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ON THE IDENTITY OF *ARIUS ONCINUS* R. H. SCHOMBURGK (PISCES, NEMATOGNATHI, AUCHENIPTERIDAE)

by

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With one table and two plates

The catfish which R. H. Schomburgk (1841b: 173, pl. 4) named *Arius oncinus* *), from a description and a drawing made in the field, has remained a puzzle to ichthyologists ever since.

It is true that it has been recognized that *Arius oncinus* is not an *Arius* but belongs to the Auchenipteridae. Günther (1864: 194) merely listed the name in a footnote under *Auchenipterus*, without being able to do anything with it. Eigenmann & Eigenmann (1890: 266) referred to it as a "doubtful species of *Centromochlus*". Gosline (1945: 10) included it without comment in the genus *Centromochlus* under the name *C. oncinus*, but the only reference given is to the Eigenmanns and in the absence of material the name remained as problematic as ever. Fowler (1951) made no mention of *Arius oncinus* at all, probably because he found it too doubtful a species for inclusion in his work on Brazilian freshwater fishes. Finally Mees (1974: 59 footnote) quoted R. Schomburgk (1848) to show that R. H. Schomburgk's (1841b) description might be incorrect and expressed as his opinion that, whatever it was, the fish as described was not well-placed in the genera *Tatia* and *Centromochlus*. In summary it may be said that since its description no ichthyologist has known what to do with *Arius oncinus* and that no material was known to exist.

It was therefore with considerable interest that in an illustrated article recently published (Brittan, 1976) I noted some colour photographs of a live catfish, under the name *Centromochlus altae*, which immediately reminded

*) In Schomburgk's text the species is called *Arius oncina*, but the caption of the plate reads *Arius oncinus*. The species was named for the resemblance of its colour-pattern to that of the Jaguar, *Panthera onca* (L.). The specific name is therefore an adjective that in combination with generic names of the masculine gender must be spelled *oncinus*.

me of Schomburgk's plate of *Arius oncinus*. There was a reference to an earlier paper (Brittan, 1974), with another coloured plate. Correspondence with Professor Brittan revealed the presence of preserved material of this species in the California Academy of Sciences, and a loan could be arranged.

For comparative purposes Schomburgk's (1841b) description is here quoted in full:

"This fish was taken in the Rio Padauiri. The dorsal and pectoral spines are serrated, cranium hard, body without scales, but there is a bony process on which the dorsal spines close, posterior to the helmet or cranium. Lateral line straight, body yellowish brown, variously spotted with black, and not unlike the markings of the jaguar. The ventral fin is placed nearer to the anal than the pectoral, the second dorsal moderately large; tail is slightly forked, and has the upper lobe rather longer than the lower. The eyes are small, placed near the snout, iris brown; nostrils near the snout; teeth, a series thickly set in both jaws, all fine. Surface of the gill-covers slightly striated, edges smooth, opening semilunar; lives often three or four hours after being taken from the water. It is taken by the hook baited with worms on set-lines at night, and is one of our best flavoured fish; it is considered a great luxury, and grows to the length of ten inches. Intestines form flexures, and have appendices attached".

It may be added that Schomburgk arrived at the mouth of the Rio Padauiri (or Padaviri) on 19 March 1839. He ascended the river about nine miles to visit the "Etablissement" and left the next morning to continue his journey down the Rio Negro (cf. R. H. Schomburgk, 1841a: 491). This means that the date of discovery and the type locality of *Arius oncinus* are exactly known: the published description, with the vernaculars, proves that the fishes had been obtained near the "Etablissement", where evidently they were well known to the inhabitants. The specimen or specimens studied by Schomburgk were not preserved but found their way into his stomach; he appears to have enjoyed his meal as is clear from the almost lyrical description quoted above.

