

A Synopsis of the Centropomid fishes of the subfamily Chandinae, with descriptions of a new genus and two new species

By A. FRASER-BRUNNER

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WHILE ENDEAVOURING to establish the relationship of some small fishes sent to me by Capt. M. A. W. Davies and Mr. M. W. F. Tweedie from Malaya, which are dealt with on later pages, it became evident that the group to which they belonged, the Chandinae, was very badly in need of revision. Indeed, their taxonomy and nomenclature were so confused that the accurate identification of specimens or the recognition of new forms was virtually impossible. I have therefore made a study of the comprehensive material in the British Museum (Natural History) which includes type-specimens of sixteen of the species. Much of this material has proved to be incorrectly named, and its sorting and re-grouping has helped to clarify many of the problems posed by the literature.

In the course of this work I have had the assistance of my daughter Pamela, and would like to record my gratitude for her patient checking of essential characters and references, which has enabled me to accomplish a considerable task in a reasonable space of time. My grateful thanks are also due to Mlle. Yseult le Danois for examining certain type-specimens preserved in the Paris Museum.

The Chandinae is the Old World subfamily of the Centropomidae; it is distinguished from the Atlantic subfamily Centropominae by the absence of a supramaxillary bone, and the cycloid scales. It consists mostly of small species which are either marine, often ascending estuaries, or wholly freshwater in habitat. The purely freshwater forms appear to be more nearly related to one another than to the rest, and are here regarded as generically distinct.

Some members of the marine group have been found in freshwater, but their distribution suggests that they breed in the sea.

The group seems to be Australasian in origin, for all the forms which may be regarded as primitive are to be found in Australia or New Guinea.

Taxonomic characters.—Previous authors have given attention primarily to the number of soft dorsal and anal fin rays, the presence or absence of a procumbent spine before the spinous dorsal fin, the denticulation, the proportions of the body, the continuity or otherwise of the lateral line, the length of the lower jaw and the shape of the maxillary bone. These have presumably been regarded as reliable, while the denticulation of the opercular and circumorbital bones has been considered to be a variable and unimportant feature. As a result, many existing accounts are very deficient in their description of the latter features. A good deal of confusion has arisen because of this.

My study shows that the armature of the opercular bones is of first importance in defining groups of species, that it is quite constant and very reliable, and that the other characters mentioned are of importance only within the groups so defined. The following brief notes upon the characters used in this synopsis may be helpful. It may be mentioned that most of them can be seen more clearly if the specimen is allowed to dry a little superficially.

Preorbital bone.—This has, in addition to the edge which overhangs the maxillary, a ridge which is usually continuous with that of the suborbital bone. The edge is usually armed; the ridge is entire in a number of species.

Suborbital bone.—The first suborbital bone has also an edge and a ridge, the latter lying close to the orbital rim. The edge is not armed. The ridge is denticulate in certain groups. The denticulation is sometimes rather fine, and may extend onto the second suborbital.

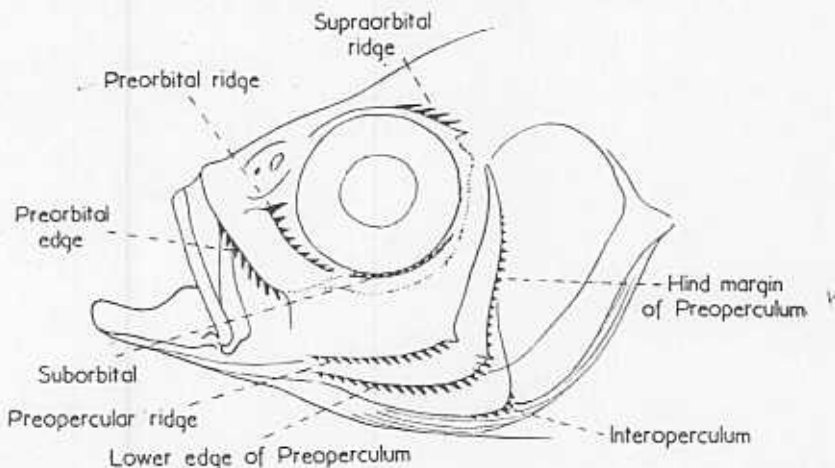


Fig. 1. Head of a Chandine fish showing ridges and edges of bones upon which denticulation of taxonomic importance may occur.

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Supraorbital bone.—This forms a ridge lying above the orbit. Usually it is smooth, terminating in a single backwardly directed point or spine, but in certain groups the ridge may have 3 to 5 other backwardly-directed denticles towards its rear end.

Preopercular bone.—A characteristic of this family is the double edge of the preoperculum, so that this bone also may be said to have an edge and a ridge. The lower edge is nearly always dentate, but the hind edge is entire in a number of species. The ridge is sometimes entire, or may have only 1 or 2 spines at its angle, but in some species the horizontal ridge is denticulate.

Interopercular bone.—The edge of this bone is entire in many species, but in others may be serrated or dentate posteriorly, near its junction with the operculum. Sometimes this serration is rather feeble, and should be sought with care.

Maxillary bone.—No great importance has been attached to the shape of this bone, as it varies not only individually, but particularly with age. In small specimens the end is pointed or obtusely rounded; with growth an upper lobe develops until in large examples the bone appears expanded and truncate (Fig. 2).

Procumbent spine.—All the species have a forward projection from the head of the first interneural bone. Some authors have attached importance to its being concealed or exposed. I notice that it is concealed in all those species with large scales, and exposed (in preserved specimens) in the small-scaled forms. I am convinced that the projection of the scales, for of the small-scaled forms, those with scales most reduced have the spine most prominent. When a large-scaled specimen shrinks in spirit, the large scale covering it tightens upon it, but still conceals it; but in the small-scaled forms, shrinkage causes the scales to be pulled away on each side and so exposes the spine. To confirm this, I have examined living specimens of *Chanda ranga*, which has very small scales, and find that the spine does not project, although it is conspicuous in the spirit-specimens.

Scales.—Scale-counts are made from the upper end of the operculum to the base of the caudal fin (the end of the hypural bones) and not on to the fin itself. Scales on the cheek are counted in horizontal rows. Predorsal scales are those in the median line between occiput and spinous dorsal fin.

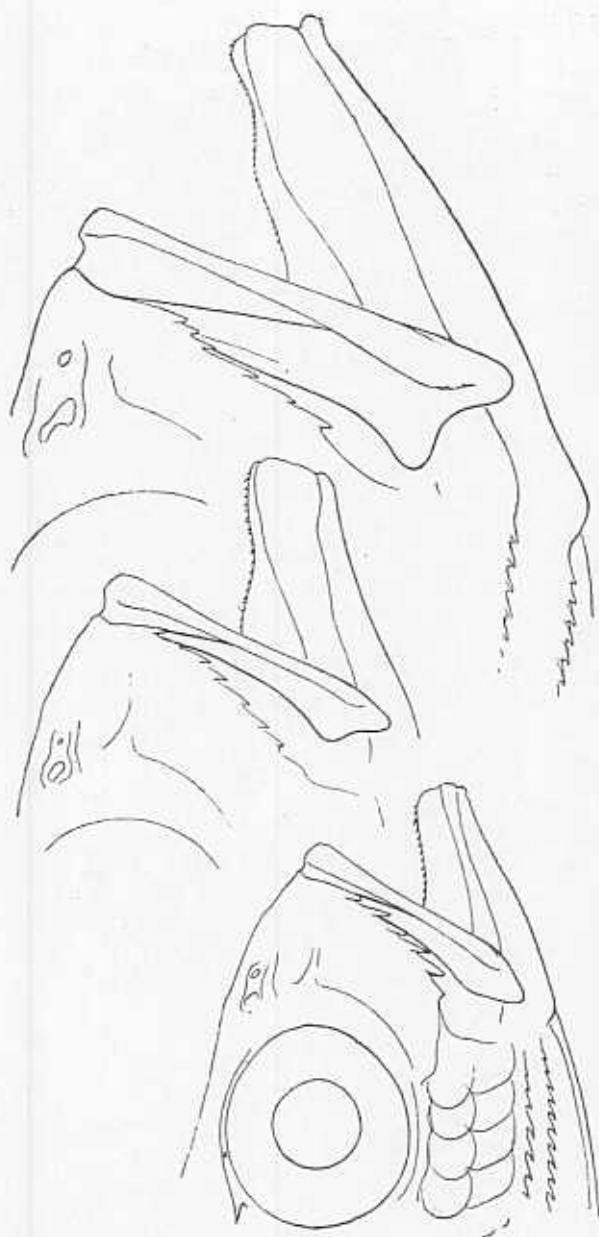


Fig. 2. Change of shape of maxillary bone during growth of *Ambassis macracanthus*.

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Lateral line.—Generally speaking, an incomplete lateral line, especially when abruptly broken, with a horizontal row of scales dividing it, or much further reduced, is constant for a given species, but there are exceptions in which the lateral line may be complete, simply interrupted (by the loss of only 1 or 2 pores) or very distinctly broken in the same species.

