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Ctenophthalmus fransmiti, a New Species of Flea from Romania (Siphonaptera: Hystrichopsyllidae)

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Abstract. This paper describes a new species of the genus *Ctenophthalmus* which differs morphologically from the members of the *agyrtes*-subgroups and forms a separate unit which, from a phylogenetic standpoint, is placed in the vicinity of the *apertus*-subgroup. The new species is characterized in the male by the structure of sterna VIII and IX, the phallosome and the presence of two large and distinct lobes (strongly developed intersegmental membranes) between sterna VIII and IX. The main host of this flea is *Apodemus sylvaticus*.

Our material of the hitherto undescribed flea was collected during a three year period (1965—1967), when we studied the ecology of Siphonaptera from the northern half of the Dobrogea (Jijila, Jurilovca, Luncavița and Babadag), but we also have several specimens from Valul lui Traian and from a cave at Limanu (southern Dobrogea).

Analysing the biotopes of the collecting places, we see that around Jijila (45° 19′ N., 28° 10′ E.), a village located in the north-western corner of Dobrogea where the holotype was found, cultures of cereal plants prevail, with strips of vine and fallow areas covered by weeds and shrubs (*Prunus spinosa*, *Crataegus monogyna*, *Cornus mas*, *Padus mahaleb*), such places offering ideal living conditions for Sciuridae (*Citellus citellus*), Cricetidae (*Mesocricetus newtoni*), Muridae and Microtidae. On the other hand, in the neighbourhood of Jurilovca village (Razelm Lake) the vines prevail and the cereal cultures alternate annually with hayfields (clover and lucerne), fallow areas being less common. Although both collecting places are in the proximity of large water regions — the Danube swamps and the Razelm Lake — the humidity is rather low. In the biotopes of both Jijila and Jurilovca we found that in the mammal population structure *Apodemus sylvaticus* and *Citellus citellus* were the most abundant species. Located in the middle of the Dobrogea steppe, Valul lui Traian is a vast crop area, where *Microtus arvalis* is very common.

Two paratypes originate from the cave of Limanu which is situated on the southern border of the Mangalia Lake. This cave offers a good microclimate for various animals (invertebrates and vertebrates), which shelter in it during periods of drought. The occurrence of fleas in the cave indicates that the hosts sought a shelter in that place. The fleas were collected from the gallery floor, but they came presumably from *Apodemus sylvaticus*, which is common in this area.

Ctenophthalmus fransmiti sp. n.*)

Type material: ♂ holotype, Jilila, 3—7. III. 1966, from *Apodemus sylvaticus*, L. ♀; ♀ allotype, same locality, 20—24. V. 1966, from *Apodemus sylvaticus* ♂; 1 ♂ paratype, same locality, 3—7. III. 1966, from *Apodemus sylvaticus* ♂ (this specimen is in the British Museum (Natural History), Tring, Herts.); 1 ♀ paratype, same locality, 3—7. III. 1966, from *Apodemus sylvaticus* ♀; 1 ♂ paratype, Jurilovca, 5. XI. 1965, from *Apodemus sylvaticus* ♀; 2 ♀♀ paratypes, same locality, 29. V. 1967, from *Apodemus sylvaticus* ♀ (one specimen in the British Museum, Tring, Herts.); 1 ♂ paratype, Valul lui Traian, 2. IV. 1965, from *Microtus arvalis* PALL. ♂, lgt. M. Hamar; 1 ♀ paratype, from the cave of Limanu (hall X), 29. VII. 1962; 1 ♂ paratype, from the cave of Limanu (complex I), 8. X. 1963, Collection of the Institute of Speleology "Em. Racovita"**).

The material is in our collection, except for a male and a female which have been donated to the British Museum (Natural History).

