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ANCYLODISCOIDES (MONOGENOIDEA: DACTYLOGYRIDAE) FROM THE GILLS OF THE MONGOLIAN PARASILURUS ASOTUS L.*)

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Abstract. The determining features of 8 species of the genus *Ancylodiscoides* Yamaguti, 1937 collected from the gills of the Mongolian *Parasilurus asotus* are described and figured. A critical evaluation is given of the standard techniques employed for measuring the chitinoid parts of the haptor of these parasites.

In Mongolia, the species *Parasilurus asotus* has been found only in the basin of the Amur River, where its numbers are very high in rivers and lakes. During the Czechoslovak-Mongolian ichthyoparasitological expedition in 1966, we examined 6 specimens of this fish species, 4 of them from Lake Buyr nur (at the eastern border of Mongolia), 2 from a small, unnamed lake near the town Binder (NE-Mongolia). The gills of these specimens were parasitized by a total of 236 helminths, members of 8 species of the genus *Ancylodiscoides* Yamaguti, 1937. The paper presents descriptions and figures of these species (of the principle determining features) and discusses different descriptions in the partinent literature.

The parasites were fixed in a mixture of ammonium picrate and glycerine, then transforred into Canada balsam. The permanent mounts are deposited in the collection of the Institute of Parasitology of the Czechoslovak Academy in Prague.

SURVEY OF SPECIES

1. *A. asoti* Yamaguti, 1937 — Fig. 1

Locality: Lake Buyr nur; of a total of 4 fishes, one was parasitized with 3 specimens.

The morphological and metrical variability of all determining features of our specimens is within the range of that given by Gussev (1955).

2. *A. botulovagina* Gussev et Strelkow, 1960 — Fig. 2

Locality: Lake Buyr nur; found on 3 of the 4 fishes examined (maximum 49 specimens per host).

None of these specimens surpassed the limits of the morphological and metrical variability given in the original description of this species.

*) Results of the Mongolian-Czechoslovak expedition in Mongolia, 1966. Communication No. 8.