Dentition.—The dentition of the jaws is not a very satisfactory character, varying individually and with age. The teeth on the vomer and palatine, however, were found to be of use in defining certain species, especially when they occur in a single series. All the species of *Ambassis* have been found to have teeth on the tongue, and all the species of *Chanda* to lack them. Only 3 exceptions to this are to be found in the literature, and as these are of species which I have not seen I suspect that re-examination of the specimens would show them to conform with the rest. ✓

Proportions.—The depth of the body is found to vary somewhat within species; young specimens of *Ambassis* are always much more slender than the adults, whereas the young of *Chanda* are deeper in the body. The spinous dorsal fin in all species tends to be higher in young specimens than in older ones.

Gill-rakers.—In only very few previous descriptions have gill-raker counts been given, but I find them to be, in some cases, useful in helping to distinguish closely allied species.

In the synopsis which follows, it has not been thought necessary to give a full description of every species, for many of them, particularly East Indian forms, have been described a number of times in the literature quoted. It has been thought more helpful to include all diagnostic characters in the keys, followed by synonymies and notes for the species.

No attempt has been made to provide full references in the synonymy. Indeed, this is scarcely possible, since in many previous works, owing to the omission of descriptions of opercular and orbital bones, it is not clear what the authors actually had, while in others the descriptions are evidently composite. I have therefore restricted my references to pure synonyms—i.e. the first use of each new trivial or generic name, or combination of both, for each species—together with such others as may clarify the position by providing further references or a figure. With the help of these and the keys provided, the reader is left to decide, if he can, what other authors had before them; but in many cases this will not be possible without re-examination of their material.

Key to the Genera of Chandinae

- I. Spinous dorsal fin continuous, the last dorsal spine not much longer than the one before it. No teeth on tongue. Scales on cheek in 3 rows; about 30 scales in longitudinal series. Lateral line continuous.
 - A. Third dorsal spine the longest. 3 anal spines, the third the longest
1. *Synechopterus*
 - B. Second dorsal spine the longest. 4 anal spines, the second the longest 2. *Tetracentrum*
- II. Spinous dorsal fin deeply notched, the last spine (supporting the soft fin) more than twice as long as the one before it. 3 anal spines.
 - A. Second dorsal spine shorter than the third, and not stouter than the others. No teeth on tongue. Scales on cheek in 2 rows; 27-29 scales in longitudinal series. Lateral line continuous
3. *Velambassis*
 - B. Second dorsal spine longer than the rest, and usually much stouter.
 1. Scales present. Soft dorsal and anal rays not filamentous.
 - a. Scales large, 25 to 30 in longitudinal series; 1 or 2 rows on cheek. Teeth present on tongue. Lateral line continuous, interrupted or obsolete
 - i. Gill-rakers well developed, 13 or more on lower limb of first branchial arch. Mucous pores on orbital and preopercular bones not conspicuous. Preopercular ridge denticulate or entire except for one or two spines at angle. Teeth present on tongue. Lateral line complete, interrupted or obsolete 4. *Ambassis*
 - ii. Gill-rakers reduced to mere stumps, 6 on lower limb of first branchial arch. Mucous pores on preorbital, supraorbital and preopercular bones enlarged and conspicuous. Preopercular ridge entire, without spine at angle. No teeth on tongue. Lateral line obsolete 5. *Denariusa*
 - b. Scales smaller, 40 or more in longitudinal series; (3) 4 or more on cheek. No teeth on tongue. Lateral line continuous.
 - i. Preorbital bone dentate at least on edge. Preoperculum dentate at least on lower edge. Symphyseal teeth not massive 6. *Chanda*
 - ii. Preorbital bone entire, both ridge and edge. Preoperculum entire except for few spines at angle. Symphyseal teeth massive, the tips of the largest directed forwards
7. *Hamiltonia*
 2. No scales. Anterior rays of soft dorsal and anal fins filamentous. Teeth on tongue. Lateral line continuous
8. *Gymnochanda*

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Genus 1. *Synechopterus* Norman

Synechopterus Norman 1935, Copeia (2) p. 61 (Type: *Synechopterus caudovittatus* Norman).

Xenambassis Schultz 1945, Proc. U.S. Nat. Mus., xcvi, p. 115. (Type: *Xenambassis honessi* Schultz).

Habitat: Freshwaters of New Guinea.

Key to the Species

- I. Suborbital ridge entire. Preopercular ridge entire except for 2 small spines at angle; lower and hind margins of preoperculum dentate. 14 gill-rakers on lower limb of first branchial arch
(Sub-genus *Synechopterus*)
D ix, 10; A iii, 10. Dusky lateral band ending in black blotch at base of caudal fin 1. *caudovittatus* Norman
- II. Suborbital ridge denticulate. Preopercular ridge denticulate; lower and hind margins of preoperculum dentate. 13 gill-rakers on lower limb of first branchial arch (Sub-genus *Xenambassis*)
A. D. viii, 10 or 11; A. iii, 10. Dusky lateral band ending in black blotch at base of caudal fin 2. *honessi* Schultz
B. D. ix, 10; A. iii, 10. No black blotch at base of caudal fin 3. *simoni* Schultz

There is no need to deal with these species separately, as they are known only from the original descriptions quoted for the genus. They seem to represent a generalised Percoid type from which either *Ambassis* or *Chanda* could be derived. The type of *S. caudovittatus* is in the B.M.N.H. collection.

Genus 2. *Tetracentrum* Macleay

Tetracentrum Macleay 1883 Proc. Linn. Soc. N. S. Wales, viii, p. 256 (Type: *Tetracentrum apogonoides* Macleay) *Tetracentron* Brauer 1865 not involved.

Negambassis Whitley 1935 Rec. S. Austral. Mus., v, p. 360 (Substitute name for *Tetracentrum* believed preoccupied).

The single species, *Tetracentrum apogonoides* Macleay, has preorbital, suborbital, preopercular ridges, both lower and hind margins of preoperculum, and posterior edge of interoperculum dentate. One of the co-types, from the Goldie River, New Guinea, is in the B.M.N.H. collection.

Genus 3. *Velambassis* Whitley

Velambassis Whitley 1935, Rec. S. Austral. Mus., v, p. 365 (Type: *Pseudambassis jacksoniensis* Macleay).

The single known species, *Velambassis jacksoniensis* (Macleay 1881, Proc. Linn. Soc. N.S. Wales, v, p. 340), has in addition to the characters for the genus, the edge and ridge of preorbital, ridge of

suborbital and both ridge and lower edge of preoperculum denticulate. The interoperculum and the hind margin of the preoperculum are entire. D vii, i 9 or 10, A iii, 9. Predorsal scales 10 to 12. About 21 gill-rakers on lower limb of first branchial arch.

Habitat: Freshwaters of New South Wales.

This is a generalised little fish which might well represent the ancestral form of the genus *Ambassis*. It has been well figured by Whitley (*loc. cit. supra*).

Six specimens, 47 to 49 mm. standard length, from the Hunter River, are in the British Museum collection.

Genus 4. *Ambassis* Cuvier & Valenciennes

Ambassis Cuvier & Valenciennes 1828, Hist. Nat. Poiss., ii, p. 176 (Type: *Centropomus ambassis* Lacepède). Also spelt *Ambassus* and *Ambasis* by authors.

Priopis Cuvier & Valenciennes 1830 *ibid.* vi, p. 503 (Type: *Priopis argyrosoma* C. & V. ex Kuhl & Van Hasselt).

Pseudoambassis Castelnau 1878, Proc. Linn. Soc. N.S. Wales, iii, p. 43 (Type: *Pseudoambassis macleayi* Castelnau).

Blandowskiella Iredale & Whitley 1932, Vict. Natural., xlix, p. 95 (Type: *Pseudoambassis castelnaui* Macleay).

Austrochanda Whitley 1935, Rec. S. Austral. Mus., v, p. 357 (Type: *Pseudoambassis macleayi* Castelnau). Substitute name for *Pseudoambassis* Castelnau, supposed to be preoccupied by *Pseudambassis* Bleeker.

Priopidichthys Whitley 1935 *ibid.* p. 364 (Type: *Pseudoambassis ramsayi* Macleay).

Konopickia Whitley 1937, Mem. Queensland Mus., xi, p. 133 (Type: *Ambassis mulleri* Klunzinger).

Habitat: Indian and Western Pacific Oceans, on coasts, often ascending rivers.

Key to the Species

I. Supraorbital ridge smooth, terminating posteriorly in a single backwardly-directed spine (rarely double or absent). (Sub-genus *Ambassis*).

A. Suborbital entire.

1. Interoperculum entire; preorbital ridge entire.

a. Hind margin of preoperculum entire.

i. 1 row of scales on cheek. 20 to 22 gill-rakers on lower limb of first branchial arch. Lateral line continuous, or little interrupted

1. *commerioni*

ii. 2 rows of scales on cheek.