Far more informative than the description is the coloured plate, which unfortunately I can reproduce only in black-and-white (pl. 1). In view of R. Schomburgk's statement already referred to that the descriptions and plates in R. H. Schomburgk's (1841b) book have suffered from editing, it appeared worth enquiring whether Schomburgk's original drawings still exist. To this purpose I contacted Mr. Wheeler, who was able to tell me that three days before I wrote him, on 9 November 1976, a collection of Schomburgk's original paintings was sold as part of a lot from the Jardine collection at Christie's Sale Rooms in London. The collection was purchased by the National Library of Scotland, but further correspondence revealed that a

plate of *Arius oncinus* was not included in the collection. This does not really matter much in this case as actually the plate as published is remarkably accurate, especially when considering that it was drawn after a painting made in the field. The large, coalescent bony helmet covering the upper surface of the head, reaching backwards to and on each side beyond the dorsal spine in a horn curved slightly outwards, the strong and serrated dorsal and pectoral spines, the restricted gill-openings, the plump naked body, etc., all confirm its place in the Auchenipteridae. The one outstanding character, shown very distinctly, is the peculiar rasp-like postcleithral process; without it the figure might possibly have been dismissed as a poor representation of a *Parauchenipterus*. Additional useful characters visible on the plate are the distinctive colour-pattern, rather short anal fin, shape of the caudal fin, size and position of the eyes, well-developed but not very long adipose fin, and the length of the barbels.

In all the characters mentioned the fish figured by Schomburgk agrees remarkably well with the specimens which Dr. Brittan secured, so well indeed that I have included the measurements and counts taken from the figure in the table, where they fit in nicely. Note that even as regards numbers of teeth on the dorsal and pectoral spines Schomburgk's figure is accurate, except that the number of teeth along the posterior border of the dorsal spine (20) is high; the material suggests, however, that there is a relation between body size and number of these teeth, and the drawing may have been taken from a large specimen, no scale being indicated on it. The pectoral spine in the figure shows the teeth along its anterior edge curved towards the body instead of pointing away from it, an error of a kind that is very easy to make. Finally, the outer pair of mental barbels is a little shorter than in any of the specimens at hand. These are all the differences I have been able to find. Add to this that the localities of provenance of Dr. Brittan's specimens, "Rio Negro region above Manaus" and Lago de Massai, Rio Xeruiuni, are quite close to the type-locality of *Arius oncinus*, and the conclusion that they are the same becomes inevitable. An interesting additional point is that Schomburgk gave this fish the name *A. oncinus*, comparing its colours and markings to those of a Jaguar, and that quite independently Brittan (1976) christened his specimens Jaguar Catfish or Onca Catfish.

Systematic knowledge of the South American freshwater ichthyofauna is still in a stage where a perfectly valid species may remain unrecaptured for over a century; in this respect *Arius oncinus* is not exceptional. Nevertheless it appeared worth investigating whether in the intervening 135 years the species had never been recorded or redescribed under a different name. Actually, the receipt of the fresh specimens brought to mind the description

of another little-known species, *Liosomadoras morrowi* Fowler (1940). This species, based on a single specimen obtained near Contamana, Peru, shares the peculiar character of the rasp-like postcleithral process. Fowler's description and illustrations show a fish remarkably similar to *Arius oncinus*. Perhaps the resemblance ought to have struck me even before the actual material of the latter became available. However, Schomburgk's plate shows a fish in lateral view, thus disguising the very short, broad, tapering shape of the body so well illustrated by Fowler, and in the description he also fails to comment on the body-shape so that I imagined *A. oncinus* to be a more slender species than the short broad one it is. Add to this that Fowler described his species in the Doradidae and not in the Auchenipteridae, and it becomes perhaps understandable why the resemblance had escaped me.

Whereas its description made clear that *L. morrowi* is very similar to *A. oncinus*, it did not at first look probable that they would be identical. For one thing, *L. morrowi* was described as having a rather different coloration: mainly dark brown, with small round black spots. Also its type-locality is at least some 1600 km away from that of *A. oncinus*. Evidently a direct comparison between *A. oncinus* and *L. morrowi* was desirable. By a fortunate co-incidence the type of *L. morrowi*, which had been missing, had recently been located in the collection of the Academy of Natural Sciences by Dr. Böhlke, who had prepared a redescription of it with notes on its systematic position and affinities (Böhlke, MS). Dr. Böhlke most generously placed the specimen at my disposal and somewhat to my surprise I was unable to find any morphological character by which to distinguish it from *A. oncinus* (pl. 2). As regards colour-pattern: this has faded so much that a comparison has only limited value. The specimen of *L. morrowi* is now uniform pale yellowish with a few scattered roundish dark markings. In fact, it looks exactly as one might expect *A. oncinus* to look after forty years of preservation when most of the colour-pattern has faded. Although complete certainty can only be obtained with the collecting of fresh material, on present evidence *L. morrowi* must be regarded as a synonym of *A. oncinus*. Böhlke (MS) has already redescribed *Liosomadoras*, and concluded that it is a valid genus. I agree. The nomenclature will now stand as follows:

Liosomadoras Fowler

Liosomadoras Fowler, 1940, Proc. Acad. Nat. Sci. Philad., 91: 226 — type by original designation and monotypy, *Liosomadoras morrowi* Fowler.

