

BOCAGIANA

Museu Municipal do Funchal

Madeira

17. II. 1959

No. 1

AULOSTOMUS, A RECENT SPONTANEOUS SETTLER IN MADEIRAN WATERS

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INTRODUCTION

In August 1949 a specimen of *Aulostomus* sp. was captured in the bay of Funchal by a fisherman, who brought it to the Museum as a great rarity; a fish new to him or any of his companions. Indeed, no fish belonging to this genus had hitherto been recorded in Madeira, though now, since the publication of Wheeler's paper on the genus *Aulostomus*, in August 1955, it has been stated in print that the British Museum (Natural History) possesses a specimen measuring 589 mm., collected in Madeira in 1881 by J. Y. Johnson.

The taking of this specimen in 1949 was at first believed to constitute one of the comparatively numerous appearances of isolated stragglers coming to Madeira, either brought in drifting sea weed (as is believed to be the case with frogfishes) or accompanying schools of fishes with migratory habits or, perhaps more often than not, brought here by means as yet unexplained. Most of these are known to belong to faunas, either not far removed from Madeira or lying in the line of drift of the Gulf Stream passing Madeira. All cases observed, as far as the sea is concerned at least, seemed quite accidental and of no lasting consequence.

Soon, however, it became evident that in the case of *Aulostomus* a number of individuals, at the very least one male and one female, must have found their way to these waters, for specimens continued to

be captured or observed at more or less short intervals, and speculation as to whether this species would be able to settle here, naturally, arose. Up to the present moment 24 specimens of varying sizes have been taken, and the observations made on this material and the conclusions drawn from it form the subject of this paper.

LIST OF MATERIAL

(24 specimens in chronological order of capture)*

REG. NO.	S.L.	SEX.	LOCALITY	DATE	COLLECTOR	DEVICE	DEPTH
3125	339	♂	—	1949	Fisherman	—	—
3105	476	♀	Funch. Bay	12.8.49	»	Net	ca. 5m.
3191	534	♀	»	20.6.50	»	Line	—
3198	615	♀	»	29.9.50	»	—	—
3255	593	♀	—	15.9.51	»	—	—
3256	617	♀	—	1.10.51	»	—	—
3481	632	♀	—	18.6.52	»	—	—
3567	529	♂	Funch. Bay	27.11.52	»	Net	ca. 5m.
3582	416	♀	Gorgulho	1.1.53	J. de Castro	Harpoon	—
3756	568	♀	Funch. Bay	7.6.53	Fisherman	Pot	15m.
3777	536	♂	—	3.7.53	»	—	—
3826	485	♀	—	5.8.53	»	—	—
3857	485	♀	Santa Cruz	14.9.53	R.I.N. Pereira	—	—
3856	560	♀	»	14.9.53	»	—	4m.
3890	349	♂	—	2.10.53	Fisherman	Net	25m.
4484	164.5	?	—	5.6.54	»	—	—
4531	393	♂	—	17.7.54	»	—	—
4540	385	♂	Funch. Bay	24.7.54	A. Câmara	Pot	—
4634	336	♂	C. de Lobos	6.10.54	Fisherman	—	—
5592	400	♂	Gorgulho	3.5.55	F. Gomes	Pot	—
6006A	451	♀	Calheta	10.8.55	H. de Abreu	—	—
11946	564	♀	Santa Cruz	30.7.57	A. Durão	Line	—
13455	748	♀	Porto Novo	19.1.58	J. de Castro	Harpoon	7m.
13607	551	♀**	Funch. Bay	14.3.58	Fisherman	—	—

* 20. XII. 1958. Since the writing up of the material included in the lists and tables of this paper 6 more specimens have come to hand. Their numbers, standard lengths and dates are: 14703, 515mm., 20.IX.53; 14968, 552mm., 10.X.1958;

DESCRIPTION

Method of measuring and counting: All measurements taken from the snout are those between the foremost point of the upper jaw and the respective part indicated. The length of the head is measured from the snout-tip to the end of the actual opercle, not the upper curved membrane. The caudal peduncle is the distance between the inner posterior angle of the base of the anal and the end of the hypural.

