

VI CONTRIBUTIONS TO A KNOWLEDGE
OF THE TERRESTRIAL ISOPODA
OF INDIA

PART I.—ON A COLLECTION FROM THE MADRAS
PROVINCE AND SOUTHERN INDIA.

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(Plates IV—XII.)

The majority of the species here described were collected by Dr. Annandale and Mr. S. W. Kemp in the Ganjam district in the north-eastern corner of the Madras Presidency. Unfortunately in a number of instances there are only single or imperfect specimens, these are not described. I have reluctantly been compelled to establish two new genera, viz. *Ennurensis* for an interesting species collected at Ennur, near Madras, and also at Mandapam, Southern India; and *Hemiporcellio* for two new species allied to both *Porcellio*, Latreille, and *Porcellionides*, Miers. Of the remainder there is a new species of *Arhina*, Budde-Lund, one each of *Philoscia*, Latreille, *Periscyphis*, Gerst., and three new species of *Cubaris*, Brandt. The complete list is as follows:—

- Ennurensis hispidus*, gen. et sp. nov.
- Philoscia tenuissima*, n. sp.
- Porcellio* sp.
- Hemiporcellio carinatus*, gen. et sp. nov.
- „ *hispidus*, n. sp.
- Arhina barkulensis*, n. sp.
- Periscyphis gigas*, n. sp.
- Cubaris solidulus*, n. sp.
- „ *nacrum*, n. sp.
- „ *granulatus*, n. sp.

Ennurensis hispidus, gen. et sp. nov.

(Plate iv, figs. 1–10.)

Body oblong oval, convex, covered with small setae. Cephalon (figs. 1 and 2) convex, fairly long, almost smooth excepting for numerous fine setae; lateral lobes small, no median lobe or definite anterior margin; epistoma convex, smooth and setaceous.

Eyes large, dorso-lateral. Antennulae small, 3-jointed. Antennae (fig. 3), first four joints short, fifth joint long, 2nd-4th characterised by deep groove on their inner border; flagellum 2-jointed, proximal joint slightly longer than the distal one. First maxillae (fig. 4), the outer lobe terminates in four stout, slightly incurved spines and seven smaller finer ones, inner lobe thin and spoon-shaped terminally, proximally thickened. Second maxillae (fig. 5) thin, plate-like, bilobed distally and setaceous. Segments of the mesosome convex and almost sub-equal, the lateral plates well developed on the 1st segment, but small on the remaining ones, the posterior angles of segments 1-4 produced backwardly, overlapping the succeeding segments. Maxillipedes (fig. 6) with elongated palps, outer one terminating in outer multispinous process and two inner spines, inner palp with single spine. Thoracic appendages (fig. 7) rather short, fringed on the inner side with few stout spines, claws long. Uropoda (figs. 8 and 9) extending beyond the telson, basal plate convex both sides with lateral expansions, dorsally there is a lateral process with which the endopodite articulates; exopodite and endopodite small and almost sub-equal in length, setose and each terminating in a fine spine. Telson (fig. 10) small, sub-equal with basal plates of uropoda, triangular with antero-lateral portions extended, depressed in the median line, apex sub-acute. Length 7 mm. Colour (in alcohol) very variable, some a creamy white with posterior margins and lateral plates of all segments a fuscous-brown, others a light brown with darker markings laterally and in the median line.

Habitat.—Ennur, nr. Madras, under stones on sand, 19-x-13, No. 8671/10; Mandapam, Pamben Passage, S. India, No. 8605/10. "In both cases the specimens were on bare sand close to the sea-shore" (*N. Annandale*.)

Type.—In the collection of the Indian Museum.

This interesting species will, I believe, be found to have a wide distribution in India. The form of the head, antennae, telson, and uropoda at once separate it from any other genus I know of, while there are a number of minor, but pronounced characters in the mouth parts. In colour it is exceedingly variable, particularly so in specimens under 7 mm. in length. To those who attach any great importance to the mouth parts, the form of the inner lobe of the 1st maxilla should prove of interest.

