

As regards their habits I do not think I can say anything beyond that they appear to be shier and somewhat less noisy birds than their Himalayan relations. They seem to be partially migratory, and during the cold season I have not seen half a dozen birds in as many years. They are confined to the East and South-East of the district, and, as I have already said, to a certain extent replace *H. psaroides* in that part, though even there they are less common than that bird is. I have never seen a bird further West than the centre of the Sub-division, and only once as far as that. Another thing that seems to point to their being more or less migratory is that certain seasons they are more common than in others. Thus in 1891 and 1889 they were very plentiful, comparatively speaking, in 1888 and 1890 they were rarely met with, and amongst my notes I have not one concerning any bird or nest taken in 1887.

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REPORT UPON TWO COLLECTIONS OF MYRIOPODA  
SENT FROM CEYLON BY MR. E. E. GREEN, AND  
FROM VARIOUS PARTS OF SOUTHERN INDIA  
BY MR. EDGAR THURSTON, OF THE  
GOVERNMENT CENTRAL MUSEUM,  
MADRAS.

By R. I. Pocock, of the British (Nat. Hist.) Museum.

(With Plates *I.* and *II.*)

(Read before the Bombay Natural History Society, 5th April, 1892.)

In seeking the honour of laying this paper before the Natural History Society of Bombay, it has been my hope that from the information thus afforded something, however little, is being done to throw light upon Myriopod fauna of India, and that it may induce naturalists resident in that country to pay attention to these little-known animals.

The neglect that this group, as a whole, has met with, is a circumstance sufficiently familiar at least to all who have studied it. Nor is an explanation of this hard to find, for the species that compose it are lacking in almost all those attributes which recommend more favoured ones to the notice of collectors. They are difficult

to preserve, obscure in characters, and, doubtless to many, though not, let us hope, to the majority, repulsive in aspect; with no marketable value worth mentioning, and with little or nothing of interest in their habits to attract the attention of naturalists. Add to all this that the literature is scattered, that such species as have been described are not as a rule recognisable from their descriptions, and that the name of the species is legion, and we need look no further for the causes of the fact that so small an amount of time and trouble has been devoted to these creatures by systematic zoologists.

The above remarks apply, however, most forcibly to the group of Millipedes. The Chilopoda or Centipedes are much fewer in number of species, and such as have been described are now well-known. But even in this group an enormous amount of new material must be still undiscovered. Perhaps a rough estimate of the new forms, likely to be obtained, may be gathered from the following figures:— Out of a collection of 33 species of Chilopoda amassed by Mr. Oates and Signor L. Fea in Burma, 16 were new; while out of the 11 species that Mr. Thurston has sent home to the British Museum, 5 were new. This percentage is very large, and it could doubtless be increased if special attention were paid to the smaller and more obscure forms.

The average number of new species in Diplopoda would most likely be higher. Mr. Thurston has been somewhat unfortunate in only obtaining 3 new ones out of 11, while Mr. Green, on the contrary, discovered 11 new species in a collection of 21, and without especially laying himself out to get these animals, he has, apart from the species, added two families and one genus to the Oriental fauna, and one interesting new genus to science.

But in the present state of our knowledge of this group, the value of a collection depends perhaps less upon the discovery of new forms than upon the re-discovery of old ones. For what is now required in the Myriopoda is that the species that have been poorly characterised in past years should be brought again to light; so that opportunities may be afforded of re-describing them in accordance with modern requirements or of figuring them so that they may be readily recognised. For unless the species that have been

characterised are known to an author, all work that he may do in the description of new species is more or less groping in the dark. As by slow degrees the old species are re-determined, so firmer and firmer becomes the basis from which satisfactory work in the future can be done. The described Indian and Ceylonese species are not so many, but that with a little diligent collecting they may one and all be found again. When this result is once attained, the working out of the fauna will be tolerably plain sailing.

For these reasons it was far more gratifying to me, when examining Mr. Thurston's collection, to discover examples referable to species long buried in obscurity, than to be compelled to characterise them all as *species novæ*.

It was originally my intention to write separate reports upon the two collections forming the subject-matter of the present paper; but upon further consideration, seeing that so many of the species occur both on the mainland and in Ceylon, I have thought that it would be more convenient both to my readers and to myself, if I treated the two collections as a whole and wrote the one report for them both. But to render the paper a still more complete record of Indian and Ceylon Myriopoda, I have incorporated descriptions of other new species from these countries.

To further the object which, as above expressed, I had in view in sending this paper to an Indian Natural History Journal, I have been asked to say a few introductory words upon the various kinds of Myriopoda that are known from India and Ceylon. It has also been suggested to me that a list of the described species might still further forward the same object.

The so-called group Myriopoda is, with the exception of some obscure forms, readily divisible into two sections—the Chilopoda or Centipedes, and the Diplopoda or Millipedes.

The Chilopoda are carnivorous, active, flattened, more or less soft animals with a single pair of legs attached to each somite. They are divisible into four families, *Scutigeriæ*, *Lithobiidæ*, *Scolopendridæ*, and *Geophilidæ*. The *Scutigeriæ* contains one genus, *Scutigera*, of which only two Indian species are known. This is an exceedingly long-legged, swift-footed diurnal species, no examples of which were found in either of the collections here discussed. The *Lithobiidæ* have not yet

been recorded from India or Ceylon; but doubtless the genus *Lithobius* exists in these countries, since two species of it have been described from Burma. Any one who remembers the common English centipede—the ‘forty-legs’ of some parts—found under almost every stone in England, will know *Lithobius* if he comes across it in India. The *Geophilidae* are the long, vermiform, subterranean centipedes, all being of relatively small size, with legs varying in number from about 40 up to over 100. Three species, referable to three genera, have, so far, been recorded from India and Ceylon; but many more undoubtedly remain to be discovered; for Mr. Oates obtained eight species in Burma. Two of the three known Indian forms are recorded below; the third was on a previous occasion sent by Mr. Thurston from Madras. The *Scolopendridæ* are the best known members of the group. They are mostly of large or medium size, and have 21 (rarely 23) pairs of legs. The Indian and Ceylonese members of the group are referable to the genera *Scolopendra*, *Cormocephalus*, *Otostigma*, *Rhysida*, (*Branchiostoma*), and *Heterostoma*. The last two differ from the others in having a pair of stigmata on the 7th somite. *Heterostoma*, recognisable from *Rhysida* by its large sieve-like stigmata, is of large size, approaching in this respect *Scolopendra*; there are some five or six mostly ill-defined species of this genus known from India, Ceylon, and Burma.

*Rhysida*, with two Indian species, both recorded below, is of small size, and has stigmata that have been described as ‘ear-shaped.’ *Otostigma* is exactly like *Rhysida* except for the absence of stigmata on the 7th somite. This is the most abundant genus in the Oriental region—6 species having been recorded from Burma, 2 of them occurring also in Ceylon, and 5 being known from India, 4 of them having been sent by Mr. Thurston from Madras. *Cormocephalus* differs from *Otostigma* in the structure of the head-plate, and in the more elongate shape of its stigmata. Four species, all of small size, are known from India and Ceylon. One of these is described below as coming from Madras. *Scolopendra* differs from all the preceding genera in having the head covering the anterior portion of the tergite that succeeds it. There are only about 7 species known from Burma, India, and Ceylon. The genus *Cryptops*, which is composed of small, slender, somewhat geophilus-like, blind species, has not yet been



recorded from Ceylon and India, although three species are known from Burma; and the peculiar genus *Asanada*, with its single species, occurs in Burma, and was originally recorded from Kulu in the Western Himalayas.

The Diplopoda are herbivorous, slow-moving, usually cylindrical, hard crustaceous animals, with two pairs of legs upon most of the segments of the body. The Oriental families of this group are the *Polyxenidæ* or hairy-tailed millipedes; the *Zephroniidæ* or pill millipedes, the *Polyzenidæ* or suctorial millipedes, the *Lysiopetalidæ*, *Iulidæ*, and *Polydesmidæ*. The *Polyxenidæ* and *Lysiopetalidæ* are here for the first time recorded as Indian or rather Ceylonese. The former are quite unmistakable, and the affinities of the single-known genus of the latter are given below. The *Zephroniidæ* cannot be confused with the others, and the *Polydesmidæ* differ from the *Iulidæ* in having only 20 segments in the body. Four of the genera of *Polydesmidæ* mentioned are hard to recognise and of doubtful value. In *Leptodesmus* the tail is cylindrical; in *Paradesmus* and *Strongylosoma* it is triangular and truncate, *Paradesmus* having larger keels than *Strongylosoma*; while *Polydesmus* has the dorsal surface sculptured. The form of the other two genera is very peculiar, and is well shown in the plate at the beginning of this paper. The two genera of *Iulidæ* are very much alike externally. *Spirobohus* as a rule is shorter and stouter, with the mandibles more exposed at the sides, a differently constituted lower lip, and the 4th and 5th segments each with a single pair of legs; in *Spiros-treptus*, on the other hand, the 4th segment is without legs, and the 5th has two pairs. *Trachyintus* may be recognised from both of them by the peculiar arrangement of the eyes, the carinate or warty segments of the body, &c.

List of the described species of Indian and Ceylonese Myriopoda:—

CLASS, DIPLOPODA.

SUB-CLASS, PSELAPHOGNATHA.

Family, *Polyxenidæ*.

*Polyxenus ceylonicus*, sp. n. Ceylon (cf. infra, p. 142).

SUB-CLASS, CHILOGNATHA.

Order, ONISCOMORPHA.

Family, *Zephroniidæ*.

*Zephronia heterosticatica*, Newport; *brandti* and *inermis*, Humbert (cf. infra, pp. 145, 143, 144); *zebraica*, Butler (Ann. Nat. Hist., (4), x, p. 356), Bombay; *marmorata*, id. (Ann. Nat. Hist., (5), ix, p. 197); *versicolor*, White (Ann. Nat. Hist., (3), iii, p. 405), Ceylon; *noticeps*, Butler (Ann. Nat. Hist., (4), x, p. 355), Ceylon; *pilifera*, id. (loc. cit., p. 357), Ceylon; *hercules*, (Brandt), Ceylon (*teste* Karsch, Arch. Naturg., 1881, p. 34); *nigrinota*, Butler (Ann. Nat. Hist., (4), x, p. 356), Assam, Sikkim; *tumida*, id. (Ann. Nat. Hist., (5), ix, p. 196), N. Assam; *tigrina*, id. (op. cit., p. 356), Assam; *excavata*, id. (Ann. Nat. Hist., (4), xiv, p. 185); *maculata*, id. (l. c., p. 186), Sikkim.

## ORDER, HELMINTHOMORPHA.

Family, *Polydesmidæ*.

*Polydesmus stigma*, Fabr. (Ent. Syst., ii, p. 394), Tranquebar, (doubtless either a *Leptodesmus*, *Strongylosoma*, or *Paradesmus*).

*Polydesmus* (s. s.) *cognatus*, Humbert (cf. infra, p. 153), Ceylon.

