

IV.—*Monographic Note on the Rotifera of the Family Asplanchnidæ.* By M. JULES DE GUERNE*.

As previously indicated, one of the most remarkable types of the pelagic fauna of the Lagoa Grande is a new Rotifer of the genus *Asplanchna*. I give the description of it below, and follow it with a summary investigation of the family Asplanchnidæ. Having been struck long since with the fact that its representatives exist in almost all lacustrine faunas, I had collected numerous documents upon most species of the group. The present work furnishes a very natural opportunity to coordinate these.

Asplanchna Imhofi, sp. nov. (Fig. 1.)

Diagnosis.—*Femina*. Corpus ovato-globosum, pellucidum; maxillæ duobus tantum ramis compositæ, robustæ, elongatæ, apice paululum incurvato, bifido; rami in medio unco valido interno armati; ramorum basis triangularis, solida, hamulo externo superne instructa.

Mas ignotus.

Long. mill. 0.45–0.50, lat. mill. 0.30–0.35.

The dimensions, taken from specimens fixed by osmic acid or plunged while alive into alcohol, are certainly below the reality. The animals have undergone a violent contraction and must be much larger when alive.

The body is globular and extremely transparent, with the exception of the stomach, as in all the species of the genus. I have seen no oculiform point. The masticatory apparatus, composed only of two pieces, is very characteristic; it differs from that of all known *Asplanchnæ* (fig. 1); its form is constant, and I have observed it in a great number of specimens.

Locality.—This species is exceedingly abundant in the produce of pelagic fishings made in the Lagoa Grande at

* Extracted from a volume published at the cost of His Highness Prince Albert of Monaco, who has been kind enough to permit us to translate this chapter. The work is entitled 'Excursions Zoologiques dans les îles de Fayal et de San Miguel (Açores),' and the materials for it were collected by the author during the third scientific expedition into the North Atlantic, made in 1887 by His Highness Prince Albert of Monaco in his yacht 'l'Hirondelle,' the Prince having invited M. Jules de Guerne to accompany him as zoologist.

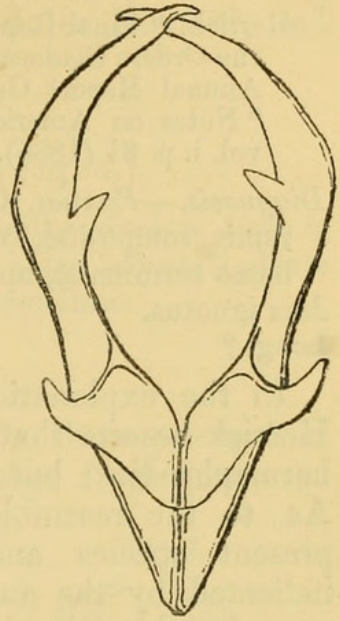
Sete Cidades. It is found in comparatively small numbers in the surface-fishings, but swarms at a certain depth.

No doubt this Rotifer feeds by preference at night; the stomachs of the numerous individuals which have passed under my eyes, and which I examined carefully in order to detect Protozoa in them, were absolutely empty.

I have seen no males, and it is probable that at the period of my investigations (July 9) they are still very rare. The winter eggs, however, had not made their appearance.

I beg Dr. O. E. Imhof, of the University of Zurich, to accept the dedication of this new species of *Asplanchna*. This homage is due to him for the series of interesting memoirs in which he has been the first to show the considerable part taken by the Rotifera in the constitution of the lacustrine pelagic faunas.

Fig. 1.



Masticatory apparatus of *Asplanchna Imhofi*, $\times 700$.

The figure does not sufficiently show the bifid character of the extremities of the jaws.

