

A C T A   Z O O L O G I C A  
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Jan STACH

**Przerzutki (*Machilidae*, *Thysanura*) Bulgarii**

***Machilidae* (*Thysanura*) Болгарии**

**The *Machilidae* (*Thysanura*) of Bulgaria**

(Pl. I—VII)

In 1937 I have received from Mr A. K. DRENOWSKI materials of the *Apterygota* collected by him in Bulgaria, especially in mountains of that country. In this collection I have found some new species from *Collembola* and other orders of *Apterygota*. I have returned the list of all species and materials determined by me to Mr DRENOWSKI. That list was published in 1937, in Bulgaria as a private edition. The outbreak of the war has not allowed me to describe these Bulgarian *Apterygota*.

From the order *Thysanura* four new species distinguished by me, *Atelura montana*, *Dilta macedonica*, *Trigoniomachilis urumovi* and *Admesomachilis drenowskii* were noted in the list.

In the meantime Dr P. W. WYGODZINSKY, in 1941, has described on the ground of materials determined by me and send him by Mr DRENOWSKI two species, viz. *Atelura montana* STACH and *Trigoniomachilis urumovi* STACH. Two others of the above-mentioned new species remained undescribed. Since at present I have received new materials of the Bulgarian

*Apterygota* collected by Mr A. K. DRENOWSKI and other Bulgarian entomologists, and some specimens caught in Bulgaria also by Polish naturalist Prof. Dr J. URBAŃSKI, so have I resolved to the nearer description of the Bulgarian *Machilidae*, the more so as in these materials are represented still some other new species from this family<sup>1</sup>.

The number of the species of *Machilidae* known at present from Bulgaria is quite great. The *Machilidae* examined by me are as follows:

*Admesomachilis drenowskii* STACH, 1937,  
*Admesomachilis drenowskii* var. *catamachilideus* n. v.  
*Charimachilis armata* n. sp.  
*Silvestrichilis macedonica* (STACH, 1937),  
*Trigoniophthalmus banaticus* (VERHOEFF, 1910),  
*Trigoniophthalmus wygodzinskyi* n. sp.,  
*Trigoniomachilis urumovi* STACH, 1937,  
*Lepismachilis notata* STACH, 1919,  
*Lepismachilis feminata* STACH,  
*Lepismachilis janetscheki* n. sp.,  
*Berlesilis targionii* (GRASSI, 1887).

The species determined by other authors:

*Machilinus kleinenbergi* (GIARDINA, 1900) — determ. WYGODZINSKY, 1941,  
*Lepismachilis praestans* (SILV. 1942) — determ. SILVESTRI, 1942,  
*Silvestrichilis orientalinus* (SILV. 1942) — determ. SILVESTRI, 1942.

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<sup>1</sup> Lately Prof. H. JANETSCHEK has published the paper „Über Felsenspringer aus Kreta und den Balkanländern“ (Acta Zool. Crac. 2, 1957) in which he has described some new species related to those here examined by me. Among them there is also one species from Central-Macedonia, Yugoslavia, belonging to my proposed genus *Admesomachilis*. Prof. JANETSCHEK establishes for this species a new genus and was so kind to call it *Stachilis* JANETSCHEK.

I am publishing my examination of the Bulgarian Machilidae in its original form and I do not change the primary term of this genus, as I leave the decision in this problem to Prof. JANETSCHEK.



*Admesomachilis drenowskii* STACH, 1937<sup>1</sup>

Plate I, fig. 1—8, II, fig. 1—6, III, fig. 1—4

Oculi almost as wide as long (16 mm:15 mm), weakly arched, uniformly dark coloured, touching together medianly in the line 9 mm long. This contact-line is thus about  $\frac{2}{3}$  of the eye-length. Ocelli broadly elliptical, 3,5 mm long and 5 mm wide, placed sublaterally, in the specimens preserved in alcohol white, sometimes medianly with a trace of brownish pigment. The distance between the inner edges of the ocelli is about 2,5 times longer than the width of one ocellus. The median part between the ocelli is only weakly elevated.

The antennae, only a little damaged in examined specimens, are 3,5 mm long, thus distinctly shorter than the body. Scapus, slightly longer than wide (as 4:3), and flagellum are covered abundantly with brown scales and relatively stout brown setae. Flagellum, only weakly thickened at the basis, narrows gradually towards the end. After about 50 proximal joints there follow, at first indistinctly delimited 2—3 chains composed of 6—8 joints in the female specimens, and 5 in the male. The proximal and median joints in the female are narrower than those in the male and differently equipped with setae. In the female each of these joints has one or two whorls of rather long setae, in the male, however, the median joints are furnished beside some longer setae with 3—4 parallel rows of many short stout setae forming on the outer edge of the antennae a dense long brush. The terminal joints of both sexes are equally long and wide, but in the male they are also here clothed with shorter setae than those in the female. On ventral side of the each 4—6 joints appear in both sexes a small, dark yellowish-brown coloured sensory bladder of relatively

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<sup>1</sup> The species *Stachilis pectinata* JANETSCH. akin to *Admesomachilis drenowskii* var. *catamachilideus* differs in some characteristics from the latter, especially in the pigmentation of the head and maxillary palps; in the chaetotaxy of the antennae and last segment of maxillary palps; absence of the sensible granules on the femur of the foreleg in the male and other features.

thick walls; in terminal chains of joints such a bladder is on only one joint of each chain.

Maxillary palps in both sexes without integumentary pigment, uniformly pale brownish, covered with many brown scales and short stout brownish-black setae, moreover at the 6—8th joints dorsally with spines, some of which are brownish coloured at the tip, especially in the male. The last distal joint is in female distinctly conical, gradually tapering towards the end, armed apically with a moderately long spine. In the male a small distal part of the 6th joint and whole ventral side of the 7th and 8th joint is covered densely with minute spine-like granules and many stout brown setae. The last distal joint is thicker than that in the female, approximately ovoid, at the tip narrowed, however, and furnished apically with a spine shorter than that in the female.

Labial palps in both sexes about equally long; only the terminal joint is in the male a little broader than that in the female. The joints are covered with scales and setae, but not modified in any special form.

Mandibles with well developed molar plate and four teeth apically.

Legs slender, provided with stylets at the third pair only. All legs in both sexes covered with scales and brownish-black stout setae. The ventral edge of femur furnished with an abundant cluster of long, stout, straight bristles, which further at ventral edge of the tibia are arranged in two longitudinal rows and on tarsus become shorter, more similar to straight, blunt spines; all these spine-like bristles are dark brownish coloured. The femur of the first pair of legs is in both sexes broader than that of the following pairs; in the male it is, however, covered at the outer side with finer setae than in the female and among the setae there is a small field with some indistinct small heaps of minute granules, homologous with those existing in *Lepismachilis* VERH., but weakly developed and without the company of short sensory setulae.

Sternites well developed, triangular, on the II—VII segments right or obtuse angled, on the VIII in the male short, of a parenthical shape. Segments II—V with two pairs of vesicles each. Coxites of all segments without the spines late-



rally. Segments II—IX with stylets furnished with moderately long, stout, pale brownish setae, and at the tip with an sting-like bristle. Relation of the length of the stylet with apical bristle: length of the coxite is

	in female	in male
II—VII . . .	0,6	0,6
VIII . . .	0,8	0,8
IX . . .	0,8	1,0

The relation of the length of the coxite IX of the female to that of the male is as 17:12.

Ovipositor slender, cylindrical, projecting beyond the stylets of the IX segment at the length of these stylets. Gonapophyses of the VIII segment consist of 50—52 joints. On the 5th proximal joint there appears at the inner edge a fine, minute setula which on the following joints become gradually longer, stouter and brownish coloured. The further joints are furnished moreover with one long, stout seta at the outer edge, two a little shorter submedianly, and one small setula medianly or near the inner edge. Gonapophyses of the IX segment are finer than those of the VIII segment and composed of 51—54 joints. The proximal joints beginning from the 9, are provided only with a minute setula on the inner edge each. This setula becomes from the 25 gradually longer, and on the 35th joint there appears near it one short seta. On the last five joints is found moreover a fine, short sensory rod placed between these two setae. The apical joint is furnished besides with a stout bristle as long as the four last joints together.

Paramera present on the IX segment only. They are relatively long, reaching up to the end of the coxae, and consisting of the basal part and six terminal joints. Each of the four median joints is furnished with a group of short rods and delimited at its posterior edge by an oblique transversal comb of many sharp, spine-like processes. The apical joint is longer, conical, furnished with many short rods. Penis is as long as the paramera; its circular aperture, lying subapically, is at its circumference and in environment beset densely with many stiff, short rods.

Cerci and filum were damaged in all specimens.



The colour of animals preserved in alcohol is uniformly dirty brownish. The hypodermal pigment is absent. The pattern formed by scales was not preserved.

Body length 11 mm.

Locality in which the specimens were found: Bulgaria. — Lulin-mountains, Bankja, 26 VII 1935, 8 sp., leg. A. DRENOWSKI.

I have erected for the specimens nearer described here a separate genus with the genotype *Admesomachilis drenowskii* STACH. As this species has two pairs of vesicles on the II—V segment, and large triangular sternites it should be referred to the genus belonging to the subfamily *Machilinae*. By the legs provided with stylets only on the third pair, and the presence of paramera only on IX segment, it comes nearer to *Metamachilis* SILV., *Mesomachilis* SILV. and *Promesomachilis* SILV. The species of the *Metamachilis* SILV. and *Promesomachilis* SILV. have, however, the ovipositor short, furnished with spines, and of the *Mesomachilis* SILV. ovipositor without spines, but the ocelli broad, sole-like.