* Predorsal scales not more than 10. 16 gill-rakers on lower limb of first branchial arch. Lateral line obsolete except anterior 2 or 3 pores

2. *mulleri*

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** Predorsal scales 13 or more. Gill-rakers 15-24 on lower limb of first branchial arch.

† Maxillary reaching to anterior margin of orbit. Teeth on vomer and palatines in villiform bands, inner ones on vomer enlarged. Third dorsal spine distinctly shorter than second. Lateral line interrupted.

3. *bueroensis*

†† Maxillary reaching to below anterior edge of pupil. Teeth on vomer and palatines in single series.

‡ Predorsal scales 13-16. Third dorsal spine scarcely shorter than second. Lateral line continuous or interrupted

4. *miops*

‡‡ Predorsal scales 17-22. Third dorsal spine distinctly shorter than second. Lateral line continuous

5. *macracanthus*

b. Hind margin of preoperculum denticulate. Predorsal scales 9 or 10. Teeth on vomer and palatines in narrow bands. Tip of spinous dorsal fin black between second and fifth spines 6. *ambassis*

2. Interoperculum denticulate posteriorly.

a. Hind margin of preoperculum entire. Preorbital denticulate on both edge and ridge.

i. Predorsal scales 8 or 9. Teeth in villiform bands on jaws, vomer and palatines. Lateral line continuous 7. *kopsii*

ii. Predorsal scales 12 to 16. Teeth in villiform bands on jaws; vomer and palatine teeth in single series.

* Gill-rakers 18 to 20 on lower limb of first branchial arch. Lateral line continuous 8. *nalua*

** Gill-rakers 25 on lower limb of first branchial arch. Lateral line interrupted 9. *interruptus*

b. Hind margin of preoperculum denticulate. Lateral line continuous. Teeth in narrow bands on jaws, vomer and palatines.

i. Preorbital ridge entire.

o Preopercular ridge entire except for a spine at angle. Mouth small, maxillary reaching to below anterior margin of orbit. Predorsal scales

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- about 10. Membrane between second and third dorsal spines blackish 10. *natalensis*
- ⇒ Preopercular ridge denticulate, with 1 or 2 larger spines at angle. Mouth larger, maxillary reaching to below middle of eye. Predorsal scales about 15 11. *dayi*
- ii. Preorbital ridge denticulate. Preopercular ridge denticulate. Teeth in villiform bands on jaws, vomer and palatines. Predorsal scales 14-17. Lateral line continuous. Membrane between second and third dorsal spines blackish 12. *productus*
- B. Suborbital denticulate. Interoperculum denticulate posteriorly. Preorbital ridge denticulate. Lateral line interrupted or obsolete. Predorsal scales 12-13.
1. Hind margin of preoperculum entire.
- a. Preopercular ridge entire, except for 2 spines at angle. Gill-rakers 18-20 on lower limb of first branchial arch. Soft dorsal and anal rays 8-10 13. *macleayi*
- b. Preopercular ridge denticulate. Gill-rakers 24-26 on lower limb of first branchial arch. Soft dorsal and anal rays 7 or 8 14. *pallidus*
2. Hind margin of preoperculum denticulate.
- a. Preopercular ridge scarcely denticulate. Second dorsal spine not longer than base of the spinous fin. Gill-rakers 18 on lower limb of first branchial arch 15. *agassizi*
- b. Preopercular ridge strongly dentate. Second dorsal spine much longer than base of the spinous fin.
- i. Soft dorsal and anal rays 7-8. Gill-rakers 18 on lower limb of first branchial arch. Colour plain, a silvery band along side; membrane between second and third dorsal spines blackish 16. *agrammus*
- ii. Soft dorsal and anal rays 9 or 10. Gill-rakers 20 on lower limb of first branchial arch. Each scale bordered with blackish, forming a reticulate pattern; fins blackish 17. *reticulatus*
- II. Supraorbital ridge dentate at least posteriorly. Suborbital entire. Interoperculum entire. Preorbital dentate on both edge and ridge. Gill-rakers about 20 on lower limb of first branchial arch. Membrane between second and third dorsal spines blackish. (Sub-genus *Priopidichthys*).
- A. Hind margin of preoperculum entire. 26 to 28 scales in longitudinal series. Predorsal scales 14 or 15 ... 18. *gymnocephalus*
- B. Hind margin of preoperculum denticulate.
1. 27 or 28 scales in longitudinal series. Predorsal scales 14 19. *dussumieri*
2. 24 or 25 scales in longitudinal series. Predorsal scales 16 to 18 20. *marianus*

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Although sufficient names are available in the literature to provide one for each of several groups in the above key, it would be unwise to apply them, as the characters used do not necessarily indicate immediate relationships. It will be evident, on examination, that by using the same characters, but giving them different values, a quite different grouping could be obtained. A large proportion of the species show a very close general resemblance to one another, not only in proportions but in colour (in spirit), which is most frequently olivaceous with a silvery band along the side in the middle of which is a thin black line; such species frequently have the membrane between the second and third dorsal spines blackish. There can be little doubt that all such species are nearly related, though they appear in different sections of the key, which has been devised in the way most practical for distinguishing the species. *Priopidichthys*, however, as here defined, does seem to be a well-defined and closely knit group, though it has the common, and presumably generalised, colour-pattern described.

1. *Ambassis commersoni* Cuvier & Valenciennes

- Ambassis commersoni* Cuvier & Valenciennes 1828, Hist. Nat. Poiss., ii, p. 176, pl. xxv (Pondichery specimens only).
Ambassis dussumieri Quoy & Gaimard 1834, Voy. Astrolabe Zool., p. 650, pl. i, fig. 3. (non Cuvier & Valenciennes).
Ambassis urotaenia Bleeker 1852, Nat. Tijds. Ned. Ind., iii, p. 257, and of most subsequent authors.
Ambassis papuensis Alleyna & Macleay 1877, Proc. Linn. Soc. N.S. Wales, p. 266, pl. v, fig. 4; Whitley 1935, Rec. S. Austral. Mus., v (3), p. 362, fig. 10.
Priopis lungi Jordan & Seale (1906) 1907, Bull. U.S. Bur. Fish., xxvi, p. 18.
Ambassis lungi Evermann & Seale (1906) 1907, loc. cit. p. 75.
Chanda commersonii H. M. Smith 1945, Bull. U.S. Nat. Mus. 188, p. 481.

Several other species have been confused under this name in the past. The British Museum material bearing this label included five species. Cuvier & Valenciennes themselves applied the name to more than one, but their figure, which should be accepted as representing the typical specimen, is evidently one of those from Pondichery, collected by Peschenault. (Paris Museum echantillon no. 9164). Mlle. le Danois has kindly examined these for me; there are 4 specimens 68 to 123 mm. in total length, having the characters shown in the key. The figure mentioned shows 5 rows of scales on the cheek—evidently a guess by the artist.

A specimen labelled "*Ambassis dussumieri*; Type; Amboina; Paris Museum", without doubt one of those reported by Quoy and Gaimard, is in the British Museum collection, and is quite clearly conspecific with Cuvier and Valenciennes' figure and specimens quoted. In addition we

have 18 specimens, 42 to 70 mm. in standard length, from the Seychelles, Nicobar Islands, Manado and Goram. As *A. urotaenia* it has been recorded from many other points over this range, from Natal and Fiji.

2. *Ambassis mulleri* Klunzinger

- Ambassis mulleri* Klunzinger 1879, Sitzb. Akad. Wiss. Wien lxxi (1) p. 346, pl. i, fig. 3.
Pseudambassis castelnaui Macleay 1881, Proc. Linn. Soc. N.S. Wales, v, p. 139.
Blandowskiella castelnaui Whitley 1935, Rec. S. Austral. Mus. v (3), p. 361, fig. 9.
Konopickia mulleri Whitley 1937, Mem. Queensland Mus. xi (2), p. 173.

This small species has been recorded from Port Darwin, Queensland, the Narrandera district of New South Wales, and from the Murray River, Victoria. The British Museum collection contains a specimen 38 mm. long from the Moonie River, Queensland.

3. *Ambassis buroensis* Bleeker

- Ambassis buroensis* Bleeker 1857, Nat. Tijds. Ned. Ind. xxxiii, p. 79; 1876-77, Atlas Ichth. Ind. Neerl. viii, p. 137, pl. (lxxv) cccliii.
Ambassis buruensis Günther 1858, Cat. Fish. Brit. Mus., i, p. 226; Weber & de Beaufort 1929, Fish. Indo-Austral. Arch., v, p. 417.
 ? *Priopsis buruensis* Jordan & Seale (1906) 1907, Bull. U.S. Bur. Fish. xxvi, p. 103.
Chanda buruensis H. M. Smith 1945, Bull. U.S. Nat. Mus. 188, p. 484.

This species seems not to have been recorded from the western Indian Ocean, but I found it to be the common species in the Gulf of Aden, particularly on the Somali coast, where it may often be found in dense shoals in the shadow of dhows lying at anchor.

