

THE FISHES
OF THE
INDO-AUSTRALIAN
ARCHIPELAGO
IV



LEIDEN 1922 - E. J. BRILL LTD

THE FISHES
OF THE
INDO-AUSTRALIAN ARCHIPELAGO

IV

HETEROMI, SOLENICHTHYES,
SYNENTOGNATHI, PERCESOCES,
LABYRINTHICI, MICROCYPRINI

with 103 illustrations

BY

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INTRODUCTION.

The present volume is the fourth of the series of volumes devoted to the knowledge of the fishes of the indo-australian Archipelago and the third in which we endeavour to give a concise description of all the fishes at present known to inhabit the seas and freshwater of that Archipelago and also to show their distribution through this area. We have already defined the character and geographical limits of this area in the Introduction to the second volume.

In the present volume the orders of *Heteromi*, *Solenichthyes*, *Synentognathi*, *Percosoces*, *Labyrinthici* and *Microcyprini* are treated.

The material at our disposal has already been mentioned in the Introduction to the former volumes, so that we have only to add the following new additions.

In acknowledging our obligations to contributors of valuable material, we have to mention the following collections:

From Sumatra a collection made by Jonkheer F. C. VAN HEURN at Deli.

From New Guinea an extensive collection made by Jonkheer W. C. VAN HEURN in the Mamberamo-river and its tributaries.

In former volumes we had the opportunity to thank Dr. J. C. KONINGSBERGER for his interest and collaboration in the present work which was published with his aid.

Dr. W. M. DOCTERS VAN LEEUWEN, his successor as Director of 's Lands Plantentuin at Buitenzorg, Java, has shown the

same interest. We are under particular obligations to him and to Dr. A. L. J. SUNIER, Head of the Government Laboratory for Marine Investigation at Batavia and to Dr. K. W. DAMMERMAN, Director of the Zoological Museum at Buitenzorg, for sending us for study the fishes in the institutions under their control.

We are also indebted to Mr. B. A. BEAN (Washington), A. R. McCULLOCH (Sydney), Dr. G. DUNCKER (Hamburg), H. W. FOWLER (Philadelphia), Dr. J. PELLEGRIN (Paris), Dr. F. SARASIN and Dr. J. ROUX (Basel) for valuable informations concerning species in the collections under their charge.

Again we have to thank Prof. Dr. E. D. VAN OORT and Miss Dr. C. POPTA for giving us every facility to study the fishes in the Leiden Museum, especially the specimens of BLEEKER's collection.

We beg to express our hearty thanks to Mr. C. TATE REGAN for his kind help in studying some fishes in the British Museum during the preparation of this volume. Also to Dr. V. PIETSCHMANN when comparing some types in the Vienna Museum.

For the benefit of those who make use of this volume we repeat the technical informations, given in the Introduction to the former volumes of this series.

"In describing the fishes we understand by *Length*, in the discussions of the proportions, the distance between the snout and the base of the caudal fin; in giving the largest size known for a species, we include the caudal fin.

The *Head* is measured from the tip of the snout to the end of the opercle, its proportion to the length is indicated e.g. as follows: head 4—4½ means, that the length of the head is contained 4 to 4½ times in the length.

Height is the maximum height; in special cases it is indicated how it is measured; the figures placed behind "height" indicate how many times it is contained in the length.

The size of the *Eye*, the length of the *Snout*, of the *Faws* etc. are compared with the length of the head; thus "eye 4" means, that its diameter is ¼ of the length of the head.

In counting the *Scales*, under "*L.l.*" is given the number of scales, with or without sensory organs, between the head

and the caudal fin or, in most cases, between ~~the fin and~~ the upper corner of the opercle.

L.t. $\frac{3\frac{1}{2}}{6(7)}$ signifies, that there are $3\frac{1}{2}$ rows of scales between the dorsal fin and the lateral line and 6 to 7 below it, the lateral line itself is in this case not counted. In other cases

the lateral line itself is also counted f.i. *L.t.* $\frac{4\frac{1}{2}}{1}$ (between D. and V.),

which signifies, that there are $4\frac{1}{2}$ rows of scales between the dorsal fin and the lateral line, one in the lateral line itself and one between it and the ventral fin..

In the *Fin formulae* the spines and the simple, non-branched rays are generally indicated by a figure, separated by a point from that of the number of the branched rays.

The last soft ray of the dorsal and anal, in case it is cleft to the base and therefore counted as two by some authors (BLEEKER e. g.), is reckoned as one, being supported by a single pterygophore.

The *Gillmembranes* may be totally free from each other and from the isthmus; they may be united, but still remain free from the isthmus; or they may be connected with the isthmus and with each other. When in the last case the posterior border of the united gillmembranes is not quite adnate to the isthmus, there remains a free posterior margin, running as a fold over the isthmus from one gillopening to the other.

