

Atherina lacunosa and the Fishes Described by J. R. Forster

Peter J. P. Whitehead and Walter Ivantsoff

(Received January 26, 1982)

Abstract Fishes collected on the second voyage of Captain Cook have been causing many problems to taxonomists, partly because the fishes were described and named but the manuscripts not published by their author, Johann Reinhold Forster, the naturalist on the second voyage; partly because the present whereabouts of manuscripts and drawings are not known to most modern workers and partly because the collected fishes had been widely dispersed. The present paper gives a brief account of the fate of the notes, drawings and the present whereabouts of some of the fishes and in particular, *Atherina lacunosa*. This species has been, for a long time, a subject of considerable controversy. The examination of all available resources leads the authors to the conclusion that the type specimen of *A. lacunosa* in Paris is indeed a Forster specimen. Types of a number of nominal species which have been compared with the type of *A. lacunosa* are now considered indistinct from it. *A. lacunosa* is placed in the genus *Atherinomorus* which is now regarded as the senior synonym of *Pranesus*.

The fishes described and named, but not published, by Johann Reinhold Forster (1729~98) while naturalist on the second of Captain Cook's three voyages (1772~75) have sometimes caused taxonomic problems. In part this is because modern authors have not always been aware of the manuscript, iconographic and actual material resources available, and indeed essential, for a proper assessment of Forster's species. The history of Forster's atherinid *Atherina lacunosa* provides a good example of such taxonomic confusion. In resolving this problem, we take the opportunity to outline the various sources of information for the benefit of others with a 'Forster problem'.

The difficulties arise simply because of Forster's bitter quarrel with the admiralty after the voyage, chiefly on account of Forster's proposed and actual publication of a voyage Journal albeit in his son's name, before the official account appeared. As a result, he forfeited necessary patronage, had to sell his son's drawings to Sir Joseph Banks, and in July 1780 fled England for Germany, taking with him the manuscript of the "Descriptiones animalium" but leaving behind not only the drawings but almost all his animal specimens. This is well described in the excellent biography by Hoare (1976). Thus the drawings and the specimens were no longer available to him and were also not seen by J. G. Schneider and M. H. K.

Lichtenstein, the first naturalists to resurrect the manuscript "Descriptiones" after Forster's death. Schneider (1801) published some of Forster's fish descriptions, while Lichtenstein (1844) reproduced the entire "Descriptiones", some seventy years after the voyage. By this time, however, many of Forster's species had been rediscovered and renamed by Lacepède, Bloch, Cuvier, Valenciennes and others, or at least so subsequent authors believed, for rather few took the trouble to search out and compare Forster's actual specimens and the drawings of them. In some cases Forster's species have been considered only doubtfully identifiable, while in others two or more different interpretations have been placed on them. Thus, *Atherina lacunosa*, which Schneider based solely on Forster's manuscript description, has been almost consistently misidentified, whereas examining the drawing provides a most helpful clue to what it really is; a Forster specimen in Paris provides further confirmation.

The Forster source (manuscripts, drawings, specimens) will be reviewed and on the basis of these the identity of *Atherina lacunosa* will be examined.

The Forster manuscripts. In the course of the voyage J. R. Forster evidently wrote up his notes and descriptions (in Latin), perhaps roughly at first but by the end of the voyage in virtually

the final form of the “Descriptiones” as reproduced by Lichtenstein. The species were arranged by localities and not by overall systematic order (which makes searching difficult for those unfamiliar with the indexed but archaic generic names). The manuscript is in three quarto and one folio volume:

Vol. I from August 1772, 98 figs.

Vol. II from July 1773, 134 figs.

Vol. III from April 1774, 135 figs.

Vol. IV from December 1774, 86 figs.

Schneider apparently knew Forster well and was perhaps instrumental in acquiring these four volumes for the Königlichen Bibliothek (later Preussische Staatsbibliothek) in Berlin. These were among the manuscripts evacuated during the Second World War to Kloster Beuron, brought to Tübingen after the war, and eventually deposited in the Staatsbibliothek Preussische Kulturbesitz in West Berlin (Whitehead, 1976), where they can be seen today (Ms. Lat. qu. 133~136).

Schneider (1801) used some of Forster's fish descriptions, not always with the Forster name, and strictly speaking these are Schneider species, although it is useful to state ‘on Forster’ in synonymies. The roman and arabic numerals used by Schneider refer to the volume and page of the manuscript “Descriptiones”.

In editing the “Descriptiones”, Lichtenstein generally avoided making any textual alterations, but he numbered the species and added subsequent synonyms to the manuscript in red ink; the numbering is defective, both in the manuscript and the printed work (Whitehead, 1978: 27). On one occasion Lichtenstein seems to have substituted a name (IV, fig. 12—*cyprinooides* for *setipinna*), but in general he published the work as Forster wrote it. There are no illustrations and the introduction is also in Latin.

The second important manuscript is Forster's “Journal” of the voyage, written more or less daily over the three years. The work is in six volumes, in English, and is also deposited in West Berlin (Ms. germ. qu. 222~227): it has now been transcribed and published, with annotations, by Hoare (1982). In his “Journal”, Forster often supplied additional information on the animals and plants collected or seen. There are also clues to the books that he took with him and thus his means of identifying his

material, and it is often possible to confirm the localities given on the drawings.