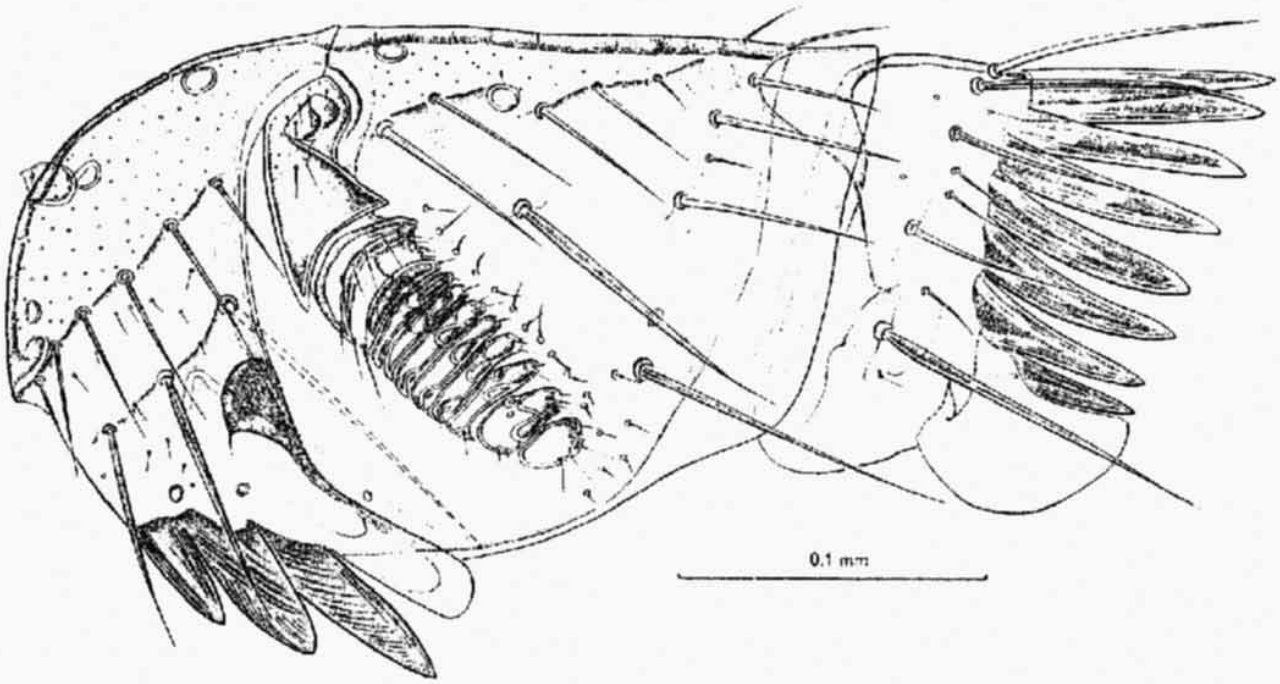

Fig. 1. *Ctenophthalmus fransmiti* sp. n. Head and pronotum, ♂ paratype.

Diagnosis: This new species is a member of the *agyrtes*-group of species of the genus *Ctenophthalmus*, reminiscent of *C. apertus apertus* Jordan et Rothschild, 1921, by the clasper and details of the phallosome and of *C. egregius* Peus, 1964, by the chaetotaxy of sternum VIII, ♂. The characteristic features of our species are the shortness of the proximal arm of sternum IX and the exaggerated development of the membrane between sterna VIII and IX, ♂, giving it a peculiar appearance among the species of the *agyrtes*-group. We consider therefore that it is clearly differentiated from the related forms and constitutes a subgroup of its own.

*) This species is dedicated to Mr. Frans Smit, British Museum (Natural History), Tring, Herts, as a sign of homage and gratefulness.

**) We are deeply indebted to our colleague A. Popescu for the host determination and to the speleologist team composed of Prof. Margareta Dumitrescu, Prof. Tr. Orghidan and main research worker J. Tanasache, as well as to Dr. M. Hamar.

Description: Head (Fig. 1, ♂), thorax, unmodified abdominal segments and legs show no difference in comparison with other members of the *agyrtes*-group.

Male (Figs. 2, 3). Sternum VIII (Figs. 2, 3) with a weakly rounded posterior margin and ventro-posteriorly a group of 8—10 long and curved setae. Anterior to this group of setae there is a straight and rather short seta. The chaetotaxy of our species differs from that of *C. egregius*, mentioned above, by the dense grouping of setae,