The last rays in the dorsal or anal fin, when bifid, have been counted as two. The scales above lateral line are those immediately touching the lateral-line scales, beginning above the hindmost point of attachment of the upper membrane of the opercle and ending at the origin of the median caudal rays.

Counts: The range of variation is the following: First dorsal VII-XI; second dorsal III,22-III,24; anal III,24-III,26; pectorals 15-17. The frequencies shown in a graph give us the following picture:

Spines of first dorsal

7 ○
 8 ○ ○ ○ ○
 9 ○ ○ ○ ○ ○ ○ ○ ○
 10 ○ ○ ○ ○ ○ ○ ○ ○ ○ ○
 11 ○

Soft rays of second dorsal

22 ○ ○ ○
 23 ○ ○ ○ ○ ○ ○ ○ ○ ○ ○
 24 ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○

Soft rays of anal

24 ○ ○ ○ ○ ○ ○ ○ ○ ○ ○
 25 ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○
 26 ○ ○ ○

14530, 540mm., 26.VIII.1958; 15110, 570mm., 5.XI.1958; 14177, 598mm., date not known; 15111, 650mm., 5.XI.1958. Of these Reg.No.14703 has extended the range for the percentage of snout in head by 1.3% and Reg.No.15111 by 0.5%, both at the lower extreme; Reg.No.14703 has extended the range for the percentage of the longest ray of the pectorals in head by 1.2% at the upper extreme. As can be seen these differences are negligible. The remaining 17 characters lie mostly more or less medianly within the extremes of the ranges given for the material considered in this paper. As for the coloration, it may be mentioned that the axillary black pelvic spot is distinct in all 6 specimens.

** The sack which envelops the reproductive elements is quite empty and greatly shrunk. The consistency of its tissues is similar to that of the sacks which generally envelop eggs.

TABLE I. — (Continued)

3255	10	26	27	16	16	14	18	248
3198	8	26	28	16	16	14	19	240
3256	10	27	27	16	16	14	19	250
3481	9	26	29	17	17	15	19	249
13455	7	25	28	16	16	13	18	246

Proportions: As percentages of the standard length: Depth 8.0-10.5; head 29.7-32.7; snout to upper edge of base of pectoral 30.9-34.2; snout to ventral 58.0-61.5; snout to second dorsal 79.0-82.2; length of caudal peduncle 8.9-12.6.

As percentages of head: Snout 66.3-68.1; postorbital distance 23.0-28.2; maxillary 9.5-17.3; eye 6.9-9.8; interorbital 7.3-8.9; longest ray of pectorals* 13.0-15.3.

The depth of the caudal peduncle* is 22.2-30.0 % of its length.

Measurements: For measurements see Table II. on page 6.

Colour: Dark orange on upper half of sides of head and body and more or less the whole of the region between the second dorsal and anal, and the caudal peduncle. Back olive brown. This coloration tends, on the whole, to be darker the larger the specimen. Lower half of body and about two proximal thirds or more of head greyish white. Small dark brown, round spots scattered sparsely in varying number over body, but along the belly they are often arranged in a longitudinal straight row.

Black more or less well marked spots of varying sizes (but larger than the dark brown ones of the sides) on second dorsal, anal, caudal, and part of body between second dorsal and anal. A distinct and conspicuous axillary black spot at the base of the pelvic fins is present in all the 13 specimens measuring 485 mm. and more.** It is absent in the 4 specimens up to 385 mm. S.L. and in one of two measuring 485 mm., and small or faint in the 5 specimens between 385 mm. and 485 mm. The black maxillary stripe is conspicuous in all. Between the second dorsal and the anal there are two pairs of large round whitish

* Small specimen measuring 164.5 mm. S.L. excluded.

** The spot at the base of the pelvic fins described by Wheeler for *A. chinensis* is not axillary and is also much larger and more distinct than the spot mentioned here.

