a groove that is paralleled by a nodule on each side, and this situation seems to be confined solely to males of maximum development; in such individuals the spination of legs is frequently aborted or absent. For this group of species Hope and Westwood (Cat. Lucan. Coleop., 1845, p. 30) proposed the subgenus *Metopodontus*; however, as the characters are confined to specimens of maximum development, it is of little value in systematics of Lucanidae.

in every respect with the fine figure of ♀ *cardoni* that accompanies Didier's description. The question hence arises as to whether or not the female figured by Arrow is really *buddha*; it could just as well represent *cardoni*; it positively does not agree with the specimen in Benesh Collection, even though it was named *buddha* by Arrow.

Figulus delislei Benesh, new species

Figure 2.

Black, shining; allied to *F. acutangulus* Arrow.

Head transverse, twice as broad as long (2.1 x 0.9 mm.), anterior margin straight; antero-lateral angles nearly obsolete, slightly emarginate, posterior to these angles, gently, arcuately divergent to posterior angles of the canthus—which are nearly right angles and situated well beyond the eyes—thence converging obliquely to occipital foramen. Surface of head declivous in front, cribripunctate, declivity demarcated anterior to the ocular bosses by a transverse, raised shelf; disc, posterior to the shelf, with a shallow, circular excavation, ocellately punctate to occiput; posterior to the eyes, towards basal angles, with sparse, simple punctures. Clypeus inconspicuous, rounded. Canthus of a nearly perfect quarter-circle in outline, is, as broad, opposite the eye, as the transverse diameter of the eye. Mandibles short (0.5 mm.), robust, inner edge medially unidentate, apices blunt. Antenna of usual figuline aspect, consisting of nine segments; scape, funicle, and clava blood-red, glabrous; clava flattened, sensory area pubescent, opaque.

Pronotum broader than long (2.9 x 2.5 mm.), broadest in posterior third, depressed; anterior margin feebly sinuate, antero-lateral angles slightly produced and broadly arcuate, sides gently dilated to posterior third, thence converging to basal angles, which are obtuse; basal margin nearly straight. Disc highly polished and shining, with a median, longitudinal, punctate fovea, which does not attain the base; lateral declivity coarsely punctured, puncturation diminishing in size toward the lateral margins of the punctate fields; basal portion of lateral margins crenate. Scutellum not evident.

Elytra nearly twice as long as broad (5.5 x 3.1 mm.), broadest in basal third, gently converging to apical third, thence regu-

larly semicircular; punctate-striate, punctures ovate, interstices broad and flat; lateral margins somewhat irregularly punctured; striation consisting of six striae between suture and humeri, the latter obscurely mucronate; apical declivity strongly tumular, the post-declivous area rather strongly and closely punctured, much as in *F. manillarum* Hope & Westwood.

Legs short and stout, with femora and tibiae blood-red, knee and tarsi black; anterior tibiae strongly furcate distad and, externally, with 4 or 5 equidistant teeth; intermediate and posterior tibiae armed in distal half with two unequal spines.

Venter black, shining, excepting the mentum and gula, which are blood-red.: Mentum slightly broader than long, broadest anteriorly, feebly bilobate, sides rounded and converging to base, latter produced and straight; central area circularly hollowed and scarified; lateral margins each with a median tubercle. Metasternum with a median, longitudinal, impressed line; closely punctured laterally. Prosternal and mesosternal process not prominent, sloping. Inflexed portion of the elytra strongly punctured; abdominal segments rather coarsely and strongly punctured, the punctures diminishing in size and strength towards the mid section of the segments, which is highly polished and shining, but has a few, fine, remote punctures.

Length: 9.3 mm.; breadth: 3.1 mm.

The distinguishing characters between *F. delislei* and *acutangulus*, the most nearly allied of the previously described species, can be tabulated thus:

<i>delislei</i>	<i>acutangulus</i>
anterior margin of head nearly straight	margin semicircularly excised
front of head simple	front with a median tubercle
antero-lateral and basal angles of pronotum rounded	pronotal angles angulate
pronotal fovea not reaching basal margin	fovea attaining base, with pronounced lateral ridges
strial punctures small, interstices broad, flat	punctures larger, interstices narrower, convex
hollow of mentum cicatricose; sides ridged, each with a median tubercle	hollow of mentum rugulose; nontuberculate laterally

Holotype: Example of undetermined sex, Hoa-Binh, Tonkin (from the collection of Melchior de Lisle); at present in possession of the writer, to be incorporated eventually in the Benesh Collection in the Chicago Natural History Museum.

Received in a small lot of undetermined insects from Monsieur M. de Lisle, director of public works, Douala, French Cameroon. The new species is gratefully dedicated to the donor, who, very generously, permitted the retention of the type by the writer.

AGABUS VANCOUVERENSIS IN ALASKA

By BORYS MALKIN

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The published records of this species (H. B. Leech, Canadian Ent., vol. 77, p. 77, 1945) show the distribution limited largely to southern British Columbia, Vancouver Island, and Mt. Baker, Washington. A specimen from Mt. Rainier, Wash., in the collection of Dr. M. H. Hatch extends its range considerably to the south while its northern distribution is extended greatly by the following Alaskan material in my collection: Deer Mtn. nr. Ketchikan, July 23, 1952, elev. 2000-3000 feet; and 1 specimen from Knight Island, Prince William Sound, August 1952, elev. 1500-2000 feet (*H. Shippen*). There is an interesting feature concerning its ecological preference. Leech reports it as being partial to the pools formed by melting snow. The Deer Mtn. series (over 200 specimens) I collected in just such situation, and Mr. Herbert S. Shippen, who collected the Knight Island material, tells me that he found them in an analogous situation. While other records are all from about 4000 feet and above, the Alaskan records come from much lower elevation, which shows that the beetle follows the climatic conditions quite closely.



Benesh, Bernard. 1953. "Descriptions of New Exotic Species of Stag-Beetles (Lucanidae)." *The Coleopterists' Bulletin* 7(4), 25–32.

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