We follow the law of priority and use the oldest name which can with certainty be made out by the description, belonging to a certain species. Its author is quoted as the author of the species and his paper is quoted in the first place, when there is no stringent reason to do otherwise.

Mention is further made of all synonyms; besides, we have quoted those papers, which contain a description of the species. If it is a widely spread one, only those papers are quoted, which contain a description of or give some informations — others than those regarding locality only — about Indo-Australian specimens of that species.

According to the international rules of nomenclature we have neglected the generic names, as e.g. those of SWAINSON, which are not accompanied by a description.

We have recorded under: "nomina indigena" those native names, which seemed to us to be trustworthy. We are of

VIII

opinion that no great value ought to be attached to them, as the unavoidable series of difficulties is still enlarged by the fact, that the authorities for those names have mostly been European ichthyologists and no linguists."

Finally there remains for us the pleasing duty of expressing our sincere thanks to Mr. J. F. OBBES, to whom we are indebted for most of the figures, which illustrate this volume and to Mr. C. PELTENBURG, head of the firme E. J. BRILL Ltd of Leiden for his interest in publishing this volume.

Eerbeek
Amersfoort, May 1922.

MAX WEBER.
L. F. DE BEAUFORT.

SYSTEMATIC INDEX

	page		page
Order HETEROMI Gill (Boulenger emend.)	1	5. Fam. SYNGNATHIDAE	30
1. Fam. HALOSAURIDAE	1	1. <i>Syngnathoides</i> Bleeker	39
1. <i>Halosaurus</i> Johnson	2	1. <i>biaculeatus</i> (Bl.)	40
1. <i>carinicauda</i> (Alc.)	2	2. <i>Acanthognathus</i> Duncker	41
2. <i>Halosauropsis</i> Collett	4	1. <i>dactyliophorus</i> (Blkr.)	42
1. <i>mediorostris</i> (Gthr.)	4	3. <i>Microphis</i> (Kaup) Duncker	43
2. <i>affinis</i> (Gthr.)	5	1. <i>brachyurus</i> (Blkr.)	44
Order SOLENICHTHYES		2. <i>manadensis</i> (Blkr.)	46
Regan	7	3. <i>boaja</i> (Blkr.)	47
1. Fam. AULOSTOMATIDAE	8	4. <i>heterosoma</i> (Blkr.)	48
1. Subfam. Aulostomatinae	9	4. <i>Doryichthys</i> (Kaup)	
1. <i>Aulostoma</i> Lacépède	10	Duncker	49
1. <i>valentini</i> (Blkr.)	10	1. <i>spinachiodes</i> Dunck.	50
2. Subfam. Fistulariinae	11	2. <i>caudocarinatus</i> M. Web.	51
1. <i>Fistularia</i> Linné	12	3. <i>brevadorsalis</i> (de Bft.)	51
1. <i>villosa</i> Klunz.	12	4. <i>retzii</i> (Blkr.)	52
2. <i>petimba</i> Lacép.	14	5. <i>deokhatoides</i> (Blkr.)	53
2. Fam. MACRORHAMPHOSIDAE	15	6. <i>martensi</i> (Ptrs.)	54
1. <i>Macrorhamphosus</i> Lacépède	16	Doubtful species:	
1. <i>velitaris</i> (Pallas)	16	1. <i>fluviatilis</i> (Blkr.)	55
3. Fam. CENTRISCIDAE	18	5. <i>Coelonotus</i> Peters	56
1. <i>Aeoliscus</i> Jordan & Starks.	20	1. <i>argus</i> (Ptrs.)	57
1. <i>strigatus</i> (Gthr.)	20	2. <i>liaspis</i> (Blkr.)	57
2. <i>Centriscus</i> Linné	21	6. <i>Belonichthys</i> Peters	59
1. <i>scutatus</i> L.	22	1. <i>fluviatilis</i> (Ptrs.)	59
2. <i>cristatus</i> (De Vis)	23	7. <i>Choeroichthys</i> Kaup	60
4. Fam. SOLENOSTOMIDAE	24	1. <i>sculptus</i> (Gthr.)	61
1. <i>Solenostomus</i> Lacépède	25	2. <i>brachysoma</i> (Blkr.)	62
1. <i>cyanopterus</i> Blkr.	26	8. <i>Doryrhamphus</i> Kaup	63
2. <i>paradoxus</i> (Pall.)	27	1. <i>melanopleura</i> (Blkr.)	64
3. <i>armatus</i> M. Web.	28	9. <i>Solegnathus</i> Swainson	65
		1. <i>lettiensis</i> Blkr.	66
		2. <i>güntheri</i> Duncker	67
		10. <i>Corythoichthys</i> Kaup (p.p.)	68
		1. <i>fasciatus</i> (Gray)	70
		2. <i>crenulatus</i> (M. Web.)	72
		3. <i>corrugatus</i> (M. Web.)	73