TABLE II. — Individual Measurements of the 24 Specimens

Reg. No.	S.L. (mm.)	Head	Eye	Postorbital	Depth	Snout to upper edge of base of P	Snout to V	Snout to D2	Length of caudal peduncle	Snout	Maxillary	Interorbital	Longest ray of P	Depth of caudal peduncle
4484	164.5	55	5.2	12.2	—	54.5	95.5	131.6	17	35.8	5	4.5	8.6	—
4634	336	102	8	25	27	107.5	195	272	33	69	13	8.4	14	7.7
3125	339	102	9	24.5	27	108	198	273	33	69	14	8.5	15	7.6
3890	349	104	9	26	28	110	202	280	34	70	14	8.7	14	8.5
4540	385	122	11	29	30	131	230	304	41	82	17	10	?	9.5
4551	395	125	10.5	29	32	130	229	313	40.5	85	17.5	10	18.5	9
5592	400	125	10	31	35	151.5	235	320	41	85	17.3	10	17.5	10
3592	416	127	10.5	31	31	133	242	331	42	86	19.5	10.5	17.6	9.6
6006A	451	141	11	35	34	146.5	264	365	44	96	21	11	19.3	11
3105	476	147	12	37	43	156	278	385	46	99	24	12	20	10.5
3826	485	151	12	37	47	156	287	333	51	102.5	22.5	11.7	21	12
3857	485	149	11	38	43	154	286	393	44	100	23	11.5	21.5	11
3567	529	169	14.5	42	46	179	317	424	48.5	112	26	15	26	12
3191	534	163	12.5	42	45	174	316	430	54	110	25.5	12	23	12
3777	536	170	14	43	46	181	320	434	50	115	25	13	25	12.5
15607	551	176	13.7	44	50	182.5	332	445	54	119	26	13.5	25	13.5
3586	560	177	13	46	59	181	340	450	55	120	29	13	26	13
11946	564	176	13	47	46	185	341	455	53	118	28	13.3	24.5	12.5
3756	568	185	14	48	49	192	347	467	52	124.5	31	14.1	26	13.2
3255	595	183	14	49	52	192	354	479	59	123	30	14	26	14
3198	615	192	15	49	57	200	372	496	58	130	33.3	14	25	14.6
3256	617	193	14	49	54	198	361	497	61	131	30.5	15	27	15
3481	632	200	14.5	55	52	208	388	514	56	134	31	15.5	26	14
13455	748	233	16	66	68	241	454	610	68.5	153.5	38.2	17.2	33	16

