

LIST OF SIPHONAPTERA COLLECTED IN EASTERN HUNGARY.

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DURING July and early August of last year the senior author spent some four weeks at Bihárfüred (= Stina de Vale) in the forest-clad Bihár Mountains of Eastern Hungary. The insect fauna of that district proved to be very poor, there being hardly anything among the Lepidoptera which is worth recording. The high-lying parts are open grazing ground, where large herds of horses, cattle and sheep are encountered, and on these closely-cropped hills hardly any Lepidoptera were seen but *Hepialus fusconebulosus* and some Pyralis. The virgin forest, which covers the mountain-sides nearly without interruption, consists almost exclusively of beech and pine, there being hardly any brush-wood and no oak from about 700 metres upwards. The woods are very damp, springs being found almost everywhere, and the amount of rainfall is very high. Bihárfüred, which has a season of barely ten weeks, is noted for its low average temperature and pure ozonified air, and remained true to its reputation even in the exceptional summer of 1911. While the rest of Europe was being baked and parched, the rainy days were in the majority at Bihárfüred, and the guests often gathered around the stove to warm their benumbed fingers, attempts even being made by enterprising people to light the stove in their bedroom, the attempt generally ending in smoke.

As a rule, trapping for small mammals was only attended to on rainy days, when it was impossible to make excursions to the hunting grounds for Lepidoptera, situated on the slopes towards Belényes between 800 and 1300 m. The number of species obtained was only five, of which four (*Sorex araneus*, *Mus silvaticus*, *Hypudaeus glareolus* and *Microtus agrestis*) were quite common in the beech-woods and on the meadow before the bungalows, while *Sorex minutus* appeared to be rare. These mammals frequented the same places and even the same holes—which accounts for the fact that the species of fleas were greatly mixed up on the various hosts.

As among the fleas collected there are several species not previously recorded from Hungary, we deem the captures of sufficient interest to be recorded here.

No bird-fleas were obtained. Bird-life was even poorer at Bihárfüred than the Lepidoptera. Besides two species of *Motacilla*, a solitary couple of swallows, an occasional jay and nuthatch, and some woodpeckers, there was nothing in the hollow where the "Luftkurort" is situated—not even a sparrow. The place is too densely wooded, and the warm season too short, being moreover frequently interrupted by a sudden fall of the thermometer to freezing-point, for harbouring an abundance of insect and bird life, which flourishes more on open, sunny glades than in a pure, bracing atmosphere with a high percentage of ozone.

Pulex irritans, *Ctenocephalus canis*, and *Ct. felis* do not appear in our list of captures—from which fact, however, it would be hasty to draw conclusions as to their absence.

1. *Ceratophyllus penicilliger* Grube (1852).

6 ♂♂, 7 ♀♀; July 12 and 31, and August 2 and 3, off *Microtus agrestis*.

1 ♀; July 12, off *Hypudaeus glareolus*.

Not previously recorded from Hungary.

The specimens agree with the insect identified by Wagner as *penicilliger*.

C. pedias Roths., *Ann. Sci. Nat.* p. 231. no. 21 (1910), based on a single ♂ from Finland, is close to *penicilliger*, but differs in the ninth abdominal sternite of the ♂ bearing only thin hairs proximally to the sinus of the horizontal arm, while in *penicilliger* there is a short spine among the hairs.

2. *Ceratophyllus sciurorum* Schrank (1803).

1 ♀; July 8, off *Microtus agrestis*.

The occurrence on this host is certainly accidental. The presence of squirrels in the woods was testified by the fir-cones on which they had been at work.

3. *Ctenophthalmus agyrtes eurous* subsp. nov.

Typhlopsylla agyrtes (Heller), Wagner, *Hor. Soc. Ent. Ross.* xxxi. p. 589, tab. 9, fig. 23 (1898).

3 ♂♂, 11 ♀♀; July 8, 11, 12, 21, and August 2 and 31, off *Microtus agrestis*.

6 ♂♂, 3 ♀♀; July 12 and August 3, off *Hypudaeus glareolus*.

2 ♂♂, 2 ♀♀; July 11 and 18, off *Mus silvaticus*.

1 ♂, 2 ♀♀; July 31 and August 2 and 3, off *Sorex araneus*.

This is a particularly interesting form of *agyrtes*, inasmuch as it goes far to prove that *agyrtes* Heller (1896) and *provincialis* Roths. (1910), and presumably also *baeticus* Roths. (1910), are geographical races of one widely distributed species. This species appears to respond more readily to differences in its surroundings than any other European flea. The specimens which we have examined from a number of countries confirm Dr. A. Dampf's view, expressed to us *in litt.*, that *C. agyrtes* would be a profitable subject for the study of the geographical variation of the clasping organs.