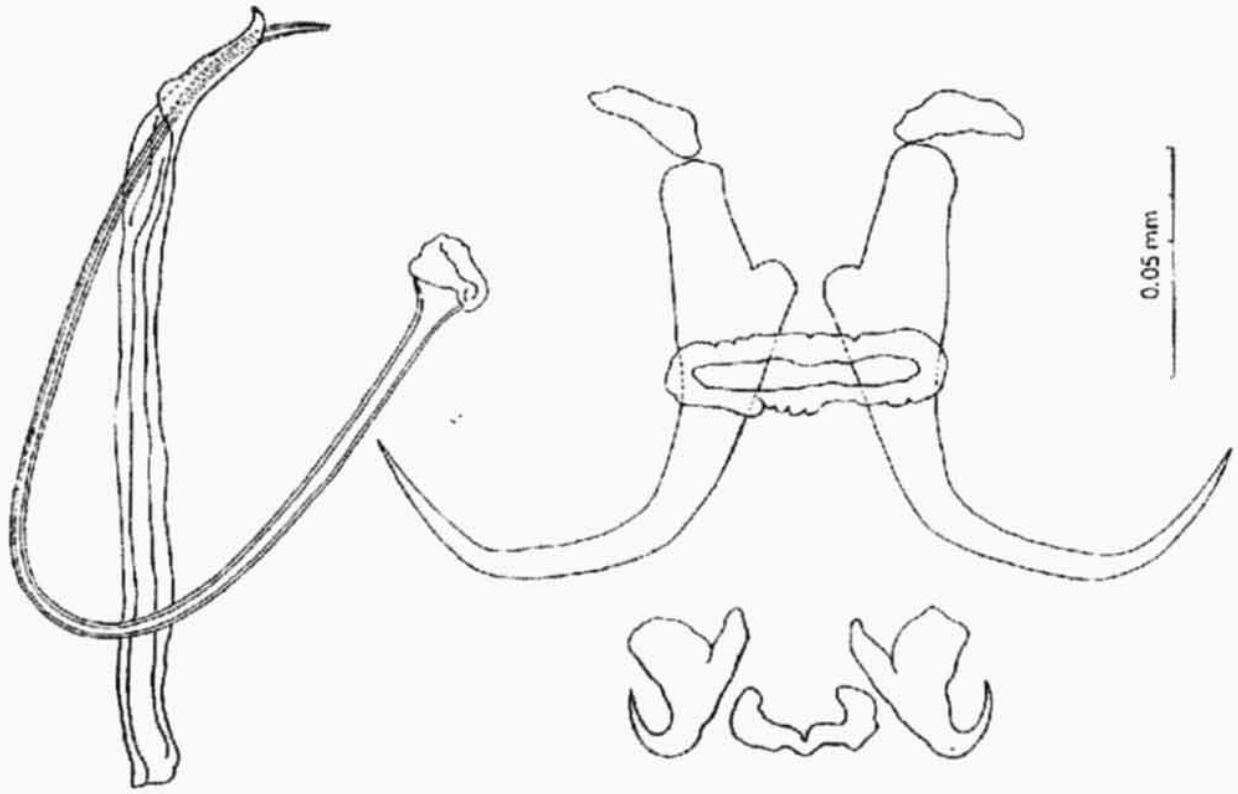

Fig. 1. Chitinoid parts of the haptor and the copulatory organ of *A. usoti* Yamaguti, 1937.

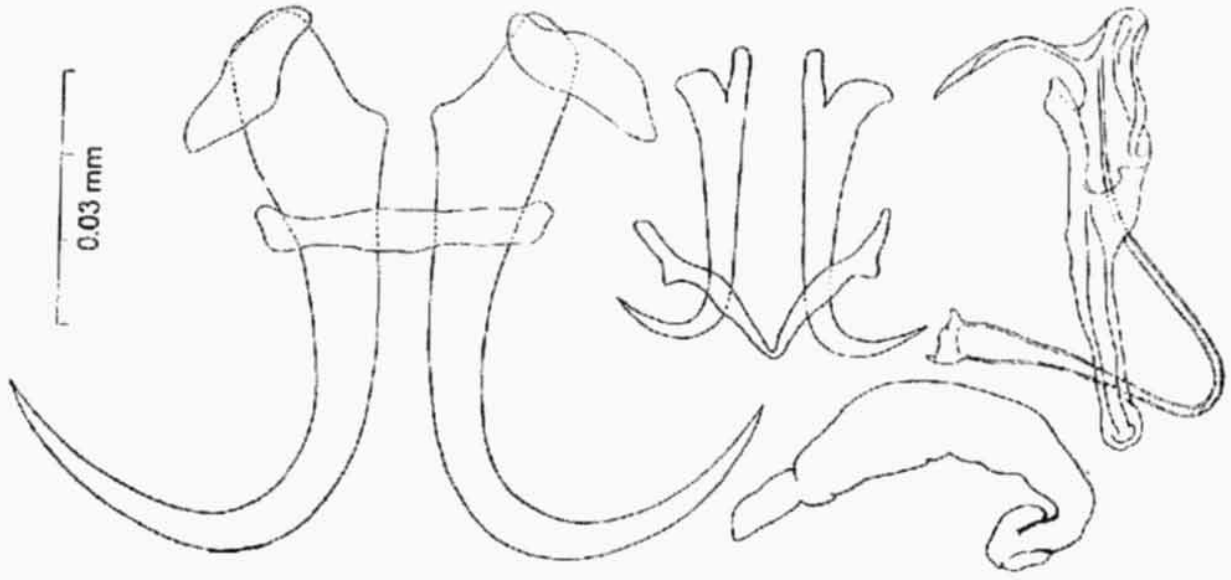

Fig. 2. Chitinoid parts of the haptor, the copulatory organ and vaginal support of *A. botulovagina* Gussev et Strelkow, 1960.

3. *A. cochleovagina* Gussev et Strelkow, 1960 Fig. 3

Locality: Lake Buyr nur; collected on one of the 4 fishes examined (7 specimens).

The determining features of all specimens examined are in accord with those of the original description of this species. This refers both to their morphology and size.