Sixty-four specimens, 19 to 66 mm. standard length, from Somaliland, Hong Kong, Philippines, and New Guinea are in the British Museum collection; these include two of Bleeker's specimens, without locality.

4. *Ambassis miops* Günther

- Ambassis miops* Günther 1871, Proc. Zool. Soc. p. 655.
Ambassis myops Day 1888, Fishes of India, p. 784.
Ambassis lafa Jordan & Seale (1905) 1906, Bull. U.S. Bur. Fish. xxi, p. 235, fig. 46.
Ambassis buton Popta 1918, Meded. Zool. Mus. Leiden, p. 6; Weber & de Beaufort 1929, Fish. Indo-Austral. Arch. v, p. 411.
Ambassis urotaenia Fowler & Bean 1930, Bull. U.S. Nat. Mus., 100, p. 150.
Ambassis fontoynti Pellegrin 1932, Bull. Soc. Zool. France, lvii, p. 425.

There is little doubt that *A. fontoynti*, from Madagascar, is this species; Pellegrin's description fits it in all essential respects, and he mentions a curious feature—the unusual length of the third dorsal

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spine. He states that this is longer than the second, as indeed it appears to be when the fin is not fully erect, but this is an illusion, and measurement shows it to be a trifle shorter or at the very most equal to the second spine; nevertheless, the third spine is longer in this species than in related forms. Pellegrin mentions that this species is rare at Madagascar.

Some of our specimens, from Goram and Bowen, Queensland, agree with the description of *A. buton* in having the lateral line more or less interrupted; this unimportant feature is the only one by which *A. buton* appears to be distinguishable from *A. miops*, and I am therefore unable to regard them as separate species. Similar variation in the lateral line is to be found in other species.

The British Museum collection includes the holotype, 52 mm. standard length, from Rarotonga, and 20 other specimens from Madras, Goram, Philippines, New Hebrides, and a locality near the Maratiri (Bass) Islands in the South Pacific (Challenger). It has been recorded from many other localities, from Madagascar to Japan.

5. *Ambassis macracanthus* Bleeker, Fig. 2

Ambassis macracanthus Bleeker 1849, Verh. Batav. Gen. xxii, p. 30.

Ambassis vaiyasensis Jordan & Seale 1905, Bull. U.S. Bur. Fish. xxv, p. 254, fig. 47.

Ambassis commersoni Weber & de Beaufort 1929, Fish. Indo-Austral. Arch. v, p. 406; and later authors (*non* Cuvier & Valenciennes).

Recorded from the Andaman Islands eastward to Samoa. Our material contains 18 specimens 42 to 97 mm. standard length, from Madras, Java, Amboina, New Guinea, Philippines, and Tonga.

6. *Ambassis ambassis* (Lacepède)

Centropomus ambassis Lacepède 1802, Hist. Nat. Poiss., iv, pp. 252, 282.

Ambassis dussumieri Cuvier & Valenciennes 1833, Hist. Nat. Poiss. ix, p. 431 (*non* C. & V. 1828).

Ambassis commersoni Günther 1859, Cat. Fish. Brit. Mus., p. 223 (*part.*) and later authors.

This species seems to be restricted to the East African area. The holotype of the species, the first specimen mentioned by Lacepède, from Mauritius, 81 mm. in standard length, is in the British Museum collection. In addition there are 36 specimens, 27 to 58 mm. long, from Zanzibar, Bububa, Roruma River and Dar-es-Salaam. Three specimens from the Seychelles, collected by Dussumier and recorded by Cuvier and Valenciennes as *A. dussumieri*, have been examined by Mille. le Danois and found to be this species (Paris Mus. echantillon no. 9333).

7. *Ambassis kopsii* Bleeker

Ambassis kopsii Bleeker 1858, Nat. Tijds. Ned. Ins., xv, p. 253.
Ambassis kopsii Bleeker (1873) 1874, Nat. Verh. Holl. Maatsch., (3) ii,
 p. 91; 1876-77, Atlas Ichth., viii, p. 134, pl. (66) 344, fig. 1.
Chanda kopsii H. M. Smith 1945, Bull. U.S. Nat. Mus., 188, p. 481.

Habitat: East Indian islands, from Malaya to the Philippines. Not represented in the British Museum collection.

8. *Ambassis nalua* (Hamilton)

Chanda nalua Hamilton 1822, Fish. Ganges, p. 107, pl. vi fig. 36.
Ambassis nalua Cuvier & Valenciennes 1828, Hist. Nat. Poiss., ii, p. 182;
 Day 1878, Fish. India, p. 53; Weber & de Beaufort 1929, Fish Indo-
 Austral. Arch. v, p. 409.

Habitat: India eastward to the Philippines. 2 specimens, 48 and 66 mm. long, from Sarawak, are in our collection.

9. *Ambassis interrupta* Bleeker

Ambassis interrupta Bleeker 1852, Nat. Tijds. Ned. Ind. iii, p. 696; 1876-77,
 Atlas Ichth. viii, p. 137, pl. (lxx) cccxlviii, fig. 5.
Ambassis macracanthus Day 1870, Proc. Zool. Soc. p. 681 (*non*. Bleeker).

Recorded from the Andamans, East Indies and Philippines. The British Museum material includes two of Bleeker's co-types, 32 and 72 mm. standard length; also 10 others, from "India", Manado, Amboina and Philippines, 39 to 70 mm. long.

10. *Ambassis natalensis* Gilchrist & Thompson

? *Apogon roseus* Fischer 1885, Jahrb. Hamburg Anat. ii, p. 66.
Ambassis natalensis Gilchrist & Thompson 1908, Ann. S. African Mus., vi
 (2) p. 148.
Ambassis safga J. L. B. Smith 1949, Sea Fish. Southern Afr., p. 245.

Known only from the east coast of Africa. Four co-types, 39 to 48 mm. standard length, from Natal, and 1 specimen 32 mm. long from East Africa, are in the British Museum collection.

11. *Ambassis dayi* Bleeker

Ambassis nalua Day 1865, Fish. Malabar, p. 15 (*non*. Hamilton).
Ambassis dayi Bleeker 1874, Nat. Verh. Holl. Maatsch., (3) ii, (2) p. 95;
 Day, 1878, Fishes of India, p. 54, pl. xv. fig. 7.

Habitat: Malabar coast of India. Known to me only from descriptions and Day's figure.

12. *Ambassis productus* Guichenot

Ambassis commersoni Cuvier & Valenciennes 1828, p. 176 (*part.*, Mauritius specimens only).
Ambassis productus Guichenot 1866, Mem. Soc. Sci. Cherbourg, xii, p. 130.

We have 2 specimens from Madagascar, 4 from Zanzibar, 4 from Dar-es-Salaam, and 1 from Durban. They range from 38 to 115 mm. standard length. No doubt some East African records of *A. commersoni* or *A. ambassis* refer to this species.

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13. *Ambassis macleayi* Castelnau

- Ambassis macleayi* Castelnau 1878, Proc. Linn. Soc. N.S. Wales, iii, p. 43.
Pseudoambassis elongatus Castelnau 1878, *ibid.* p. 44.
Ambassis elevatus Macleay 1881, Proc. Linn. Soc. N.S. Wales, v, p. 338.
Pseudambassis convexus De Vis 1884, Proc. Linn. Soc. N.S. Wales, ix, p. 394.
 ? *Pseudambassis nigripinnis* De Vis 1884, *ibid.* p. 393.
Ambassis mulleri Weber 1895, Zool. Forsch. Austral. v p. 263 (*non* Klunzinger).
 ? *Priopis olivaceus* Ogilby 1910, Proc. Roy. Soc. Queensl., xxiii, p. 11.
Austrochanda macleayi Whitley 1935, Rec. S. Austral. Mus., v (3), p. 357, fig. 6.

Whitley has given an account, and a good figure, of this species. In the British Museum collection are 2 specimens from Queensland (40 m. S.W. of Townsville, collected by Wilkins in 1924). These were labelled *Ambassis nigripinnis*, and agree with published descriptions of that species, but I cannot find any positive character by which they can be distinguished from *A. macleayi* except a much higher spinous dorsal fin. The latter character, however, varies with age; our examples are only 32 and 35 mm. long.

A. macleayi is apparently confined to the estuaries and streams of Queensland.

14. *Ambassis pallidus* De Vis

- ? *Ambassis brevipinnis* Kner 1868, Sitz. Akad. Wiss. Wien, lviii (1) pp. 27, 298, pl. i, fig. 2.
Pseudambassis pallidus De Vis 1884, Proc. Linn. Soc. N.S. Wales, ix, p. 393.
Austrochanda macleayi Whitley 1935, Rec. S. Austral. Mus., v (3) p. 357, fig. 7 (*non* *Pseudoambassis macleayi* Castelnau).

