

RESULTS OF THE ZOOLOGICAL SCIENTIFIC EXPEDITION
OF THE NATIONAL MUSEUM IN PRAHA TO TURKEY.

5.

THYSANURA.

Machilidae and *Lepismatidae*.

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When doing field-work in Turkey in 1947, as a member of the Expedition of the National Museum, of Prague, Dr. Ludvík Hoberlandt collected a small amount of *Thysanura* which he has kindly placed in our hands for identification. We are much obliged to the authorities of the National Museum and to Dr. Hoberlandt for the privilege of examining this material.

The following species are contained in the sample at hand:

MACHILIDAE:

1. *Machilinus rupestris* (LUCAS, 1846)
2. *Silvestrichilis trispina* (WYGODZINSKY, 1939)
3. *Praemachilinae* ?gen. ?sp.
4. *Lepismachilis hoberlandti* sp. n.
5. *Lepismachilis handschini* sp. n.

LEPISMATIDAE:

6. *Ctenolepisma lineata pilifera* (LUCAS, 1840)
7. *Allacrotelsa kraepelini* (ESCHERICH, 1905)

There is no doubt that further collecting will prove the number of *Thysanura* of Turkey to be considerably larger. For this reason we refrain, for the time being, from any generalized considerations on the zoogeography of the *Thysanura* of that country.

Machilinus rupestris, *Otenolepisma lineata pilifera* and *Allacrotelsa kraepelini* are widely distributed in the mediterranean region, and their presence in Turkey is no surprise. The genus *Silvestrichilis* is typical of the eastern Mediterranean. The most interesting feature, however, is the presence of two species of *Lepismachilis*, the genus having been known before only from Eastern, Central and Southern Europe.

The specimens treated in the present note are conserved in the entomological collections of the National Museum, Prague, with the exception of two paratypes of *Lepismachilis hoberlandti*, retained for the author's collection.

***Machilinus rupestris* (LUCAS, 1846)**

Material examined: Ayas, Anatolia, 17. VII. 1947, Exp. N. Mus. ČSR (numerous specimens of both sexes). This locality is situated at about 45 km W of Ankara, the specimens being collected in a deep valley on stones among poplar trees. — Ankara-Baraj, Anatolia, 4. VII. 1947, Exp. N. Mus. ČSR (several males and females). The specimens were taken in stony and sandy valleys near the river Çubuk çay, on the roots of *Tamariscus* sp. and fig-trees.

***Silvestrichilis trispina* (WYGODZINSKY, 1939)**

Praemachilis trispina WYGODZINSKY, 1939

Material examined: Beynam, Anatolia, 28. VI. 1947, Exp. N. Mus. ČSR (1 female).

The specimen corresponds quite well to those examined by WYGODZINSKY (1939, 1942) from Palestine, though the eyes seem to be slightly wider. The exact specific determination of female *Machilidae*, when specimens have been kept in alcohol, is sometimes rather difficult if no correlated males are available.

The genus *Silvestrichilis* is being described elsewhere (WYGODZINSKY, 1951) for the reception of the present species and of *Dilta heterotarsus* SILVESTRI, 1942.

***Praemachilinae* ?gen. ?spec.**

Material examined: Agapinari, East Toros, Anatolia, 13. VIII. 1947, Exp. N. Mus. ČSR (3 specimens).

These are very small (less than 5.0 mm) and not well conserved specimens, the determination of which is not possible. They might belong to the genus *Haslundichilis* WYGODZINSKY (actually being described elsewhere) which has representatives in Palestine, Afghanistan and South Kansu (China).

***Lepismachilis* VERHOEFF, 1910**

The determination of the species of the present genus is exceedingly difficult, especially so in the female sex, where it must be based almost exclusively on the pattern of the eyes and that formed by the body scales. The papers by WYGODZINSKY (1941), KRATOCHVIL (1945) and JANETSCHEK (1949) have shown the number of species existing to be surprisingly large, and also that it is necessary to revise the older de-

terminations, before a comprehensive picture of the distribution of the species of *Lepismachilis* can be obtained. We have prepared the following key for the determination of the males of *Lepismachilis* (color forms not considered), which might prove useful in future work, though the original or revised descriptions should be consulted in order to be completely sure of any determination.

We have not overlooked the fact that SILVESTRI uses *Machilis* LATREILLE for *Lepismachilis* VERHOEFF. As long as the identity of *Lepisma polypoda* L., the type species of *Machilis* LATREILLE, is not cleared up, or the matter settled definitely by the International Commission of Zoological Nomenclature, we prefer to adopt the name used by VERHOEFF and most subsequent authors.

