

A C T A Z O O L O G I C A
C R A C O V I E N S I A

Tom IX

Kraków, 15 II 1964

Nr 1

Jan STACH

Materials to the Knowledge of Chinese Collembolan Fauna

[Tables I—XIII]

Materiały do znajomości fauny skoczogonków (*Collembola*) Chin

Материалы к познанию *Collembola* Китая

The Collembolan Fauna of China is very insufficiently known.

First species of this group of insects were reported from China in 1929 by DENIS, who on the basis of material collected by SILVESTRI in North China (Peking), Central China (Hankow) and South China (Kwantung and Yunnan Districts) described ten species, one new form and five species noted already from other countries, in his two articles.

In 1935, MING TSANG CHEO noted three injurious species of *Collembola* from China, among them *Sminthurus viridis* (L.) new to China, but widely distributed over continents. In 1948 UCHIDA reported seven species of *Collembola*, among which two new to science from Shansi (prov. of North China).

I had occasions to describe five species new to the Chinese fauna at various times, namely in 1947 *Proisotoma minuta* (TULLB.), in 1954 *Onychiurus sinensis* STACH, and in 1963 *Entomobrya imitabilis* STACH, *Entomobrya pekinensis* STACH and *Entomobrya hortensis* STACH.

This small number of *Collembola* known from China has been augmented pretty remarkably by the species found in the material collected occasionally by Prof. Dr K. KOWALSKI during his specialistic studies in China, in three localities: Peking, Nanking and Hangchow, in 1962. Although Prof. KOWALSKI had no suitable equipment to catch the *Collembola*, his collection is fairly abundant, and contains about as many species as are known from China so far. Among these species are 11 new to science and 9 new to the fauna of China.

The number of species of the Chinese Collembolan fauna known at present amounts to 47. They are:

- Podura aquatica* L.
Hypogastrura yosii sp. n.
Ceratophysella communis FOLS.
Ceratophysella adexilis sp. n.
Ceratophysella sinensis sp. n.
Brachystomella quadrituberculata sp. n.
Neanura hypostoma (DEN.).
Lobella (*Yuukianura*) *aphoruroides* YOSH.
Onychiurus kowalskii sp. n.
Onychiurus orientalis sp. n.
Onychiurus hangchowensis sp. n.
Onychiurus sinensis STACH.
Onychiurus conjungens BÖRN.
Onychiurus fimetarius s. DENIS.
Paranurophorus simplex DEN.
Proisotoma minuta (TULLB.).
Isotoma imparidentata sp. n.
Isotomurus palustris (MÜLL.).
Sinella coeca (SCHÖTT).
Sinella curviseta BROOK.
Sinella monoculata DEN.
Sinella straminea (FOLS.).
Sinella yaszynatium UCHIDA.
Entomobrya aino MATSUM. & ISHIDA.
Entomobrya marginata (TULLB.).
Entomobrya imitabilis STACH.
Entomobrya pekinensis STACH.
Entomobrya hortensis STACH.
Entomobrya dorsosignata sp. n.
Entomobrya corticalis (NIC.).
Homidia socia DEN.
Homidia sauteri BÖRN.
Homidia transitoria DEN.
Orchesella sinensis DEN.
Lepidocyrtus hankowi DEN.
Lepidocyrtus coeruleicornis DEN.
Tomocerus folsomi DEN.
Tomocerus minutus TULLB.
Tomocerus ocreatus DEN.
Salina yunnanensis DEN.
Salina maculata YOSH.
Sminthurus viridis (L.).
Sminthurus orientalis sp. n.
Sminthurus pekinensis sp. n.

Sminthurus wutaii UCHIDA.

Sphyrotheca multifasciata (REUT.).

Ptenothrix mirabilis DEN.

This small number of *Collembola* known at present from China does not permit us to say anything interesting and reliable on the character of the Chinese Collembolan fauna, the more so that all of the collections of this group of insects were made occasionally, and so contain mostly only common and larger animals.

Generically this fauna is very similar to the European one, since out of 21 genera known up to now from China only two, namely *Salina* MACGILLIVRE. and *Homidia* BÖRN. do not appear in Europe and are rather widely distributed in eastern Asia from Japan up to the Malayan-Islands. Specifically, however, this fauna differs more considerably, as out of the 47 species here listed only 9 are common to the Chinese and European faunae.

The writer would like to express here his heartiest thanks to Prof. Dr K. KO-WALSKI for collecting the *Collembola* for him.

Hypogastrura yosii sp. nov.

Pl. I, figs. 1—8

Body covered with granules moderately large and uniformly disposed dorsally on the head. On the tergites they become gradually coarser towards the end of the body and the largest are on Abd. V. Clothing composed of short setae arranged sparsely on tergites in two transverse rows, and on Abd. III in three rows. Some longer setae appear only laterally on Abd. V and VI.

Antennae shorter than diameter of the head. Ant. III with sensory organ composed of two short rods located in a small groove protected on either side by one short, erect sensory hair. Ant. IV dorsally with six blunt, curved olfactory hairs and at the tip with a relatively large, simple, ovoid, sensory papilla ciliated at its surface very finely and shortly. Eversible antennal sack between Ant. III and IV is wanting.

Postantennal organ with four equally large vesicles arranged crosswise, and small accessory tubercle. The organ is only somewhat larger than one ocellus.

Eight ocelli on either side of the head, and three setae on each eye-patch.

Unguis slightly curved, untoothed. Empodial appendage without basal lamella, tapering gradually into fine tip reaching to about half length of inner lamella of the unguis. Tibiotarsal tenent hair moderately stout, not thickened at the tip, as long as the whole unguis.

Ventral tube with 4 — 4 setae, and tenaculum with 4 — 4 barbs.

Furcula well developed. Dentes moderately thick, dorsally coarsely granulate, each with 7 setae, the basal of which is half as long as dens, the remaining

about subequal in their length. Mucro, 3.3—3.7 times shorter than dens and half as long as inner lamella of unguis, has straight or weakly curved ventral edge slightly thickened at the tip, very narrow indistinct lateral lamellae and high median part.

Anal spines very short, but located on high, finely granulated papillae with their bases touching each other. Spine measured together with papilla is somewhat shorter than the mucro (2/3—4/5:1).

Colour of animals bluish-brown, ventrally the body almost uncoloured.

Length 0.7—1 mm.

China — Hangchow, in litter, 4 XII 1962 ... 2 sp., leg. K. KOWALSKI.

The new species resembles *Hypogastrura papillata* GISIN, 1949 from Switzerland in some morphological characteristics, namely in coarse granulation of tergites, number of dental setae, very small anal spines located on high papillae, and others. The Swiss species has, however, empodial appendage provided with distinct basal lamella, unguis untoothed, tenent hair distinctly thickened at the tip, mucro furnished with high lamella, anal papillae coarsely granulated, and the body dark blue coloured.

Ceratophysella adexilis sp. nov.

Pl. III, fig. 6

A species of the *Ceratophysella communis* group, similar in many body characteristics to the principal form of this group, but somewhat different in arrangement of the dorsal setae, especially on Abd. IV and V, judging from the figures given by YOSII for *Ceratophysella communis* (FOLS.) in 1960, fig. 4, and, in 1962, fig. 3 A, and also for *Ceratophysella exilis* YOSII in 1956, pl. III, fig. 25 and in 1962, fig. 3 B. Thus the submedian and lateral strong erect bristles are on all tergites smooth and considerably long; on tergites of Abd. III—VI almost as long as dens measured together with mucro.

Granulation of the body is dorsally moderately fine, coarser on the median part of Abd. V, which runs across the tergite as a wide transverse grobly granulated band, sharply delimited at its posterior margin from the finely granulated hind part of the segment. The granules in this band are almost equal, arranged in somewhat irregular cross rows, but not as irregular and considerably large as in some members of the *Ceratophysella denticulata* group.

Antennae distinctly shorter than diameter of the head. Antennal organ III composed of two short rods located in common small groove and protected laterally by a moderately long, blunt sensory hair. Between Ant. III and IV a distinct eversible antennal sack. Ant. IV dorsally with stiff, long setae and 7 moderately long and blunt olfactory hairs; ventrally this antennal joint has sparse and short setae. Subapically a small pit with a minute sensory papilla.

Postantennal organ rather variable, composed mostly of two anterior vesicles lying in a straight line and two posterior, smaller, placed obliquely. But sometimes posterior vesicles are parallel to anterior ones and are almost subequal with them, or all vesicles are irregular. Accessory tubercle finely granulated, rounded, small, placed behind posterior vesicles. Whole organ is about twice as long as diameter of one ocellus.

Unguis slender, weakly curved, with distinct inner tooth in the middle. Lateral teeth absent. Empodial appendage almost half as long as inner lamella of unguis, with broad, rounded basal lamella and short apical needle. Tibiotarsal tenent hair as long as unguis, not thickened at the tip.

Ventral tube with 4 — 4 setae, and tenaculum with 4 — 4 barbs.

Furcula well developed. Length of manubrium : dens : mucro on average as 3 : 3 : 1.6. Dens dorsally finely granulated, provided with 7 setae, two terminal of which, located on inner side of dens, are distinctly thicker at their bases, rarely subequal in length and thickness with remaining setae, barring the basal one. Mucro boat-like, rounded at the tip, with well-developed outer lobe, 1.85—2.2 times shorter than dens.

Anal spines long, slightly curved, pale yellowish, located on high papillae touching each other with their bases. The spines together with the papillae are longer than the whole unguis of the third pair of legs, without papillae somewhat longer than inner side of unguis.

China — Environs of Peking, near a small stream, 21 X 1962 ... 5 sp., leg. K. KOWALSKI.

— Nanking, 24 XI 1962 ... many specimens, leg. K. KOWALSKI.

Specimens examined seem to come near to the typical form of *Ceratophysella communis* (FOLS.) or its variety *exilis* YOSII, 1956, elevated by him, in 1962, to the rank of a separate species.

Ceratophysella communis, described by FOLSOM in 1897 from Japan has also been noted from China by DENIS (1929), and *Ceratophysella exilis* YOSII registered from Japan, Taiwan and North America (Canada, U. S.).

Ceratophysella sinensis sp. nov.

Pl. II, figs. 1—6

Body covered uniformly with moderately fine granules, but the tergite of Abd. V is in half its length with a rather wide transverse band composed of fairly coarse granules arranged in cross rows. Posterior margin of this band is pretty distinctly and sharply delimited from the finely granulated hind part of the tergite.

Body setae smooth, of various lengths, arranged as in *Ceratophysella armata* (NIC.); thus Thor. II and III with setae in three cross rows and long, strong M_2 ; Abd. I—III with two rows of setae, long p^2 ; Abd. IV with three rows, p_1 longer than p_2 and p_3 ; Abd. V with rows of setae arising from margin of the median,

coarsely granulated band and p_1 larger than p_2 . Arrangement of setae on Thor. III — Abd. I and Abd. IV—VI shown in fig. 6.

Antennae subequal to head in length. Antennal organ III with two short sensory rods located in a small groove, protected on either side by a moderately long blunt sensory hair. Between Ant. III and IV a large eversible antennal sack. Ant IV dorsally with stiff bristles and seven relatively long sensory setae, ventrally with some fine, short, curved, acuminate setulae disposed around one long seta. Subapically a small pit housing a minute sensory papilla.

Postantennal organ with two anterior vesicles arranged in a straight line and two somewhat smaller ones lying obliquely. Close to last ones is placed a small, granulated accessory tubercle. Whole organ is about twice as long as one ocellus in diameter.

Eight subequal ocelli on either side of the head and three setae on each eye-patch.

Area frontalis of the head with typically arranged setae and on either side with very characteristic half globular elevation, directed to the eye-group, very similar to an eye-cornea viewed laterally. This eye-like elevation is always guarded by a short curved seta.

Unguis slightly curved, provided with a distinct tooth in middle of inner lamella, and laterally with a pair of small teeth. Empodial appendage with well developed, rounded basal lamella and apical needle, shorter than half length of inner lamella of the unguis. Tibiotarsal tenent hair strong, at the tip slightly knobbed, in length subequal to whole unguis.

Ventral tube with 4 — 4 setae, and tenaculum with 4 — 4 barbs.

Furcula well developed. Length of manubrium : dens : mucro on average as 7 : 4.5 : 2. Dens dorsally uniformly finely granulated, armed with 7 setae, two internal of which are somewhat, but very indistinctly, basally thickened. Mucro boat-like, apically rounded, with well-developed outer lobe.

Anal spines weakly curved, located on high papillae touching basally each other. Spines measured together with papillae are as long as unguis of third pair of legs. Without the papillae it is $3/4$ of the claw length.

Body colour dark brown.

Length of largest specimen 2 mm.

China — Hangchow, 2 XII 1962 ... 30 sp., leg. K. KOWALSKI.

The new species belongs to the group of *Ceratophysella armata* (NIC.) and is very well characterized by its cornea-like feature on area frontalis of the head.

Brachystomella quadrituberculata sp. nov.

Pl. III, figs. 3—5

Body clothed sparsely with very short setae. On last abdominal tergites the setae are longer, but fine. Tergite of Abd. V with two short setae in anterior transverse row and 6 long in posterior one. All setae are smooth and finely pointed. Skin coarsely granulated.

Antennae about half as long as diameter of the head. Ant. III and IV almost entirely ankylosed. Sensory organ of third antennal joint with two globular sensillae. Fourth joint at the tip with a large retractile sensory papilla.

Mouth parts reduced. Mandible absent, head of maxilla approximately quadrangular, with about 7 teeth arranged in two parallel rows.

Eight ocelli on either side of the head equally large.

Postantennal organ small, about $2/3$ as large as one ocellus, consists of four equal vesicles.

Unguis rather long, with minute inner tooth. Empodial appendage absent. Tibiotarsal tenent hair moderately strong, not thickened at the tip, as long as ventral side of the unguis.

Tenaculum with three barbs on each ramus.

Furcula well developed. Dens dorsally coarsely granulated, furnished with three setae, the median one of which is straight and long. Mucro about 2.5 times shorter than dens, provided with weakly bent ventral margin, stout median shaft, short outer and long inner lamella.

Anal spines absent.

Colour of the body dark blue, paler ventrally. Under a microscope of greater power it can be perceived that dark pigment is not uniformly disposed on the body and many small irregular areas remain also unpigmented on dorsum. Antennae and legs lighter coloured.

Length of the body 1.2 mm.

China — Nanking, 24 XI 1962 ... 2 sp., leg. K. KOWALSKI.

The new species in having four vesicles in postantennal organ comes near to *Brachystomella tuberculata* (WAHLGREN, 1906) from East Falklands, *Brachystomella stachi* MILLS, 1954 from North America (Iowa), *Brachystomella hiemalis* YOSII, 1956 from Japan, and *Brachystomella nubila* GISIN, 1957 from Switzerland. The first, second and last species have, however, six setae dorsally on each dens and other different body details. The Japanese species differs in not granulated dentes, two clavate tenent hairs and long clavate setae on tergites of Abd. V and VI.

***Lobella (Yuukianura) aphoruiroides* (YOSII, 1953)**

Syn.: *Protanura aphoruiroides* YOSII, 1953;

Yuukianura aphoruiroides (YOSII, 1953).