The Hungarian examples before us agree very well in the ♂-genitalia with the figure given by J. Wagner of a Russian specimen, and differ markedly from the figure we published of true *agyrtes* in *Nov. Zool.* 1898, tab. 15A, fig. 1, and tab. 17, fig. 12. Wagner and others attributed the differences in the figures to incorrectness of our drawings. Although our figures were not so good as one might have wished them to be, still the most conspicuous characteristics of true *agyrtes* are nevertheless well brought out in them.

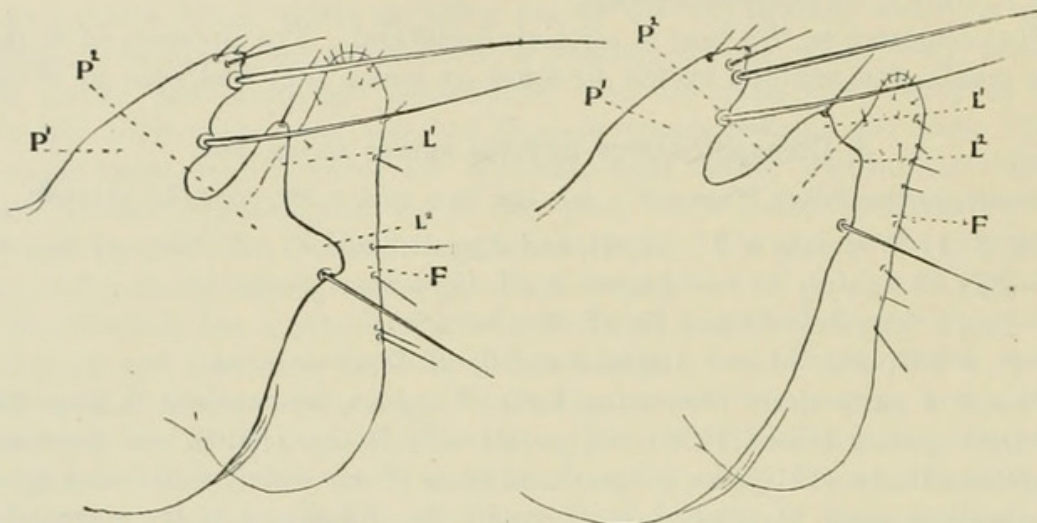
From the specimens we have examined true *agyrtes* appears to occur, roughly speaking, only west of the Elbe, and the present new geographical race in the countries east of the Elbe. We believe that we can distinguish several more (undescribed) geographical forms. We are, however, not yet in a position to elucidate the question satisfactorily. *C. agyrtes eurous* is, from the point of view of the clasping organs of the ♂, intermediate between *C. agyrtes agyrtes* and *C. provincialis*; and, in the ♀, closely approaches *provincialis* in the shape of the seventh abdominal sternite.

♂. The eighth abdominal sternite bears a row of three instead of four bristles, besides a number of bristles more proximally placed. The clasper (text-fig. 1) is divided, as in *C. agyrtes agyrtes*, into a long and conical upper process (P¹) and shorter and broader lower process (P²). This second process is again divided into a conical

upper lobe (L^1) and a more or less truncate lower one (L^2). For comparison we figure these organs of an Hungarian example and of an *agyrtes* from Borkum (the original locality of *agyrtes*). It will be noticed that in true *agyrtes* (text-fig. 2) the lobe L^2 is obsolescent, while it is well produced in all examples of *eurous*. There is some variability in the length of L^1 and L^2 in *eurous*, but the sinus between them is never so deep as in *provincialis*.

♀. The seventh abdominal sternite is deeply and broadly sinuate ventrally, there being one large lateral lobe, which is broader than in *agyrtes*. There is no narrow lobe beneath this broad one. The eighth tergite has ventrally a row of five bristles as in *agyrtes*, the last one being short, and above this row one long bristle accompanied by one, two, or rarely three small ones.

C. agyrtes has not previously been recorded from Hungary.



TEXT-FIG. 1.

TEXT-FIG. 2.

4. *Ctenophthalmus obtusus* spec. nov.

