

Varietäten ungerechnet, beträgt. Die neu für Deutsch-Ostafrika festgestellten Arten kann man in drei Gruppen einteilen.

Die erste Gruppe wird von den Arten:

Megalotrocha semibullata,
Euchlanis lyra,
Metopidia oxysternum und
Brachionus furculatus

gebildet, die in den andern Gegenden Afrikas bekannt, bisher aber in Deutsch-Ostafrika, also in dem einzigen Gebiet der eigentlichen Tropenregion Afrikas, das in dieser Hinsicht wissenschaftlich erbeutet wurde — nicht nachgewiesen wurden.

Zu der zweiten Gruppe, die neue Rotatorienarten für das ganze afrikanische Kontinent enthält, gehört in meiner Sammlung bloß eine Art:

Asplanchna ebbesbornii.

Die dritte Gruppe endlich enthält neu entdeckte Formen, von denen ich hier drei aufführe:

Distyla carinata,
Distyla aculeata,
Brachionus macrocanthus.

Unter den vier Varietäten verschiedener Arten, von denen zwei schon früher bekannt waren, befindet sich eine südafrikanische Form;

Brachionus furculatus var. *inermis*

und eine neue Varietät derselben Art:

Brachionus furculatus var. *testudinarius*.

7. On some points in the organization of Specimens of *Loxogenes arcanum* Nickerson, from Minnesota, U.S.A.

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(Contribution from the Biological Laboratory of Hamline University, Saint Paul, Minnesota, U.S.A.)

(With 4 figures.)

eingeg. 8. März 1912.

The trematode species *Distomum clavigerum* of Rudolphi from the alimentary tract of frogs was subdivided by Olsson, who in 1878 recognized *D. medians*, and again by Looss, who in 1894 added *D. confusum* to this group. In 1899 Looss gathered these into the family Pleurogenetinae because of the lateral position of the genital opening with two genera: *Prosotocus* with *confusus* as its species and *Pleurogenes* for the reception of *claviger* and *medians*. In August 1900 Stafford

found, in Ontario Canada, two specimens of a trematode, encysted in the liver of *Rana catesbiana*, which he identified with the *D. medians* of Olsson. In October of the same year Nickerson published an account of the structure of a fluke, which he had frequently found in Massachusetts, encysted in the wall of the duodenum at the pylorus of various species of the genus *Rana*, but not of the species *catesbiana*. Nickerson recognized this form as new and described it under the name of *Distomum arcanum*. He thus contributed a new member to the family Pleurogenetinae. In a paper written five years later Stafford recognized the identity of the Ontario form with Nickerson's species *arcanum*. He separated this species from the rest of the family because of »its generative opening being situated on the ventral surface midway between the left coecum and the margin«. Nickerson in his account had made the error of locating the generative opening on the ventral surface whereas it is dorsal in location and Stafford followed in the same mistake.

There have been only two localities recorded for this form until in 1909 it was found by the writer in frogs which had been obtained in the region about Saint Paul. In this instance the worms were encysted on the dorsal side of the neck of the urinary bladder of a female frog measuring 96 mm. The details of this case are shown in figure 1. On folding back the anterior part of the bladder so as to display its dorsal surface a large oval sack was found. This was an abnormal outgrowth of the neck of the bladder, which extended forward to and adhered slightly with the duodenum. This sack measured 13×9 mm. On being opened, it was found to be very thick walled, and filled and distended with a fine-grained whitish material, scattered through which were limited numbers of the eggs of *L. arcanum*. There were no flukes in the cavity of the sack and there was no open communication from the sack to the bladder. - There was no positive evidence to indicate that the flukes were responsible for the presence of the sacks, though that seemed likely. The four cysts already mentioned were examined. They were entirely closed. Each one contained a single specimen of *L. arcanum*.

This species has been met twice subsequently in Minnesota frogs, from the neighborhood of Saint Paul. In May 1911 four individuals were found in the urinary bladder of a female specimen of *Rana pipiens* measuring 58 mm. Each one of the flukes was enclosed in a thin-walled cyst, the four cysts being free in the right horn of the bladder. As they were dark colored and distended the organ considerably they were quite conspicuous objects. Still another occurrence of the worm was observed in July 1911, this time in a female frog of 74 mm. The worms were encysted at the pylorus, apparently in much the same way as those

described by Nickerson. The details of this are shown in figure 2. Three cysts were present, two lay on the ventral surface of the mesentery, entirely free from the alimentary wall, in the angle between the stomach and the duodenum. The third was a growth upon the ventral wall of the duodenum at the pylorus. It was determined by means of a careful examination of the mucosa that the cyst cavity was entirely closed. The two smaller cysts measured 2,5 mm in diameter, the larger, 3,0 mm. The dark-colored bodies of the worms could be faintly seen through the walls of the cysts. The smaller ones contained each two worms and the larger one contained five. In the latter there was an accumulation of a creamy substance which was composed largely of eggs which had been

Fig. 2.

Fig. 1.



Fig. 3.

