

## IX A NEW *CHLAMYS* FROM CALCUTTA.

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Among the Hispinae and Cassidinae sent to me by Mr. Gravely from the Indian Museum, there occurs an interesting insect, belonging to the division Camptosomes of the family Chrysomelidae. It is necessary to describe it as a new species, it being the fourteenth *Chlamys* recorded from the Indian region. I name it after Mr. Gravely who found it on *Ziziphus jujuba* at Calcutta and tells me that in life it closely resembles a piece of caterpillar excrement. I thank Dr. Gahan for allowing me to see the types in the collection of the British Museum, and Mr. Andrewes for letting me examine the types in his collection.

Family CHRYSOMELIDAE.

Division CAMPTOSOMATA.

Sub-family CHLAMYDINAE.

Genus *Chlamys*, Knoch.

*Chlamys gravelyi*, n. sp.

Sub-quadrate, broadest at the middle, narrowed anteriorly and posteriorly, black, five basal joints of antennae fulvous, the remaining six joints very dark brown. The insect is completely covered with coarse and shallow punctures, in some parts the punctures are shallower and in others they are deeper. The elevated surface of the prothorax with four ridges and without any tubercles, each elytron with ten sharp tubercles. Length 2.5 mm.

*Head* with the vertex coarsely punctate, shallowly depressed in the middle; eyes oval, convex, triangularly notched on the inner side; basal joint of the antenna thickest, longest, and curved to fit into the grooves round the eyes, 2nd joint small and rounded, 3rd-5th joints small and equal to one another in length, 6th joint transverse but smaller than the following joints, 7th-11th joints large and transverse, apex of 11th joint rounded. When the antennae are extended forwards the lateral expansions of the apical 6 joints are on the outer side, in repose they lie closely pressed to the sides of the prosternum, the tips reaching up to its constricted portion, and the lateral expansions being on the inner side. It is difficult to examine the antennae properly unless they are dissected off and a balsam mount made of them.

*Prothorax* bisinuate on either side at base which is as broad as that of the elytra; narrowed in front, anterior margin circular, the head fits in well into this circular front of the prothorax; lateral margins oblique and straight; the disc in the middle is triangularly and considerably elevated, the apex of the triangle being towards the scutellum, on this elevated portion there are two strong ridges running parallel down the middle, and from near the bases of these middle ridges two other sinuous ridges branch off, all of these ridges scarcely reach the anterior margin, they become feebler towards the margin.

*Scutellum* about twice as broad as long, the two apical outer angles produced, surface rough.

*Elytra* broadest at base, constricted at the middle; coarsely and deeply punctate; suture serrate throughout; humeral callus raised, rounded, surface finely strigose. Each elytron has ten

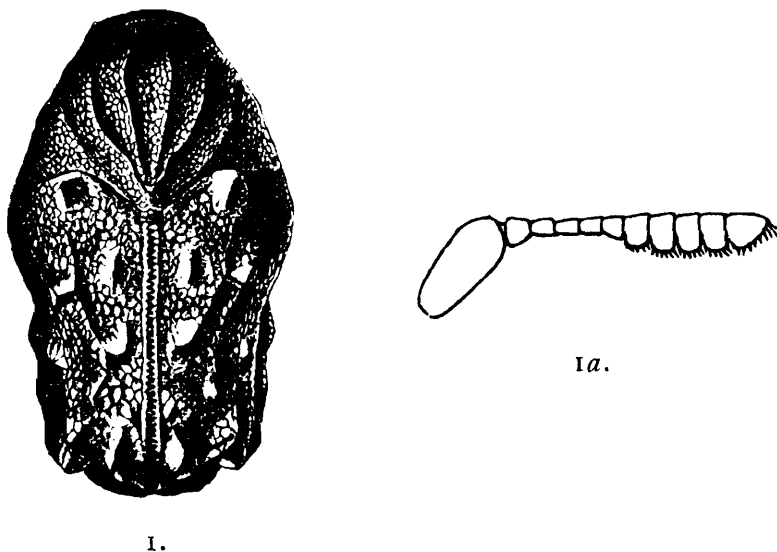


FIG. 1.—*Chlamys gravelyi*, n. sp. from above; 1a. antenna.

sharp tubercles disposed as follows:—in a longitudinal line parallel to the suture there are four tubercles, the third being smaller and more towards the suture, along the median longitudinal line three, and finally there are three along the lateral marginal line, the second of these tubercles being deviated more towards the median line; the fourth tubercle of the sutural line, third of the median line and the second of the lateral marginal line being close together form a group. The surface of the elytra is rough being raised in places, particularly between the tubercles.

*Underside*.—Prosternum widened anteriorly and greatly constricted towards the posterior extremity. Last abdominal sternite with a depression in the middle. Pygidium with three ridges and four deep furrows.

*Localities*:—Calcutta, 3-iv-1915, 25 and 30-v-1915, 8-vii-1912, 27-ix-1915, 2-x-1915, "on *Ziziphus jujuba*" (F. H. Gravely); Paresh-

nath, W. Bengal, 4000-4400 ft., 10-iv-1909, "on various shrubs" (*Annandale*).

Described from 14 examples.

*Type* in the Indian Museum, Calcutta; 2 co-types in the British Museum.





## X DESCRIPTIONS OF TWO NEW FISH FROM THE CHILKA LAKE

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Descriptions of two new species in the Chilka Survey collection are now published in advance of the report on the fish which is under preparation, in order to avoid the detention of a paper on the larval stages by Professor D. R. Bhattacharya, which will be issued shortly in vol. V of our *Memoirs*.

### ***Gobius ostreicola*, sp. nov.**

The height of the body is 22·2% of the total length without the caudal fin, the length of the head is 35·5%, the least depth of the caudal peduncle is 15·5%, the diameter of the eye is 9%, the height of the first dorsal fin is 22·2%, the length of the pectoral fin is 33·3%, the length of the ventral fin is 26·6%, the base of the anal fin is 20%, the base of the second dorsal is 26·5%, the length of the caudal fin is 26·6% in the total length without the caudal fin.<sup>1</sup>

The body is elongate and compressed. The caudal peduncle is very much compressed. The dorsal profile slopes downwards from the nape towards the caudal peduncle as well as towards the snout; the ventral profile is almost a straight line.

The head is large and broad and is very much depressed, its breadth being shorter than its length by the length of its snout. The part of the head on each side in front of the opercle and behind the eye protrudes above and is inflated sideways with a pore behind. There is a median longitudinal groove from the occiput to the back of the eye. The interorbital space is saddle-shaped with a slight bridge-like elevation in the middle and is equal to the length of the snout. There are a series of minute pores—openings of muciferous glands—arranged in patterns round the eyes, the nasal area and other parts of the head. The nasal area has two fleshy tubular protuberances with two valvular openings behind each in front of the eyes. The eyes are rather large, and are not lateral but wholly superior, and project beyond the dorsal profile. The snout is short and is less than the diameter of the eye in length.

The mouth is horizontal, the jaws are subequal, the lower jaw being slightly the longer, the angle of the jaws is vertically below the middle of the eye. The teeth are villiform and are in several

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<sup>1</sup> Measurements are in hundreds of length without the caudal fin.

rows in each jaw, those of the upper jaw being smaller and less numerous than those of the lower. The teeth in the upper jaw are in two series: the outer series consists of two or three rows of teeth larger anteriorly but becoming smaller laterally; the inner (posterior) series forms a cluster of smaller teeth several rows deep but not spreading laterally. In the lower jaw there are broad bands of teeth several rows thick which continue to the angle of the mouth in almost equal thickness; the outer ones of this set are slightly larger than those behind.

The gill openings are lateral and they do not continue forward beneath. The isthmus is broad, the width being contained three times in the length of the head. Pseudobranchiae are present.

There are two dorsal fins, entirely separated from each other, the first one has six spines and the second has ten rays; the anterior end of the first dorsal is considerably behind the base of the pectoral fin, the third to fifth spines are the longest but they do not reach beyond the third ray of the second dorsal fin when lying horizontal. The second dorsal fin begins a little forward of the tip of the pectoral fin; the posterior rays of this fin are slightly longer than the anterior ones and the last of these rays almost reaches the base of the caudal fin.

The anal fin has nine rays the first of which is undivided; it is inserted a little behind the origin of the second dorsal fin and is somewhat similar in shape to that fin. Its posterior rays are longer and are long enough to reach some of the rays of the caudal fin that are attached to the ventral side of the base of that fin.

Six specimens—one type and five co-types—have the dorsal and anal fin rays as follows:—

|           | Dorsal spines. |      | Dorsal rays. |    | Anal rays. |    |
|-----------|----------------|------|--------------|----|------------|----|
|           | VI.            | VII. | 10           | 11 | 9          | 10 |
|           | 5              | 1    | 5            | 1  | 4          | 2  |
| Specimens | ...            |      |              |    |            |    |

The pectoral fin has sixteen rays, some of which are thin and silky; the fin is somewhat low down; rather broad, and has a rounded margin.

The tip of the united ventral fin reaches the vent. The anal papilla is prominent, long and muscular. The caudal fin is broadly rounded.

The scales are small and are mostly ctenoid, except a few very small scales embedded in the occipital region of the head which is otherwise naked; the isthmus and chest are also scaleless. There are a few embedded scales in front of the vent and the part of the abdomen above the joined-ventral fin is scaleless. The number of scales in the lateral line is thirty-seven and in the lateral transverse fourteen.

The colour of the body (in spirit) is mottled dark brown, the ventral side and the sides of the abdomen being slightly lighter; the fins are dull white and the two dorsal, anal and caudal fins are banded by series of black spots in the spines and rays; in the first dorsal fin there are four such series of black dots, in the rest it varies from two to three.

The fish was found breeding among the oyster beds near Manikpatna in the Satpara peninsula.

The type specimen, measuring 45 mm. without the caudal fin and 57 mm. with it, was collected in the beginning of the month of December, 1914 near Manikpatna among the oyster beds.

There are altogether five co-types, two of which, measuring 48 mm. and 49 mm., were collected along with the type specimen near the same spot. The other three co-types measuring 39 mm. to 41 mm. were collected on the 5th of September, 1914 near the same locality.

***Petroscirtes bhattacharyae*, sp. nov.**

The height of the body is 18% of the total length without the caudal fin, the length of the head is 25%, the least depth of the caudal peduncle is 11.5%, the diameter of the eye is 7%, the length of the snout is 9%, the length of the pectoral fin is 18%, the length of the ventral fin is 14%, the length of the caudal fin is 16%, the base of the dorsal fin is 72%, and the base of anal fin is 22% in the total length without the caudal fin.

The body is moderately elongate, round and naked. The snout is rounded and short; the mouth is sub-inferior and terminal; the cleft of the mouth is narrow. There are two small tentacles about the middle of the snout in front of the nasal openings.

There are long incisiform teeth in a single row in each jaw, and a pair of canine teeth at each angle of the jaws. The upper canine teeth are very much bent and recurved, the lower ones are longer and stouter and not curved. The number of incisor teeth in the upper jaw is 18 and that in the lower 16. There is a considerable alveolar space between the upper canine and the last (outermost) incisor of the upper jaw in each side—in which space the lower canine is lodged when the mouth remains shut.

The fins are thin, the spines and rays are hyaline and the interstices are membranous. There is a single dorsal fin with thirty-one spines commencing slightly in front of the gill-openings and ending near the base of the caudal fin; the posterior spines of the dorsal fin are higher than the anterior ones, some of the long posterior spines being almost double the length of the anterior short ones. The anal fin has twenty-one rays, the last rays almost touch the lower caudal rays. The caudal fin is fan-shaped, it appears to be somewhat truncated and has rounded sides. The ventral fin consists of two fleshy round rays united at the base and free at the end, the free portion of the outer ray is nearly double that of the inner free end. The pectoral fin is

rounded and has a somewhat muscular base. It is considerably posterior to the origin of the ventral fin. There is an anal papilla equidistant from the end of the snout and the base of the caudal fin, it is also in the middle of the vent and the anterior origin of the anal fin.

The ground colour of the head and of the body is dull brown with a lighter shade in the abdominal region. On each side of the head there are four broad transverse bands, black in colour, with interspaces equally broad but white; on the upper part of the head there is one white horse-shoe-shaped loop commencing behind the eyes and reaching round the occiput. On the side of the body there are eight or nine very faint but darkish transverse bands—broader than those on the sides of the head, with interspaces equally broad; along the middle line on each side of the body—on each of these dark faint bands—there are altogether eight or nine round black blotches. Looking from above the lighter interspaces, that pass through the base of the dorsal fin from side to side, appear as many white blotches. The fins are diaphanous and slightly darkish, the anal fin being darker than the rest. The dorsal and the anal fins are edged with bright white points and the base line of the caudal fin has a white band posterior to a dark band. There is a transverse broad black band low down on the anterior side of the base of the pectoral fin. The terminal edge of the opercular membrane is white.

The type specimen, measuring 44 mm. without the caudal fin and 51 mm. with that fin, was obtained at Barkul Point on the 2nd March, 1914. There are altogether eleven co-types.

*Habitat.*—The species is a permanent inhabitant of the lake, both in the Main Area and in the outer channel, breeding in the lake.

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XI DESCRIPTION DE LA LARVE DE  
*LASIODACTYLUS CHEVROLATI*,  
REITT

[COLEOPTERA, NITIDULIDAE].

Par P. DE PEYERIMHOFF.

Matériel étudié: Nombreuses larves de tous âges, conservées dans l'alcool faible, recueillies avec l'imago.

Provenance: Barkuda I., Chilka L. (Ganjam, Madras, Indes Anglaises), dans des fruits tombés et fermentés de *Melia azadirachta* (*Neem* ou *Nim* tree). Coll. Chilka Survey.

Longueur des plus grands spécimens: 7 mm.—Largeur: 1.5 mm.

Corps éruciforme, assez convexe, d'un jaune orangé; tête plus foncée; pronotum chargé de deux plaques cornées brunes; contours des mandibules, taches rétinienne, stigmates, quatre taches cornées sur le mésonotum et le métanotum, deux taches analogues sur les 9 tergites abdominaux, extrémité des prolongements du dernier segment et trochantins, d'un brun clair. Téguments mats, sauf sur la tête et sur les taches cornées. Pilosité presque nulle, au moins chez les individus âgés.

Tête dégagée chez les individus jeunes, légèrement engagée dans le prothorax chez les individus âgés, atténuée en avant à partir de la moitié, arrondie en arrière, portant une forte impression en U superposée aux sutures de l'aire frontale, ornée de quelques soies, claviformes en dessus, simples en dessous. Clypeus transversal, fortement tuméfié de chaque côté, sans suture nette. Labre bien détaché, encore plus transversal, portant six soies sur le pourtour et des papilles au bord antérieur.