**var. *catamachilideus* n. var.**

The specimens of this variety agree exactly in all their characteristics with the principal form, but differ distinctly by having only one pair of vesicles on the II—VII segment each. This difference is, however, so remarkable that I was a long time undecided, whether these specimens should be regarded only as a variety of *Admesomachilis drenowskii*, or referred to the genus *Catamachilis* SILV. near the species *Catamachilis torquata* SILV. which have also the ovipositor without the spines. In this case we should deal with two species, which, except the number of vesicles do not differ in any other characteristic, the one of them belonging, however, to the subfamily *Praemachilinae* CARP., the other to the subfamily *Machilinae* VERH.

In each case, however, both considered as separate species or as varieties, destroy the limit, which have existed

up to day between the subfamily *Praemachilinae* and the subfamily *Machilinae* VERH.

Locality in which the specimens of this variety were found: Bulgaria. — Golo Brdo, about 850 m alt., 11 VI 1949, 10 sp.

***Charimachilis armata* n. sp.**

Plate II, fig. 7—10

Length about 10 mm.

Body covered densely with brown scales, but the pattern is not preserved in the specimen kept in alcohol. Integumentary pigment is absent.

Oculi uniformly black coloured. The relation of the length of the oculus to its width is as 4,2:6. The contact line of the oculi is a little longer than half the length (2,5) of the oculus; the ratio of these lengths is thus 0,6. Ocelli brownish black. Ocellus almost as wide as the oculus (5,5:6), is at its median end a little broader than on the lateral one, and narrowed in the middle.

Antennae, covered abundantly with scales and setae, are a little damaged in the examined specimen, 4 mm long. The scapus is longer than wide (5,5:3,6) and the flagellum moderately thick basally, tapering gradually towards the end. Behind the 35 proximal joints there appear in the flagellum distinctly delimited chains composed of 7, 6, 9, 9, 10 joints. Each of these joints is furnished with one whorl of about 15 long setae; sometimes there appear distally a second whorl of some shorter setae and two fine short sensory rods.

Maxillary palp covered with many brown scales and short setae; the relation of the lengths of the joints in the examined specimen is as 4,5:7:7:6:9,5:7:7,6. The last joint is conical, gradually tapering, armed at the end with relatively long spine (0,8). The dorsal edge of the VI joint is furnished along its whole length with 6 spines, the VII with 9 arranged in two rows and the VIII with 16 spines. The spines are relatively long and not coloured.

The apical joint of the labial palp is not broadened remar-



kably, 2 mm long and 1 mm wide; it is covered with scales and short setae, moreover at the upper edge with about 25 conical sensory rods.

Mandible with well developed molar plate and with four teeth apically.

Legs moderately long, slender. The second and third pair of legs provided with stylets. The legs are covered abundantly with scales and setae. At ventral edge of the trochanter, femur, tibia and tarsus the setae set densely and are long, about half as long as the width of the femur, but rather thick, not similar to fine thin hairs. Among these setae stand moreover some stout spines, about twice thicker than the neighbouring long setae. 3 of the spines appear on the femur, 10 on the tibia arranged in two longitudinal rows, 4 in two rows on third tarsal joint, and 10 in two rows on second joint; the spines of the tarsal joints are also stout, but longer and more similar to thick bristles.

Sternites long, triangular, sharp-angled ( $50^{\circ}$ — $60^{\circ}$ ). Segments I—VII with one pair of vesicles each. Segments II—IX with stylets moderately long setose, furnished at the tip with strong bristle, about half as long as the stylets. Coxites of I—VIII segments without spines laterally. The relation of coxites of the VIII segment to the length of the styli and apical bristle is as 10:6:2,5; and of these of the IX segment as 18:9,5:3,3. The coxite of the IX segment is provided near the outer edge with 1—2 strong hyalin spines and at the inner edge with 7 spines.

Ovipositor relatively short, does not reach up to basis of the stylet of IX segment. It is provided with many short and some remarkably long setae. Gonapophyses of the VIII segment composed of 18 joints; the submedial ones are remarkably broadened, four distal ones are armed with a strong spine laterally, and the last joint furnished at the tip with a strong bristle inserted in a shallow deepening, which at the outer edge is provided with two spine-like processes. Gonapophyses of the IX segment are composed of 17 joints which gradually narrow towards the end, have no lateral spines, but the whole apical joint is elongated in a strong, curved, chitinized prickle, furnished laterally with a stout bristle, longer than this joint.



The tip of the long filum terminale is breached off. The cerci, 2,5 mm long, end with a strong spine, provided subapically with a small secondary spine and with two pairs of moderately long setae.

The locality in which the specimen was found:

Bulgaria. — Cap Galata near Varna, under a stone in a moist forest with white poplar for the most part 22 XI 1953, 1 sp. leg. Prof. J. URBAŃSKI.

From the genus *Charimachilis* WYG. four species were known at present, viz. *Charim. orientalis* (SILV., 1908) from Korfu and Italy, *Charim. palaestinensis* WYG., 1939, from Palestine, *Charim. dentata* WYG. from Greece (Leonidion), and *Charim. relictata* JANETSCH. from Tirol (Stubai Alps)<sup>1</sup>. From all these species only the females are known.

The new Bulgarian species agree in many body details with *Charimachilis relictata* JANETSCH. and *Charimachilis dentata* WYG. first of all by the shape and equipment of the ovipositor with long hairs and of the distal joits of gonapophyses VIII with spines.

From the first species the new one differs in greater number of the joints in gonapophyses, in the form of the last joint of gonapophyses VIII, which is armed laterally at the end with two distinct spine-like processes and apically with longer bristle, further by presence of spine-like stout bristles ventrally on the legs, and by the spines on the coxa of IX segment.

More similar is the new species to *Charimachilis dentata* WYG. from Greece, which description based on examination of the one damaged specimen is insufficient in some details. The new species differs only in the ratio of the length of the stylets to the length of the coxites of the VIII and IX segments, which in *Charimachilis dentata* WYG. are 0,6 and 0,4 and in Bulgarian specimen 0,8 and 0,7. Nothing is mentioned in the description of *Charimachilis dentata* WYG. on the clothing of the legs and shape of the sternites in this species.

It is not excluded that the Bulgarian species represents only a variety of the *Charimachilis dentata* WYG.

<sup>2</sup> Prof. JANETSCHKEK describes lately two new subspecies of the species *Charimachilis relictata* JANETSCH. namely *Ch. relictata meridionalis* from Greece and *Ch. relictata insularis* from Crete.

*Silvestrichilis macedonica* STACH

Plate IV, fig. 1—13; Pl. V, fig. 1—6

Syn.: *Dilta macedonica* — STACH, 1937 in litt.

Length of the body 11 mm.

Colour of animals preserved in alcohol is uniformly dirty pale brownish. The pattern formed by scales is not preserved.

The composed eyes uniformly dark coloured, relatively small, weakly arched, broadly elliptical; the relation of their length to the width is as 16:21,5. They touch together in median line of the head on the distance, which is about  $\frac{1}{3}$  as long as one oculus. The ratio of the length of this distance to the eye-length is 0,34. Ocelli narrowly elliptical, half as long as wide, placed sublaterally, strictly speaking below the middle of each eye, in specimens preserved in alcohol weakly red-brownish pigmented in the middle. The distance between the ocelli is twice longer than the width of one ocellus. They are separated by a moderately high median hump, covered by small brown scales and some shorter and longer hairs. More abundantly clothed with hairs is the clypeus at the front and laterally.

Antennae of examined specimens were damaged. The remaining part of antennae is 7,5 mm long, thus about  $\frac{2}{3}$  of the length of the examined specimens; as the terminal joints of antennae are still thin, the total length of the undamaged antennae seems to be shorter than the body-length of animals. Scapus and all joints of flagellum furnished with fine scales and setae. Flagellum slightly thickened basally, narrows gradually towards the end and forms terminally distinctly separated chains composed of nine small globular secondary joints. Each of these joints has across wrinkled surface, one or two whorls of setae, some short sensory rods and globular sensillae, moreover some of these joints have also very minute rosace-like sensillae.

Maxillary palp in both sexes almost equally long, of the same shape, covered abundantly with brown scales and setae.

The joints narrow gradually towards the end, and the last joint is as thick in the male as in female. The relative lengths of the joints in the female is as 4:6:5:6,2:9,5:7,8:6,5, and in male 3,5:6:7:8,5:10:8:7. The 3—5 joints in the male are furnished in ventral part with many fine hairs approximately as long as the width of these joints; in female there appear also ventrally long hairs, but on the third joint only, less abundantly and a little thicker. On the other hand the number of spines standing dorsally on the last joint is in the female greater than in male; in female 5, 13, 13, in male 2, 7, 10 and apically a large spine. The weakly developed integumentary brown pigment appears only on the basal joint of the palp.

Labial palps have three proximal joints clothed with fine setae. The fourth joint is hatchet-like, in the male almost twice as broad as long, and more than twice broader than in female. The upper edge of the palp is furnished in female with an irregular row of about 15 high sensory rods; in the male these rods appear on the ventral side of the palp in great number, about 300, and are arranged in about 9 parallel rows beginning at the half of the length of this joint.

Mandibles with well developed molar plate and four teeth apically.

Legs slender, the second and third pair of them a little longer than the foreleg and furnished with relatively long stylets. All legs in both sexes covered with scales and furnished ventrally on trochanters, femur and tibia with long, fine hairs, and on tarsal segments moreover with some stiff, long, stout bristles. The hairs on tibia and femur are half as long as the width of these segments, and on second segment of tarsus the stout bristles are as long as or longer than the width of tarsus. Moreover there appear on the ventral edge of the first and second segment of the tarsus, or only on the second one strong, thick, vertically standing spines. In the female they appear only on second segment, namely on foreleg 1—2, on second leg 3, on the third 0—3; in male on foreleg 4—5 on second segment and 1 on first segment, on the second leg 3—4 on second segment and no on the first one, on the third leg 4 on the second segment and no at the first. On the outer side of



the femur of the foreleg there is in the male relatively large triangular field covered with fine setulae and small granulated features similar as those in *Lepismachilis* VERH.