The *Asplanchnæ* are not rare animals, as seems to be thought by various English authors, as, for example, by Hudson, with reference to *A. Ebbesbornei* (Hudson and Gosse, 'Rotifera,' vol. i. p. 122). We have only to seek them where they are to be found and with suitable apparatus; they are then taken in enormous quantities. This is so true that, notwithstanding their extreme transparency, certain observers have detected them as it were in spite of themselves. This has been the case especially with Herrick when collecting the Entomostraca of Minnesota. The American author, however, does not seem to have appreciated at its full value the importance of a discovery which has just furnished a new and remarkable example of the singular homogeneity of the lacustrine pelagic faunas and the vast geographical distribution of the types which constitute it. Nevertheless Herrick has figured one of the *Asplanchnæ* which he collected so clearly to enable us to recognize in it an undescribed species and to describe it, at least briefly.

Asplanchna Herricki, sp. n. (Fig. 2.)

Herrick, "Final Report on the Crustacea of Minnesota, included in the Orders Cladocera and Copepoda," pl. v. figs. 8, 9 (in the Twelfth Annual Report Geol. Nat. Hist. Surv. of Minnesota, 1884), and "Notes on American Rotifers," Bull. Sci. Labor. Denison Univ. vol. i. p. 61 (1885).

Diagnosis.—*Femina*. Corpus lageniforme; maxillæ duobus tantum ramis compositæ, validæ, margine interno fere recto, unco robusto terminatæ, apice interne haud denticulato.

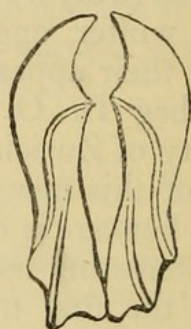
Mas ignotus.

Long. ?

In the explanation of his plate v. Herrick asserts that his *Asplanchna* is hermaphrodite; but this is not probable. As to the resemblance between the present species and *A. Brightwelli*, indicated by the author in his second memoir, this simply shows that the comparison was not carefully made. We have only to glance at the masticatory apparatus of the two types to see how different they are.

Locality. Minnesota, United States.

Fig. 2.



Masticatory apparatus of *Asplanchna Herricki* (after Herrick).

Before Herrick, a German entomologist, Kramer, well known for his works on the Acarina, had the opportunity (probably in seeking after the freshwater Acarina) of meeting with a species of *Asplanchna*. Examined and figured by Kramer, although imperfectly, this Rotifer has not received a name. The form of its maxillæ appears, however, to distinguish it from all its congeners.

Asplanchna Krameri, sp. n. (Fig. 3.)

Kramer, "Eine Bemerkung über ein Räderthier aus der Familie der Asplanchnen," in Archiv für Naturg. Jahrg. 1876, vol. i. pl. viii. figs. 1-4.

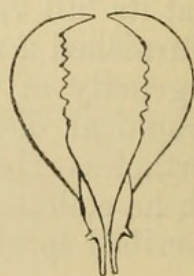
Diagnosis.—*Femina*. Corpus globosum; maxillæ duobus tantum ramis compositæ, curvatæ, ad basin graciles, extremitate valida, cultriformi, margine interiore denticulato.

Mas ignotus.

Long. 0.5 mill.

Locality. Schleusingen?

Fig. 3.



Masticatory apparatus of *Asplanchna Krameri* (after Kramer).

Lastly, the following is the description of a species which has been communicated to me by M. Jules Richard, and which I cannot refer to any known form.

Asplanchna Girodi, sp. n. (Fig. 4.)

Diagnosis.—*Femina*. Corpus globosum; maxillæ duobus tantum ramis compositæ, elongatæ, validæ; rami apice bidentati, dente uno curvato, subobtusos, altero compresso, lamellosos.

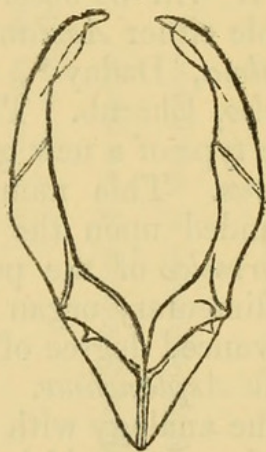
Mas ignotus.