Liosomadoras oncinus (R. H. Schomburgk)

Arius oncina R. H. Schomburgk, 1841, Fish. Guiana, 1: 173 — Rio Padauiri.
Arius oncinus R. H. Schomburgk, 1841, Fish. Guiana, 1: pl. 4.

Liosomadoras morrowi Fowler, 1940, Proc. Acad. Nat. Sci. Philad., 91 : 226 — Ucayali River basin, Contamana, Peru.

Material. — One specimen, July-August 1937, Ucayali River basin, Contamana, Peru (W. C. Morrow, ANSP no. 68646), total length 98 mm, standard length 76 mm, holotype of *Liosomadoras morrowi*. One specimen, 5 May 1964, Rio Xeruiuni at Lago de Massai, about 10 km from Santa Angela, ca. 50 km upstream from the mouth of the Rio Branco, Amazonas, Brazil (M. R. Brittan, CAS no. 35112), total length 105 mm, standard length 80 mm. Three specimens, purchased 2 March 1974, Rio Negro region above Manaus, Amazonas, Brazil (M. R. Brittan, purchased from Cardinal Aquarium, Manaus, CAS no. 36642), total length 82, 93, 147 mm, standard length 63, 73, 113 mm.

Redescription. — In a previous paper (Mees, 1974: 13-14) I have already given some reasons for regarding *Liosomadoras* as a valid genus. These were not based on a personal examination of material, but only on Fowler's adequate description. As only one species is known, there is no need to distinguish in the diagnosis between generic and specific characters. The genus is characterized by its broad and heavily-armoured head, the unique rasp-like postcleithral process, short and tapering body, small eyes, comparatively large adipose fin, seven rays in the ventral fins, 12-14 rays in the anal fin.

D I.6, A 12-14 (ii-iii.10½-11½), P I.6, V 7 (i.6), C i.15.i and rudiments (one specimen has C ii.14.i). Body short and broad, widest between the cleithra where 2.5-2.7 times in standard length; depth of head at the same place well over half (0.6-0.65) the width between the cleithra; depth of body measured from the base of the dorsal spine downwards 3.4-3.7 times in standard length; head 2.8-3.05 times in standard length. For further measurements, see table.

Head large; upper surface of head and nape heavily armoured with a helmet of rough bone, covered by a thin layer of skin. The helmet passes over the upper edge of the eye and curves down to protect its anterior edge; backwards the bony helmet reaches to the dorsal origin and on each side beyond, its horns curving outwards. Fontanel an elongated slit, reaching backwards to or scarcely beyond a line connecting the posterior borders of the eyes, and forwards almost to the upper lip, from which it is separated by a narrow bridge of bone. Mouth wide, with a slightly protruding lower jaw; each jaw with a well-developed band of depressible more or less conical teeth, laterally rounded without backward projections, the band in the upper jaw continuous with only a suture line in the middle, the one in the lower jaw narrowly interrupted at the symphysis. No teeth on tongue, vomer or palatines. Tongue very broad, anteriorly free. Eyes rather small, lateral in position with a slight upwards slant, without free rim, 6.6-7.7 times in head, 1.3-2.0 times in snout, and 3.4-3.6 times in bony interorbital. Nostrils placed in a rectangle just over twice as wide as long, the anterior pair tubular,

TABLE

Measurements (in mm) and counts of *Liosomadoras oncinus*. The figures in the second column from the right (s. l. 104 mm) are taken from Schomburgk's plate, the others are from the specimens studied.