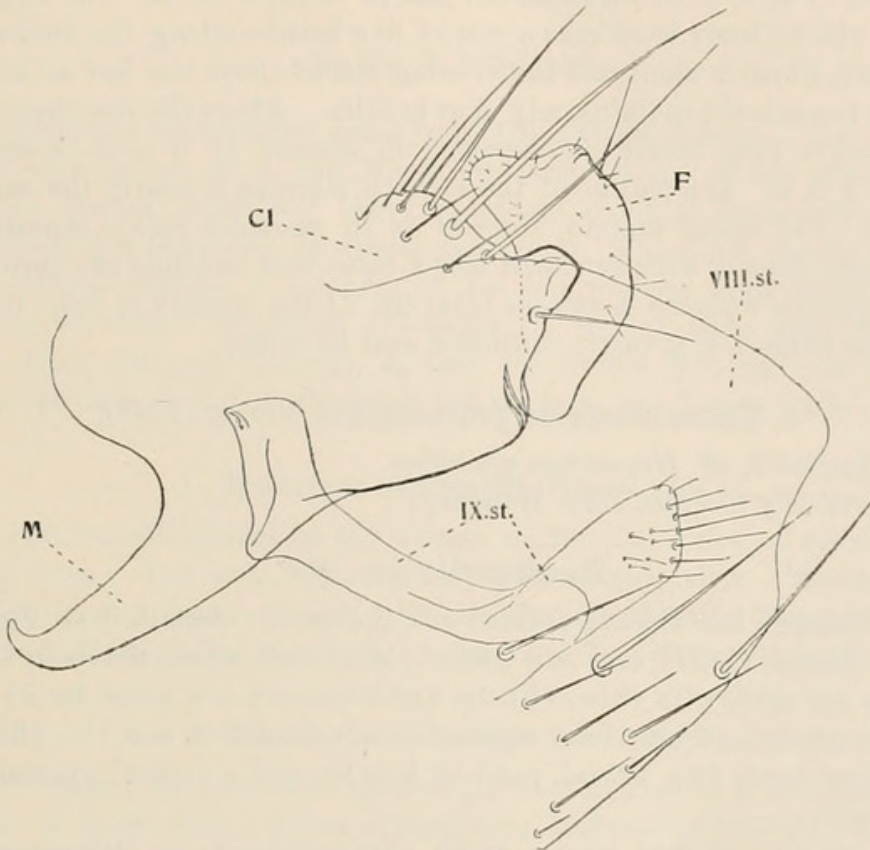
3 ♂♂, 4 ♀♀; July 12 and 21, and August 2, off *Microtus agrestis*.

2 ♀♀; July 12 and August 3, off *Hypudaeus glareolus*.

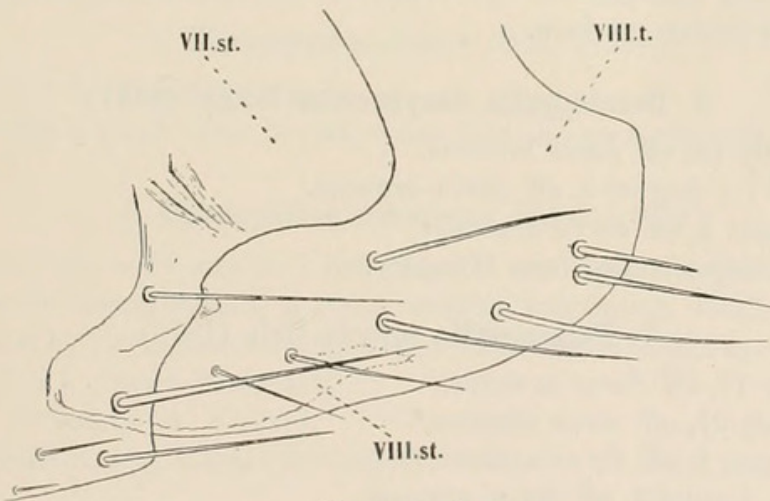
Very near *C. uncinata* Wagn., *Hor. Soc. Ent. Ross.* xxxi. p. 590 tab. 9. fig. 24, tab. 10. fig. 29 (1898), described from 2 ♂♂ and 1 ♀ found on *Putorius vulgaris* at New Alexandria. The occurrence of *uncinata* on *Putorius* we believe to be accidental, the true host probably being *Microtus*, as in the case of *obtusus*. As we have no example of *uncinata* in the collection, we rely on Wagner's figures, which represent the claspers of the ♂ and the head, and therefore restrict our description to the modified abdominal segments, whose structure affords the best and perhaps the only distinguishing characters. The chaetotaxy of the body and legs in *uncinata* according to Wagner is the same as in *C. assimilis* Tasch. (1880), but differs appreciably in *obtusus*, especially in the ♀.