Antennes ayant à peu près la longueur de l'épistome et du labre pris ensemble, basées sur une large membrane cupiliforme, de 3 articles décroissant en largeur, le 1<sup>o</sup> carré, plus ou moins enchâssé dans la membrane basilaire, le 2<sup>o</sup> allongé, légèrement fusiforme, le dernier très petit, subulé, terminé par une soie et accolé à un cône sensitif interne moindre de moitié.

Ocelles latéraux, au nombre de 4, sous forme de cornées saillantes disposées au-dessus d'une tache rétinienne foncée.

Mandibules courtes, à peu près symétriques, cachées sous l'épistome et le labre, peu chitinisées, sauf sur les bords et sur les condyles, fortement anguleuses au côté externe, composées d'une pointe cornée à sommet bifide, portant 4 ou 5 dents au bord interne,—d'une lacinia formée de lanières multifides réunies en frange,—d'une mola finement striée, semblant évidée en dessous et un peu davantage à droite qu'à gauche.

*Trou occipital* inféro-postérieur; *trou maxillaire* vaguement

rectangulaire; tous deux communiquant entre les pleures, dont les ailes sont distantes du dixième environ de la largeur de la tête. *Pièces labio-maxillaires* en partie membraneuses, peu saillantes en dessous.

*Maxilles* formées d'un *stipe* deux fois plus long que large, à contours externes flexueux basé sur un *cardo* très peu coudé, et au sommet, séparé du lobe par une suture très nette. *Lobe* maxillaire oblong, couvert au sommet de papilles et de soies sensibles et portant à la base, sur la face dorsale, un fascicule de 4 dents aigues, dont deux beaucoup plus développées, dépassant le bord interne. *Membrane articulaire* à peine chitinisée sur son bord interne. *Palpes maxillaires* épais, le palpigère complètement détaché, corné à la base et simulant un premier article; l'orange paraît ainsi composé de quatre segments.

*Labium* composé d'avant en arrière: d'un *palpigère* cordiforme portant une paire de palpes *uniarticulés* recouverts d'une *langue* arrondie, obtuse, non sétuleuse,—d'un *menton* également cordiforme, pourvu de deux soies, membraneux au sommet, où il peut enchâsser une partie du palpigère,—d'un *sous-menton* très allongé, dont le tégu-

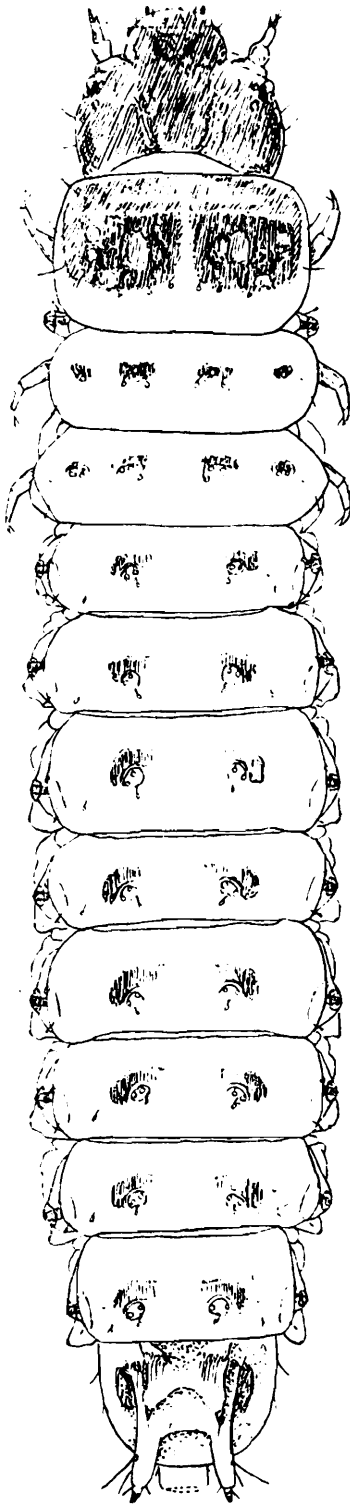


FIG. 1.—Larve de *Lasiodactylus chevrolati*.  
Specimen âgé.

ment luisant contrasta avec la matité de la membrane articulaire, —d'une *gula* membraneuse (à peu près invisible sans dissection) et située exactement entre les deux sommets cornés des pleures.

*Pronotum* beaucoup plus développé que tout autre segment, transversal à côtés arrondis, orné sur ses deux tiers antérieurs de

deux plaques cornées et luisantes, presque contigues; chacune d'elles porte quelques courtes soies claviformes et quatre impressions, une médiane et trois latérales, à fond plus clair.

*Mésonotum* et *métanotum* identiques, presque de moitié plus courts que le pronotum, portant quatre plaques luisantes bien moins étendues, les médianes plus développées, terminées en arrière par un tubercule charnu couronné de trois soies claviformes,—les latérales munies de deux soies seulement; de chaque côté en outre, deux papilles et une soie claviforme.

*Segments abdominaux* ornés sur les 8 premiers de deux plaques seulement, de plus en plus étendues et à tubercule sétigère de plus en plus isolé et saillant d'avant en arrière,—portant en outre une papille et une soie discales de chaque côté. Neuvième segment

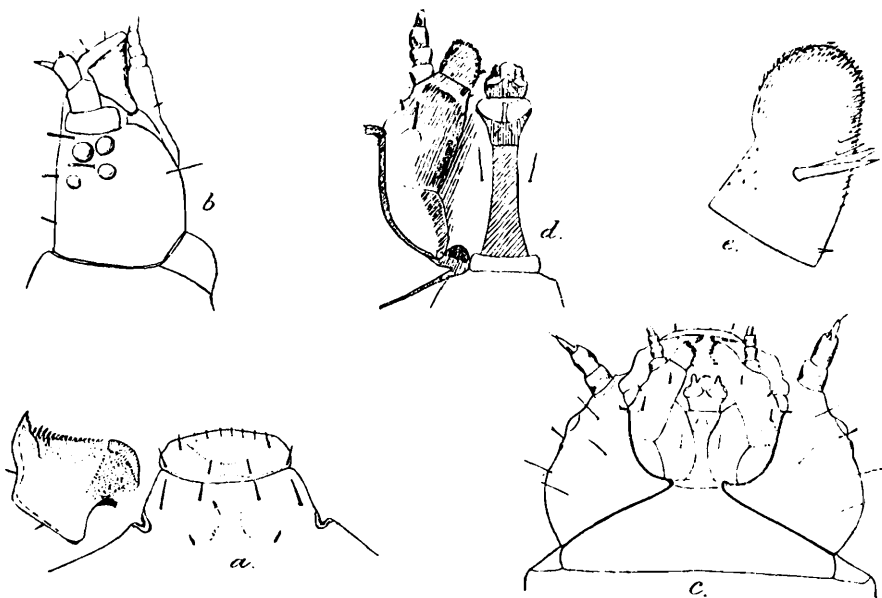


FIG. 2.—Larve de *Lasiodactylus chevrolati*.

a. Clypeus, labre et mandibule (légèrement détachée), face dorsale : b. Tête vue latéralement : c. Face ventrale de la tête : d. Maxillaire et labium vus par la face ventrale : e. Lobe maxillaire vu par la face dorsale.

sensiblement plus étroit, en trapèze renversé, tuméfié vers le sommet, d'où partent deux paires d'appendices à sommet chitineux, les antérieurs courts, les postérieurs allongés, sétigères.

*Dessous* membraneux et mou. *Prosternum* relié à la tête par un goître transversal très développé. *Pleurites* thoraciques et abdominaux composés de toutes les pièces indiquées par Hopkins<sup>1</sup>, savoir l'épipleure, l'hypopleure, le sternum (silloné longitudinalement), le sternellum et le poststernellum (fig. 3a). L'épipleure, de plus en plus saillante d'avant en arrière, se termine latéralement par un tubercule charnu, orné d'une papille antéapicale. *Anus* tronconique, à extrémité orné de 6 soies; maqueuse érectile quadrilobée.

<sup>1</sup> "The genus *Dendroctonus*". Washington, 1909, p. 62, fig. 39.

*Stigmates* en nombre normal, la 1<sup>re</sup> paire inféro-latérale, située à la marge antérieure du métathorax, les 8 autres dorso-latérales, de plus en plus rapprochées, d'avant en arrière, du bord postérieur des segments. Ils sont très saillants, en forme de boutons foncés, et constitués par un élément de trachée très élargi, très chitinisé, recouvert d'une sorte de cloche également chitineuse, percée au sommet par le péritrème, qui est légèrement réniforme.

*Pattes* très écartées, et de plus en plus de la 1<sup>re</sup> à la 3<sup>e</sup> paire, rattachées à un *trochantin* bien visible, composées d'une *hanche* globuleuse semée de papilles microscopiques, sauf sur la partie centrale, qui s'affaisse en contraction pour recevoir une partie des segments suivants,—d'un *trochanter* égal à la moitié du fémur,—d'un *fémur* deux fois plus long que large,—d'un *tibia* égal en longueur au fémur, mais deux fois plus mince,—d'un *tarse* formé d'un ongle à base membraneuse portant une soie en-dessous.

Chez les larves de plus en plus jeunes, la tête est de plus en plus grosse par rapport au prothorax, les tubercules sétigères sont de plus en plus saillants, et les soies elles-mêmes, simples ou clavi-

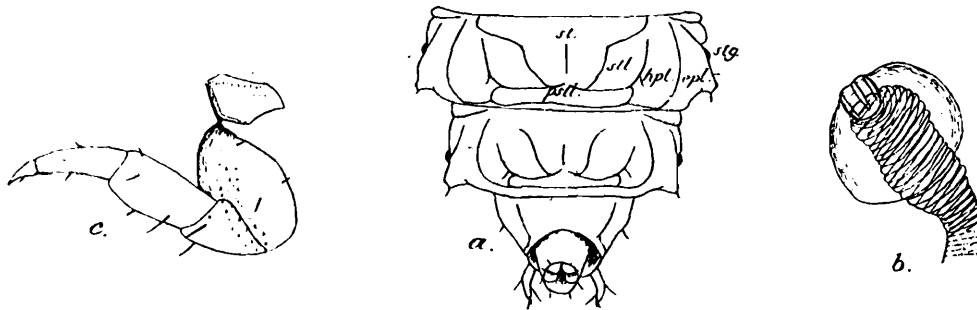


FIG. 3.—Larve de *Lasiodactylus chevrolati*.

a. Face ventrale des derniers segments: b. Extrémité d'un tronc trachéen et stigmate: c. Patte postérieure droite, vue de dessous (avec le trochantin précédant la hanche).

formes, de plus en plus longues; les papilles deviennent également sétifères, notamment celles qui terminent le processus latéral des pleures. Les soies inférieures participent au même développement.

Larve de Nitidulide typique, à structure très différenciée et à adaptation nettement saprophage. La discussion de ses caractères et leur comparaison avec ceux des autres types seront faites ultérieurement. D'ailleurs, le petit nombre de Nitidulidae connus à ce point de vue et l'insuffisance de la plupart des descriptions, rendraient actuellement cet examen comparatif aussi incomplet que difficile.

Deux larves de *Lasiodactylus* ont été déjà décrites:

1. Celle de *L. pictus*, Mac-Leay (E. Candèze, Histoire des métamorphoses de quelques Coléoptères exotiques, Liège, 1861, p. 16, pl. iii, fig. 6 [sub "*Lordites glabricula*, Murray i. litt.].—Quoi que très succincte, cette description permet de constater que la larve de *L. pictus* (de Ceylan) diffère peu de celle de *L. chevrolati*. Elle n'aurait toutefois que deux taches cornées au lieu de 4, sur le

mésnotum et le métanotum, et ces taches, comme celles des segments de l'abdomen, seraient surmontées d'épines au lieu de soies claviformes.

2. Celle de *L. caliginosus* Reitt. [d'après une communication *in litteris* de M. le Dr. Sicard, qui a récolté cette larve et l'a communiquée à l'auteur de la description]—Capt. Xambou, Larves de Madagascar, 14<sup>e</sup> Mémoire, sep. 1905, p. 16—17 [sub "*Lordites species*"].—Cette larve n'a que deux ocelles, et le mésnotum, le métanotum et les segments abdominaux sont dépourvus de plaques ou taches cornées. Différences relativement importantes, et qui laisseraient supposer une erreur d'attribution ou de détermination.





XII CONTRIBUTIONS TO A KNOWLEDGE  
OF THE TERRESTRIAL ISOPODA  
OF INDIA

Part II.—SOME NEW SPECIES OF *PARAPERISCYPHIS*,  
*CUBARIS*, etc.

By WALTER E. COLLINGE, *M.Sc., F.L.S., etc.*, Research  
Fellow of the University of St. Andrews.

(Plates IX—XIX.)

The present contribution deals mainly with new species of the genus *Cubaris*, Brandt, amongst which is an interesting one from caves near Cherrapunji, Assam. Two new species of *Paraperiscyphis*, Stebbing, are described from single specimens from Ceylon, but their characters are so distinct from any known forms, that I offer no excuse for departing from a rule not to describe from single examples. It is interesting to be able to record a new species of *Burmoniscus*, Cllge., also from a cave near Cherrapunji. The complete list is as follows :

*Paraperiscyphis* *stebbingi*, Cllge.

,, *pulcher*, n. sp.

,, *scabrus*, n. sp.

*Cubaris* *gravelii*, n. sp.

,, *expansus*, n. sp.

,, *dilectum*, n. sp.

,, *pusillus*, n. sp.

,, *brunneocaudatus*, n. sp.

,, *chiltoni*, n. sp.

,, *cavernosus*, n. sp.

,, *lobatus*, n. sp.

,, *albolateralis*, n. sp.

*Burmoniscus* *kempi*, n. sp.

Genus **Paraperiscyphis**, Stebbing.

1911. *Paraperiscyphis* Stebbing, *Rec. Ind. Mus.*, vol. VI, p. 184.

**Paraperiscyphis** *stebbingi*, Cllge.

1914. *Paraperiscyphis* *stebbingi*, Collinge, *Rec. Ind. Mus.*, vol. X, p. 207,  
pl. xxiv, figs. 1-10.

*Habitat*.—Kavalai, 1300-3000 ft., Cochin State, 24—27-ix-1914.  
No.  $\frac{8928}{10}$  (*F. H. Gravelly*).

This is an additional record for this interesting species.

I find that in describing this species I made a most unfortunate slip in the diagnosis wherein it was stated (p. 207) "2-jointed flagellum, the first joint longer than the second," and again on p. 208 the error was repeated. In *P. stebbingi* the first joint of the flagellum is *not longer than the second*, but as correctly figured (*cf.* pl. xxiv, figs. 1 and 2).

### ***Paraperiscyphis gigas* (Collge.).**

1915. *Periscyphis gigas*, Collinge, *Rec. Ind. Mus.*, vol. XI, p. 148, pl. ix, figs. 1-10.