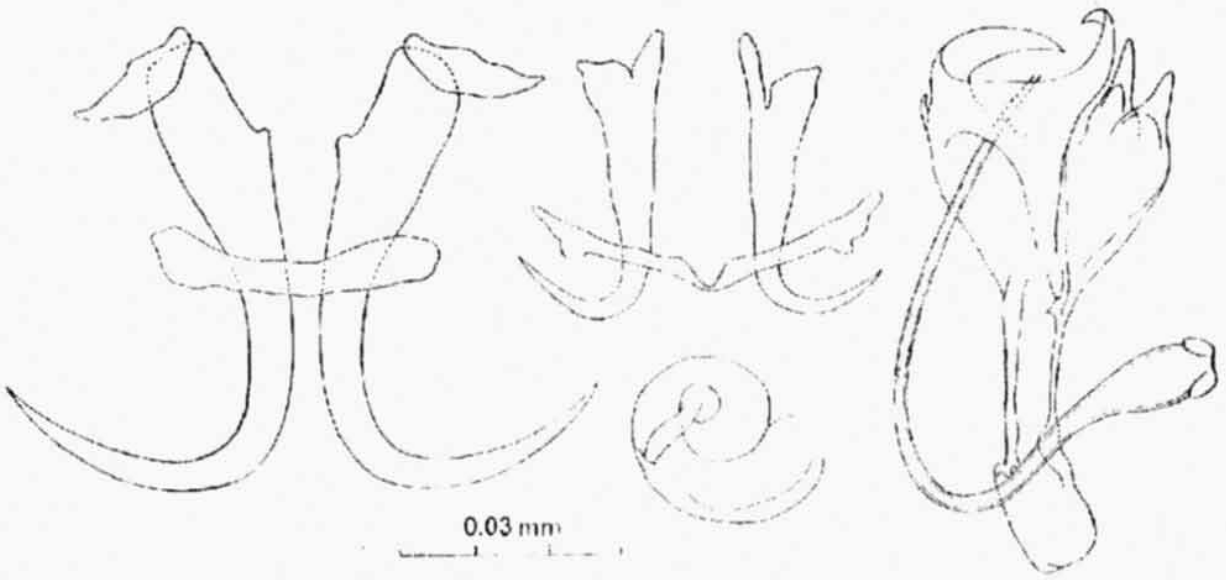

Fig. 3. Chitinoid parts of the haptor, the copulatory organ and vaginal support of *A. cochleovagina* Gussev et Strelkow, 1960.

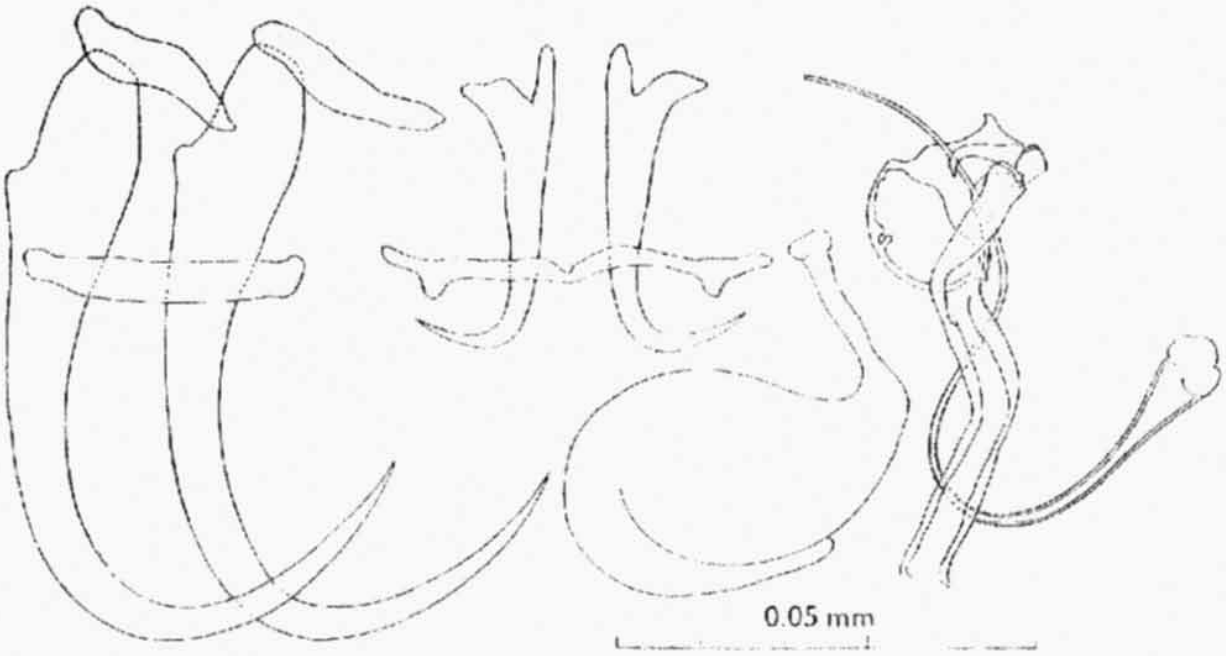

Fig. 4. Chitinoid parts of the haptor, the copulatory organ and vaginal support of *A. curvilamellis f. typica* Achmerow, 1952.