*Paradesmus kelaarti* (Humbert) (cf. infra, p. 149), Ceylon and Madras.

*Leptodesmus luctuosus*, Peters (Mon. Ak. Wiss. Berlin, 1864, p. 532); *saussurii*, Humbert (Mem. Soc. Phys. Genève, 1866, p. 26); *thwaitesii*, id. (cf. infra, p. 147); *layardi*, id. (p. 28); *inornatus*, id. (cf. infra, p. 147)—all from Ceylon; *tanjoricus*, sp. n. (cf. infra, p. 147), Tanjore.

*Strongylosoma nietneri*, Peters (op. cit., p. 535), Ceylon; *skinneri* Humb. (op. cit., p. 31); *simplex*, id. (cf. infra, p. 149); *cingalense*, id. (cf. infra, p. 150); *greeni*, sp. n. (cf. infra, p. 149)—all from Ceylon; *phipsoni*, sp. n. (cf. infra, p. 151), Calcutta; *jerdani*, sp. n. (cf. infra, p. 152), Madras.

*Cryptodesmus ceylonicus*, sp. n. (cf. infra, p. 153); *greeni*, sp. n. (cf. infra, p. 154), Ceylon.

*Pyrgodesmus obscurus*, g. et sp. n. (cf. infra, p. 155), Ceylon.

Family, *Lysiopetalidæ*.

*Stemmiulus ceylonicus*, sp. n. (cf. infra, p. 157), Ceylon.

Family, *Iulidæ*.

*Trachyiulus ceylonicus*, Peters (cf. infra, p. 158).

*Spirostreptus nigrolabiatus*, Newport (cf. infra, p. 159), Madras; *cinctatus*, Newport (Ann. Mag. Nat. Hist., xiii, p. 270); *maculatus*, id., ibid., India; *malabaricus*, Gervais (cf. infra, p. 158), Malabar; *spinicaudus*, id. (Ins. Apt. p. 165), Malabar; *lunellii*, Humbert (Mem. Soc. Phys. Genève, 1866, p. 47); *kandyanus*, id., p. 49; *lankaensis*, id.,

p. 50; *hamifer*, id., p. 52 (cf. infra, p. 160); *modestus*, id., p. 53—all Ceylon; *caudiculatus*, Karsch (Zeits. Ges. Naturw., (3), vi, pp. 27, 28); *contemptus*, id. (p. 29), Ceylon; *asthenes*, sp. n. (cf. infra, p. 161), Madras; *jerdani*, sp. n. (cf. infra, p. 161), Madras; *centrurus*, sp. n. (cf. infra, p. 162), Ceylon; *insculptus*, sp. n. (cf. infra, p. 163), Ceylon.

*Spirobolus carnifex*, (Fabr.), (cf. infra, p. 166), Madras and Ceylon; *crebrestriatus*, Humbert, op. cit., p. 55; *taprobanensis*, id., p. 56, Ceylon; *spirostreptinus*, Karsch, op. cit., p. 55, Ceylon; *goësi*, Porath (cf. infra, p. 167), Madras; *thurstoni*, sp. n. (cf. infra, p. 167), Madras; *uroceros*, sp. n. (cf. infra, p. 169), Madras; *greeni*, sp. n. (cf. infra, p. 170), Ceylon; *longicornis*, sp. n. (cf. infra, p. 171), Ceylon; *longicollis*, sp. n. (cf. infra, p. 172), Ceylon; *obtusospinosus*, Voges, Zeits. wissen. Zool., xxxi, p. 189, Ceylon.

Family, *Polyzonidæ*.

*Siphonophora picteti*, Humbert, op. cit., p. 59; *humberti*, sp. n. (cf. infra, p. 173), Ceylon.

The following species of *Iulidæ* are too briefly described to be recognizable:—*Iulus indicus*, Linn., Mus. Adolf. Frid., p. 90; *indus*, id., Syst., Nat., p. 3019; *fuscus*, Linn., Amœn. Acad., iv, p. 263; *ceilanicus*, Brandt, Rec. Mem., p. 93.

CLASS, CHILOPODA.

Family, *Scutigridæ*.

*Scutigera longicornis* (Fabr.), Haase, Abh. Ber. Mus. Dresden, 1887, no. 5, p. 17, India and Ceylon; *rabrolineata*, Newport, Tr. Linn. Soc., xix, p. 358, India.

Family, *Scolopendridæ*.

*Asanada brevicornis*, Meinert, Amer. Phil. Soc., 1886, p. 189, Kulu. *Scolopendra hardwickii*, Newport, op. cit., p. 395, India and Ceylon; *subspinipes*, Leach, Tr. Linn. Soc., xi, p. 383, India and Ceylon; *morsitans*, (Linn.), Kohl. (see infra, p. 140); *latro*, Meinert (Vid. Medd. nat. Forening, Copenhagen, 1884, p. 127), Serampore; *indica*, id. (Ann. Phil. Soc. 1886, p. 104), Kulu.

*Cormocephalus sarasinorum*, Haase (op. cit., p. 63), Ceylon; *inermipes*, Pocock (Ann. Nat. Hist., 1891, p. 64), Ceylon; *dentipes*, id. (loc. cit., p. 66), Bengal; *pygmæus*, sp. n. (cf. infra, p. 140), Madras.

*Otostigma carinatum*, Porath (Bih. Sv. Vet. Ak. Handl., iv, pt. 7, p. 20); *ceylonicum*, Haase (cf. infra, p. 140); *orientale*, Porath (op. cit.,

p. 19), Bombay ; *splendens*, *morsitans*, *nudum*, *ruficeps*, Pocock (Ann. Nat. Hist., 1890, pp. 245-248), Madras.

*Rhysida longipes*, Newport (cf. infra, p. 139), Madras and Ceylon ; *immarginata*, Porath (cf. infra, p. 139), Madras and Ceylon.

*Heterostoma langiconda*, Pocock (Ann. N. H., 1891, p. 55), India and Ceylon ; *spinosum*, Newport (op. cit., p. 414), Ceylon ; *paucispinosum*, Haase (cf. infra, p. 138), Ceylon ; *triste*, Meinert (cf. infra, p. 139), Madras, &c. ; *silhetense*, Haase (op. cit., p. 92), Silhet ; *cribriferum*, Gervais, (teste Haase, op. cit., p. 94), Mysore.

Family, *Geophilidæ*.

*Mecistocephalus punctifrons*, Newport (op. cit. p. 429), Ceylon and India.

*Orphnæus brevilabiatu*s, Newport (cf. infra, p. 142), Ceylon.

*Himantosoma striatum*, Pocock (Ann. Nat. Hist., 1890, p. 248), Madras.

This list does not contain references to those species which have been recorded vaguely as from the East Indies, although it must be admitted the area is sufficiently comprehensive to embrace any spot between Papua and the Punjab.

Nor are the Burmese species included. For the Chilopoda of this country, reference may be made to my paper in the Ann. Mus. Genov., (2), x, (xxx), pp. 401-432 (1891) on the Chilopoda collected by Sig. L. Fea and Mr. E. W. Oates. Of the Diplopoda, only one group, the *Oniscomorpha*, has as yet been worked out. This may be found in the Ann. Mus. Genov., (2), x, pp. 384—395 (1890).

CLASS, CHILOPODA.

Family, *Scolopendridæ*.

*Heterostoma paucispinosum*, Haase.

Die Indisch.-Austral. Chilopoden, Abh. Ber. Zool. Mus. Dresden, no. 5, 1887, p. 90, pl. v, fig. 95.

Dr. Haase looked upon this form as a variety of *H. spinosum* of Newport, a species which also occurs in Ceylon. It appears to me, however, to be sufficiently well characterised to rank, at all events, provisionally, as a distinct species. The two forms agree in the interesting fact that in the ♂ the distal spine on the upper inner edge of the anal femur is enormously enlarged. *H. paucispinosum* may be recognised by the presence of only 7 spines on the anal femur, by



the absence of sulci on the sternites, and by the fact that the anal pleura is terminated by two spines, one inferior and large, the other at some distance above it and smaller.

Ceylon: Mr. Green brought back one female specimen measuring about 90 mm. ( $3\frac{1}{2}$  inches) in length.

*Heterostoma triste*, Meinert.

Meinert, Vid. Medd. Nat. Foren. (Copenhagen), 1886, pp. 114, 115; Haase, op. cit., pp. 91, 92.

This is the species that I previously (Ann. Nat. Hist., 1890, p. 245) referred to as the ♀ of *H. spinosum*. Mr. Thurston has sent one specimen from Madras, another from the Nilghiri Hills, and a third from Mysore. Dr. Meinert's specimens were from Vellore and the Sheveroy Hills.

In this species the anal femur is armed with 7 or 8 strong spines; the anal pleura terminates with two spines, one above, smaller and at some distance from the other, there is a conspicuous lateral spine and sometimes also a superior spine; the sternal sulci are conspicuous although posteriorly abbreviated. In the ♂ the tarsal segments of the anal leg are thickened and compressed.

The ♀ of this species bears a strong resemblance to the ♀ of the Ceylonese species *paucispinosum*. It may, however, be recognised by the absence of sternal sulci.

Dr. Haase regards *triste* only as a variety of the Chinese species *H. rapax* of Gervais.

*Rhysida longipes*, (Newport).

Haase, op. cit., p. 83.

One specimen sent from Madras by Mr. Thurston. This species is wide-spread, occurring in both the East and West Indies. The British Museum has examples from Burma, Bengal, and Ceylon.

This species may be recognised from the one following by the strong spine-armature of its anal legs, and by the raised side margins of the tergites in the posterior half of the body.

*Rhysida immarginata*, (Porath).

Bih. Sv. Vet. Ak. Handl., iv, no. 7, p. 24 (1876); for full synonymy, see Pocock (Ann. Mus. Genov., (2), x, p. 417).

One specimen sent from Ceylon by Mr. Green.

The tarsi of the pre-anal legs are furnished with a single spur; the anal pleuræ are furnished on one side with two apical spines and on the other with one; the anal femora are armed with three small spines, one on the middle of the upper inner edge, one on the under inner edge, and one on the under outer edge.

Mr. Thurston has, on a previous occasion, sent this species from Madras.

*Otostigma ceylonicum*, Haase.

Op. cit., pp. 69, 70, pl. iv, fig. 67.

Mr. Green brought back several specimens from Punduloya.

This species also occurs in Burma, as I have elsewhere pointed out.

Two very nearly allied forms were on a previous occasion sent to the British Museum from Madras by Mr. Edgar Thurston. Both of these were new and were described by me in the paper to which reference has already been made. These were called *Ot. splendens* and *Ot. morsitans*; but at the time, not having then seen *Ot. ceylonicum*, I was not able to give very satisfactory characters to distinguish the three. In *Ot. splendens* the anal pleuræ are much longer and stronger than in *Ot. ceylonicum*, in which they are remarkably weak; while in *Ot. morsitans* the tergites are beset with minute spicules, and the sternites are laterally and not mesially impressed.

*Scolopendra morsitans*, (Linn.), Kohl.