Whitley has considered this fish to be conspecific with *A. macleayi*, but his excellent drawing of the type shows that this cannot be so. The dentate preopercular ridge, larger maxillary and other details suggest a quite distinct species, and this is borne out by my discovery among our material of 4 specimens from Goram which are without doubt *A. pallidus*. They have not, of course, the abnormal arrangement of dorsal spines seen in the type, but the spinous dorsal fin is similarly shaped, high, with a concave margin and quite different from that of *A. macleayi* or *A. nigripinnis*; in all other respects they resemble very closely Whitley's figure. They are 37 and 45 mm. standard length.

15. *Ambassis agassizii* Steindachner

- Ambassis agassizii* Steindachner 1867, Sitzb. Akad. Wiss. Wien lv (1) p. 9; Whitley 1935, Rec. S. Austral. Mus. v (3) p. 363.
Chanda agassizii Waite 1904, Mem. N.S.W. Nat. Club, i, p. 29.
Priopis nigripinnis Ogilby 1910, Proc. Roy. Soc. Queensl. xxiii, p. 13 (*non* *Pseudambassis nigripinnis* De Vis).

Of this species, the British Museum collection contains 2 specimens 40 mm. long from the Clarence River, N.S.W., and one 42 mm. long from Hermannsburg, South Australia.

16. *Ambassis agrammus* Günther

Ambassis agrammus Günther 1867, Ann. Mag. Nat. Hist., xx (3) p. 37.
Priopis agrammus Jordan & Seale (1905) 1906, Bull. U.S. Bur. Fish., xxv, p. 255.

The 3 types of the species, 35.5 to 42 mm. standard length, from Cape York, are in the British Museum collection. The largest is designated the holotype.

17. *Ambassis reticulatus* Weber

Ambassis interrupta var. *reticulata* Weber 1913, Nova Guinea V. Livr., ii, p. 245.
Ambassis reticulatus Regan 1914, Trans. Zool. Soc. London, xx (6), p. 276;
 Weber & de Beaufort 1929, Fish. Indo-Austral. Arch., v, p. 4, 4, fig. 98.

One specimen, 63 mm. standard length, from the Setakwa River, is in the British Museum collection. The species is known only from the freshwaters of New Guinea. The reticulate pattern gives this fish a distinctive appearance, but it is in other respects an *Ambassis*, and the usual silvery lateral band can be discerned beneath the pigmentation.

18. *Ambassis gymnocephalus* (Lacepède)

Lutjanus gymnocephalus Lacepède 1802, Hist. Nat. Poiss., iii, pl. xxiii, fig. 3; iv, pp. 181, 216.
Ambassis dussumieri Cuvier & Valenciennes 1828, Hist. Nat. Poiss., ii, p. 181; and many subsequent authors.
 ?*Priopis argyrozona* Cuvier & Valenciennes 1830, Hist. Nat. Poiss., vi, p. 304.
Ambassis vachelli Peters 1868, Monatsab. Akad. Wiss. Berlin, p. 255 (non Richardson).
Ambassis denticulata Klunzinger 1870, Verh. zool. bot. Ges. Wien, xx, p. 719.
Ambassis gymnocephalus Bleeker (1873) 1874, Nat. Verh. Holl. Maatsch. (3) ii (2) p. 99; 1876-77, Atlas Ichth. viii, p. 138, pl. (lcciv) ecclii, fig. 3.
Ambassis klunzingeri Steindachner 1880, Sitz. Ber. Akad. Wiss. Wien, lxxxii (i), p. 238.
Priopis gymnocephalus Jordan & Seale 1905, Proc. U.S. Nat. Mus. xxviii, p. 780.
Chanda gymnocephala H. M. Smith 1945, Bull. U.S. Nat. Mus. 188, p. 483.

The backwardly-directed spines on the supraorbital edge are normally 4 in number, but occasional variations of 3 or 5 occur.

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This species has been recorded over a wide range, from Sokotra and Zanzibar south to Natal and eastwards to China but some of these no doubt refer to the next species. The British Museum collection contains 13 specimens, from Dar-es-Salaam, Durban, Sind, Madras, Malabar, and Burma, ranging from 36 to 61 mm. standard length.

19. *Ambassis dussumieri* Cuvier & Valenciennes

Ambassis dussumieri Cuvier & Valenciennes 1828, Hist. Nat. Poiss. ii, p. 181.

Ambassis vachelli Richardson 1846, Rep. Ichth. China, p. 221.

Ambassis telkara Whitley 1935, Rec. S. Austral. Mus. v (3), p. 349, fig. 2.

The holotype, collected by Reynaud from Pondichery, 52 mm. long, still exists in the Paris Museum (echantillon no. 9334), and I am indebted to Mlle. le Danois for giving me information about its critical features. It has been confused in the past with *A. gymnocephalus*. The rest of Cuvier and Valenciennes' material under this name belongs to *A. ambassis* Lacepède.

The description of *A. vachelli* from Canton agrees very closely with this, except for the statement of the depth of the body—1.68 inch, for a fish 2.50 inch long—but this is evidently a misprint as no *Ambassis* could be so deep; .68 inch is the probable figure. Richardson's type unfortunately appears to be lost. Whitley's description and excellent figure also seems to represent this fish. Twelve specimens, 22 to 53 mm. long, are in the British Museum collection, from Siam, Malaya and China.

20. *Ambassis marianus* Günther

Ambassis marianus Günther 1880, Rep. Voy. Challenger Zool., i (6) p. 32.

Pseudambassis ramsayi Macleay 1881, Proc. Linn. Soc. N.S. Wales, v, p. 340.

Ambassis commersoni Ogilby 1886 Cat. Fish. N.S. Wales, p. 14 (non Cuvier & Valenciennes).

Chanda buruensis Waite 1904, Mem. N.S.W. Nat. Club, i, p. 29 (non *Ambassis biroensis* Bleeker).

Priopis ramsayi McCulloch 1911, Zool. Res. Endeavour, i, p. 57, pl. xvi, fig. 3.

Priopidichthys marianus Whitley 1935, Rec. S. Austral. Mus. v (3) p. 364.

The 3 type-specimens, 59 to 63 mm. standard length, from Tiaro, Mary River, Queensland, are in the British Museum collection. The largest is designated the holotype. This species has also been recorded from other brackish or marine localities in New South Wales.

Genus 5. *Denarius* Whitley

Denarius Whitley 1948, Rec. Austral. Mus. xxii (1) p. 92 fig. 11 (Type: *Denarius bandata* Whitley).

Though nearly related to *Ambassis*, the single known species comprising this genus is very distinctive. Described from Arnhem Land, Northern Territory, it is represented in the British Museum collection by 3 specimens from Rockhampton, Queensland. Our specimens are from 25 to 33 mm. standard length, larger than the typical examples (the holotype being only 23 mm. long). In addition to the characters noted in the Key to the genera, it has, as Whitley states, only 9 pectoral rays; he says, however, that they are simple, whereas they are mostly branched in our specimens and in his figure. There is no supraorbital spine. The colour in spirit is yellowish brown, with 8 or 9 narrow vertical bands on side; the spinous dorsal fin is broadly bordered with black, and the pelvic fins are blackish.

Genus 6. *Chanda* Hamilton

Chanda Hamilton 1822, Fish. Ganges, pp. 103, 370 (Type: *Chanda lala* Hamilton, designated by Fowler 1905).

Parambassis Bleeker 1874, Nat. Vern. Holl. Maatsch. Haarlem, (3) ii pp. 86, 102 (Type: *Ambassis apogonoides* Bleeker).

Pseudambassis Bleeker 1876, Arch. Neerl. Sc. Nat., xi, p. 292 (Type: *Chanda lala* Hamilton).

Acanthopercu Castelnau 1878, Proc. Linn. Soc. N.S. Wales, iii, p. 44 (Type: *Acanthopercu gulliveri* Castelnau).

Whitleya Fowler & Bean 1930, Bull. U.S. Nat. Mus., 100 (10) p. 148 (Type *Ambassis wolffi* Bleeker). *Non Whitleya* Chabanaud 1930.

Whitleyina Fowler & Bean 1930, *ibid.* p. 163 (*Errore pro Whitleya*).

Habitat: Freshwaters of India, Burma, Siam, Malaya, East Indian Archipelago and Australia.

Key to the Species

I. Supraorbital ridge smooth, ending in a single spine posteriorly. Dorsal and anal rays not more than 11. Interoperculum denticulate posteriorly (Sub-genus *Parambassis*).

A. Suborbital entire. 5 rows of scales on cheek. Predorsal scales 18 to 21. Gill-rakers 17 or 18 on lower limb of first branchial arch.

1. 40 to 47 scales in longitudinal series. Second dorsal spine not longer than base of the spinous fin. Second anal spine not much enlarged. Sides without brown pattern
1. *apogonoides*

2. 39 or 40 scales in longitudinal series. Second dorsal spine much longer than base of the spinous fin. Second anal spine much enlarged. Brown stripes along rows of scales on side 2. *gulliveri*

B. Suborbital denticulate. Second dorsal spine not longer than base of the spinous fin. Teeth in villiform bands in jaws, the outer ones enlarged.