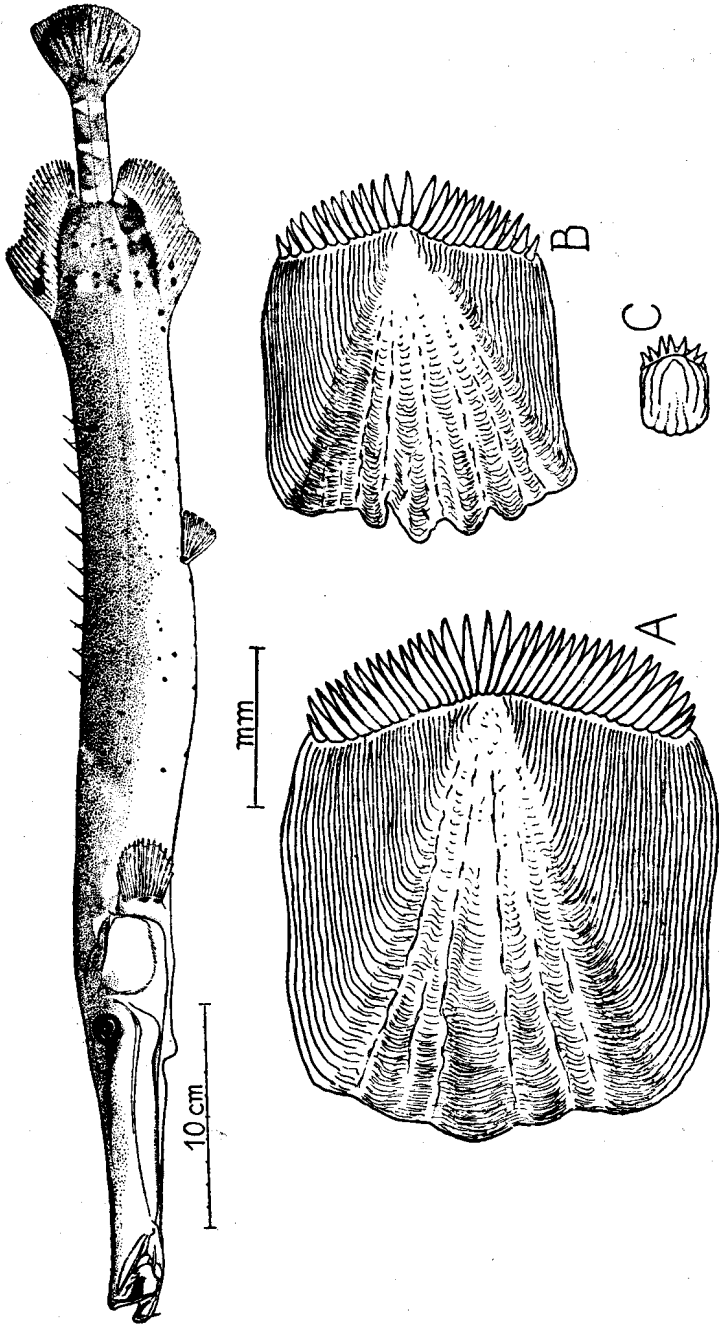


FIG. 1. — *Aulostomus* sp. Reg.No. 15607. A - C Scales from middle of distance between top of back and lateral line, above the base of the ventrals: A Scale of Reg.No. 15455, S.L. 748 mm. B Scale of Reg. No. 6006A, S.L. 451 mm. C Scale of Reg.No.4484, S.L. 164.5 mm.

spots, the two lower ones connected by a wide stripe going through them. The caudal peduncle has 3 wide whitish cross bars, superiorly not quite reaching the top.

In a few specimens there are also spots scattered over the back. No silvery streaks anywhere.

ON THE EVIDENCE DEMONSTRATING *AULOSTOMUS* AS A NEWLY SETTLED FISH IN MADEIRA.

For centuries most intensive fishery has been going on in the coastal waters of Madeira and, leaving aside extremely small fishes, there is not one of the shallow water species that is not well known to Madeiran fishermen. All have vernacular names currently used by a large part of the population, and the hypothesis that a species which has now been observed frequently over several years could have escaped notice must be put aside.

The fairly frequent occurrence of *Aulostomus* over a span of about 9 years, in itself, almost constitutes convincing enough evidence that this fish has definitely settled. To eliminate further the possibility of a large number of specimens of greatly varying sizes having taken up residence only for a lifetime without breeding in this new locality the problem can be approached from a study of the size ratio relative to time within the total span. The list of material (p. 2) shows us clearly, then, that it is mainly three and a half years after the first record that much smaller specimens than the previous ones were taken. One specimen, taken nearly 5 years after the first, measures only 164.5 mm. S.L. and has very much the aspect of a young fish. Though nothing is known of the growth rate of *Aulostomus* the possibilities that this young specimen can be more than a few months old are slight. For if this specimen took about 5 years to attain 165 mm. S.L. then the first specimen, measuring 476 mm., would at that growth rate be at least 15 years old, for the ratio of growth in relation to age is likely to diminish with age.

A further proof of its juvenile state can be found in a comparative study of the scales of the material at hand (Figs. 1a, b, c). For this purpose some 6 to 10 scales have been removed from above the lateral line at about the middle of the body length and their striae and terminal spines have been counted. The marking of years such as occurs in the scales of many pelagic fish could not be observed, but

there is a steady increase of both the striae and spines proportionate with the increase in size of the whole fish. Even individuals of somewhat less than half the size of the largest specimen have 17-22 lateral striae and 21-22 terminal spines, in comparison to which the smallest specimen only possesses 6 lateral striae and 7 terminal spines; an ontogenetic relation clearly showing the latter as a very young specimen:

BREEDING

To come to a more accurate conclusion as to when *Aulostomus* spawns in these waters it would be desirable to have a sufficient number of representatives for all the months of the year. Unfortunately our

TABLE III.