Haase, op. cit., pp. 52, 53.

Mr. Thurston sent specimens from Mysore and Madras.

This species is found in all tropical and subtropical countries. It is of medium size, and varies considerably in colour; but it may be recognised by the presence of nine spines in three longitudinal rows on the lower surface of the femur of the anal legs. It seems to be widely distributed in India; the British Museum has examples from Burma, Calcutta, Bengal, N.-W. India, Maballah, Midnapore, Madras, and Ceylon.

*Cornocephalus pygmaeus*, sp. n.

*Colour* a deep greenish-blue throughout, darker posteriorly.

*Body* moderately robust and nearly parallel-sided.

*Head* very minutely punctured, marked in its posterior half with two anteriorly diverging sulci.

*Antennæ* short, thick at the base, attenuate, composed of 17 segments, whereof the basal six are naked, and the rest pubescent.

*Maxillipedes* minutely punctured, coxæ slightly depressed mesially in front, the anterior plates somewhat long, slightly separated at the base, in contact distally, each bearing four teeth, whereof the three internal are fused, and the external distinct and conical.

*Tergites* minutely punctured, each of them, with the exception of the last *but including the first*, marked throughout by two complete conspicuous sulci; the last five with raised margins.

*Sternites*, except the last and first, with conspicuous sulci, not impressed.

*Anal somite; tergite* with a complete median sulcus; *pleuræ* marked with very clearly defined circular larger and smaller pores, the process conspicuous but not elongate, smooth, tipped with two spines, a single spine near the tergite on the posterior border; *sternite* somewhat narrow, its sides strongly converging posteriorly, with rounded posterior angles; *legs* moderately robust and moderately long, the femur armed with about 17 spines, 3, 4, 3 in longitudinal rows on the inner surface, and 3, 4 in longitudinal rows on the under outer edge, the process small and tipped with two spines, the claw not basally spurred.

*Legs* somewhat robust with unspined tarsi but spurred claws.

*Stigmata* small and circular.

Length 25 mm.

A single specimen, probably not adult, from Madras.

Resembling *C. dentipes*, from Bengal, in having the first tergite completely bisulcate, but differing in having the anal legs smooth and not tubercular.

Family, *Geophilidæ*.

*Mecistocephalus punctifrons*, Newport.

Trans. Linn. Soc., xix, p. 429 (1845); for synonymy, Pocock. Ann. Mus. Genova, (2), x, p. 423.

Ceylon: Mr. Green.

This is far the commonest oriental species of this family. Mr. Thurston has already sent it from Madras. Mr. Oates has collected it at many localities in Burma.

*Orphnæus brevilabiatu*s, (Newport.)

Op. cit., p. 439; for synonymy, Pocock, op. cit., p. 425.

One specimen sent by Mr. Green from Ceylon. With the exception of the preceding this species is more abundant in the East than any other member of the family.

The British Museum has examples from Burma, Madras, and Ceylon.

## CLASS, DIPLOPODA.

## SUB-CLASS, PSELAPHOGNATHA.

Family, *Polyxenidæ*.*Polyxenus ceylonicus*, sp. n.

*Colour* (in alcohol) entirely ochraceous.

Of large size.

Lower half of *head* perfectly smooth, labrum defined by a sulcus and angularly excised in the middle; a deep sulcus between the antennæ; upper surface of head lightly hollowed in the middle, furnished along its anterior margin with two tufts of long hairs; eyes composed of about 8 ocelli on each side; antennæ long and slender, projecting far beyond the sides of the head. *Body* composed of 11 segments, the terga indistinctly divided longitudinally in the middle line; each tergite furnished on each side of its posterior border with a transverse tuft of hairs; the pleura on each side produced into a prominence which is adorned with a large tuft of hairs; the terminal segment bearing an elongate funnel-shaped tuft of hairs.

Length 3 mm.

*Punduloya*. Mr. Green informs me that he obtained this species by beating the bushes.

Unfortunately the immersion in alcohol of these specimens has removed nearly all the hairs that adorn the body when living. I have consequently been obliged to judge of their position by the scars which mark their points of attachment. Fortunately Mr. Green made a sketch of the lower surface of one of these animals before the destruction of the hairs, and this sketch shows clearly that the plumes were arranged very much as they are in *P. lagurus*. The hairs, judging from a few that remain on the dorsal surface, were very much finer than in our European species.



## SUB-CLASS, CHILOGNATHA.

Order, ONISCOMORPHA.

Family, *Zephroniidae*.*Zephronia brandti*, Humbert.

Syn. *Sphaeropæus brandti*, Humbert, Mem. Soc. Phys. Genève, xviii, p. 38, p. iii, fig. 15 (1865); Karsch, Arch. Naturg., 1881, p. 29.

„ *Zephronia chitonoides*, Butler, Ann. N. H., (4), x, p. 354, pl. xviii, fig. 2 (1872).

„ „ *rugulosa*, id., t. c., p. 355, pl. xviii, fig. 1.

Mr. Green obtained this species at Punduloya, in Ceylon.

*Colour* testaceous or ochraceous, head and nuchal plate usually darker than rest of the body, the anterior portion of the tergites may be darker than the posterior.

*Head* sparsely punctured above, more thickly so in region of labrum; armed above with from four to ten sharp teeth borne on a ridge which extends without interruption from one eye to the other.

*Nuchal plate* with inferior margin nearly straight and upturned edge; not marked with a sulcus or ridge; almost without punctures, somewhat thickly punctured above its inferior margin.

*First tergite* with somewhat abruptly rounded anterior border; not sulcate; lamina very slightly developed, scarcely represented by more than the upturned edge of the tergite; anterior edge of the tergite very gradually produced forward on each side of the head, then curving gently back to the inferior portion; anterior portion either punctured or almost smooth.

*Tergites* anteriorly more or less punctured or rugulose; posteriorly without punctures; sometimes almost wholly smooth.

*Anal tergite* exceedingly finely or coarsely punctured or rugulose; without a ridge on each side of the inferior internal surface, and without a trace of a notch or the antero-lateral inferior edge.

♂. *Anal tergite* saddle-shaped, *i. e.*, concave from before backwards and from side to side. Antennæ larger.

*Forceps*; 1st pair—proximal and second segments wide and flat; third segment rounded and stout, with a slender conical dactylar prolongation; distal segment more compressed, truncate, projecting

a long way beyond the dactylus of the preceding segment; bearing two processes, of which the proximal is very small and the distal very large.

2nd pair—proximal segments stout, dactylar prolongation of the second blade-like, with straight minutely denticulated inner surface, rounded apex and outer surface rounded from base to apex; distal segment also blade-like, considerably longer than the dactylus of the preceding segment; anterior edge of the inner surface straight and simple, the posterior edge furnished with a series of minute denticles is considerably thicker at its proximal than at its distal extremity; outer surface evenly rounded from base to apex.

♀. Anal tergite not saddle-shaped, antennæ smaller.

*Vulva*. Basal sclerite rounded proximally, distally angled and separating the two distal sclerites; internal sclerite, from the front, more or less rod-like, with perfectly straight outer border and rounded apex, expanded proximally and distally, projecting considerably beyond the external sclerite; external sclerite (the cap) varying somewhat in shape, with tolerably straight inner border and more or less irregularly rounded external border, thinner at its proximal than at its distal end.

Length 15-40 mm.

The species *Z. chitonoides* was established by Mr. Butler upon certain specimens which differ from *Z. brandti* in the narrower and more elongate shape of the body. But this difference of shape is clearly due to distortion of the tergites during the process of drying.

The type of *Z. rugulosa* cannot be separated by any reliable characters from specimens of *Z. brandti*.

*Zephronia inermis*, Humbert.

Syn. *Sphæropæus inermis*, Humbert, Mém. Soc. Genève, xviii, p. 37, pl. iii, fig. 16 (1865).

„ *Zephronia corrugata*, Butler, Ann. Nat. Hist. (4), x, p. 355 (1872).

„ „ „ id., Proc. Zool. Soc. 1873, p. 180, pl. xix, fig. 8.

„ „ *leopardina*, id., t.c., p. 356.

„ „ „ id., Proc. Zool. Soc. 1873, p. 181, pl. xix, fig. 10.

Not *Sphaeropæus inermis*, Karsch, Arch. Naturg., 1881, p. 29, pl. ii, G. and g.

Also obtained at Punduloya by Mr. Green.

It is needless to describe this species, for, as Mons. Humbert pointed out, it can only be distinguished from *Z. brandti* by the absence of the teeth on the head. I very much doubt the value of this character by itself, and am disposed to think that further researches will show that it cannot be considered as of specific importance.

Although in his original descriptions Mr. Butler points out the resemblance existing between *Z. corrugata*, *Z. leopardina*, and *Z. inermis*, in his later revision of this group, he refers these three species to distinct sections of the genus. The rugosity upon which *corrugata* was based and the colours of *leopardina* are not, in my opinion, of specific importance.

Dr. Karsch's specimen of *Z. inermis* differs from those in the British Museum in the form of the copulatory forceps; and, since Mons. Humbert asserts that in the shape of this organ *Z. inermis* resembles *Z. brandti*, I have no doubt that the specimens in the Berlin Museum have been wrongly identified. The copulatory foot of Dr. Karsch's *Z. inermis* appears to bear some resemblance to that of *Z. versicolor*.

*Zephronia heterostaticata*, Newport.

(Pl. i, fig. 1.)

Syn. *Zeph. heterostaticata*, Newport, Ann. Nat. Hist. (1), xiii, p. 265 (1844).

„ „ *lutescens*, Butler, Ann. Nat. Hist. (4), x, p. 356 (1872).

„ „ „ id., Proc. Zool. Soc., 1873, p. 179, pl. xix, fig. 5.

„ „ *atrisparsa*, id., Trans. Ent. Soc., 1878, p. 302.

*Colour*, varying from testaceous to olivaceous, tergites generally ornamented with more or fewer irregularly arranged black spots; dull or slightly polished; without punctures or sparsely punctured.

*Head* like that of *Z. inermis*; nuchal plate like that of *Z. inermis* in having a nearly straight inferior border, and in not being marked with a faint sulcus or ridge; a row of punctures along the superior and along the inferior border.

*1st tergite* with scarcely developed lamina and evenly arched anterior border; the upper surface evenly sloped from behind

forwards; in small specimens (*i.e.*, in those named *atrisparsa* and *lutescens*) there is a faint sulcus running parallel with the anterior border and just behind it; in larger forms this sulcus becomes obsolete.

*Anal tergite* near the middle of its hinder half more thickly punctured than the others; the ridge on its inner surface represented by an anterior longer and a posterior shorter black portion; the notch absent or scarcely visible.

♂. *Anal tergite* rounded.

*Forceps*.—1st pair with immovable dactylus short and upcurled; movable dactylus with a basal external rounded projection, a compressed distal half, and a distinct more or less rounded tooth projecting inwardly to meet the immovable dactylus.