Sternites well developed triangular, on the anterior segments sharp-angled, on posterior almost rect-angled; they reach to about half the length of the urosternites. Segments I—VII with one pair of vesicles each. Coxites of the IV—VIII segments armed laterally in both sexes with 1—2 hyaline spines; of the IX segment in the male on the outer edge with 2 and on the inner with 4 spines. Segments II—IX with stylets moderately long setose, furnished at the tip with a stout, sting-like bristle which on the II—VIII segments is about half as long as the stylet, on the IX segment in the male of 1/4 its length. Relation of the length of the stylet: length of coxite is:

female			male		
coxit:	stylet:	stylet with bristle	coxit:	stylet:	stylet with bristle
II—VII	0,4—0,5	0,6—0,7	II—VII	0,4—0,5	0,6—0,7
VIII	0,7	0,9	VIII	0,6	0,8
IX	stylet absent		IX	0,9	1,2

The relation of the length of the coxite IX of the female to that of the male is as 20:14.

Ovipositor slender, approximately cylindrical, projecting beyond the coxites of the IX segment for more than the length of them. Gonapophyses of the VIII segment consist of 62 joints. At the 19 proximal joints (except the basal joint) each is on the inner edge with a minute setula only, on the 20th appears similar small setula at the outer edge of each joint and on the following joints it becomes gradually longer; at the 30th joint appears medianly a third seta and on 48th and following joints each moreover a minute rod. Each of the four distal joints have two longer setae and one or two rods, and the last joint besides a pair of minute rods and apically a long bristle about as long as the length of four last joints together. Gonapophyses of the IX segment are composed of the basal joints and 59

others. The 35 proximal joints are unsetaceous, the following ones with one long seta on the inner edge and one minute rod on the outer one, below which on each of the 7—13 joints appears a short, relatively thick, curved, dark brown coloured, spine-like, but blunt process; on the further 10—13 joints this process disappears and each joint is furnished with one long seta on the inner edge, a little shorter one at the outer edge, and one or two small rods; the last joint is armed moreover with a long apical bristle.

Paramera present on the VIII and IX segments, relatively slender and moderately long, consist of a long basal part and six terminal joints, each furnished at the inner edge with some blunt spine-like rods. Paramera of the IX segment are  $\frac{3}{4}$  as long as the coxites. Penis a little shorter than paramera; it is slender, cylindrical with sharp triangular processes at the tip and some longer setae curved at the ends. The apical part of the penis is shorter than the basal one.

Cerci in female 3,75 mm and in male 4,5 mm long; they are covered densely with brown scales and at the inner edge armed with 2—3 hyalin spines on the joints. At the end of the cercus there is a strong, conical process furnished with 3 setae. Filum terminale in the female about  $\frac{2}{3}$  as long as the body and in the male equally long as the body, ends also with stout spine-like process.

Locality in which the specimens were found:

Bulgaria. — Alibotuš-mountains, Kitka, about 1450 m alt.,  
2—10 VII 1936, 2 ♂ and 3 ♀, leg. A. DRE-  
NOWSKI.

I have determined, in 1937, the species described here as *Dilta macedonica* n. sp. as in that time the European *Machilidae* provided with one pair of vesicles on I—VII segments, well developed triangular sternites, stylets at the second and third pairs of legs, and sublateral ocelli were referred to the genus *Dilta* STRAND or *Praemachilis* SILV. SILVESTRI, in 1942, has also determined as *Dilta heterotarsus* the specimens examined by him from mounts Dospatsky, Rhodope in Bulgaria. So did WYGODZINSKY, in 1939 and 1942, determining the

related specimens from Palestine as *Praemachilis trispina* WYG.

In 1950 erected WYGODZINSKY a new genus *Silvestrichilis* WYG. for the *Dilta heterotarsus* SILV. and *Praemachilis trispina* WYG., which differs — according to the author — from *Praemachilis* SILV. by the sublateral position of the ocelli and the presence of spines at the second joint of tarsus, and from *Dilta* STRAND by the more transversally lengthened ocelli and the presence of spines on the tarsus.

Recently, in 1955, JANETSCHEK has described from Montpellier, France, a new species *Silvestrichilis tuzeti* JANETSCH. and to this genus should be referred also *Silvestrichilis macedonica* STACH described here.

Unfortunately from these four species of the genus *Silvestrichilis* WYG. only two are known at present in both sexes namely *Silvestrichilis heterotarsa* (SILV.) and *Silvestrichilis macedonica* STACH, of two other the females only are described.

The species described here differs from *Silvestrichilis heterotarsa* (SILV.) by having a large field with sensillae at the outer side of the femur of the foreleg in the male, the shape of the spines at the second joint of the tarsus, and by very characteristic dark brown coloured, curved rods on some joints of the gonapophyses of the VIII segment.

In *Silvestrichilis trispina* (WYG.) the line of the touching of the eyes is very short, about three times shorter than in *Silvestrichilis macedonica* STACH, instead the number of joints in gonapophyses is greater, in gonapophyses of VIII segment 82—84, in those of IX segment 79—80 and the setae covering the gonapophyses are of a common shape.

The most similar is *Silvestrichilis macedonica* STACH to *Silvestrichilis tuzeti* JANETSCH. as both these species have on some joints of the gonapophyses of the IX segment dark coloured spine-like features, but in *Silvestrichilis tuzeti* JANETSCH. they are slender, short and straight. *Silvestrichilis tuzeti* JANETSCH. differs moreover by greater number of joints in gonapophyses (VIII — 74—75, IX — 73—75); also greater number and shape of tarsal spines; further by the form of the joints in maxilar palp which from the fifth one are very



thin, at the fifth joint basally and at sixth laterally distinctly pigmented, and dorsally on the sixth joint without spines and other features<sup>1</sup>.

***Trigoniophthalmus banaticus* (VERH.)**

Plate V, fig. 7—11

Syn.: *Coryphophthalmus banaticus* — VERHOEFF, 1910.

*Trigoniophthalmus banaticus* (VERH.) described shortly by VERHOEFF, in 1910, as *Coryphophthalmus banaticus* VERH. on the ground of specimens from Banat and Bulgaria was found then, in 1937, by me in many specimens in material collected by A. DRENOWSKI in Bulgarian mountains. Afterwards, in 1941, this species was described in detail by WYGODZINSKY also on the base of specimens send him by DRENOWSKI from Bulgaria and noted from this country by SILVESTRI, in 1942.

I have examined at present many Bulgarian specimens of *Trigoniophthalmus banaticus* (VERH.) and I am able to supplement in some details the good description of this species by WYGODZINSKY.

The line of contact of the oculi to the length of ones fluctuates from 0,48—0,7.

The antennae in the male are sometimes as long as the body of animal and composed of about 200 joints. The distinct chains of joints consist in female of 9—10 joints, in male of 11—14 ones, and the commonest number here is 12.

The spines on the legs are absent, but on the tibia and tarsus among moderately long fine hairs are inserted ventrally some rather long, stout, hyaline, spine-like bristles. The field with sensory features at the outer side of the femur in the male is absent.

Sternites long, triangular, sharp-angled (65°). Urosternites II—IV with two pairs of vesicles each. Coxae of the VIII segment with 2—3 spines laterally, and of IX segment with 3—6 on the inner edge.

<sup>1</sup> Recently (1957) Prof. JANETSCHEK has described a female of a new species *Silvestrichilis uncinata* JANETSCH. from Greece, which is still more similar to Bulgarian species described here, as it has also spine-like dark coloured curved features on the gonapophyses of the IX segment.

The number of joints in gonapophyses of Bulgarian specimens is variable. In the specimens from Golo Brdo there are in gonapophyses of VIII segment 40—(43) joints, in those from Witoša 50—52 ones; in gonapophyses of IX segment by the former specimens 38—(40), by those from Witoša 49. The gonapophyses of the VIII segment are stronger than those of IX segment and their joints are more abundantly furnished with setae. On the gonapophyses of VIII segment there appear already on the 3th proximal joint three setae, on the 8th seven, and on each following joint four long and 1—4 short setae; the apical joint is furnished with some short sensory rods and at the end with one long, stout apical bristle. The number of proximal joints of gonapophyses of IX segment is up to 19—21 unsetaceous ones, and on following joints appear one long and one short seta only; but the apical joint is also here furnished with some short sensory rods and with a long, stout, apical bristle at the end.

The localities in which the specimens were found:

- Bulgaria. — Mt. Bucino, in Lulin-mountains, 21—26 VII 1935 ... 2 + 18 young, leg. DRENOWSKI;  
 — Nornbranja, about 850 m alt., near Bistrica-river, in East Rila, 26 VIII 1935 ... 3 sp., leg. DRENOWSKI;  
 — Banja, about 850 m alt. in East Rila, 17 IV 1936 ... 29 sp., leg. DRENOWSKI;  
 — Witoša Planina, about 900—1000 m alt., 13 V — 14 VI 1936, about 100 sp. adult and young, leg. DRENOWSKI;  
 — Witoša Planina, about 950 m alt., 18 V 1949 ... 7 sp., leg. DRENOWSKI;  
 — Golo Brdo, about 1000 m alt. 19 VI 1949 ... many sp.;  
 — Tirnowo, Carewec-hill, XI 1953 ... 1 sp., leg. J. URBAŃSKI.

The genera *Coryphophthalmus* VERH. and *Trigoniophthalmus* VERH. erected by VERHOEFF, in 1910, differ — according to diagnosis given by the author — in different number of the segments furnished with two pairs of coxal vesicles; in



the length of ovipositor and different number of its joints. WYGODZINSKY, in 1941, joins together both these genera in the one genus *Trigoniophthalmus* VERH. sensu WYGODZINSKY., as he considers that the differences quoted by VERHOEFF for these genera are of an unimportant generic value.