Pl. III, figs. 1—2

Body narrow, elongated, covered with fine granules becoming coarser on tubercles especially of Abd. VI. On the head only weak traces of ocular and subdorsal tubercles. Body with well-developed, dorso-lateral and lateral tubercles, more distinct on tergites of abdominal segments, and weak dorsal tubercles. Setae

short; on tubercles rather long, moreover fine long sensory setae, all smooth. Sensory seta located on outer side of each dorso-lateral tubercle of Abd. I—V.

Antennae shorter than diameter of the head. Ant. III not delimited from Ant. IV.

Three ocelli on either side of the head, two anterior of which lie before weakly delimited ocular tubercle, the third at a distance on this tubercle, protected by two small setae and one long bristle. In one specimen examined, on right side of the head, were grouped close together three ocelli and fourth ocellus was placed on the tubercle.

Unguis stout, slightly curved, with strong oblique notches laterally and granulate basal part. It is armed at half length of inner lamella with a distinct spine-like tooth. Empodial appendage wanting, but its basal papilla is well developed, rather high.

White with minute granules of black pigment laterally.

Body length 1.8 mm.

Besides, it shows morphological characteristics given by YOSII for this species.

China — Hangchow, in litter in a subtropical wood, 4 XII 1962 ... 3 sp.,
leg. K. KOWALSKI.

The members of the subgenus *Yuukianura* YOSII are known otherwise only from Japan.

***Onychiurus hangchowensis* sp. nov.**

Pl. IV, figs. 4—8

In general habitus similar to *Onychiurus armatus* (L.). Granulation of the body dorsally relatively fine, somewhat coarser only on the head and lateral parts of thoracic tergites. Areas with larger granules do not appear in the regions of pseudocelli. Body clothed mostly with short setae; some longer ones located on tergites are not considerably long even on Abd. V and VI.

Antennae somewhat shorter than the diameter of the head, covered uniformly with fine granules and moderately long setae. Ant. organ III composed of two globular, straight, coarsely granulated sensory clubs and two short sensory rods protected at the front by five finely granulated papillae higher than sensory rods, and by five strong setae.

Postantennal organ with 22 compound vesicles not touching each other, located in shallow elliptical depression longer than the whole row of pseudocelli lying on antennal basis.

Pseudocelli arranged dorsally as follows: three in one cross row at base of each antenna and two placed obliquely on hind margin of head; Thor. I with one pseudocellus located submedially on either side; Thor. II on each side with one submedian and one dorso-lateral pseudocellus; Thor. III — Abd. III each with three pseudocelli, the median and lateral ones near the mid-length and

the dorso-lateral near the hind margin of tergite; Abd. IV on each side with four pseudocelli, two of which lie close together obliquely near the mid-line, the third in postero-lateral corner and the fourth anteriorly to the third; Abd. V with two pseudocelli close together near the mid-line and the third one located more laterally. Ventrally one pseudocellus anteriorly on each side of the head, and one on sternite of Abd. II and IV. Subcoxae each with one pseudocellus.

Formula of pseudocelli: dorsally 3,2/1,2,3/3,3,3,4,3; ventrally 1/0,0,0/0,1,0,1.

Unguis untoothed. Empodial appendage basally with narrow extension imitating the basal lamella and terminating as a fine needle, about half as long as the unguis.

Ventral tube each with 6 short setae at the basis.

Furcula and male ventral organ absent.

Anal spines weakly curved, located on papillae touching each other with their bases. The spines are as long as the whole unguis and measured with anal papillae distinctly longer.

Length of specimen examined was 1.8 mm.

Body colour white.

China — Hangchow, in litter in a subtropical wood, 4 XII 1962 ... 1 sp., leg. K. KOWALSKI.

The new species comes near to *Onychiurus flavescens* KINOSHITA, 1916, from Japan, described more accurately by YOSHII, in 1954 and 1956. Similar is the arrangement of pseudocelli on the body, the number of compound vesicles in postantennal organ, the shape of the empodial appendage, and other details. The Chinese species differs, however, in relatively small globular straight sensory clubs in antennal organ III, anal papillae touching each other with their bases, and in long anal spines (in *Onychiurus flavescens* „viel kleiner als die Klaue“).

Onychiurus orientalis sp. nov.

Pl. IV, figs. 1—3

Body similar to that of *Onychiurus armatus* (TULLB.), not considerably widened in region of abdominal segments.

Skin-granulation uniform, moderately fine, coarser only dorsally on the head. Clothing sparse and mostly short; not numerous longer setae located only laterally on tergites and on last abdominal segment.

Antennae shorter than diameter of the head (about 9.5:12), covered dorsally with coarser granules and longer setae than ventrally. Antennal organ III composed of two thick, smooth, strongly curved sensory clubs and two erect, short sensory rods protected by five conical, finely granulated, high papillae and five strong setae. Ant. IV subapically with indistinct integumentary pit housing a minute sensory papilla.

Postantennal organ as long as the unguis, composed of about 27—30 equal, narrow, simple vesicles arranged with their longer axis vertically to the long axis of the organ.

Pseudocelli arranged on the body as follows: three in one cross row at the base of each antenna, and two on hind margin of the head; Thor. I on either side with two pseudocelli, one lying close to mid-line of the body and the second dorsolaterally; Thor. III — Abd. III each with three pseudocelli on either side, the median one near the mid-line, the second dorso-laterally near the hind margin, and the third laterally somewhat higher anteriorly than the median pseudocellus; Abd. IV also with three or four pseudocelli on either side, the third of which is placed in postero-lateral corner and the fourth anteriorly to the third one; Abd. V with two obliquely placed pseudocelli. Ventrally, two pseudocelli on either side of the head and one on Abd. IV. Subcoxae, each with one pseudocellus.

Formula of pseudocelli: dorsally 3,2/2,2,3/3,3,3,3-4,2; ventrally 2/0,0,0/0,0,0,1.

Unguis untoothed. Empodial appendage without true basal lamella, tapering gradually into fine apical needle, reaching almost to the tip of the unguis.

Ventral tube laterally with 9—10 short setae each.

Furcula absent.

Anal spines conical, erect, short, located on small papillae; measured together with those half as long as inner side of the claw. Anal papillae are at a distance of the length of one spine from each other.

Body length 1.6 mm.

Only female specimens were present in material.

China — Nanking, under stones, 24 XI 1962 ... 5 sp., leg. K. KOWALSKI.

The new species differs distinctly from the Japanese species so far known. Of the European species widely distributed *Onychiurus hortensis* GISIN, 1949 seems to resemble it.

Onychiurus sinensis STACH, 1954

Pl. V, figs. 1—6

Body dorso-laterally distinctly compressed with abdominal part laterally widened and posteriorly rounded.

Granulation dorsally on the head and tergites uniform, fine. Antennal bases distinctly delimited and covered by finer granules. Body clothed sparsely with short setae; some longer ones located laterally on tergites and on last abdominal segment. Arrangement of setae on Thor. III and Abd. IV is shown in figs. 1 and 4.

Antennae somewhat shorter than diameter of the head. They are dorsally with longer seta and more coarsely granulated than ventrally. Sensory organ of Ant. III composed of two smooth, straight, pear-like sensory clubs depressed somewhat at the tip, and two short, erect, fine sensory rods protected at the front by four conical, finely granulated papillae and five strong setae. Ant. IV with small subapical pit housing a minute sensory papilla.

Postantennal organ composed of 10—12 compound vesicles located in moderately deep groove as long as the distance between the pseudocelli located on antennal base.

Pseudocelli arranged on the body as follows: two at the base of each antenna and the third at a small distance behind the median pseudocellus; two pseudocelli placed obliquely on hind margin of the head; Thor. I., without pseudocelli, furnished with 7—9 setae at either side; Thor. II and III each with one submedian and one lateral pseudocellus, placed beyond the more coarsely granulated part of tergite; Abd. I—III each with one submedian pseudocellus placed more anteriorly on either side, one sublateral and one lateral; Abd. IV on either side also with three pseudocelli, but two of them placed close together submedianly and the third at a distance laterally; abnormally, appears anteriorly one accessory pseudocellus; Abd. V each with two pseudocelli placed close together. Ventrally, only one pseudocellus on either side of the head and one on Abd. IV. Subcoxae each with one pseudocellus.

Formula of pseudocelli: dorsally 3,2/0,2,2/3,3,3 (4),2; ventrally 1/0,0,0/0,0,1,0.

Unguis somewhat curved, with distinct tooth in about half length of inner lamella; lateral teeth absent. Empodial appendage without basal lamella, reaches to the tip of unguis.

Ventral tube with 4—4 setae.

Furcula and anal spines absent.

Ventral organ of adult male consists of four small sensory tubercles located close together in a cross row in the middle of the second abdominal sternite, and six stout, short, acuminate setae on the third sternite. Such a tubercle greatly enlarged resembles a minute sea-anemone with eight fine arms stretched horizontally or raised upwards and projecting as a cluster of fine sensillae.

Body colour white; length 1.5—2 mm.

China — Chankuchei (Kwantsunghsien, Hopeh), under stones in a garden, 9 VII 1936 ... 15 sp., leg. F. ARCISZEWSKI.

Onychiurus sinensis, diagnosed shortly by me in 1954, agrees in many body characteristics with some European species having straight, smooth, pear-like sensory clubs in the third antennal organ; postantennal organ with compound vesicles; similar male ventral organ; no pseudocelli on Thor. I and no anal spines. They are *Onychiurus stachianus* BAGNALL, 1939, from Postumia-cave (Yugoslavia), *Onychiurus rectopapillatus* STACH, 1933, from Poland and western Ukraine, *Onychiurus pseudostachianus* GISIN, 1956, from Switzerland, Italy and France, *Onychiurus gotoi* CHOUDHURI, 1958, from England, and *Onychiurus sublapidarius* STACH, 1963, from Afghanistan.

However, it closely resembles *Onychiurus musae* from Tenerife, described very accurately by SELGA, in 1962. The last differs from the Chinese species only in less significant body-marks, such as untoothed unguis, a greater number of pseudocelli on the ventral side of the body, namely 2/0,0,0/1,1,1,1, and presence of one abnormal sensory tubercle on the third abdominal sternite.

Onychiurus kowalskii sp. nov.

Pl. VI, figs. 1—5

Body somewhat dorso-laterally compressed, extended approximately elliptically in regions of abdominal segments.

Clothing sparse, in great part consisting of short, fine setae; some longer setae appear mostly laterally on the tergites and on the last abdominal segment. Granules of the skin relatively fine, uniformly disposed on the body; somewhat coarser granules appear dorsally on the head and in the median parts of thoracic tergites. Antennal bases covered with more fine granules delimited distinctly from neighbourhood.

Antennae somewhat shorter than diameter of the head, covered with coarser granules dorsally than ventrally. Sense organ of third antennal joint consists of two short sensory rods and two smooth, erect, ovoid or pear-like sensory clubs, mostly bilobed at the tip; they are protected by four high, conical, finely granulated papillae and five strong setae. Ant. IV subapically with a small pit housing a very minute sensory papilla. Ventrally many (about 30) short, fine, curved, sharply pointed setae appear on this joint.

Postantennal organ consists of 20—24 compound vesicles not touching each other, located in a rather shallow elliptical depression, somewhat longer than the distance between two anterior basal pseudocelli.

Pseudocelli arranged on the body as follows: two at base of each antenna and the third outside beyond the median pseudocellus; hind margin of the head on either side with two obliquely placed pseudocelli; Thor. I without pseudocelli; Thor. II and III each with two, the median one near the mid-line of the body, the second laterally; Abd. I—III each with three pseudocelli on either side, the median placed near the mid-line, the second dorso-laterally near the hind margin of the tergite, and the third laterally; Abd. IV and V each with two pseudocelli lying close together, obliquely, near the mid-line. Ventrally two pseudocelli on either side of the head, and one on fourth abdominal sternite. Subcoxae, each with one pseudocellus.

Formula of pseudocelli: dorsally 3,2/0,2,2/3,3,3,2,2; ventrally 2/0,0,0/0,0,0,1.

Unguis with minute lateral teeth near its base. Empodial appendage without distinct basal lamella, tapering gradually towards the tip into a fine long needle, but shorter than unguis.

Furcula, male ventral organ, and anal spines wanting.

• Body colour white. Length of largest specimen 2 mm.

China — Nanking, near a house, 24 XI 1962 ... 32 sp., leg. K. KOWALSKI.

The new species agrees with *Onychiurus himalayensis* CHOUDHURI, 1958 in many morphological characteristics such as compound vesicles in postantennal organ; smooth, erect, bilobed sensory clubs, and absence of furcula and anal spines, but differs in number and distribution of the pseudocelli (in *Onychiurus himalayensis* dors. 3,2/1,3,3/3,3,3,4,2; ventr. 3/0,1,1/2,1,2,1) and in absence of male ventral organ.

It also comes near to European *Onychiurus gridellii* DENIS, 1938 from Italy, which has similar sensory clubs and no male ventral organ, but a smaller number of vesicles in the postantennal organ and 3 pseudocelli dorsally on either side of Abd. IV and V.

***Proisotoma minuta* (TULLBERG, 1871)**

Pl. VII, fig. 5

In typical form, with broadly elliptical postantennal organ 3—4 times longer than diameter of one ocellus, 8+8 equally large ocelli, untoothed unguis, not clavate tenent hair, tenaculum with 4 — 4 barbs and one seta, manubrium ventrally with only one pair of setae, mucro tridentate, and grayish body colour.

China — Chankuchei (Kwantsunghsien, Hopeh), under stones in a garden, 7 V 1936 ... 6 sp., leg. F. ARCISZEWSKI.

I have already recorded this species from China (1947).

Proisotoma minuta (TULLB.) is a very widely distributed cosmopolitan species, known from Europe, Asia (Siberia, China), North and South America, Australia and Africa (Egypt).

***Isotoma imparidentata* sp. nov.**

Pl. VII, figs. 6—10

Body covered rather sparsely with moderately long, smooth, pale brownish common setae and dorsally, on tergites, with some outstanding longer macrochaetae. On anterior segments the macrochaetae are only somewhat longer than the common setae, but on the following ones they become gradually longer, and on Abd. V and VI are longer than the tergites, strongly bent backwards, and on their dorsal edge provided with 3—4 weak serrations.

Antennae somewhat longer than the diameter of the head, covered with setae of various lengths. Sensory organ of Ant. III consists of two blunt, short, curved sensory hairs located in one small groove, not guarded laterally by blunt sensory hairs. Ant. IV rounded at the tip, subapically with very small pit housing a minute papilla.

Postantennal organ broadly elliptical, small, about 2/3 as long as the diameter of one ocellus.

Eight subequal eyes on either side of the head.

Unguis armed with a pair of lateral teeth and two very indistinct inner teeth, inserted one at half length of lamella, second at about 3/4 of its length. Empodial appendage about half as long as unguis, with a broad, rounded untoothed basal lamella. Dorsally near the base of unguis a fine long hair.

Tenaculum with 4 — 4 barbs and some setae.

Furcula long, covered dorsally and ventrally with simple setae. Dens about 2.5 times longer than manubrium, tapering gradually towards the end, densely crenulated. Mucro small, about 30 times shorter than dens, tridentate. The apical and the anteapical tooth are located one after another in the same line, but the third, outer tooth, protrudes distinctly to the side.

Ground colour of animal is pale yellowish. Dorsally in the mid-line of the body dark violet pigment forms one discontinuous irregular, longitudinal band, beginning on the head and running up to Abd. V. Small, irregular pale violet areas appear also on tergites laterally. Antennal joints pale violet in their distal ends. Legs violet only distally.

Body length 1.5 mm.