Key for the determination of the males of *Lepismachilis* VERHOEFF

1. Two pairs of exsertile vesicles on sternites II—V.....2
 — Two pairs of exsertile vesicles on sternites II—VI.....
 **targionii** (GRASSI, 1887)
2. Inner surface of fore femur without sensory field...**hoberlandti** sp. n.
 — Inner surface of fore femur with sensory field3
3. Sensory field attaining distal transverse row of strong bristles.....4
 — Sensory field not attaining distal transverse row of strong bristles..6
4. Color of eyes an uniform reddish brown; relation length : width of eyes = 0.8 **cisalpina** WYGODZINSKY, 1940
 — Color of eyes not uniform; length : width of eyes larger than 8.8....5
5. Sensory field of fore femur nearly parallel-sided ...**notata** STACH, 1919
 — Sensory field of fore femur distinctly oval
 some specimens of **y-signata** KRATOCHVIL, 1945
 — Distance from lower border of sensory field of fore femur to base of
6. femur as large or larger than length of sensory field
 **hanseni** WYGODZINSKY, 1941
 The mentioned distance smaller than length of sensory field 7
7. Distance from lower border of sensory field to base of femur larger than transverse diameter of the field; relation line of contact of eyes: length = 0.5.....**transalpina** WYGODZINSKY, 1940
 — The mentioned distance not larger than transverse diameter of sensory field; the mentioned relation larger than 0.58
8. Ventral surface of first and second tarsal joints with short and distinct spines (fig. 23); apical spinulets of distal joint of maxillary palpi very short and stout (fig. 17)9
 — These spines absent; apical spinulets of distal joint of maxillary palpus slender**rozsypli** KRATOCHVIL, 1945
9. Terminal joint of labial palpus unpigmented, very strongly widened apically (fig. 19)..... **handschini** sp. n.
 — Terminal joint of labial palpi slightly pigmented, not strongly widened
 **y-signata** KRATOCHVIL, 1945

***Lepismachilis* spec.**

Material examined: Suluhan, East Toros, Anatolia, 14. VIII. 1947, Exp. N. Mus. ĆSR (numerous immature males and females). This locality is situated at about 95 km from Adana in a valley of the inner range of the Eastern Taurus. Specimens were taken in the bottom of a valley among fallen leaves of platans, oleanders and fig-trees.

The complete absence of a sensory field on the inner surface of the femora of the males makes it probable that these specimens belong to *Lepismachilis hoberlandti* described below.

***Lepismachilis hoberlandti* sp. n.**

Length of male 9.5, of female 11.0 mm.

Hypodermal pigment absent. Pattern unknown.

Pattern of eyes unknown. Relation line of contact: length = 0.6, length : width = 0.8. Ocelli reddish, sole-shaped, very strongly constricted medially. Clypeus and labrum of male with numerous long hairs.

Antennae at least as long as body, uniformly brownish. Distal segments with 10—14 subjoints.

Maxillary palpi of male and female as in figs. 3—5. Palp of male on all joints ventrally with numerous ciliae, those of the two apical joints slightly longer than diameter of the latter. Spinulets of the distal joint of the male palp short (fig. 4); last joint about as long as the penultimate.

Labial palpi of male and female as in figs. 6—7, second and third joint of male palpi on outer surface with numerous long hairs; apical joint not strongly widened.

Legs of the male strong, though not excessively so. A few rather delicate and elongate hyaline spine-like bristles ventrally on apex of tibia and on tarsus of fore legs, and on apex of femora, on tibiae and tarsi of mid and hind legs, in both sexes. Apex of fore femur of male ventrally, tibia ventrally and tarsus dorsally and ventrally with numerous very long hairs; those of second pair of identical distribution, though somewhat shorter and less numerous. Ventral surface of trochanter and femur of third pair of male with very numerous short ciliae (fig. 9). Legs of female without special characters.