♂. The clasper (Cl) agrees perfectly with the figure given by Wagner of that sclerite of *C. uncinata*, the nose-like process varying a little individually, being sometimes more rounded, sometimes more pointed. The movable process (F) is more than twice as long as it is broad in *obtusus*, whereas it is only half as long again as it is broad in Wagner's figure of *uncinata*; its proximal margin is incurved, not straight, the upper margin also being distinctly excised. The upper distal corner, which is produced into a hook in *uncinata*, projects very little in the new species. But there is on the inner surface of F just below the corner a groove

above which F is somewhat incrassate, this portion of F corresponding to and somewhat resembling the hook of *uncinata*. The upper edge of F is distinctly incurved, not straight as in *uncinata*. The ninth sternite (ix. st.) is very much the same as in *C. assimilis*. The eighth tergite (viii. t.) bears on each side a



TEXT-FIG. 3.



TEXT-FIG. 4.

postmedian row of three bristles, and proximally to this row five or six additional bristles.

♀. The ♀ of *uncinata* is said by Wagner to agree with *assimilis*, no distinctions between the ♀♀ of the two species being mentioned. The ♀ of *obtusius*, on the other hand, is distinguished from *assimilis* by the smaller number of bristles on the abdominal segments ii. to vii. The basal sternite bears only a pair of ventral bristles, no lateral bristle, and the numbers on the sternites of segments iii. to vii.

are on the two sides together: iii. 5, 9; iv. 7-9, 10; v. 6-11, 8 or 9; vi. 9-11, 8; vii. 3-7, 7 or 8; the second figures referring in each case to the postmedian row of bristles, and the first numbers to the additional bristles placed in front of this row. The numbers are in *assimilis* on sternites iv. to vii. as follows: iv. 9-14, 11 or 12; v. 13-16, 11 or 12; vi. 15, 10 or 11; vii. 12 or 13, 12 or 13. The eighth tergite (text-fig. 4, viii. t.) bears in *obtusus* a row of five bristles along the ventral margin, a sixth bristle, which is short and thick, being placed above the last as in *assimilis*, but the row in *assimilis* contains only four bristles. Above the row there is in both species a single long bristle accompanied in *obtusus* by 0 to 2 bristles and in *assimilis* by 4 to 6. The outline of the seventh sternite is nearly the same in the two species. The apical margin, however, is in *assimilis* rather strongly convex below the large lobe, or even produced into a short lobe recalling the narrow lobe of *C. agyrtes agyrtes*, whereas in *obtusus* (text-fig. 4) the margin is only very faintly convex. The oviduct is strongly chitinated near its orifice.

5. *Ctenophthalmus pentacanthus* Roths. (1897).

1 ♀; August 3, off *Hypudaeus glareolus*.

Not previously recorded from Hungary.

Doratopsylla gen. nov.

As A. Dampf* has already pointed out, the species described as *Typhlopsylla dasyncnemus* Roths. (1897), and now either placed into *Ctenophthalmus* or *Palaeopsylla*, does not agree with either of them and requires a new genus for its reception. The rostrum consists of only four segments instead of five, and the fifth segment of all the tarsi bears four lateral pairs of bristles and a ventral proximal pair as in *Palaeopsylla*.

There are also tropical species under *Ctenophthalmus* or *Palaeopsylla* which have the rostrum four-jointed—for instance, *intermedia* Wagner (1900)—which, however, do not concern us here.

6. *Doratopsylla dasyncnemus* Roths. (1897).

3 ♂♂; July 12, off *Sorex araneus*.

3 ♂♂, 2 ♀♀; August 2, off *Sorex araneus*.

1 ♀; August 3, off *Sorex araneus*.

Not previously recorded from Hungary.

7. *Palaeopsylla sorecis* Dale (1878).

1 ♂; July 12, off *Sorex araneus*.

3 ♀♀; July 31, off *Sorex araneus*.

1 ♀; August 2, off *Sorex araneus*.

1 ♂, 1 ♀; August 3, off *Sorex araneus*.

Not previously recorded from Hungary.

8. *Hystrihopsylla talpae* Curtis (1826).

1 ♂, 1 ♀; July 12 and August 2, off *Hypudaeus glareolus*.

4 ♂♂, 3 ♀♀; July 12, 21 and 31, August 2, off *Microtus agrestis*.

* Zool. Jahrb., Suppl. 12. p. 632 (1910).



1912. "List of Siphonaptera collected in eastern Hungary." *Novitates zoologicae : a journal of zoology in connection with the Tring Museum* 19, 58–62.

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