2nd pair:—The two dactyli about equal in length; the immovable blade-like, not attenuated towards distal end, with a nearly straight denticulate inner edge, outer edge proximally nearly straight, distally exceedingly convex, the movable dactylus hollowed internally, and with hinder edge denticulate, much thicker at base than at apex, with gently convex outer border and concave inner border.

♀. *Anal tergite* resembling that of the male.

*Vulva* formed on the same plan as in *Z. brandti*, and not differing from it in any important particulars.

Length 1.8-3.5 mm.

This species closely resembles *Z. inermis*, Humbert, in the form of the head, nuchal plate, and 1st tergite, but differs in the form of the copulatory forceps, in the presence of the ridge on the anal tergite, in colour, and in sculpture.

I cannot separate *Z. lutescens* from *Z. heterostatica* by any character which I consider specific. There are certainly no black spots on the two specimens of the former species, which served as Mr. Butler's types, and there is a sulcus on the first tergite. Nevertheless both these characters are variable, inasmuch as in one specimen of *Z. heterostatica*, the spots are few in number and the sulcus is feebly indicated.

The type of *Z. atrisparsa* differs from *lutescens* and resembles *heterostatica* in being, as the name indicates, spotted with black; and it closely resembles *lutescens* in having the first tergite sulcate.



This species has not yet been recorded from Ceylon. It appears, however, to be tolerably widely distributed in Southern India. The British Museum has examples from Bombay and Madras; and in addition to further examples from Madras, Mr. Thurston has sent others from the Nilghiri Hills.

Order, HELMINTHOMORPHA.

Family, *Polydesmidæ*.

*Leptodesmus inornatus*, (Humbert).

Loc. cit. pp. 30, 31, pl. iii, fig. 11.

This species was recorded originally from Peradenia. Mr. Green brought one example from Punduloya. This specimen is concolorous and pale coloured, thus differing markedly from the *L. tanjoricus* described below.

*Leptodesmus thwaitesii*, (Humbert).

Loc. cit., pp. 27, 28, pl. ii, fig. 9.

This beautiful species was also recorded in the first instance from Peradenia; Mr. Green obtained several examples at Punduloya. It is a very marked form. The keels are well-developed and like the posterior half of the segment are nearly white, while the anterior half is chocolate-brown with white spots.

*Leptodesmus tanjoricus*, sp. n.

(Pl. i, figs. 3, 3a, 3b.)

*Colour*, upper surface deep chocolate-brown, almost black, the under surface, the labral region of head, the antennæ and legs pale brown, the keels of all the segments and the caudal process pale yellow; polished.

*Body* nearly parallel-sided; somewhat slender, lightly convex between the keels. First tergite much wider than head with lightly convex anterior border, the posterior border nearly straight and running obliquely outwards, forwards, and downwards, the border with raised margins, the keels of the 1st, 2nd, 3rd and 4th tergites nearly in a straight line, sloping backwards and upwards to the 5th; keel of the 2nd well developed and a little depressed, with anterior border and angles lightly convex, squared posteriorly; 3rd and 4th with keels horizontal and directed backwards; the rest of the segments with the keels horizontal and not elevated, not long, the posterior

border being slightly produced backwards in the anterior half of the body and more so in the posterior half, but the keels never extend beyond the level of the posterior border of the tergites, the antero-lateral border convex; border of the keels thickened and elevated, those of the poriferous segments much thicker than the others; keels of the 19th somite not produced, tuberculiform; the pores completely lateral and situated in the posterior half of the lateral surface; 5th to the 18th furnished with a weak median transverse sulcus. Lateral portion of the somites beneath the keel sub-granular, the upper surface being smooth or at most slightly reticulated; the 2nd to about the 18th somites furnished with a conspicuous ridge above the tracheal apertures.

Sternal surface of the 5th furnished in its anterior half with a low, wide, posteriorly slightly elevated prominence; sternite of the 20th obtusely triangular, its posterior angle rounded, bearing a tubercle on each side in front of the margin.

*Legs*: femur of 5th, 6th and 7th pairs (*i. e.*, the posterior pair on the 5th and the two pairs of the 6th somites) bearing an inferior prominence, which is smaller on the 5th, largest on the 7th. Copulatory feet reaching to the middle of the sternum of the 6th somite (with the body extended), the 2nd segment hairy, narrowed distally, and bearing internally and posteriorly a backwardly-directed projection, the 3rd segment externally convex, terminated by four processes, which considered from behind forwards may be described as follows—the first is slender, short, and nearly at right angles to the axis of the foot, the second belonging to the same piece as the first, is directed forwards, thin, blade-like, and pointed, the other two are slender, curved and closely in contact, almost equal in length, the external embracing the internal.

Length 36 mm.

Several specimens, all males, from Tanjore.

This species at least differs from *L. luctuosus*, (Peters), from Ceylon, in colouring; for *luctuosus* is said to have the posterior border of the somites pale coloured. It cannot, moreover, be confounded with any of the species recorded by Humbert from the same island.

*Paradesmus kelaarti*, (Humbert).

(Pl. ii, fig. 12.)

Essai Sur les Myriapodes de Ceylan. Mém. Soc. Phys. Genève, xviii, pp. 23, 24, pt. ii, fig. 7.

Recorded originally from Ceylon.

Mr. Thurston sent one specimen (♂) from Tanjore, and two (♀) from Madras.

This species has the dorsal surface remarkably flat and rugulose, and only the posterior angles of the keels flavous.

*Strongylosoma simplex*, (Humbert).

Loc. cit., pp. 34, 35, pl. iii, fig. 14.

Specimens of both sexes from Punduloya (Ceylon) were brought by Mr. Green.

The types of the species were collected by Mons. Humbert at Pundel-Oya (*sic*).

This species approaches *Leptodesmus* in the form of its caudal process. The colour of the head, antennæ, legs, caudal process, and the anterior and inferior portions of the somites—of the whole animal in fact, except just the upper surface of the keel-bearing portion of the somites and the keels, which are ferruginous or piceous—is ochraceous or testaceous.

*Strongylosoma greeni*, sp. n.

(Pl. ii, fig. 14.)

Colour (in alcohol) entirely pale ochraceous or testaceous.

♀. *Body* attenuated in its anterior half.

*Head* hairy below with a vertical sulcus above; *antennæ* long, the 2nd, 3rd, 4th, and 5th segments sub-equal in length.

*Segments* smooth and shining; the 1st with convex anterior margin, rounded angle and posterior margin straight in the middle, not sulcate; the 2nd with an indistinct transverse sulcus, the keel projecting below the level of the angle of the 1st and the keel of the 2nd, produced forwards and downwards; 3rd and 4th obsolete sulcate transversely, the keels very small, the 2nd, 3rd and 4th with an elongate tubercle above the base of the legs; the rest of the somites marked with a transverse sulcus; the keels very small, situated above the middle, not attaining the posterior margin of the somites, the pores situated in their posterior half, keels on the 19th

somite almost absent; the caudal process of the 20th normal in form; the sternum bituberulate posteriorly. *Legs* hairy and elongate.

♂. Body a little more slender, the keels a little more prominent; the sternum of the fifth unmodified, and the femora of all the legs normal.

Copulatory feet short; the basal segment hairy, the second segment stout and terminating distally in two processes, an external slender, filiform, and curled at the apex, an internal stouter, giving off a short slender lamina on the inner side at its base, strongly curved inwardly in its distal half.

Length up to 23 mm.

Several examples from Punduloya; Mr. Green.

This species resembles *St. simplex* in having only a transverse dorsal sulcus; but may at once be recognised by the difference in colouring, in the form of the copulatory apparatus, smaller keels, &c. Moreover in *simplex* there is present on all the segments except those at the posterior end of the body a conspicuous sub-crescentic crest above the base of the legs—a crest which is entirely absent in *Str. greeni*.

*Strongylosoma cingalense*, Humbert.

(Pl. i, fig. 5.)

Loc. cit., pp. 32, 33, pl. iii, fig. 13, ♀.

Two males and three females were obtained by Mr. Green. Humbert's species was based upon a single female specimen which was also captured at Pundel-Oya. As this author pointed out, this species is very closely related to his *Str. skinneri*, and the differential characters he was able to give were of doubtful value seeing that members of different sexes were being compared. Mr. Green's discovery of the male has, however, settled the point, and has clearly shown that the two species are in reality distinct, although very closely allied. Thus the male of *St. cingalense* has the same peculiar process on the sternum of the 5th somite, and its copulatory feet are very like those of *St. skinneri*. In *St. skinneri*, however, according to Humbert's figure and from a specimen of this species in the Museum collection, the two slender pieces of the copulatory apparatus are as long as the median laminate piece, and there is a distinct small basal process. Whereas in *St. cingalense* there is no small basal process, and the slender pieces are shorter than the central lamina, which is itself differently cleft.



Furthermore, the longitudinal sulcus of the tergites is *less* strongly developed than in the ♀, being in fact nearly obsolete, while in *St. skinneri* it is more strongly developed than in the ♀ of *cingalense*.

*Strongylosoma phipsoni*, sp. n.

(Pl. i, fig. 4; Pl. ii, fig. 13.)

♀. *Colour*; head, antennæ, upper surface of legs and somites, as far as the transverse sulcus, ferruginous, the lower surface of the legs and of the somites pale coloured; the borders of the first tergite, the portions of the other tergite, posterior to the transverse sulcus, with the corresponding half of the keel yellow; sometimes there is an abbreviated, narrow, darker median longitudinal streak on the posterior half of the tergites; the entire upper surface generally exceedingly polished.

*Head* with a sulcus running from the vertex to a point on a level with the joint of the antennæ, labral region rugulose; antennæ elongate. *First tergite* without trace of keel; the second with a conspicuous keel, slightly produced in front and behind, which is below the level of the margin of the first and of the keel of the third; the other segments distinctly keeled, the keels, however, are small, although defined above almost throughout the length of the keel-bearing portion of the tergites, and project slightly posteriorly; the upper surface of the tergites is perfectly smooth, the transverse sulcus is conspicuous, but there is no longitudinal sulcus; the portion beneath the keel is at the anterior extremity of the body apparently granular, posteriorly it is irregularly and longitudinally striate, especially behind; there is a complete inferior keel above the base of the legs on all the segments; the pores are lateral and situated in the posterior half of the keels; the groove which separates the anterior cylindrical from the posterior keel-bearing portion is above indistinctly beaded.

*Legs* shortly hairy beneath.

♂. Of more slender build, with more prominent keels. The anterior legs thickened, the two distal segments of the legs thickly hairy beneath. The sternum of the 5th somite without any outgrowth.

The copulatory feet short; the proximal segment is thickly hirsute and bearing a backward projection, the following segment apparently undivided, but stout at the base and tapering to the point, its distal half, when at rest, spirally coiled on itself.

Length up to 27 mm. The British Museum has several dried specimens of this species. Most of these are ticketed 'Indian Museum,' so doubtless they came from some part of India; but one of them presented by Mr. G. R. G. Rothney is labelled Calcutta.