Urosternites as in fig. 11. Apical spine of stylets II—VII somewhat longer than half the length of the stylet. Relation length of stylet: coxite of male on the segments

$$\text{II—VII} = 0.5$$

$$\text{VIII} = 0.7$$

$$\text{IX} = 0.8$$

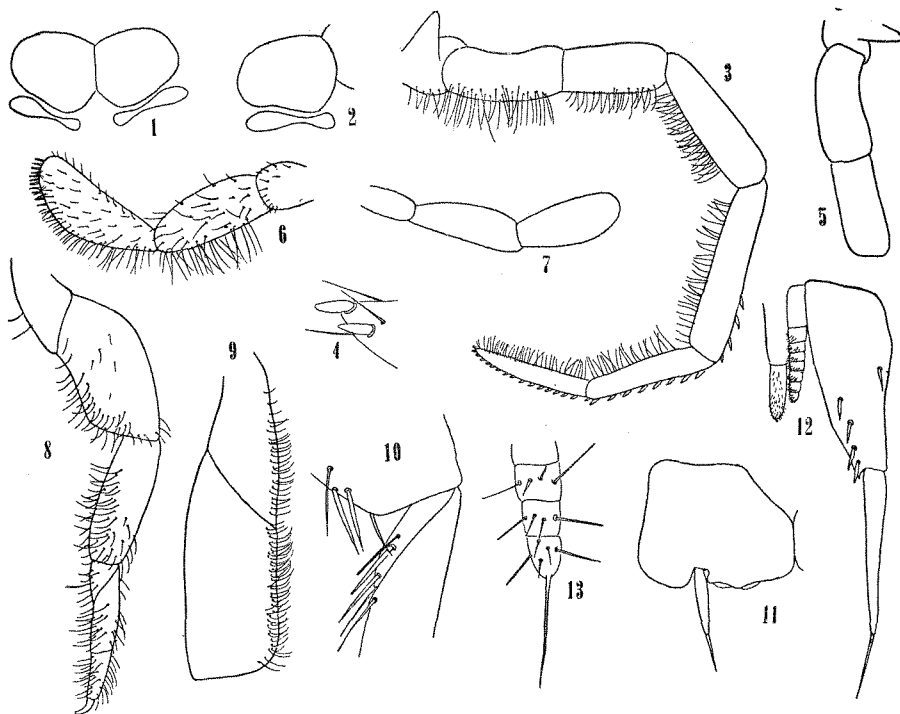
of female

$$\text{II—VII} = 0.45$$

$$\text{VIII} = 0.65$$

$$\text{IX} = 0.6$$

Urosternites II—V with 2 + 2, I, VI and VII with 1 + 1 exsertile vesicles. Posterior coxites with stout hyaline spines.



Lepismachilis hoberlandti sp. n. — Fig. 1, Eyes and ocelli, frontal aspect; fig. 2, eye and ocellus, lateral view; fig. 3, maxillary palp of male; fig. 4, apical spinulets of last joint of maxillary palp of male; fig. 5, basal joints of maxillary palp of female; fig. 6, labial palp of male; fig. 7, labial palp of female; fig. 8, inner surface of fore leg. of male; fig. 9, trochanter and femur of hind leg of male; fig. 10, ventral surface of apex of tibia and base of tarsus of hind pair of legs of female; fig. 11, urosternite V of male; fig. 12, segment IX of male, with penis and paramere; fig. 13, apex of anterior gonapophysis of female. — Wygodzinsky del.

Parameres of male slender, those of segment VIII with I + 6—7, of IX with I + 7—8 joints. Penis slender, elongate, somewhat surpassing apex of posterior parameres, its apical section about as long as the basal one, the former with a small triangular apical process.

Ovipositor of the female of the primary type, slender, attaining apex of distal spine of posterior stylets. Joints of anterior and posterior gonapophyses with two long and one to several shorter simple bristles; no specialized setae present. Apical spine about as long as the three last joints together. Gonapophyses with about 60 segments.

Material examined. Gyaur dag, 12 km from Fevzipasa, Anatolia, 16. VIII. 1947, Exp. N. Mus. ČSR (1 male *holotype*, 1 female *allotype*, numerous males and females *paratypes*). These specimens were collected in a swampy locality on stones together with *Hemiptera* of the family *Leptopodidae*.

Lepismachilis hoberlandti, which we have much pleasure in dedicating to its collector, occupies an isolated position within the genus. The males of all species hitherto known possess a peculiar sensory field on the inner surface of the fore femora, which completely lacks in *ho-*

berlandti. On the other hand, we have had opportunity (WYGODZINSKY, 1941) to examine a female of an undescribed species from Southern Italy which also possesses the mentioned sensory field, generally absent in the female sex. In this seems obvious that the value of this sensory field as secondary sexual character is relative only.

***Lepismachilis handschini* sp. n.**

Length of male 10.5, of female 14.0 mm.

Pattern unknown.

Pattern of eyes unknown; relation line of contact: length = 0.6; length : width = 0.95. Ocelli sole-shaped, slightly constricted medially. Head with very little pigment, with exception of a distinct central spot on labrum. Clypeus and labrum of male with numerous long hairs.