	page		page
11. <i>Micrognathus</i> Duncker . . .	74	1. Fam. BELONIDAE . . .	116
1. brevirostris (Rüpp.) . . .	75	1. <i>Belone</i> Cuvier . . .	116
2. mataafae (Jord. & Seale) . . .	77	1. Subgenus <i>Eurycaulus</i>	
12. <i>Syngnathus</i> Linné (Kaup) . . .	77	Ogilby . . .	117
1. djarong Blkr.	79	1. platyura Benn.	118
2. spicifer Rüpp.	80	2. persimilis Gthr.	118
3. argyrostictus Kp.	82	2. <i>Tylosurus</i> Cocco	119
4. fasciolatus Dum.	83	1. strongylurus (v. Hass.)	121
5. cyanospilus Blkr.	83	2. macrolepis (Blkr.)	122
6. uncinatus M. Web.	84	3. krefftii (Gthr.)	123
7. punctatus M. Web.	86	4. leiurus (Blkr.)	124
8. pelagicus L.	87	5. incisus (C.V.)	125
9. acus L.	88	6. annulatus (C.V.)	126
13. <i>Ichthyocampus</i> Kaup	90	7. melanotus (Blkr.)	127
1. carce (Ham. Buch.)	92	8. crocodilus (Lesueur)	128
2. kampeni M. Web.	93	9. punctulatus (Gthr.)	129
14. <i>Nannocampus</i> Günther	94	3. <i>Athlennes</i> Jordan &	
1. weberi Duncker.	95	Fordice.	130
15. <i>Penetopteryx</i> Lunel	95	1. hians C.V.	131
1. epinnulatus (M. Web.)	96	4. <i>Xenentodon</i> Tate Regan	132
16. <i>Stigmatophora</i> Kaup	97	1. canceloides (Blkr.)	133
1. argus (Rich.)	97	Doubtful species:	
17. <i>Trachyrhamphus</i> Kaup	98	1. cancela H.B.	134
1. serratus (Schl.)	99		
18. <i>Yozia</i> Jordan & Snyder	100	2. Suborder Exocoetoidea	134
1. bicoarctata (Blkr.)	101		
19. <i>Halicampus</i> Kaup	102	1. Fam. HEMIRHAMPHIDAE	135
1. koilomatodon (Blkr.)	103	1. <i>Dermogenys</i> van Has-	
2. elegans (Steind.)	104	selt	136
20. <i>Haliichthys</i> Gray	105	1. orientalis (M. Web.)	137
1. taeniophorus Gray	106	2. weberi (Blgr.)	138
21. <i>Hippocampus</i> Rafinesque	106	3. ebrardti Popta	139
1. abdominalis Less.	108	4. sumatranus (Blkr.)	139
2. spinosissimus M. Web.	109	5. pusillus v. Hass.	140
3. hystrix Kp.	109	2. <i>Nomorhamphus</i> nov.	
4. kuda Blkr.	110	gen.	141
5. trimaculatus Leach.	112	1. celebensis n.sp.	141
6. coronatus Schl.	113	2. hageni (Popta)	142
Order SYNENTOGNATHI		3. <i>Hemirhamphodon</i> Bleeker	142
Gill	115	1. phaiosoma (Blkr.)	143
1. Suborder Scombresocoi-		2. pogonognathus (Blkr.)	144
dea	115	4. <i>Hemirhamphus</i> Cuvier	145
		1. georgii C.V.	147
		2. unifasciatus Ranz.	149