Long. 0·85, lat. 0·55 mill.

This *Asplanchna*, which must certainly attain a length of 1 millim. (the above measurements are taken from specimens contracted in alcohol), is distinguished among all its congeners by the lamellar tooth of its masticatory apparatus (fig. 4).

Locality. Found first of all in small quantities by M. J. Richard in the neighbourhood of Vichy (Allier) in the pond of Cognet, on 16th September, 1886, this Rotifer has since been collected by the same zoologist in Lake Chambon (Puy-de-Dôme) at an elevation of 880 metres, on 15th August, 1887. I proposed at first to dedicate this species to the young and zealous naturalist who discovered it; but M. Richard, by a sentiment which does him honour, has begged me to attach to it the name of Dr. Girod, Professor in the Faculty of Sciences of Clermont, under whose guidance his first work was performed*.

Fig. 4.



Masticatory apparatus of *Asplanchna Girodi*, × 500.

In the following table I have summarized, in an artificial manner (which, however, I have endeavoured to render clear and practical), the principal characters of the known species of the genus *Asplanchna*. It seemed to me that the distinctions should as far as possible be derived from the masticatory

* It is to the initiation of Dr. Girod that we owe the investigations at present in progress upon the fauna of the Auvergne, investigations in the course of which M. J. Richard has not only met with the *Asplanchna* above described, but with many other interesting types, the lists of which he will soon publish.

apparatus, which seems to vary very little in the same species. Moreover the mastax, which resists the digestion of certain fishes to such an extent that it may be recognized in their intestine, may serve to determine the types obtained by distant fishings and mounted on the spot. It will often happen, however, especially in the case of pelagic faunas, that the *Asplanchnæ* will occur in great numbers and that it will be easy to break up many specimens for the purpose of study.

The dichotomic table will have to be kept up with the progress of science. It is possible that future discoveries will compel us to transfer from the first division into the second the species of which the male is unknown. At present, I assume, until there is evidence to the contrary, that all the forms of which the female alone is described have globular males destitute of appendages.

It will be observed that I have not introduced into the table either *Asplanchna intermedia*, Hudson, and *A. triophthalma*, Daday *, which are not well defined, or *A. myrmeleo*, Ehrenb. This last, it seems to me, must be taken as the type of a new generic group, which I will name *Asplanchnopus*. This name, like the separation of the genus, is founded upon the remarkable peculiarity presented by *A. myrmeleo* of the possession of a foot. The presence of this rudimentary organ seems to indicate in this Rotifer a less advanced degree of adaptation to a pelagic life than in the true *Asplanchnæ*. From this point of view it would present some analogy with *Notops*. The male has not yet been met with. It would be the more interesting to ascertain whether, like the other sex, it has retained a vestige of the foot, because all the males of the class are singularly atrophied.

* Hudson, "On some Male Rotifers," in Monthly Micr. Journ., February 1875, p. 53, pl. xci. fig. 7, and Hudson & Gosse, *loc. cit.* vol. i. p. 122, note. Von Daday, "Neue Beiträge zur Kenntniss der Rädertiere," in Math. u. naturwiss. Berichte aus Ungarn, vol. i. p. 263 (1883). The following is the diagnosis of *A. triophthalma*:—"Corpus truncato-ovatum; ocellis tribus, duobus marginalibus, una majore collari; organo rotatorio simplice, parum undulato; fronte organis tentaculatis; pedo anoque caret. Longit. corp. 0^{mm}.8-1^{mm}.2."

According to the author this Rotifer, one of the largest known, would closely resemble *A. Sieboldi*, Leyd.; the male, however, is globular. Von Daday gives no particulars as to the mastax. Its locality is Mezö-Záh (Hungary?).