Porcellio sp.

Habitat—Marikuppam, S. India, 2500 feet, 21-x-10, No. 8588. (*R. Hodgart*.)

Two examples, both without their antennae or uropoda, I am referring to the genus *Porcellio*. In colour they are a deep blackish-brown, with the posterior angles of the lateral plates of the mesosomatic segments a yellowish-brown. The head and all the segments of the body are richly tuberculated. The lateral and median lobes of the head are well-developed, epistoma convex:

***Philoscia tenuissima*, n. sp.**

(Plate v, figs. 1-10.)

Body oblong oval, slightly convex, lateral plates of mesosome but slightly expanded; metasome abruptly narrower than mesosome. Cephalon (figs. 1 and 2) convex above, slightly rounded in front, median and lateral lobes absent; frontal margin ill-defined and bent downward laterally; epistoma flattened with transverse ridge. Eyes prominent, dorso-lateral, ocelli large. Antennulae small, 3-jointed, basal joint large. Antennae (fig. 3) long and slender, the distal joint being the longest; flagellum 3-jointed, with deep groove on the anterior border, terminating in long spinous style, setaceous. First maxillae (fig. 4), outer lobe terminates in three stout, curved spines and five smaller inner ones; inner lobe terminates in two setaceous spines. Second maxillae (fig. 5) thin, plate-like, bilobed distally, inner division terminating in fairly long setae. Segments of the mesosome almost subequal, posterior angle of lateral plates not produced backwards. Maxillipedes (fig. 6) with elongated palps, outer one terminating in multispinous process and a single long spine; inner palp somewhat cone-shaped, sunken at the apex, with tooth-like spine on the inner border and a long pointed one arising from the base of the concavity, and four small tooth-like spines on the outer border. Thoracic appendages (fig. 7) comparatively short, setaceous, 5th joint and claw elongated, 4th joint with two spines on the inner border with obtuse plumose apices. Uropoda (figs. 8 and 9) extending beyond the telson, basal plate small with deep groove on the under side which also extends along the inner border of the exopodite, the endopodite is also grooved on its ventral side. Telson (fig. 10) short and broad, produced to a blunt point in the median line posteriorly. Length 6.5 mm. Colour (in alcohol) horny-brown with light greyish markings.

Habitat.—Museum compound, Madras (town). No. 8668/10. (*N. Annandale*.)

Type.—In the collection of the Indian Museum.

***Hemiporcellio carinatus*, gen. et sp. nov.**

(Plate vi, figs. 1-10.)

Body (fig. 1) oblong oval, flattened, with irregular tuberculations, and tooth-like tubercles on the posterior margin of the metasomatic segments; metasome narrower than mesosome. Cephalon (figs. 2 and 3) narrow, tuberculated, setose, lateral lobes cup-shaped, median lobe formed by a dipping forward and downward of the anterior margin which is continuous; epistoma convex with numerous small setae. Eyes large, sub-lateral. Antennulae very small. Antennae (fig. 4) elongated, with well-marked carination on the dorsal side of 3rd, 4th and 5th joints; flagellum 2-jointed, the proximal joint being the longer. First

maxillae (fig. 5), outer palp terminating in four stout curved spines and four smaller ones with bifid terminations, inner lobe with short blunt spine on the outer side and two setaceous spines on the inner side. Second maxillae (fig. 6) thin, plate-like, bilobed, inner lobe setaceous. The segments of the mesosome somewhat depressed, lateral plates small, slightly deflected outwards, the posterior angle of 5-7 produced backwardly, as also those of the three last metasomatic segments. Maxillipedes (fig. 7), outer palp with multispinous process on the outer side and three long spines internal to this, the inner palp has two spines and four small tooth-like processes on the margins. Thoracic appendages (fig. 8) fringed with stout spines on the inner side of the three distal joints. Uropoda (fig. 9) extending beyond the telson, basal plate with lateral extensions dorsally and ventrally, with the former the slightly curved endopodite articulates, the exopodite which is cuniform articulates at the base of the basal plate. Exopodite nearly twice the length of the basal plate, and of the endopodite, both covered with fine setae. Telson (fig. 10) short, not extending beyond the basal plates of the uropoda, triangular, apex sub-acute. Length 7.5 mm. Colour (in alcohol) greyish-brown, cephalon and metasome usually darker, lateral plates of mesosome with dark patch uniformly a blackish-brown, very variable.