The form of the uropoda, which is a character of the very greatest importance in the classification of this and allied genera, will necessitate the removal of this species to the genus *Paraperiscyphis*.

### ***Paraperiscyphis pulcher*, n. sp.**

(Pl. ix, figs. 1-5).

Body oblong oval, dorsal face strongly convex, surface irregular but smooth. Cephalon (fig. 1) small, flanked by the lateral plates of the first segment of the mesosome, lateral lobes well developed, median lobe represented by slight median expansion of the anterior margin; epistoma carinate. Eyes subdorsal. Antennulae (fig. 2) small, 3-jointed, distal joint with terminal style and indented on the inner side. Antennae (fig. 3) moderately stout, joints 2-4 subequal, 5th joint the longest; flagellum 2-jointed, with the first joint shorter than the second which has a fine terminal style. Uropoda (fig. 4) extending beyond the telson, basal plate short and stout with antero-dorsal surface expanded, convex dorsally, concave ventrally; exopodite and endopodite extending beyond the basal plate, both articulating on the inner margin, exopodite flat and blade-like, endopodite three-sided. Telson (fig. 5) obtusely triangular, dorsal surface convex, irregular and smooth. Length 14.5 mm.  $\times$  7 mm. Colour (in alcohol) greyish-green ground colour with small irregular blackish spots on the posterior border of each mesosomatic segment, in the median line on each mesosomatic and metasomatic segment is a yellowish spot, lateral to this an irregular yellowish marking, and still more laterally another spot, which together give the appearance of five broken lines.

*Habitat*.—Peradeniya, Ceylon, 28-v-1910. No.  $\frac{8603}{10}$  (*F. H. Gravely*).

*Type*.—In the collection of the Indian Museum.

The form of the cephalon, antennae and uropoda separate this handsome species from any other member of the genus. There being only a single example, I have not attempted any examination of the mouth-parts.

***Paraperiscyphis scabrus*, n. sp.**

(Pl. ix, figs. 6—10).

Body oblong oval, dorsal face strongly convex, richly tuberculated. Cephalon (fig. 6) small, flanked by the 1st segment of the mesosome, lateral lobes well developed, median lobe small and confluent with carina of epistoma. Eyes subdorsal. Antennulae (fig. 7) small, 3-jointed, distal joint terminating as a cone. Antennae (fig. 8) with joints 2 and 3 subequal, 4th joint nearly twice as long and 5th nearly three times as long; flagellum 2-jointed, with the first joint shorter than the second which has a fine terminal style. Whole of appendage sparsely covered with short bluntly ending setae. Uropoda (fig. 9) extending beyond the telson, basal plate short and stout, with antero-dorsal surface expanded, convex dorsally with thickened antero dorsal margin bounding the antero-dorsal surface, concave ventrally with groove; exopodite and endopodite both extending beyond the basal plate and articulating on the inner margin. Telson (fig. 10) obtusely triangular, dorsal surface convex, tuberculated. Length  $11.5 \times 6$  mm. Colour (in alcohol) greenish-brown with yellowish mottling.

*Habitat* —Peradeniya, Ceylon. No.  $\frac{8585}{10}$  (F. H. Gravely).

*Type*.—In the collection of the Indian Museum.

In the form of the telson and uropoda this species shows a relationship to *P. pulcher*, but is separated by the striking difference in the shape and development of the lateral and median lobes of the cephalon, there are also well-marked differences in the form of the antennulae and antennae.

**Genus *Cubaris*, Brandt.**

The widely conflicting opinions held as to the position of this genus afford a typical instance of the very unsatisfactory state of the classification of the Terrestrial Isopoda.

Brandt's description<sup>1</sup>, though brief, is quite clear, and the slight modifications suggested by Miers<sup>2</sup> in 1877 scarcely affect it. Budde-Lund<sup>3</sup> in his 'Revision' p. 36, under the Family Oniscidae, subfamily 7 Oniscinae, Tribe 1 Armadilloidea, cites the genus *Armadillo*, Dum., and under Tribe 2 Oniscoidea, the genus *Armadillidium*, Brandt, and from the later text we gather that the genus *Cubaris* is sunk as a synonym of *Armadillo*. In 1910<sup>4</sup> (p. 9) the genus is recognized and appears between *Armadillo*, Dum., and *Pericephalus*, B.-L., whilst in 1912<sup>5</sup> it is regarded by him as a subgenus only, in the subfamily Oniscinae.

<sup>1</sup> *Bull. Nat. Hist. Soc. Moscow*, 1833.

<sup>2</sup> *Proc. Zool. Soc. Lond.*, 1877.

<sup>3</sup> *Rev. Crust. Isop. Terr.*, 1904.

<sup>4</sup> Sjöstedts *Kilimandjaro-Meru Exped.* 21 Crust. 2 Isop., 1910.

<sup>5</sup> *Trans. Linn. Soc. Lond. (Zool.)*, 1912.

This author's attempts at classification were frequently unfortunate, as in the present instance. He approached more closely to a sound classification perhaps in 1910 than in any of his previous or later writings, but did not seem able to decide upon any system or parts, other than the oral appendages, which frequently misled him.

I hope at a later date, when more of the Indian and Asiatic species have been worked out, to submit a revision of the Family Armadillidiidae founded upon structural characters, in the meantime I am provisionally placing all the Indian forms in the one genus.

**Cubaris gravelii, n. sp.**

(Pl. x, figs. 1—11).

Body oblong oval, slightly convex, smooth. Cephalon (figs. 1 and 2) small, strongly marginate anteriorly and posteriorly, lateral lobes small, median lobes absent; epistoma vertical with triangular-shaped depression in the medio-anterior line. Antennulae (fig. 3) small, 3-jointed, terminal joint pointed with number of fine setae laterally, proximal joints globose, distal joint attenuated. Antennae (fig. 4) short, sparsely setaceous, joints 3—5 slightly grooved on their outer side; flagellum 2-jointed, the distal joint being the longer. First maxillae (fig. 5), outer lobe terminating in four stout incurved spines and four smaller inner ones. Second maxillae (fig. 6) thin and plate-like, terminating distally in a bilobed manner, the outer lobe is fringed with setae, and those on the inner one form a brush-like lobe. Segments of the mesosome convex, lateral plates of 2nd to 4th segments slightly excavate, remainder truncate, posterior angles only slightly produced backwards. Segments 1 and 2 with notch and groove on their lower inner margins for reception of succeeding segments (fig. 7). Maxillipedes (fig. 8), outer palp terminates in a multispinous process on the outer side, with a very small spine and then two larger ones below it, from the base of the outer palp are three large spines, the inner palp is very broad and has two spines with wide bases, and one short, blunt, tooth-like one on the innermost border and a longer pointed one on the lower margin. Uropoda (figs. 9 and 10) not extending beyond the telson, basal plate narrow posteriorly, thickened and convex dorsally, antero-dorsal surface prominent; exopodite articulating in deep groove on the inner border of the basal plate, which here is slightly excavate, endopodite setaceous, with two long whip-like setae terminally. Telson (fig. 11) longer than the breadth at the posterior margin which is slightly curved, expanded anteriorly, somewhat flattened. Length 12 mm. Colour (in alcohol) dark horny-brown with few lighter lateral flecks on the mesosomatic segments.

*Habitat*.—Pass between Chaibassa and Chakardharpur, Chota Nagpur, 24-iii-13. No.  $\frac{8604}{10}$  (*F. H. Gravely*).

*Type*.—In the collection of the Indian Museum.

The species is named in compliment to Mr. F. H. Gravely.

The antennules here differ strikingly from any other species of *Cubaris* I know of. The mouth-parts are typical of the genus. The tooth on the underside of the lateral plate of the first mesosomatic segment is small, being just large enough to overlap the anterior wall of the groove on the second segment. The uropoda have a prominent antero-dorsal surface on the basal plate and the postero-dorsal portion is strongly convex, ventrally the plate is almost flat. Below the point of articulation of the exopodite is a small groove, and the inner border of the basal plate is slightly excavate. The length of the telson is greater than the breadth of the posterior margin.

***Cubaris expansus*, n. sp.**

(Pl. xi, figs. 1—10).

Body broadly oval, strongly convex, almost smooth. Cephalon (figs 1 and 2) small, marginate anteriorly, lateral lobes very small, median lobes absent; epistoma almost vertical. Eyes situated dorso-laterally. Antennulae (fig. 3) small, 3-jointed, terminal joint pointed with eight blunt setae, proximal joint the smallest. Antennae (fig. 4) short, covered with fine setae, 2nd to 4th joints grooved on their outer side; flagellum 2-jointed, distal joint nearly twice as long as the proximal one. First maxillae (fig. 5), outer lobe terminates in four stout incurved spines and six smaller ones; inner lobe terminally rounded, with two setose spines. Segments of the mesosome strongly convex, lateral plates of 2nd and 3rd segments slightly excavate, remainder truncate, posterior angles very slightly produced backwards. Segments 1 and 2 with notch and groove on their lower inner margins for reception of succeeding segments (fig. 6). Maxillipedes (fig. 7), the outer palp terminates in a multispinous process on the outer side, with two prominent spines below it, the inner palp possesses two spines with wide bases, then a fine marginal spine and one short blunt tooth-like one on the innermost border. Uropoda (figs. 8 and 9) not extending beyond the telson, basal plate narrower posteriorly than anteriorly, posterior margin almost straight, dorso-antero-lateral surface prominent; exopodite small, articulating on the inner border of the basal plate, which is here raised in a boss, endopodite setaceous, two and a half times the length of the exopodite, articulating at the top of the inner border of the basal plate. Telson (fig. 10) longer than the breadth at posterior margin which is almost straight, expanded anteriorly with slight concavity in the median line. Length  $13.5 \times 6.5$  mm. Colour (in alcohol) horny-brown with lighter lateral flecks on the mesosomatic segments.

*Habitat*.—Barkuda I., Chilka L., Ganjam Dist., Madras Pres., 16-vii-14. No.  $\frac{8921}{10}$ .

*Type*.—In the collection of the Indian Museum.

*C. expansus* is characterized by the broadly oval body, the series of eight blunt setae on the inner border of the distal joint of

the antennulae and the form of the uropoda. The tooth on the underside of the lateral plate of the first mesosomatic segment is fairly long and pointed and overlaps the anterior wall of the somewhat flattened groove of the second segment.

***Cubaris dilectum*, n. sp.**

(Pl. xii, figs. 1—9).

Body oblong oval, convex, finely tuberculate. Cephalon (figs. 1 and 2) small, strongly marginate anteriorly and posteriorly, lateral lobes small, median lobes absent; epistoma almost vertical, slightly depressed laterally. Antennae (fig. 3) situated rather low on the epistome, sparsely setaceous, somewhat attenuate; flagellum 2-jointed, the distal joint being the longer. First maxillae (fig. 4), outer lobe terminating in four stout incurved spines and six smaller inner ones. Segments of the mesosome convex, lateral plates of 2nd to 5th segments slightly excavate, remainder truncate, posterior angles only slightly produced backwards. Segments 1 and 2 with notch and groove on their inner margins for reception of succeeding segments (fig. 5). Maxillipedes (fig. 6), outer palp terminates in a broad multispinous process on the outer side and a single large pointed one below it, from the base of the outer palp are two large spines, the inner palp is broad and has three pointed marginal spines and one short, blunt, tooth-like spine on the innermost border. Uropoda (figs. 7 and 8) extend very slightly beyond the telson, basal plate narrow posteriorly, thickened and strongly raised, convex dorso-laterally, antero-dorsal surface expanded, strongly marginate; exopodite large and extends slightly beyond the basal plate, endopodite setaceous, broad and slightly flattened, with three long whip-like setae terminally. Telson (fig. 9) longer than the breadth at the posterior margin which is slightly curved, sides only very slightly incurved, expanded anteriorly. Length 8 mm. Colour (in alcohol) fawn with irregular light and dark brown mottling.

*Habitat*.—Kalimpong, Darjiling District, E. Himalayas, 600—4500 ft. No.  $\frac{9147}{10}$  (*F. H. Gravelly*).

*Type*.—In the collection of the Indian Museum.

This beautifully marked species differs from any other described form in a number of important characters. The tooth on the underside of the lateral plate of the first mesosomatic segment is large and truncate, and works in a slight groove in the anterior wall of the groove of the second segment. The exopodites of the uropoda extend beyond the telson and the antero-dorsal surface is unusually deep.

***Cubaris pusillus*, n. sp.**

(Pl. xiii, figs. 1—10).

Body oblong oval, strongly convex, smooth. Cephalon (figs. 1 and 2) small, but rather long, strongly marginate, lateral lobes

small, median lobes absent; epistoma vertical. Eyes prominent, situated dorso-laterally. Antennae (fig. 3) sparsely setaceous, 2nd to 5th joints deeply grooved on their outer sides; flagellum 2-jointed, the distal joint being twice the length of the proximal one. First maxillae (fig. 4), outer lobe terminating in four stout incurved spines and five smaller ones; inner lobe terminally rounded with two large setose spines. Second maxillae (fig. 5) thin and plate-like, terminating distally in an inner setaceous lobe and an outer tooth-like plate with three ridges of setae. Segments of the mesosome convex, with posterior margins prominent, lateral plates of 2nd to 5th segments slightly excavate, remainder truncate, posterior angles very faintly developed. Segments 1 and 2 with notch and groove on their inner margins for reception of succeeding segments (fig. 6). Maxillipedes (fig. 7), outer palp elongated, terminating in a multispinous process with three longer spines on the outer side and three on the inner side, inner palp also elongated, with three marginal spines and one blunt tooth-like spine on the innermost border. Uropoda (figs. 8 and 9) not extending beyond the telson, basal plate narrow posteriorly, thickened, convex dorso-laterally, antero-dorsal surface expanded, concave, strongly marginate; exopodite small and bluntly pointed, endopodite setaceous, also bluntly pointed. Telson (fig. 10) longer than broad at the posterior margin which is very slightly curved, sides faintly incurved, expanded anteriorly. Length 5.5 mm. Colour (in alcohol) variable, bluish-black to a horny-brown.

*Habitat.*—Kas, Satara Dist., Bombay Pres., 3700 ft., 23—24-iv-1912. No.  $\frac{8620}{10}$  (*F. H. Gravely*).

*Type.*—In the collection of the Indian Museum.

This is a very distinct species and the type of an interesting group. The head is longer than in most species. The antennae are characterized by the unusually deep grooves on the inner sides of joints 2, 3 and 4. The second maxillae are quite unlike those of any other described member of the genus. The tooth on the underside of the lateral plate of the first mesosomatic segment is small, but stands out some little distance, overlapping the groove of the second segment. The uropoda have a deep antero-dorsal surface and small exopodite.

### ***Cubaris brunneocaudatus*, n. sp.**

(Pl. xiv, figs. 1—10).