	page
3. <i>gaimardi</i> C.V. . . .	150
4. <i>melanurus</i> C.V.. . .	151
5. <i>balinensis</i> Blkr. . .	152
6. <i>quoyi</i> C.V. . . .	154
7. <i>dussumieri</i> C.V. . .	155
8. <i>far</i> (Forsk.) . . .	156
9. <i>marginatus</i> (Forsk.) .	157
10. <i>convexus</i> n. sp. . .	159
Doubtful species:	
1. <i>russelli</i> C.V. . . .	161
2. <i>erythrorhynchus</i> Le- sueur	162
3. <i>lucens</i> C.V. . . .	162
5. <i>Zenarchopterus</i> Gill . .	162
1. <i>caudovittatus</i> (M. Web.)	164
2. <i>ectuntio</i> (Ham. Buch.)	165
3. <i>rasori</i> (Popta) . . .	166
4. <i>novae-guinea</i> (M. Web.)	167
5. <i>kampeni</i> (M. Web.). .	167
6. <i>brevirostris</i> (Gthr.).	167
7. <i>dux</i> Seale	169
8. <i>dispar</i> (C.V.). . .	169
9. <i>buffoni</i> (C.V.) . . .	170
6. <i>Arrhamphus</i> Günther. .	171
1. <i>brevis</i> (Seale) . . .	172
2. Fam. EXOCOETIDAE . . .	173
1. <i>Parexocoetus</i> Bleeker. .	173
1. <i>brachypterus</i> (Rich.) .	174
2. <i>Evolantia</i> Snodgrass & Heller	175
1. <i>micropterus</i> (C.V.). .	176
3. <i>Exocoetus</i> Linné . . .	177
1. <i>volitans</i> L. . . .	177
4. <i>Cypsilurus</i> Swainson . .	179
1. <i>oxycephalus</i> (Blkr.) .	181
2. <i>speculiger</i> (C.V.) . .	181
3. <i>arcticeps</i> (Gthr.). .	182
4. <i>nigricans</i> (Benn.). .	183
5. <i>altipennis</i> (C.V.) . .	184
6. <i>hexazona</i> (Blkr.). .	185
7. <i>bilobatus</i> n. sp. . .	185
8. <i>poecilopterus</i> (C.V.)	186
9. <i>atrisignis</i> Jenk. . .	187

	page
10. <i>spilopterus</i> (C.V.) . .	187
11. <i>naresi</i> (Gthr.). . .	188
12. <i>oligolepis</i> (Blkr.) .	189
13. <i>bahiensis</i> (Ranz.) .	190
14. <i>opisthopus</i> (Blkr.) .	191
15. <i>nigripennis</i> (C.V.) .	192
16. <i>brevis</i> n. sp. . . .	192
17. <i>rondeleti</i> (C.V.) . .	193
Order PERCESOCES . . .	195
1. Fam. POLYNEMIDAE . .	196
1. <i>Eleutheronema</i> Bleeker	197
1. <i>tridactylum</i> (Blkr.) .	198
2. <i>tetradactylum</i> (Shaw)	199
2. <i>Polynemus</i> Linné . .	200
1. <i>plebejus</i> Brouss.. .	202
2. <i>microstoma</i> Blkr. . .	204
3. <i>indicus</i> Shaw . . .	205
4. <i>hexanemus</i> C.V.. . .	207
5. <i>pfeifferi</i> Blkr.. . .	208
6. <i>kuru</i> Blkr.. . . .	209
7. <i>sextarius</i> Bl. Schn..	210
8. <i>melanochir</i> C.V.. . .	211
9. <i>heptadactylus</i> C.V..	212
10. <i>longipectoralis</i> n. sp.	213
11. <i>borneensis</i> Blkr.. .	214
12. <i>dubius</i> Blkr. . . .	215
13. <i>macrophthalmus</i> Blkr.	216
14. <i>multifilis</i> Schl. . .	217
Doubtful species:	
1. <i>paradiseus</i> L.. . .	218
2. Fam. SPHYRAENIDAE . .	218
1. <i>Sphyaena</i> Bloch, Schneider	219
1. <i>jello</i> C.V.	220
2. <i>altipinnis</i> Ogilby . .	222
3. <i>forsteri</i> C.V.	223
4. <i>picuda</i> Bl. Schn.. . .	224
5. <i>japonica</i> Schlegel . .	225
6. <i>obtusata</i> C.V. . . .	226
7. <i>langsar</i> Blkr.. . . .	228
8. <i>brachygnathus</i> Blkr. .	229