4. *A. curvilamellis* Achmerow, 1952

Gussev and Strelkow (1960) concluded on the grounds of a systematic evaluation of a large material of this species that *A. curvilamellis* occurs in two forms — *A. curvilamellis f. typica* and *A. curvilamellis f. obscura*. We found both these forms in our material.

A. curvilamellis f. typica Fig. 4

Three specimens of *A. curvilamellis f. typica* were recovered on one of the 2 fishes obtained from a lake near the town Binder.

Our specimens differ from those described by Gussev and Strelkow (1960) only in the moderately longer overall length of the ventral anchors (up to 0.037 mm).

A. curvilamellis f. obscura Fig. 5

Four specimens were recovered from one of the 4 fishes caught in Lake Buyr nur.

Similarly as in the foregoing form, the only difference observed was that of the longer overall length of the ventral anchors (up to 0.038 mm).

The marked difference between these forms is reflected mainly in the shape of the supporting part of the copulatory organ. If this stability were proved even after evaluating a larger material from various localities and if the morphogenesis of the copulatory organ of these worms were confirmed in experiment, this difference could be used as a differentiating feature. In this connection we would have to challenge the possibility mentioned by Gussev and Strelkow that *A. curvilamellis f. obscura* may be a crossbred of *A. varicus* and *A. curvilamellis*.

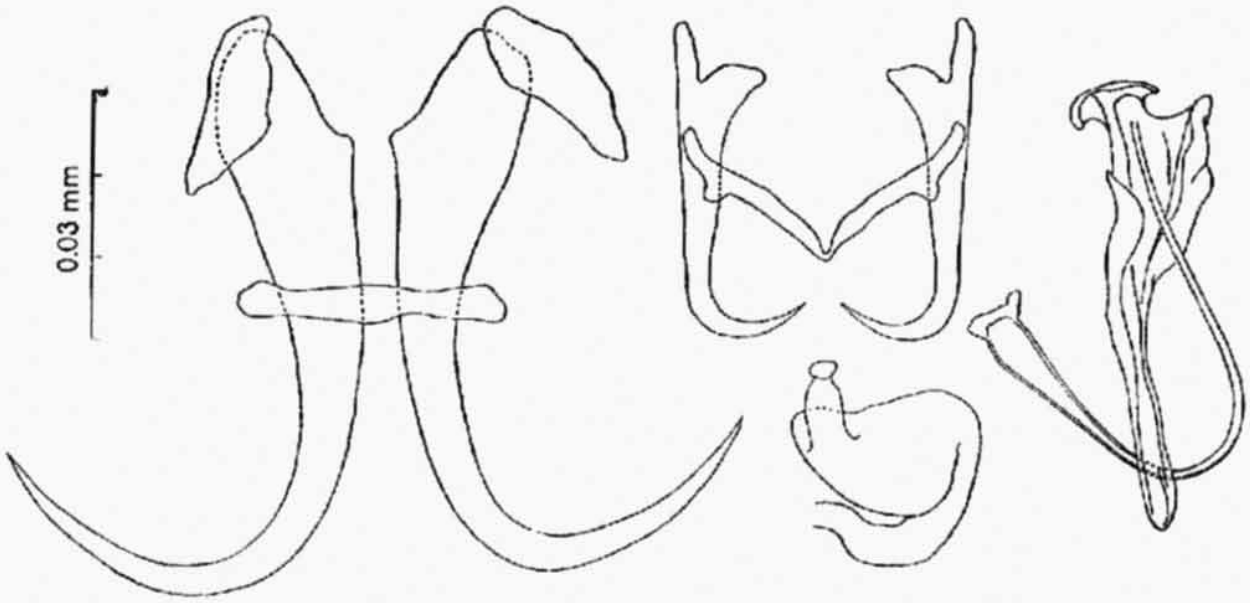

Fig. 5. Chitinoid parts of the haptor, the copulatory organ and vaginal support of *A. curvilamellis* Achmerow, 1952 *f. obscura* Gussev et Strelkow, 1960.