♂					♂		
Reg. No.	Date	Eggs (mm.)	Length of ovaries (% of head)	Condition of ovaries	Reg. No.	Date	Length of testes (% of head)
3582	1.1.53	0.65	47.3	Soft, fairly full	5592	3.5.55	36.0
13455	19.1.53	1.25	70.9	Soft, full	3777	3.7.53	57.7
3756	7.6.53	0.63	64.9	Soft, rather empty	4531	17.7.54	40.0
3481	18.6.52	none	47.6	Soft, empty	4540	24.7.54	37.0
3191	20.6.50	0.28	34.7	Soft, practically empty	3890	2.10.53	28.8
11946	30.7.57	0.70	60.3	Hard, full	4634	6.10.54	33.3
3826	5.8.53	1.08	64.8	Hard, full	3567	27.11.52	46.8
6006A	18.8.55	0.50	37.7	Soft, not very full	Sex doubtful, probably ♀		
3105	12.8.49	0.40	37.5	Hard, full	Reg. No.	Date	Length of empty sack (% of head)
3856	14.9.53	0.74	70.1	Hard, full			
3657	14.9.53	0.72	63.7	Hard, full			
3255	15.9.51	0.80	60.3	Hard, full			
3198	29.9.50	0.82	70.8	Hard, full			
3256	1.10.51	0.63	25.8	Soft, rather empty			

material is mainly concentrated over the months of June to September with only a few scattered records for the remaining months. In Table III the dates are arranged so that they are consecutive with regard to the months, regardless of the year in which the specimens were taken.

Supposing that specimen 15607 is a female, which, judging from the tough consistency of the tissues of the sack, as in the case of the other females, is most likely, it will be seen that only two eggless females are recorded, one in March the other in June. The other records all lie above the 0.28 mm. diameter, also in June, and the maximum of 1.25, in January. In spite of great irregularity, in some cases, there seems a general trend towards increasing size up to January. It seems likely, therefore, that the spawning season falls more or less between the months of March and June. This conclusion is of course tentative, and many more favourable observations will be necessary to confirm it.

FOOD

The examination of the stomach contents has confirmed former observations that *Aulostomus* feeds mainly on smaller fish. Considering its relatively small mouth and the narrow tube-like passage its food has to pass through, it is surprising how large a fish *Aulostomus* is capable of swallowing. Except for the smallest specimen all were examined for stomach contents, with the following results:—

Nine specimens had empty stomachs. Reg. Nos. 3105, one nearly full-grown cardinal fish; 3125, one small unidentifiable fish; 3191, dito; 3198, three small swallow-tailed wrasses and four small *Centrolabrus trutta*; 3255, one small unidentifiable fish and one bogue (abt. 5 cm.); 3567, three unidentifiable fish and one swallow-tailed wrasse; 3582, two swallow-tailed wrasses (abt. 4 cm); 3826, one *Atherina hepsetus* (abt. 5 cm.); 3856, six small swallow-tailed wrasses (abt. 4-5 cm.); 3857, three *Atherina hepsetus* (abt. 6 cm.); 3890, one small unidentifiable fish; 4513, one shrimp (species not identifiable); 5592, one small unidentifiable fish; 11946, three unidentifiable fish (abt. 6 cm.) and one bogue of 10 cm. length.

It is not surprising that among the species found the swallow-tailed wrasse should predominate, as this is by far the most common fish here among the rocks in shallow water. On the other hand, it was surprising to find examples of fish that swim in small schools near the surface, such as *Atherina hepsetus*.

HABITAT

Numerous people who, when swimming with goggles, have observed this fish in shallow water of the southern coast of Madeira in about

5 to 7 m. depth, mostly hiding in cavities of the rocks. It does, however, descend to greater depths, as one record of 25 m. shows.

SPECIFIC IDENTIFICATION

It would of course be interesting to know where these new settlers came from, but this would only be possible if the morphological distinctions of the various geographical populations were known. Wheeler's timely publication has solved this problem only in a general and wide way, but he himself points out the provisional character of his revision, which, anyhow, he only intends to be preliminary.