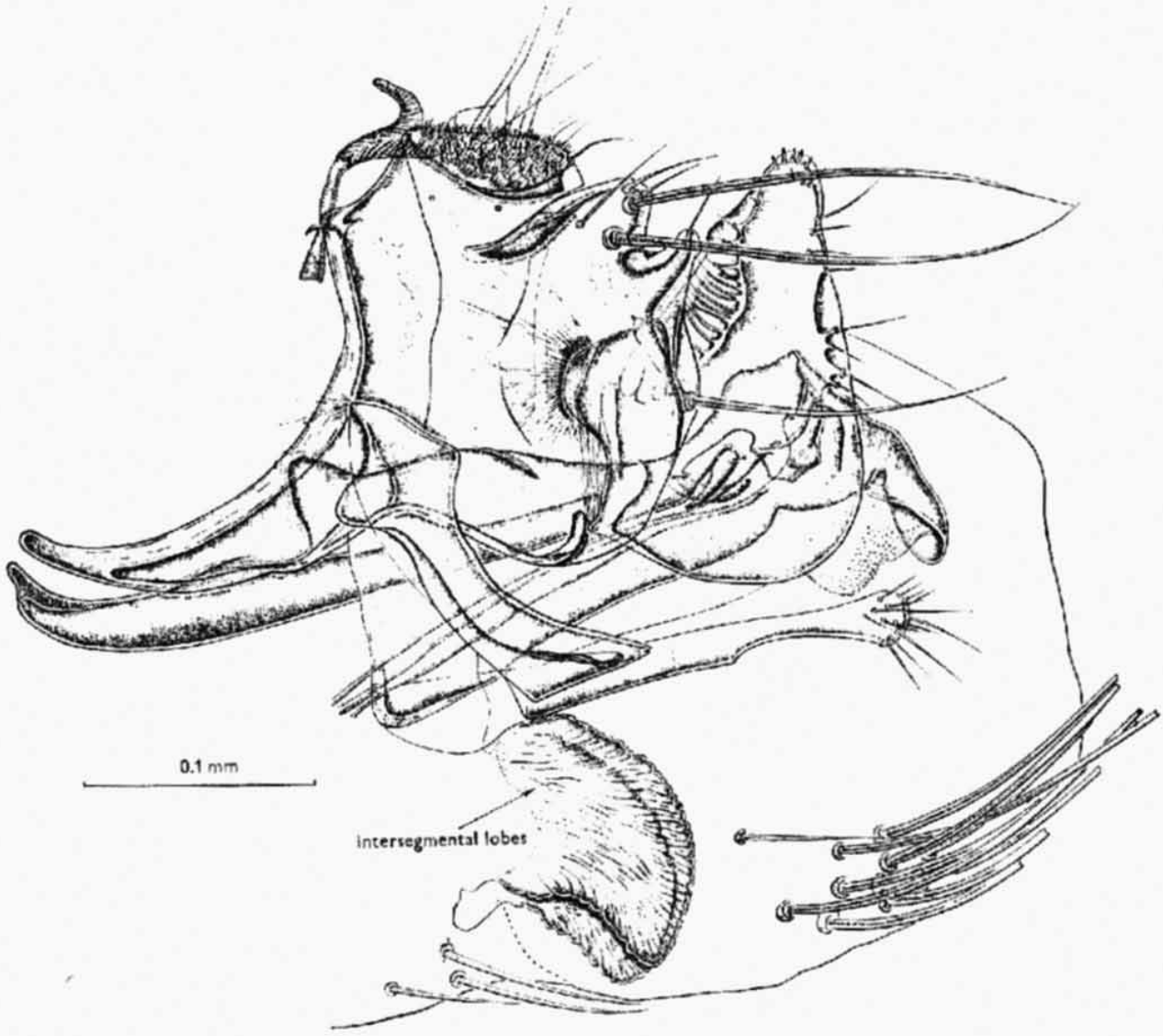

Fig. 2. *Ctenophthalmus fransmiti* sp. n. Terminalia of holotype.

their length and thickness; a number of these setae are bifurcated preapically (Fig. 3)—this most unusual feature is present in most of the individuals examined. The dorsal lobe of the fixed process of clasper (L^1 of P^1; or dP1, after Peus) is triangular with two long setae, a few dorsal bristles, 1 bristle placed toward the centre and 2 or 3 minute bristles on its posterior margin; the ventral lobe (L^2 of P^1; or dP2 after Peus) is separated from the first by a rather deep sinus, and is angular with a rounded top and with a thin apical seta. The long acetabular seta is inserted at about half the distance between the apex and the ventral margin of the ventral