It will also be remarked that no mention is made of *A. Bowesi*, Gosse. Even according to the naturalist who has described it, this species does not differ from *A. Brightwelli* (Gosse, "A Catalogue of Rotifera found in Britain," in Ann. & Mag. Nat. Hist. ser. 2, vol. viii. p. 200).

Table of the Species of the Genus Asplanchna.

Body	globular in both sexes; masticatory apparatus	formed of four pieces; median piece	wide, with the inner margin straight, extremity denticulated; denticulations	{	six in number, outer piece strongly arcuate	A. helvetica, Imhof.
				{	more numerous, the terminal tooth very long; outer piece scarcely arcuate	A. priodonta, Gosse.
			narrow, arched, with a strong tooth on its inner margin . . .			A. Brightwelli, Gosse.
			wide, robust, not denticulated on the inner margin			A. Herricki*, De Guerne.
			rather wide, denticulated on inner margin, base slender . . .			A. Krameri*, De Guerne.
		formed of two pieces	narrow, inner margin arcuate, distant from each other; extremity bidentate;	{	a faintly marked tooth towards the middle of the inner margin	A. syriac*, Ehrenb.
				{	a strong tooth towards the middle of the inner margin ..	A. Imhofi*, De Guerne.
				{	no tooth on inner margin; one of the terminal teeth lamellar	A. Girodi*, De Guerne.
	furnished with appendages	{	in the two sexes; masticatory apparatus formed of two pieces			A. Elbesbornei, Hudson.
		{	only in the male; masticatory apparatus formed of four pieces			A. Sieboldi, Leydig.

* Male unknown.

ASPLANCHNOPUS, gen. nov.

(Etymology : *Asplanchna* and ποῦς, foot.)

Diagnosis.—*Femina*. Corpus ovato-globosum, pellucidum, pede bifido minimo ventrali instructum; maxillæ duobus tantum ramis compositæ; rami incurvati, validi, apice acuto simplici.

Asplanchnopus generi *Asplanchna* dicto ceterum valde affinis.

Mas ignotus.

This Rotifer must also resume the specific name *multiceps*, which was given to it by Schrank as long ago as 1793, and which Ehrenberg changed in opposition to the rules of nomenclature.

Asplanchnopus multiceps, Schrank (sp.).

1793. *Brachionus multiceps*, Schrank, "Mikroskopische Wahrnehmungen," in Naturforscher, vol. xxvii. p. 30, pl. iii. figs. 16-19.

1803. *Brachionus multiceps*, Schrank, Fauna Boica, vol. iii. pt. 2, p. 139.

1835. *Notommata myrmeleo*, Ehrenberg, "Dritter Beitrag &c.," in Abhandl. Akad. Wiss. zu Berlin, 1833, pp. 214, 215.

1838. *Notommata myrmeleo*, Ehrenberg, Die Infusionsthierchen, p. 425, pl. xlix. fig. I, 1-3.

1854. *Notommata myrmeleo*, Leydig, "Ueber den Bau &c. der Rädertiere," in Zeitschr. f. wiss. Zool. Bd. vi. pp. 20-24, pl. iv. fig. 36.

1884. "Deadly enemy to *Chydorus*," Herrick, "Final Report &c." in Twelfth Ann. Rep. Geol. and Nat. Hist. Survey of Minnesota, pl. v. figs. 10, 11.

1885. *Asplanchna myrmeleo*, Plate, "Beiträge zur Naturg. der Rotorien," in Jenaische Zeitschrift, Bd. xix. pp. 73-83, pl. iii. figs. 31-33, 35, 36.

1885. *Asplanchna magnificus*?, Herrick, "Notes on American Rotifers," in Bull. Sci. Labor. of Denison University, vol. i. p. 60, pl. ii. fig. 2.