We do not know well at present such morphological characteristics of the *Machilidae* upon the basis of which should be rightly grouped phylogenetically many of the already described species and genera of this family. Perhaps it is thus more profitable to gather in smaller groups, at least at a time being, the species agreeing more in some morphological details.

It should be easily to divide the species of the genus *Trigoniophthalmus* VERH. sensu WYGODZINSKY known at present into two groups; the species furnished with two pairs of vesicles on II—IV segments, the former genus *Coryphophthalmus* VERH., and such which have two pairs of vesicles on II—V segments, i. e. the former genus *Trigoniophthalmus* VERH. But among the species of the first and second group there are some forms with the shortly setaceous, long ovipositor, and such with long setaceous, short ovipositor. It would be necessary to divide these genera further into:

1. — *Coryphophthalmus* VERH. with species having two pairs of vesicles on II—IV segment and with long ovipositor shortly setaceous (*Coryph. banaticus* VERH., *Coryph. csiki* STACH and *Coryph. wygodzinskyi* n. sp.);
2. *Coryphophthalmides* n. g. or subgenus with species having two pairs of vesicles on II—IV segment and short ovipositor, but long setaceous one (*Coryph. graecanicus* WYG.);
3. — *Trigoniophthalmus* VERH. with species having two pairs of vesicles on II—V segments, and long shortly setaceous ovipositor (*Trig. remyi* STACH);
4. — *Trigoniophthalmides* n. g. or subgenus with two pairs of vesicles on II—V segments, and with short ovipositor, but long setaceous (*Coryph. britannicus* WOM., *Coryph. alternatus* SILV.).

*Trigoniophthalmus wygodzinskyi* n. sp.

Plate VI, fig. 1—6

Body length 11 mm.

Colour of animal preserved in alcohol uniformly dirty pale brownish-yellow. Integumentary pigment not developed. Pattern formed by scales not preserved.

Oculi large, moderately arched, almost as long as wide (17,5:19); the contact line of the eyes is longer than half the length of one oculus (11,5). The colour of the oculi in preserved animals is uniformly brownish-black. Ocelli placed submedianly very near to each other; they have a pear-like profile and the outwards elongated narrow part is in female distinctly shorter than in the male. The fore broad part of the ocelli is dark reddish-black, the narrow laterally elongated pale red. The median part of the forehead is distinctly hump-like elevated and the broad part of the ocelli lies partly at the sides of this hump. The unpaired median ocellus is black. The clypeus in the male is covered densely with long fine hairs.

Antennae almost as long as the body, relatively thin especially in their terminal part. The scapus  $\frac{2}{3}$  as broad as long, and all joints of flagellum are furnished richly with scales and setae. From about half the length of flagellum there appear distinctly delimited chains composed of 13 joints and the further of 15—17 ones. Each of these joints is provided with 1—2 whorls of 7 setae and 1—2 short rods. The number of the joints in undamaged antennae is over 200.

The maxillary palps are in the male a little longer and thicker than those in the female. The III—V joints are in the male furnished ventrally abundantly with fine long hairs distinctly longer than the width of these joints (as 5:3,5). On the fifth joint there appear among these long hairs a little shorter and thicker, but also equally thick in all their length. Such short hairs beset ventrally the VI—VIII joint. The joints, especially three last ones are covered moreover with scales and common setae, and dorsally armed with some hyalin spines. The maxillary palps in female have no long fine hairs ventrally, and the apical joint is narrower than in the male, gradually tapering towards the end.



Labial palps in the female are  $3/4$  as long as those in the male. Third joint of the palps is in the male clothed abundantly at the outer edge with long fine hairs, a little longer than the width of this joint, and the fourth joint is moderately broadened, about half as wide as long (2,8:6), furnished at the upper edge with about 30 sensory cones. In the female the relation of the width of the fourth segment to its length is as 1,8:4,5, and the upper edge is provided with about 20 sensory cones.

Mandible with well developed molar plate and four teeth apically.

Legs of the second and third pairs provided with stylets. Femur of the foreleg in the male only slightly broader than that of the following legs, clothed moderately abundantly with thin hairs which are relatively short, half as long as the width of the femur, and on the tibia and tarsi moreover with some hyalin spinelike bristles, as long as the length of thin hairs. The second and third pair of legs is clothed only with common short setae, and much richly with spine-like bristles standing not only ventrally on all the joints, but also sub-ventrally on the outer side of the femur and tibia.

Sternites well developed, triangular, sharp-angled (about 60°). Coxites II—IV with two pairs of vesicles each. Coxites of the distal segments with hyalin spines, namely in the female coxite of VIII segment with 1 spine on the outer edge, and that of the IX segment with 4—5 spines on the inner edge; in the male coxite of the VII segment with 1 spine, that of the VIII segment with 3, and of the IX segment with 1 on the outer edge and 6—8 on the inner one. The stylets furnished with scales and moderately long hyalin setae, thinner and shorter than the stout apical bristle which on the II—VII segments is about half as long as the stylet. The relation of the lengths of the stylets: lengths of the coxites is:

in female			in male		
coxite:	stylet:	stylet with bristle	coxite:	stylet;	stylet with bristle
II—VII	0,4	0,6	II—VII	0,46	0,68
VIII	0,66	0,9	VIII	0,6	0,87
IX	0,6	0,8	IX	0,8	1,0

The relation of the length of the coxite IX of the female to that of the male is as 18,5:14,5.

Ovipositor cylindrical, reaching a little beyond the end of the apical bristle of the stylet of the IX segment. Gonapophyses of the VIII segment consist of 43 joints. Already on the second proximal joint appears at the outer edge a minute setula, on the third joint similar one on the inner edge, and on the fourth joint a minute setula also in the middle. These three setulae become on the following joints gradually longer and stouter, and on the medial joints these setae are a little longer than the width of the joints. Besides these setae there appear still 2—3 short fine others, and on last distal joints also 1—2 rods. The apical bristle on the last joint is in the examined adult specimens absent, and in the younger ones weakly developed. Gonapophyses of the IX segment are composed of 40 joints. They are a little narrower than those of the gonapophyses of the VIII segment and sparsely clothed with setae. The proximal 1—17 joints are unsetaceous. Further there appears on each joint medially a seta, which on the following joints becomes longer and stout. Beginning from about the 23th joint the joints are provided also with one short seta on the inner edge. The last joint is here also not furnished with apical bristle.

Paramera present on the IX segment only. They reach only to the half length of the coxa and consist of the basal part and six joints, each furnished with a tuft of rods. Penis a little shorter than paramera, cylindrical, at the tip gradually rounded; it is covered in this part with many short setae.

Filum terminale and cerci were damaged in the examined specimens.

Locality in which the specimens were found:

Bulgaria. — Semen-Kraište, W. Bulgaria, 2 VII 1949 ...  
5 sp., leg. ?.

The species described here agrees in many details with *Trigoniophthalmus banaticus* (VERH.) and *Trigoniophthalmus esikii* (STACH), also with the group of species of the genus *Trigoniophthalmus* (VERH.), which have two pairs of vesicles on the II—IV segment, and a long, cylindrical ovipositor,



shortly setaceous, thus with the group of the VERHOEFF's primary genus *Coryphophthalmus* VERH.

The differences existing between these three species are, however, indistinct; they appear in the shape of ocelli, the number of joints in the chains of antennae, the form of the angle in sternites, the number of setae on the joints of gonapophyses and other features. These species may be also considered as geographical varieties of only one species.

***Trigoniomachilis urumovi* STACH, 1937**

Plate III, fig. 5—11

Syn.: *Trigoniomachilis urumovi* STACH — DRENOWSKI, 1937

*Trigoniomachilis urumovi* STACH — WYGODZINSKY, 1941;

*Haplomachilis orientalinus* — SILVESTRI, 1942.

Also this species erected by me, in 1937, on the ground of specimens send me by A. DRENOWSKI from Bulgaria is described by WYGODZINSKY, in 1941, who has had, however, the occasion to examine only the female specimens of this species. Almost at the same time, in 1942, SILVESTRI has described the Bulgarian specimens of the same species under the name *Haplomachilis orientalinus* SILV.

To these descriptions some details should be added.

The length of the females is 11—15 mm, of males 9—12 mm.

The colour of animals preserved in alcohol is uniformly dirty brownish. The pattern formed by scales is not preserved.

Oculi moderately arched, about as long as wide, touch together at the line which in the specimens examined by me is half as long as the length of one oculus or a little shorter. Ocelli, pear-like in profile, brown with a narrow yellowish border all around, placed near together submedianly, are separated by a moderately high median hump covered with brown scales and furnished with some setae. The setae are arranged in a transverse row on the genae, and clypeus is abundantly beset with relatively long hairs.

Antennae, covered abundantly with scales and setae, are in female specimens shorter than the body, in the males a little longer, composed of about 210 joints. After 75 joints in female and 94 in male appear distinctly delimited chains consisting of 10—13 joints in female and 11—15 in the male. Each joint of these chains is furnished with 1—2 whorls of relatively long setae and 1—2 short sensory rods, moreover some of the joints with a weakly developed rosette-like sensilla. The greatest number of the joints in one male examined by me was 226.

Maxillary palps are in the male furnished on all joints ventrally moderately abundantly with fine hairs; on the III—V joint they are half as long as the width of these joints. The last joint in the male is shorter than that in female and thicker, not conical. At the apex of the VI joint there are in both sexes 1—3 hyaline spines dorsally, and at the VII and VIII joints about 10 such spines arranged in two irregular longitudinal rows dorsally. The relation of the length of the VII: VIII joints in the female is as 10:9, and in the male as 10:6,3.