	page		page
3. Fam. MUGILIDAE	229	1. nouhuysi (M. Web.).	278
1. <i>Mugil</i> Linné	231	3. <i>Telmatherina</i> Boulenger	278
1. dussumieri C.V.	235	1. celebensis Blgr.	279
2. tade Forsk.	236	2. bonti n.sp.	280
3. engeli Blkr.	238	3. abandononi M. Web.	281
4. longimanus Gthr.	239	4. <i>Pseudomugil</i> Kner.	282
5. ophuyseni Blkr.	240	1. gertrudae M. Web.	283
6. speigleri Blkr.	241	2. novae-guineae M. Web.	284
7. cunnesius C.V.	242	Subfam. <i>Melanotaen-</i>	
8. subviridis C.V.	243	niinae	286
9. vaigiensis Q.G.	244	1. <i>Melanotaenia</i> Gill	287
10. oligolepis Blkr.	245	1. multisquamata n.sp.	290
11. melinopterus C.V.	246	2. dumasi M. Web.	290
12. ceramensis Blkr.	247	3. patoti (M. Web.).	291
13. troscheli Blkr.	248	4. maculata M. Web.	292
14. borneensis Blkr.	249	5. ogilbyi M. Web.	293
15. caeruleomaculatus Lac.	250	Doubtful species:	
16. seheli Forsk.	252	1. loriae (Perugia)	294
17. cephalus L.	253	2. rubrostriata Rams.	
18. crenilabis Forsk.	256	& Ogilby	295
19. macrochilus Blkr.	257	2. <i>Rhomatractus</i> Gill	
20. heterochilus Blkr.	258	(Weber).	296
21. labiosus C.V.	259	1. praecox n. sp.	298
2. <i>Cestracus</i> Cuvier & Valen-		2. vanheurni n.sp.	299
ciennes.	260	3. lorentzi M. Web.	300
1. plicatilis C.V.	261	4. kochi M. Web.	302
2. goldiei (Macl.)	262	5. catherinae de Bfrt.	303
3. oxyrhynchus C.V.	263	6. goldiei (Macleay)	304
3. <i>Myxus</i> Günther	264	3. <i>Centratherina</i> Tate	
1. elongatus Gthr.	264	Regan	305
Appendix		1. crassispinosa (M. Web.)	306
<i>Agonostomus</i>		4. <i>Chilatherina</i> Tate Regan	307
<i>bryanti</i> Bean & Weed.	265	1. fasciata (M. Web.)	308
4. Fam. ATHERINIDAE	266	2. sentaniensis (M. Web.)	309
1. <i>Atherina</i> (Artedi) Linné.	268	5. <i>Glossolepis</i> M. Weber	309
1. temmincki Blkr.	269	1. incisus M. Web.	310
2. eendrachtensis Q. G.	270	Order LABYRINTHICI	312
3. valenciennesi Blkr.	272	1. Suborder <i>Ophiocephaloidei</i>	313
4. forskåli Rüpp.	274	1. <i>Ophiocephalus</i> Bloch	313
5. duodecimalis (C.V.)		1. maruliioides Blkr.	315
Blkr.	275	2. melanopterus Blkr.	315
2. <i>Craterocephalus</i> McCul-		3. striatus Bl.	317
loch.	277		

	page		page
4. melanosoma Blkr.	319	2. unimaculata (Popta).	355
5. gachua H.B.	321	3. fusca Regan	356
6. bistriatus nom. nov.	322	4. akarensis Regan	357
7. bankanensis Blkr.	323	5. anabatooides Blkr.	357
8. pleurophthalmus Blkr.	324	6. patoti n.sp.	359
9. lucius (K.v.H.) C.V.	326	7. picta C.V.	360
10. micropeltes (K. v. H.)		8. rubra Perugia	361
C. V.	328	9. taeniata Regan	362
Doubtful species:		10. fasciata Regan	362
1. punctatus Bl.	330	11. bellica Sauv.	363
		Doubtful species:	
2. Suborder Anabantoidei	330	1. Betta pugnax (Cant.)	364
1. Fam. ANABANTIDAE	331	11. <i>Trichopodus</i> Lacépède.	365
1. <i>Anabas</i> Cuvier	333	1. trichopterus (Pall.).	366
1. testudineus (Bl.).	334	2. leerii Blkr.	367
2. <i>Polyacanthus</i> (K.v.H.)			
C. V.	337	2. Fam. LUCIOCEPHALIDAE	368
1. hasselti C.V.	338	1. <i>Luciocephalus</i> Bleeker.	368
3. <i>Helostoma</i> Cuvier	339	1. pulcher (Gray)	369
1. temminckii C.V.	340		
4. <i>Trichogaster</i> Bloch,		Order MICROCYPRIINI Tate	
Schneider	341	Regan	370
1. fasciatus Bl. Schn.	341		
2. lalius (Ham. Buch.)	342	1. Fam. CYPRINODONTIDAE	371
5. <i>Osphronemus</i> Lacép.	343	1. <i>Aplocheilichthys</i> McClelland	371
1. goramy Lac.	344	1. javanicus Blkr.	372
6. <i>Macropodus</i> Lacépède.	345	2. celebensis M. Web.	373
1. cupanus C.V.	346	3. timorensis n.sp.	373
2. opercularis (L.)	346	2. <i>Panchax</i> Cuvier &	
7. <i>Parosphromenus</i>		Valenciennes	374
Bleeker	348	1. panchax (H.B.)	374
1. deissneri Blkr.	348		
8. <i>Sphaerichthys</i> Cane-		2. Fam. ADRIANICHTHYIDAE	376
strini.	348	1. <i>Xenopoeilus</i> Tate	
1. osphromenoides Ca-		Regan	377
nestrini	349	1. sarasinorum (Popta).	378
9. <i>Ctenops</i> Mc Clelland	350	2. poptae n.sp.	379
1. vittatus (C.V.)	351	2. <i>Adrianichthys</i> M. Weber	379
Doubtful species.		1. kroyti M. Web.	381
1. nobilis Mc Clell.	352		
10. <i>Betta</i> Bleeker	352	3. Fam. PHALLOSTETHIDAE	381
1. macrostoma Regan.	355	1. <i>Neostethus</i> Tate Regan.	382
		1. lankesteri Regan.	382

Order HETEROMI Gill (Boulenger emend.).