Forster's son George Forster (1754~94), engaged as official natural history artist on the voyage, also kept a natural history journal or “Observationes historiam naturalem”, a small book of 103 pages (but pp. 55~72 missing), covering the period to December 1772 and again 26 March to 11 May 1773 (more fully described in Whitehead, 1978). The first part (to p. 54) is in English and sometimes mentions species or gives data not included in the “Descriptiones”; the Dusky Bay section contains Latin descriptions which have been crossed out as if transferred to the “Descriptiones”. This notebook is in the Bibliothèque Centrale of the Museum National d'Histoire Naturelle in Paris (MS. 189), with a xerox in the British Museum (Natural History); it was published by Kahn et al. (1972: 93~107—Fragmente).

A final manuscript, dubbed ‘Catalogue B’ by Whitehead (1978: 32), is a list of George Forster's zoological drawings from the voyage (75 fishes). This is one of five catalogues in the British Museum (Natural History) listing the zoological drawings once in the possession of Sir Joseph Banks. In some instances the entries in Catalogue B supply some data on method of capture, habitat, habits, scale of the drawing and comments on its accuracy, copied out from notes made by George Forster or his father. The probable original of this was bought by the Königlichen Bibliothek and is now in the Staatsbibliothek in West Berlin (not seen).

The Forster drawings. Almost all of George Forster's drawings are in the British Museum (Natural History), having come from Banks via his third librarian Robert Brown to the British Museum and thence to South Kensington. There are four volumes, two being zoological, containing 271 drawings of animals, of which 81 are of fishes. The collection is fully described by Whitehead (1978), who listed all the non-avian drawings with their annotations and with references to the “Descriptiones”, the “Observationes”, Catalogue B and occasionally Forster's “Journal”; the bird pictures were catalogued by Lysaght (1959).

As stated already, the fish drawings were not used by Schneider or by Lichtenstein, but they were studied in 1780~82 and 1786 by

Pierre-Marie-Auguste Broussonet (1761~1807) on two visits to England. He intended a complete description of the fishes from the three Cook voyages, but he published on only ten in the first decade of his "Ichthyologia" (Broussonet, 1782); he also included Cook fishes in his paper on cartilaginous fishes (Broussonet, 1780) and on the sailfish (Broussonet, 1786). The drawings were also studied by Daniel Solander (1733~82), Banks' companion on the first Cook voyage, who presumably used them in his compilation intended as a 13th edition of the *Systema naturae* (the so-called 'Solander slips' now in the British Museum (Natural History) and well worthy of study as a clue to what specimens were once in the collections of Banks and the British Museum).

Thereafter the drawings, at least as far as the fishes were concerned, seem to have been neglected except by Shaw for the "Naturalists miscellany" and perhaps some of the other compilations of that period. Interest was revived, however, in the period 1826~46, when the fish drawings formed the basis of species proposed by Cuvier, Valenciennes, Lay and Bennett, Müller and Henle, Richardson, Swainson, Gray and others. Cuvier, who seems to have placed great faith in drawings, had the Forster fish drawings copied for him by Sarah Lee (better known as Mrs. Bowdich—Cuvier, 1828: 128) and it is these copies that are cited by both Cuvier and Valenciennes; they are now in the Bibliothèque Centrale. Since then the Forster fish drawings have again been rather neglected, but five were reproduced out of forty Cook voyages drawings by Whitehead (1969a).

Only 34 other Forster drawings are recorded, being a set of 26 gouaches (copies by an unknown artist of drawings in the main Forster collection) in the Forschungsbibliothek at Gotha (one bird and one fish, *Blennius fenestratus*, sold in 1936 and on sale in London in 1976—reproduced in Joppin, 1976); also 6 watercolours of birds in the Schlossmuseum at Weimar; and 2 watercolours of penguins in the Universität-bibliothek at Jena. These three collections were listed by Whitehead (1978: 46).

Not all the Forster drawings are coloured, but in very many cases they provide an easier and more reliable means of identifying the species than the text of the "Descriptiones".

The Forster specimens. The extraordinarily complex traffic in natural and artificial curiosities from the Cook voyages has been described elsewhere (Whitehead, 1969b) and an alphabetical register of the people and institutions involved, with a summary of their transactions, has also been published (Whitehead, 1979). The wonder is perhaps that anything remains at all.

No list exists of even part of the zoological collections brought back by the Forsters from the second voyage. Some specimens were certainly sent to Solander at the British Museum in September 1775, with instructions that the insects at least were to be divided between the British Museum, Banks, the Royal Society, Marmaduke Tunstall and Sir Ashton Lever of the Leverian Museum (letter Solander to Banks, in Dawson, 1958: 772); 141 fishes were apparently presented at this time according to the British Museum "Book of Presents". Banks later acknowledged receiving "very many specimens, both of plants and animals" from Forster, either from this consignment or later (MS. note by Banks, copied out by Robert Brown—see Britten, 1885). Forster also sent some specimens to Linnaeus, most likely pressed plants, molluscs and insects, but perhaps dried fishes (letters Forster to Johann Spener, 10 November 1775, and Spener to Linnaeus, 10 December 1775, Linnaeus Correspondence, Linnean Society of London).