This species may be easily recognised from all the known Ceylonese and Indian species by its curious banded colouring—a character in which it appears to come nearest to an Australian species known as *transverse-tæniatum* of L. Koch—a species of which the Museum has several examples. But in this last-named the keels are brown, as also are the anterior and lateral borders of the first tergite. It is moreover not smooth and polished. I have great pleasure in dedicating this well-marked species to Mr. H. M. Phipson of the Bombay Natural History Society.

*Strongylosoma jerdani*, sp. n.

*Colour* (dry specimens), entirely testaceous throughout. Closely related to the preceding species; it is consequently needless to reproduce in full the foregoing description. The most satisfactory way of describing this new form will be perhaps to point out how it may be recognised from *phipsoni*.

1st.—The colour is entirely different.

2nd.—The upper surface of the somites is not smooth and polished, but dull and rugulose.

3rd.—The keels are almost absent; they are very short, being scarcely represented by more than a tubercle on the hinder portion of the somite, and are less conspicuous than the inferior keels. These specimens are all males, and if we may judge by analogy with *phipsoni*, in which the keels of the males are larger than those of the females, in this new species the keels should be absent in the females.

In sexual characters, *i.e.*, the form of the copulatory foot, the absence of any prominence of the sternum of the 8th somite, and the hairy tarsi of the legs—this species is quite like *phipsoni*.

The Museum has three dry, possibly faded male examples from Madras from the collection of Mr. Jerdan.

I trust that Mr. Thurston will soon obtain fresh specimens of this species so that its real colour may be known.

*Polydesmus cognatus*, Humbert.

Loc. cit.; pp. 22, 23, pl. ii, fig. 6.

Three specimens from Punduloya (Mr. Green).

Recorded by Humbert from Peradenia and from Pundel-Oya.

*Cryptodesmus ceylonicus*, sp. n.

(Pl. ii, figs. 2, 2c.)

*Colour* (in alcohol) uniform pale brown above; upper part of head also pale brown; labral region and legs ochraceous.

*Head* thickly and shortly hairy, labral region somewhat produced and quadrate with rounded angles, defined from the upper part of the head by a shallow transverse groove; vertex of head lightly sulcate longitudinally.

*Antennae* short but thick and clavate, the sixth segment the largest, the seventh nearly as large as the fifth.

*Body* hairy, a little narrowed in front and behind, the upper surface very convex, the keels rising low on the segments and directed downwards; the first tergite narrower than the second, but much wider than the head and covering it, its anterior border evenly convex from apex to apex of keel, its posterior border nearly straight, covered throughout with tubercles arranged irregularly in 5 or 6 rows; the keel-bearing part of the rest of the segments covered with large tubercles which are arranged in three transverse rows, in some of the segments there are also indications of a fourth row of smaller tubercles; the anterior margin of the keels is defined by a sulcus but is unarmed, the antero-lateral angle is obtuse and rounded, the postero-lateral angle is sharp and produced, the posterior border being slightly concave, the lateral margin bears five or six sharp teeth, and the posterior margin also five or six more or less quadrate teeth, the keels of the nineteenth do not project so far posteriorly as the extremity of the anal segment; the sides of the anal segment meeting at an angle of 90°; the lower surface of the keels is transversely sulcate towards the lateral margin. Sterna deeply sulcate longitudinally and very narrow.

*Legs* thickly hairy.

Length, 11 mm.

Two female specimens from Punduloya (Mr. Green).

This is the first record of this genus from any part of the Oriental Region.

*Cryptodesmus greeni*, sp. n.

(Pl. ii, fig. 3.)

*Colour* (in alcohol), brown above, antennæ and labrum testaceous, legs ochraceous.

*Head* hairy, with a shallow vertical sulcus, labrum defined above by a transverse furrow, somewhat produced as in the preceding species, with rounded angles and widely excised border. *Antennæ* short and thick, clavate, the segments increasing in size to the sixth, the seventh about as large as the fifth.

*Body* hairy, convex above, the keels directed downwards and outwards, not continuing the slope of the back but inclined to it at an obtuse angle; 1st tergite much wider than the head and narrower than the 2nd, convex in the middle, the margins of its keels sloping towards each other and meeting in a rounded angle of about  $50^{\circ}$ , covered with close-set rounded tubercles; the rest of the tergites adorned with many tubercles arranged in four transverse rows, these tubercles becoming nearly obsolete on the keels; anterior border of the keels unarmed, lightly convex and defined by a sulcus, posterior border straight and armed with a series of close-set quadrate teeth, the anterior angle rounded, the posterior angle squared, the lateral margin quadri-dentate; keels of 19th extending nearly as far as the apex of the anal which is pointed; under surface of the keels sulcate towards their margins, the sulci running inwards from the margins. *Sterna* narrow and deeply sulcate; *anal sternite* tri-tuberculate.

*Legs* hairy.

♂. Copulatory forceps very small, the distal segments simple, closely in contact, hooked at the apex.

Length about 9 mm.

A single male specimen from Punduloya (Mr. Green).

This may prove to be the ♂ of the preceding species. But there is no evidence at present to show that the differences between the two are of a sexual nature. The keels are very different in shape. In *Cr. ceylonicus* they are much narrower, the posterior angle is produced, and the posterior border concave. Whereas in *Cr. greeni* they are more produced, the posterior border is straight, and the posterior angle squared.



*Pyrgodesmus*, gen. nov.

(Pl. ii, figs. 1, 1b.)

Allied to *Cryptodesmus*.*Head* covered by an expansion of the first tergite.*Keels* rising below the middle of the sides of the somites and depressed.*Each somite* bearing a large upstanding projection or keel in the middle of its dorsal surface.*Pores* minute, occurring on the 5th, 7th, 9th, 10th, 12th, 13th 15th—19th segments, situated on the upper surface of a special tubercle which projects from the posterior half of the lateral margin of the keels.*Pyrgodesmus obscurus*, sp. n.*Colour* (in alcohol); somites of a uniform dull brown colour; labrum, antennæ, and legs testaceous.*Head* tubercular above, labral region smooth but punctured and hairy, produced, its sides being sub-parallel, its angles rounded. *Antennæ* close together, of moderate length, the second segment long, the fifth the longest and the thickest, the sixth and seventh very small, forming together a conical termination to the appendage.*Body* granular and subtubercular throughout; 1st tergite with its anterior border carinate and evenly convex from side to side, as wide as the second segment, bearing on its upper surface a very large, erect, wide, tubercular prominence, the upper surface of which is shallowly excavated; the rest of the segments with keels depressed, oblique, *i. e.*, sloping backwards and upwards, with anterior and posterior margins sub-parallel, the angles squared, and the lateral margin quadri-lobate, those of the 2nd, 3rd and 4th segments straight, the rest projecting more and more backwards towards the posterior end, those of the 19th small and not produced posteriorly so far as end of the 20th, the keels of the 2nd with margins a little thicker than those of the rest, but of the same level; the median dorsal crests or prominences thicker at the apex than at the base, those at the anterior end of the body directed forwards, and those at the posterior end backwards, those in the posterior three-quarters of the body marked on the summit with a longitudinal groove, the two sides of which are bilobate; at the anterior end of the body the groove becomes deeper and deeper,

and the prominences in consequence more and more bifid, so that the crest on the 2nd is divided to the base and consists of a right and left half; the surface of the segments between the base of the dorsal and the base of the lateral keel furnished with a longitudinal series of three conspicuous tubercles.

*Sterna* very narrow, so that the bases of the legs are nearly in contact in the middle line; *anal sternite* triangular.

♂. All the legs thick, especially those in front of the seventh somite; copulatory feet with basal segment enormously enlarged, hairy, punctured and sub-tubercular, the distal segment pale coloured, slender, blade-like, in repose projecting obliquely inwards and backwards, crossing its fellow of the opposite side.

Length 10·5 mm.

Two male specimens from Punduloya (Mr. Green).

Family, *Lysiopetalidæ*.

Genus, *Stemmiulus*, Gervais.

Gervais, Ann. Soc. Ent. Fr., (2), ii, p. 28; Ann. Sc. Nat., (3), ii, p. 70; Ins. Apt., iv, p. 200, pl. 41, fig. 7. Karsch, Zeits. Naturwiss., (3), vi, p. 11.

This genus was referred to the *Iulidæ* by both Gervais and Karsch, both authors stating that it differs from *Iulus* in the structure of its eyes.

The type of the genus, *i. e.*, *St. bioculatus* from Colombia, is in the collection of the British Museum, and is beyond all question congeneric with the specimens described below.

The characters that I believe to be of generic value are as follows:—

1. The eyes are situated behind the antennæ and consist of either one or two, simple, round ocelli.
2. The antennæ are exceedingly long, slender, and not incrassate.
3. The collum is small like that of *Lysiopetalum*.
4. The body is compressed, and each somite is divided above by a longitudinal sulcus.
5. The pedal laminae are all free.
6. The pores begin upon the 5th somite.

It will thus be seen that in characters 2, 4, 5, and 6, the genus agrees with *Lysiopetalum*, and differs from the typical *Iulidæ*. In character 1 it resembles neither.

It therefore appears to me to be rightly referable to the *Lysiopetalidæ*.

*Stemmiulus ceylonicus*, sp. n.

(Pl. i, fig. 2.)

*Colour* (in alcohol), obscure testaceous or ochraceous, with fuscous bands; head, antennæ and collum black, the posterior end of the body becoming infuscate, the terminal somites being black; legs pale infuscate.

*Body* moderately robust, compressed, a little narrower in front, and tapering to a point posteriorly.

*Head* and face convex, not sulcate, sparsely punctured and hairy; margin of labrum shallowly and angularly excavated and serrate throughout its width, with about 6 piliferous pores above; *eyes* two on each side, subcontiguous, round, behind the socket of the antennæ, a larger above and a smaller below. *Antennæ* long, slender, not incrassate, the second segment the longest, the third, fourth, and fifth about equal in length, sixth about half the length of the fifth,

*Somites* finely striolate; *collum* narrowed laterally to an acute angle, margin thickened as high as the eye, and marked behind by a fine sulcus, the rest of the somites marked anteriorly by a fine transverse sulcus, those at the anterior end of the body obliquely striate inferiorly and laterally, the striæ ascending posteriorly so that the dorsum of the middle and posterior end of the body is conspicuously striate; the striæ sub-parallel on each side, but these on one side inclined at an angle of about  $80^{\circ}$  to those on the other; the middle line of the back marked by conspicuous longitudinal sulcus, and the inferior portion of the somites above the legs also marked by a strong and deep sulcus; the posterior margin of each somite inferiorly dentate, the teeth very strong at the anterior extremity of the body; *anal tergite* very small, not produced beyond the valves; *valves* hairy, nearly flat, with simple margins, a few short membranous processes projecting above the valves; *sternite* with straight or lightly concave hinder border and rounded posterior angles. *Pores* small, just behind the transverse sulcus and far from the hinder border of the somite, situated very high on the lateral surface of the dorsum.

*Legs* not long, hairy.

Number of segments 40-45; length about 32 mm.

Punduloya (Mr. Green).