Body oblong oval, strongly convex. Cephalon (figs. 1 and 2) small with posterior margin slightly raised, lateral lobes small, median lobe absent; epistoma vertical. Eyes fairly large, situated dorso-laterally. Antennulae (fig. 3) small, 3-jointed, with few stout setae on the terminal joint. Antennae (fig. 4) deeply grooved on the outer side of joints 3—5; flagellum 2-jointed, distal joint two and a half times as long as the proximal one. First maxillae (fig. 5), outer lobe terminates in four stout incurved spines

and six smaller ones. Segments of the mesosome strongly arched, lateral plates of 2nd to 5th segments slightly excavate, remainder truncate, posterior angles only slightly developed. Segments 1 and 2 with notch and groove on their inner margins for reception of succeeding segments (fig. 6). Maxillipedes (fig. 7), the outer palp terminates in a multispinous process on the outer side with two large spines at its base, internal to the process are three pointed spines, the inner palp appears to be thrown into three folds with a marginal tooth-like spine on the outer border of each and a longer spine on the inner border of the most dorsal fold. Uropoda (figs. 8 and 9) not extending beyond the telson, basal plate narrow posteriorly, thickened, convex dorso-laterally, antero-dorsal surface expanded, concave with raised margin ventrally, the anterior margin forms a deep fold which is continued laterally on the outer border; exopodite small, not more than half the length of the endopodite, terminating in a finely pointed style, endopodite bluntly pointed, with three whip-like setae terminally. Telson (fig. 10), posterior margin broader than the length, sides faintly curved, expanded anteriorly. Length 10.5 mm. Colour (in alcohol) dark grey with the telson and uropoda a reddish-brown.

*Habitat*.—Tatkon, Burma, 6-ix-1914. No.  $\frac{9151}{10}$  (T. B. Fletcher).

*Type*.—In the collection of the Indian Museum.

This species in the form of the cephalon and uropoda exhibits a slight relationship with *C. solidulus*, Clg., but differs from that species in the form of the antennulae, antennae, and maxillipedes and the strongly arched body. There are also well marked differences in the shape of the tooth and groove on the under side of segments 1 and 2.

### ***Cubaris chiltoni*, n. sp.**

(Pl. xv, figs. 1—11).

Body oblong oval, slightly convex, finely punctulated. Cephalon (figs. 1 and 2) small with posterior margin slightly raised, lateral lobes distinct, median lobe absent; epistoma medianally convex. Antennae (figs. 3 and 4) with the outer side of the joints 2—5 almost flat; flagellum 2-jointed, distal joint two and a half times as long as the proximal one. First maxillae (fig. 5), outer lobe terminates in four stout incurved spines and six rather long thin ones; inner lobe short, rounded terminally, with two setaceous spines. Second maxillae (fig. 6) thin, plate-like, terminating distally in an inner lobe with short stout setae on the inner side and long fine setae on the outer side, and an outer tooth-like plate. Segments of the mesosome slightly convex, lateral plates of 2nd to 5th segments slightly excavate, remainder truncate, posterior angles produced backwards. Segments 1 and 2 with notch and groove on their inner margins for reception of succeeding segments (fig. 7). Maxillipedes (fig. 8), the outer palp terminates in a multispinous process on the outer side external to which is a small spine and two internal to it and a further two at the inner border, the inner

palp shows three folds with two curved spines on the outer border of the ventral one and a longer spine on the margin of the most dorsal fold. Uropoda (figs. 9 and 10) not extending beyond the telson, basal plate narrow posteriorly, thickened and slightly convex dorso-laterally, antero-dorsal surface expanded, ventrally almost flat; exopodite small, half the length of the endopodite, terminating bluntly, no style, endopodite bluntly pointed with whip-like setae. Telson (fig. 11), posterior margin almost straight and shorter than the length, sides curved, anterior portion expanded, and convex dorsally. Length 9 mm. Colour (in alcohol) blackish-brown with lighter irregular markings laterally and as a broken median line on the mesosome.

*Habitat*.—Puenjikara I., nr. Ernakulam, Cochin State, ix-1914. No.  $\frac{8908}{10}$  (*F. H. Gravely*).

*Type*.—In the collection of the Indian Museum.

*C. chiltoni* is allied to *C. brunneocaudatus*, agreeing with this last mentioned species in the form of the mouth-parts and in a lesser degree the uropoda. It differs, however, in the shape of the cephalon, antennae, maxillipedes, uropoda, and telson, as also in the more depressed form of the body and in the form of the notch and groove on the underside of segments 1 and 2. Most species of *Cubaris* show the peduncular joints of the antennae grooved on the outer side, but in *C. chiltoni* these grooves have become widely expanded, so that the outer side of the joints 2—5 are almost flat, in section exhibiting a form as shown in figure 4 (pl. xv).

I have much pleasure in associating with this interesting species the name of Professor Charles Chilton, to whom we are indebted for his valuable work on the Isopoda and other Crustacea of New Zealand.

### *Cubaris cavernosus*, n. sp.

(Pl. xvi, figs. 1—9).

Body oblong oval, convex dorsally with faintly rugose lateral patches on the mesosomatic segments. Cephalon (figs. 1 and 2) small, lateral lobes fairly well developed, median lobe absent; epistoma depressed laterally and in the medio-dorsal portion. Eyes very small, occasionally one or both imperfect. Antennules (fig. 3) 3-jointed, with lateral setae on the distal joint. Antennae (fig. 4) rather slender, joints 2—5 slightly grooved, setae small and fine; flagellum 2-jointed. First maxillae (fig. 5), outer lobe terminates in five stout curved spines and four smaller ones, inner lobe truncate terminally with two short setose spines. Segments of the mesosome convex, lateral plates of 2nd to 5th segments excavate, 6th and 7th very slightly so, posterior angles of 2nd—5th segments only very faintly developed. Segments 1 and 2 with notch and groove on their inner margins for reception of succeeding segments (fig. 6). Maxillipedes (fig. 7), the outer palp terminates in a multispinous process on the outer side, at its base is a small upright

spine and three directed outwards, still more internally there are three fine spines; the inner palp has a single long marginal spine and two blunt tooth-like ones. Uropoda (fig. 8) not extending beyond the telson, basal plate narrow posteriorly, thickened and slightly convex dorso-laterally, antero-dorsal surface expanded obliquely; exopodite extending to the end of the basal plate, terminally truncate with short style, endopodite large, with two long whip-like setae terminally and numerous long setae elsewhere. Telson (fig. 9) slightly longer than the breadth of the posterior margin, which is almost straight, sides faintly curved. Length  $10.5 \times 5.5$ . Colour (in alcohol) tawny-yellow.

*Habitat*.—Caves near Cherrapunji, Assam, ca. 4000 ft., 31-x-1914. No.  $\frac{8920}{10}$  (R. Friel).

*Type*.—In the collection of the Indian Museum.

The eyes in this species are present in varying degrees of complexity. Sometimes they are represented by two or three pigmented facets with others in which there is no pigment, in other cases the facets are imperfect, the eye being represented by irregular-shaped pigment spots.

### **Cubaris lobatus, n. sp.**

(Pl. xvii, figs. 1—11).

Body oblong oval, strongly convex, anterior margin deflected backwards. Cephalon (figs. 1 and 2) small, lateral lobes well developed, median lobe absent; epistoma sunken laterally with raised medium portion. Eyes large, situated dorso-laterally. Antennulae (fig. 3) longer than usual, 3-jointed, the terminal joint has a number of lateral setae and the 2nd joint a short spine on the inner side. Antennae (fig. 4) rather longer than usual, joints 2—5 grooved on their outer sides; flagellum 2-jointed, distal joint nearly three times as long as the proximal one, terminally there is a style. First maxillae (fig. 5), outer lobe terminates in four stout incurved spines and six smaller ones, inner lobe terminally rounded, with two setose spines. Second maxillae (fig. 6) thin and plate-like, outer lobe tooth-like, inner lobe terminating in a dense mass of fine setae. Segments of the mesosome strongly convex, lateral plates of 2nd to 5th segments excavate, remainder truncate, posterior angles very faintly developed. Segments 1 and 2 with notch and groove on their lower inner margins for reception of succeeding segments (fig. 7). Maxillipedes (fig. 8), outer lobe terminating in a multispinous process, external to this is a small curved spine and one large one and four short ones internally, on the ventral side a very large spine arises from the base of the lobe, the inner lobe has two stout curved tooth-like spines and a single fine one; arising from the basal segment are two long stout spines. Uropoda (figs. 9 and 10) not extending beyond the telson, basal plate narrow posteriorly, thickened, convex dorso-laterally, antero-dorsal surface expanded, oblique, with raised margin ven-

trally; exopodite small, articulating slightly away from the inner margin, endopodite stout, setose, terminating in three stout whip-like setae, which exhibit a series of spiral markings. Telson (fig. 11), posterior margin slightly broader than the length, sides faintly curved, expanded anteriorly, slightly raised in the median line. Length 9 mm. Colour (in alcohol) brown with light broken median line and yellowish mottling laterally

*Habitat*.—Parambikulam, 1700—3200 ft., Cochin State, 16—24-ix-1914. No.  $\frac{8912}{10}$  (*F. H. Gravely*).

*Type*.—In the collection of the Indian Museum.

*Cubaris lobatus* exhibits a number of features not found in the majority of known species of the genus, thus the lateral lobes of the cephalon are well developed, the antennulae and antennae are longer than usual, and the maxillipedes differ markedly in detail.

### *Cubaris albolateralis*, n. sp.

(Pl. xviii, figs. 1—12).

Body oblong oval, strongly convex, smooth, with a small lateral indentation on each side of all of the mesosomatic segments. Cephalon (figs. 1 and 2) small, with posterior margin raised, lateral lobes feebly developed, median lobe absent, dorsal surface with raised lateral lines; epistoma dorsally sloping backwardly, otherwise almost vertical. Eyes dorsal. Antennulae (fig. 3) 3-jointed, proximal joint attenuated at its base, distal joint with number of lateral setae on the inner border. Antennae (fig. 4) short and stout, 2nd to 5th joints deeply grooved on their outer sides; flagellum 2-jointed, distal joint three times the length of the proximal one terminally there is a short style. First maxillae (fig. 5), outer lobe terminates in four stout curved spines and six smaller ones, inner lobe rounded terminally with two long curved setose spines. Second maxillae (fig. 6) thin and plate-like, terminating distally in an inner setaceous lobe and an outer tooth-like plate. Segments of the mesosome strongly convex, each has laterally a small indentation (fig. 7), lateral plates of 2nd to 4th segments slightly excavate, remainder truncate or almost so, posterior angles only slightly produced backwards. Segments 1 and 2 with notch and groove on their inner margins for reception of succeeding segments (fig. 8). Maxillipedes (fig. 9), outer lobe terminates in a multispinous process and four inner fine pointed spines, the inner lobe has a tooth-shaped spine on its outer and inner border and two longer pointed spines. Uropoda (figs. 10 and 11) not extending beyond the telson, basal plate narrow posteriorly, terminally blade-like, thickened and slightly convex dorso-laterally, antero-dorsal surface expanded, ventrally the outer border shows a flattened rim and blade-like posterior margin; exopodite small with terminal style, situated on the inner lateral margin of the basal plate, which is obliquely flattened, endopodite large, with two long whip-like setae terminally, setose elsewhere, in section triangular.

Telson (fig. 12), posterior margin almost straight and broader than the length, sides curved, anterior portion expanded, convex dorsally. Length 8 mm. Colour (in alcohol) greyish-green, dorsally with few lateral irregular yellowish markings, yellowish below the indentations.

*Habitat*.—Under stones, Kamalapuram, S. India, 6-ix-1912. No.  $\frac{8911}{10}$  (*T. B. Fletcher*).

*Type*.—In the collection of the Indian Museum.

There are a number of important characters in this species by which it differs from any other members of the genus, amongst these may be mentioned the dorsal position of the eyes and the very feeble development of the lateral lobes of the cephalon, the short, thick-jointed antennae, the broad maxillipedes, the truncate lateral plates of the 5th—7th mesosomatic segments, and the form of the uropoda.

### Genus *Burmoniscus*, Cllge.

Hitherto this genus has been known only from the two examples of *B. moulmein*us, Cllge.,<sup>1</sup> obtained by Mr. F. H. Gravely, from the Farm Caves, near Moulmein.

With so limited a supply of material the description of the genus was perforce somewhat imperfect, and I am now able to give a fuller diagnosis, and at the same time add an additional species to the genus.

*B. moulmein*us, and *Philoscia coeca*, Budde-Lund<sup>2</sup>, have hitherto been the only cavernicolous species of Terrestrial Isopoda known from India, indeed only very few have been described from Asia. Ridley<sup>3</sup> mentions *Armadillo intermixtus*, Budde-Lund, as being common on the walls of caves in the Malay Peninsula, and Budde-Lund<sup>4</sup> describes with that species *A. nigromarginatus* from the same locality. He has also described<sup>5</sup> an *Armadillo infuscatus* from the same source.

In all probability there are a considerable number of species awaiting discovery, especially belonging to the genus *Cubaris*. Just as in Europe we have a large Isopodean cave fauna<sup>6</sup> belonging to the Trichoniscidae, so, I think, we shall find a similar one in India referable to the Cubaridae.

### *Burmoniscus*, Cllge.

1914. *Burmoniscus*, Collinge, *Rec. Ind. Mus.*, vol. VIII, p. 466, pl. xxxi.

Body oblong oval, dorsal surface strongly convex, perfectly smooth and shiny. Cephalon small, emarginate, median and lateral lobes absent. Eyes absent, may be represented by pigmented

<sup>1</sup> *Rec. Ind. Mus.*, 1914, vol. VIII, p. 466.

<sup>2</sup> *Ann. Mus. Civ. Stor. Nat. Genova*, 1894, s. 2, vol. XIV p. 612.

<sup>3</sup> *Brit. Assocn. Rpt.*, 1898, p. 581.

<sup>4</sup> *Rev. Crust. Terr. Isop.*, 1899, pp. 126, 127.

<sup>5</sup> *Proc. Zool. Soc. Lond.*, 1902, p. 380.

<sup>6</sup> Racovitza, *Arch. Zool. exp. e. gén.*, 1907, t. 7 and 1909, t. 9.

areas. Antennae slender, elongated, joints grooved on their outer sides, with 3-jointed flagellum. First maxillae, outer lobe terminates in four stout curved spines and four finer inner ones which latter have bifurcated ends. Second maxillae thin and plate-like, the inner one terminating in a brush of fine setose spines. Segments of the mesosome strongly convex, the lateral plates of 1 to 4 slightly overlap one another posteriorly, whilst those of 5 and 7 are produced backwardly, especially the 7th. Maxillipedes poorly developed, with the inner lobe the larger. Metasome narrow, lateral plates small and slightly incurved. Uropoda with elongated, somewhat flattened basal plate, which extends beyond the telson; exopodite long and pointed, endopodite elongated. Telson very short and broad, terminally rounded or pointed.