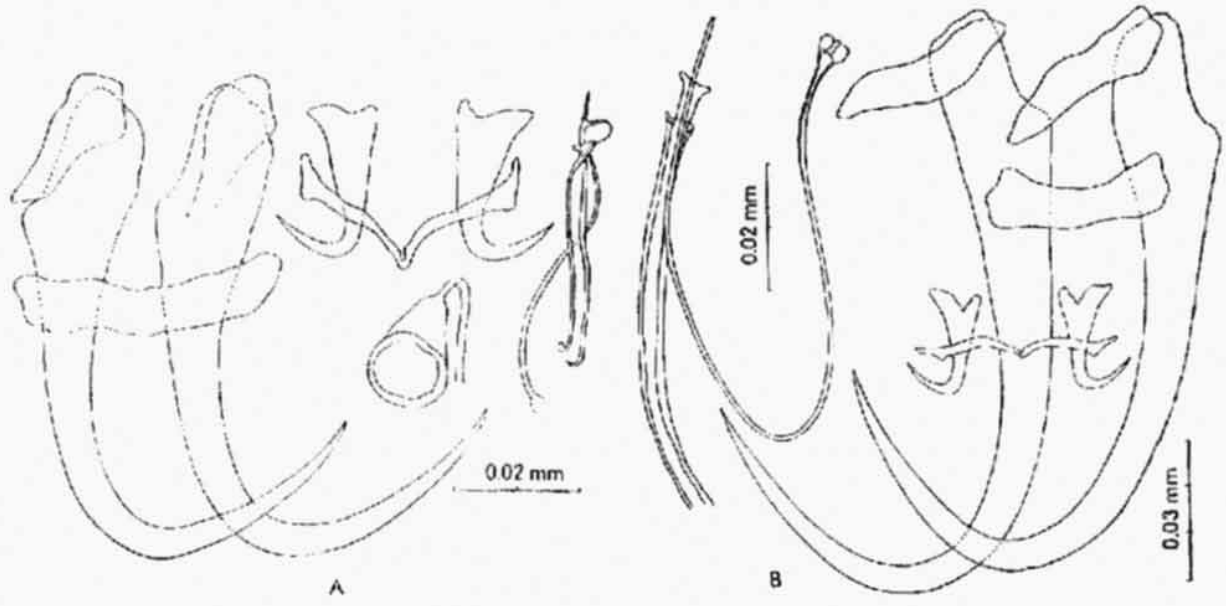

Fig. 6. Chitinoid parts of the haptor, the copulatory organ and vaginal support. a — *A. infundibulovagina* Yamaguti, 1942, b — *A. mediacanthus* Achmerow, 1952.

5. *A. infundibulovagina* Yamaguti, 1942 Fig. 6a

Locality: Lake Buyr nur; found on one of the 4 fishes examined (3 specimens).

The metrical and morphological variability of the determining features of our specimens is in concord with that recorded by Gussev and Strelkow (1960). We agree with these authors in that a printing error must have occurred in the original description of the length of the copulatory tube of the copulatory organ (0.05—0.06 mm). This chitinoid formation attains a maximum length of 0.045 mm.

6. *A. mediacanthus* Achmerow, 1952 Fig. 6b

Locality: Lake Buyr nur; found on two of the four fishes examined (6 and 8 specimens).

The determining features of all worms examined are in complete agreement with the morphological and metrical variability given for this species.