Standard length	63	73	76	80	104	113
Predorsal length	25.0	29.1	31.6	33.5	40	45.9
Head from middle of snout to end of opercle	22.6	27.3	26.8	28.7	35	38.9
Distance from middle of lower jaw to ventral base	38.2	41.6	42.7	48.5	61	67.6
Pectoral spine length	—	24.0	29.0	28.8	28.5	37.0
Dorsal spine length	15.0	19.0	21.0	20.2	27	26.9
Width across cleithra	24.3	29.2	29.8	31.5	—	42.2
Depth at level of cleithra	15.8	18.4	17.2	19.7	25	26.4
Depth below dorsal origin	18	22	21	25	32	33
Width of gape	12	14.5	17	15.7	—	19
Right pectoral spine: number of teeth along anterior margin	—*)	23	22	23	—	24
Number of teeth along posterior margin	—	14	15	14	—	18
Left pectoral spine: number of teeth along anterior margin	—	20	22	24	23	24
Number of teeth along posterior margin	—	14	15	15	21	20
Dorsal spine: number of teeth along anterior margin	15	18	19	17	22	22
Number of teeth along posterior margin	0	3	8	5	20	13

*) This specimen has both pectoral spines broken.

placed just behind the upper lip, the posterior pair above, or rather inwards from the anterior eye rim, with a flap along their anterior border. Three pairs of slender barbels. Maxillary barbels originating above and just inwards from the gape, reaching backwards to the pectoral base or to as far as the end of the postcleithral process. The outer pair of mental barbels varies from almost as long to definitely shorter than the maxillary barbels, the inner pair of mental barbels is about half the length of the outer pair. Gill-openings restricted, membranes attached to the cleithrum, branchiostegals present, opercle rather small, as in related genera. Postcleithral process long, strongly denticulated as already described. Porus pectoralis inconspicuous, just below the postcleithral process, above the middle of the soft pectoral base.

Dorsal fin with one strong spine and six rays. The spine has a series of 15-22 teeth along its anterior margin and from none in the smallest specimen to 13 in the largest along its posterior margin; all teeth tend to point out-

wards, away from the body. All soft rays divided; the first one is a little longer than the spine but each succeeding one is shorter and the last is less than half the length of the first. Although the last ray is implanted very near the penultimate one, it appears to be separate.

Anal fin rounded in outline, with twelve to fourteen rays, the first two or three of which are simple, the others divided, the last one to its base. The longest rays are about half the length of the pectoral spine.

Pectoral fins with one spine and six rays. The spine is strong and long, slightly curved backwards, with 22-24 teeth pointing outwards along the anterior margin and 14-20 teeth curved inwards along the posterior margin. The six divided rays diminish rapidly in size from the first, which is almost as long as the spine, to the sixth which is less than a third of this length.

Ventral fins rounded in outline, placed well beyond the middle of the body, when depressed just reaching the anal origin, normally with seven rays, the first of which is simple, the others divided. In one specimen (ANSP no. 68646) I counted in the right fin i.7, in the left fin i.6.

Caudal fin shallowly forked, with 15 (7 + 8) divided rays and above and below one fully developed simple ray, besides shorter and rudimentary simple rays. One specimen (CAS no. 36642, 73 mm s. l.) has only 14 divided rays although attaining the same number of 17 fully developed rays: C ii.6 + 8.i.

Adipose fin well-developed, rather long but low, placed opposite the anal fin, its base of about the same length as the anal base.

Sensory canal system well-developed. Lateral line complete, almost straight, continued onto the caudal fin, with 29-37 + 3 or 4 pores. The head has three conspicuous pores just below each eye, and several between the anterior and the posterior nostrils and medially from the posterior nostril, but also a number in the skin covering the helmet. In addition there are some pores on the sides between the dorsal fin base and the lateral line. In the largest specimen pores are also in evidence farther backwards on the sides of the body above the lateral line, where they tend to fall in vertical series; they may represent branches of the lateral line; in the smaller specimens these vertical branches are not or poorly developed.

Colours in preservative pale greyish yellow, with many black or blackish blotches and dots of varying size and shape extending over the body and all the fins; sometimes the blotches have pale centres. In the smaller specimens the under surface from chin to ventrals is pigmentless, white; in the largest specimen, only the breast is unpigmented white, the belly being covered with dark spots of somewhat smaller size and lesser intensity than the lateral spots and blotches. The blotches are largest on the sides, above and below the lateral line, leaving the lateral line itself showing as an irregular pale

longitudinal band. Brittan's (1974, 1976) photographs show that when fresh the body is more distinctly yellow, even approaching orange-yellow.