Labial palp is in both sexes almost equally long and apically weakly broadened, but in the male the third joint is furnished with longer hairs along the outer edge and apically, and the fourth joint on the outer edge in basal half.

Legs slender provided with stylets on the second and third pairs. Femur, tibia and tarsus are furnished at the ventral edge with moderately long common setae among which there are some stout longer spine-like hyaline bristles about half as long as the width of these joints. In the male at the outer side of the fore legs the field with sensory sensillae is absent.

Sternites well developed, triangular, sharp-angled. Segments II—V with two pairs of vesicles each. Coxites of the distal segments with spines on the outer edge; coxite VI with 0—1 spines, VII with 0—3, VIII with 3, and coxite of IX segment on the outer edge with 1—3 spines in the male only, and on the inner edge with 4—8 in both sexes. The stylets furnished with moderately long, uncoloured setae and with a stout bristle



at the tip; this bristle is on II—VII segment a little shorter than half the length of these stylets. The relation of the length of the stylet together with apical bristle to the coxite is

in female on II—VII	0,6	in male	0,7
VIII	0,8—0,9		0,9
IX	0,8		1,2

The relation of the length of the coxite IX of the female to that of the male is as 23:14.

Ovipositor relatively thick, cylindrical reaches up to half length of the stylets of IX segment. Gonapophyses of the VIII segment consist of 30—32 joints, clothed abundantly with setae beginning from the first proximal joint. The setae, at first short, are inserted in 1—3 longitudinal rows near the inner edge of the joints and one seta on the outer edge. Further the setae become longer and stouter, and on the median joints they are arranged, 9—12 in number, in two irregular transverse rows. The 4—5 last joints are armed with 1—3 (4) strong, brownish coloured spines and 1—2 short fine rods each; the last joint moreover with a long, stout apical bristle. Gonapophyses of the IX segment, narrower than those of the VIII segment, consist of 30 joints. In  $\frac{2}{3}$  of the length of the gonapophyses there appear only 2—3 setae on the inner edge of each joint, the further ones, however, are furnished with an irregular transversal row of (5)—6 setae. The 3—4 last joints are moreover armed with 1—3 strong, brown spines and 1—2 short, fine rods each; the last joint besides with a long stout apical bristle.

Paramera present on the IX segment only. They reach  $\frac{2}{3}$  of the length of the coxae and consist of the basal part and six terminal joints furnished with a tuft of the rods each. Penis as long as paramera, weakly club-shaped, furnished abundantly with many fine hairs and some short spine-like rods.

Filum terminale a little longer than the body, and cerci about  $\frac{1}{3}$  as long as the filum. They are at the end provided with a pretty strong spine furnished laterally at the basis with a stout seta each.

Locality in which the specimens were found:

- Bulgaria. — Alibotuš-mountains, N. O. Macedonia, about 1800 m. alt., 8 VI 1936 ... 2 sp., leg. A. DRENOWSKI;  
— Alibotuš-mountains, about 1450 m alt., 11—14 VII 1936 ... some sp., leg. A. DRENOWSKI;  
— Alibotuš-mountains, about 110 m alt., 10 VI 1938 ... 15 sp.

*Trigoniomachilis urumovi* STACH is the one species known at present from the genus *Trigoniomachilis* STACH. It belongs probably to the group of endemic insects in the fauna of Bulgaria.

***Berlesilis targionii* VERHOEFF, 1910**

Plate VI, fig. 7—11

Syn.: *Machilis targionii* — GRASSI, 1887;

*Lepismachilis targionii* (GRASSI) — WYGODZINSKY, 1941.

The Bulgarian specimens of this species agree with those described by WYGODZINSKY and JANETSCHEK from other countries.

The length of examined specimens was 12 mm.

The pattern of the specimens kept in alcohol is not preserved and the integumentary pigment appears only on a part of galea, and is absent on the second joint of maxillary palp and the coxae.

The ratio of the contact-line of the oculi to the length of one oculus is 0,5.

The ocelli are distinctly narrowed medianly.

The antennae are in the female 7 mm and in male 9 mm long; the distinctly delimited chains consist in female of 9 and 11 joints, in the male of 9, 11 and 14 joints.

The maxillary palp of the male is furnished with long, fine hairs on the V and VI joint; they are, however, not remarkably long, only a little longer than half the width of these joints. The VIII joint, shorter than the VII (as 6:8), is conical similarly as in the female, covered with common setae and provided with rather long, stout spine at the end.

Labial palps of the male not distinctly broadened, about half as wide as long (as 2,8:6), not furnished with long hairs.

The second and third pair of legs provided with stylets. The ventral edge of the legs is clothed with rather long setae moderately long, but not similar to fine hairs (Wimperborsten). Among these setae there are on the second and third pair of legs some moderately long, stout, hyalin spines, namely in the female on the femur 0, tibia 0—3, tarsus I 2—3, II 5—6, III 0; in the male on the femur 3, tibia 6—7, tarsus I 5, II 7—8, III 0. The femur of the fore leg in the male is on the outer side provided with a sensory field, which extends from about half the length of the femur up to the transverse row of stout setae on distal end of the femur; the rest of the femur is covered with scales and setae.

Segments II—VI with two pairs of vesicles each. The apical bristle of the stylets is half as long as their lengths. The ratio of the stylet measured with apical bristle to the length of the coxa of IX segment is in female 0,9, and in male 1,4. The relation of the length of the coxa of IX segment of the female to that of the male is as 18:14.

Ovipositor cylindrical attains the end of the apical bristle of the IX segment. Gonapophyses of the VIII segment consist of 61 joints; the proximal 14 joints are unisetaceous, on the following appears a minute seta on the inner edge and further also such seta on the outer edge of each joint; these setae become on following joints gradually longer and stouter and in about half the length of gonapophyses appear on the joints still other setae, and each joint is furnished with two long stout setae at the inner edge, one on the outer edge and moreover with 2—3 short setae. The apical joint is armed moreover with long bristle, about as long as the length of the 3—4 distal joints together. Gonapophyses of the IX segment consist of 67 joints which up to  $\frac{2}{3}$  of the length of the gonapophyses are unisetaceous. The following joints are provided with one long stout seta on the inner edge, one second long near the outer edge and 1—2 short ones between. The apical joint is furnished moreover with about 5 fine, minute rods and at the tip with bristle about as long as the 3—4 distal joints measured together.



Penis a little shorter than paramera, cylindrical; it is clothed along its median line with short, spine-like rods, and laterally with relatively long setae.

Filum terminale a little shorter than the body; cerci are about half as long as filum, and armed laterally with two pairs of setae at the end and with a stout spine having at its basis a small secondary spine.

Locality in which the specimens were found:

Bulgaria. — Dolni Tschiflik, marin-tepe, beech-oak forest, 22 XI 1953 ... 10 sp., leg. KARNOŻYCKI.

In some details the Bulgarian specimens differ from those described by WYGODZINSKY, in 1941, from Italy (Ischia), e. g. in the maxillary palps of the male, which in Italian specimens are furnished on all joints with long hairs; in the length of the penis; and other features. They differ also from those described by JANETSCHEK, in 1954, from Italy, as they have no integumentary pigment on the maxillary palps and legs, a different shape of the stout spine at the apex of the cerci, which — according to JANETSCHEK — in the specimens examined by him are without a secondary point.

I am of the opinion that this species included by WYGODZINSKY, in 1941, in the genus *Lepismachilis* VERH. as a subgenus, differs in the number of the vesicles so distinctly from all species of *Lepismachilis* VERH., that it should be separated from them and considered again as the genotype of the genus *Berlesilis* VERH.

*Berlesilis targionii* (GIARD) is quite widely distributed over the southern Europe, noted from southern France, Italy and Yugoslavia (Postumia). It was not known hitherto from Bulgaria.

### *Lepismachilis notata* STACH

This species and its variety, var. *aureodorsata* STACH, found by me in material collected by A. DRENOWSKI in Bulgaria were noted in 1937. At present I have found still one specimen of a male among the other *Machilidae* from that country. This specimen, caught in Golo Brdo, in 1949, and preserved in alcohol, does not permit to discern the pattern

of the eyes. The other characteristics, however, such as the sensory field on the femur of the foreleg wide and long, extending almost along the whole length of the femur, the long hairs ventrally on the legs, the maxillary palps furnished with fine, very long hairs on all joints, the VIII joint of the maxillary palps cylindrical, rounded at the tip and armed with a short spine, and others, show that this specimen and these determined formerly by me belong probably to the *Lepismachilis notata* STACH.

Also WYGODZINSKY, in 1941, has determined the specimens from Witoša, send him by DRENOWSKI as this species.

Localities in which the specimens were found:

- Bulgaria. — Witoša Planina, Dragolewski-monastery, about, 900 m alt., 13 V 1936 ... 39 sp., leg. A. DRENOWSKI;  
— Witoša, about 1000 m alt., 7 VI 1936 ... 9 sp. leg. A. DRENOWSKI;  
— Lülín-mountains, about 900 m alt., 27 V 1936 ... 2 ♂ and 3 ♀ of v. *aureodorsata*, and 8 VI 1936 ... 4 young sp.  
— Golo Brdo, about 850 m alt., 11 VI 1949 ... 1 ♂.

### *Lepismachilis feminata* STACH

Plate VII, fig. 8

This species erected by me in 1929 on the ground of the specimens caught in Podolia (Kasowa Góra), Volhynia, and Fatra-mountains, was found in 1937 also in Bulgaria.

WYGODZINSKY, in 1941, considered this species as identical with *Lepismachilis notata* STACH, still it differs in some body marks from the latter. The male of *Lepismachilis feminata* STACH has the maxillary palps furnished ventrally with short hairs only, the setae on the ventral edge of the femur distinctly shorter than those in *Lepismachilis notata* STACH, and the sensory field on the femur of foreleg very wide and rounded at the tip.