Two species of this genus have hitherto only been known—*St. bioculatus* of Gervais from Columbia, and *St. compressus* of Karsch from Porto Rico. Consequently the occurrence of the genus in Ceylon is of very great interest.

The species here described resembles *compressus* and differs from *bioculatus* in having *two* eyes on each side of the head. From *compressus* it seems to differ in the form of the collum, in having all its segments, except the first, marked with a median, dorsal, longitudinal sulcus (Dr. Karsch describes a median, dorsal *costa*). Moreover, Dr. Karsch makes no mention of the segments being laterally dentate.

Family, *Iulidæ*.

*Trachyiulus ceylonicus*, Peters.

Peters, Mon. Ak. Wissen., Berlin, 1864, p. 547.

Humbert, op. cit., pp. 43-46, pl. iii, fig. 18.

Mr. Green obtained several examples of this remarkable species at Punduloya.

Hitherto it has been regarded as peculiar to Ceylon, but the British Museum has one example ticketed Madras.

*Spirostreptus malabaricus*, Gervais.

Ins. Apt., iv, p. 165.

*Colour*; *head* castaneous, clouded with piceous above; *antennæ* clear yellow, the basal segment brown, and the second segment feebly shaded with the same colours; *legs* the same tint as the antennæ, with the basal or basal two segments infusate; *collum* fusco-castaneous; anal segment and valves nearly black; the rest of the segments with anterior half ferruginous and posterior half very nearly black; shining.

*Head* entirely smooth and polished, at most very faintly punctured with feebly rugulose upper portion of vertex, the sulcus on the vertex faint, inner angles of the eyes not united by a transverse sulcus; labral margin moderately excavated, with 2 (? more) punctures above the excavation. Antennæ short, punctured, when stretched laterally barely reaching to the hind border of the collum; the four distal segments pubescent. Eyes composed of about 72 ocelli, and separated by a space greater than their longest diameter.



*Somites*; collum smooth and shining, much narrowed laterally, with anterior and posterior borders of the lateral portion concave, with squared angles, the inferior and the anterior margin as high as the eye defined by a sulcus which widens below, for the rest entirely without grooves and ridges; the rest of the segments (except the anal) with a strong transverse median circular sulcus, the anterior portion of each nearly smooth, only very feebly concentrically striate, the posterior portion smooth above, but very finely striolate, the lower portion longitudinally striate above the legs to about half the distance between the legs and pores; *pores* situated about the middle of the body immediately behind the sulcus, which is at this point lightly sinuate; ventral grooves small, triangular, about half the width of the sternal piece; anal somite convex above from before backwards and from side to side, the process projecting over the valves, slender, short and upcurled apically, finely and closely punctured, the valves convex from above downwards and from before backwards, the margins distinctly compressed, but not defined by a strong groove, the sternite with lightly convex hinder border.

*Legs* with one strong spine above the terminal claw; not hairy above.

Number of segments 79; length about 250 mm.

A single ♀ specimen sent by Mr. Thurston from Kortallum. I have very little doubt that I have correctly identified this specimen, although Gervais' description is not so exact as one could wish. Gervais' type was taken on the coast of Malabar.

*Spirostreptus nigrolabiatu*s, Newport.

(Pl. i, fig. 7; pl. ii, fig. 5.)

Newport, Ann. Mag. Nat. Hist., xiii, p. 269 (1844).

This species is undoubtedly closely related to the preceding, the colour, sculpturing, form of collum and of anal somite being very similar in the two. It is, however, much smaller, measuring only about 134 mm. in length, has only 57 or 59 segments, and in the ♀ the face is strongly striate and rugulose. Moreover the lateral portions of the collum are less slender, the anterior angle is rounder, and the posterior a little more obtuse.

In the ♂ the collum is of the same form as in the ♀. In the copulatory foot the anterior piece of each half gradually widens from above downwards, ending in two processes below, the external of these

is shorter, rounded and blunt, the internal, directed inwards towards its fellow of the opposite side, has the form of an upcurled hook; the posterior piece sends a long slender process down the outer surface of the anterior piece, but ceases at the base of the external process; the central (protrusible) piece is distally expanded, sub-membranous, and spirally coiled, the membranous portion is divided distally into two laminae, each of which is irregularly excised along its free border, and the posterior is armed with a single elongate style.

The specimens here identified have been compared with Newport's type of the species, which is preserved in the British (Nat. Hist.) Museum. Newport vaguely gives 'East Indies' as the locality of this species. It is consequently satisfactory to know exactly an area where it does occur.

*Spirostreptus hamifer*, Humbert.

Mem. Soc. Phys. Genève, xviii, pp. 52, 53, pl. iv, fig. 22.

Madras (Mr. Thurston), and Punduloya (Mr. Green).

The Madras specimen that I refer to this species differs from the specimen figured and described by Humbert in possessing 66 segments, and in having the lateral portions of the collum posteriorly striate. The caudal process moreover is longer and more hooked than in Humbert's specimen.

This species was originally obtained from Peradenia in Ceylon; this is, I believe, the first record of its existence on the mainland. It is of small size, slender build, and may be recognized by its curiously hooked caudal process.

*Spirostreptus caudiculatus*, Karsch.

Zeits. Gen. Naturwis., (3), vi, pp. 27, 28 (1881).

Madras: Mr. Thurston sent one specimen only. Described by Karsch from Ceylon.

This species is small, measuring about 50 or 55 mm. in length, and being relatively slender. It may easily be recognised by the longitudinal parallel ridges that adorn the segments, a form of sculpturing in which it closely resembled *Spirobolus crebrestriatus* of Humbert from Ceylon. But apart from its different generic characters, *Sp. caudiculatus* may be at once recognized by its pointed and upcurled 'tail'—a process which is not developed in *Sp. crebrestriatus*.

The two specimens from Madras have a median dorsal flavous band.

*Spirostreptus asthenes*, sp. n.

*Colour* (in alcohol). Head infusate above, ochraceous beneath, the antennæ and legs ochraceous; collum infusate, with paler anterior border; anterior part of the rest of the segments pale, posterior part infusate with reddish border, a pale median spot on each forming together a dorsal band; anal somite infusate except for the pale borders of the valves and the median dorsal band which extends on to the caudal process.

Of small size and slender build.

*Head* smooth, not sulcate, margin of labral excavation furnished with six pores, of which the two extremes are widely separated from the rest. Eyes composed of about 40 ocelli, widely separated.

*Somites*; collum smooth, its lateral portions with straight posterior and lightly sinuate anterior border, its anterior border defined by a sulcus which extends as far as the eye, the inferior portion marked by about two straight ridges and sulci; the rest of the tergites nearly smooth, irregularly and feebly longitudinally striolate, the inferior and lateral surface of the posterior portion ridged up to the pores, which are situated in the posterior half a little below the middle line; *anal tergite* above produced into a short blunt nearly straight process, compressed at the base, projecting beyond the anal valves, with its upper edge pointing slightly downwards and backwards; *valves* convex, their borders smooth, very convex and strongly compressed, the angle formed by the compressed portion roughened; *sternite* small, with posterior border very slightly angled.

Number of segments 63. Length about 53 mm., width about 3.5 mm.

A single ♀ specimen from Madras (Mr. Thurston).

*Spirostreptus jerdani*, sp. n.

*Colour?* (specimen dry and probably faded); tergites cinereous, with ochraceous posterior border; legs, face and collum entirely ochraceous.

*Face* convex, with frontal sulcus, punctulate above, marked below with a coarse reticulated pattern of short sulci; *antennæ* of moderate length, reaching beyond the margin of the collum; *eyes* of large size, composed of about 60 ocelli arranged in 8 transverse rows.

*Collum* punctulate, its hinder border shortly striate, moderately narrowed laterally, the anterior and posterior borders being inferiorly at most very slightly concave, the anterior angle rectangularly convex, the posterior angle nearly a right angle, marked with normal marginal sulcus, but not marked with other sulci or striæ. The rest of the somites marked with transverse sulcus, the half in front of the sulcus transversely striolate in front and thickly punctured and rugulose close to the sulcus, the half behind the sulcus also closely punctured and rugulose in front and shortly striolate along the hinder border, the inferior part furnished with five longitudinal ridges, which do not extend as high as the pores. *Anal somite* punctulate and striolate; the tergite simply angled along its posterior border, without any caudal process, the angle not impressed, its apex just covering but not projecting beyond the superior angle of the valves; valves widely but weakly compressed. *Pores* about the middle of the side, behind the sulcus.

*Legs* with a single set on the under surface of each segment.

Number of segments 66, length about 88 mm.

A single female specimen from Madras (Jerdan coll.)

In the absence of a caudal process projecting beyond the anal valves, this species resembles *Sp. insculptus* and *Sp. modestus*. In *Sp. modestus*, however, the segments are described as smooth, and in *Sp. insculptus* they are very much more coarsely sculptured, the anal tergite is more acutely angled, the valves more compressed, and the face not rugose.

*Spirostreptus centrurus*, sp. n.

(Pl. ii, fig. 4.)

♂. *Colour* ? specimen dried and faded, but probably castaneous or olivaceous, with the hinder margins of the segments darker; antennæ and legs ochraceous.

*Head* with a superior vertical sulcus, convex, smooth and polished, with six labral punctures; *antennæ* long, reaching considerably beyond the collum; *eyes* rather small, composed of about 44 ocelli, arranged in about 7 transverse rows, separated by a space that is about equal to a diameter and a half.

*Collum* very large, almost entirely smooth and polished; the anterior angle very much thickened and produced, so that the anterior



border is inferiorly lightly concave; the posterior angle nearly a right angle, the portion of the posterior border immediately above it lightly emarginate; a few obliquely longitudinal sulci on the surface of the lateral portion. The rest of the segments with the posterior portion a little higher than the anterior; the anterior portion finely striolate in front, and covered with a closely and finely reticulated pattern of smooth low ridges behind; the portion behind the transverse sulcus, which on the posterior somites is almost obsolete, is polished above, but is more or less longitudinally sulcate throughout; below the level of the pores the striæ are close-set and clearly defined, above the pore, however, they are more widely separated and less clearly defined; one sulcus is median. *Anal somite* smooth, produced into a long stout caudal process, the axis of which is directed slightly upwards, forming an obtuse angle with the line of the back, and the apex is neither up turned nor down turned, anal valves with margins widely compressed. *Pores* conspicuous behind the transverse sulcus and about in the middle of the side. *Ventral grooves* short.

*Legs* tolerably long, with the fourth and fifth segments padded beneath, and the others adorned with three or four hairs in a series. Number of somites 67; length about 160 mm.

*Copulatory feet* with anterior laminae very narrow and slender, widening distally, with its surface sub-costate; the central, protrusible portion consisting of an elongate, slender, cylindrical rod, pointed at its distal end; from the distal fourth of its length there springs a posterior piece, which, slender at first, rapidly expands into a wide lamina bearing distally on its external angle a backwardly directed, slightly curved, slender-pointed process, fringed beneath with conspicuous hairs.