China — Hangchow, in litter of a small wood, 4 XII 1962 ... 2 sp., leg. K. KOWALSKI.

In having three teeth on mucro, two inner teeth on unguis, eight eyes on either side of the head, the Chinese species agrees with the widely distributed *Isotoma viridis* BOURL. differs, however, from it in arrangement of teeth on mucro, weak inner teeth and lack of lateral notches on unguis, absence of spines on ventral side of manubrium, small body length and other things.

Isotoma gracilliset BÖRN from Japan has also three teeth on mucro and 8+8 eyes, but quite different sensory organ of Ant. III and strongly serrated body-macrochaetae.

Isotomurus palustris (MÜLLER, 1776)

Pl. VIII, figs. 1—8

Body clothed densely with numerous smooth pale brownish setae of various lengths, the longest of them about as long as unguis. Three last abdominal tergites with six long stout macrochaetae each. Abd. II—IV with fine ciliate, long trichobothria.

Antennae about twice as long as diameter of the head. All joints with dense, short setae. Sensory organ of third antennal joint consists of two moderately short, blunt, curved sensory rods, located in a shallow depression. Fourth joint rounded at the tip.

Postantennal organ elliptical, only somewhat shorter than diameter of one ocellus (0.8:1).

Eight ocelli on either side of the head, subequal in length.

Unguis only with a pair of distinct lateral teeth. Empodial appendage about half as long as inner lamella of the unguis, provided with a broad, rounded untoothed basal lamella.

Tenaculum with 4 — 4 barbs and some setae on corpus.

Furcula long, abundantly setaceous. Dentes about twice as long as manubrium, narrowing gradually towards the end, densely crenulated dorsally. Mucro quadridentate with a small apical tooth, two large teeth arranged in a line,

and one small thorn-like outer tooth; a thin lamella runs on inner side of the mucro from the tip of the large proximal tooth. A short mucronal seta on outer side of mucro.

Body colour of animals examined is mostly greenish, rarely rosy. A black-violet discontinuous, mostly irregular band runs usually along the median line of the dorsum from anterior margin of Thor. II up to Abd. V. On either side of this band appear more or less darkly pigmented areas. In the same populations there appear also individuals green coloured without dark violet pigment and rarely others in which all tergites are almost entirely black-violet. The head with more or less long median band. Antennae grayish violet. Legs uncoloured or in dark coloured specimens with pigmented coxae and femora.

Body length of specimens examined 1.5—2 mm.

China — Peking, near a stream, 21 X 1962 ... 3 sp.,

— Nanking, 24 XI 1962 ... 7 sp.,

— Hangchow, in a wood, 2 XII 1962 ... 6 sp., all leg. K. KOWALSKI.

The examined Chinese specimens of this species agree almost in all morphological characteristics with the European ones, especially with f. *maculata* (SCHÄFFER), figured by me in 1947 (Pl. XLVIII, figs. 1—6). In Chinese specimens I have not observed inner tooth on unguis and empodial appendage, but such individuals appear often also in many territories of Europe and were noted by various authors.

The Chinese specimens differ from the European ones examined by me in only one detail, namely in the presence of lamella at the inner side of the mucro running from the large proximal tooth of the mucro, but as such a lamella appears in some other species of the genus *Isotomurus* BÖRN., e. g. *I. alticolus* (CARL.), *I. ciliatus* STACH and others, I do not consider this difference to be a taxonomically important characteristic.

Isotomurus palustris (MÜLLER) belongs to the cosmopolitan insects. However, it was not recorded from China.

Sinella coeca (SCHÖTT)

Pl. X, figs. 3—9

Body covered with finely ciliated setae of various length as well as with many strong stiff bristles of „flexed“ type.

Antennae longer than half length of the body measured together with the head, and about 2.7 times longer than diameter of the head. Ant. I covered with many setae of various lengths, moreover, dorsally with some „flexed“ bristles, somewhat shorter than those arranged on the head. Ant. II, besides common setae, with some stronger ones dorsally, and fine ciliate hairs ventrally. Antennal organ of Ant. III consists of two short, blunt, curved, sensory rods located in a small, shallow groove. Ant. IV at the tip without retractile sensory papilla.

Labrum dorsally with four small papillae at the front, each armed with a minute setula.

First external labial papilla with four common setae and one blunt, differentiated, extending beyond the tip of papilla, but not thicker than the other labial setae.

Eyes and postantennal organ wanting.

Legs covered with many moderately long, ciliate setae, moreover, dorsally and ventrally with some long bristles on all joints. Stout straight bristles arranged ventrally in double row on tibiotarsi of all legs are not all entirely smooth in specimens examined. The ciliation of 2—3 terminally located bristles is visible only under the microscope of great power, on the higher located bristles it is very distinct. Unguis slender without outer tooth and very minute indistinct lateral teeth, located near to base of the unguis. Of four inner teeth, those of the basal pair reach the same height, but the inner tooth of this pair is distinctly larger and wing-like. Higher located odd tooth well developed and the subapical one very minute. Empodial appendage with wide outer tooth. Tibiotarsal tenent hair short, fine, not thickened at the tip.

Furcula well developed, but somewhat shorter than antennae. Length ratio of manubrium to dens is 6:9. Mucro falcate, with long basal spine. Terminal not crenulated part of dens is as long as mucro.

Abd. IV is about 3 times longer than Abd. III.

Body colour of specimens examined white, length 2.5 mm.

China — Chankuchei (Kwantsughsien, Hopeh), on flower-pots in dwelling, 8 IV 1935 ... 30 sp., leg. F. ARCISZEWSKI;

— Chankuchei, in an ant-nest under a stone, V 1937 ... 8 sp., leg. F. ARCISZEWSKI.

The Chinese specimens examined by me differ from the European ones in distinct ciliation of higher located bristles on the ventral edge of the tibiotarsus. Their tenent hair is not clavate at the tip, and the inner tooth in the basal pair of teeth of the unguis is distinctly broader and winglike.

Sinella coeca (SCHÖTT, 1896) has already been noted from China by DENIS (1929). It is a species very widely distributed, probably a cosmopolite.

Sinella straminea (FOLSOM, 1899)

Syn.: *Entomobrya straminea* FOLSOM, 1899;

Sinella straminea (FOLSOM) — BÖRNER, 1903.

Pl. X, fig. 10

In material examined I found one specimen of this species described by FOLSOM (1899) from Japan and by DENIS (1929) from China (Peking).

The specimen examined by me agrees in general characteristics with the descriptions given by these authors, and differs only in two details of the body.

In the basal pair of the teeth the inner one is wing-like, distinctly broader than in the Japanese specimens and its tip reaches higher than the outer tooth does; also the dentes are provided dorsally with 3—4 long, abundantly ciliated vertical hairs, in their basal parts.

The tenent hair in my specimen is clavate, and the shape of mucro similar to that figured by DENIS, only the basal spine is very minute in my specimen. On the other dens of this specimen the mucro was abnormal, falcate, without anteapical tooth and basal spine.

China — Chankuchei (Kwantsunghsien, Hopeh), under a stone in a garden,
5 V 1937 ... 1 sp., leg. F. ARCISZEWSKI.

Sinella straminea (FOLS.) is at present known only from Japan and China.

Sinella curviseta BROOK 1882

This probably cosmopolitan species, distributed very widely in Palearctic, furnished with two ocelli on either side of the head, an untoothed empodial appendage and bidentate mucro with a long basal spine, appears also in China.

China — Nanking, 20 XI 1962 ... 3 sp., leg. K. KOWALSKI.

Recorded from Europe, North America, Costa Rica, India, Japan.

Entomobrya dorsosignata sp. nov.

Pl. IX, figs. 4—7

Body somewhat dorso-ventrally compressed, covered very densely with fine relatively long, indistinctly shortly ciliated setae. Flexed bristles, moderately long and thickened at the tip, form a mane dorsally on the head and on the anterior tergites, while on the posterior tergites are located only laterally. All these setae are brownish in colour. Trichobothria in normal numbers on Abd. II—IV.

Antennae shorter than half length of the body measured together with the head, and only somewhat (1.2 times) longer than the diameter of the head. All joints of antennae are densely covered with rather long, shortly ciliated setae. Dorsally on Ant. I are located some flexed bristles, similar to those in the mane, but somewhat shorter. Ant. IV with one knobbed sensory papilla at the tip.

Eight eyes on either side of the head, two median of which are distinctly smaller than the remaining ones.

Labrum with three transverse rows of setae and, at the front, four broad, entirely smooth papillae.

Differentiated seta of external labial papilla not thicker than other setae of labial papillae, but high located, reaches beyond the tip of papilla.

Legs of normal length, but stout, covered densely with indistinctly ciliate, rather long, brownish setae. Moreover, on all joints were located dorsally and ventrally some long, outstanding bristles. Stout bristles arranged on ventral

edge of tibiotarsus are rather long, but not especially thickened and ciliated. Unguis slender, armed with small lateral and three inner teeth. Empodial appendage also slender, about $2/3$ as long as unguis. Tibiotarsal tenent hair stout, flattened at the tip, as long as unguis.

Abd. IV about 5—6 times longer than Abd. III.

Furecula well developed, covered densely, dorsally and ventrally, with rather long, finely ciliate setae. Mucro about half as long as empodial appendage, bidentate and with rather long basal spine. Apical tooth of the mucro is distinctly smaller than anteapical one, and directed backwards.

Ground colour of animals is pale brownish. Black-violet pigment covers the lateral parts of the body and also extends more or less on to the dorsal parts of tergites. In dark-coloured individuals only the median area on the head, Thor. II — Abd. II and anteriorly Abd. IV remain pale brownish dorsally. In lighter specimens black-violet pigment forms dorsally transverse bands on Thor. III and Abd. III. Antennae and legs are pale brownish.

Length of animals is 1.2 mm.

China — Peking, under stones, 21 X 1962 ... 3 sp., leg. K. KOWALSKI.

Entomobrya aino (MATSUMURA et ISHIDA, 1931)

The only specimen of this species found in the material from China agrees entirely with the description and figures of this species given by YOSII in 1954 from Ozé-Reserve Territory (Japan).

According to YOSII the first specimens of this species found by MATSUMURA and ISHIDA in Japan were uncorrectly determined as *Seira aino* MATS. & ISH., 1931.

China — Hangchow, in litter in a wood, 2 XII 1962 ... 1 sp., leg. K. KOWALSKI.

Entomobrya aino (MATS. & ISH.) is at present known only from Japan and China.

Entomobrya marginata (TULLBERG, 1871)

Pl. IX, fig. 3

The Chinese specimens of this species do not differ in their body characteristics from those distributed widely in Europe.

They have an abundant mane dorsally on the anterior half of the body; antennae shorter than half length of the body; $8 + 8$ ocelli; labral papillae small, each provided with a minute setula; differentiated seta of external labial papilla short and fine; unguis provided with outer tooth, a pair of lateral and four inner teeth; tenent hair longer than unguis; furecula somewhat shorter than antennae; mucro bidentate with small basal spine.

Ground colour of animals is gray. Dark violet pigment forms a regular, long, narrow, continuous, very distinct, transverse stripe at posterior margin of all tergites. As it is usual in European individuals, this stripe is widest on Thor. III and Abd. II.

Body length of specimens examined was small, about 1.5 mm.

China — Chankuchei (Kwantsunghsien, Hopeh), under loose bark of a tree, 13 VII 1936 ... 7 sp., leg. F. ARCISZEWSKI.

Entomobrya marginata (TULLB.) has not hitherto been recorded from China. It has not been registered from Japan either.

***Homidia socia* DENIS, 1929**

Pl. X, fig. 2

DENIS (1929) has already described this species from China (Fukien). Afterwards it was reported by YOSII (1942) from Japan, and I have found it in material from Vietnam.

China — Hangchow, in litter in a forest, 4 XII 1962 ... 1 sp., leg. K. KOWALSKI.

Homidia socia DEN. is a frequent species, widely distributed in East Asia.

***Homidia sauteri* (BÖRN.) var. *sinensis* DENIS, 1929**

Pl. X, fig. 1

Homidia sauteri described by BÖRNER, in 1901 on the basis of animals collected by SAUTER in many localities of Japan; then it was closely examined by various authors (DENIS, CHRISTIANSEN, YOSII, STACH). In various localities of its wide range it sometimes appears changed in body pattern. Some of these modifications of pattern were distinguished and named.

DENIS, in 1929, examined specimens of this species collected in China [Yunnfu and Foochow (Fukien)]. They had a dark transversal band on Thor. III, which in BÖRNER's specimen was wanting and DENIS called them *Homidia sauteri* f. *sinensis* DEN.

In 1942 YOSII erected a new species *Homidia nipponica* YOSII for animals differing from *Homidia sauteri* BÖRN. in grayish body colour and some morphological details. In 1956, however, YOSII canceled this species as identical with *Homidia sauteri* v. *sinensis* DEN.

The Chinese specimens examined by me from Peking differ somewhat from those described by DENIS, as they have a transverse dark band on Thor. III and Abd. III interrupted laterally and the cross dark band running over the middle of Abd. IV is here divided into four separate irregular patches.

China — Environs of Peking, under a stone, 8 V 1937 ... 3 sp., leg. F. ARCISZEWSKI.

Homidia sauteri (BÖRN.) is very widely distributed over East Asia, recorded from Japan, China and Vietnam. CHRISTIANSEN has described this species also from North America (Louisiana).

***Salina maculata* YOSII, 1961**

Pl. IX, figs. 1—2

The only specimen found in the material does not permit me to examine exactly its chaetotaxy, the significant body characteristic of this group of insects. Judging, however, by its pattern and other body marks it is very probably identical with *Salina maculata*, a species accurately described by YOSII, from Thailand in 1961.

The species examined is more similar to this species than to *Salina yunnanensis* (DEN.) described by DENIS from Yunnan (China) in 1929.

China — Hangchow, in litter in a forest, 2 XII 1962 ... 1 sp., leg. K. KOWALSKI.

***Lepidocyrtus coeruleicornis* BONET, 1930**

In colouration of the body, short, dark violet antennae, unguis furnished with teeth, lancet-like empodial appendage, bidentate mucro with a basal spine, the Chinese specimen seems to be identical with *Lepidocyrtus coeruleicornis* BONET, examined closely by DENIS, in 1948, on the basis of specimens from Caudâ (South Annam).

China — Chankuchei (Kwantsunghsien, Hopeh), under a stone in garden 5 V 1937 ... 1 sp., leg. F. ARCISZEWSKI.

Lepidocyrtus coeruleicornis BON. is at present known only from India (Bandra, Salsette-isl. near Bombay), South Annam (Cauda) and China (Chankuchei).

***Tomocerus ocreatus* DENIS, 1948**

Pl. VII, figs. 1—4

The Chinese specimens of *Tomocerus* examined by me agree almost in all body details with those from Annam described by DENIS, in 1948.

Body covered densely with many dark brown scales and straight, simple setae of various lengths. On tergites of the last abdominal segments there appear some long macrochaetae and long not ciliated trichobothria. Body denuded of scales is brownish, but dark blue pigment colours tergites of Thor. II, III and Abd. I laterally.

Antennae dirtily violet, about half as long as the body measured together with the head, and 2.5 times longer than the diameter of the head.

Six ocelli on either side of the head, equally large, located on a black patch. In front of this patch and behind it there is a small area yellow in colour.