Considering the instruments which he had at his disposal, Schrank very well investigated *Asplanchnopus multiceps*. The name that he gave it, however, has its origin in an error of observation, which was likewise committed by Ehrenberg. These naturalists mistook for so many rotatory organs the groups of cilia which better means of investigation have enabled us to study more completely. Further, both of them regarded the rudiment of the foot as lateral, whilst it is in reality ventral, as Leydig was the first to indicate*.

At any rate the "vielköpfiges Kapselthier" furnished Schrank with the subject of interesting observations. He says that it is met with frequently in stagnant but clear

* Leydig, *loc. cit.* p. 20, pl. iv. fig. 36. See also Plate, *loc. cit.* pl. iii. fig. 31.

water. Although it is one of the largest known Rotifera, its extreme transparency has concealed it from observation. It would remain invisible if its viscera were not generally filled with yellowish matter. Yet it is very difficult to distinguish in a somewhat strong light*.

Schrank gave four figures of this animal, and from these it appears that he had grasped the general features of its organization. Nevertheless many details are wanting, and the mastax, among other things, was not observed; but there is no doubt as to the identity of the species, as Ehrenberg has already recognized, although, as I have stated, he changed the name†.

It is to be remarked that *Asplanchnopus multiceps* is the only type of the family which possesses maxillæ terminating in a simple acute point‡.

Gosse seems to think§ that this Rotifer is destitute of a contractile vesicle; but this is very improbable, considering the contrary and concordant observations of Ehrenberg, Leydig, and Plate.

I think that we must identify with *A. multiceps* the species recently described by Herrick under the name of *Asplanchna magnificus*, and previously figured by him with no other indication than this:—"Deadly enemy to *Chydorus*." Truth, however, compels me to add that the figures of the American author surpass in mediocrity anything that it is possible to imagine. The little engravings given by Schrank in 1793 are indisputably better than these quite recent figures.

Asplanchnopus multiceps, which was discovered by Schrank at Ingolstadt in Bavaria, was found at Berlin by Ehrenberg, in the neighbourhood of Wurzburg by Leydig, and more recently at Bonn and at Bremen by Plate. Lastly, it has

* Schrank, 'Naturforscher,' xxvii. pp. 30-32. It is certain that the transparency of the Rotifera of the family Asplanchnidæ renders their capture very difficult in the vessels in which they are kept alive. I have had to seek in vain for a long time for one of these animals in water which I knew to be full of it. No doubt this circumstance, coupled with the minuteness of their size, has hitherto prevented the discovery of the males of several species.

† In 1838. Ehrenberg does not appear to have been acquainted with Schrank's work when he first described *Notommata myrmeleo*.

‡ From the description ("rami with singly pointed ends") and fig. 32 in the text of Gosse and Hudson (*loc. cit.* vol. i. pp. 29 and 120) it might be thought that this is also the case in *Asplanchna Ebbesbornei*; but fig. 3e in pl. xi. bears an indication of a small tooth, much more marked still in fig. 15 of pl. x. of the previous memoir by Hudson (*Journ. Roy. Micr. Soc.* ser. 2, vol. iii., 1883).

§ Hudson and Gosse, *loc. cit.* vol. ii. p. 134.

been met with in Scotland, at Dundee (according to Gosse, in Hudson and Gosse, *loc. cit.* vol. ii. p. 134), and, if the identification above proposed be accepted, at Minnesota in the United States.

As regards the numerous forms of the genus *Asplanchna* their geographical distribution is scarcely known. First studied in Germany and in England, for a long time they were noticed only in those countries; but more recently, as investigations have become more numerous, and especially as the work relating to the pelagic faunas has been greatly extended, these Rotifera, formerly reputed rare, have seemed to become more and more common. Thus, *A. helvetica*, discovered in Switzerland by Imhof, exists in a great number of lakes of Northern Italy, Austria, and North* and South Germany. It is probable that the *Asplanchnæ* indicated by Imhof † first in Alsace and then in the harbours of Lubeck and Stockholm, and by Nordqvist ‡ in Russia and in Finland, also belong to this species.