The Forster and other specimens acquired by Banks had a somewhat chequered history and rather few remain today. For a while they remained in Banks' basement at Soho Square, becoming increasingly neglected after Solander's death in 1782, until Banks finally decided to get rid of them in 1792. Half he gave to the British Museum and half to the surgeon/anatomist John Hunter (1728~93) whose collection became from 1800 the museum of the Royal College of Surgeons. Meanwhile, the British Museum had its own problems with basement storage and in 1809 invited Banks to supervise the selection of a large number of spirit-preserved specimens for sale to the Royal College of Surgeons (including some of the Banksian gift of 1792, and thus some Forster specimens). By 1845, however, the College decided that it had no further use for these specimens and they

thus made the journey back to the British Museum. Unfortunately, no detailed lists were made at the time of the transfers, although in 1806 George Shaw catalogued the Banksian specimens already in the College, calling them the "New Holland Division" (344 specimens, including about two dozen additional ones given by Banks after 1800).

The British Museum also received, in 1780, the collections of the Royal Society, amongst which there will have been Forster specimens. Many of these, however, will have been among the lot transferred to the Royal College of Surgeons and thence back to the British Museum and the loss of specimens, let alone of information, during these transactions must have been considerable.

To complicate matters still further, Banks also allowed Broussonet to take with him to Montpellier at least 23 fishes (probably more), where they were deposited with the Faculty of Medicine. Forty years later they were noticed by Cuvier and 46 fishes from Broussonet's collection were sent to Paris. They were rediscovered by Bauchot (1969), who was able to recognize 23 Banksian specimens and 14 types, including specimens of *Esox argenteus* and *Atherina lacunosa* of Forster. Two more of the species described by Broussonet in his "Ichthyologia" are in the British Museum (Natural History), *Chaetodon longirostris* and *Clupea cyprinoides*, of which the latter is a Forster specimen.

The material in the British Museum prior to the initiation of the modern registration system in 1837 by J. E. Gray was uncatalogued and bore little information on the labels. Gray catalogued the cartilaginous fishes (Gray, 1851) but if he produced a manuscript catalogue of the bony fishes, as seems likely, this has never been found and was unavailable to Günther, who merely records "Old Collection" or perhaps "Cooks voyages", usually without a locality.

In general, therefore, Forster types should be sought amongst the fairly well documented Broussonet fishes in Paris; amongst the bottles with old labels in the British Museum (Natural History); and perhaps amongst the dried fishes in the Linnaeus collection at the Linnean Society in London. Where possible, the type should be the model for a Forster drawing (usually natural size) or should match the meas-

urements and counts of the "Descriptiones" (if different). Further information on the type should be sought in the "Descriptiones", the "Observationes", the "Journal", Catalogue B and perhaps the Solander slips. Lack of a specimen in London or Paris is not an absolute guarantee that the type is lost since specimens from the Leverian Museum were widely scattered (Whitehead, 1979) but the chances of tracing such material are very slender.

Using these sources and following Bauchot (1969), it has now been possible to establish the true identity of Forster's *Atherina lacunosa*, to correct the hitherto tangled synonymy and to confirm that Lacepède's *Atherina pinguis* is the same as Forster's *Atherina lacunosa*.

Atherinomorus lacunosus (Schneider, 1801)

Atherina lacunosa, MS. name in J. R. Forster, Descriptiones animalium, IV, p. 13, New Caledonia, plus drawing No. 246 (in BMNH).

Atherina lacunosa Schneider, 1801: 112 (on Forster's MS. description but not drawing); Cuvier and Valenciennes, 1835: 454; Bleeker, 1853: 504; Günther, 1861: 400; Günther, 1876: 212; Kendall and Goldsborough, 1911: 253; Bauchot, 1969: 131. Examined holotype in Paris (MNHN A4400). Type locality: New Caledonia.

Atherina pinguis Lacepède, 1803: 372; Günther, 1861: 399; Klunzinger, 1870: 833; Weber, 1913: 135. Type lost. Type locality: Mauritius.

Atherina vaigiensis Quoy and Gaimard, 1824: 335; Kendall and Goldsborough, 1911: 255; Fowler, 1938: 275. Examined holotype (MNHN A4408). Type locality: Waigeo Island (0°30'S, 131°E), West Irian.

Atherina affinis Bennett, 1831: 166 (fide Jordan and Hubbs, 1919: 32). Type lost. Type locality: Mauritius.

Atherina punctata Bennett, 1832: 184 (fide Jordan and Hubbs, 1919: 32). Type lost. Type locality: Mauritius.

Atherina pectoralis Cuvier and Valenciennes, 1835: 447. Syntypes in MNHN: 8103 (4, specimens examined); A962 (2, specimens examined); A4304 (5); A4305 (5); A4388 (2); A4389 (3); A4390 (2, specimens examined); A4392 (1); A4395 (4); A4398 (4); A4399 (5). Type locality: Mauritius.