Airbladder without an open duct. Body elongate, tail tapering to a point in recent forms. Scales cycloid; lateral line present. Orbito-rostral part of cranium elongate. Parietals meeting in the middle line, excluding the frontals from the supraoccipital. Pectoral arch suspended from supraoccipital or epiotic. Mesocoracoid arch absent, scapula lamellar. Opercle well developed. Fins with or without spines. Pectorals inserted high up the sides. Ventrals abdominal and not attached to cleithra. Anal very long, reaching end of tail; a caudal rudimentary or wanting. Anus posterior. Anterior vertebrae not modified. Mouth generally small, inferior, bordered by maxillaries and intermaxillaries or by the lastnamed only.

Embracing the recent *Halosauridae*, *Lipogenyidae* and *Notacanthidae* of which the first family only is represented in the indo-australian Archipelago.

1. Fam. HALOSAURIDAE.

Elongate, somewhat compressed, with the abdomen rounded; tail very long and strongly compressed, tapering into a filament, without caudal. Head conical, the facial bones with large muciferous cavities. The flattened snout projecting beyond the mouth, which is inferior, of moderate width and anteriorly bordered mesially by the intermaxillaries, laterally by the maxillaries. No barbels. Teeth small, in villiform bands on the jaws, on the rudimentary pterygoids and palatines, none on vomer or tongue. Scales rather small, cycloid, very deciduous; head, at least on cheeks, temples and on upper part of opercle scaly. Lateral line running along lower profile; its scales scarcely enlarged and destitute of luminous organs, or these organs are

present in membranous pouches on strongly enlarged scales. Dorsal behind ventrals, short; a second long rudimentary dorsal may be present. Anal occupying the entire length of the tail. Pectorals inserted high up; ventrals not very far back, they may be united by membrane. Gillopenings wide, gillmembranes entirely separate, with numerous branchiostegals. Praeoperculum rudimentary and detached from suspensorium, suboperculum enlarged, interoperculum membranous, operculum normally connected. No pseudobranchiae. Ovaries lamellated, open, the ova falling into the abdominal cavity.

Deep sea fishes of worldwide distribution between about the 40° N.Lat. and 46° S.Lat.

Key to the indo-australian genera of Halosauridae.

1. Vertex covered with scales; scales of lateral line scarcely enlarged, without luminous organs. *Halosaurus* p. 2.
2. Vertex scaleless; scales of lateral line much enlarged, with luminous organs *Halosauropsis* p. 4.

1. *Halosaurus* Johnson.

(I. Y. JOHNSON, Proc. Zool. Soc. London 1863, p. 406).

Halosaurichthys Alcock Ann. Mag. Nat. Hist. (6) IV. 1889, p. 454 p. p.

Head with scales on cheeks, temples, vertex and in indo-pacific species also on snout. Scales of lateral line only slightly enlarged and without luminous organs. Head without angular ridges. The ventrals may be more or less united by membrane or totally free. A low median fold on the posterior dorsal part of the tail, covered by enlarged and elongated scales, may individually be present or absent.

For distribution see that of the family.

1. *Halosaurus carinicauda* (Alc.) [Fig. 1, p. 3].

Halosaurichthys carinicauda Alcock, Ann. Mag. Nat. Hist. (6) IV. 1889, p. 454.

Halosaurichthys carinicauda Goode & Bean, Oceanic Ichthyology 1895, p. 136, 517.

Halosaurus carinicauda Alcock, Journ. Asiatic Soc. Bengal LXV. 1896, p. 336.

Halosaurus carinicauda Alcock, Descript. Catal. Indian Deep-Sea Fishes 1899, p. 187.

Halosaurus carinicauda Max Weber, Siboga-Expeditie, Fische 1913, p. 93.

B. 12—13; D. 10—11; V. 1.9; P. 14—15; L.l. ca 60 (between head and anus); L.t. 16—17.

Height about 18. Head 7—8, nearly $2\frac{2}{3}$ times in trunk, about one eye-length shorter than its distance from base of ventrals; covered by scales, the snout included. Snout conical, its length somewhat more than 2.5 times in that of head, the praeoral portion about 2.5 times in length of snout. Major diameter of eye 5 to more than 6 times in length of head, more than twice in postorbital part of head and less than twice the width of the interorbital space. Maxillary not reaching frontborder of eye. Origin of dorsal opposite to about middle of length of ventrals. Ventrals more or less united by membrane. (Pectorals broken). Scales deciduous. Those of the lateral line, which are without luminous organs, only slightly enlarged, about 60 between head and anus. On the tail the scales of the lateral line are separated from the anal by two, and more hindwards by one series of scales. Some scales in the middle line behind the dorsal may be enlarged and elongated, and in the posterior part of the tail these may be set in a low median fold of skin. Pterygoid bands of teeth narrow, scarcely separated from the palatine bands. Gillrakers short, not numerous. Uniform light-brown. The black covering of the buccal and branchial cavities shining through. Length 393 mm.