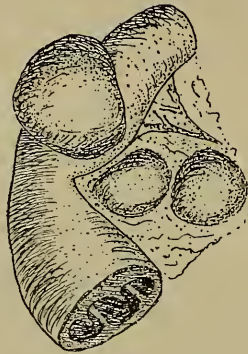


Fig. 1. Enlarged free hand drawing from bladder of frog after the anterior end had been drawn back so as to display the dorsal surface and at its neck the large sack and the four small cysts of *D. arcenum*. Drawn from an alcoholic preparation.

Fig. 2. Enlarged view of the ventral aspect of a piece cut from the stomach, duodenum and mesentery showing the position of the three cysts of *D. arcenum*.

Fig. 3. View of the dorsal surface of *L. arcenum* with magnification of about 10 diameters.

discharged by the immured worms. Nickerson states that he had not found the worm in Minnesota. As the worms are quite conspicuous enough to readily attract attention and as the frog is used so extensively in biological work we must conclude that it is very rare in this region.

In view of the fact that the European forms related to this worm all live free in the alimentary canal, it is surprising to find that all the American forms thus far found are encysted either in the wall of the alimentary tube (Nickerson and Osborn) or else in the liver (Stafford) or urinary bladder (Osborn), organs connected with it. It is not at the present moment possible to account for the habit of encystment, which seems to be so characteristic of the American species. There is no room to doubt that these worms are fully matured. The discharge of eggs into

the cyst proves that conclusively. If these were immature as are the forms of *Clinostomum* found quite commonly encysted in our frogs (Osborn 1911) we should account for encystment as an adaptation by means of which the parasite could reach a final host. On the other hand the imprisonment as in this case of both the parent and the eggs for an indefinite period of time is quite unintelligible.

The form of body of *L. arcanum* is shown in figure 3, a view of the dorsal surface of a whole specimen in alcohol. The outline is heart-shaped, the oral sucker is located at the anterior end, the excretory pore lies in the indentation at the posterior end. The length 2,6 mm in this individual slightly exceeds the breadth which is 2,3 mm. In some, the two are 2 mm and thus about equal. In thickness the preserved worms measure about one third of their breadth. The drawing fig. 3 shows a decided deviation from a strict bilateral symmetry. The same is shown in Nickerson's drawing, and is also found in several of my specimens. Since this asymmetry was not noticed in the living worms, I am inclined to attribute it to the action of reagents, the right side having shrunken more than the left where the heavy walled cirrus sack and metraterm are located. A careful study of the dorsal surface of several specimens showed very surely that the generative opening is located there, it being as shown in the figure midway between the margin of the body and the middle line. As this is at variance with the statements of Nickerson and Stafford on this point I was very careful indeed to verify my observations both by means of studies of the surface and by sections. In the vast majority of trematodes the opening lies upon the ventral surface and in a few it is lateral so that *Loxogenes* stands practically alone in regard to this matter. I have had the privilege of examining Nickerson's sections and found that this opening is dorsal in his specimens as well. There is thus no doubt at all upon this point and current statements must be revised.

The ventral sucker occupies a position in the centre of the ventral surface. It is very small indeed, measuring only 0,025 mm. Its wall possesses the usual equipment of radial muscles of an organ of adhesion, but they are not developed so as to form a strong and powerful layer. The small size of the sucker suggests the possibility that it is rudimentary. A still more remarkable peculiarity of the ventral sucker and one entirely unique so far as I know in trematodes and one not hitherto recorded is the fact that the cuticle lining the cavity of the ventral sucker is clothed with heavy spines in the same way as that of the general exterior surface of the animal. Usually the spines cease at the margin of the ventral sucker but here they pass over the edge and clothe the entire interior cavity. These spines have the same size and form of those of the outer

surface. It is quite impossible to find a physiological explanation for the presence of these spines in such a situation. It would seem that they would interfere with the action of the sucker as an organ for adhesion. The small size of the ventral sucker would indicate that it is of little use if any, possibly we may regard the organ as degenerating and reverting to the character of the general body wall.

The internal organization of the Minnesota worms is shown in figure 4, made from a drawing from a living specimen under slight compression, with some additions derived from serial sections. While the worms are too thick and dense for complete study alive and compressed,



Fig. 4. View of *L. arcanum* as if it were a transparent object, seen from the dorsal surface; based chiefly on studies from a living compressed specimen with some points from serial sections added. Magnified about 20 diameters.

many of the chief topographical points can be determined in that way. The testes ovary and vitellaria are lighter and more highly refractive than the surrounding organs. Many of the chief coils of the uterus can be followed. It was somewhat more complicated than the drawing. In the main the drawing corresponds with that of Nickerson apart from the position of the generative opening and excepting as to some minor details.

The oral sucker lies in the extreme anterior end of the body, it is globular and measures about 0,02 mm. There is a much smaller pharynx immediately following and a very short gullet, in marked contrast with *P. medians* in which the gullet nearly equals the length of the coeca of the intestine. These are short extending posteriorly less than

half the length of the body. A very short median tube passing forward from the excretory pore very soon broadens into the common meeting place of two broad and much flattened bladders. These lie dorsally to the coils of the uterus. The remaining members of this system have not yet been recognized.