Unfortunately I cannot say anything concerning the pattern of the eyes and the body of this species since the specimens were preserved in alcohol for a long time.

Localities in which the specimens were found:

- Bulgaria. — Lulin-mountains, about 1000 m alt., 22 III 1936 ... 6 sp., leg. A. DRENOWSKI;  
— East Rila-mountains, Banja-valley, about 850 m alt., 17 IV 1936 ... 26 sp., leg. A. DRENOWSKI.

*Lepismachilis janetscheki* n. sp.

Plate VII, fig. 1—7

Length of the body 12,5—13 mm.

The integumentary pigment is absent, and the pattern formed by the scales on the body is not preserved.

The eyes are  $\frac{2}{3}$  as long as their width, and the ratio of the contact line of the eyes to their length is 0,6. The pattern composed of the pigment on the eyes is also not preserved, but not the whole surface of the eyes is uniformly dark pigmented. Ocelli sole-like, laterally elongated, a little shorter than the width of the eyes, are pale brownish coloured.

Antennae long, but shorter than the body, covered with scales and setae. In the male behind about 55 proximal joints there appear at first indistinctly delimited chains of 8 joints, further distinctly separated with 12—14 joints. Each of the distal joints has two whorls of long setae, 2—3 fine rods, and 1—2 distinct rosette-like sensillae.

Maxillary palp in the female clothed with scales and short setae; in the male moreover ventrally on III—VII joint with long, fine hairs which on the III—V joint are up to twice as long as the width of these joints. The last joint is in both sexes conical, but in the male a little thicker and armed with a short spine at the tip. On the last joint in the female appear here and there small rosette-like sensillae.

Labial palps in the female of normal shape and furnishment. In the male the third joint is on the outer edge clothed densely with long hairs, almost as long as the width of this joint, and the fourth joint is triangular, a little longer than the third



one, half as long as wide and provided with small number of sensory rods (9—11) at the tip only.

Mandible with well developed molar plate and four teeth apically.

The second and third pair of legs provided with stylets. Femur of the foreleg in the male on the outer side with a distinct elliptical field covered with small setae and many sensillae; this field is placed in the middle of the femur. The ventral edge of the trochanter, femur and tibia are clothed in the male with long fine hairs, in the female with a little shorter and thicker setae. On the first joint of the tarsus of the third pair of legs there appear in the female 3 hyalin spines among the stout bristles, and in the male 4 spines arranged ventrally in one row along the second joint of the tarsus.

Sternites well developed, sharp-angled ( $70^{\circ}$ — $80^{\circ}$ ). Segments II—V with two pairs of vesicles each. Coxites of the II—VIII segment without lateral spines, of the IX segment with 2—3 spines on the inner edge in both sexes. Stylets of the segments richly setaceous, furnished with strong apical bristle a little longer than half the length of the stylets. The relation of the length of the coxite IX in the female to that of the male is as 20:15.

Ovipositor long, twice longer than the coxite of the IX segment, cylindrical. Gonapophyses of the VIII segment consist of 64 joints. Beginning from the 5th proximal joint there appears on the outer edge of each joint a fine short setula which becomes gradually longer; on the 26th joint there appears at its side a second seta and on the inner edge a short one; all these setae become on following joints gradually longer, and at last appear still near the second seta and the outer one a fine short setula, thus in sum 5 setae on each of the more distal joints. On the last joints there appear besides the setae 2—3 rods and on the endjoint also a long bristle. Gonapophyses of the IX segment consist of 73 joints, and are more slender and less abundantly setaceous. The  $4/5$  of the proximal part of the gonapophyses are without the setae; each of the following joints are provided with two setae at the outer edge, the distal ones also with 2—3 rods, and the apical joint moreover with long bristle.

The parameta are on the VIII and IX segment. These of the IX segment consist of 9 joints and are a little shorter than penis.

Filum terminale and the cerci are damaged.

Localities in which the specimens were found:

Bulgaria. — Malko-Tarnowsko, 14 VI 1933 ... 3 sp.;

— Dolni Tschiflik, southwards from Warna, in Longosa forest, 23 VI 1953 ... 1 sp., leg. KARNO-  
ZYCKI.

The new species belongs to the group of the species of *Lepismachilis* VERH., in which the sensory field on the femur of the foreleg in the male is of the elliptical shape, separated from the upper and low edge of the femur by scales. The new species of this group comes nearer to *Lepismachilis handschini* WYG., described by WYGODZINSKY, in 1950, on the ground of the specimens collected in Anatolia. It differs, however, by the more broader last joint of the labial palps in the male and its furnishment with remarkably small number of sensory rods arranged in a cluster at the tip of this joint only; also longer apical bristle on the stylets; and small number of the spines on the legs.

20 June 1957

Kraków Branch of the Institut of Zoology  
of the Polish Academy of Sciences.

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#### STRESZCZENIE

Autor wymienia 10 gatunków przerzutek (*Machilidae*) zbadanych przez siebie z fauny Bułgarii i opisuje szczegółowo pięć nowych dla nauki gatunków i jedną odmianę: *Admesomachilis drenowskii*, *Admesomachilis drenowskii* v. *catamachilideus*, *Charimachilis armata*, *Silvestrichilis macedonica*, *Trigoniophthalmus wygodzinskyi* i *Lepismachilis janetscheki*, a do opisu pozostałych gatunków dołącza spostrzeżenia dotyczące niektórych szczegółów ich morfologii.

Najbardziej interesujący z tych gatunków jest *Admesomachilis drenowskii*, który posiada dwie pary woreczków na

spodniej stronie II—V pierścienia odwłoku i na tej podstawie musi być zaliczony do podrodziny *Machilinae* VERH., zaś jego odmiana v. *catamachilideus*, mająca tylko po jednej parze woreczków na pierścieniach odwłokowych I—VII powinna być zaliczona jako odrębny gatunek do podrodziny *Praemachilinae* CARP. Ponieważ jednak poza tą różnicą nie można dostrzec żadnych innych różnic pomiędzy tymi dwiema formami, przeto autor złączył je w jednym gatunku, jako formę główną i jej odmianę. Przez to zburzona zostaje granica przyjmowana dotychczas pomiędzy rodzajami zaliczanymi do podrodziny *Praemachilinae* CARP., odznaczającymi się posiadaniem tylko jednej pary woreczków na I—VII pierścieniu odwłoku, a należącymi do podrodziny *Machilinae* VERH., które mają na pierścieniu II—V po dwie pary woreczków, a na I, VI i VII pierścieniu po jednej parze.

## РЕЗЮМЕ

Автор перечисляет 10 видов (*Machilidae*) исследованных им из фауны Болгарии и подробно описывает пять новых для науки видов, а также одну разновидность: *Admesomachilis drenowskii*, *Admesomachilis drenowskii* v. *catamachilideus*, *Charimachilis armata*, *Silvestrichilis macedonica*, *Trigoniophthalmus wygodzinskyi* и *Lepismachilis janetscheki* К описанию остальных видов автор прилагает свои наблюдения относящиеся к некоторым особенностям их морфологии.

Наиболее интересным из этих видов является *Admesomachilis drenowskii*, обладающий двумя парами мешочков на нижней стороне II—V кольца абдомена, и на этом основании должен быть причислен к подсемейству *Machilinae* VERH., тогда как его разновидность v. *catamachilideus*, имеющая только по одной паре мешочков на кольцах абдомена I—VII, должна быть причислена, как обособленный вид, к подсемейству *Praemachilinae* CARP. Однако, ввиду того что за исключением этой разницы, других разниц между этими двумя формами не наблюдается, автор соединил их в один вид, как главную форму и её разновидность. Вследствии этого исчезает принятая до сих пор граница между родами причисляемыми



к подсемейству *Praemachilinae* CARP., отличающимися обладанием только одной парой мешочков на I—VIII кольце абдомена, а принадлежащими к подсемейству *Machilinae* VERN., которые имеют на кольце II—V по две пары мешочков, а на I, VI и VII кольце по одной паре.

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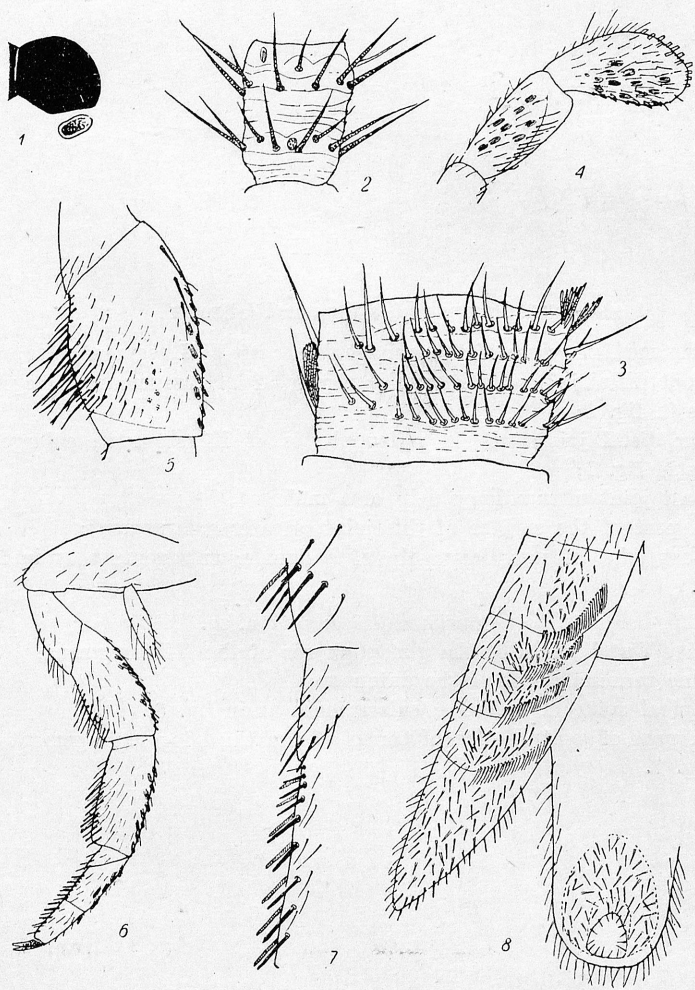
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## PLATE I

*Admesomachilis drenowskii* STACH

1. One oculus and ocellus;
2. One median joint of antennae of a female;
3. One median joint of antennae of a male; enlargement as in fig. 2;
4. Labial palp of a male;
5. Femur of the foreleg of the male; enlargement as in fig. 4;
6. Third leg of a male;
7. A ventral part of tibia and tarsus of the third leg of a female;
8. Distal part of one paramer and penis; enlargement as in fig. 7.