Legs covered densely with setae and some long bristles on all joints. Unguis slender, provided basally with moderately long pseudonychia, and at inner lamella with minute basal spine and five teeth, of which only the first located about at one third of the lamella length is well developed and that inserted higher very weak. Empodial appendage about $2/3$ as long as inner lamella of the unguis is provided with a very small spine, which sometimes is wanting. Tibiotarsal tenent hair strong, longer than ventral lamella of the unguis.

Dentes basally without a pair of scales characteristic of the *Pogognathellus* group. Each dens armed in its basal part with 4 nearly equally long spines, and in the distal part with (4)—5 short and 2 strong ones. All spines are dark brown-coloured, covered in their basal half with many small splinter-like serrations. Mucro 5 times shorter than dens, densely setaceous, provided dorsally with a pair of unequally shaped spines, 5—7 intermediate small teeth at the base and at the end with an apical and an anteapical tooth.

Body length measured together with the head is 3—3.5 mm.

China — Hangchow, under stones, 4 XII 1962 ... 3 sp., leg. K. KOWALSKI.

Of the genus *Tomocerus* NICOLET DENIS described, in 1929, from Yunnan (South China) *Tomocerus varius* FOLS., which he considered afterwards as a new different species and named *Tomocerus folsomi* DEN. This species differs from *Tomocerus ocreatus* DEN. in a greater number of dental spines and their arrangement on the dens 5—8/3—6,1, 1—2,1.

Doubtless identical with *Tomocerus ocreatus* DEN. is, the Japanese species determined by UCHIDA in 1954 as *Tomocerus minor* (LUBBOCK), which is shown by the description and figures of this Japanese species given by the author.

Tomocerus ocreatus DEN. is at present known from Annam, China and Japan.

Sminthurinus orientalis sp. nov.

Pl. XI, figs. 1—10

Body globular, fifth abdominal segment distinctly delimited from the fourth one and Abd. VI. Skin distinctly finely granulated, clothed very sparsely with short, smooth setae. Also on the head the setae are short and fine. Three trichobothria on either side of „great“ abdomen and one laterally on furcal segment.

Antennae about 1.4 times longer than the diameter of the head. Length ratio of antennal joints is 1.5:3:4.5:10. Third joint in basal part provided with very distinct papilla subdivided into four parts, and in distal part with sensory organ consisting of two short rods. Fourth joint simple, without a trace of inclination to annulation, at the tip with distinct sensory papilla protected by some short, straight hairs.

Eight eyes on either side of the head, the central of which much smaller than the remaining ones.

Unguis relatively small, about half as long as mucro, furnished with very minute, indistinct inner tooth. Empodial appendage of first leg untoothed, with long apical needle extending beyond to the tip of the claw. On second and third pair of legs empodial appendage is provided with a small inner tooth, but a short apical needle. Tibiotarsus dorsally with three fine, distinctly clavate tenent hairs, which are shorter than unguis and arranged so that the median one is somewhat more distant from the base of unguis than both lateral ones.

Furcula well developed. Dens twice as long as mucro, furnished with 7 dorsal setae, 4 on the outer edge and one on inner edge near the base of the mucro. Ventrally 3 setae are located terminally on dens, near the base of mucro and two pairs somewhat higher. Mucro straight, narrowing gradually towards the end and with smooth outer lamella and finely serrated inner one. Mucronal seta absent.

Anal valves furnished with simple strong bristles. Subanal appendages strongly curved, split apically into some branches, two median of which are somewhat flattened.

Ground colour of the body is dirty yellowish. Dark brown pigment colours widely lateral parts of the body. Dorsally a broad, irregular area remains in the anterior half of the dorsum pale, in the posterior one distinctly yellow-brownish. Head laterally darkened, at front with black patch. Antennae dark brownish-violet. Legs, furcula and ventral side of the body uncoloured.

Length of females 0.8, of male 0.5 mm.

China — Hangchow, in litter in a wood, 4 XII 1962 ... 2 ♀ and 1 ♂, leg.

K. KOWALSKI.

The new species belongs to the group of *Sminthurinus niger* (LUBB.). It differs from principal member of this group and some other in having only one serrated lamella of the mucro, not flattened bristles on anal valves, smaller number of setae on dens, colour and other details.

***Sminthurinus pekinensis* sp. nov.**

Pl. XII, figs. 1—8

Body globular, fifth abdominal segment distinctly delimited from the fourth one and Abd. VI. Skin finely granulated, clothed very sparsely with short, smooth setae. Arrangement of these setae on black-blue dorsum is distinctly marked by minute white spots appearing at their insertions. Three trichobothria on either side of great abdomen and one, lateral, on furcal segment.

Antennae 1.4 times longer than the diameter of the head. Length ratio of antennal joints is 1.5 : 3 : 4.5 : 10. Third joint near base with a broad, protruding papilla subdivided very distinctly into four rather large equal parts. In distal part of this joint sensory organ composed of two fine rods. Fourth joint simple, without a trace of inclination to annulation, at the tip with distinct, simple sensory papilla, guarded by some short, straight hairs.

Eight eyes on either side of the head, the central of which distinctly smaller than the remaining ones.

Unguis small, about half as long as mucro, with minute inner tooth located in terminal part and very indistinct serration of lateral edges in basal part. This serration is better visible in ventral position of the unguis. Empodial appendage of foreleg with narrow inner lamella provided with small tooth and long subapical needle somewhat shorter than the unguis. Empodial appendage of remaining legs with a broad inner lamella. On the second pair of legs this lamella is provided with a minute tooth and a short subapical needle, on the third leg it is untoothed and without a needle. Tibiotarsal tenent hairs three, fine, clavate, shorter than inner edge of unguis.

Furcula well developed, longer than antennae. Dens about twice as long as mucro (6.3:1.8), furnished with 5 dorsal, 4 outer, and 3 inner setae. Ventrally 3 setae are located on dens near the base of mucro and higher a pair of somewhat longer ones. Mucro straight, narrowing gradually towards the end, with smooth outer lamella and distinctly serrated inner one. Mucronal seta absent.

Anal valves with strong, at their bases somewhat flattened bristles. First upper bristle on upper valve is deeply slitted. Anal appendages with some short branches.

Ground colour white, but black-violet pigment covers almost whole body. White remains a prominent quadrangular area on forehead of animal, pale lateral parts of the head, and of Abd. IV—VI, legs and furcula, moreover a pair of eye-like spots with black point dorsally in middle of Abd. VI.

Body length 1.2 mm.

China — Hongchow, in litter in a wood, 4 XII 1962 ... 1 sp., leg. K. KO-
WALSKI.

The new species, very characteristic for its wide, quadrangular, prominent white patch on forehead and dark-blue colour of the body, at first sight seems to be identical with *Sminthurinus albifrons* (TULLB.) described by TULLBERG, in 1871 and 1872 from Sweden and widely distributed in Finland.

In morphological body characteristics it differs, however, distinctly from the Scandinavian species, which has the basal papilla on Ant. III simple, unguis with two inner teeth, empodial appendage without apical needle equal on all legs, mucro with both lamellae serrated, and anal appendages palmate.

Sphyrotheca multifasiata (REUTER, 1878)

Pl. XIII, figs. 1—9

Head relatively wide, approximately circular, forehead with a pair of semi-globular, uncoloured, distinctly granulated eminences, each with three minute setae. Behind each eminence a long, strong, rough, apically blunt, thick hair. Three pairs of such hairs are also located between eye-patches; below, fine common setae appear on the head. The segments of the body are not marked

by furrows. In the region of, probably, third thoracic segment are located four erect, thick, rough, apically blunt and strongly curved hairs. Similar blunt, long hairs, but bow-like curved appear in a small group at the beginning of abdominal segments and, numerous, in four longitudinal parallel rows on fourth abdominal segment; all these hairs are longer than unguis. Between the first and second of these groups on small papillae are located fine, smooth, erect rather long trichobothria. A pair of similar trichobothria are located also on — Abd. V, but this segment and the following ones are already furnished dorsally with short, common setae. Short fine, erect hairs appear also among the long rough ones on Abd. IV.

Antennae short, somewhat longer than the diameter of the head (5:3.8). Sense organ of third joint composed of two fine, straight sensory rods. And. IV, without sensory papilla, shows 10 annulations.

Claw with a pair of pseudonychia, small inner tooth and terminally with very indistinct tunica, visible only after the use of KOH. Empodial appendage of foreleg with inner lamella shorter than on other legs; each provided with a long subapical needle. Inner side of trochanter of third pair of legs with a strong, erect, capitate bristle.

Mucro with smooth outer and serrated inner lamella.

Ground colour of animals pale brownish-yellow. Dark brownish-violet pigment covers great part of the body; only dorsally there remain some pale irregular, parallel cross bands and irregular spots on the head and laterally on the body. Antennae, legs and furcula grayish-violet.

Body length 1.6 mm.

China — Nanking, 24 XI 1962 ... 1 sp., leg. K. KOWALSKI.

Sphyrotheca multifasciata, named by REUTER (1878) on the basis of animals from Finland, described more widely and figured by SCHÖTT in 1894, was recorded by BÖRNER (1909) from Japan, described and well figured by YOSII (1954) and by UCHIDA (1957).

The Chinese specimen examined by me differs from those from Japan in the shape of long rough bristles on the body as they are not sharply pointed at the tip, but distinctly blunt, and in the inner lamella of mucro which is rather distinctly serrated.

So far *Sphyrotheca multifasciata* (REUT.) has been registered from North Europe (Finland), Japan, China, and described as *Sminthurus minnesotensis* GUTHRIE (1903) from North America (U. S. A.).

REFERENCES

- BAGNALL, R. 1939. Notes on British *Collembola*. Ent. Monthly Mag. 75: 91—102.
 BONET, F. 1930. Sur quelques Collembolés de l'Inde. Eos, 6 (3): 249—273.
 BÖRNER, C. 1909. Japans Collembolenfauna (Vorläufige Mitteilung), Sitz. Ber. Ges. Naturf. Freunde, (2): 99—135.

- CHOUHDURI, D. K. 1958. On two new species of *Onychiurus* GERV. (*Collembola: Onychiuridae*) from the British Isles. Proc. R. Ent. Soc. London (B.) **27**: 9—10.
- CHRISTIANSEN, K. 1958. The Nearctic members of the genus *Entomobrya* (*Collembola*). Bull. Mus. Comp. Zool. Harvard Coll., **118** (7): 439—545.
- DENIS, J. R. 1929. Notes sur les Collemboles récoltés dans ses voyages par le Prof. F. Silvestri. Boll. Lab. Zool. gen. e agr. Portici **22**: 166—180, 305—320.
- DENIS, J. R. 1938. Collemboles d'Italie (principalement cavernicoles). Boll. Soc. adriat. Sci. natur. Trieste **36**: 95—165.
- DENIS, J. R. 1948. Collemboles d'Indochine, récoltés de M. C. N. Dawydoff. Musée Heude. Nat. Entom. Chinoise, Changhei, **12** (17): 183—311.
- FOLSOM, J. W. 1897. Japanese *Collembola*. Part I. Bull. Essex Inst. **29**: 51—57.
- FOLSOM, J. W. 1899. Japanese *Collembola*. Proc. Amer. Acad. Arts a. Sc. **34** (9): 261—274.
- GISIN, H. 1949. Notes sur les Collemboles avec description de quatorze espèces at d'un genre nouveaux. Mitt. Schweiz. Entom. Gesel. **22** (4): 385—410.
- GISIN, H. 1956. Nouvelles contributions au démembrement des espèces d' *Onychiurus* (*Collembola*). Mitt. Schweiz. Entom. Gesel. **29** (4): 329—352.
- GUTHRIE, J. E. 1903. The *Collembola* of Minnesota. Rep. deol. natur. Hist. Surv. Minnesota (Zool. 4): 1—110.
- LINNANIEMI (AXELSON), W. M. 1912. Die Apterygotenfauna Finnlands II. Spez. Teil. Acta Soc. Sc. Fenn. **40** (5): 1—359.
- MATSUMURA, S. & ISHIDA, M. 1931. Nippon konchu dai zukan. Tokyo.
- MILLS, H. B. 1934. A monograph of the *Collembola* of Iowa. Iowa Coll. Press, Monogr. **3** Ames, Iowa 1—143.
- MING-TSAN CHEO. 1935. Pekin Hakubutsu Shushi.
- SCHÖTT, H. 1894. Zur Systematik und Verbreitung paläarktischer *Collembola*. Sven. Vet.-Akad. Händl. (B) **25** (LL): 1—100.
- SELGA, D. 1962. *Onychiurus musae* n. sp. (*Collembola*) de la isla Tenerife. Bol. R. Soc. Esp. Hist. Nat. (B) **60**: 61—67.
- STACH, J. 1947. The Apterygotan fauna of Poland in relation to the world-fauna of this group of Insects. *Isotomidae*. Acta monogr. Mus. Hist. natur. Kraków (1): 1—488.
1949. Id. *Neogastruridae* and *Brachystomellidae*. Ibid. (2): 1—341.
1954. Id. *Onychiuridae*. PAN. Inst. Zool. Kraków. 1—219.
1963. Id. *Entomobryidae*. PAN. Inst. Zool. system. 1—121.
- TULLBERG, J. 1871. Förteckning öfver svenska Podurider. Öfvers. Vet.-Akad. Förh. **28**: 143—155.
- TULLBERG, T. 1872. Sveriges Podurider. Svens. Vet.-Akad. Handl. **10** (10): 1—70.
- UCHIDA, H. 1948. *Apterygota* of Shansi, China. Mushi **19** (1): 1—5.
- UCHIDA, H. 1954. The Insect-Fauna of Mt. Ishizuchi and Omago-valley Iyo, Japan. The *Collembola*. Transact. Shikoku Ent. Soc. **11** (1): 1—6.
- UCHIDA, H. 1957. On some Sminthurid Collembolous from Hokkaido. Insecta Matsumurana, **21**: 22—30.
- WU, C. F. 1935. Catalogus Insectorum Sinensium. Peiping **1**: 1—14.
- YOSHI, R. 1939. Isotomid *Collembola* of Japan. Tenthredo. Act. Entom. **2** (4): 348—392.
- YOSHI, R. 1942. Japanische Entomobryinen. Ins. Collemb. Arch. f. Naturg. N. F. **10**: 476—495.
- YOSHI, R. 1953. Einige japanische *Collembolen*, die von den Qullen und Brunnen erbeutet waren. Annot. Zool. Japanenses, Tokyo, **26** (2): 67—72.
- YOSHI, R. 1954. Springschwänze des Ozé-Naturschutzgebietes. Scient. Research. Ozegahara Moor, Tokyo: 777—830.
- YOSHI, R. 1956. Monographie zur Höhlencollembolen Japans. Contrib. Biol. Lab. Kyoto Univ. **3**: 1—109.
- YOSHI, R. 1960. Studies on the Collembolen genus *Hypogastrura*. American Midland Naturalist, **64** (2): 257—281.

- YOSH, R. 1961. On some *Collembola* from Thailand. *Nature and Life in Southeast Asia*, 1: 171—198.
- YOSH, R. 1962. Studies of the Collembolan genus *Hypogastrura* II. Nearctic forms collected by Prof. F. Bonet. *Contr. Biol. Lab. Kyoto Univ.*, 13: 1—25.