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1. Narrow bands of villiform teeth on vomer and palatines.
 - a. 4 rows of scales on cheek. 40 to 43 scales in longitudinal series. Predorsal scales 15 or 16. Second anal spine not stronger than the third 3. *thomassi*
 - b. 7 rows of scales on cheek. 43 to 46 scales in longitudinal series. Second anal spine much stronger than third 4. *wolffi*
 2. Teeth on vomer in single, or incomplete double series; palatine teeth in a single series.
 - a. 3 rows of scales on cheek. 44 (37-39) scales in longitudinal series. Predorsal scales 14. Second anal spine scarcely stronger than third. A dark longitudinal band on side ... 5. *confinis*
 - b. 9 or 10 rows of scales on cheek. 50 to 59 scales in longitudinal series. Predorsal scales 26 to 28. Second anal spine stronger than third. A silvery band along side 6. *macrolepis*
- II. Supraorbital ridge dentate. Dorsal and anal rays 12 or more. Interoperculum entire, or feebly serrate posteriorly (Sub-genus *Chanda*).
- A. Hind margin of preoperculum entire.
1. Preopercular ridge entire, except for 2 small spines at angle. Scales very small, about 90 in longitudinal series. About 10 rows of scales on cheek. 12 or 13 gill-rakers on lower limb of first branchial arch. Mouth small, maxillary reaching anterior margin of orbit; lower jaw included. Soft dorsal and anal rays 13. Spinous dorsal fin conspicuously edged with black 7. *baculis*
 2. Preopercular ridge dentate. Gill-rakers 13 to 15 on lower limb of first branchial arch.
 - a. About 90 scales in longitudinal series; 6 or 7 rows on cheek. Mouth larger, maxillary reaching nearly to below middle of eye. Soft dorsal and anal rays 13 to 15. Tip of spinous dorsal fin blackish 8. *ranga*
 - b. About 60 scales in longitudinal series; 4 or 5 rows on cheek. Maxillary reaching to below anterior margin of eye. Soft dorsal and anal rays 14 or 15. Spinous dorsal fin with conspicuous black blotch at tip between second and fifth spines; each scale on side with small black spot at base; a black vertical bar at shoulder 9. *punctulata*
- B. Hind margin of preoperculum denticulate.
1. Preopercular ridge entire, except 2 small spines at angle. 63 to 66 scales in longitudinal series; 6 or 7 rows on cheek. 18 or 19 gill-rakers on lower limb of first branchial arch. Maxillary reaching to below middle of eye. Soft dorsal and anal rays 13 or 14. Spinous dorsal fin dusky at tip 10. *notata*
 2. Preopercular ridge dentate. About 70 scales in lateral line; 5 or 6 rows on cheek. 12 or 13 gill-rakers on lower limb of first branchial arch. Maxillary reaching to below anterior third of eye. Soft dorsal and anal rays 14 or 15. Spinous dorsal fin without black 11. *alta*

1. *Chanda apogonoides* (Bleeker)

Ambassis apogonoides Bleeker 1851, Nat. Tijds. Ned. Ind. ii, p. 200.
Parambassis apogonoides Bleeker (1873) 1874, Nat. Verh. Holl. Maatsch.,
(3) ii (2) p. 103; 1876-77 Atlas Ichth. p. 139, pl. (ix) cccxxxviii fig. 1.

Habitat: Freshwaters of Sumatra and Borneo.

This species is said by Bleeker to have teeth in the middle line of the tongue, but it seems possible that he was mistaken, in view of the absence of lingual teeth in the rest of the genus; a median ridge of bone on the basibranchials sometimes gives the impression of teeth when felt with the point of a needle.¹

2. *Chanda gulliveri* (Castelnau)

Acanthopercu gulliveri Castelnau 1878, Proc. Linn. Soc. N.S. Wales, iii,
p. 44.
Ambassis gigas Ramsay & Ogilby 1886, Proc. Linn. Soc. N.S. Wales (2) i,
p. 9; Weber & de Beaufort 1929, Fish. Indo-Austral. Arch., v, p. 403,
fig. 97.

Habitat: Freshwaters of southern New Guinea.

A specimen 105 mm. long from the Lorentz River, and one 70 mm. long from unknown locality (N. Australian Exp.) are in the British Museum collection. Reaches 280 mm. in length.

3. *Chanda thomassi* (Day)

Ambassis thomassi Day 1870, Proc. Zool. Soc., p. 369; 1878, Fish. India,
p. 52, pl. xv, fig. 2.
Chanda thomassi H. M. Smith 1945, Bull. U.S. Nat. Mus. 188, p. 482.

Day's description of this species is curiously defective. He states that there are 3 rows of scales on the cheek; I find 4. He states there are 35 to 41 scales along the lateral line; I find 40 to 43. He gives the soft dorsal ray counts as 10 to 12, and anal as 9 or 10; in all those I have examined the dorsal has 10 and the anal 9. All these specimens are from Day's collection, including the 2 type specimens from Wynaad, 58 and 83 mm. standard length (the larger selected as holotype), 2 from Canara and one from Malabar.

Habitat: Streams of Malabar coast of India; said to occur in Siam and Malaya.

4. *Chanda wolffi* (Bleeker)

Ambassis wolffi Bleeker 1850, Nat. Tijds. Ned. Ind., i, p. 9; 1876-77, Atlas
Ichth. viii, p. 133.
Ambassis robustus Günther, 1859, Cat. Fish. Brit. Mus., i, p. 222.
Ambassis boulengeri Volz 1903, Zool. Anz. xxvi, p. 553.
Chanda wolffi H. M. Smith 1945, Bull. U.S. Nat. Mus. 188, p. 482.

¹ Since writing the above I have received specimens from Amsterdam and cannot find lingual teeth.

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Habitat: Freshwaters of Siam, Sumatra and Borneo.

Our collection contains 15 specimens, 37 to 140 mm. standard length, including 2 of Bleeker's typical specimens (102 and 114 mm.) and the type of *A. robustus* (130 mm.). It reaches more than 200 mm. in length.

5. *Chanda confinis* (Weber)

Ambassis confinis Weber 1913, Nova Guinea ix (4) p. 577.
Ambassis confinis occidentalis Weber & de Beaufort 1929, Fish. Indo-Austral. Arch., v, p. 420.

Habitat: Freshwaters of New Guinea. Specimens of both "sub-species" have been received by courtesy of Dr. de Beaufort and M. Hoedeman of Amsterdam. Those of *C. c. confinis* are from Sermowai River; that of *C. c. occidentalis* has about 42 scales in longitudinal series.

There seem to be only 3 rows of scales on the cheek in all.

6. *Chanda macrolepis* (Bleeker)

Bogoda macrolepis Bleeker 1857, Act. Soc. Sc. Ind. Neerl., ii, p. 13.
Ambassis (Bogoda) microlepis Martens 1868, Arch. Naturg. (34) i, p. 9.
Parambassis microlepis Bleeker (1873) 1874, Nat. Verh. Holl. Maatsch. (3) ii, (2) p. 104.
Ambassis macrolepis Vaillant 1893, Nouv. Arch. Mus. Hist. Nat. (3) v, p. 110; Weber & de Beaufort 1929, Fish. Indo-Austral. Arch. v, p. 420.

Habitat: Freshwaters of Sumatra and Borneo.

7. *Chanda baculis* Hamilton

Chanda baculis Hamilton 1822, Fish. Ganges, pp. 112, 371.
Ambassis baculis Cuvier & Valenciennes 1828, Hist. Nat. Poiss., ii, p. 187; Day 1878, Fish. India, p. 51, pl. xv, fig. 1.

Habitat: Freshwaters of northern India, Burma and Siam.

We have one of Day's specimens from Gowhatty, Bengal. The rather slender form, short lower jaw and black border to spinous dorsal fin distinguish this small species at once.

8. *Chanda ranga* Hamilton

Chanda ranga Hamilton 1822, Fish. Ganges pp. 113, 371, p. xvi, fig. 38.
Chanda lala Hamilton 1822 *ibid.* pp. 114, 371, pl. xxix, fig. 39 (young).
Ambassis ranga, A. lala Cuvier & Valenciennes 1828, Hist. Nat. Poiss., ii, pp. 183, 184.
Chanda (Ambassis) ruconius McClelland 1842, Calcutta J. Nat. Hist., ii, p. 586 (*non* Hamilton).
Ambassis ranga Day 1878, Fish. India p. 51 (*part.*):

Habitat: Freshwaters of India.

Day confused *C. alta* with this species, with the result that he extended its range to Burma. Our material suggests that the true *C. ranga* is not found outside India itself.

The British Museum collection contains 15 specimens, 21 to 56 mm. standard length, from Kurnool and Lahore (Day), Cochin, and unstated localities in India.

As *Ambassis lala* this is a popular aquarium fish, but it is very likely that many specimens passing under that name are actually *A. alta* or *A. notatus*.