Of this handsome species the British Museum has a single dried specimen from Ceylon (Holdsworth coll.).

This species may be at once recognised by the form of the collum in the ♂, and by the straight, long, stout caudal process.

*Spirostreptus insculptus*, sp. n.

(Pl. i, fig. 8.)

*Colour* (in alcohol), anterior half of somites deep reddish-cinereous, posterior half deep blackish-grey, anterior and posterior borders of collum narrowly ferruginous, upper portion of head brunneo-fuscous,

lower portion ferruginous; antennæ flavous; legs flavous-ferruginous at the base; anal somite with valves pale ochraceous.

*Head*; vertex with a faintly marked sulcus, lower portion irregularly striolate, four punctures above the labral excision; *eyes* composed of 53-66 ocelli arranged in 7 or 8 transverse rows, distance between the eyes about equal to or a little less than a diameter; *antennæ* somewhat short, reaching just beyond the hind border of the side of the collum.

*Somites*; collum covered with a reticulated pattern of striolæ; lateral portion not markedly narrowed, with infero-anterior angles obtusely convex and defined by a sulcus, posterior angle rectangularly convex, marked inferiorly and posteriorly with two crescentic sulci; the rest divided into an anterior and posterior half by a complete transverse groove, the anterior half nearly smooth in front and finely striolate transversely, but distinctly and finely rugose behind; the posterior half strongly sculptured out into fine, close-set, more or less branching and anastomosing, smooth ridges which inferiorly pass into the normal longitudinal striæ; the *pores* situated about in the middle of the side, in the posterior half immediately behind the groove which here is sinuate: *anal somite* covered with a reticulated pattern of striolæ, the upper portion irregularly grooved longitudinally, transversely impressed and angled posteriorly, but not produced into a tail, merely covering and not overlapping the upper angles of the valves; *valves* with their margins but little convex, but strongly and somewhat widely compressed; *sternite* with hinder border convex.

*Legs* very smooth, with a single set on the lower surface of each segment.

Number of *somites* 64-65; length up to 117 mm.

The British Museum has two dried and faded examples of this species from Ceylon (Templeton); Mr. Green brought one from Punduloya, which, seeing that it is not faded, I have selected as the type of the new species. This specimen is the smallest of the three, measuring only 70 mm. in length; whereas Templeton's examples measure 90 and 117 mm. respectively.

*Sp. contemptus* of Karsch is related to *Sp. insculptus*; the two may indeed prove to be synonymous, but in the description of *Sp. contemptus*,

nothing is said about the size of the species, or the number of segments, or the distance between the eyes, and the segments are described as being laterally and superiorly "subgranulosa, rugosa," and since the former epithet certainly does not to my mind intelligibly express the sculpturing of *Sp. insculptus*, I must provisionally, at all events, look upon the two species as distinct.

*Spirostreptus lankaensis*, Humbert.

(Pl. ii, fig. 6.)

Op. cit., p. 50.

*Colour* (in alcohol); *head* ochraceo-fuscous; *antennæ* fuscous, flavo-annulate; *legs* ochraceous, concolorous, *anal somite* fuscous, with margins of valves and apex of tail ochraceous; rest of the somites fuscous anteriorly, ochraceous posteriorly.

*Body* long and slender; sub-cylindrical. *Head* and face convex, smooth and shining; with a very faint sulcus above; four labral punctures; *eyes* widely separated, composed of about 39 ocelli arranged in six transverse series; *antennæ* moderately long, stretching to the end of second somite.

*Somites*; collum laterally narrowed, its anterior border straight, anterior angle widely rounded, inferior border lightly convex, posterior angle nearly squared, a wide and deep sulcus running from the posterior angle as high as the eye, defining a narrow inferior border and a wide anterior border to the lateral lamina, in front of this sulcus is a second fine and shorter one reaching half way to the eye. The rest of the somites (except the anal) with a deep transverse sulcus; the anterior half concentrically and transversely striolate anteriorly, the posterior half longitudinally striate throughout, the striae close-set, running from the sulcus and just falling short of the hinder margin, some longer and some shorter; *pores* about the middle of the body, conspicuous, situated in a smooth area, about one-quarter of the distance between the sulcus and the hinder margin of the somite; *ventral grooves* small; *anal somite* smooth, produced above into a short straight blunt process which continues the line of the back and projects slightly beyond the anal valves; *valves* convex, with compressed margins; *sternite* posteriorly angled, defined posteriorly by a groove.

Number of somites 63. Length about 53 mm.; width 3.5.

A single ♀ specimen from Punduloya.

This species apparently falls into the same category as *Sp. caudiculatus* of Karsch. It may, however, be recognised by its blunt, straight caudal process, the incompleteness and the varying length of the tergal striæ, the separation of the pores from the sulcus, &c.

*Spirobolus carnifex*, (Fabr.).

( Pl. ii, fig. 9. )

- Syn. *Iulus carnifex*, Fabr., Sys. Ent., p. 428; Spec. Ins., i, p. 530;  
Ent. Sys., ii, p. 395, no. 9.  
,, *Spirobolus carnifex*, Brandt, Recueil., p. 188; Gervais, Ins. Apt.,  
iv, p. 163 (1847); C. Koch, Die Myr., i,  
p. 62, fig. 53 (1863).  
,, *Spirobolus ruficollis*, Newport, Ann. Mag. Nat. Hist., xiii,  
p. 269 (1844).

Mr. Thurston sent two ♂ specimens from Madras. The British Museum has it also from Ceylon. The type was described from Tranquebar. Tönösvary has recorded it from Matang in Borneo, but whether correctly or not I am unable to judge. C. Koch has apparently described the right species, but his locality for it, *i. e.*, Georgia (N. America), needs, to my mind, confirmation.

Newport's species *Sp. ruficollis*, the type of which is in the British Museum, is the same as *Sp. carnifex*.

This author gives New Holland as the locality, but upon what authority I am unable to determine. At the present time there is not a particle of evidence to show whence the specimens were obtained.

In the ♂ the anterior 6 pairs of legs are curiously modified, the proximal segments being inferiorly produced and somewhat compressed; on the 3rd, 4th and 5th pairs there projects from between the legs an elongate, slender, clavate process which is in contact with its fellow of the opposite side; the processes are outgrowths of the basal segment of the legs. There appear to be no suctorial pads upon the feet in this sex.

The anterior unpaired portion of the copulatory foot is composed distinctly of three rami, two projecting obliquely upwards and outwards to embrace the summits of the lateral moieties and hold them together, the third slender, shorter, and pointed projects in the middle line, far below the lowest point of the anterior portion of the



lateral moiety, and almost as far as the lowest point of its posterior portion; the anterior portion terminates below in a strong spiniform process, the posterior portion is somewhat slender and pediform.

*Spirobolus goësi*, Porath.

Syn. *Spirobolus goësi*, Porath, Bih. Sv. Vet. Ak. Handl., iv, p. 36 (1876); id., Ann. Soc. Est. Belg., xxxii, pp. 244, 245 (1889).

„ *Spirobolus dominicæ*, Pocock, Ann. Mag. Nat. Hist., (6), ii, (1888), pp. 481-483, pl. xvi, figs. f.-f<sup>c</sup> (1888).

One specimen from Madras (Mr. Thurston).

This species is very widely spread, and its synonymy almost certainly not yet known.

So far as can be at present determined Porath's name has the priority; but there is little doubt, in my opinion, that this name will have ultimately to give way to some other at present not yet identified. This species is very commonly met with in the Oriental Region. Porath has recorded it from Sumatra, Java, and Borneo. The British Museum has examples from Assam, Burma, Cambodia, China, Cochin-China, Singapore, the Seychelles, and from Dominica in the W. Indies. I have carefully compared the type of *dominicæ* with examples from many localities in the old world and can find for it no differential characters.

*Spirobolus thurstoni*, sp. n.

(Pl. i, fig. 9; pl. ii, fig. 8.)

*Colour* (in alcohol); head rufo- or griseo-olivaceous, margin of labrum ochraceous; antennæ and legs ochraceous; segments deep bluish-grey in front of the sulcus, piceo-castaneous behind it, anterior border of collum pale, anal somite wholly brown.

*Head and face* punctured and striolate, the vertex with a very feeble sulcus, the face with a longitudinal sulcus, the labral margin widely excavated, bearing two widely separated punctures on each side; *eyes* forming an irregularly rounded cluster composed of about 32 ocelli; widely separated.

*Somites*; collum finely punctured and striolate, its anterior border smooth, laterally gradually narrowed, with apex blunt, rounded behind, squared in front, not marked with groove or crests, the

anterior border being undefined; the second segment also punctured and striolate, produced laterally below the level of the collum and sending forwards a strong angular process beneath it, which projects as far forwards as the anterior margin of the collum; the rest of the segments (except the anal) with a well-marked transverse circular groove, the anterior piece above ornamented with fine anastomosing striæ which behind become imperceptibly coarser, when the pattern takes the form of a multitude of close-set semilunar pits, laterally and inferiorly this portion is ornamented behind with irregularly branching longitudinal striæ; the transverse groove marked laterally with a series of pits; the posterior half is a little elevated, longitudinally sulcate at the sides, punctured and obscurely longitudinally striolate above, nearly smooth posteriorly; *pores* conspicuous, all on a level above the middle of the body, in front of the transverse sulcus; *anal somite* punctured and rugulose, a well developed, basally sub-compressed, nearly smooth, caudal process; the process nearly continuing the line of the back, usually nearly straight, rarely markedly down curled, never up-curved, projecting far beyond the margin of the valves; *valves* punctured convex, border convex above, nearly straight beneath, nearly smooth, strongly compressed, the compressed part above more than half the length of the convex part; *sternite* forming distinctly an obtuse angled triangle.

*Legs* short and very smooth, each segment furnished beneath with a single distal seta, a single seta above the terminal claw.

Number of segments 45; length about 80 mm.

♂. Slenderer than the ♀; the distal segment of the legs with adhesory disk throughout its length.

Copulatory feet; the median anterior piece very long, tongue-like, projecting below nearly as far as the apex of the lateral pieces, excavated superficially, ending above in two long stout processes which embrace the summits of the lateral portions; anterior portion, right and left halves, externally convex; the posterior portion projecting inferiorly far below the anterior, bluntly pointed below with a conspicuous notch on its external border, the notch bounded below by a conspicuous process and passing posteriorly into a wide excavated area; central (protrusible) portion anteriorly evenly convex, upper half stout, lower half ending in two processes, an upper shorter,

wider, bearing a strong curved pointed tooth, and a lower, longer, more slender, bearing an apical curved spine, and posteriorly more or less membranous.

Several specimens from Madras (Mr. Thurston).

This species, with which I have great pleasure in associating Mr. Thurston's name, appears to fall into the same category as *Sp. rogesi* of Karsch from New Hanover. It, at least, however, differs in having the collum not marked with a sulcus, and the second somite below produced forwards.

*Spirobolus uroceros*, sp. n.

(Pl. ii, fig. 7.)