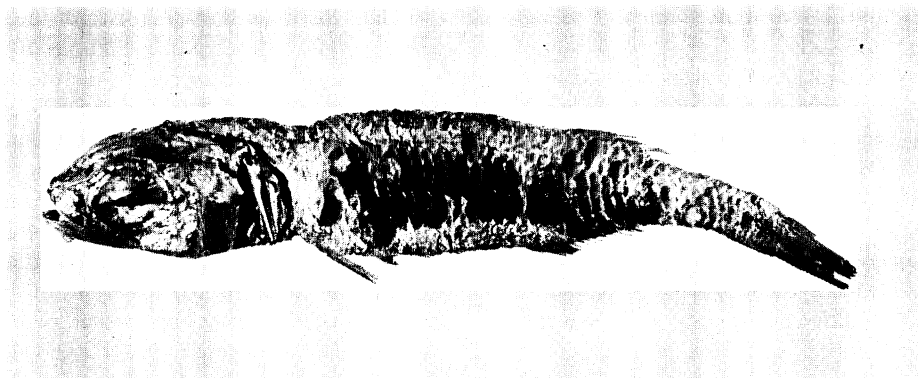


Fig. 1. Holotype of *Atherina lacunosa*, MNHN A4400.

Atherina forskalii Rüppell, 1835: 132; Günther, 1861: 397; Day, 1876: 345; Klunzinger, 1884: 130; Jordan and Hubbs, 1919: 40; Fowler, 1928: 119; 1939: 81. Designated lectotype (see Smith, 1965) in Frankfurt (SMF1898); paratype SMF6856~6860 (5); paratypes in London (BMNH 1860 11.9.153.6; 5 specimens examined).

Atherina morrissi Jordan and Starks, 1906: 697. Examined holotype in California Academy of Sciences, San Francisco (SU9359). Type locality: Miyanouura, Yakushima, Japan.

Atherina forskalii: Weber, 1913: 134; Weber and de Beaufort, 1922: 274; Herre, 1936: 89.

Hepsetia pinguis: Jordan and Hubbs, 1919: 32; Fowler, 1928: 118; 1931: 324; McCulloch, 1929: 109; Herre, 1936: 91; Schultz, 1943: 77.

Hepsetia morrissi: Jordan and Hubbs, 1919: 33.

Hepsetia vaigiensis: Fowler, 1928: 118.

Pranaseus forskalii: Fowler, 1944: 189.

Pranaseus pinguis: Schultz, 1948: 23; Fowler, 1949: 68; Schultz et al., 1953: 309; Morrow, 1954: 806; Smith, 1965: 616; Munro, 1967: 176; Tortonese, 1968: 12; Blanc and Hureau, 1972: 708; Kiener and Spillmann, 1973: 578.

Pranaseus vaigiensis: Schultz, 1948: 24; Taylor, 1964: 139.

Pranaseus morrissi: Schultz, 1948: 24.

Pranaseus forskalii: Fowler, 1949: 68.

Allanetta forskalii: Morrow, 1954: 806; Munro, 1955: 95; 1958: 156.

Pranaseus pinguis vaigiensis: Munro, 1958: 157; 1964: 168.

Pranaseus maculatus Taylor, 1964: 140. Examined holotype in Sydney (AMS IB. 5238).

Examined paratypes AMS I. 15653–O11 (10); other paratypes in Washington, USNM 174245 (10); USNM 174246 (4); USNM 174247 (78); USNM 174248 (7); USNM 174249 (7); USNM 174250 (4). Type locality: Yirkalla, Northern Territory, Australia.

The true identity of *Atherina lacunosa* has been one of the most controversial in the family Atherinidae and numerous attempts have been made to sort out the synonymy of this species. As early as 1853, Bleeker identified some specimens from Indonesia as *A. lacunosa*, which he considered to be indistinguishable from *Atherina vaigiensis* Quoy and Gaimard but distinct from *Atherina valenciennesi* Bleeker. Cuvier and Valenciennes (1835) indicated that they had identified Forster's *Atherina lacunosa* from a drawing in Banks' library and from the description of Bloch and Schneider and that they had a specimen in their collection which came from the type locality of *A. lacunosa*, namely New Caledonia. These authors also agreed that *Atherina vaigiensis* Quoy and Gaimard and *A. lacunosa* were indistinguishable. Günther (1861), in his catalogue of acanthopterygian fishes in the British Museum, noted that *Atherina lacunosa* was likely to be identical with *Atherina pinguis* Lacepède. Günther also referred to the Forster drawing in the library of the British Museum. He noted that the drawing suggested that the pectorals were darker than the rest of the body. Fifteen years later, after further examination of specimens, Günther stated that he now had no hesitation about the identity of Forster's species. In that paper he synonymized *A. pinguis*, *A.*

pectoralis and *A. forskalii* with *A. lacunosa* (Günther, 1876~81).

In 1908 Jordan and Richardson again raised the question of the identity of *A. lacunosa* but did little to contribute to the solution of the problem. Ogilby (1912), on the other hand, published a new description of "Forster's long lost species". This description was based on five specimens from Moreton Bay, Queensland, Australia, which according to Ogilby were distinct and different from a sixth specimen, which he identified as *Atherina pinguis*.

Weber (1921), wishing to take the matter further, reviewed the literature on *Atherina lacunosa* in great detail and at the same time analyzed the data of Bleeker (1853), Günther (1861, 1876~81) and Ogilby (1912). He concluded that the available literature contained nothing but contradictions, uncertainties and assumptions and that the drawings seen by Günther, Cuvier and Valenciennes were of little help. The specimen mentioned by Cuvier and Valenciennes was of doubtful value according to Weber. He was not convinced of Ogilby's rediscovery and his only positive evaluation was that all Bleeker specimens in Leiden labelled *A. lacunosa* were *A. forskalii*.