Affinities. — Although Fowler (1940) described *L. morrowi* without comment in the Doradidae, he remarked: "It is apparently unique in its family in the unarmed trunk and tail". Surprisingly he did not otherwise discuss the position of the species and he made no mention of the Auchenipteridae, distinguished from the Doradidae in exactly the character in which *Liosomadoras* is unique in the Doradidae. In other words, if only Fowler had placed *Liosomadoras* in the Auchenipteridae, there would have been no problem at all as far as I can see. I realize the danger inherent in this kind of reasoning: by transferring *Liosomadoras* to the Auchenipteridae the rasp-like postcleithral process is introduced into that family as a unique character whereas it is found in several genera of Doradidae. The difference is that lateral scutes are found in all species of Doradidae and therefore have, rightly or wrongly, been given much greater phylogenetical weight.

Following Fowler's description, Gosline (1942) was the first to comment: "... the description of *Liosomadoras* ... a genus intermediate between *Auchenipterichthys thoracatus* and *Acanthodoras cataphractus*, makes the separation of the Auchenipteridae from the Doradidae untenable". I have no idea why, of all the species of Auchenipteridae, Gosline should have singled out *Auchenipterichthys thoracatus* for comparison with *Liosomadoras* as that species (and the genus it belongs to) is not particularly close to *Liosomadoras*. When trying to identify *Liosomadoras* with the key provided in my previous publication, one would arrive at *Tocantinsia*. It should be realized, however, that the key was definitely not intended to be a "natural" one with related genera keying out near each other; as it is mainly based on numbers of rays in anal and ventral fins this only means that the two genera agree in numbers of rays in ventral and anal fins. Whereas this agreement may well have some phylogenetic significance, a comparison between *Liosomadoras* and *Tocantinsia* shows many differences. *Tocantinsia* differs from *Liosomadoras* by the postcleithral process (smooth, not rasp-like), the more slender and much more depressed body, the relatively shorter dorsal spine, the much smaller adipose fin and the more posterior position of the ventrals. It is possible but not at all certain that in the Auchenipteridae *Liosomadoras* is closer to *Tocantinsia* than to any of the other genera. On the other hand, several genera of Doradidae show the short broad body and the rasp-like postcleithral process which are such conspicuous features of *Liosomadoras*.

In this connection a few notes on the nomenclatural history of Doradidae

and Auchenipteridae are in place. Eigenmann & Eigenmann (1890: 6-7) placed both as subfamilies of the Siluridae, in which family they also included Trachysurinae, Callophysinae, Pimelodinae and Ageneiosinae. If I read the family-tree presented by these authors correctly, they considered the Hypophthalmidae and Ageneiosinae as closer related to the Auchenipterinae than are the Doradinae. How this can be reconciled with the fact that they treated the Hypophthalmidae as a separate family, and the Doradinae and Auchenipterinae as subfamilies of the Siluridae, I do not understand. Twenty and even thirty years later Eigenmann (1910, 1912, 1922) still used essentially the same system, but Eigenmann (1925) came with a new classification in which the Doradidae and Auchenipteridae were raised to family status. Admittedly this was done without explanation, except for the statement that the Doradidae: "... are distinguished from all other Nematognaths by the presence of a series of plates along the sides, each with a strong, median, backward-directed spine, sometimes supplemented by smaller spines on the surface of the plate". It should be mentioned that Regan (1911) had presented a classification in which the Doradidae were treated as a separate family, but that this family included the Auchenipteridae, the latter not even being given subfamily status.

Although it is true that other authors had recognized the Auchenipteridae and Doradidae as different families before Eigenmann did so, and even divided each of them in subfamilies or families (cf. review by Mees, 1974: 13), apparently Doradidae and Auchenipteridae were only generally accepted as families during the short period from 1925 (Eigenmann) to 1942 (Gosline). Remains the fact that the Doradidae (s. s.) are an extremely convenient and easily-recognizable group. It is possible that the scutes have not much phylogenetic significance, but it is certainly true that they enable one to recognize members of the group at the most superficial glance. It is probably this practical fact rather than considerations of phylogeny which induced Eigenmann to elevate Doradidae and Auchenipteridae to family rank. Doing so he produced a handy and not oversized group to revise. It is for the same sort of reasons that I (Mees, 1974) chose to treat the Auchenipteridae as a family. In this connection I was interested to note that Gosline (1971: 120) himself has, without explanation, reverted to listing Auchenipteridae and Doradidae as separate families.