Wheeler's material, consisting of 37 specimens from tropical and subtropical zones of three oceans, shows a wide range of variation and he has been able to find co-relating distinctive characters on the basis of which he divides his material into three groups, and establishes 3 species, *maculatus*, *strigosus* and *chinensis*. He regards these species as geographically completely isolated, the first comprising the specimens from the Western Atlantic (Cuba, Bermuda, the Bahamas and Bahia), the second from the Eastern Atlantic (examples from St. Helena, Ascension Island, Cape Verde Islands, and one specimen from Madeira), and the last from the East African coast, the Indo-Australian Archipelago and the islands of the Pacific Ocean (localities for his material not indicated). The reasons he gives for a separation of *chinensis* from *strigosus* on the basis of zoogeographical and cold water barriers are quite convincing and certainly hold good. However, the present material shows that an intermingling of the populations of the eastern and western Atlantic is indeed quite possible, for wherever the originators of the *Aulostomus* this paper is concerned with came from, they must have traversed a stretch of many miles of deep open ocean, and it seems likely that they came from the western Atlantic as we shall see below.

Comparison with Wheeler's material: In the comparison with Wheeler's material only that grouped under *A. maculatus* and his new species *strigosus* will be considered. No counts of the vertebrae were made so that, as far as counts are concerned, only those of the rays of the second dorsal, the anal and those of the scales are taken into account.

To show up the relationship between our material and Wheeler's two Atlantic species most conveniently a comparison is made in the following Table IV, which is arranged in a similar manner to his TAB. I of page 620.

TABLE IV.

	Second dorsal fin rays.					Number of specimens.	Mean.
	21	22	23	24	25		
<i>A. maculatus</i>	2	2	5	5	1	15	23.06
<i>A. strigosus</i>				5	9	14	24.64
<i>A. sp. (Madeira)</i>		3	9	12		24	23.37
	Anal fin rays.						
	22	23	24	25	26		
<i>A. maculatus</i>	1	4	4	6		15	24.0
<i>A. strigosus</i>					14	14	26.0
<i>A. sp. (Madeira)</i>			10	11	3	24	24.71
	Rows of scales above l.l.						
	16	17	18	19			
<i>A. maculatus</i>	1	9	4			14	17.41
<i>A. strigosus</i>			8	6		14	18.57
<i>A. sp. (Madeira)</i>		2	14	7		23	18.22
	Rows of scales below l.l.						
	12	13	14	15	16		
<i>A. maculatus</i>	1	9	4			14	13.21
<i>A. strigosus</i>			2	10	2	14	15.00
<i>A. sp. (Madeira)</i>		7	14	2		23	13.78
	Scales in longitudinal series.						
<i>A. maculatus</i>	220-240				14	230.3	
<i>A. strigosus</i>	247-262				14	255.25	
<i>A. sp. (Madeira)</i>	231-250				23	240.1	

As can be seen, our material is here definitely much nearer *A. maculatus* than *A. strigosus*. In fact, it is only the mean value for scales above lateral line which is nearer that of the latter. Whatever conclusion may be drawn from the comparison, one thing becomes quite clear, and that is that this new species cannot belong to Whee-

ler's *A. strigosus*. The predominance of the high counts for second dorsal rays, anal rays, scales below lateral line, and in longitudinal series warrant this. On the other hand, if our material is included in *A. maculatus* as understood by Wheeler, it would seem that more than one local variety must have been included by him, for he drew his conclusions from approximately half as much material as we have here and in several characters its range of variation is far greater. This becomes clear in a comparison of the proportions, as can be seen in the following Table V.

TABLE V.

	<i>A. maculatus</i>	<i>A. strigosus</i>	<i>A. sp. (Madeira)</i>
Number of specimens	15	14	24
Standard length (mm.)	—	182-658	164.5-748
Depth	6.8-8.6	7.5-8.4	8.0-10.5
Head	29.8-34.8	30.2-35.1	29.7-32.7
Snout to upper edge of base of P	34.4-37.0	32.5-36.4	30.9-34.2
Snout to ventrals	61.5-63.5	60-65	58.0-61.5
Snout to second dorsal	81.5-86.5	78.0-83.7	79.0-82.2
Length of caudal ped.	8.3-10.1	8.2-10.4	8.9-12.6
Snout	65.5-70	66.3-70.8	66.3-68.1
Postorbital	22-23.6	22.0-26.3	23.0-28.2
Maxillary	12.8-16.4	10.2-15.5	9.5-17.3
Eye	7.6-11.0	7.0-12.3	6.9-9.8
Interorbital	5.9-8.9	6.2-9.1	7.3-8.9
Longest ray of P.	15.0-17.4	11.9-15.3	13.0-15.3
Depth of caudal ped. as % of its length.	21.7-28	19.5-31.9	22.2-30.0