Although Smith (1965) did not address himself to the problem of resolving the status of *A. lacunosa*, in his review of fishes of the Red Sea and the western Indian Ocean, he did resolve the relationship of several nominal species which have in recent times been attributed to Whitley's genus *Pranesus*. Smith, however, concluded that *P. forskalii* and *P. pinguis* were not distinguishable at specific level after having examined a series of specimens which included Rüppell's types of *A. forskalii*.

Basing their identification on Ogilby's (1912) description, Schultz (1948) and Munro (1967) by and large accepted *Atherina lacunosa* as a species closely related to *Hypoatherina temminckii* (= *Atherina uisila* Jordan and Seale, 1906).

Bauchot (1969), in her list of Broussonet specimens in Paris, restated that Valenciennes had seen the drawing of *Atherina lacunosa* in Banks' library and that he had in his possession a specimen which had counts that were identical with those given in Forster's description of *Atherina lacunosa*. Bauchot did note that Forster's drawing is slightly larger (102 mm TL,

84 mm SL) than the actual size of the specimen (90 mm TL, 76 mm SL). Like her predecessor Valenciennes, she verified all the described characters, which included the fin-ray counts "représentés sur ce dessin détaillé, et mentionnés dans la description manuscrite de Forster". Bauchot concluded that specimen A4400 is indeed the holotype of *Atherina lacunosa*.

Re-examination of George Forster's drawing at the British Museum and of the specimen A4400 in Paris leads the present authors to the same conclusion which Cuvier and Valenciennes reached in 1835 and Bauchot in 1969. The counts and measurements made from the drawing and the specimen are presented in Table 1. The present condition of the specimen (Fig. 1) is such that it would be unreasonable to expect the morphometrics taken from the drawing to conform precisely with those obtained from the specimen. Yet, morphometric measurements on parts of the head where deterioration has been minimal, coincide very well. The fin ray counts of the specimen are identical with those given in Forster's original description. The pectoral count of 17 is unusual for this species, as the mean and the range of variations will attest in Table 1. This further strengthens our conviction that Forster's description is based on the Paris specimen.

With the identity of *A. lacunosa* now known, it is also possible to resolve the status of several other nominal species, which from time to time had been considered synonyms of *A. lacunosa*. The types of *A. vaigiensis*, *A. pectoralis*, *A. forskalii*, *A. morrissi* and *Pranesus maculatus* have been examined and all of the above are considered indistinguishable from *A. lacunosa*. Although the type of *A. pinguis* is lost, the identity of this nominal species has never been in doubt and it too must be regarded as *A. lacunosa*, as Günther correctly surmised in 1876~81.

Although a more complete discussion of the generic status of *Atherina lacunosa* will be the subject of another paper, it must be noted that despite Schultz's revision of genera and subfamilies of silversides in 1948, much confusion still prevails with regard to the generic status of a closely related group of species of silversides of the Indo-Pacific region. These species are variously attributed to the three genera *Pranesus*, *Hypoatherina* and *Allanetta*. The

last has been shown to be a monotypic genus by Taylor (1964) and is closely related to *Craterocephalus*, a predominantly freshwater group of atherinids of Australia and New Guinea. *Hypoatherina* includes all species which have a highly elevated ramus of dentary, a moderately long to very long median process of the premaxilla (usually more than twice as long as its width) and a fairly protrusible mouth. The remainder of the species have a short and wide median process of the premaxilla, a lower jaw which is not highly elevated posteriorly and a non-protrusible mouth and these species have been usually attributed to the genus *Pranesus* Whitley (1930).

No systematic analysis other than that of Hubbs (1944) has ever been made on the last species group. In that paper, Hubbs noted that the status of *Pranesus* was based on tenuous grounds and that *Thoracatherina* Fowler was probably indistinct from *Pranesus*. Hubbs, however, did indicate that erecting the genus *Atherinomorus* for the Carribean species *Atherina stipes* was justified, since this species has scale sheaths on the dorsal, anal and pectoral fins

and on these characters it is distinct and different from *Hepsetia*. Hubbs did not go on to establish the relationship between *Pranesus* and *Atherinomorus*.

Patten and Ivantsoff (unpublished data) have compared *Atherinomorus stipes* with all of the species which hitherto have been placed in *Pranesus* and the conclusion based on this comparison indicates without doubt, that the generic separation between *Atherinomorus* and *Pranesus* is unwarranted. *Atherinomorus* therefore appears to have a curious distribution, with one species in the Carribean and seven others widely scattered in the Pacific and Indian Oceans.

Atherinomorus is defined as: deep bodied, laterally compressed fishes with large eyes. Median process of premaxilla short and wide, 0.15~0.37 diameter of eye. Premaxilla long, its distal end extending past vertical through anterior border of eye. Free edge of dentary gently sloping upward and backward, with or without small tubercle at distal end. Coronary process of dentary pointed posteriorly. Small teeth in both jaws with denticles frequently extending to outer surface of premaxilla. Teeth

Table 1. Selected measurements and counts taken from the type, drawing and 65 specimens of *Atherinomorus lacunosus*.