*Colour*: the posterior half of the segment probably piceous and the anterior more or less cinereous; face, antennæ and legs ochraceous. *Face* tolerably flat, with a short frontal sulcus, and a conspicuous long sulcus dividing the labral region, punctulate, with four labral pores, two near the middle and two at the sides; *antennæ* short although of normal length for the genus; *eyes* composed of about 43 ocelli arranged in 6 or 7 transverse rows; the distance between them about equal to a diameter and a half.

*Collum* punctulate, coarsely punctured along its posterior border; neither striate nor sulcate laterally, and with an almost obsolete marginal sulcus, the anterior angle nearly a right angle, the posterior angle widely convex, the posterior border sloping obliquely backwards and upwards from the posterior angle; the 2nd segment projecting inferiorly below the level of the first, with its inferior portion produced forwards to a point on a level with the anterior angle of the collum. The hinder half of all the segments, except the first and last, furnished posteriorly with distinct coarser and finer tubercles, which gradually disappear inferiorly and laterally, and give place to longitudinal striæ, the anterior portion, lower than the posterior portion, nearly smooth, the sterna striate. The *anal somite* of large size, punctulate, compressed above and produced into a long, stout, smooth, pointed, slightly down-turned caudal process; margins of the anal valves strongly compressed. *Pores* situated in front of the transverse sulcus and above the middle of the side; the first on a level with the rest. *Ventral grooves* short.

*Legs* with a single seta on the under surface of each segment.

Number of segments 49. Length about 120 mm.

A single ♀ specimen from Madras (Jerdan coll.)

This species may be readily recognised by its long hooked caudal process, and the tubercular ornamentation of the tergites. This last character is one by which it may be at once distinguished from *Sp. thurstoni*, which in other respects it seems to approach.

*Spirobolus greeni*, sp. n.

(Pl. i, figs. 10, 10a.)

*Colour* (in alcohol); *head* infusate, antennæ infusate, paler at the base; *collum* infusate with paler borders, rest of the somites bluish slate-grey, with a single large, wide, fulvous spot on the posterior half on each side of the middle line of the back, anal somite fulvous, slightly fuscous above; legs wholly fulvous.

*Head* and *face* smooth, the latter marked with a longitudinal sulcus, and with two pores on each side; *antennæ* very long for the genus, reaching to about the 4th or 5th somite; *eyes* large, widely separated, composed of about 50 well defined ocelli.

*Somites* without scobina; *collum* punctulate and rugulose, not produced so low as the inferior extension of the second, the apex obtusely rounded, with the margins nearly straight, *i.e.*, only slightly convex, the apex and the anterior margin as high as the eye defined by a sulcus; the posterior half of the other segments much higher than the anterior, marked laterally as high as the pores with distinct sub-parallel longitudinal striæ, the upper part above the pores marked with punctures and irregularly scattered, abbreviated, anastomosing striæ, forming an obscurely reticulated pattern; the anterior portion marked above with circular or elliptical areas, and below with oblique more or less curved striæ which are continuous with the striæ of the posterior portion; *pores* situated above the middle of the sides, in the posterior half of each somite the first a little lower than the second. *Anal somite* punctulate, the upper part produced into a short, blunt, straight, slightly compressed caudal process, projecting a little beyond the margin of the valves; *valves* convex, strongly but narrowly compressed, the upper angle not compressed and a little produced; *sternite* posteriorly rounded and angulate.

*Legs* slender, elongate, with a single seta on the lower edge of each segment.



Number of somites about 40 ; length about 35 mm. *Punduloya* (Mr. Green).

Like *Sp. spirostreptinus* of Karsch in having long antennæ, in the position of its pores, &c. But differs in sculpturing, *Sp. spirostreptinus* having the upper part of its segments roughened with longitudinal striæ.

*Spirobolus longicornis*, sp. n.

( Pl. ii, fig. 11. )

*Colour* (in alcohol); head fusco-testaceous, antennæ testaceous, infusate at the apex, legs ochraceous, somites with ferruginous posterior portions, fuscous anterior portions, anal somite paler.

*Head* and face smooth, vertex marked with a slender sulcus ; face marked with a sulcus, and furnished with 2 pores on each side ; antennæ long as in the preceding species ; eyes composed of about 30 ocelli.

*Somites*; *collum* finely reticulated, not produced inferiorly so low as the second somite, its inferior angle less narrowed, more rounded, with convex posterior and lightly concave anterior border, posteriorly striolate, anteriorly marked with a marginal sulcus ; posterior part of the rest of the somites scarcely higher than the anterior, and ornamented throughout with exceedingly fine, close-set, sub-parallel striolæ, but these striolæ, instead of being absolutely longitudinal, are slightly oblique, diverging slightly from the median dorsal line which is a little elevated, the anterior portion with scobina, marked below laterally with longitudinal striolæ continuous with those of the posterior portion, and above with a distinctly defined reticulated network formed by the anastomosis of striolæ; *pores* above the middle in the hinder half of each somite, the first scarcely below the level of the rest. *Anal somite* punctulate and striolate, produced above into a short, blunt, markedly compressed process which projects a little beyond the margin of the anal valves; *valves* convex with borders compressed ; *sternite* conspicuously angled.

*Legs* slender, elongate, with a single seta on the under edge of each segment.

Number of somites 40-42 ; length up to about 32 mm.

*Punduloya* (Mr. Green).

Resembles the preceding species and *Sp. spirostreptinus* in having long antennæ, but differs from both in colouring, in being furnished

with the so-called scobina, &c. Probably most nearly related to *Sp. crebrestriatus* of Humbert, which it somewhat resembles in sculpturing and in possessing the so-called scobina. It may, however, be recognised by the much greater convexity of the margins of the anal valves, and by the strongly-angled border of the anal sternite, and by the differences of colour.

*Spirobolus longicollis*, sp. n.

(Pl. ii, fig. 10.)

*Colour* (in alcohol); pale testaceous throughout, the anterior half of the somites only being of a deeper greyish tint.

*Head* nearly smooth, the face marked with a short longitudinal sulcus; two widely separated pores on each side of the labral region; *eyes* widely separated, composed of about 30 indistinctly defined ocelli; *antennæ* very short, scarcely reaching to the margin of the collum.

*Somites* without scobina; *collum* punctured throughout, produced laterally *below* the inferior extension of the succeeding somite, narrowed to a rounded apex with convex posterior border and straight anterior border, the apex and the anterior border as high as the eye defined by a groove, the rest not sulcate; the second and succeeding segments divided into an anterior and posterior portion by a groove; the posterior portion is more elevated than the anterior, punctured and obscurely and irregularly striolate above, longitudinally striate at the sides, the anterior portion marked laterally and inferiorly with oblique close-set striæ, which becoming more and more curved dorsally, eventually pass into elliptical and crescentic areas on the upper surface; *pores*, all on a level above the middle of the side, in the posterior half of the somites well behind the transverse groove; anal somite punctulate, the upper surface produced posteriorly into a stout, blunt, cylindrical, slightly down-turned caudal process which projects a little beyond the anal valves; *valves* convex with strongly but narrowly compressed borders; *sternite* transversely elongate, with nearly straight hinder border.

*Legs* slender, with a single seta on the under surface of each segment.

Number of segments 38 or 40; length about 28 mm.

Two female specimens from Punduloya (Mr. Green).

Differs from all the known Ceylonese forms in that the collum extends laterally below the level of the 2nd somite.

Family, *Polyzonidae*.

*Siphonophora humberti*, sp. n.

*Colour* (in alcohol) uniformly ochraceous.

*Body* slender, composed of 60 segments.

*Head* ovate, about as long as the rostrum which is lightly curved; *antennæ* about as long as the rostrum.

*Somites* lightly convex above, meeting the pleuræ at an obtuse angle, and separated from them by a distinct suture, neither tubercular nor carinate. (The upper part of some of the somites is higher than the others. But since there is no symmetry in these elevations I shall regard them as abnormalities, until evidence to the contrary is forthcoming.) Anal somite blunt posteriorly.

The head and upper part of the somites densely and coarsely hairy and granular; pleuræ granular but less hairy; rostrum smooth.

Length about 12 mm.

A single specimen from Punduloya (Mr. Green).

Only one species of this genus has hitherto been recorded from Ceylon, namely, *S. picteti* of Humbert. This species is unknown to me, but judging from the figure, it is much stouter in build than the one here described. Moreover, the somites are laterally carinate.

(To be continued.)

#### DESCRIPTION OF PLATE I.

- Fig. 1. *Zephronia heterostatica*, Newp. (nat. size).  
 ,, 2. *Stemmiulus ceylonicus*, sp. n. ( $\times 3$ ).  
 ,, 3. *Leptodermus tanjoricus*, sp. n. ( $\times 2$ ).  
 ,, 3a. ,, ,, copulatory foot.  
 ,, 3b. ,, ,, posterior leg of 6th somite of  $\sigma$ .  
 ,, 4. *Strongylosoma phipsoni*, sp. n. ( $\times 2$ ).  
 ,, 5. ,, *cingalense*, Humb., copulatory foot.  
 ,, 6. ,, *skinneri*, Humb., copulatory foot.  
 ,, 7. *Spirostreptus nigrolabiatus*, Newp. (nat. size).  
 ,, 8. ,, *insculptus*, sp. n. (nat. size).

- Fig. 9. *Spirobohus thurstoni*, sp. n. (nat. size).  
 „ 10. „ *greeni*, sp. n. (× 2).  
 „ 10a. „ „ „ one of the body segments.

DESCRIPTION OF PLATE II.

- Fig. 1. *Pyrgodesmus obscurus*, gen. et sp. n. (nat. size).  
 „ 1a. „ „ „ (enlarged).  
 „ 1b. „ „ „ antenna.  
 „ 2. *Cryptodesmus ceylonicus*, sp. n., dorsal view (× 6).  
 „ 2a. „ „ „ dorsal view of one of the keels.  
 „ 2b. „ „ „ antenna.  
 „ 2c. „ „ „ leg.  
 „ 3. „ *greeni*, sp. n., dorsal view of one of the keels.  
 „ 4. *Spirostreptus centrurus*, sp. n., collum, anal somite and median somite (nat. size).  
 „ 5. „ *nigrolabiatus*, Newp., copulatory feet, front view.  
 „ 6. „ *lankaensis*, Humb.  
 „ 7. *Spirobohus uroceros*, sp. n., collum, anal somite and median somite (nat. size).  
 „ 8. „ *thurstoni*, sp. n., copulatory feet, anterior view.  
 „ 9. „ *carnifex* (Fabr.) „ „ „  
 „ 10. „ *longicollis*, sp. n., anterior and posterior ends of the body.  
 „ 11. „ *longicornis* „ „ „ „ „  
 „ 12. *Paradesmus kelaarti*, Humb., copulatory foot.  
 „ 13. *Strongylosoma phipsoni*, sp. n. „ „ „  
 „ 14. „ *greeni* „ „ „

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*N.B.*—The figures of these plates are not entirely satisfactory. Where discrepancies are to be found between the figures and the descriptions, the former must be regarded as in error.

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