Habitat.—Under stones and dead water weeds at edge of Chilka Lake, Rambha, Ganjam, Madras Pres., 27-xii-13, No. 8692/10. "Apparently an amphibious species" (N. Annandale.)

Type.—In the collection of the Indian Museum.

This species is closely allied to *Porcellio immsi*, Cllge.,¹ which latter must now be referred to the genus *Hemiporcellio*; it differs, however, from *immsi* in the form of the antennae, in the anterior margin of the cephalon, which is continuous, and in the form of the uropoda.

The colour is exceedingly variable. Examples measuring 5.5 and 6 mm. invariably have the first three and last mesosomatic segments a reddish-brown colour and the whole of the metasome a deep blackish-brown. Similar variations obtain in *H. immsi* judging from an immature specimen.

***Hemiporcellio hispidus*, n. sp.**

(Plate vii, figs. 1-9.)

Body oblong-oval, flattened, tuberculated and covered with fine setae; metasome narrower than the mesosome. Cephalon (figs. 1 and 2) small, tuberculated, lateral lobes slightly cup-shaped, median lobe absent, anterior margin distinct and continuous, epistoma convex and covered with stellate setae. Eyes small, sub-dorsal. Antennulae small, 3-jointed, basal joint prominent. Antennae (fig. 3) elongated, with well-marked carination on the

¹ Ann. Mag. Nat. Hist. 1914, s. 8, vol. xiv, p. 207, pl. ix.

3rd, 4th and 5th joints; flagellum 2-jointed, the distal joint being the longer. First maxillae (fig. 4), outer lobe terminates in three long and one short stout spine on the outer side, on the inner side are four smaller ones and two fine spines; the inner lobe terminates in two setaceous spines. The lateral plates of the mesosomatic segments are small and slightly overlap one another, posterior angle slightly produced. Maxillipedes (fig. 5), outer palp with multispinous process on the outer side and three spines internal to this, inner palp has a single spine and three tooth-like marginal processes. Thoracic appendages (fig. 6) short, with the 1st and 2nd joints grooved on their outer side, the three terminal joints are fringed with stout spines with trifid terminations. The whole of the appendages are covered with fine hair-like setae. Uropoda (figs. 7 and 8) extending beyond the telson and covered with fine setae, basal plate with lateral extensions, exopodite cuniform and grooved on the outer side, endopodite triangular in section. Telson (fig. 9) short, extending beyond the basal plates of the uropoda, triangular, apex sub-acute. Length 5 mm. Colour (in alcohol) greenish-grey with few irregular blackish blotches.

Habitat.—Satpara, Lake Chilka, Orissa, 17-ix-13, No. 8635/10. "A terrestrial species" (*N. Annandale*).

Type.—In the collection of the Indian Museum.

Arhina barkulensis, n. sp.

(Plate viii, figs. 1-10.)