9. *Chanda punctulata*, sp. n. (Fig. 3)

Depth of body contained 2-3 times in the standard length, length of head (without opercular flap) 3 times. Diameter of eye contained 2-3 times in length of head, postorbital distance 3 times. Interorbital width .6 diameter of eye. Length of base of spinous dorsal fin contained 1.5 times in length of head, that of soft dorsal fin 1.2 times; length of whole anal fin equal to length of head, least depth of caudal peduncle equal to diameter of eye.

First dorsal fin with 8 spines, the first one about one third of the length of the second, which measures 1.4 times in the length of the head; seventh spine about one fourth length of second, its membrane joined to the base of the eighth spine, which is half the length of the head and supports the soft fin. Soft dorsal rays 14 or 15, the last one divided and sometimes appearing as two. Anal fin with 3 spines, the first one half as long as the second, which measures 1.6 times in length of head; third spine a little shorter than the second; 14 or 15 soft rays. Pectoral fin about as long as the head without snout, with 12 principal rays. Pelvics with 1 spine, half length of head, and 5 rays.

Mouth rather small, the maxillary reaching to below the front margin of the eye. Lower jaw included when closed. Teeth in a narrow, villiform band in both jaws, those near the symphysis a little stronger. Narrow bands of very fine teeth on vomer and palatines. No teeth on the tongue. Gill-rakers slender and pointed, about 15 on lower limb of first branchial arch.

Preorbital with a strong backwardly-directed spine and several smaller ones on its ridge; its edge coarsely dentate (about 6 strong teeth). Supraorbital ridge with 3 backwardly-directed spines posteriorly. Horizontal preopercular ridge strongly dentate; lower preopercular margin dentate, the spines much stronger at the angle; hind margin of preoperculum entire. Operculum and sub-operculum entire, the latter bearing a small membranous flap.

Scales very small, about 60 in longitudinal series; others on cheek mostly lost, but apparently in 4 or 5 rows. Lateral line continuous, greatly arched below spinous dorsal, straight along side of tail.

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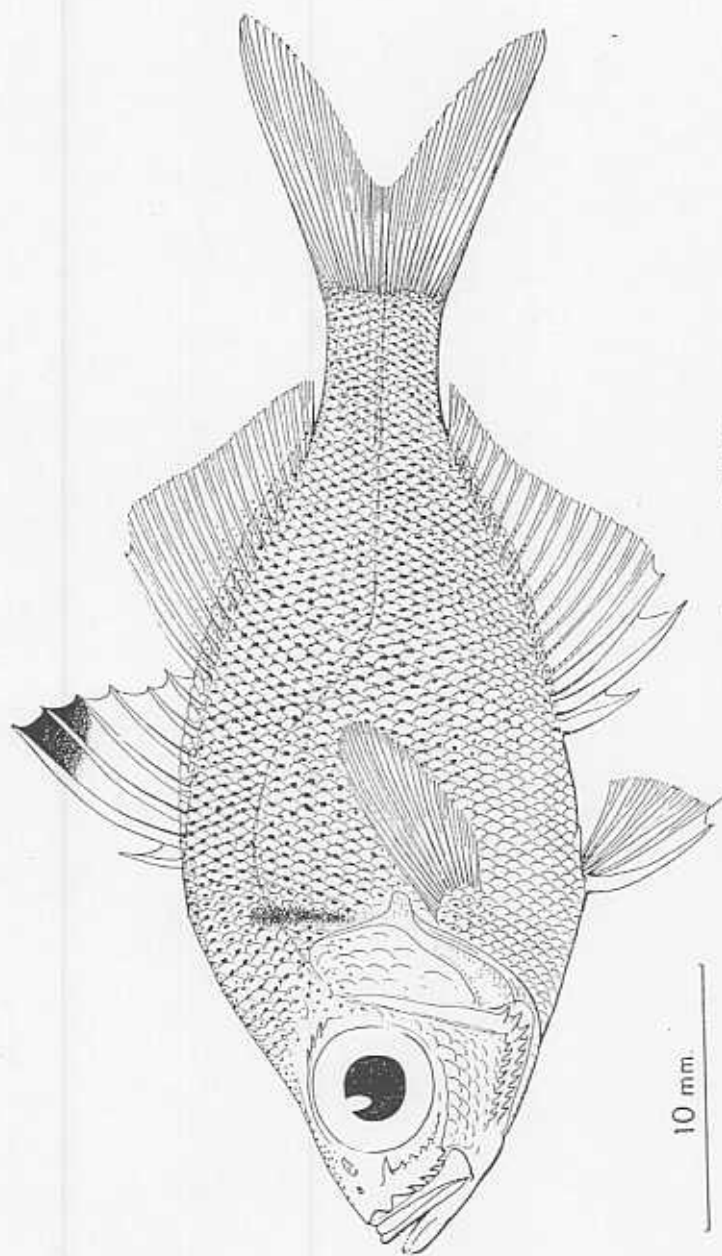


Fig. 3. *Chanda punctulata* sp. n. Holotype.

Colour in spirit: Yellowish, each scale on side with a small black spot at base, these consequently forming transverse rows corresponding with the rows of scales. A very distinct black bar at shoulder, above operculum. Spinous dorsal fin with a conspicuous black blotch at apex, on the membrane between the second and fourth spines. The spines and rays of dorsal and anal fins dusky; caudal fin blackish; pectoral and pelvic fins clear.

Described from the holotype 35 mm. standard length, and 15 others (12 to 33 mm. long), from Tasek Bera, Pahang, Malaya, received from the Dept. of Fisheries, Singapore (B.M.N.H. Regd. no. 1931.7.20.56-65). These had been previously identified as *C. ranga*. Also 1 specimen from Lahore, received from Hamid Khan, which had been identified as *C. nama*. The colour-pattern, as described above, is rather strikingly similar to that of *Hamiltonia nama* as described by Day; in other respects, however, the two species are very different. The second dorsal spine is rather longer (as long as the head), in the Lahore specimen than in the others.

10. *Chanda notata* (Blyth)

Ambassis notatus Blyth 1860, J. Asiat. Soc. Bengal, p. 138.

Ambassis baculis Day 1878, Fish. India, p. 51 (*part. non.* Hamilton).

Chanda siamensis Fowler 1937, Proc. Acad. Nat. Sci. Philad., lxxxix, p. 230, fig. 228.

Habitat: Freshwaters of Burma, Siam and Malaya.

Day confused this species with *C. baculis*, although it bears little resemblance to it. Two of his specimens, from Moulmein, Burma, in the British Museum collection, originally bore the name *notatus* but this was altered to *baculis*. In all we have 18 specimens, 24 to 75 mm. in standard length, from Kokanet (Tenasserim), Monam River, Moulmein (Burma) Tembeling River and Kuala Tahan, Pahang (Malaya). It seems clear that this species is not found in India itself.

Small specimens of this species sent to me for identification by Mr. M. W. F. Tweedie were partly responsible for my investigation of this group.

11. *Chanda alta* (Cuvier & Valenciennes)

Ambassis alta Cuvier & Valenciennes 1828, Hist. Nat. Poiss., ii, p. 183.

Ambassis ranga Day 1878, Fish. India, p. 51 (*part.*) pl. xiv, fig. 6.

Habitat: Freshwaters of India, Burma and Malaya.

Most of Day's specimens of "*Ambassis ranga*" preserved in the British Museum belong to this species, and it is also represented by his

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figure. It is evidently the commonest of the group. We have 76 specimens, 19 to 57 mm. standard length, from Amadpur, Bengal; Darna River, Bombay; Jove River; Debroo; Jubbulpore; Hardwar; Assam; Sittang River and Pinang. Siamese records of *C. ranga* (H. M. Smith 1945) probably also belong here.

Genus 7. *Hamiltonia* Swainson

Hamiltonia Swainson 1839, Nat. His. Fishes, etc., ii, pp. 176, 250 (Type: *Hamiltonia ovata* Swainson; = *Chanda nama* Hamilton).

Bogoda Bleeker 1853, Verh. Batav. Gen. xxv, Bengal, p. 89; 1857, Act. Soc. Sci. Indo-Neerl., ii, p. 13 (Type *Chanda bogoda* Hamilton = *Chanda nama* Hamilton).

Habitat: Freshwaters of India.

The single species is at once distinguishable from all species of *Chanda* by the comparatively long, ovate body, unarmed preorbital and scarcely armed opercular bones, and particularly by the large mouth with very projecting lower jaw bearing a group of massive teeth at the symphysis, the points of the longest being curiously bent forwards in large specimens (the points otherwise would pierce the upper lip).

1. *Hamiltonia nama* (Hamilton)

Chanda nama Hamilton 1822, Fish. Ganges, pp. 109, 371, pl. xxxix, fig. 37.

Chanda phula, *C. bogoda* Hamilton, *ibid*, pp. 111, 371.

Ambassis oblonga Cuvier & Valenciennes 1828, Hist. Nat. Poiss., ii, p. 185.

? *Ambassis indica* McClelland 1842, Calcutta J. Nat. Hist., ii, p. 585.