Clearly, not only are the extremes of variation outside the limits of our material, but, contrary to the meristic values, the proportions of the Madeiran material are nearer *A. strigosus* than *A. maculatus*. To be precise, out of 13 characters given 7 are nearer the former, only 3 nearer the latter, and 3 about equally near to both. Furthermore, the maximum value of the distance from snout to upper edge of base of

pectorals in our material is lower than the minimum value of the same character in *A. maculatus*.

Another important character to be considered is the coloration, which, in the present material, is of a very stable pattern. In fact, the only variation to be observed is in the number of the small black spots on the body. The presence or absence of the axillary spot on the pelvic fins is an ontogenetic feature. On the whole the coloration is in good agreement with that of *A. strigosus* as described by the author of that species, but, on the other hand, variations of great significance, which may well include a pattern such as is found here, may occur among Wheeler's material of *A. maculatus*, for the silvery stripes he mentions in his description of that species are obviously not found in all his specimens, as on p. 622, where he discusses the distinguishing characters of the 3 species he recognizes, he says that specimens of *A. maculatus* are *often* marked with silvery stripes. Therefore, the fact that no trace of them is found in our material does not exclude it from *A. maculatus* as understood by him. Actually, it may ultimately be found that these stripes are a distinguishing character of two different forms, for where they exist they are very distinct— even striking.

LOCALITY OF ORIGIN

So far we have found evidence on morphological grounds which make it likely that our material should be included in a broad sense in the species *maculatus* as defined by Wheeler and geographically restricted to the Caribbean Sea, northward to Florida, Bermuda, southward to Bahia. Although this area is extremely distant from Madeira and lies on the other side of a deep and wide ocean, the appearance of marine animals from there is easier to explain than from the much nearer Cape Verde Islands or those parts of the West African coast from where *Aulostomus* has been recorded, for the current that touches Madeira, with its centre between the latter and the African Continent, is the South East Drift of the Gulf Stream, originating in the very area from where *A. maculatus* is commonly recorded. The explanation that poor swimming species might accidentally come here accompanying floating sea weeds or other objects is therefore quite feasible. On the other hand, as the upper current runs from north to south in the Madeira-Canaries area, any marine animals coming

from the neighbourhood of the Cape Verde Islands or further south would have to swim against the current. In fact, the only other slow swimming fishes from distant waters we have collected within the last 30 years are frogfishes. Of the total of 4 specimens one could be identified as *Antennarius radiosus*, a species known from the Gulf of Mexico and neighbouring areas, including Bermuda. The identification of the other three presents some difficulty but they are likely to turn out to be *Antennarius bermudensis*. At any rate, they are not *A. pardalis*, the only species known from the West African coast. All four examples were collected on different, widely separated dates.

SPECIMEN OF *AULOSTOMUS* COLLECTED IN
MADEIRA IN 1881 BY J. Y. JOHNSON

The only other specimen of *Aulostomus* from Madeira we know of is the one collected by J. Y. Johnson, mentioned in the Introduction to this paper. Wheeler attributed it, as paratype, to his new species *A. strigosus*, possibly persuaded by the fact that the locality it came from is included in the area ascribed to this new species and not to either of the others and, of course, a general great similarity with the other specimens of this Eastern Atlantic material. However, a confrontation of the individual counts and proportions of this specimen with those of *A. strigosus* and the Madeiran form shows that those characters which are near or at the extremes of the ranges for *A. strigosus* fit more or less medianly into the ranges of the Madeiran material, as Table VI on page 16 illustrates.