Antennae about as long as body, uniformly brownish.

Maxillary palpi of male and female as in figs. 16—18, those of male ventrally on all joints with numerous ciliae which are longer than the diameter of the respective joint. Apical spines of distal joint of palp of male very short and stout (fig. 17), that joint distinctly shorter than penultimate.

Labial palpi of male and female as in figs. 19—20, unpigmented, joints II and III of palpi of male on their outer surface with numerous short ciliae; apical joint very strongly widened distally.

Legs of the male stout. Inner surface of fore femur with a large sensory field, which is separated from the apical row of strong bristles by one row of scales, and which approaches the base of the article by a distance about equal to its transverse diameter. First pair of legs of male without distinct spiniform setae, tarsi of second and third pair ventrally with several short spines. Legs of female with distinct short spiniform bristles on ventral surface of all tarsi, and also on apex of hind tibia; those spines somewhat more numerous than in male. Ciliae of legs of male distributed as follows: trochanter, femur, tibia and tarsus of fore femur ventrally, apex of tibia and tarsi dorsally, rather short; second pair as first, however ciliae of trochanter and femur ventrally much longer; third pair identical, however ciliae short and very sparse. Legs of female without special characters.

Urosternites without special characters. Segments II—V with 2 + 2, I, VI and VII with 1 + 1 exsertile vesicles. Apical spine of stylets II—VII not longer than half the length of stylet.

Relation length of stylet : coxite of male, on segments

$$\text{II—VII} = 0.55$$

$$\text{VIII} = ?$$

$$\text{IX} = 0.85$$

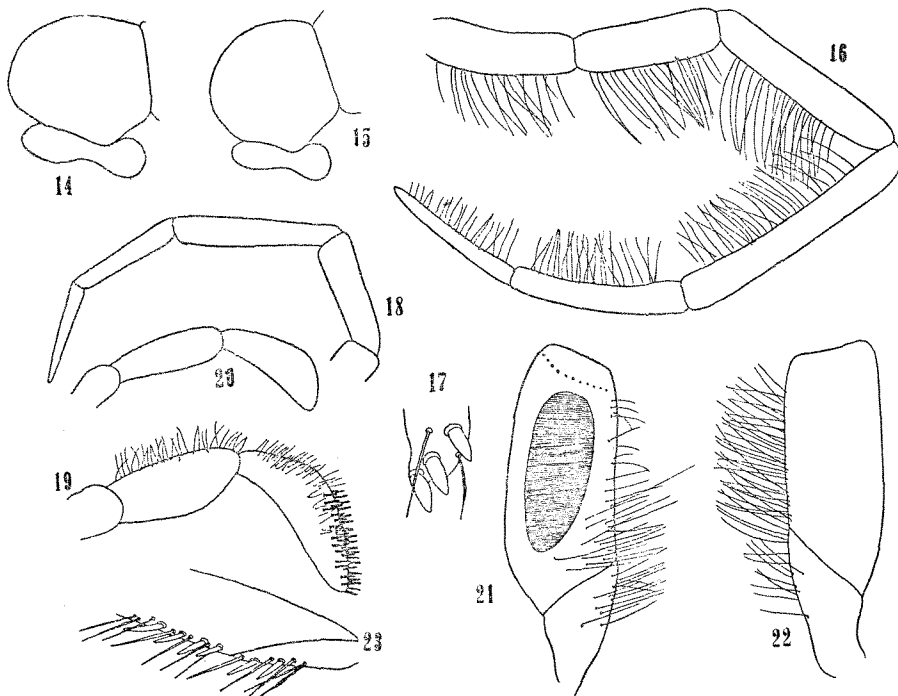
of female

$$\text{II—VII} = 0.45$$

$$\text{VIII} = 0.7$$

$$\text{IX} = 0.7.$$

Parameres of male slender, those of segment VIII with I + 7, of IX with I + 8—9 segments. Penis slender, elongate, considerably sur-



Lepismachilis handschini sp. n. — Fig. 14, Eye and ocellus, lateral view; fig. 15, eye and ocellus, frontal view; fig. 16, maxillary palp of male; fig. 17, apical spinulets of distal joint of maxillary palp of male; fig. 18, maxillary palp of female; fig. 19, labial palp of male; fig. 20, labial palp of female; fig. 21, inner surface of trochanter and femur of fore leg of male, with sensory field; fig. 22, trochanter and femur of leg III of male. — Wygodzinsky del.

passing apex of posterior parameres, its apical section slightly shorter than the basal section, the former with a distal subtriangular process.