	MNHN A4400	Forster's drawing 236 in British Museum	Mean & range of 65 specimens
Standard Length	76 mm	82.3 mm	30.3~105.7 mm
Head in SL	3.6	3.9	3.5 (3.2~4.1)
H max in SL	4.8	5.2	4.6 (4.1~5.6)
Sn-OD ₁ in SL	1.7	1.9	1.8 (1.6~2.0)
Sn-OD ₂ in SL	1.4	1.4	1.4 (1.3~1.5)
Sn-OV in SL	2.4	2.4	2.4 (2.1~2.5)
Sn-TV in SL	1.9	1.7	1.8 (1.7~2.0)
Sn-OA in SL	1.5	1.4	1.4 (1.4~1.6)
Sn-TA in SL	1.2	1.2	1.2 (1.1~1.3)
Eye in head	2.5	2.5	2.6 (2.4~3.1)
Interorbital in head	2.9	2.9	2.8 (2.3~3.3)
Postorbital in head	2.7	2.8	2.6 (2.2~2.9)
Snout in eye	1.6	1.6	1.7 (1.3~2.3)
Premaxilla in eye	0.9	0.9	0.9 (0.7~1.0)
Midlateral scales	40	—	42.2 (39~44)
Dorsal fins	V, li 9		IV~VII, li7~10
Anal fin	li 15		li 11~15
Pectoral fin	li 17		li 13~17
Gill rakers in first lower gill arch	19		21 (18~25)

SL, standard length; H max, greatest body depth; Sn, snout; OD₁, origin of first dorsal fin; OD₂, origin of second dorsal fin; OV, origin of ventral fin; OA, origin of anal fin; TA, last ray insertion of anal fin.

usually present on vomer, palatines, ectopterygoids and always forming a strong ridge or ridges on mesopterygoids. Cranial sensory canals broad and covered by thin skin. Distinct notch in anterior border of preopercle; notches present also in infraorbitals. Otic bulla rounded. First dorsal fin originating near vertical through tips of ventrals or behind them and always originating behind tips of pectorals. Scales dorsoventrally elongated, either entire or crenulate; those below pectorals always enlarged. Sheath of scales at bases of dorsal, anal and pectorals in *A. stipes* only.

Literature cited

- Bauchot, M. L. 1969. Les poissons de la collection de Broussonet au Muséum National d'Histoire Naturelle de Paris. Bull. Mus. Hist. Nat., Paris, (2) 41(1): 125~143.
- Bennett, E. T. 1831. Observations on a collection of fishes from the Mauritius, presented by Mr. Telfair, with characters of new genera and species. Proc. Zool. Soc. Lond., (1): 165~169.
- Bennett, E. T. 1832. Two new fishes from the Mauritius (*Atherina punctata* and *Julis strigiventer*). Proc. Zool. Soc. Lond., (2): 184.
- Blanc, M. and J. C. Hureau. 1972. Catalogue critique des types de poissons du Muséum national d'Histoire naturelle (suite) (Mugiliformes et Polynémiformes). Bull. Mus. Nat. Hist. Nat., Paris, (3, Zool.), (14): 673~734.
- Bleeker, P. 1853. Nieuwe tientallen diagnostische beschrijvingen van nieuwe of weinig bekende vischsoorten van Summatra. Nat. Tijdschr. Ned. Ind., 5: 495~534.
- Britten, J. J. 1885. The Forster herbarium. J. Botany, 23: 360~368.
- Broussonet, P. M. A. 1780. Mémoire sur les différents espèces de chiens de mer. Mém. Acad. Sci. Paris, 1780: 641~680 (also, J. Physiol., 26: 51~67 and 120~131).
- Broussonet, P. M. A. 1782. Ichthyologia, systems piscium descriptiones et icones. Decas I. P. Elmsly, London, 41 pp.
- Broussonet, P. M. A. 1786. Mémoire sur le volier. Mém. Acad. Sci. Paris, 1786: 450~455.
- Cuvier, G. L. C. F. G. 1828. Histoire naturelle des poissons. I. Levrault, Paris, 573 pp.
- Cuvier, G. L. C. F. G. and A. Valenciennes. 1835. Histoire naturelle des poissons. 10. Levrault, Paris, 482 pp.
- Dawson, W. 1958. The Banks letters: a calendar of the manuscript correspondence of Sir Joseph Banks. Trustees, British Museum (Natural History), London, 965 pp.
- Day, F. 1876. The fishes of India, being a natural history of the fishes known to inhabit the seas and fresh water of India, Burma and Ceylon. Part 2. Bernard Quaritch, London, pp. 169~368.
- Fowler, H. W. 1928. The fishes of Oceania. Mem. Bishop Mus., 10: 1~540.
- Fowler, H. W. 1931. The fishes of Oceania. Supplement I. Mem. Bishop Mus., 11 (5): 313~381.
- Fowler, H. W. 1938. The fishes of the George Vanderbilt South Pacific Expedition, 1937. Monogr. Acad. Nat. Sci. Philad., 2: 1~349.
- Fowler, H. W. 1939. Zoological results of the Denison-Crockett South Pacific Expedition for the Academy of Natural Sciences Philadelphia, 1937~38. Part 3.—The Fishes. Proc. Acad. Nat. Sci. Philad., 91: 77~96.
- Fowler, H. W. 1944. Fishes obtained in the New Hebrides by Dr. Edward L. Jackson. Proc. Acad. Nat. Sci. Philad., 96: 155~199.
- Fowler, H. W. 1949. The fishes of Oceania. Supplement III. Mem. Bishop Mus., 12 (2): 38~186.
- Gray, J. E. 1851. List of the specimens of fish in the collection of the British Museum, Part 1. Chondropterygii. Trustees, British Museum (Natural History), 160 pp.
- Günther, A. 1861. Catalogue of the acanthopterygian fishes in the British Museum, 3. Trustees, British Museum, 586 pp.
- Günther, A. 1876~81. Andrew Garrett's Fische der Südsee. J. Mus. Godeffroy, 2 (4, Heft XI): 212~13.
- Herre, A. W. 1936. Fishes of Crane Pacific Expedition. Field Mus. Nat. Hist. (Zool.), 21: 1~472.
- Hoare, M. E. 1976. The tactless philosopher. Johann Reinhold Forster (1729~98). Hawthorn Press, Melbourne, 419 pp.
- Hoare, M. E. 1982. (In press). The 'Resolution' Journal of Johann Reinhold Forster, 1772~75. Hakluyt Society, London.
- Hubbs, C. L. 1944. Relationships of *Alepidomus*, a new genus of atherinine fishes from the fresh waters of Cuba. Occ. Papers Mus. Zool. Univ. Michigan, (488): 1~10.
- Joppien, R. 1976. Drawings from Captain Cook's voyages. An unrecorded collection of fourteen ethnographical and natural history drawings relating to the second and third voyages. (Catalogue of exhibition and sale, 13 Sept. ~10 Oct. 1976). Hartnoll & Eyre, London, 57 pp.
- Jordan, D. S. and C. L. Hubbs. 1919. A monographic review of the family Atherinidae or silver-sides. Stanford Univ. Publ., Univ. Ser., 87 pp.
- Jordan, D. S. and R. E. Richardson. 1908. Fishes from islands of Philippine Archipelago. Bull. U.S. Bur. Fish., 27: 233~287.