In the case of the row of scales immediately above the lateral line an error must have occurred, for Wheeler himself, on re-counting these scales obtained a result of 244, whereas the author obtained 242*. This count lies 3, respectively 5, below the lower extreme he gives for this character, and, again, quite near the median value for the Madeiran specimens.

*. Slight discrepancies in individual counts of these scales may occur as sometimes a small number of them are dislocated in such a way that it is difficult to decide to which of the adjoining rows they belong. This irregularity in the placing of the scales is, however, rare and the error resulting from it is not likely to exceed 2 or 3.

A further point to be considered, the pattern of the coloration, is also in perfect agreement with what can be observed in the Madeiran examples, including the presence of the axillary pelvic black spot found in all specimens above a certain size.

TABLE VI.

	<i>A. strigosus</i>	<i>Aulostomus</i> sp. (Madeira)	<i>A. strigosus</i> (paratype from Madeira)*
Standard length (mm.)	182 - 658	164.5 - 748	591
Second dorsal fin rays	24 - 25	22 - 24	24
Anal fin rays.	26	24 - 26	26
Rows of scales above l.l.	18 - 19	17 - 19	18
Rows of scales below l.l.	14 - 16	13 - 15	14
Scales in longitudinal series	247 - 262	231 - 250	242 (244)
Depth	7.5 - 8.4	8.0 - 10.5	8.8
Head	30.2 - 35.1	29.7 - 32.7	31.0
Snout to upper edge of base of P	32.5 - 36.4	30.9 - 34.2	32.1
Snout to ventrals	60 - 65	58.0 - 61.5	61.1
Snout to second D	78.0 - 83.7	79.0 - 82.2	80.4
Length of caud. ped.	8.2 - 10.4	8.9 - 12.6	10.2
Snout	66.3 - 70.8	66.3 - 68.1	66.7
Postorbital	22.0 - 26.3	23.0 - 28.2	26.8
Maxillary	10.2 - 15.5	9.5 - 17.3	16.0
Orbit	7.0 - 12.8	6.9 - 9.8	7.4
Interorbital	6.2 - 9.1	7.3 - 8.9	7.7
Longest ray of P	11.9 - 15.3	13.0 - 15.3	14.8
Depth of caudal ped. as % of its length	19.5 - 31.9	22.2 - 30.0	23.3

* Counts and measurements by author. Number for scales in longitudinal series in () obtained by Wheeler on re-counting these scales.

Judging by all these observations it is probable that this specimen, found here many years past, came from the same or nearby locality as those that appeared some 10 years ago and have now become integrated in the local fauna of Madeira.

With this the spontaneous settling of the second new vertebrate, in the astonishingly short period of somewhat less than a quarter century, is being reported for this area, the other being the Spanish Sparrow, *Passer hispaniolensis*, which came over here in large quantities in 1935, during a prolonged period of continuous strong easterly winds and has by now ousted from towns the formerly very common Rock Sparrow, *Petronia petronia*. The Spanish Sparrow, which is said to have entirely rural habits, has here taken up the habits of the House Sparrow, so well known in the towns of almost the whole world, but never reported in Madeira.

SUMMARY

The specimens of *Aulostomus* obtained during the past 10 years by the Funchal Municipal Museum are described and compared with the Atlantic species *A. maculatus* and *A. strigosus* recognized by Wheeler. It is shown that fish of this genus did not inhabit Madeiran waters prior to about 1949 and that they have now settled here and breed freely. It is predicted that among the material referred to *A. maculatus* by Wheeler two or more local forms are included and the likelihood that the present specimens came from one of the localities of the region he assigned to this species is suggested.

RESUMO

Os espécimes de *Aulostomus* obtidos nos passados 10 anos pelo Museu Municipal do Funchal são descritos e comparados com as duas espécies atlânticas admitidas por Wheeler, *A. maculatus* e *A. strigosus*. Demonstra-se que peixes deste género não habitavam águas madeirenses antes de cerca de 1949, e que agora nelas se estabeleceram e aí se reproduzem. Sugere-se que duas ou mais formas locais estejam incluídas no material referido por Wheeler a *A. maculatus*, e que os exemplares colhidos na Madeira viessem duma das localidades da região atribuída por aquele autor a esta espécie.

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