Ovipositor of the female of primary type, simple, slightly surpassing apex of terminal spine of stylets IX, the gonapophyses with 65—70 joints; chaetotaxy as in *L. hoberlandti*.

Material examined: Bürücek, Toros, Anatolia, 1200 m, 30. VII. 1947, Exp. N. Mus. ČSR (1 male *holotype*). Specimen collected on the soil under stones and leaves in arid forest, composed of oak, *Pinus nigra*, *Pinus brutia*, *Abies cilicica* and *Juniperus excelsa*. — Suluhan, Toros, Anatolia, 14. VIII. 1947, Exp. N. Mus. ČSR (1 female *allotype*). Specimen taken under leaves in the shade of platans, oleanders and fig-trees.

Lepismachilis handschini which we respectfully dedicate to Prof. Dr. E. Handschin, of Basel, Switzerland, is easily to be separated from the other turkish species by the characters described and figured. It seems to approach *Lepismachilis y-signata* KRATOCHVIL, 1945, from which it differs in the female sex by the more numerous joints of the gonapophyses, and in the male sex by the strongly widened apical joint

of the labial palpus, and the absence of pigment on the same. The examination of the eye pattern, so characteristic in *y-signata*, will doubtlessly show additional differential characters.

***Ctenolepisma lineata pilifera* (LUCAS, 1840)**

Material examined: Ankara — Çankaya, Anatolia, 10. IX. 1947. Exp. N. Mus. ČSR (1 male, 2 females.)

Allacrotelsa kraepelini* (ESCHERICH, 1905), *nov. comb.

Ctenolepisma kraepelini ESCHERICH, 1905

Isolepisma kraepelini SILVESTRI, 1923

Stachisma kraepelini WYGODZINSKY, 1942

Material examined: Agapinari, East Toros, Anatolia, 13. VIII. 1947 Exp. N. Mus. ČSR (2 males). — Bürücek, Middle Toros, Anatolia, 1200 m, 29/30. VII. 1947, Exp. N. Mus. ČSR (1 male 3 females, 1 juv.). These specimens were collected in the soil under stones and among fallen leaves, in a dry forest, composed of oak, *Pinus nigra*, *Pinus brutia*, *Abies cilicica* and *Juniperus excelsa*. — Erdemli, Anatolia, 27. VIII. 1947, Exp. N. Mus. ČSR (1 male, 1 female). Specimens taken under stones at about 20 m from the shores of the Mediterranean.

This is a mediterranean species, known from the Baleares, Greece, Palestine, Syria and Mesopotamia. The turkish females examined differ from those we have seen from Palestine by their much longer ovipositor which surpasses the stylets of the ninth segment by the length of those stylets (not attaining the apex of the stylets in the specimens from Palestine). As the number of the joints, however, is identical (35—38) and as neither male nor female show any additional differential characters, we are inclined to consider the specimens in hand as belonging to the true *kraepelini*.

Summary.

This paper constitutes a report on the *Machilidae* and *Lepismatidae* (*Thysanura*) collected in Turkey by Dr. Ludvík Hoberlandt, of the Expedition of the Czechoslovakian National Museum to that country in 1947. The following species were found:

Machilidae: *Machilinus rupestris* (LUCAS), *Silvestrichilis trispina* (WYGODZINSKY), *Praemachilinae* ?gen. ?sp., *Lepismachilis hoberlandti* sp. n. and *Lepismachilis handschini* sp. n.

Lepismatidae: *Ctenolepisma lineata pilifera* (LUCAS) and *Allacrotelsa kraepelini* (ESCHERICH).

This is the first time that representatives of the genus *Lepismachilis* are being found outside Europe; a key for the determination of the males of this genus is appended.

Souhrn.

Tato práce přináší výsledek zpracování čeledí *Machilidae* a *Lepismatidae* (*Thysanura*) sbíraných expedicí Národního musea v Praze do Turecka v roce 1947. Byly nalezeny následující druhy:

Machilidae: *Machilinus rupestris* (LUCAS), *Silvestrichilis trispina* (WYGODZINSKY), *Praemachilinae* ?gen. ?sp., *Lepismachilis hoberlandti* sp. n. a *Lepismachilis handschini* sp. n.

Lepismatidae: *Ctenolipisma lineata pilifera* (LUCAS) a *Allacrotelsa kraepelini* (ESCHERICH).

Jest to po prvé, co příslušníci rodu *Lepismachilis* byli nalezeni mimo Evropu; klíč na určování samců tohoto rodu jest připojen.

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