- Jordan, D. S. and A. Seale. 1906. The fishes of Samoa. Bull. (U.S.) Bur. Fish., 25: 173~455.
- Jordan, D. S. and E. C. Starks. 1906. List of fishes collected on Tanega and Yaku, offshore islands of southern Japan, by Robert Van Vleck Anderson, with descriptions of seven new species. Proc. U.S. Nat. Mus., 30 (1462): 695~706.
- Kahn, R. L., G. Steiner, H. Fiedler, K. Popp and S. Schreibe. 1972. Georg Forsters Werke. Sämtliche Schriften, Tägibucher, Briefe, 4-Streitschriften und Fragmente zur Weltreise. Inst. Deutsche Sprache Literatur Deutschen Akademie der Wissenschaften, Berlin, 9 vols., 5~8 unpublished.
- Kendall, W. C. and E. L. Goldsborough. 1911. Reports on the scientific results of the expedition to the tropical Pacific, in charge of Alexander Agassiz, by the U.S. Fish Commission Steamer "Albatross", from August, 1899, to March 1900, commander Jefferson F. Moser, U.S.N. commanding. XIII. The shore fishes. Mem. Mus. Comp. Zool. (Harvard), 26 (7): 239~243.
- Kiener, A. and C. J. Spillmann. 1973. Atherinidae. In Hureau, J. C. and Th. Monod, eds.: Checklist of the fishes of the north-eastern Atlantic and of the Mediterranean. Vol. 1. UNESCO, Paris, 683 pp., (pp. 576~578).
- Klunzinger, C. B. 1870. Synopsis der Fische des Rothen Meeres. 1. Percoiden-Mugiloiden. Verh. Zool.-Bot. Ges., Wien., 20: 669~834.
- Klunzinger, C. B. 1884. Die Fische des Rothen Meeres. Eine Kritische Revision mit Bestimmungstabellen, 1. Acanthopteri veri. Stuttgart, 133 pp.
- Lacepède, B. G. E. 1803. Histoire naturelle des poissons. 5. Paris, 803 pp.
- Lichtenstein, M.H.K. 1844. Descriptiones animalium quae in itinere ad maris australis terras per annos 1772, 1773 et 1774 suscepto collegit observavit et delineavit Johannes Reinholdus Forster. Dummer, Berlin, XVI+424 pp.
- Lysaght, A. 1959. Some eighteenth century bird paintings in the library of Sir Joseph Banks. Bull. Br. Mus. Nat. Hist. (Hist. Ser.), 1 (6): 251~371.
- McCulloch, A. R. 1929. A check list of the fishes recorded from Australia. Mem. Aust. Mus., 5 (1): 1~144.
- Morrow, J. E. 1954. Fishes from East Africa, with new records and descriptions of two new species. Ann. Mag. Nat. Hist., (12) 7: 797~820.
- Munro, I. S. R. 1955. The marine and fresh water fishes of Ceylon. Department of External Affairs, Canberra, 349 pp.
- Munro, I. S. R. 1958. The fishes of the New Guinea region. A checklist of the fishes of New Guinea incorporating new records of species collected by the Fisheries Survey Vessel Fairwind during the years 1948 to 1950. Papua and New Guinea Agric. J., 10 (4): 97~369. (Also T. P. N. G. Dept. Agric., Stock, Fish. Bull., I, 1958: same pagination).
- Munro, I. S. R. 1964. Additions to the fish fauna of New Guinea. Papua and New Guinea Agric. J., 16 (4): 141~186.
- Munro, I. S. R. 1967. The fishes of New Guinea. Department of Agriculture, Stock and Fisheries, Port Moresby, 650 pp.
- Ogilby, J. D. 1912. On some Queensland fishes. Mem. Qld. Mus., 1: 26~65.
- Quoy, J. R. C. and P. Gaimard. 1824. Remarques sur quelques poissons de mer; description des poissons. In Freycinet, L.: Voyage autour du monde des corvettes 'l'Uranie' et 'le Physicienne' pendant les années 1817~1820. Zool., Part 2, Poissons. Paris, pp. 182~401.
- Rüppell, E. 1835. Fische des Rothen Meeres, 4. In Neue Wirbelthiere zu der Fauna von Abyssinien gehörig. Frankfurt am Main, pp. 1~148.
- Schneider, J. G. 1801. M. E. Blochii. Systema ichthyologiae iconibus ex illustratum. Post obitum auctoris opus inchoatum absolvit, correxit, interpolavit. Berlin, 2 vols., LX+584 pp.
- Schultz, L. P. 1943. Fishes of the Phoenix and Samoan Islands collected in 1939 during the expedition of U.S.S. "Bushnell". Bull. U.S. Nat. Mus., 180: 316.
- Schultz, L. P. 1948. A revision of six subfamilies of atherine fishes, with descriptions of new genera and species. Proc. U. S. Nat. Mus., 98 (3220): 1~48.
- Schultz, L. P., E. S. Herald, E. A. Lachner, A. D. Welander and L. P. Woods. 1953. Fishes of the Marshall and Marianas Islands. Vol. 1. Families from Asymmetrontidae through Siganidae. Bull. U.S. Nat. Mus., 202 (1): 1~685.
- Smith, J.L.B. 1965. Fishes of the family Atherinidae of the Red Sea and the Western Indian Ocean with a new freshwater genus and species from Madagascar. Ichthyol. Bull. Rhodes Univ., 31: 601~632.
- Taylor, W. R. 1964. Fishes of Arnhem Land. Rec. Am.-Aust. Exped. Arnhem Land, Zool., 4: 45~307.
- Tortonese, E. 1968. Fishes from Eilat. (Red Sea). Bull. Sea Fish Res. Stn. Haifa, 51: 6~30.
- Weber, M. 1913. Die Fische der Siboga Expedition. Leiden, 710 pp.
- Weber, M. 1921. Revision der Indo-Australischen Arten von *Atherina*. Zool. Med. Leiden, 6: 45~53.
- Weber, M. and L. F. de Beaufort. 1922. The Fishes of the Indo-Australian Archipelago, 4. E. J. Brill, Leiden, 410 pp.
- Whitehead, P. J. P. 1969a. Forty drawings of fishes