Body oblong-oval, strongly convex, surface shiny, minutely punctate. Cephalon (figs. 1 and 2) covered with minute raised tubercles, lateral lobes well developed, median lobe small, epistoma slightly raised in median line, concave laterally with transverse ridge above the antennules. Eyes large, sub-lateral. Antennulae (fig. 3) 3-jointed, the terminal joint having a number of bristle-like setae at the apex and side. Antennae (fig. 4) characterised by the shortness of the three first joints, 3rd and 4th joints together equal in length to the 5th which is as long as the flagellum, the three joints of which are almost sub-equal; terminal stylet slender; whole of the appendage covered with short setae, those on the flagellum rather longer. First maxillae (fig. 5), the outer lobe is very solid and terminates in eight stout spines; the inner lobe is scroll-like, the inner border partly overlapping the flat outer portion, terminally there are two long setaceous spines. Second maxillae (fig. 6) a thin bilobed plate terminating in an inner dense tuft of setae and an outer tuft. The segments of the mesosome almost sub-equal, posterior margins of 1-4 almost straight, lateral angles rounded, of 5-7 slightly produced backward, sub-acute. Lateral plates of metasomatic segments greatly prolonged backwards (fig. 10). Maxillipedes (fig. 7), the outer palp terminates in a strong spine with two tufts of setae, at the base of this are two further tufts arising from a slight eminence, and a third pair still more inwardly; there are no spines on the inner palp, which

is fringed with short setae. Thoracic appendages (fig. 8) stout and comparatively short, first joints almost equal in length to the next three, stout claw with lateral spines; the 3rd, 4th and 5th joints have on their inner side a dense mass of long setae, with paired stouter spines on the outer side of the 2nd, 3rd, and 4th and on the inner side of the 5th joints. Uropoda (fig. 9) extending beyond the telson; basal plate sparsely covered with setae, there is a short, blunt spine on the outer side and a raised portion extending across the proximal end to the inner side, beneath which the endopodite articulates; exopodite somewhat conical in shape, more globose on the inner side, endopodite slender, terminating in two long setae. Telson (fig. 10) triangular, flat, sides straight, apex sub-acute. Length 11.5 mm. Colour (in alcohol) greenish-brown with yellow flecks on the head and mesosomatic segments.

Habitat.—Under stones at edge of lake, Barkul, Lake Chilka, Orissa, 22-vii-13, No. 8670/10. "Apparently an amphibious species" (*N Annandale*.)

Type.—In the collection of the Indian Museum.

The genus *Arhina* was constituted by Budde-Lund (Rev. Crust. Isop. Terr., 1904, p. 44) for a species, *A. porcellioides*, found "in a warehouse at Copenhagen, perhaps imported from East India." The genus is placed by Budde-Lund under the sub-family Spherillioninae, which includes *Pseudophiloscia*, *Suarezia*, *Scleropactes*, *Sunniva*, *Saidjahus*, *Ambounia* and *Spherillo*. Neither *Pseudophiloscia* or *Arhina* are closely related to any of the above mentioned genera, and whilst I differ strongly from Budde-Lund in his views on classification, they would, in my opinion, have found a more natural position in his Tribe Alloniscoidea, (*op. cit.*, p. 37).

The form of the antennae, 1st maxillae, maxillipedes and uropoda clearly indicate the relationship of this species to *Arhina porcellioides*.

***Periscyphis gigas*, n. sp.**

(Plate ix, figs. 1-10.)

Body (fig. 1) oblong oval, dorsal face strongly convex, sloping downwards posteriorly, almost smooth. Cephalon (figs. 2 and 3) small with median depression, flanked laterally by the lateral plates of the 1st segment of the mesosome, the anterior border of which extends slightly beyond the cephalon; lateral lobes well developed, median lobe absent. Ventrally there is a strong median carination. Eyes prominent, sub-dorsal. Antennulae (fig. 4) short and stout, 3-jointed. Mandibles (fig. 5), the outer cutting edge has three blunt teeth and a blunt process on the inner edge, beneath which is a tuft of setae. First maxillae (fig. 6), the outer lobe terminates in four curved spines and five finer and straighter ones on the inner side. Second maxillae (fig. 7) thin and plate-like; the inner lobe terminates in a mass of setae, whilst the outer lobe is more robust and tooth-like. The segments of the mesosome are strongly convex, excepting those of the 1st the lateral plates are only slightly produced backwards. Maxillipedes (fig.