Although I have carefully examined a number of specimens I have not so far been able to find any antennules. Apart from the maxillae, the mouth parts are of little value here for purposes of generic distinction.

Respecting the affinities of this genus it is not possible to say much, as our knowledge of the Indian and Asiatic Terrestrial Isopoda is, as yet, so fragmentary. In the form of the cephalon, the mesosome, and metasome and the uropoda, *Burmoniscus* undoubtedly shows a remote relationship with *Philoscia*, at least the Asiatic *Philoscias*, although these also are, as yet only imperfectly understood.

### ***Burmoniscus kempi*, n. sp.**

(Pl. xix, figs. 1—8).

Body oblong oval, dorsal surface convex, smooth and shiny. Cephalon (figs. 1 and 2) larger than in *B. moulmeinensis*, Collge., and partly flanked by the lateral plates of the 1st segment of the mesosome, emarginate, median and lateral lobes absent; epistoma almost vertical. Eyes absent. Antennae (fig. 3) slender and elongated, especially the 4th and 5th joints, peduncular and flagellar joints grooved on their outer sides, flagellum 3-jointed, terminal joint with long fine style. First maxillae (fig. 4), outer lobe terminates in four stout curved spines and four inner ones deeply bifurcated, inner lobe rounded terminally with two setose spines. Second maxillae (fig. 5) thin and flexible, somewhat thicker on the inner side, on the outer side it is produced into a thin plate with radiating thickened arms, anteriorly terminating as a flattened tooth, and a smaller one on the inner side, between the two the inner lobe forms a brush-like mass of setae. Maxillipedes (fig. 6) poorly developed, the inner lobe the larger. Uropoda (fig. 7) with elongated, somewhat flattened basal plate which extends beyond the telson, grooved dorsally between points of articulation of exopodite and endopodite; exopodite long, stout, and slightly ridged dorsally on the outer side, endopodite elongated, and comparatively not so stout. Telson (fig. 8) short with the posterior

margin rounded. Length 7.5 mm. Colour (in alcohol) light brown with darker pigmented network.

*Habitat*.—Maosmai Cave, Cherrapunji, Assam, ca. 4000 ft., x-1914. No.  $\frac{8918}{10}$  (S. W. Kemp). Living in total darkness.

*Type*.—In the collection of the Indian Museum.

*B. kempi* differs from *B. moulmeinensis* in having a larger cephalon, in the more elongated form of the spines of the outer lobe of the 1st maxillae and in the form of the inner lobe also. The 2nd maxilla is quite unlike that in *B. moulmeinensis*, and the basal plate of the uropoda is narrower and more elongated, there is also a lateral ridge on the outside of the exopodite. The telson is very different, being shorter and rounded posteriorly.

This species is named in compliment to Mr. S. W. Kemp, by whom it was discovered, and whose work has added so largely to our knowledge of the Decapod and other Crustacea of India.

#### ERRATA.

In the previous "Contribution", *Rec. Ind. Mus.*, 1915. Vol. XI, Pt. II, No. 6, on pages 144, 149 and 151 under the descriptions of the antennae, the word *inner* should read *outer*.

---

EXPLANATION OF PLATE IX.

*Paraperiscyphis pulcher*, n. sp.

FIG. 1.—Dorsal view of the cephalon.

„ 2.—Right antennule.

„ 3.—Right antenna.

„ 4.—Right uropod, dorsal view.

„ 5.—Telson and uropoda.

*Paraperscyphis scabrus*, n. sp.

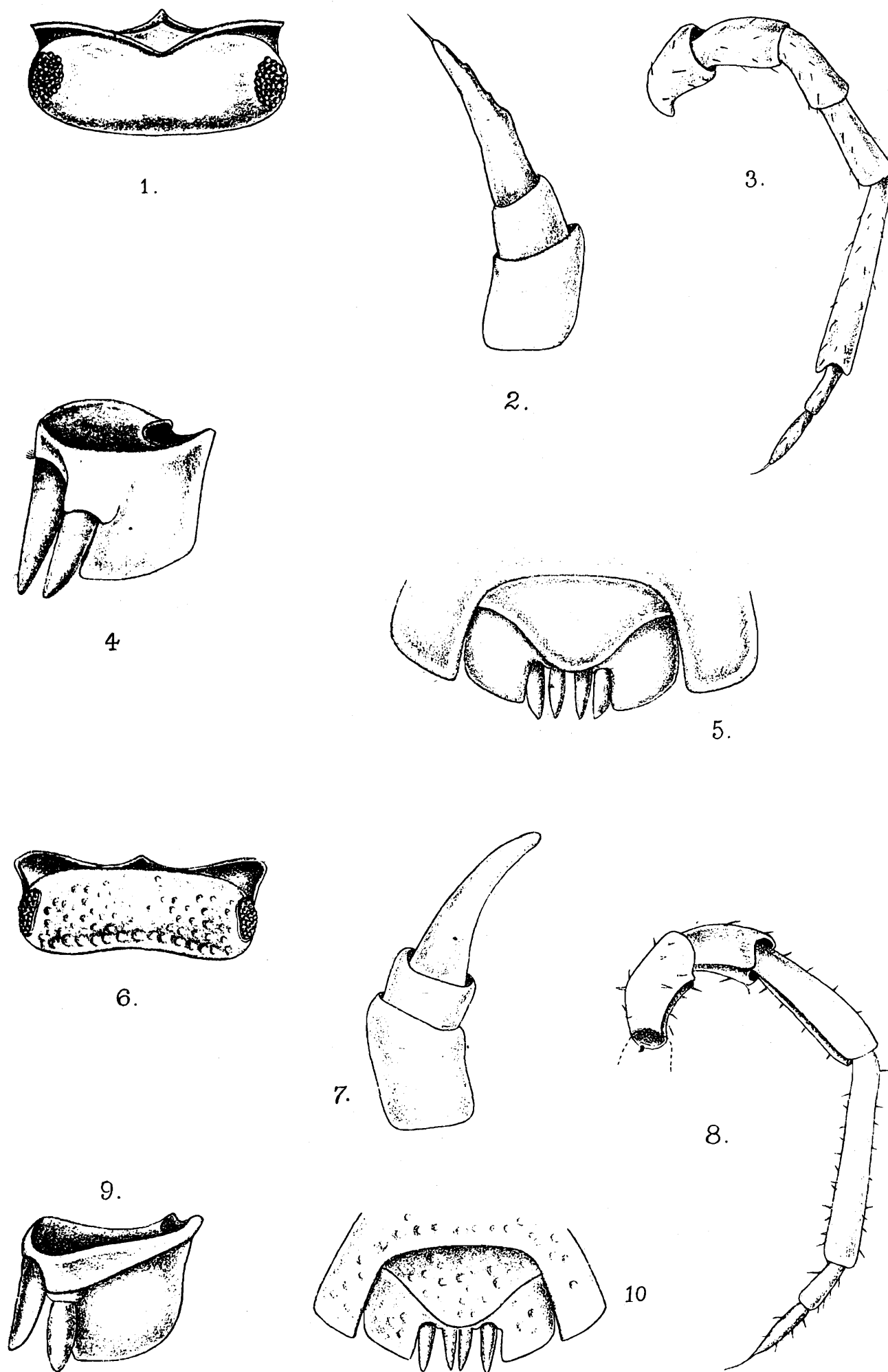
FIG. 6.—Dorsal view of the cephalon.

„ 7.—Left antennule.

„ 8.—Right antenna.

„ 9.—Right uropod, dorsal view.

„ 10.—Telson and uropoda.



H.G.K. del.

A. Chowdhary, lith.

1-5. *PARAPERISCYPHIS PULCHER*, n.sp.  
6-10. *PARAPERISCYPHIS SCABRUS*, n.sp.

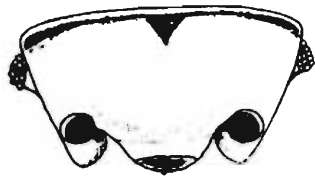
## EXPLANATION OF PLATE X.

*Cubaris gravelii*, n. sp.

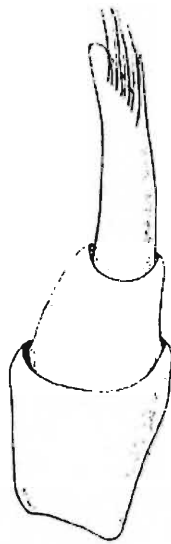
- FIG. 1.—Dorsal view of the cephalon.  
,, 2.—Anterior view of the cephalon.  
,, 3.—Antennule.  
,, 4.—Right antenna.  
,, 5.—First maxilla, outer lobe.  
,, 6.—Second maxilla.  
,, 7.—Lateral portions of 1st and 2nd mesosomatic segments,  
showing notch and groove on the inner border of the  
under side.  
,, 8.—Maxillipede, terminal portion.  
,, 9.—Right uropod, dorsal view.  
,, 10.—Right uropod, ventral view.  
,, 11.—Last metasomatic segment, uropoda, and telson.



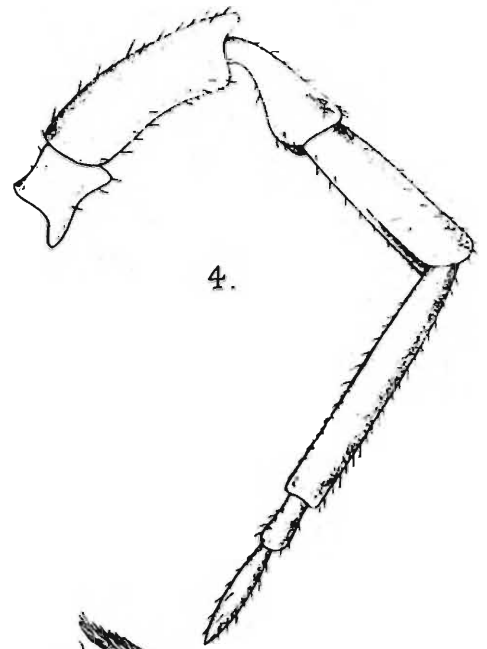
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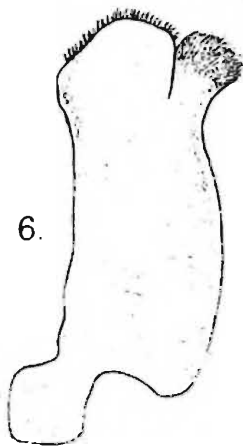
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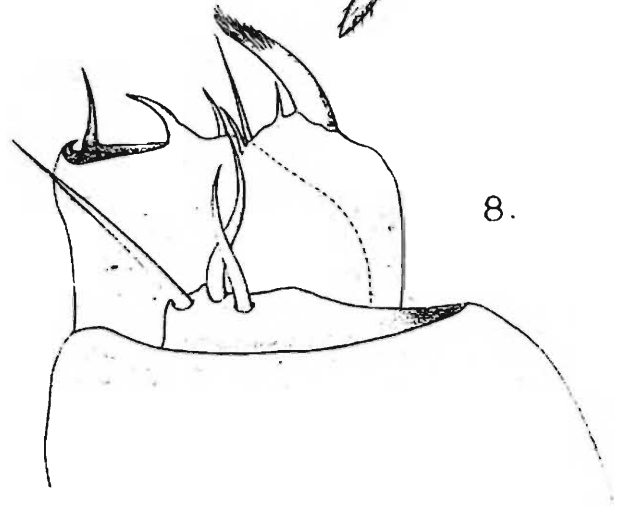
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4.



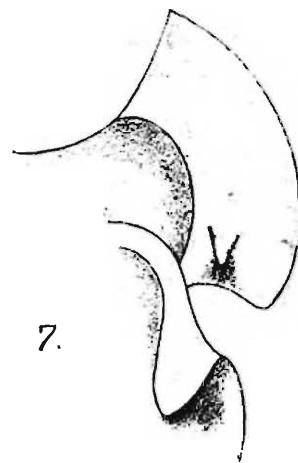
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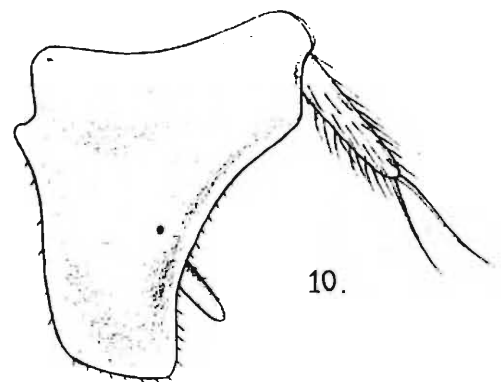
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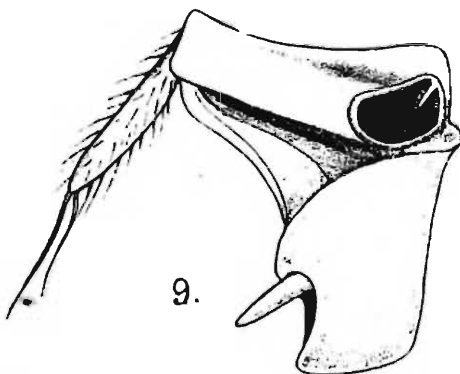
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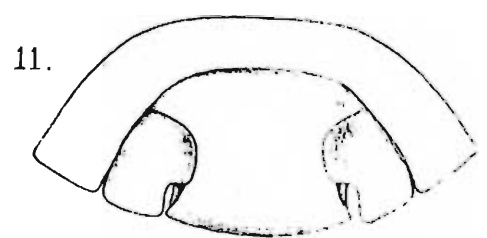
7.



10.



9.



11.

H.G.K. del.

A. Chowdhary, lith

CUBARIS GRAVELII, n. sp.

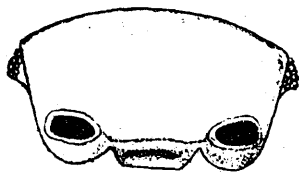
## EXPLANATION OF PLATE XI.

*Cubaris expansus*, n. sp.

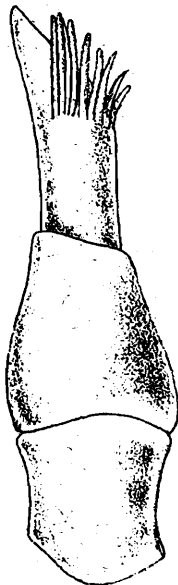
- FIG. 1.—Dorsal view of the cephalon.  
,, 2.—Anterior view of the cephalon.  
,, 3.—Antennule.  
,, 4.—Right-antenna.  
,, 5.—First-maxilla, terminal portion of outer lobe.  
,, 6.—Lateral portions of 1st and 2nd mesosomatic segments,  
showing notch and groove on the inner border of the  
under side.  
,, 7.—Maxillipede, terminal portion.  
,, 8.—Right uropod, dorsal view.  
,, 9.—Right uropod, ventral view.  
,, 10.—Last metasomatic segment, uropoda, and telson.