- made by the artists who accompanied Captain James Cook on his three voyages to the Pacific 1768~71, 1772~75, 1776~78, some being used by the authors in the description of new species. Trustees, British Museum (Natural History), 31 pp., 36 pls.
- Whitehead, P. J. P. 1969b. Zoological specimens from Captain Cook's voyages. J. Soc. Biblioph. Nat. Hist., 5 (3): 161~201.
- Whitehead, P. J. P. 1976. The lost Berlin manuscripts. Notes J. Amer. Music. Libr. Assoc., 33 (1): 7~15.
- Whitehead, P. J. P. 1978. The Forster collection of zoological drawings in the British Museum (Natural History). Bull. Br. Mus. Nat. Hist. (Hist. Ser.), 6 (4): 25~47.
- Whitehead, P. J. P. 1979. A guide to the dispersal of zoological material from Captain Cook's voyages. Pac. Studies, 2 (1): 52~93.
- Whitley, G. P. 1930. Ichthyological miscellanea. Mem. Qld. Mus., 10 (1): 8~31.

(PJPW: Department of Zoology, British Museum (Natural History), Cromwell Road, London, SW7 5BD, England; WI: School of Biological Sciences, Macquarie University, North Ryde, N.S.W. 2113, Australia)

Atherina lacunosa と J. R. Forster により記載された魚類

Peter J. P. Whitehead • Walter Ivantsoff

Captain Cook の 2 回目の航海で採集された魚類標本と, J. R. Forster によるそれらの記載や図等が現在どうなっているかについて, 特に *Atherina lacunosa* の例を中心として簡単に述べた。この種に関しては長年少なからぬ議論が戦わされてきたが, 著者らは可能な限りのあらゆる角度から検討した結果, パリにある *A. lacunosa* の模式標本は実際に Forster の標本であると結論した。また多くの名称種の模式標本は, この標本と比較して明瞭な差異はないと考えられる。*A. lacunosa* は *Atherinomorus* に含められるべきで, 後者は *Pranesus* の senior synonym である。