When Gosline (1945) published his list, only 73 species of Doradidae (s. s.) were known, but many genera and species have been added in recent years. For example, in a single paper, Fernández-Yépez (1968) described four new genera and eleven new species from Venezuela alone. Not having studied this complicated group I feel incompetent to make any statement

regarding its exact relations to the Auchenipteridae and regarding the position *Liosomadoras* holds in these relations. I realize that this conclusion is as unsatisfactory to the reader, who had expected to be enlightened, as it is to me.

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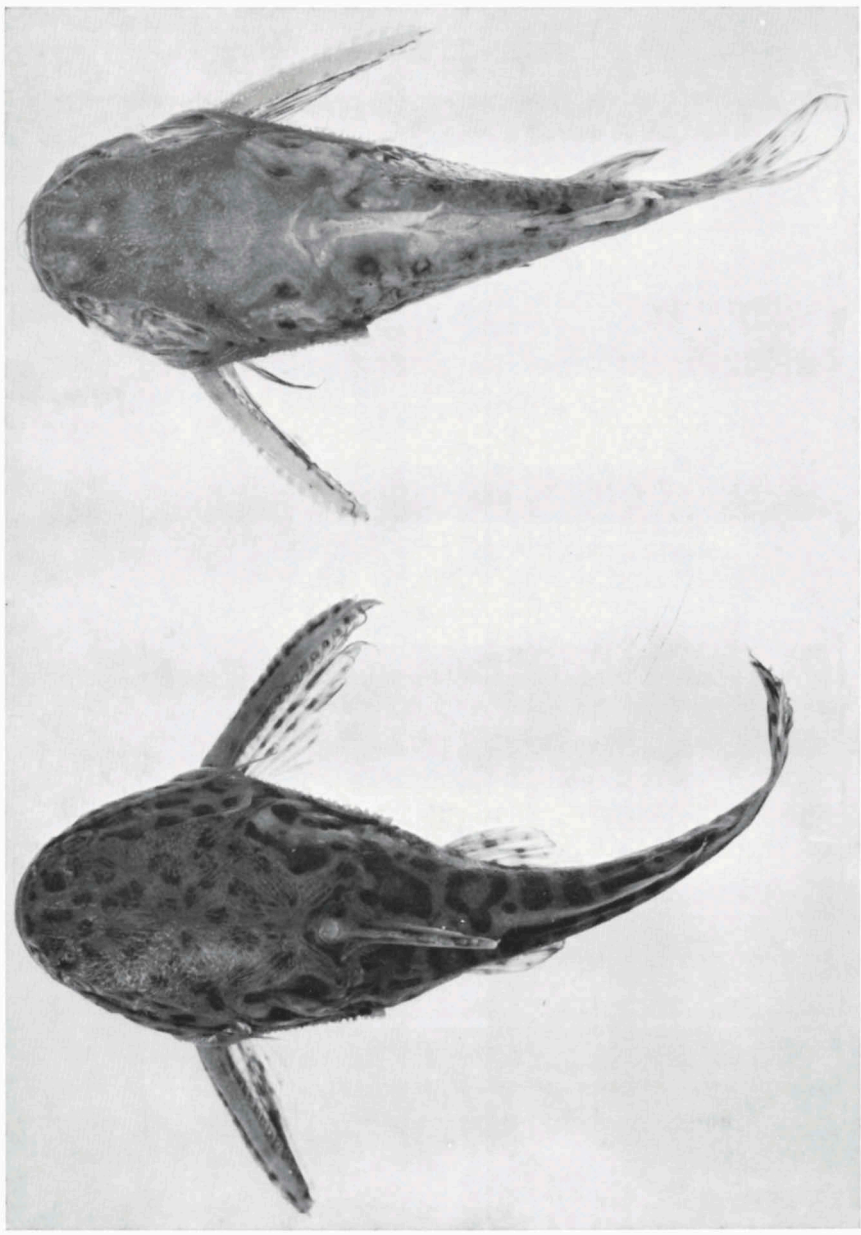
Schomburgk's plate of *Arius oncinus*, reproduced at the original size.



Liosomadoras oncinus: left CAS no. 35112, right ANSP no. 68646 (holotype of *L. morrowi*). Slightly more than natural size.