8), inner lobe palp-like with setae on the inner side and two rows across the dorsal face, the outer palp terminates in three multi-spinous processes. Basally there is a raised portion studded with numerous small setae. Thoracic appendages (fig. 9) robust and fringed with numerous spines with trifid terminal portions (fig. 9a) and smaller spines, 2nd appendages having on the apical border of the fifth joint two with obtuse plumose apices. Uropoda (fig. 10), basal plate large, extending beyond the telson; outer margin sub-crenate; exopodite articulating on the middle inner border, endopodite slightly longer than the exopodite and articulating at the top of the inner border of the basal plate. Telson (fig. 1), dorsal face strongly convex, obtusely triangular, almost smooth. Length 20.5×13 mm. Colour (in alcohol) horny-brown with the lateral plates of the 1st, 5th and 6th mesosomatic and the 3rd and 4th metasomatic segments yellow.

Habitat.—Ponmudi, Travancore, September, 1893, No. 8626/10. (H. S. Ferguson.)

Type.—In the collection of the Indian Museum.

This interesting species is, I believe, the largest yet described of this genus. Unfortunately there were no antennae on either of the two specimens. Owing to the strong convexity of the 1st segment of the mesosome the dorsal surface of the head is almost vertically disposed.

***Cubaris solidulus*, n. sp.**

(Plate x, figs. 1-12)

Body oblong oval, moderately convex, minutely punctate with lateral rugosities. Cephalon (figs. 1 and 2) small with posterior margin slightly raised, lateral lobes small, median lobe absent, epistome flat. Eyes small, situated dorso-laterally. Antennulae (fig. 3) small, 3-jointed, with numerous short setae on the terminal joint. Antennae (fig. 4) short, covered with fine setae, 2nd to 5th joints grooved on their inner side; flagellum 2-jointed, the distal joint being a little over one 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, almost straight ones; inner lobe terminally rounded, with two setose spines. Second maxillae (fig. 6) thin and plate-like, terminating distally in two setaceous lobes, the inner of which is jointed. Segments of the mesosome with posterior angles of 1-4 produced backwards, overlapping the succeeding segments, fitting into a slight groove in segments 2-5, segments 5-7 almost straight. Segments 1 and 2 notched on their lower inner margins for reception of succeeding segments (figs. 7 and 8). Lateral plates of metasomatic segments 3-5 elongated. Maxillipedes (fig. 9), the outer palp terminates in a multispinous process on the outer side, with two small spines below it, internal to the large process are two long fine spines, the inner palp possesses five tooth-like spines and one larger one. Thoracic appendages (fig. 10) comparatively short, setaceous, with few stout spines on the inner side of the

three distal joints. Uropoda (fig. 11) not extending beyond the telson, basal plate somewhat triangular, posterior margin almost straight; exopodite small, situated on the inner lower border of the basal plate, endopodite nearly twice as long, setaceous and terminating in two long setae, situated at the top of the inner margin of the basal plate. Telson (fig. 12) slightly longer than broad, concave laterally, posterior margin straight, anteriorly with slight median depression. Length 11 mm. Colour (in alcohol) horny-brown with greyish rugosities.

Habitat.—Oorgaum, Kolar District, S. India, 20-X-10, No. 8598/10.

Type—In the collection of the Indian Museum.

The rugosities on the mesosomatic segments are more distinct in some specimens than in others. The form of the uropoda, antennae and telson serve to separate it from its allies, and minor differences are also present in the mouth parts and thoracic appendages.

***Cubaris nacrum*, n. sp.**

(Plate xi, figs. 1-10.)