Habitat: Bali Sea (1008 M. fine mud)! — Andaman Sea (896 M.).

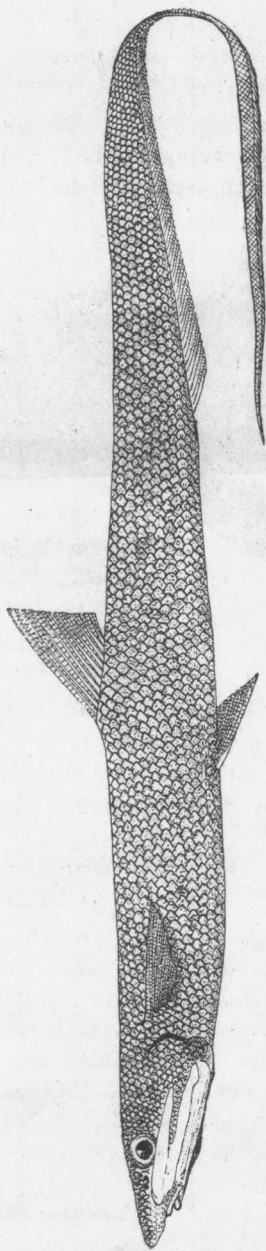


Fig. 1. *Halosaurus carinicauda* (Alc.)-X $\frac{2}{3}$.

2. *Halosauropsis* Collett.

(COLLETT, Result. Campagnes sci. Hirondelle, Poissons, 1896, p. 143).
Aldrovandia Goode & Bean, Ocean. Ichth. 1895 (issued 1896), p. 608.

Head generally with scales, — often few in number — on cheeks, temples and upper part of opercle, none on vertex or snout. Scales of lateral line strongly enlarged and provided

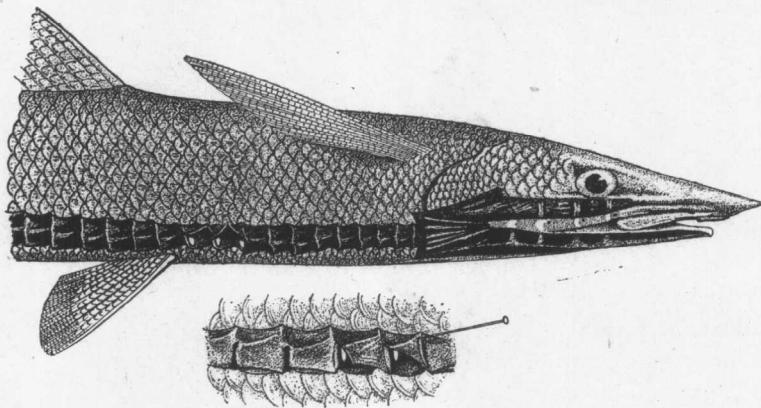


Fig. 2. Anterior part of *Halosauropsis macrochir* (Gthr.) and part of the lateral line with luminous organs (after Collett).

with luminous organs, which are also present in a suborbital and mandibulary series. Head with angular ridges. Base of ventrals united or not by membrane.

For distribution see that of the family.

Key to the indo-australian species of *Halosauropsis*.

1. Length of head $1\frac{1}{2}$ to 2 times in distance between head and base of ventrals. Ventrals almost entirely in advance of dorsal. P. with 8 rays. Lateral line with 20—25 enlarged scales between head and vent. . . . *H. mediorostris* p. 4.
2. Length of head about equal to distance between head and base of ventrals. Only anterior fourth of ventrals in advance of dorsal. P. with 10—13 rays. Lateral line with 30 enlarged scales between head and vent. *H. affinis* p. 5.

1. *Halosauropsis mediorostris* (Gthr.)

Halosaurus mediorostris Günther, Challenger Exped. XXII. Rep. Deep-Sea Fish. 1887, p. 239.

Halosaurus mediorostris Alcock, Journ. Asiat. Soc. Bengal LXIII. 1894, p. 136. —
ibid. LXV. 1896, p. 336. — Descript. Cat. Indian Deep-Sea Fish. 1899,
p. 185.

Halosaurus mediorostris Max Weber, Siboga-Exp. Fische, 1913, p. 94.