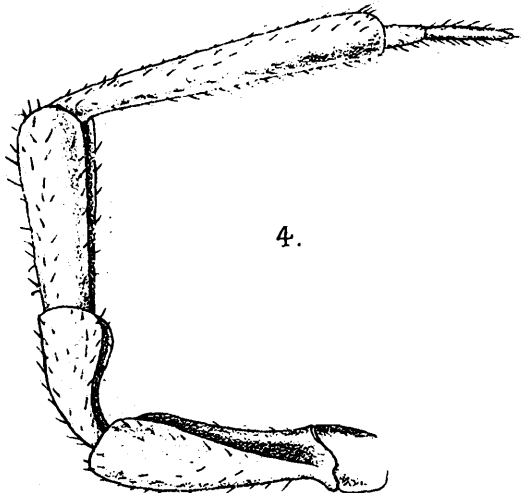
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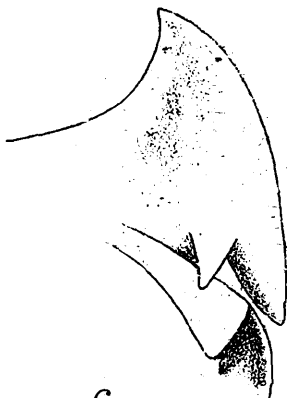
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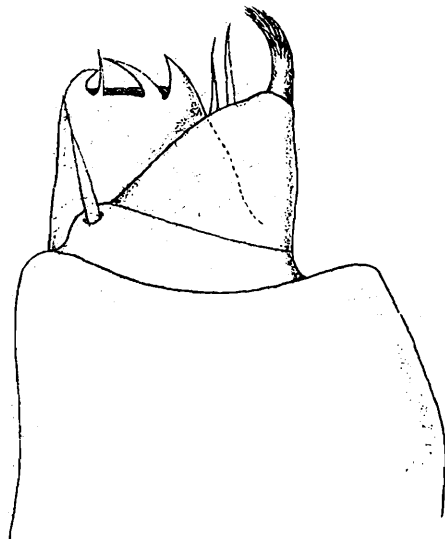
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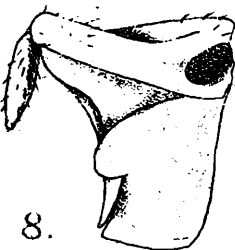
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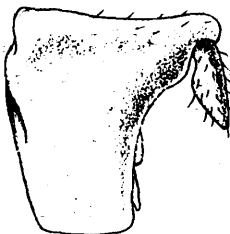
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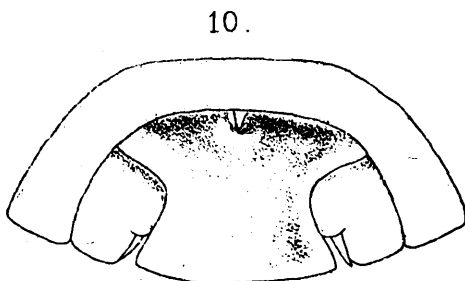
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8.



9.



10.

H.G.K. del.

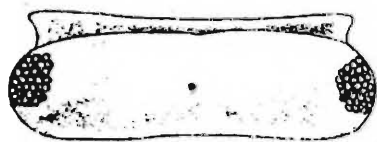
CUBARIS EXPANSUS, n. sp.

A. Chowdhary, lith.

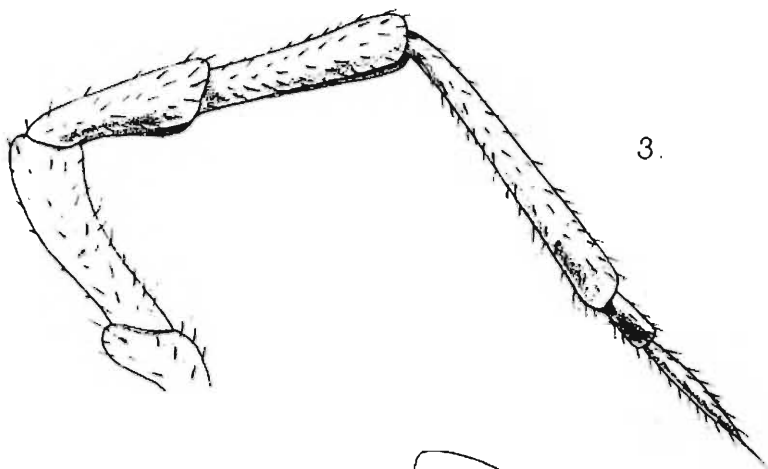
## EXPLANATION OF PLATE XII.

*Cubaris dilectum*, n. sp.

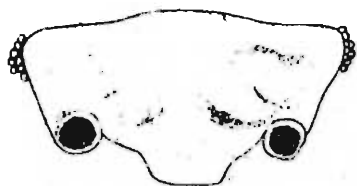
- FIG. 1.—Dorsal view of the cephalon.  
,, 2.—Anterior view of the cephalon.  
,, 3.—Right antenna.  
,, 4.—First maxilla, terminal portion of outer lobe.  
,, 5.—Lateral portions of 1st and 2nd mesosomatic segments,  
showing notch and groove on the inner border of the  
under side.  
,, 6.—Maxillipede, terminal portion.  
,, 7.—Right uropod, dorsal view.  
,, 8.—Right uropod, ventral view.  
,, 9.—Last metasomatic segment, uropod and telson.



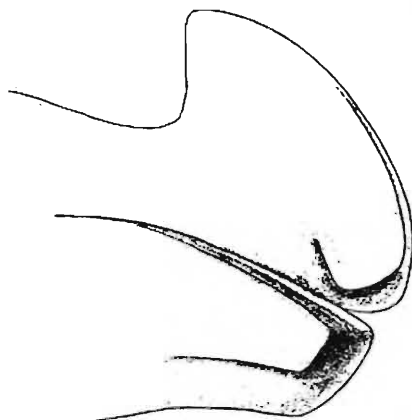
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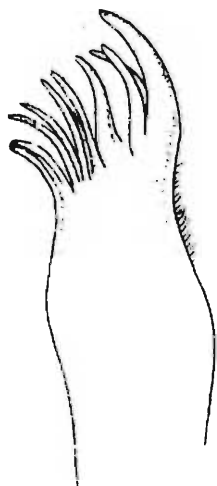
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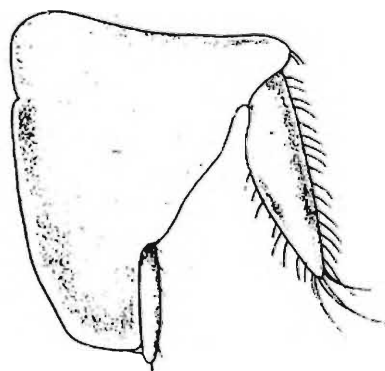
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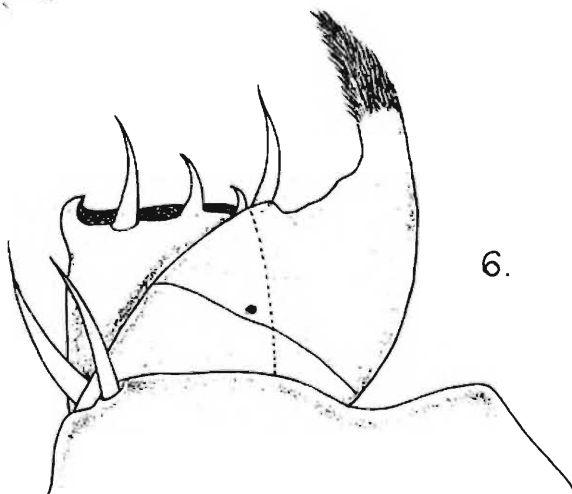
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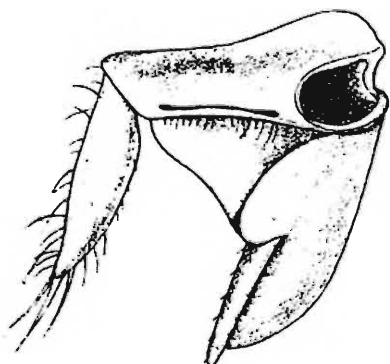
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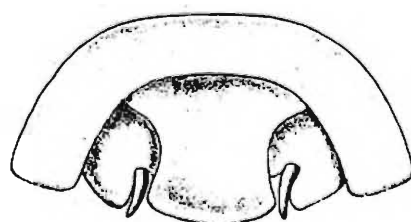
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6.



7.



9.

H.G.K. del.

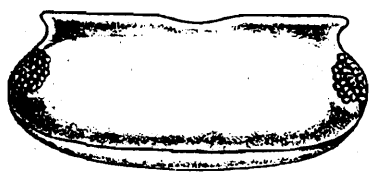
A.Chowdhary.lith

CUBARIS DILECTUM, n. sp.

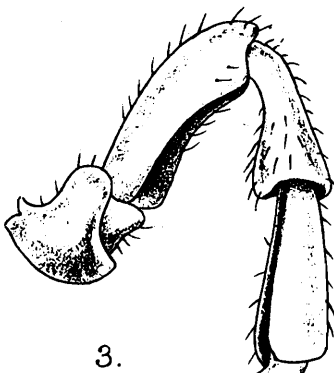
## EXPLANATION OF PLATE XIII.

*Cubaris pusillus*, n. sp.

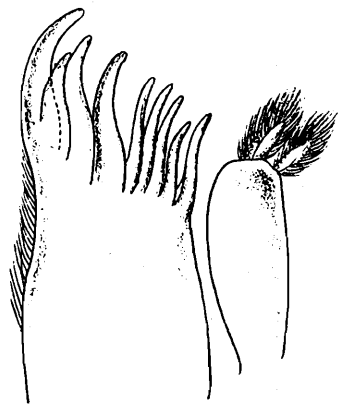
- FIG. 1.—Dorsal view of the cephalon.  
,, 2.—Anterior view of the cephalon.  
,, 3.—Right antenna.  
,, 4.—First maxilla, terminal portions of inner and outer lobes.  
,, 5.—Second maxilla, terminal portion.  
,, 6.—Lateral portions of 1st and 2nd mesosomatic segments,  
showing notch and groove on the inner border of the  
under side.  
,, 7.—Maxillipede, terminal portion.  
,, 8.—Right uropod, dorsal view.  
,, 9.—Right uropod, ventral view.  
,, 10.—Last metasomatic segment, uropod and telson.



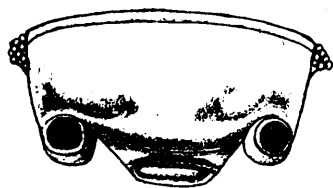
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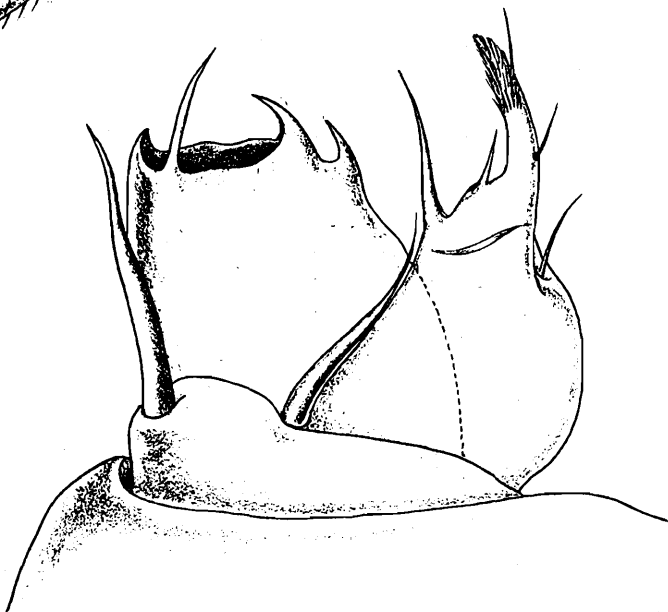
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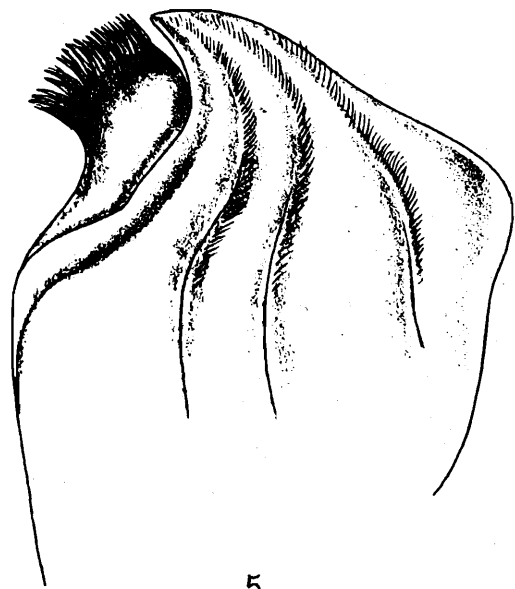
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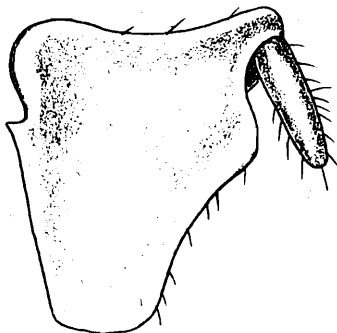
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7.



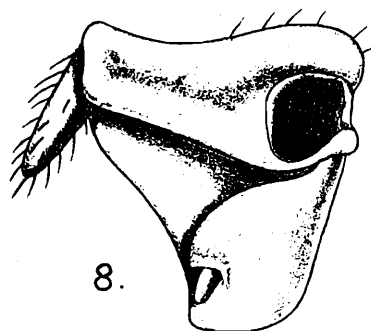
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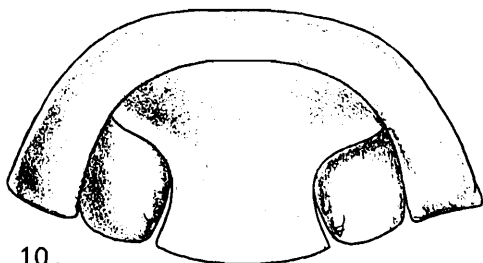
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6.



8.



10.

H.G.K. del.