STRESZCZENIE

Fauna *Apterygota* Chin jest bardzo niedostatecznie poznana. W okresie lat 1929—1962 z całego tak rozległego obszaru Chin podano tylko 17 gatunków skoczogonków (*Collembola*). Pod koniec 1962 roku Prof. dr KAZIMIERZ KO-
WALSKI, w czasie trzymiesięcznego swego pobytu w Chinach zebrał okolicznościowo materiał z tej grupy owadów, w którym znalazła się stosunkowo znaczna liczba gatunków, mianowicie 11 nowych dla tej gromady owadów, a 9 nie notowanych dotychczas z Chin.

Tak mała liczba gatunków skoczogonków, wykazanych dotychczas z Chin, nie pozwala na scharakteryzowanie fauny *Collembola* Chin. Zdaje się być podobna do występującej w Europie, bo z 21 rodzajów wykazanych dotychczas z Chin, tylko dwa, mianowicie *Salina* M. GILV. i *Homidia* BÖRN. są obce dla fauny europejskiej, natomiast szeroko rozprzestrzenione są we wschodniej Azji. Gatunkowo fauna skoczogonków Chin różni się jednak znacznie od europejskiej, bo z 47 gatunków wykazanych dotychczas z Chin tylko 9 jest wspólnych dla obu tych faun.

РЕЗЮМЕ

Фауна *Apterygota* Китая исследована весьма недостаточно. В период от 1929 до 1962 г. из целой столь обширной территории Китая представлено лишь 17 видов *Collembola*. В конце 1962 года проф. Др Казимир Ковальски, во время своего трехмесячного пребывания в Китае, собрал случайно материал из этой группы насекомых, в котором очутилось сравнительно большое количество видов, именно 11 новых для этого класса насекомых, а 9 неизвестных до сих пор в Китае.

Такое небольшое число видов *Collembola* обнаруженных до сих пор в Китае не разрешает на охарактеризовании фауны *Collembola* Китая. Она кажется похожа на выступающую в Европе так как из 21 видов, обнаруженных до сих пор в Китае, только два, а именно *Salina* M. Gilv. и *Homidia* Börn., являются неизвестными для европейской фауны, в тоже время широко известны в Восточной Азии. В видовом составе фауна *Collembola* Китая значительно отличается однако от европейской ибо из 47 видов обнаруженных до сих пор в Китае только 9 есть общих для обеих фаун.

PLATES

Plate I

Hypogastrura yosii sp. nov.

- Fig. 1. Dorsal part of Abd. IV—VI.
- Fig. 2. Antenna.
- Fig. 3. Antennal organ III, $\times 1000$ (approx.).
- Fig. 4. Apical sensory papilla, $\times 1000$ (approx.).
- Fig. 5. Postantennal organ, $\times 1000$ (approx.).
- Fig. 6. Dentes.
- Fig. 7. Dens of another specimen.
- Fig. 8. Terminal part of third leg.

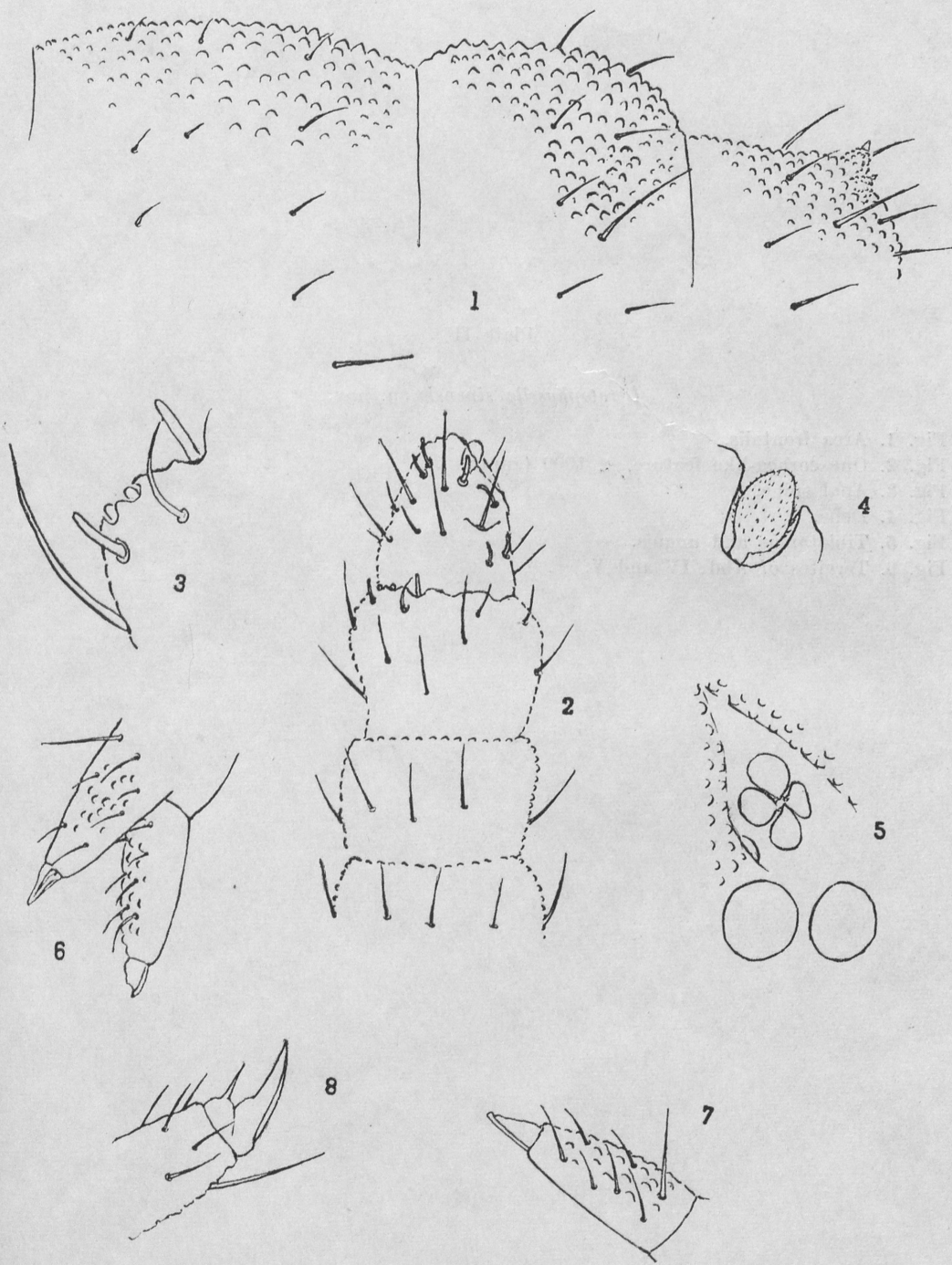


Plate II

Ceratophysella sinensis sp. nov.

- Fig. 1. Area frontalis.
- Fig. 2. One cornea-like feature, $\times 1000$ (approx.).
- Fig. 3. Anal spine.
- Fig. 4. Dens.
- Fig. 5. Tibiotarsus and unguis.
- Fig. 6. Tergites of Abd. IV and V.

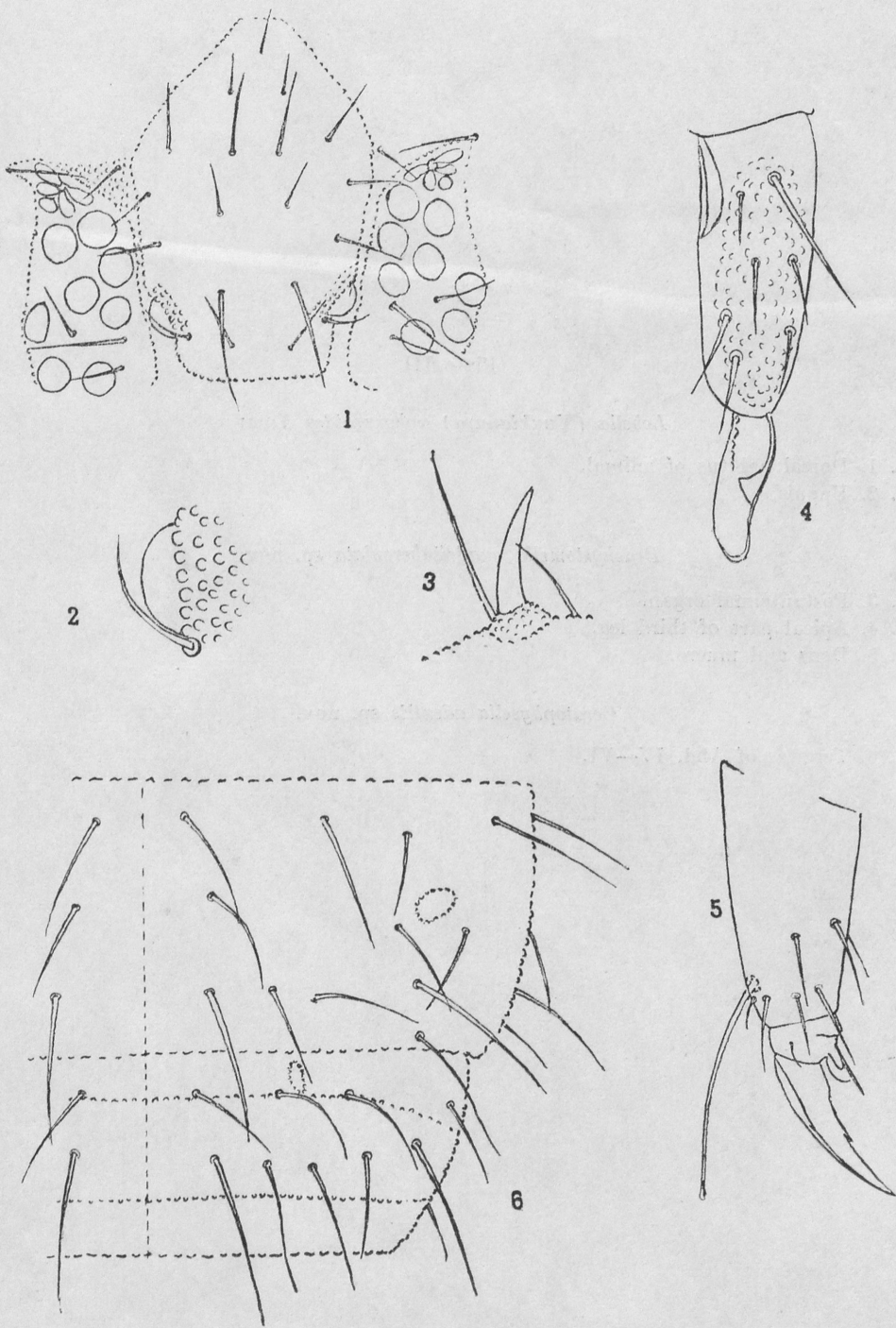


Plate III

Lobella (Yunkianura) aphoruroides YOSH

Fig. 1. Dorsal habitus of animal.

Fig. 2. Unguis.

Brachystomella quadrituberculata sp. nov.

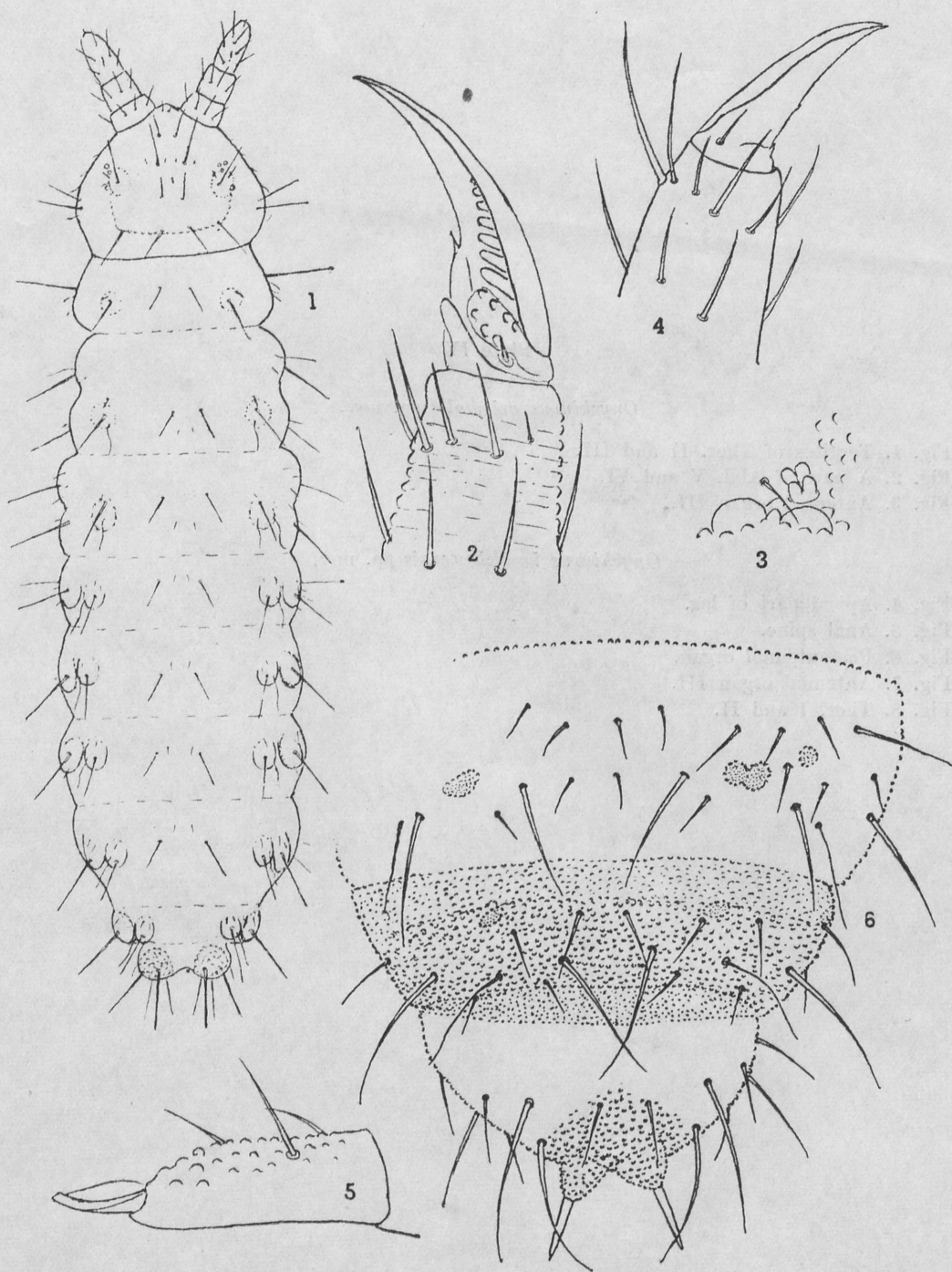
Fig. 3. Postantennal organ.

Fig. 4. Apical part of third leg.

Fig. 5. Dens and mucro.

Ceratophysella adexilis sp. nov.

Fig. 6. Tergites of Abd. IV—VI.



J. Stach

Plate IV

Onychiurus orientalis sp. nov.

Fig. 1. Tergites of Thor. II and III.

Fig. 2. A part of Abd. V and VI.

Fig. 3. Antennal organ III.

Onychiurus hangchowensis sp. nov.

Fig. 4. Apical part of leg.

Fig. 5. Anal spine.

Fig. 6. Postantennal organ.

Fig. 7. Antennal organ III.

Fig. 8. Thor. I and II.