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*J. Stach*

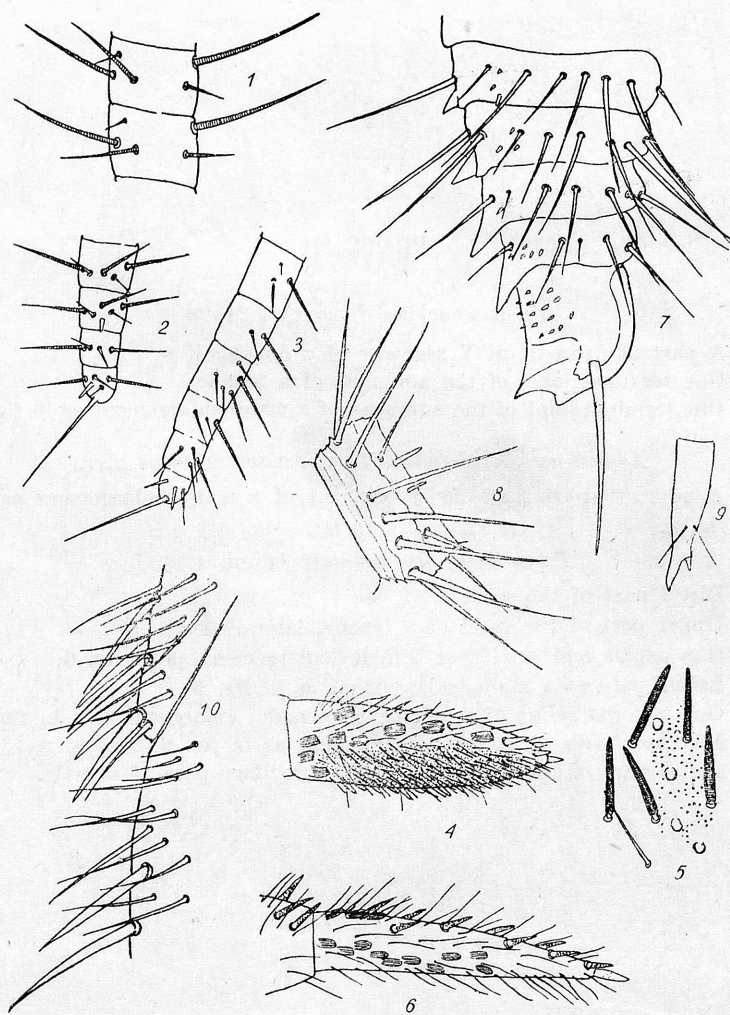
## PLATE II

*Admesomachilis drenowskii* STACH

1. The median joints of the gonapophyses of VIII segment;
2. Four distal joints of the gonapophyses of VIII segment; enlargement as in fig. 1;
3. Six distal joints of the gonapophyses of IX segment; enlargement as in fig. 1;
4. Last joint of maxillary palp of a male;
5. A part of the surface of this joint, greater enlargement;
6. Last joint of maxillary palp of a female; enlargement as in fig. 5.

*Charimachilis armata* n. sp.

7. Five distal joints of the gonapophyses of the VIII segment;
8. One terminal joint of the antennae;
9. Apical spine of a cercus; enlargement as in fig. 8;
10. A part of ventral edge of tarsus of the third leg; enlargement as in fig. 7.



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## PLATE III

*Admesomachilis drenowskii* STACH

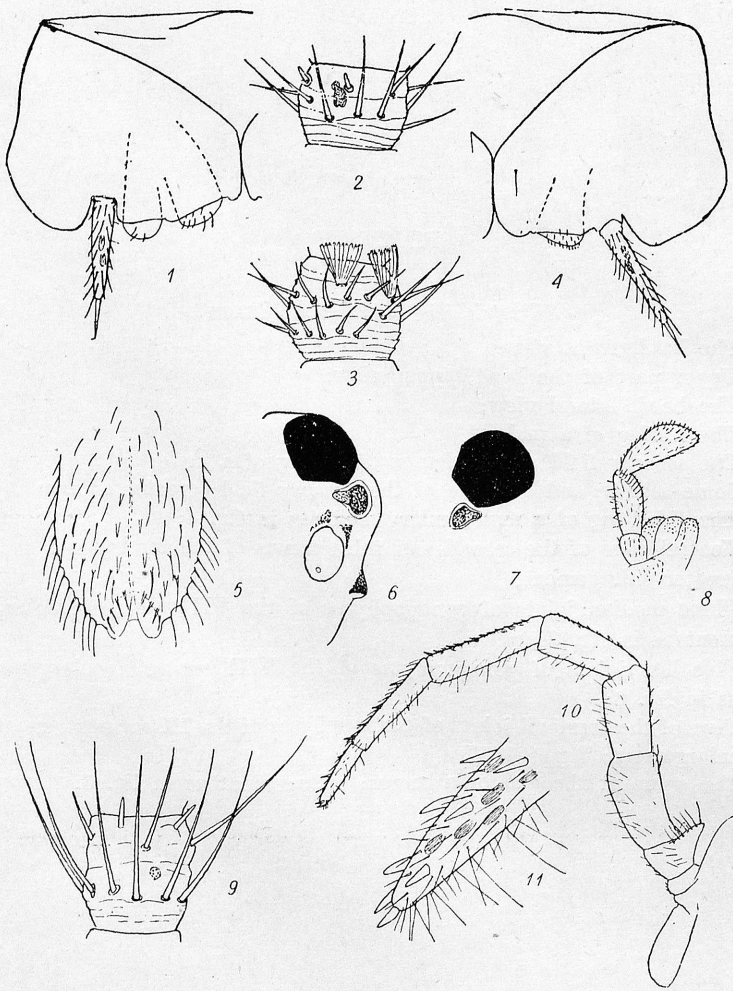
1. A part of urocoxite of V segment of a female;
2. One terminal joint of the antennae of a female;
3. One terminal joint of the antennae of a male; enlargement as in fig. 2.

*Admesomachilis drenowskii* var. *catamachilideus* n. v.

4. A part of urocoxite of the V segment of a male; enlargement as in fig. 1.

*Trigoniomachilis urumovi* STACH, 1937

5. Distal part of the penis;
6. Upper part of the head of a female, lateral view;
7. One oculus and ocellus of a male; enlargement as in fig. 6;
8. Labial palp of a male; enlargement as in fig. 6;
9. One terminal joint of antennae of a male; enlargement as in fig. 2;
10. Maxillary palp of a male; enlargement as in fig. 6;
11. Distal part of the last joint of the maxillary palp of a male.



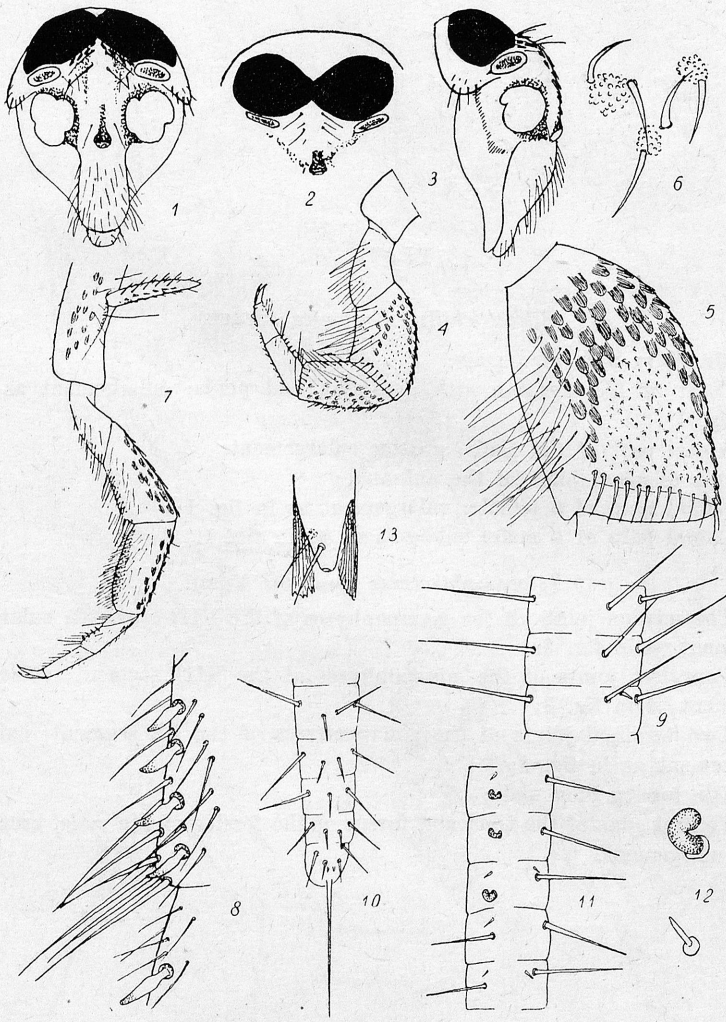
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## PLATE IV

*Silvestrichilis macedonica* (STACH)

1. The head, front view;
2. Upper part of the head, upper view;
3. The head, lateral view;
4. The foreleg of a male;
5. The sensory field on the femur of foreleg of a male;
6. Some setulae and sensillae of the sensory field; greater enlargement;
7. The third leg of a male; enlargement as in fig. 4;
8. Ventral edge of the second and third tarsus of the foreleg in a male; greater enlargement;
9. Three median joints of gonapophyses of the VIII segment; enlargement as in fig. 8;
10. Five last joints of gonapophyses of the VIII segment; enlargement as in fig. 8;
11. Five of the terminal joints of gonapophyses of the IX segment; greater enlargement;
12. The spine at the end of a cercus; enlargement as in fig. 8.