M. J. Richard informs me that he has taken it in great numbers in several lakes of the Auvergne (Bourdouze, elevation 800 m.?, and Montcineyre, 1170 m., in the department of the Puy-de-Dôme). I have collected it in abundance in the Lac d'Enghien, near Paris; lastly, Prof. Moniez sends me an *Asplanchna* captured at Lille, which also closely approaches *A. helvetica*. It will be seen that since its discovery in France by Imhof, in the lakes of Annecy and Bourget §, this Rotifer has been met with at various points very distant from each other. The same will certainly be the case in different regions.

I am now, thanks to the scientific zeal of my friend Charles

* Dr. Zacharias who first met with *A. helvetica* in North Germany, and who discovered the males of the species, appears inclined to identify it with *A. priodonta*, Gosse. There is room for further investigations upon this subject. To refer only to the mastax, none of those which I have examined in the supposed *A. helvetica* seems to me to agree with the figures and descriptions of the same part in *A. priodonta*.

† Imhof, "Pelagische Thiere aus Süßwasserbecken in Elsass-Lothringen," in Zool. Anz. 1885, p. 720 (see Annals, ser. 5, vol. xvii. p. 297), and "Ueber mikroskopische pelagische Thiere aus der Ostsee," *ibid.* 1886, p. 612.

‡ Nordqvist, "Die pelagische und Tiefsee-Fauna der grösseren finnischen Seen," in Zool. Anz. 1887, pp. 339 and 358.

§ Imhof "Die pelagische Fauna und die Tiefsee-Fauna der zwei Savoyerseen; Lac du Bourget und Lac d'Annecy," in Zool. Anz. 1883, p. 655.

Rabot, able to indicate the existence of *A. helvetica* under the Arctic circle, at a higher latitude than that of the lakes investigated by Nordqvist. It abounds in the Imandra and in the Kolozero (Russian Lapland, 68° N. lat.), where M. Rabot has taken it in considerable quantities, especially in the second locality, on the 16th August, 1885, between 8 and 9 o'clock in the evening, at the surface. These sheets of water, probably the remains of an ancient strait, are about 100 metres above the level of the sea, under the isotherm of 0° C. *

In this connexion it is of interest to remember that *A. helvetica* was collected by Imhof in Switzerland up to an elevation of about 1800 metres in the lake of Campfèr†; sooner or later it will certainly be met with close to the limit of perpetual snow.

The chorological data are much less numerous for the other species. *A. Brightwelli* and *A. priodonta*, long known in England, were met with, twenty years ago, at Brunswick by Eyferth, and more recently by Plate in the neighbourhood of Bonn and Bremen. *A. Sieboldi* is cited at Wurzburg (Leydig) and at Prague (Stein).

But the most interesting of the *Asplanchnæ* from the point of view of geographical distribution is, unquestionably, *A. syrinx*. Described by Ehrenberg from specimens collected at Berlin, it has been indicated at St. Petersburg (Weisse), in Egypt, and at the summit of Adam's Peak (2260 metres) in Ceylon (Schmarda).

One may, perhaps, be tempted to doubt the accuracy of the determinations of this species, of which, so far as I know, there still exists only the figure published by Ehrenberg in 1838. I may remark, however, that Weiss and Schmarda, who were both very well acquainted with the Rotifera, no doubt had Ehrenberg's work before them‡.

* Some zoologists regard light as the principal cause of the daily vertical migrations of the pelagic fauna. In connexion with this I would remark that, in the northern lakes in which this fauna seems to attain its maximum development, the supposed nocturnal or crepuscular animals which constitute it are condemned throughout the summer to the persistent brightness of the long polar days. From the small depth of many of the lakes it is even impossible for them to descend sufficiently to avoid the luminous rays.