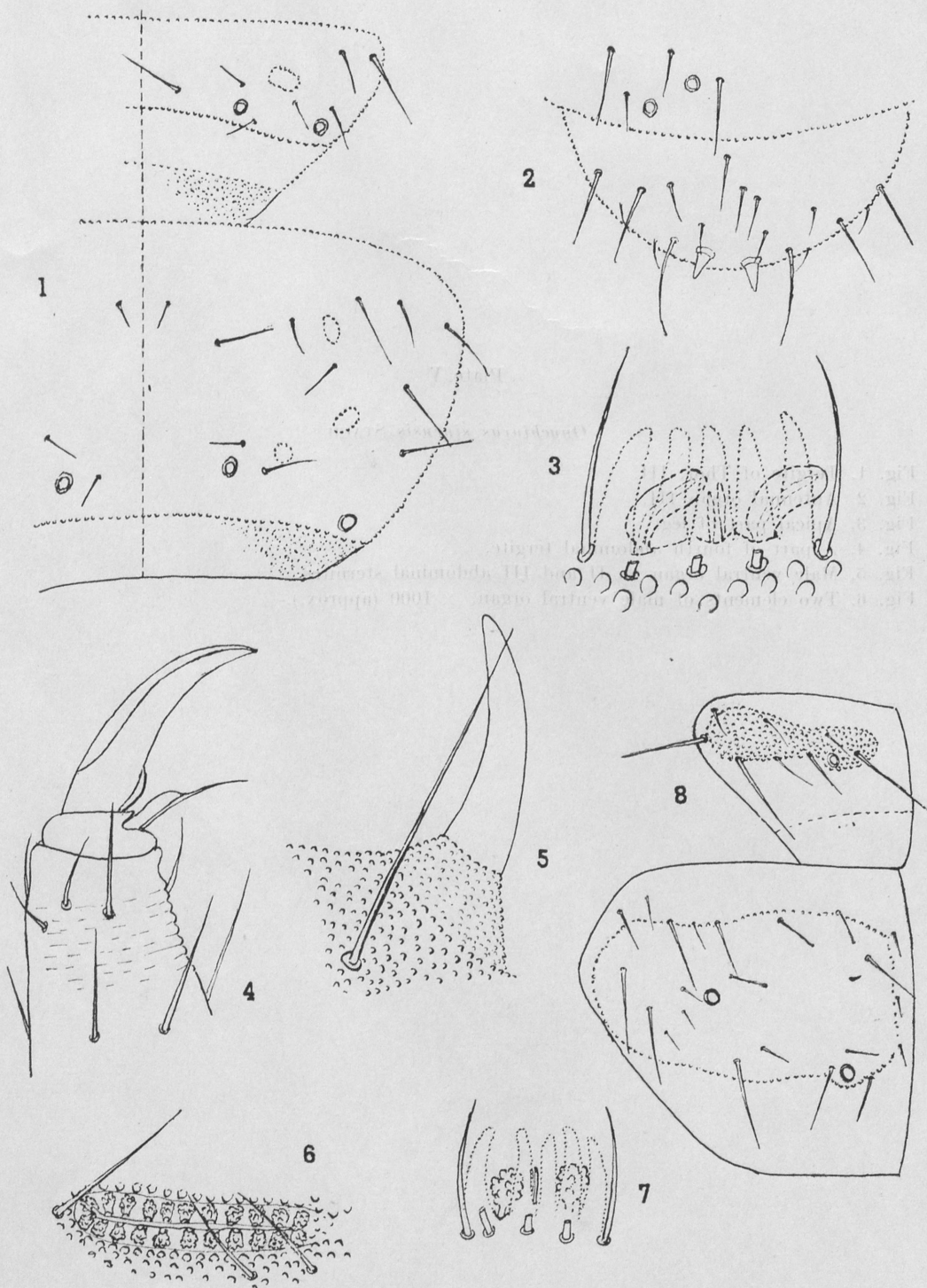


Plate V

Onychiurus sinensis STACH

- Fig. 1. Tergite of Thor. III.
- Fig. 2. Antennal organ III.
- Fig. 3. Apical part of leg.
- Fig. 4. A part of fourth abdominal tergite.
- Fig. 5. Male ventral organ on II and III abdominal sternites.
- Fig. 6. Two elements of male ventral organ, $\times 1000$ (approx.).

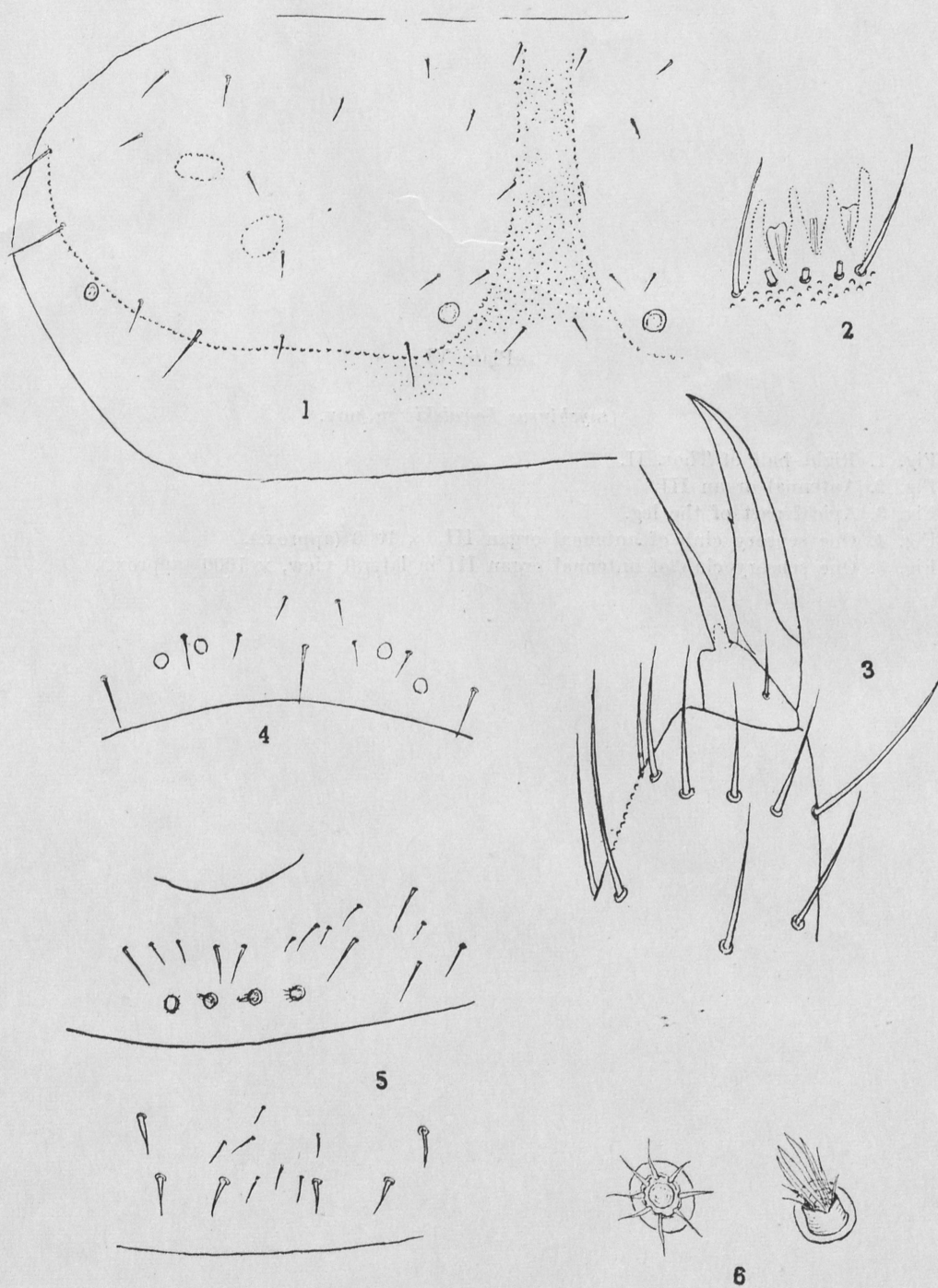


Plate VI

Onychiurus kowalskii sp. nov.

Fig. 1. Right half of Thor. II.

Fig. 2. Antennal organ III.

Fig. 3. Apical part of the leg.

Fig. 4. One sensory club of antennal organ III, $\times 1000$ (approx.).

Fig. 5. One sensory club of antennal organ III in lateral view, $\times 1000$ (approx.).

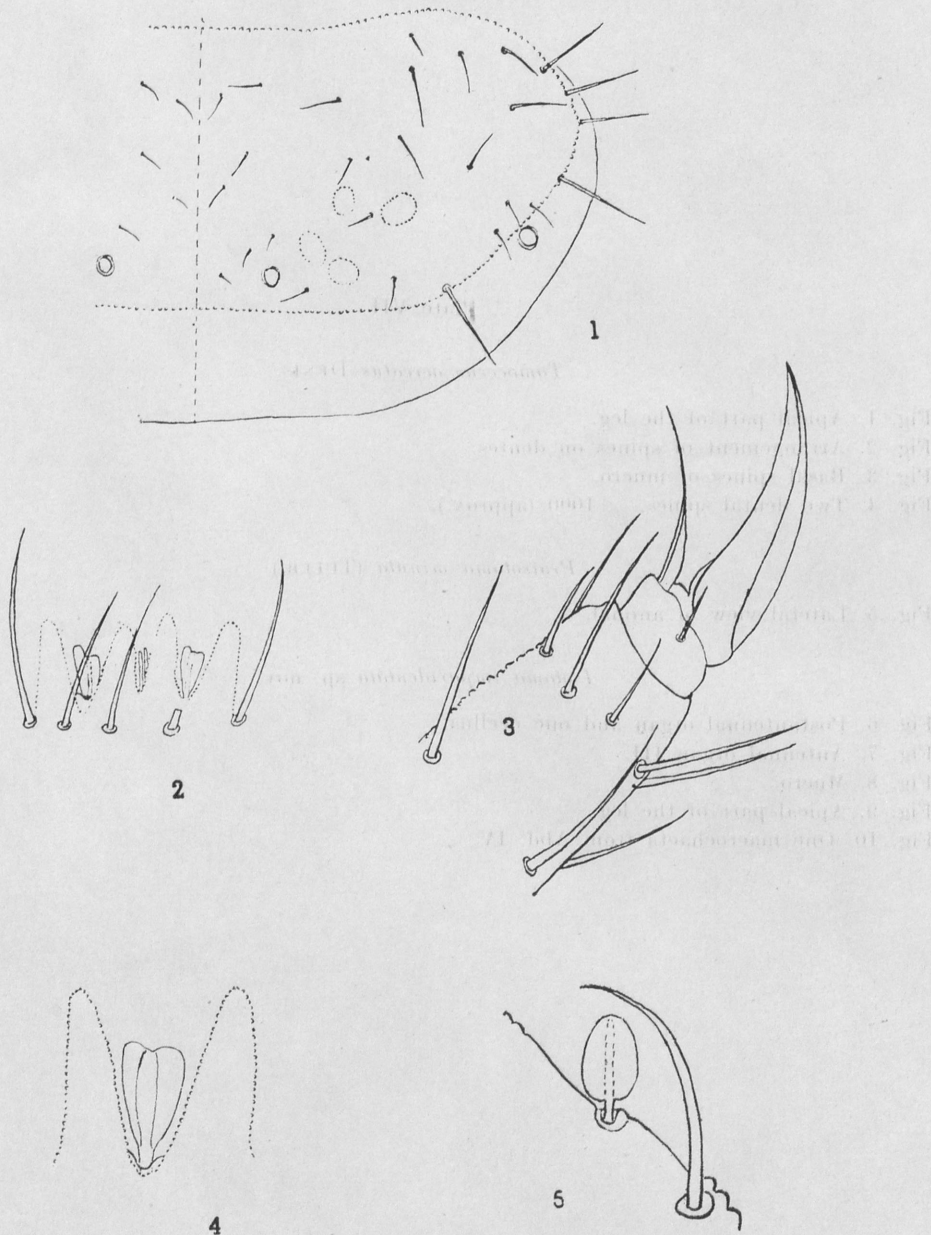


Plate VII

Tomocerus ocreatus DENIS

- Fig. 1. Apical part of the leg.
- Fig. 2. Arrangement of spines on dentes.
- Fig. 3. Basal spines of mucro.
- Fig. 4. Two dental spines, $\times 1000$ (approx.).

Proisotoma minuta (TULLB.)

- Fig. 5. Lateral view of animal.

Isotoma imparidentata sp. nov.

- Fig. 6. Postantennal organ and one ocellus.
- Fig. 7. Antennal organ III.
- Fig. 8. Mucro.
- Fig. 9. Apical part of the leg.
- Fig. 10. One macrochaeta from Abd. IV.

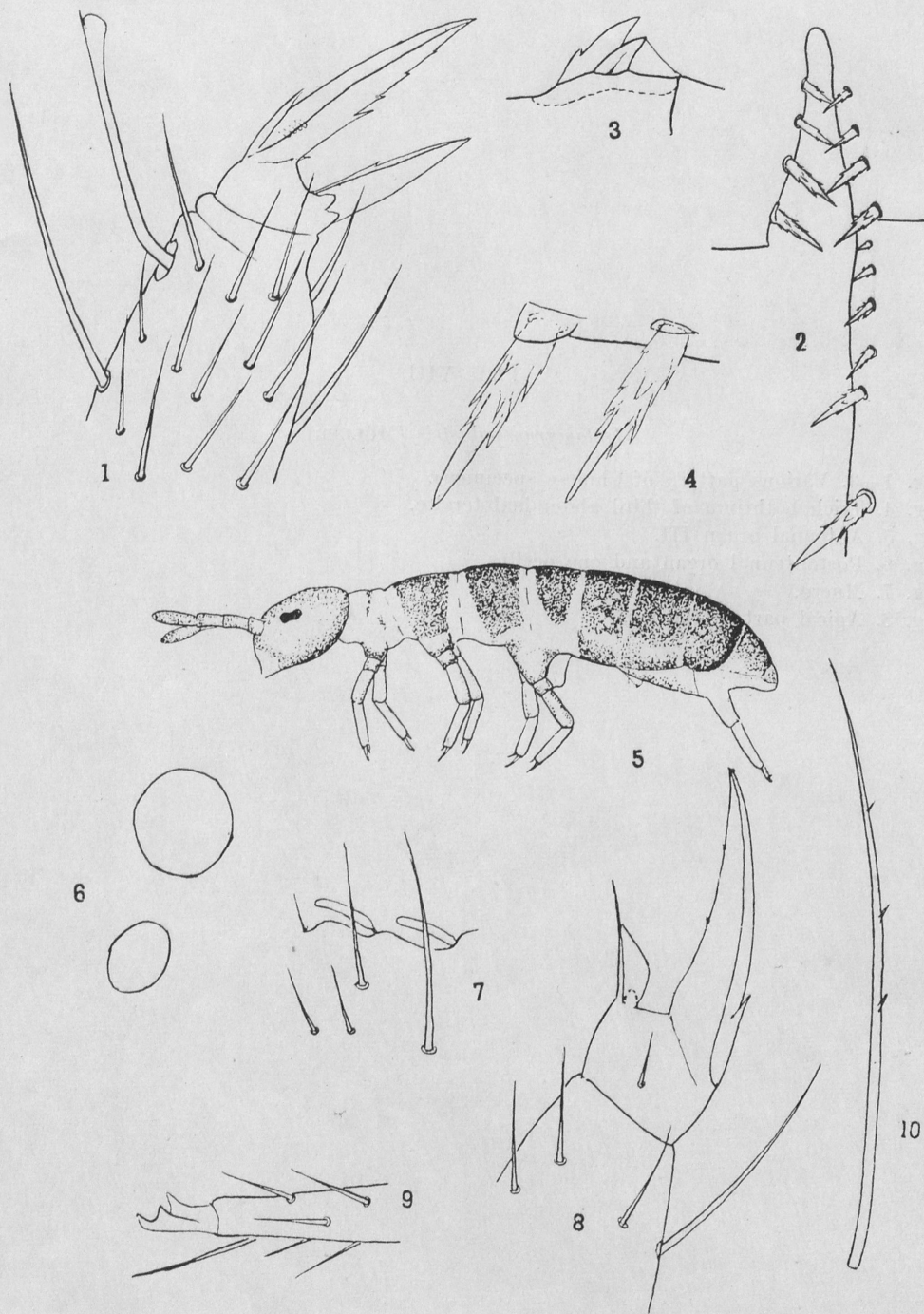


Plate VIII

Isotomurus palustris (MÜLLER)

- Fig. 1—3. Various pattern of Chinese specimens.
Fig. 4. Trichobothrium of third abdominal tergite.
Fig. 5. Antennal organ III.
Fig. 6. Postantennal organ and one ocellus.
Fig. 7. Mucro.
Fig. 8. Apical part of the leg.