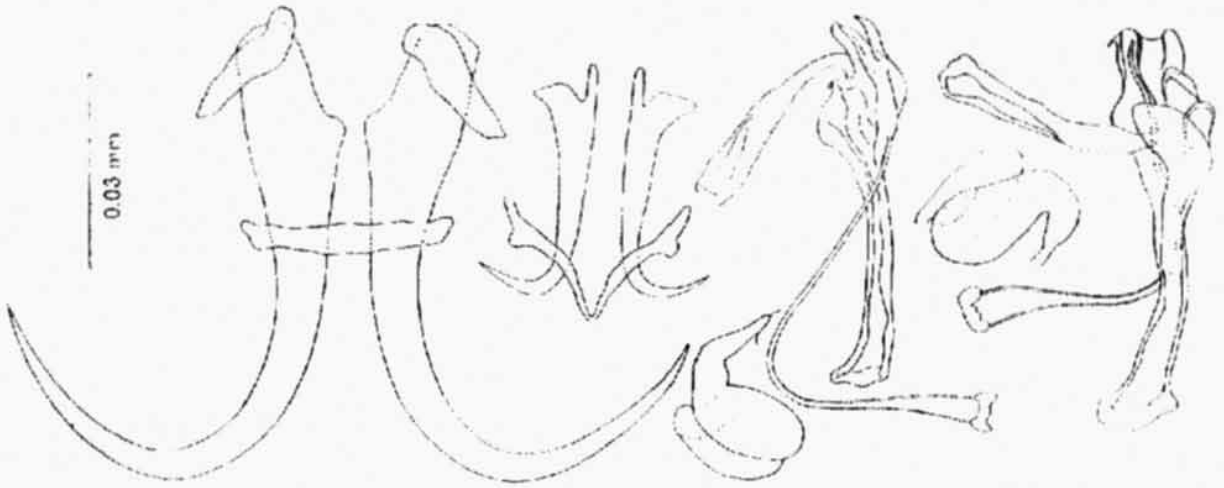

Fig. 7. Chitinoid parts of the haptor, the copulatory organ and vaginal support of *A. varicus* Achmerow, 1952.

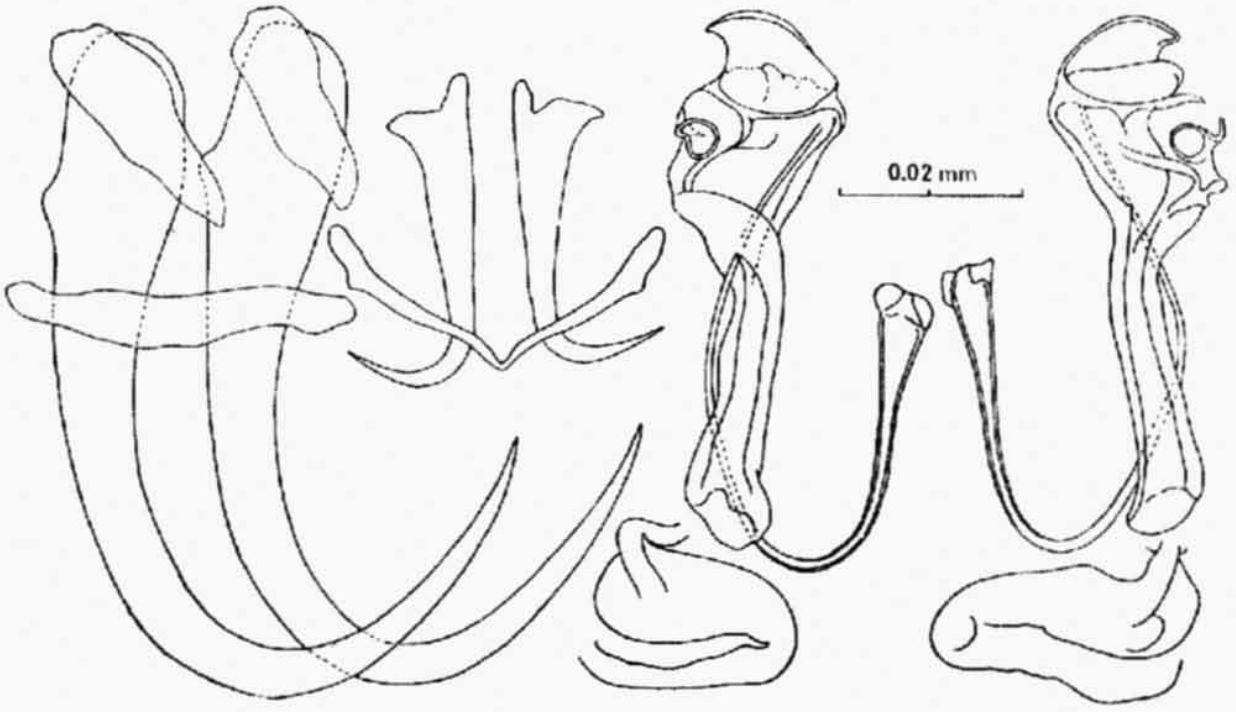

Fig. 8. Chitinoid parts of the haptor, the copulatory organ and vaginal support of *Ancylodiscoides sp.*

7. *A. varicus* Achmerow, 1952 Fig. 7

Locality: Lake Buyr nur and a lake near the town Binder; found on 5 of the 6 fishes examined (maximum 75 specimens per host).

A. varicus, together with *A. botulovagina* are the most frequent species of our material. The measurements taken from 15 specimens showed that their determining features are in morphological and metrical agreement with the variability given for this species.