Body oblong oval, strongly convex, smooth and shiny. Cephalon (figs. 1 and 2) small, with sloping anterior half, lateral lobes very small, median lobe absent, epistome almost flat. Eyes small, situated antero-dorsally. Antennulae (fig. 3) small, 3-jointed, with numerous short, thick setae on the terminal joint. Antennae (fig. 4) short, covered with fine setae, flagellum 2-jointed, distal joint almost twice as long as the proximal one. First maxillae (fig. 5), outer lobe terminates distally in four incurved spines and five smaller almost straight ones, short, simple, hair-like setae on the outer margin; inner lobe terminally rounded, thin, and with two setose spines, broader at the base. Second maxillae (fig. 6) thin and plate-like, terminating distally in a bi-lobed manner, the inner lobe having a row of strong setae on the inner face. The segments of the mesosome are strongly convex, with the lateral plates not expanded excepting in the 1st mesosomatic segment. Segments 1 and 2 notched on their lower inner margins for reception of succeeding segments. Lateral plates of metasomatic segments 3-5 greatly elongated. Maxillipedes (fig. 7), the outer palp terminates in a multispinous process on the outer side and two small spines inwardly, the inner palp possesses a single terminal spine and two smaller ones on the outer border. Thoracic appendages (fig. 8) comparatively short, setaceous, the three distal joints being fringed on the inner side with numerous stout spines. Uropoda (fig. 10) not extending beyond the telson, basal plate triangular in shape, posterior margin pointed, outer half raised above the flat, inner half; exopodite very small, situated towards the base of the raised outer half, endopodite large and situated at top of the inner margin of the basal plate, but not extending beyond it. Telson (fig. 9) slightly longer than broad, contracted

laterally, posterior margin almost straight. Length 16.5 mm. Colour (in alcohol) slaty-grey with lighter coloured lateral markings on the mesosome.

Habitat.—Under stones on hill near Rambha, Ganjam District. No. 8690/10. (*N. Annandale.*)

Type.—In the collection of the Indian Museum.

The form of the uropoda at once serve to separate this species from any other known form. Considerable variation was noticed in the mouth parts. In alcohol it is a slaty-grey colour, but when dry the specimens look like large pearls.

Cubaris granulatus, n. sp.

(Plate xii, figs. 1-11.)

Body oblong-oval, moderately convex, finely granulated with few irregular rugosities on the cephalon. Cephalon (figs. 1 and 2) small, anterior margin slightly raised, lateral lobes small, median lobe absent, posterior margin distinct, irregularly rugose, epistome with triangular convexity, deeply sunken around base of antennae. Eyes moderately large, situated dorso-laterally. Antennulae small, 3-jointed. Antennae (fig. 3) short, covered with fine setae, 2nd to 4th joints grooved on their inner side; flagellum 2-jointed, the distal joint being nearly three times as long as the proximal one. First maxillae (fig. 4), outer lobe terminates in four stout incurved spines and six smaller, almost straight ones; inner lobe terminally rounder, with two long setose spines. Segments of the mesosome with posterior angles of 1-4 produced backwards, overlapping the succeeding segments, fitting into a slight groove in segments 2-5, lateral plates of segments 6 and 7 slightly expanded. Segments 1 and 2 notched on their inner margins for reception of succeeding segments (figs. 5 and 6). Lateral plates of metasomatic segments 3-5 elongated. Maxillipedes (fig. 7), outer palp terminates in a multispinous process on the outer side and two long inner spines, at the base of the innermost are two very small spines; the inner palp has a single spine and a small tooth-like process. Thoracic appendages (fig. 8) comparatively short, setaceous with dense mass on the inner side of the 3rd and 4th joints. Uropoda (figs. 9 and 10) not extending beyond the telson, basal plate somewhat triangular, posterior margin almost straight, plicated on the ventral side; exopodite small, situated on the inner border of the basal plate, endopodite two-and-a-half times as long as the exopodite, setaceous, situated at the top of the inner border of the basal plate. Telson (fig. 11) slightly longer than broad posteriorly, expanded anteriorly, posterior margin almost straight with concavity anteriorly in the median line. Length 5.5 mm. Colour (in alcohol) dark olive brown.

Habitat.—Rambha, L. Chilka, Ganjam Dist., Madras, 22-ix-13, No. 8639-10. "Probably a terrestrial species" (*N. Annandale* and *S. W. Kemp.*)

Type.—In the collection of the Indian Museum.