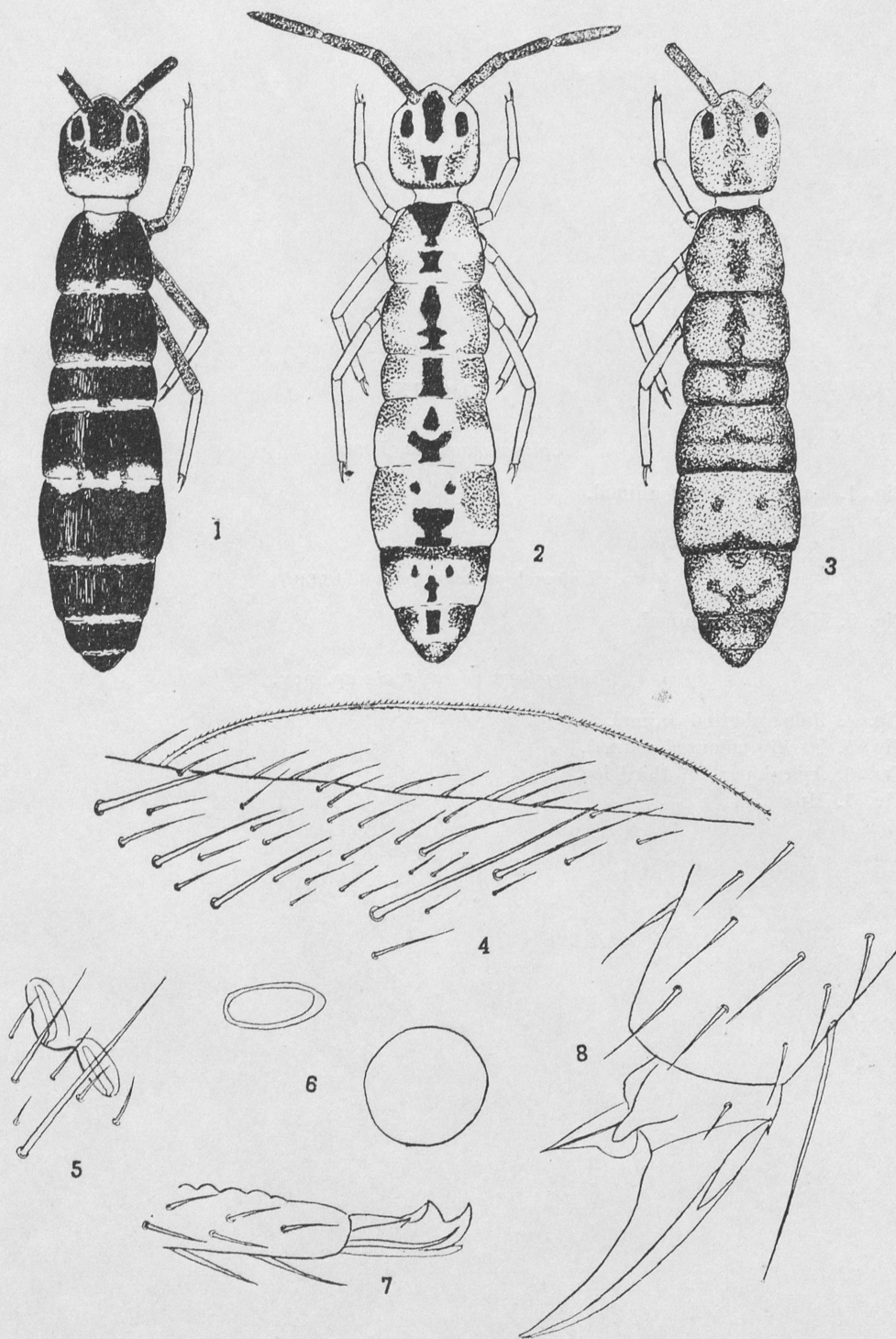


Plate IX

Salina maculata YOSHI

- Fig. 1. Lateral view of animal.
Fig. 2. Mucro.

Entomobrya marginata (TULLB.)

- Fig. 3. Habitus of animal.

Entomobrya dorsosignata sp. nov.

- Fig. 4. Pale coloured animal.
Fig. 5. Darkly coloured animal.
Fig. 6. Apical part of third leg.
Fig. 7. Mucro.

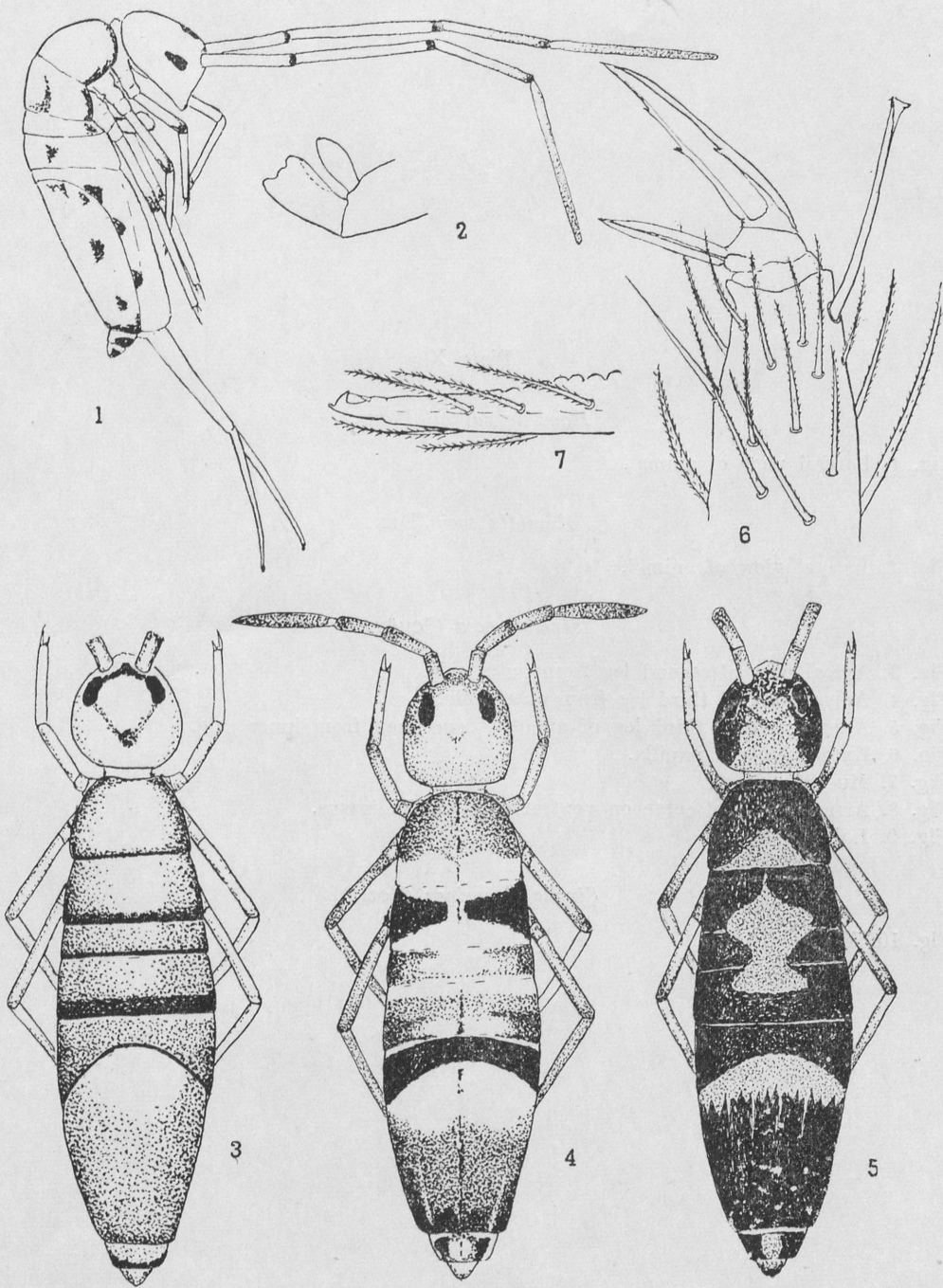


Plate X

Homidia sauteri BÖRN.

Fig. 1. Lateral view of animal.

Homidia socia DEN.

Fig. 2. Lateral view of animal.

Sinella coeca (SCHÖTT)

Fig. 3. Apical part of second leg from outer side.

Fig. 4. Apical part of third leg from outer side.

Fig. 5. Apical part of third leg of an other specimen from inner side.

Fig. 6. External labial papilla.

Fig. 7. Mucro.

Fig. 8. Arrangement of setae on ventral edge of tibiotarsus.

Fig. 9. Labral papillae.

Sinella straminea (FOLS.)

Fig. 10. Mucro.

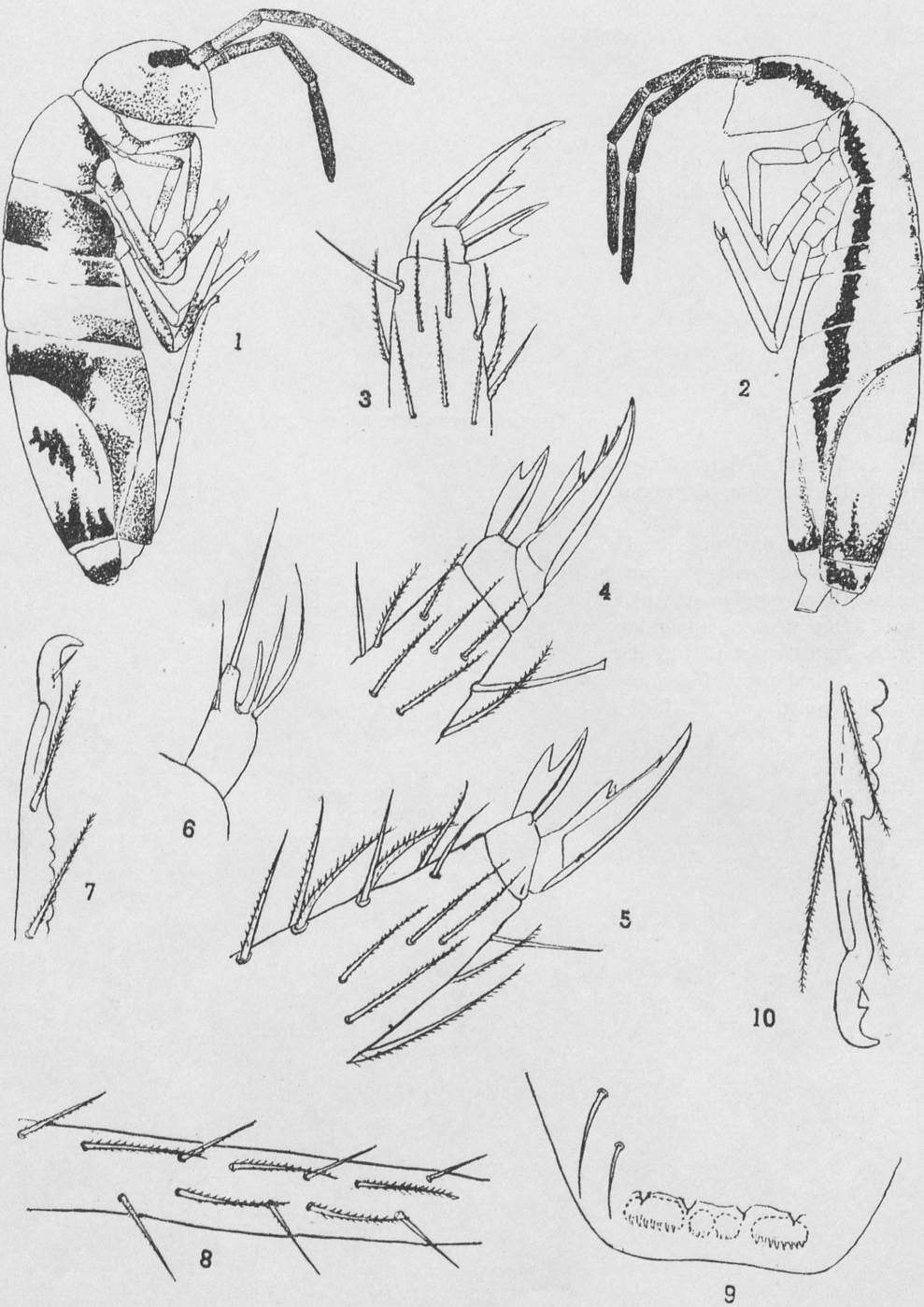
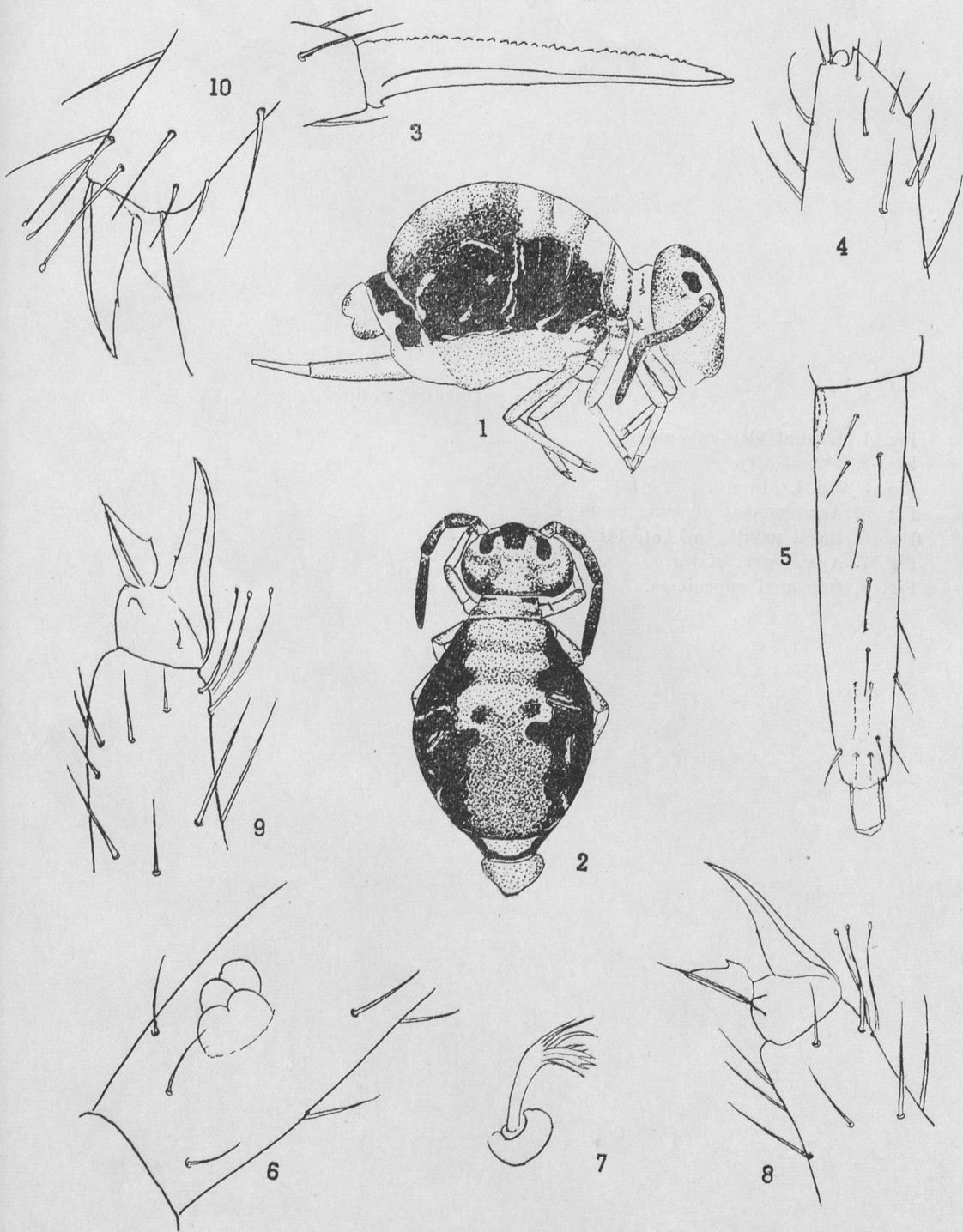


Plate XI

Sminthurinus orientalis sp. nov.