lobe. The movable process is pyriform and has five small sensilla at its apex; the group of four bristles (tetrad setae) are situated in the middle area of the posterior margin. Manubrium a little curved. Sternum IX shortened, mainly in its proximal region, the apical third of the distal arm is narrow but widens apically, taking the shape of a palette, with several bristles arranged like a fan; the angle between the proximal and the distal arms of sternum IX has an uncommon appearance, showing a tendency to form an obtuse angle. As a consequence of the shortening of sternum IX, the distance between it and the ventral part of sternum VIII has grown considerably. This has resulted in the development of the intersegmental membrane into two greatly expanded lobes which are filling the gap. These lobes are reminiscent of similar formations in e.g. males of *Neopsylla* and *Ceratophyllus gallinae*, but they differ by rather massive appearance, with festooned margins and a striated surface sculpture. Their size does not vary much and their long axis measures 0.15 mm. The phallosome is different from that of *C. apertus*. In the new species the subapical sclerite is rounded, the ventral aedeagal lobes are little developed and not curved, the velum is more folded and the aedeagal apodeme is broader.

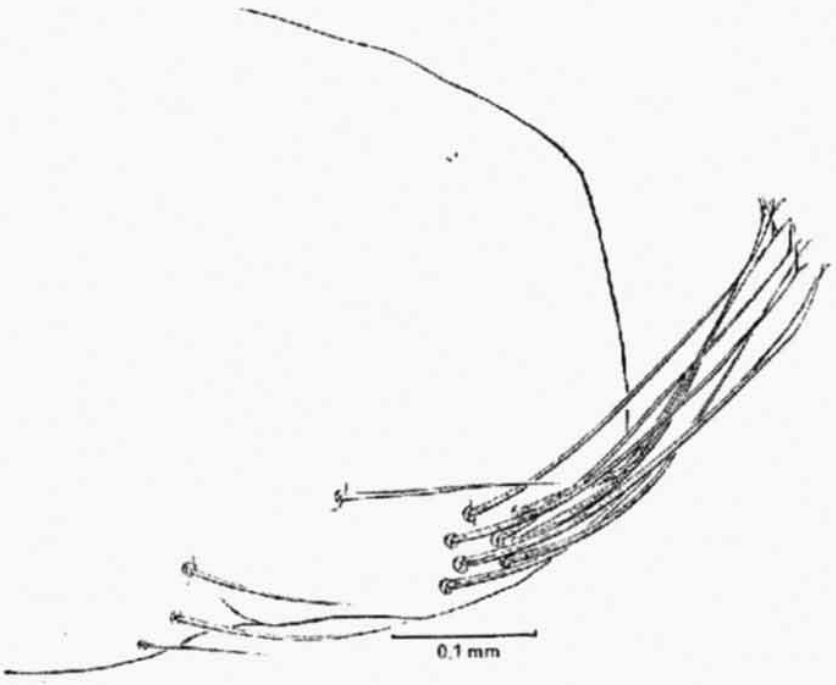

Fig. 3. *Ctenophthalmus fransmiti* sp. n. Sternum VIII, ♂.

Female (Fig. 4). This sex shows the typical features of the *agyrtes*-group. The posterior margin of sternum VII is divided by a sinus into a dorsal and ventral lobe; there is some variation in the outline of the posterior margin of sternum VII (Fig. 4a—c). Spermatheca with a well developed bulga which is longer than the hilla.

Length (of mounted specimens): ♂ 2—2.5 mm; ♀ 2.4—2.6 mm.

Conclusion: *Ctenophthalmus fransmiti* differs from the other species of the *agyrtes*-group by the characteristics of sterna VIII and IX, the phallosome and the presence of large intersegmental lobes which are developments of the membrane between sterna VIII and IX of the male. As the combination of these characteristics do not fit any extant subgroup, we suggest for it a new unit within the *agyrtes*-group, the *fransmiti*-subgroup. Since *C. fransmiti* seems to be nearest related to *C. apertus*, we would like to stress the phylogenetic relationship by placing the *fransmiti*-subgroup in close vicinity of the *apertus*-subgroup.

Even though in the biotopes near Jijila and Jurilovca the rodent populations

are composed of species of *Apodemus* and *Microtus*, we collected specimens of this flea from *Apodemus sylvaticus* only. This mouse obviously represents the main host of *C. fransmiti*, the occurrence of a single individual on *Microtus arvalis* at Valul lui Traian being accidental. This a new corroboration of SMIT's opinion (1963) that the members of the *agyrtes*-group chiefly parasitize *Apodemus*.