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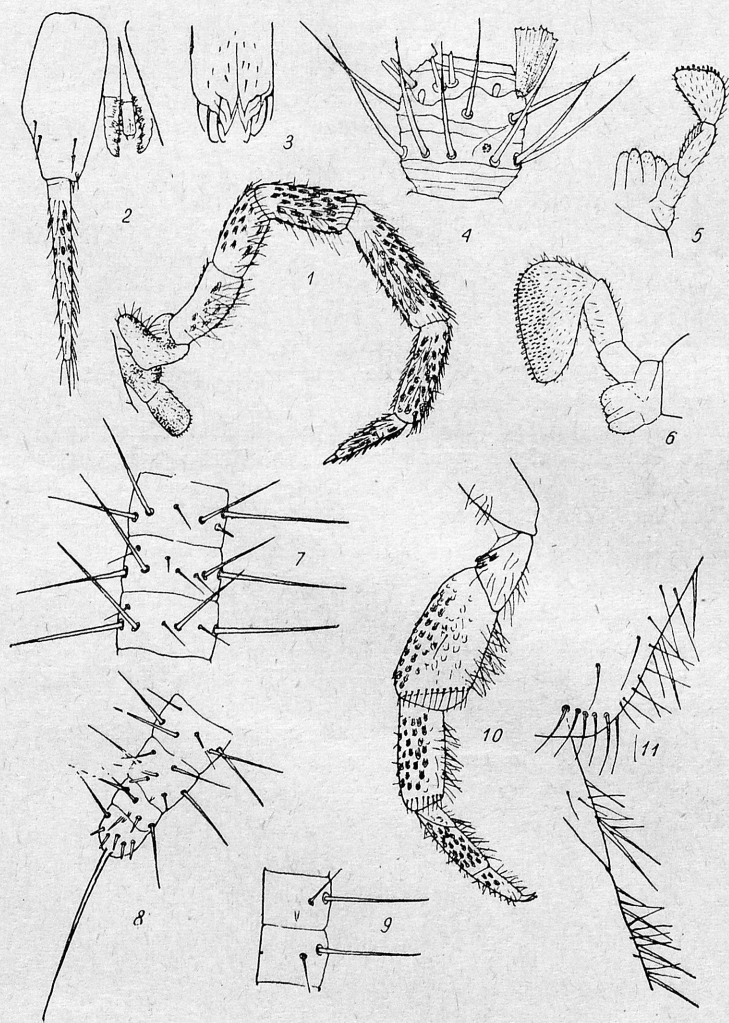
## PLATE V.

*Silvestrichilis macedonica* (STACH)

1. Maxillary palp of a male;
2. Coxit of IX segment with paramera and penis; enlargement as in fig. 1;
3. Apical part of the penis; greater enlargement;
4. One terminal joint of the antennae;
5. Labial palp of a female; enlargement as in fig. 1;
6. Labial palp of a male; enlargement as in fig. 1.

*Trigoniophthalmus banaticus* VERH.

7. The median joints of the gonapophyses of the VIII segment; enlargement as in fig. 3;
8. Four last joints of the gonapophyses of the VIII segment; enlargement as in fig. 3;
9. Two terminal joints of the gonapophyses of the IX segment; enlargement as in fig. 3;
10. The foreleg of a male;
11. Ventral edge of the tibia and tarsus of the foreleg of the male, greater enlargement.



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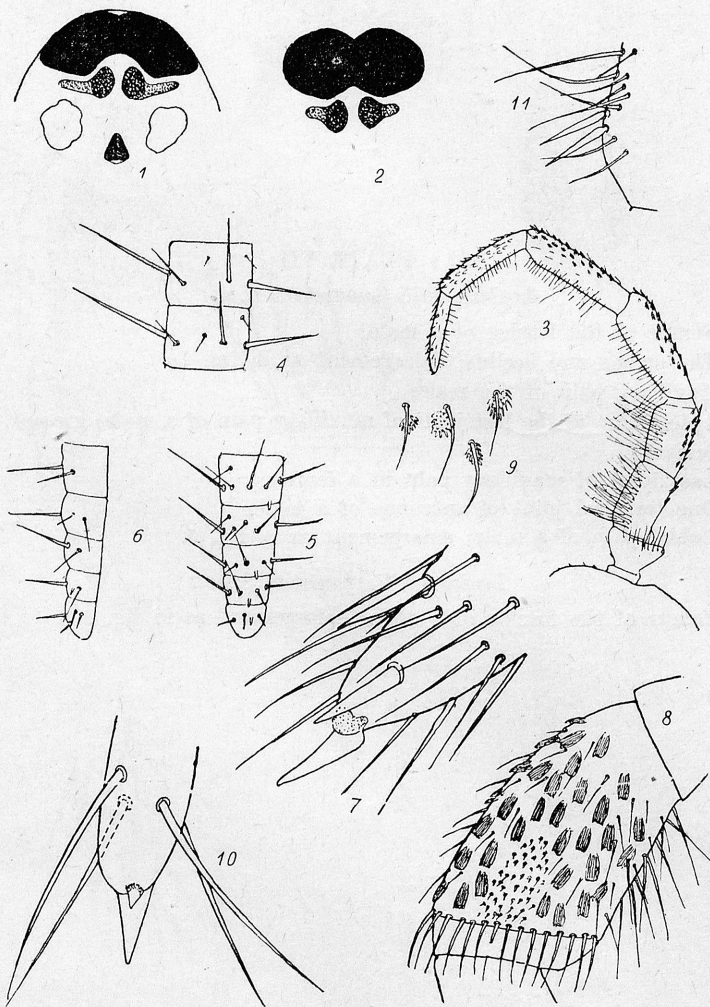
## PLATE VI

*Trigoniophthalmus wygodzinskyi* n. sp.

1. Upper part of the head of a male;
2. The oculi and ocelli of a female; enlargement as in fig. 2;
3. Maxillary palp of a male;
4. Two median joints of the gonapophyses of the VIII segment;
5. Five last joints of the gonapophyses of the VIII segment; enlargement as in fig. 4;
6. Five last joints of the gonapophyses of the IX segment; enlargement as in fig. 4.

*Berlesilis targionii* (GRASSI)

7. Apical part of the maxillary palp of a male;
8. Femur of the foreleg of a male;
9. Some setulae and sensillae of the sensory field of the foreleg in the male; greater enlargement;
10. Apical spine of a cercus of a female; enlargement as in fig. 7;
11. Ventral edge of the femur of a male.



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## PLATE VII

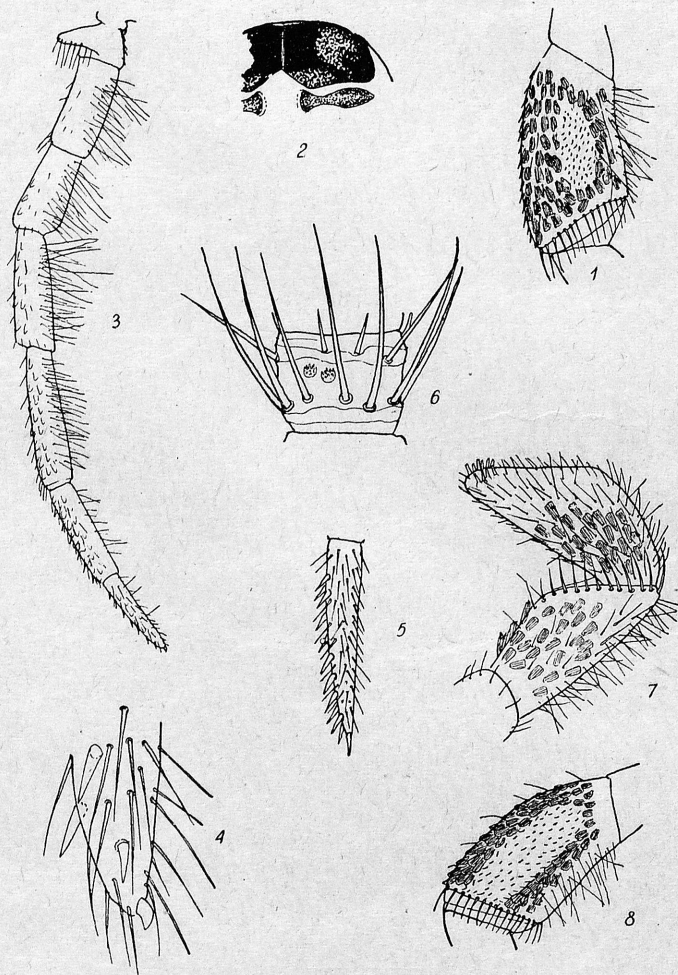
*Lepismachilis janetscheki* n. sp.

1. Femur of the foreleg of a male;
2. The oculus and ocellus; enlargement as in fig. 1;
3. Maxillary palp of the male;
4. Apical part of the last joint of maxillary palp of a male; greater enlargement;
5. Last joint of maxillary palp in a female;
6. One terminal joint of antennae of a male;
7. Labial palp of a male; enlargement as in fig. 5.

*Lepismachilis feminata* STACH

8. Femur of the foreleg of a male; enlargement as in fig. 1.





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