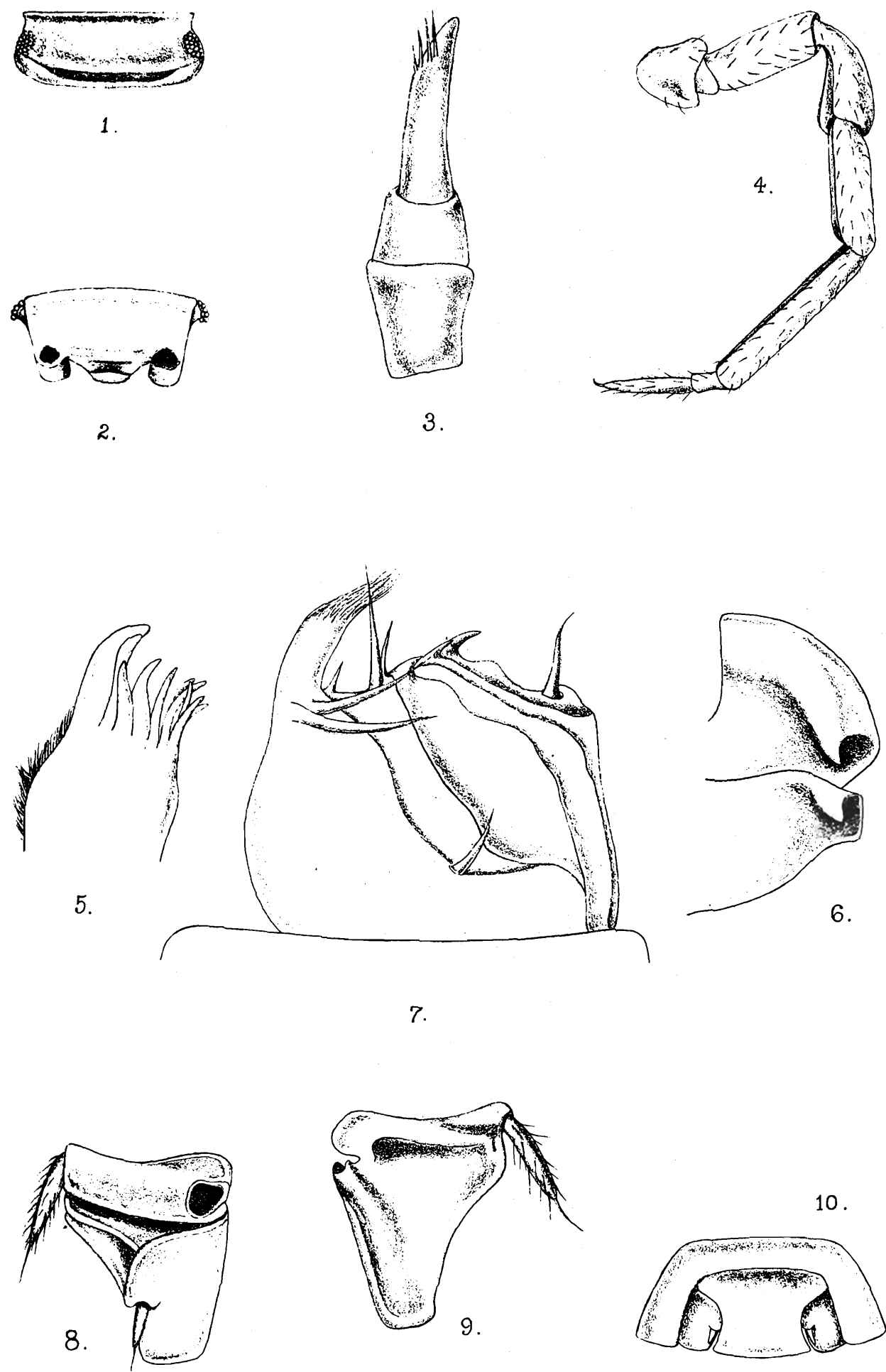
CUBARIS PUSILLUS, n. sp.

A. Chowdhary, lith.

## EXPLANATION OF PLATE XIV.

*Cubaris brunneocaudatus*, n. sp.

- FIG. 1.—Dorsal view of the cephalon.  
,, 2.—Anterior view of the cephalon.  
,, 3.—Right antennule.  
,, 4.—Right antenna.  
,, 5.—First maxilla, terminal portion of outer lobe.  
,, 6.—Lateral portions of 1st and 2nd mesosomatic segments,  
showing notch and groove on the inner border of the  
under side.  
,, 7.—Maxillipede, terminal portion.  
,, 8.—Right uropod, dorsal view.  
,, 9.—Right uropod, ventral view.  
,, 10.—Last metasomatic segment, uropoda and telson.



H. G. K. del.

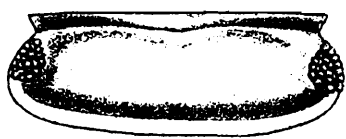
CUBARIS BRUNNEOCAUDATUS, n.sp.

A. Chowdhary, lith.

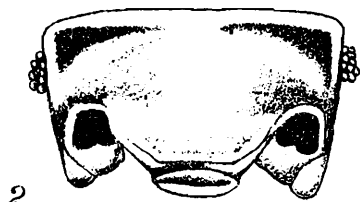
## EXPLANATION OF PLATE XV

*Cubaris chiltoni*, n. sp.

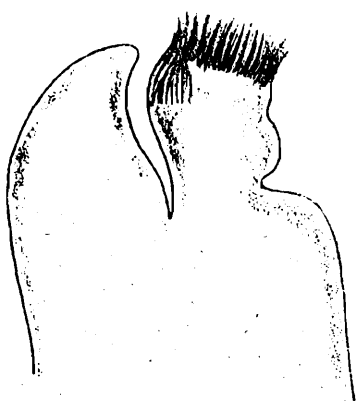
- FIG. 1.—Dorsal view of the cephalon.  
,, 2.—Anterior view of the cephalon.  
,, 3.—Right antenna.  
,, 4.—Semi-diagrammatic section of the 4th joint of the antenna.  
,, 5.—First maxilla, terminal portions of inner and outer lobes.  
,, 6.—Second maxilla, terminal portion.  
,, 7.—Lateral portions of 1st and 2nd mesosomatic segments, showing notch and groove on the inner border of the under side.  
,, 8.—Maxillipede, terminal portion.  
,, 9.—Right uropod, dorsal view.  
,, 10.—Right uropod, ventral view.  
,, 11.—Last metasomatic segment, uropoda and telson.



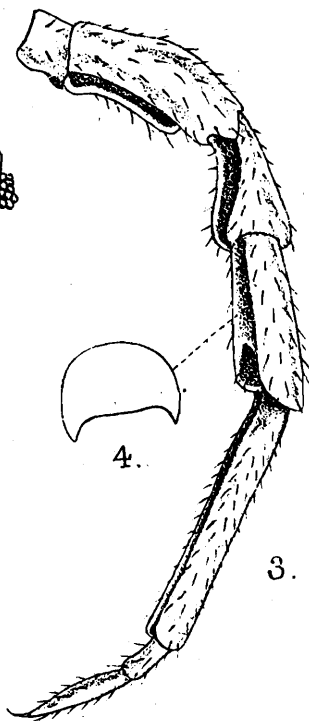
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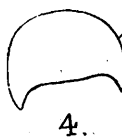
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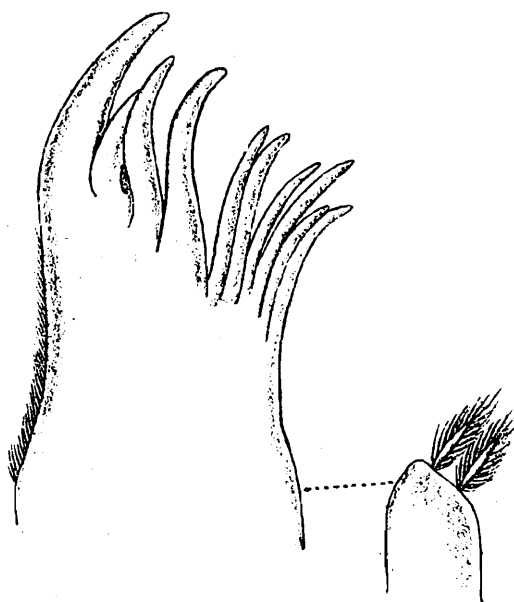
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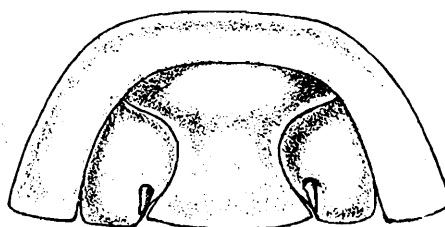
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4.



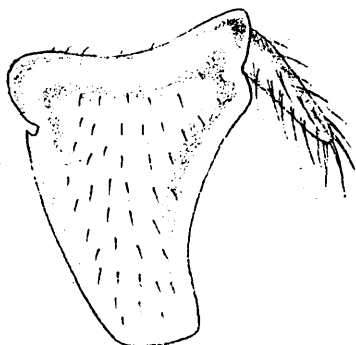
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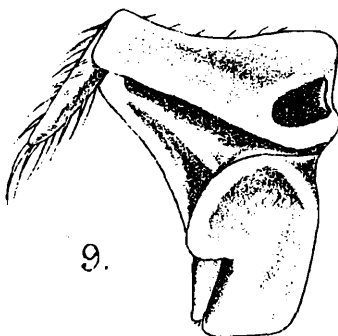
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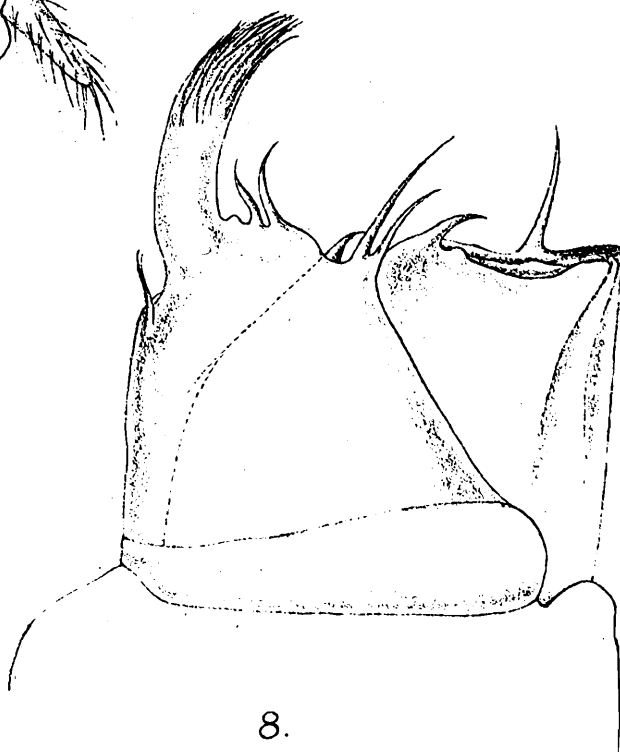
7.



10.



9.



8.

H.G. K. del.

CUBARIS CHILTONI, n.sp.

A. Chowdhary, lith.

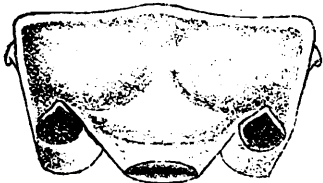
## EXPLANATION OF PLATE XVI.

*Cubaris cavernosus*, n. sp.

- FIG. 1.—Dorsal view of the cephalon.  
,, 2.—Anterior view of the cephalon.  
,, 3.—Antennule  
,, 4.—Right antenna.  
,, 5.—First maxilla, terminal portions of inner and outer lobes.  
,, 6.—Lateral portions of 1st and 2nd mesosomatic segments,  
showing notch and groove on the inner border of the  
under side.  
,, 7.—Maxillipede, terminal portion.  
,, 8.—Right uropod, dorsal view.  
,, 9.—Last metasomatic segment, uropoda and telson.



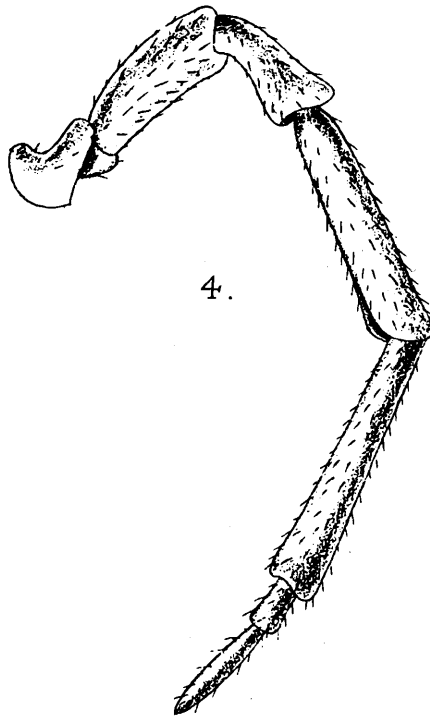
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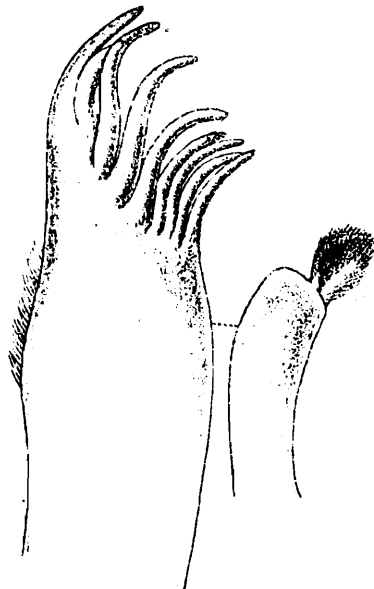
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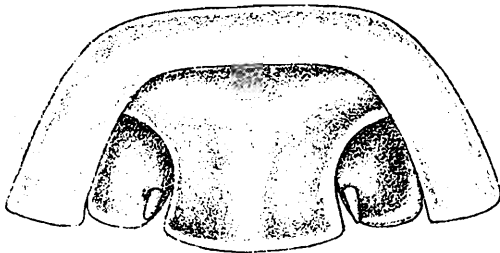
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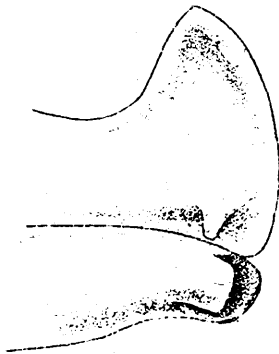
4.



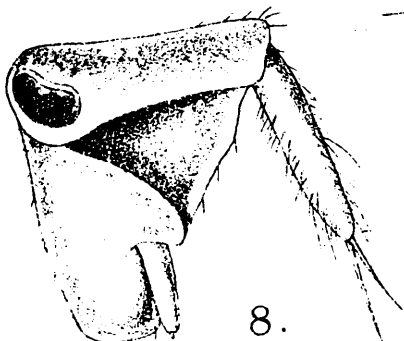
5.