Bogoda nama Bleeker 1853, Verh. Batav. Gen. xxv, p. 89.

Ambassis bogoda Günther 1859, Cat. Fish. Brit. Mus., i, p. 228.

Ambassis nama Day 1878, Fish. India, p. 50.

Habitat: India, Assam and Burma.

A number of Day's specimens are included among the 22 examples, 32 to 72 mm. standard length, from localities in India and Burma, preserved in the British Museum. Some of these show traces of the punctulation and the dark mark at the shoulder mentioned by Day, as well as the dark edge of the spinous dorsal fin. In life it must look a little like *Chanda punctulata*, but the punctulation is much finer (the scales being much smaller) and the black on the dorsal fin appears to extend across more interradiial membranes.

Genus 8. *Gymnochanda* nov.

A Chandine fish with no scales, and the anterior 3 or 4 soft rays of the dorsal and anal fins produced as long filaments. Preorbital

strongly denticulate on edge and ridge; supraorbital denticulate posteriorly; preoperculum strongly denticulate on lower and hind margins, and on ridge; other bones entire. A patch of teeth at base of tongue. Lateral line complete.

Genotype: *Gymnochanda filamentosa* sp. n.

1. *Gymnochanda filamentosa* sp. n. (Fig. 4)

Depth of body contained 2.4 times in standard length, length of head 2.5 times. Diameter of eye contained 2.8 times in length of head, somewhat greater than post-orbital length of head. Snout a little shorter than eye. Interorbital width .8 diameter of eye. Length of base of spinous dorsal fin contained 2.3 times in length of head, that of soft dorsal 1.4 times. Length of whole anal fin contained 1.1 times in length of head. Least depth of caudal peduncle contained 1.2 times in diameter of eye.

First dorsal fin with 8 spines, the length of the first one contained about 2.5 times in that of the second. Second spine as long as head without postorbital length, not much stouter than those succeeding it. Next four spines decreasing rapidly to the sixth, which is only one sixth the length of the second. Eighth spine half length of second, supporting the soft fin. Soft dorsal rays 12, the first with a filament as long as distance between orbit and base of caudal fin; the second, third and fourth with filaments of decreasing length.

Anal fin with 3 spines, the first as long as first dorsal spine, the second half length of head, the third a little shorter. Soft anal rays 12, the first 4 filamentous like the dorsal.

Pectoral fin rounded, half length of head, with 12 principal rays. Pelvic fin small, with 1 spine and 5 soft rays.

Mouth small, the maxillary not reaching anterior margin of eye. Lower jaw included when closed. Teeth in upper jaw in a single row at the sides, in 2 or 3 series near symphysis; in a narrow band in lower jaw; all very small and pointed. A small group of similar teeth on head of vomer, and a single row along each palatine. A small patch of teeth at base of tongue. Gill-rakers, long and slender, 13 or 14 on lower limb of first branchial arch.

Preorbital ridge with 3 or 4 very strong backwardly-directed spines, and a row of 4 or 5 strong ones on margin. Interorbital entire. Supraorbital ridge with 4 to 6 backwardly-directed spines posteriorly.

Horizontal part of preopercular ridge with 3 or 4 strong teeth towards the angle. Lower edge of preoperculum with 4 or 5 very strong teeth and a larger spine at angle; the hind edges with fairly regular moderate serration. Operculum, suboperculum and interoperculum entire.

FISHES OF THE SUBFAMILY CHANDINAE

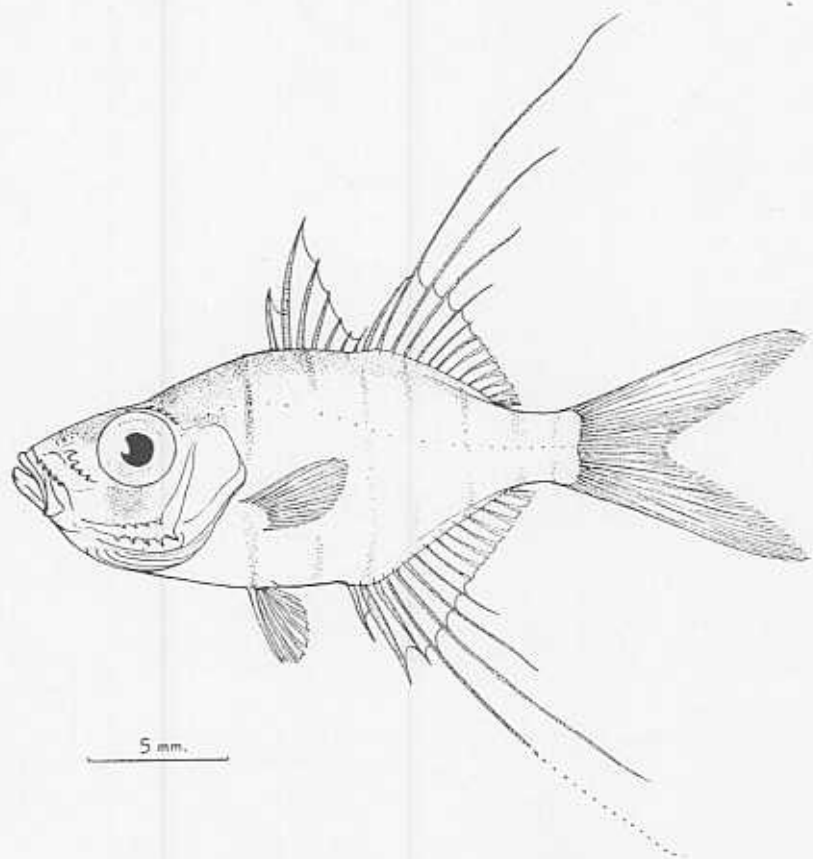


Fig. 4. *Gymnochanda filamentosa* gen. et sp. n. Holotype.

No scales. Lateral line represented by small pores in skin gently arched from head and gradually straightening towards caudal fin; there appears to be 1 pore to each myotome—27 in all.

Colour in spirits: brownish, top of head, snout and a vague band through eye, dusky. Scattered pigment on body tending to form transverse bars on some specimens. Spines and rays of dorsal and anal fins blackish; other fins clear.

Described from 9 specimens, 15 to 20 mm. standard length, from southern Malaya. A specimen 19 mm. long is selected as the holotype.

These interesting specimens were obtained alive at Singapore by Capt. M. A. W. Davies, from a Chinese collector in 1951. The precise locality from which they were obtained is not known. For some time Capt. Davies had heard reports of a "Glass Angel-fish" from the Chinese collectors, and went to some trouble to obtain samples. All died within 10 days, and four of them were sent to me, the rest being deposited in the Raffles Museum. Recently Mr. Tweedie has sent me the latter material for inclusion in this report. The following account of the living fish by Capt. Davies may be of interest:

"They are extremely transparent, more so than the well-known "*Ambassis lala*" (*Chanda ranga*). There is a small but vivid green-gold spot on the operculum, immediately behind the eye. During the first four or five days they were extremely active, the males displaying to the females and to each other by vibrating and spreading the unusual rays of the dorsal and anal fins. They would eat only living small crustacea."

The possibility that these small specimens are the young of some other well-known species at once occurred to me, but this now seems very improbable. I have seen specimens of *Ambassis* smaller than these which were recognisably similar to the adults, while at least one species of *Chanda* (*C. ranga*) is commonly bred in aquaria and shows none of the peculiarities this fish possesses. Moreover the present specimens have the appearance of mature fish, as their behaviour described above would suggest.

Some attention has also been given to the possibility that the absence of scales might be due to their loss. Every specimen has been examined carefully under the microscope, however, and there is not one scale to be found, nor any evidence that they ever existed; there are no scale-pockets and the epidermis is complete.

My thanks are due to Capt. Davies and to Mr. Tweedie for the opportunity to examine and describe this attractive new form.

Species inquirendi.

Sciaena safgha Forskal 1775, Descript. Anim. pp. xii, 53.

This is a brief description of an Ambassid fish from Arabia, but the species cannot be ascertained. The type seems to be lost. Some authors have considered it to be *Ambassis commersoni* (which itself was not properly defined until now). J. L. B. Smith applied the name to *A. natalensis*. My own observations suggest that it is mostly likely to have been *A. buroensis*. There is now no means of knowing the truth, so the name is best forgotten.

FISHES OF THE SUBFAMILY CHANDINAE

Ambassis thermalis Cuvier & Valenciennes 1829, Hist. Nat. Poiss., iii, p. 493.

The brief description of this fish would fit *A. commersoni* as here defined—the *A. urotaenia* of Bleeker, who suggested it might be the same. It was described from the warm springs of Cania, Ceylon. While Ceylon falls within the range of the species, its presence in warm springs is surprising, and raises doubt as to its true identity.

Ambassis barlovi Sykes 1841, Trans. Zool. Soc. ii, p. 350, pl. lx, fig. 1.

This represents a species of *Chanda*, but the description and figure are so bad that it is not possible to say which.