† Imhof, "Ueber die mikroskopische Thierwelt hochalpiner Seen" (600-2780 M. ü. M.), in Zool. Anz. 1887, pp. 13 and 33. (Translated in 'Annals,' ser. 5, vol. xix. p. 276.)

‡ In noticing the discovery of *Hydatina senta* in the neighbourhood of Auckland, New Zealand, Schmarda states that he was able to compare the living Rotifera on the spot with the figures of Ehrenberg, whose voluminous Atlas in folio he had taken with him on his voyage. See "Neue wirbellose Thiere beobachtet und gesammelt auf einer Reise um die Erde, 1853 bis 1857" (1859), vol. i. p. 50.

There is, however, nothing astonishing in finding distributed over the whole surface of the globe animals which are easily diffused, and which, on the one hand, either on mountains or in high latitudes, support a very intense cold, and, on the other, live in water at a high temperature, as especially in Egypt.

It is probable that future investigations will lead to the discovery in very different localities of the new species above described, as well as of *A. Ebbesbornei*, at present noted only at a single point in England. The example of *A. helvetica* (described in 1883) suffices to show with what rapidity data may be brought together upon the geographical distribution of an animal when special researches lead to its being collected by suitable processes.

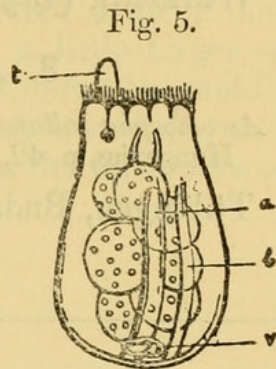
On the Genus Ascomorpha.—Before concluding this chapter I will say a few words on the *Ascomorphæ*, which are usually classed, although wrongly, in the family *Asplanchnidæ*. The very small Rotifera which belong to this genus are very difficult to study, and still appear not to be satisfactorily known. The absence of an anal aperture, which has led to their being approximated to *Asplanchna*, is not a character of prime importance, for it almost certainly results from an adaptation to a particular mode of life. To unite the forms which present this peculiarity without taking into account other details of structure is to fall into an error like that which would consist, for example, in establishing a family for all the Rotifera which are destitute of a foot.

However imperfectly investigated, it is evident that the feeble mastax of the *Ascomorphæ* in no degree resembles the powerful maxillæ of *Asplanchna*. The same observation applies to the stomach, the singular diverticula of which have been noticed by Gosse and Bartsch in two different species. The latter zoologist, to whom, indeed, we are indebted for the fullest information upon these animals, has described, in *Ascomorpha saltans*, a sort of resistant envelope bearing projecting and symmetrical ridges. Seen from the dorsal surface, with its four ridges converging towards the bottom, this envelope presents some analogy, always excepting the denticulation of the aperture, with the test of certain species of *Anuræa* (*A. striata*, Ehr., among others). Lastly, the Hungarian author indicates in the same type the existence of a sort of stout tentacle, quite unknown in the *Asplanchnæ*. I have thought it desirable to reproduce here (fig. 5) the figure

published by Bartsch in a very interesting work which is not sufficiently known*.

In this the genus *Ascomorpha* is placed at the head of the group Loricata, in which it immediately precedes the genus *Sulpina*. This course appears to me better than that which consists in combining the *Ascomorphæ* and the *Asplanchnæ* in the same family. At any rate, until we have fuller information, it is preferable to leave these Rotifera amongst the forms *incertæ sedis*.

The following gives, in a few lines, the complete synonymy of the genus *Ascomorpha*, which denomination must be adopted as the earliest in date, as well as the specific name of *ecaudis*, first employed by Perty for *A. helvetica*. I do not think that there is any reason for uniting the three species at present known, after the example of Hudson and Gosse; in any case, *A. saltans*, Bartsch, appears to me to be a very distinct type.



Ascomorpha saltans, Bartsch, seen in profile; right side.

a and *b*, ridges or ribs of the envelope; *t*, tentacle; *v*, contractile vesicle (after Bartsch).