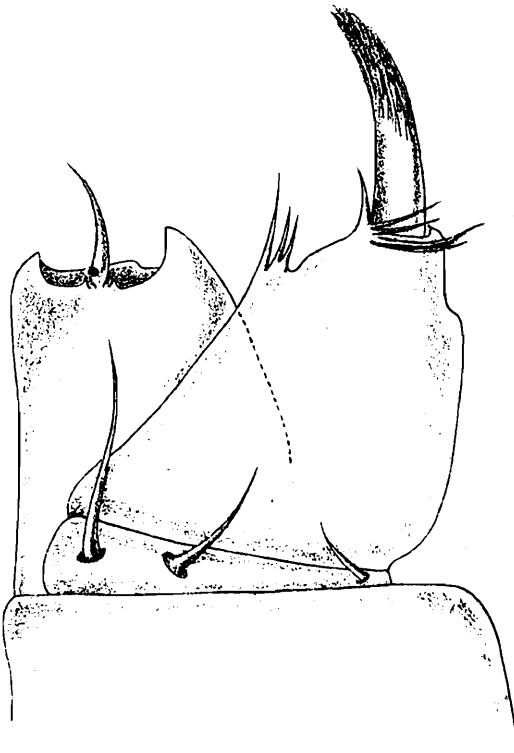
9.



6.



8.



7.

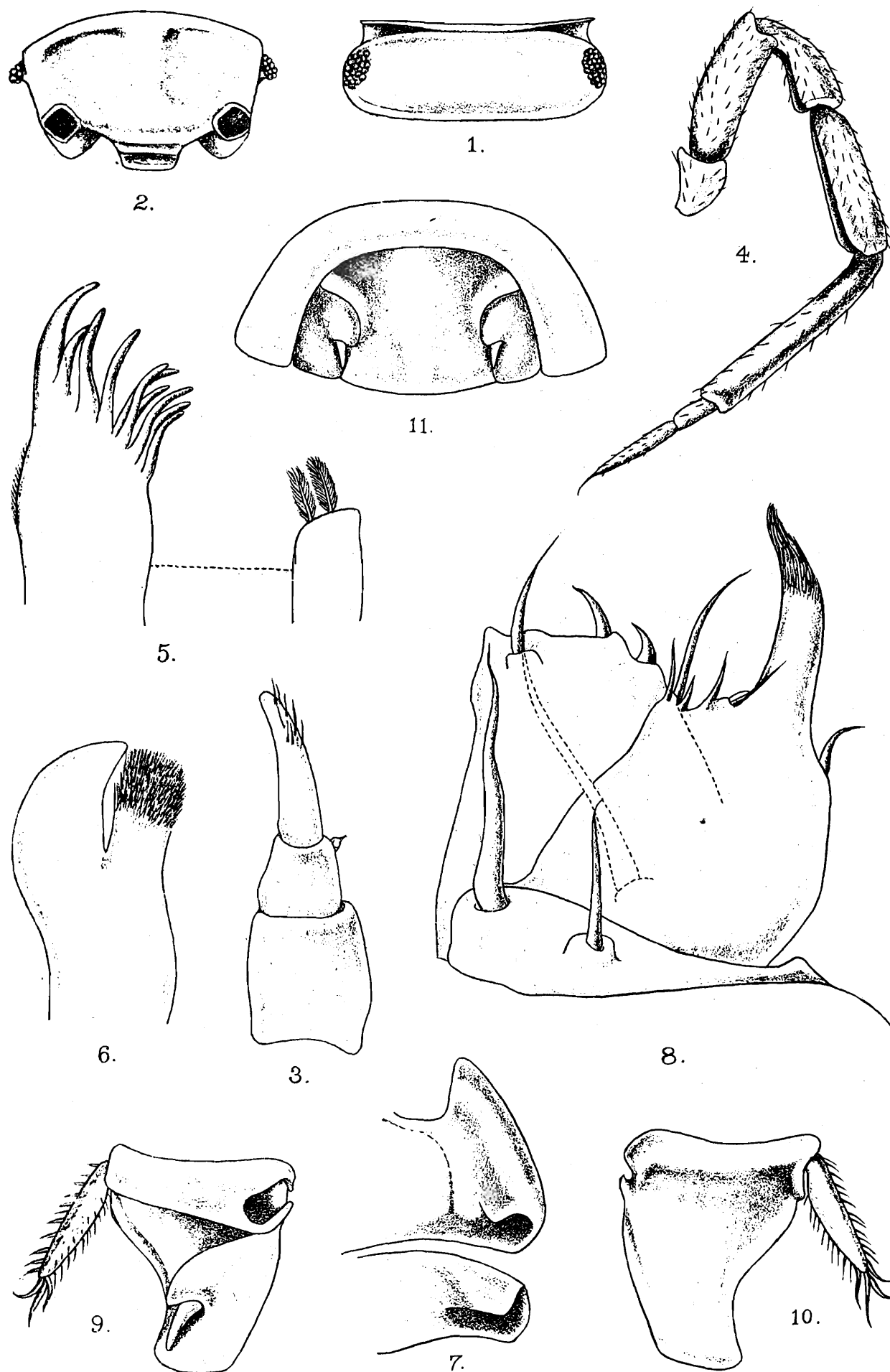
H.G. K. del.

A. Chowdhary, lith.

## EXPLANATION OF PLATE XVII.

*Cubaris lobatus*, n. sp.

- FIG. 1.—Dorsal view of the cephalon.  
,, 2.—Anterior view of the cephalon.  
,, 3.—Antennule.  
,, 4.—Right antenna.  
,, 5.—First maxilla, terminal portions of outer and inner lobes.  
,, 6.—Second maxilla, terminal portion.  
,, 7.—Lateral portions of 1st and 2nd mesosomatic segments,  
showing notch and groove on the inner border of the  
under side.  
,, 8.—Maxillipede, terminal portion.  
,, 9.—Right uropod, dorsal view.  
,, 10.—Right uropod, ventral view.  
,, 11.—Last metasomatic segment, uropoda and telson.



H.G.K. del.

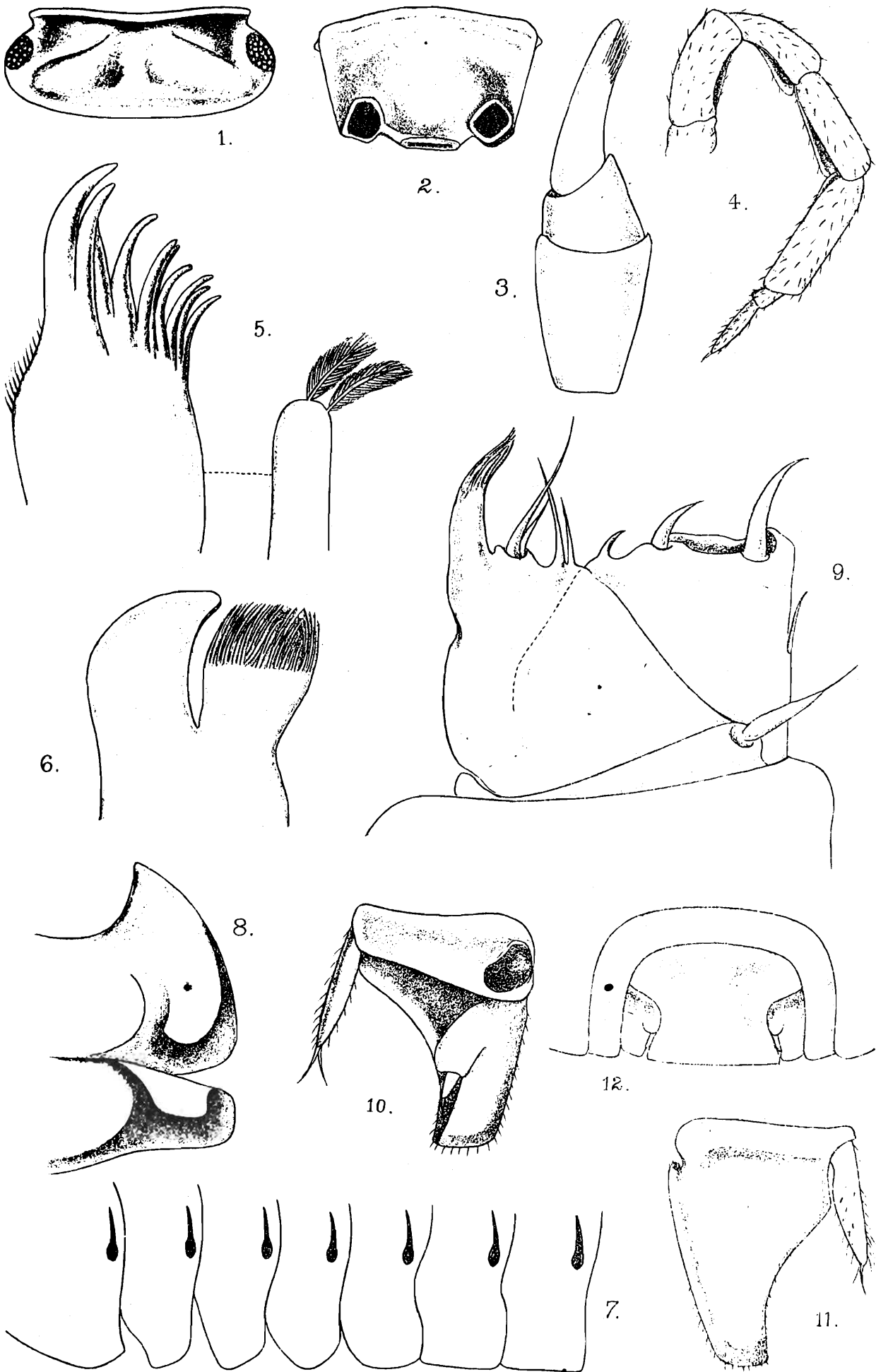
CUBARIS LOBATUS, n.sp.

A. Chowdhary, lith.

## EXPLANATION OF PLATE XVIII.

*Cubaris albolateralis*, n. sp.

- FIG. 1.—Dorsal view of the cephalon.  
,, 2.—Anterior view of the cephalon.  
,, 3.—Antennule.  
,, 4.—Right antenna.  
,, 5.—First maxilla, terminal portion.  
,, 6.—Second maxilla, terminal portion.  
,, 7.—Lateral portions of mesosomatic segments, showing form of the lateral plates and indentations on the segments.  
,, 8.—Lateral portions of 1st and 2nd mesosomatic segments, showing notch and groove on the inner border of the under side.  
,, 9.—Maxillipede, terminal portion.  
,, 10.—Right uropod, dorsal view.  
,, 11.—Right uropod, ventral view.  
,, 12.—Last metasomatic segment, uropoda and telson.



W.E.C. & H.G.K. del.

A. Chowdhary, lith.

CUBARIS ALBOLATERALIS, n.sp

EXPLANATION OF PLATE XIX.

*Burmoniscus kempi*, n. sp.

FIG. 1.—Dorsal view of the cephalon.

„ 2.—Anterior view of the cephalon.

„ 3.—Left antenna.

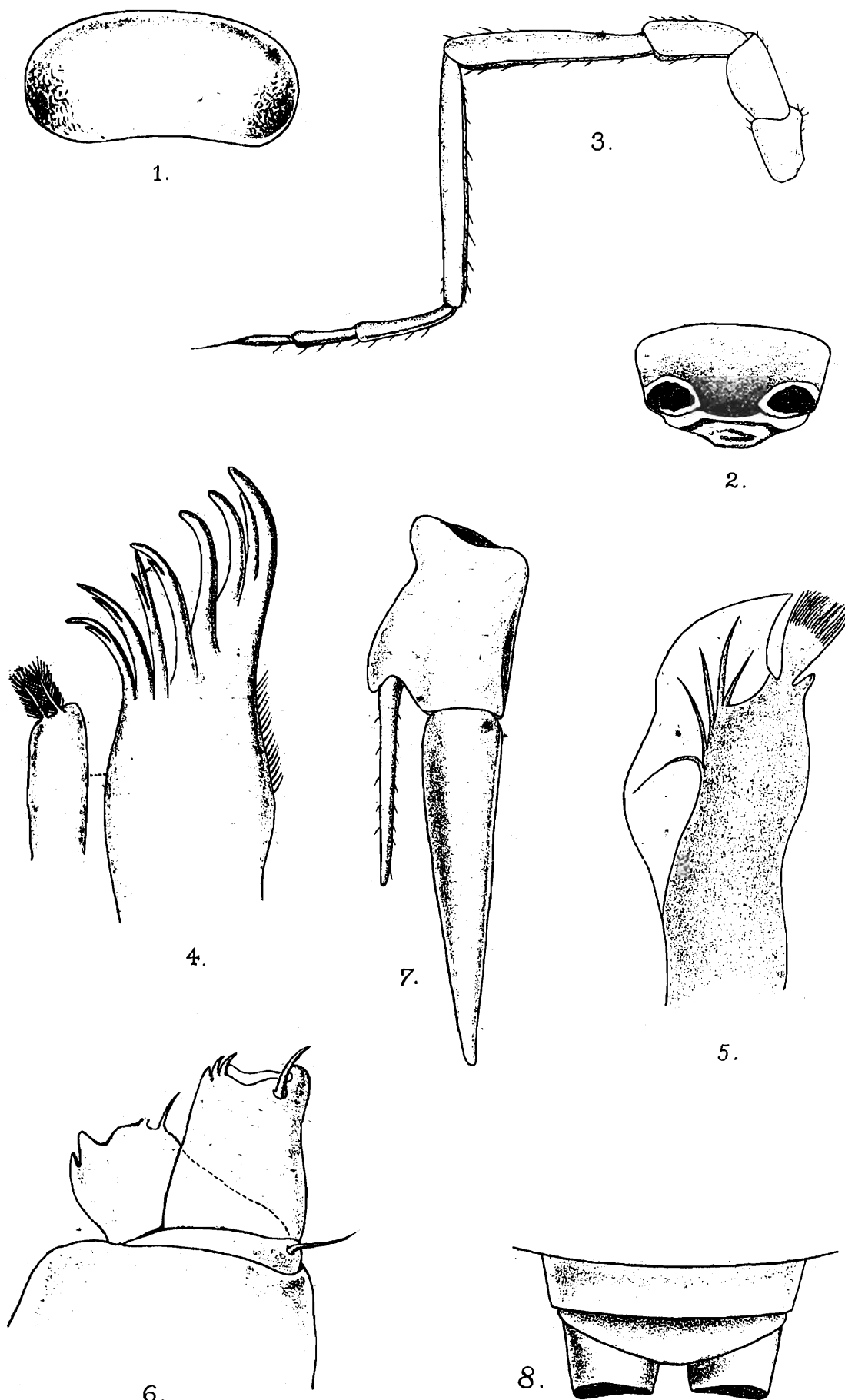
„ 4.—First maxilla, terminal portions of outer and inner lobes.

„ 5.—Second maxilla, terminal portion.

„ 6.—Maxillipede, terminal portion.

„ 7.—Right uropod, dorsal view.

„ 8.—Last metasomatic segment, telson and basal plates of  
the uropoda.



W.E.C. & H.G.K. del.

A. Chowdhary, lith.

*BURMONISCUS KEMPI*, n. sp.