- Fig. 1. Animal in lateral view.
- Fig. 2. Dorsal view of animal.
- Fig. 3. Mucro.
- Fig. 4. Apical part of Ant. IV.
- Fig. 5. Arrangement of setae on dens.
- Fig. 6. Basal papilla on Ant. III.
- Fig. 7. One subanal appendage.
- Fig. 8. Apical part of first leg.
- Fig. 9. Apical part of second leg.
- Fig. 10. Apical part of third leg.

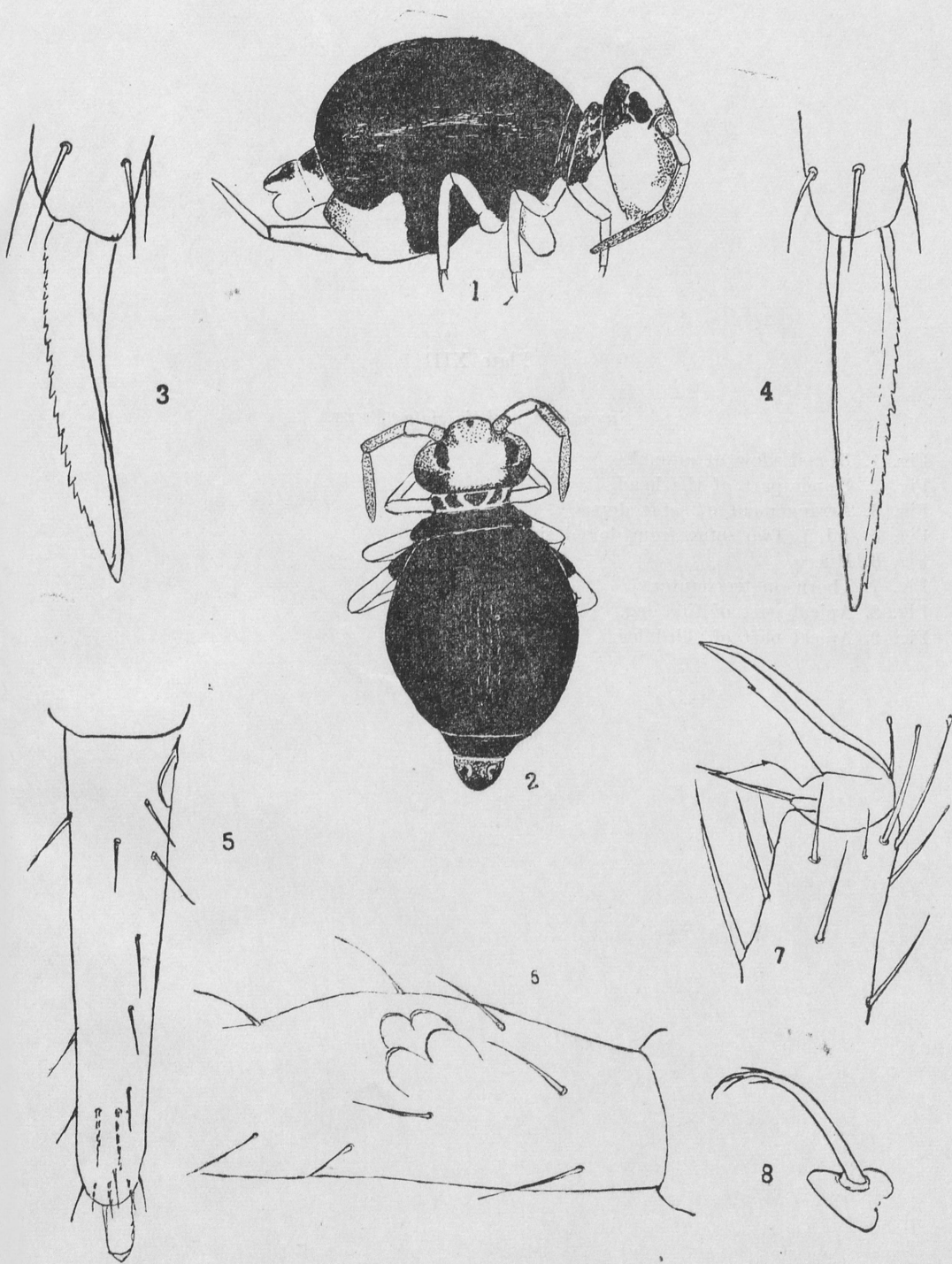


J. Stach

Plate XII

Sminthurinus pekinensis sp. nov.

- Fig. 1. Lateral view of animal.
- Fig. 2. Dorsal view of animal.
- Fig. 3 and 4. Mucro.
- Fig. 5. Arrangement of setae on dens.
- Fig. 6. Basal papilla on Ant. III.
- Fig. 7. Apical part of leg.
- Fig. 8. One anal appendage.

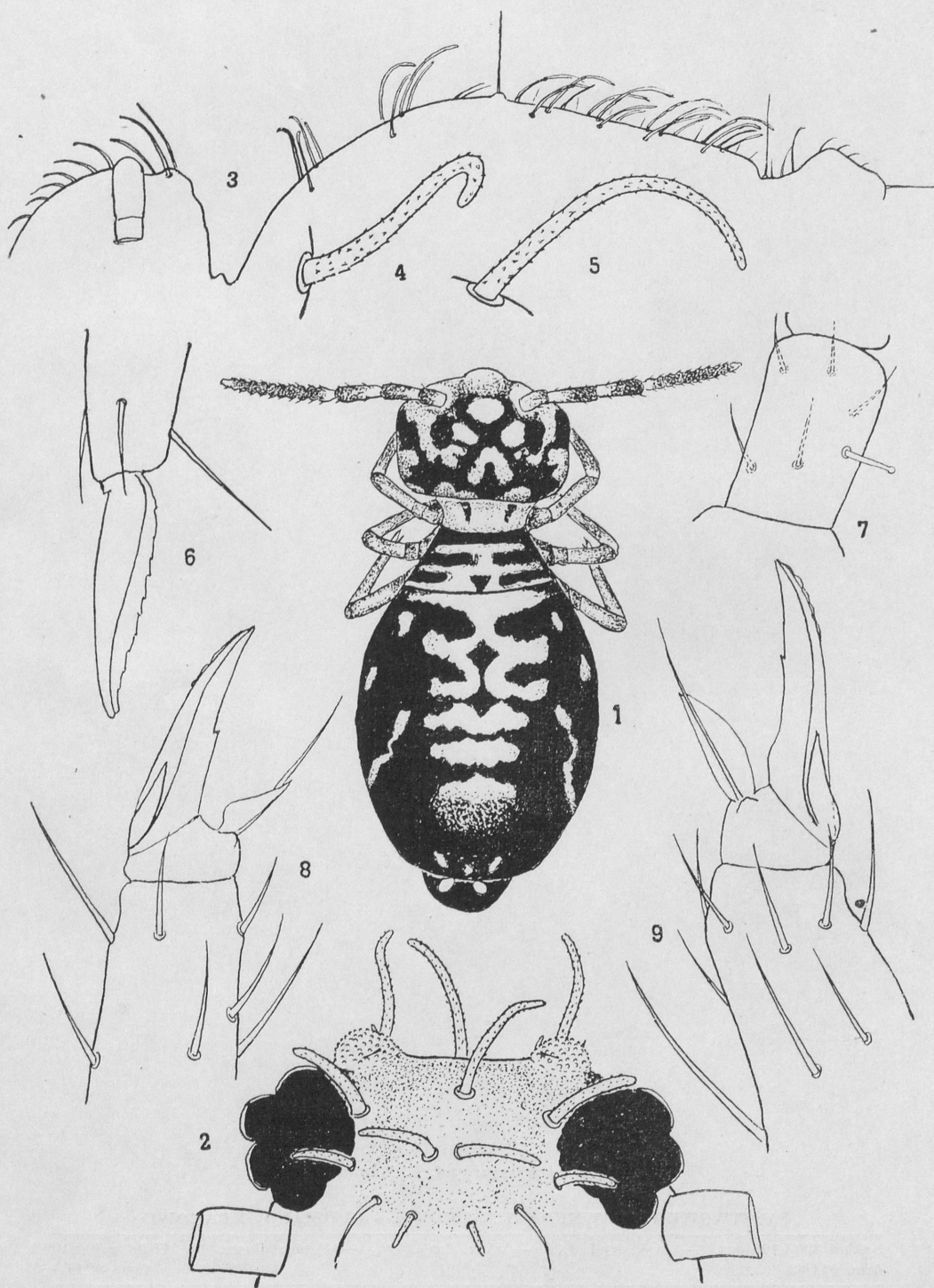


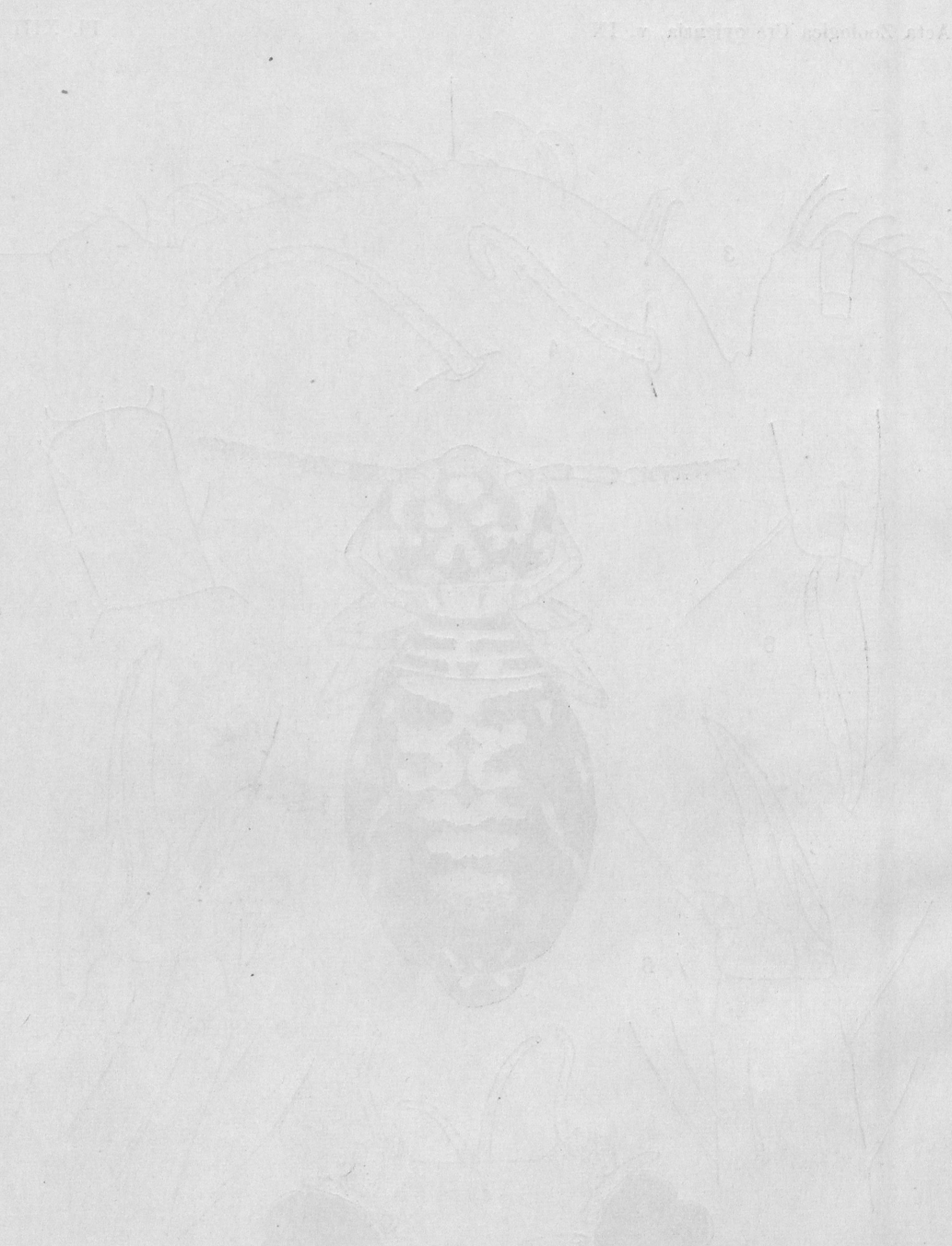
J. Stach

Plate XIII

Spyrotheca multifasciata (REUT.)

- Fig. 1. Dorsal view of animal.
- Fig. 2. Upper part of the head.
- Fig. 3. Arrangement of setae dorsally.
- Fig. 4 and 5. Two setae from dorsal side.
- Fig. 6. Muero.
- Fig. 7. Thorn on trochanter.
- Fig. 8. Apical part of first leg.
- Fig. 9. Apical part of third leg.





Redaktor zeszytu: prof. K. Kowalski.

PAŃSTWOWE WYDAWNICTWO NAUKOWE — ODDZIAŁ W KRAKOWIE

Nakład 800+100 egz. — Ark. wyd. 3,75 — Ark. druk. $3\frac{9}{16}$ — Papier ilustr. kl. III 80 g 70×100
Zam. 554/63

Cena zł 14,—

DRUKARNIA UNIwersYTETU JAGIELLOŃSKIEGO W KRAKOWIE