The testes lie in the level of the middle of the body and opposite each other. There is a long and narrow cirrus sack, on the left side of the body, whose posterior end lodges the seminal vesicle which is filled with spermatozoa and passes into the ejaculatory duct. The ovary lies between the testes and nearer the right one. It is somewhat pyramidal in form the base lobed and the apex looking backward and inward where the short oviduct originates. Laurer's canal, a small seminal receptacle and the duct from the vitellaria open into the oviduct as it passes through the shell gland whose cells are well developed and arranged radially about the duct. Laurer's canal opens to the exterior in the centre of the dorsal surface in the plane of the ventral sucker. The uterus may be divided into two parts. The proximal part lies wholly on the left side and consists of several loops which, in the main, run longitudinally. The uterus then crosses to the opposite side, to which the second part is confined, the coils again running chiefly longitudinally until at last the tube crosses under the ovary to enter the metraterm, which lies on the left side internally to the ejaculatory duct.

Earlier writers (e. g. Braun 1893 p. 737) on trematode structure state that the body wall is infolded at the genital opening to line the genital atrium retaining its structure with the exception of the spines. In the case of *L. arcanum* however the spines follow the cuticle into the atrium and clothe its surface densely everywhere. In addition to this spines are found in the outer parts of both the ejaculatory duct and the metraterm which are as large and as dense as those on the outer surface of the body. The lining of these organs still more deeply changes to a layer of fine, villus-like papillae packed very closely. These papillae possess the same optical properties as the cuticle and are undoubtedly chemically the same substance. They are elongate, slender, bluntish projections from the wall standing very close together. The centre of each one of these is occupied by a spine similar in form and appearance to those of the cuticle. These spines show the same strong affinity for iron-haematoxylin as the outer spines, so that this part of the coat is very conspicuous in sections and looks very different from the lining of these passages in most trematodes. The details of form of these papillae and their central spines were clearly seen in sections of the papillae in different planes. A detailed account of them will be published later.

The vitellaria are wholly confined to the anterior region of the body and to the ventral surface. Their ducts are fine and inconspicuous. The yolk receptacle is also small and seen only in sections. The usual shell gland is present its cells arranged radially around the oviduct. Laurer's canal has already been mentioned. The uterus contains vast numbers of eggs. The oval egg measures 0,06 mm across and 0,09 mm in length.

St. Paul, Minn. Febr. 1912.

Literature cited.

- Braun, M. 1893. Trematoden, in Bronns Klassen und Ordnungen.
 Looss, A. 1894. Die Distomen unserer Fische und Frösche. Bibliotheca Zoologica. Nr. 16. 1899. Weitere Beiträge z. Kenntnis der Trematoden Ägyptens. Zool. Jahrb. Syst. Bd. XII.
 Nickerson, W. S. 1900. Note on *Distomum arcanum* (n. sp.) in American frogs. American Naturalist. vol. XXXIV.
 Olsson, P. 1878. Bidrag til Scand. helminthfauna. Kgl. svenska vetensk. Acad. Handl. F. F. XIV.
 Osborn, H. L. 1911. On the Distribution etc. of *Clinstomum marginatum*. Biological Bull. Vol. XX.
 Stafford, 1900. Some undescribed Trematodes. Zool. Jahrb. Syst. Bd. XII. 1905. Trematodes from Canadian Vertebrates. Zool. Anz. Bd.. XXVIII.

II. Mitteilungen aus Museen, Instituten usw.

Mitteilung aus der k. k. Zoologischen Station in Triest.

1. Nachtrag zu unsrer Mitteilung: Die Hydromedusen des Golfes von Triest.

Von Valeria Neppi und Dr. Gustav Stiasny, Triest.

eingeg. 29. Februar 1912.

Seit der Veröffentlichung unsrer Mitteilung über die Hydromedusen des Golfes von Triest (Zool. Anz. Bd. XXXVIII, Nr. 16/17, S. 395 bis 399 vom 15. Oktober 1911) haben wir an der Fertigstellung dieser Arbeit weiter gearbeitet und dieselbe nunmehr zum Abschluß gebracht.

Außer den bereits in der genannten Notiz erwähnten neuen Formen haben wir noch eine neue Anthomeduse, ferner drei bisher im Mittelmeer noch nicht gefundene Anthomedusen und eine Leptomeduse nachgewiesen.

A. Von uns aufgefundene neue Art.

Anthomedusae Haeckel 1879.

Oceanidae sens. Vanhöffen 1891.

Genus *Tiara* Lesson 1843.

Tiara tergestina n. sp.

Schirm glockenförmig, mit hohem, spitzem Scheitelaufsatz, fast so lang wie die Schirmhöhe. Magen cylindrisch, den Schirmrand erreichend,

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Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Zoologischer Anzeiger](#)

Jahr/Year: 1912

Band/Volume: [39](#)

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