B. 11; D. 11; V. 1.8; P. 8; L. l. about 25 (between head and anus).

Height nearly 20. Head about $1\frac{2}{3}$ in trunk and $1\frac{1}{2}$ times to nearly twice in its distance from the root of the ventrals. Head naked, except for some scales on the upper half of the cheeks and the uppermost portion of the gillcover. Snout produced, its length about $2\frac{1}{3}$ in that of head, its praeoral portion not quite $\frac{1}{3}$ of its length. Eye more than 8, less than 4 times in postorbital part of head and less than $\frac{2}{3}$ of interorbital space. Maxillary reaching to, or slightly beyond front-border of eye. Origin of dorsal $2\frac{1}{2}$ eye lengths behind origin of ventrals, which are therefore almost entirely in advance of the dorsal. Ventrals not united by membrane. Pectorals with a very narrow base, longer than postrostral part of head and nearly reaching to ventrals. Scales very deciduous, those of lateral line much enlarged, bearing luminous organs; they are 20—25 or somewhat less in number between the gillopening and the vent. Pterygoid bands of teeth rather broad, separated from the palatine band by a considerable interval. Gillrakers numerous, close-set, rather long. Violet brown, end of tail somewhat darker. Bony parts of head silvery, the black covering of the buccal and branchial cavities shining through. Length 442 mm.

Habitat: Bali Sea (1018 M. fine mud)! — Near Philippine Islands (1288 M.); Arabian Sea (1315 M.).

2. *Halosauropsis affinis* (Gthr.)

Halosaurus affinis Günther, Ann. Mag. Nat. Hist. XX. 1877, p. 444.

Halosaurus affinis Bleeker, Verh. Akad. Amsterdam XVIII. 1877—1878, p. 21.

Halosaurus affinis Günther, Challenger Exped. XXII. Rep. Deep-sea Fish. 1887,
p. 241.

Halosaurus anguilliformis Alcock, Ann. Mag. Nat. Hist. (6) IV. 1889, p. 453.

Halosaurus affinis Alcock, Ann. Mag. Nat. Hist. (6) VI. 1890, p. 309.

Halosaurus hoskynii Alcock, ibid. p. 309.

Halosaurus affinis Alcock, Journ. Asiat. Soc. Bengal LXV. 1896, p. 335.

Halosaurus hoskynii Alcock, ibid. p. 336.

Halosaurus anguilliformis Alcock, ibid. p. 336.

Halosaurus anguilliformis Alcock, Descript. Cat. Indian Deep-Sea Fish. 1899, p. 184¹⁾.

Halosaurus affinis M. Weber, Siboga-Expeditie, Fische 1913, p. 93.

Halosaurus affinis Jordan, Tanaka & Snyder, Journ. Coll. Sci. Univ. Tokyo XXXIII. 1913, p. 40.

B. 10; D. 10—12; V. 1.8; P. 10—13; A. ca 175; L. l. about 30 (between head and vent); L. tr. ca 13—14 (between D. and V.).

Height about 17 to nearly 23; head 7—8, twice in trunk and about equal to its distance from base of ventrals. Head naked, except for a few scales on temples and cheeks. Snout produced, $2\frac{1}{3}$ — $2\frac{1}{2}$ in length of head, its praeoral portion scarcely or more than half its length. Major diameter of eye 6.5 times or less in length of head, 2.5—3 times in postorbital part of it, nearly equal to interorbital space. Maxillary nearly reaches frontborder of eye. Origin of dorsal about one eye length behind origin of first outermost ventral ray. On the posterior dorsal part of the tail there may be indication of a very low median fold of skin, provided with slightly elongated scales. Base of ventrals united by membrane. Pectorals much longer than postrostral part of head. Scales extremely deciduous; those of the lateral line much larger than the other scales and provided with a luminous organ; these organs about 30 in number between the gillopenings and the vent. On the tail the scales of the lateral line are separated from the anal fin by one series of small scales only. The palatine bands of teeth are separated from each other as also from the pterygoid bands by a narrow interspace. Ten gillrakers, the 3 inferior ones short, the others nearly reaching half length of major diameter of eye. Light brown, end of tail somewhat darker as also upper side of head and snout. Otherwise the head is black; ventral side blackish. Length 525 mm.

Habitat: Timor Sea (383 M. and 618 M. mud)! — South of Japan (1033 M.); Arabian Sea off the Laccadive Islands (1829 M.); Gulf of Manár (1234 M.).

¹⁾ *Halosaurus (Halosaurichthys) nigerrimus* Alcock, Ann. Mag. Nat. Hist. (7) II. 1898, p. 149 and Descr. Cat. Indian Deep-sea Fishes 1899, p. 188 from 459 fathoms off Maldives is probably a juvenile stage of *Halosauropsis affinis* Gthr. cfr. Max Weber, Siboga-Exp. Fische 1913, p. 93.