8. *Ancylodiscoides* sp. Fig. 8

Locality: Lake Buyr nur; found on two of the four fishes examined (1 and 2 specimens).

The measurements of the chitinoid parts of the haptor and the copulatory organ of the 3 specimens examined are: overall length of the ventral anchors 0.031—0.032 mm, of their point 0.011—0.013 mm. The V-shaped connecting bar of these anchors is laterally extended; two clearly visible mounds arise from its posterior margin. The measurements of each of these two arms of the bar (actually its half) are 0.003 × 0.021 to 0.022 mm. The overall length of the dorsal anchors is 0.071—0.072 mm. The length of the chitinoid formation on the peak of their inner root is 0.022—0.023 mm. The connecting bar of these anchors measures 0.006 × 0.031—0.036 mm. The marginal hooks are 0.014 mm long. The copulatory organ consists of a relatively fine, arched copulatory tube funnel-like extended at its base and of a massive supporting part, growing apically into several processes of different shape (viz. illustration). The overall length of the copulatory organ is around 0.060 mm, its supporting part is 0.056—0.058 mm long. The vaginal support appear like a wide S-shaped tube; its length is approximately 0.022 mm (this is not the overall length of the tube itself!).

These specimens resemble in the shape and size of the chitinoid parts of the haptor the species *A. curvilamellis f. typica*, differing from it, however, very distinctly in some details of the shape of the apical processes of the supporting part of the copulatory organ and in the size of the vaginal support (compare Figs. 4 and 8!). Their definitive systematic position will be given after evaluating a larger material or after an experimental verification of the taxonomic value of the individual determining features of members of the genus *Ancylodiscoides*.

DISCUSSION

At the present, a total of 15 species of the genus *Ancylodiscoides* is known to parasitize *Parasilurus asotus*. The fact, that we found only 8 of these species on fishes obtained from two localities only does not exclude the possibility of finding the 7 remaining species of the genus *Ancylodiscoides* (*A. disjunctus* Gussev et Strelkow, 1960, *A. hamatovagina* Yamaguti, 1942, *A. lingmoeni* Gussev et Strelkow, 1960, *A. magnicirrus* Gussev et Strelkow, 1960, *A. mutabilis* Gussev et Strelkow, 1960, *A. parasiluri* Yamaguti, 1937 and *A. sigmoidovagina* Yamaguti, 1942) on the territory of Mongolia. It may also be possible to find completely new species.

After comprehensive studies of a sufficiently large material of worms (about 60 specimens) we came to the conclusion that the present system of measuring their determining features, suggested by Gussev (1955) and used by many European authors, is, sometimes, not very convenient for the identification of the individual species. This refers mainly to the sizes (length or width) of certain parts of the chitinoid formations of the haptor, i.e. the length of both roots of the ventral and dorsal anchors, to the length of their base and, to some extent, to the length of the point and the width of the chitinoid formation of the inner root of the dorsal anchors. Our considerations are based on the following facts:

1. Both roots of the ventral anchors are approximately of the same length in most of the species. The ratio of length of both these roots does not represent a suitable taxonomic criterion. This may be illustrated by the results of measurements of about 200 specimens of *A. mediacanthus* given by Gussev and Strelkow (1960): in 50 % of the measured specimens the outer root was shorter than the inner root; in 25 % both roots were of equal length and in 25 % the outer root was longer than the inner one.
2. The length of the inner root of the dorsal anchors depends on the ontogenetic stage of the worm, the length of the outer root, if distinctly developed, is generally about the same in all species, up to 0.002 mm.
3. The length of the base and the point of both pairs of anchors are often inacurate because it is mostly very difficult to demonstrate the border line between the base and the point of the anchor.
4. The width of the chitinoid formation on the apical portion of the inner root of the dorsal anchors is almost the same in most species. Besides, in mounted worms, the width may depend on the inclination of this formation.

We believe that the only reliable criterion for the identification of the species of the genus *Ancylodiscoides* is the shape of the individual chitinoid parts of the haptor and of the copulatory organ. Therefore, all systematic papers should be completed with exact drawings.

For identifying members of the genus *Ancylodiscoides* the following metrical data should be given: overall length of both pairs of anchors, measurements of the connecting bars, length of the supporting portion of the copulatory organ and, perhaps, length of the marginal hooks and measurements of the vaginal support.

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