ASCOMORPHA, Perty.

Ascomorpha, Perty, Neue Räderthiere der Schweiz, in Mitth. Bern. Gesellsch. 1850, p. 18.

Sacculus, Gosse, Cat. Rotifera, Ann. & Mag. N. H. 1851, ser. 2, vol. viii. p. 198.

1. *Ascomorpha ecaudis*, Perty.

Ascomorpha ecaudis, Perty, loc. cit. p. 18.

Sacculus viridis, Gosse, loc. cit. p. 198; Phil. Trans. vol. cxlvii. p. 320, pl. xv. figs. 24-26 (1858); Hudson and Gosse, Rotifera, p. 124, pl. xi. fig. 2 (1886).

Ascomorpha helvetica, Perty, Zur Kenntniss kleinster Lebensformen &c. (1852), p. 39, pl. ii. fig. 1.

Switzerland (*Perty*); England (*Gosse* and *Hudson*).

* 'Rotatoria Hungariæ,' pl. ii. fig. 17 (1877). I have been enabled to take cognizance of Bartsch's memoir by the extreme kindness of Dr. Maurice Vellentszély, to whom I offer my sincere thanks.

Several distinguished Hungarian zoologists, Toth, Bartsch, Vejdovsky, and, more recently, Von Daday, have successfully studied the Rotifera. It is to be regretted that these naturalists have thought fit to publish most of their works in Hungarian. By this means they remain beyond the reach of the scientific public. To act in this way out of patriotism is certainly an error, the consequence of which is to narrow greatly the renown of the national savants.

2. *Ascomorpha germanica*, Leydig.

Ascomorpha germanica, Leydig, Zeitschr. f. wiss. Zool. vol. vi. p. 45, pl. iii. fig. 34 (1854).

Wurzburg (*Leydig*).

3. *Ascomorpha saltans*, Bartsch.

Ascomorpha saltans, Bartsch, Württ. Jahresh. 1870, p. 363; Rotatoria Hungariæ, p. 42, pl. ii. fig. 17 (1877).

Tübingen, Buda Pesth (*Bartsch*).

V.—On some Reptiles and Batrachians from Iguarasse, Pernambuco. By G. A. BOULENGER.

[Plate III.]

THE Natural-History Museum has received a small collection of Reptiles and Batrachians made at Iguarasse, Pernambuco, by Mr. G. A. Ramage. Small as it is the collection is one of the greatest interest, such as would hardly have been expected from a part of Brazil which is regarded as one of the best explored. Four species are new, two being of particular interest from a geographical point of view—the *Phyllodactylus* as the first-known Brazilian representative of a genus quartered in the West Indies, Central America, and Venezuela; the *Nototrema* (marsupial tree-frog) as extending the range of a genus otherwise restricted to the Andes, from Central America to Peru. The following known species were obtained:—

Hemidactylus mabouia, Mor.; *Enyalius catenatus*, Wied; *Strobilurus torquatus*, Wiegman.; *Microblepharus Maximiliani*, R. & L.; *Amphisbæna subocularis*, Ptrs.; *Xenodon rhabdcephalus*, Wied; *Rana palmipes*, Spix (larvæ, body as large as a pigeon's egg, with the anal opening on the right side); *Paludicola biligonigera*, Cope; and *Hyla rubra*, Daud.*

New species:—

Sphærodactylus meridionalis.

Snout pointed, as long as the distance between the eye

* To this list may be added the names of two reptiles previously obtained by Mr. H. N. Ridley at Iguarasse, viz. *Anolis fusco-auratus*, D'Orb., and *Stenolepis Ridleyi*, Blgr.



Guerne, Jules de. 1888. "IV.—Monographic Note on the Rotifera of the family Asplanchnidæ." *The Annals and magazine of natural history; zoology, botany, and geology* 2, 28–40. <https://doi.org/10.1080/00222938809460872>.

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