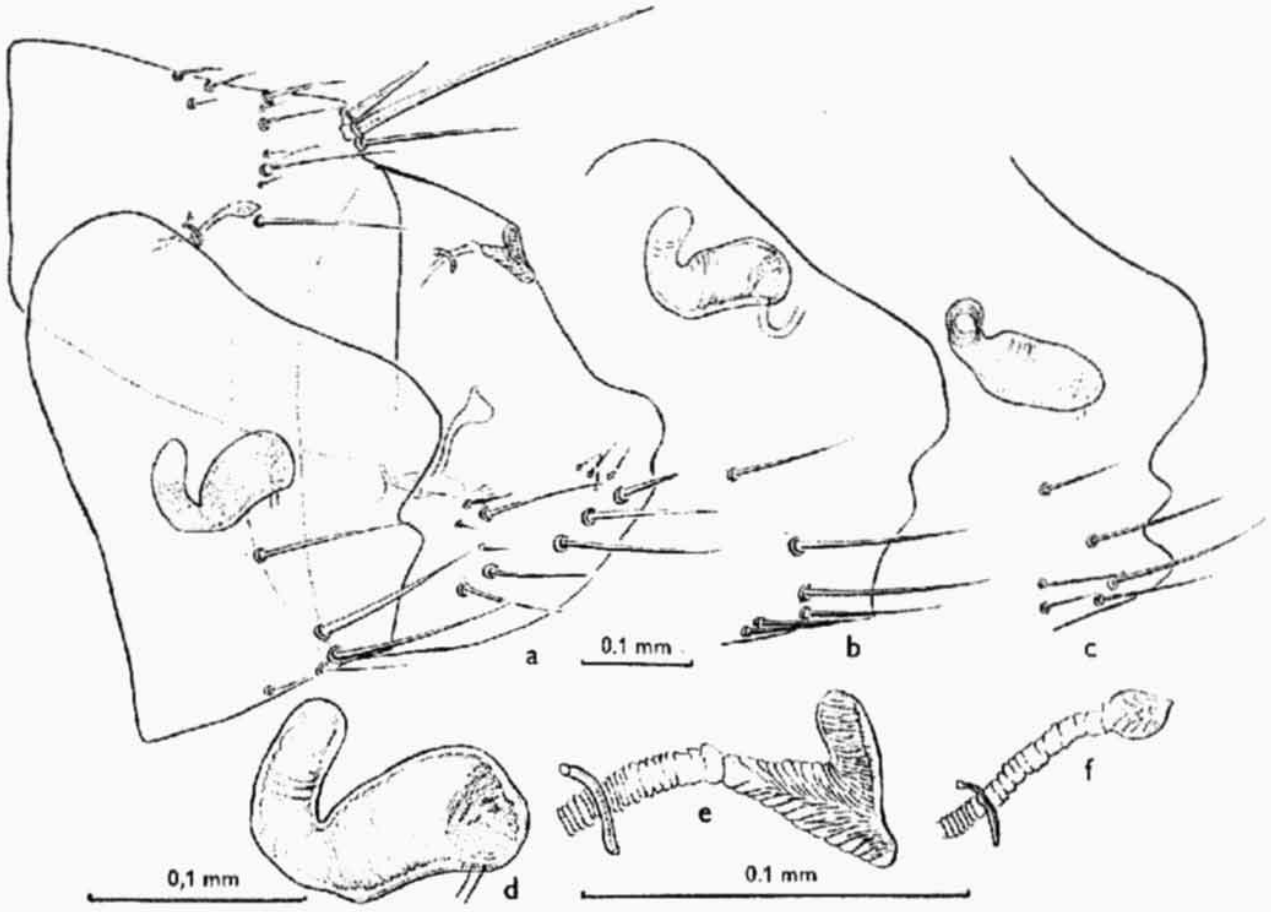

Fig. 4. *Ctenophthalmus fransmiti* sp. n., ♀: a — Terminalia of allotype; b, c — sternum VII of two paratypes; d — spermatheca of allotype; e — spiracle of tergum VIII; f — spiracle of tergum VII.

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