

RAY'S BREAM AND ITS ALLIES IN AUSTRALIA.

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(Plate xix.)

(Contribution from the Australian Museum.)

The finding of Ray's Bream, a fish usually called *Brama raii*, in any part of the world is always noteworthy, as this interesting species is of sporadic occurrence. The type-specimen was found in England in 1681 and named after John Ray, the famous naturalist of the time. In the intervening two and a half centuries, numbers of this fish have been recorded, but it is still regarded as a rarity. Apart from the typical Old World form, several allied species have been described, but we have still much to learn regarding the growth-stages and the limits of variation in these fishes. Their taxonomy is consequently tangled, as I found when identifying a new species recently caught in New South Wales, so that a brief review of the family nomenclature is necessary. The Pomfret, Ray's Bream, or Castagnole, as it is called, belongs to the Series Bramiformes of Jordan's Classification of Fishes, 1923, p. 181, and the family Lepidotidae of F. de Buen, 1935 (*Bramidae*, olim.). This family embraces only a few genera or subgenera, to which a tentative key is here offered:—

- A. More than seventy transverse series of scales on body (Sc. generally 80 to 90) *Lepidotus*.
- AA. Less than seventy transverse series of scales on body (Sc. generally 40 to 60).
 - B. Lateral line present. Scales smooth-edged . . . *Eumegistus*.
 - BB. No lateral line. At least some scales emarginate . . *Taractes*.

Other generic names have been proposed for fishes distinguished by having or lacking teeth on the vomer and palatines, having the caudal forked or lunate, the opercles denticulated or entire, and the ventrals inserted before or below the pectoral base. At least some of these characters are accounted for by changes with growth, so for the time being I recognize only the three genera in the above key, but list all the generic names hereunder so that they may be available to future students.

Genus LEPIDOTUS Asso, 1801.

- Lepidotus* Asso, An. Cien. Nat. (Madrid), iv., 1801, p. 38. Haplotype, *L. catalonicus* Asso, from Spain.
- Brama* Bloch & Schneider, Syst. Ichth., 1801, p. 98. Logotype. *Brama raji* (Bloch), from Northern Seas (i.e., England), designated by Bory de St. Vincent, Dict. Class. Hist. Nat., iii., 1823, p. 260. Not "*Brama*" Klein, Walbaum, and other non-binomial authors, also Valenciennes, Dict. Univ. Hist. Nat., ii., 1861, p. 730, a genus of Cyprinid fishes = *Abramis* Cuvier, 1816.
- Lepodus* Rafinesque, Carat. n. gen. Sicil., 1810, p. 53. Haplotype *Lepodus saragus* Raf., from Sicily.—*fide* Jordan, Copeia 49, 1917, p. 89.
- Taractes* Lowe, Proc. Zool. Soc. Lon. xi., December, 1843, p. 82. Haplotype, *T. asper* Lowe, from Madeira. Name spelt *Taraxes* by Day, Fish. Gt. Brit. Ireland, i., 1880, p. 114.
- Tylometopon* Bleeker, Nederl. Tijdschr. Dierk., iv., 1873, p. 133, and Arch. Neerl. Sci. Nat., xi., 1876, Syst. Perc. Rev., ii., p. 299. *Et* van Bemmelen, MS. Type, *Brama raii* (Bloch)—*fide* Jordan, Gen. Fish.
- Amblytoxotes* Bleeker, Arch. Neerl. Sci. Nat., xi., 1876, p. 311. Orthotype, *Toxotes squamosus* Hutton, from New Zealand.

- Argo* Steindachner & Döderlein, Denkschr. Akad. Wiss. Wien., xlvii., 1883, p. 34, pl. vii. Haplotype, *A. steindachneri* S. & D., from Japan. Preoccupied by *Argo* Herrmannsen, Indicis Gen. Malac. Primord., i., 1846, p. 77, a Gastropod mollusc.
- Collybus* Snyder, Bull. U.S. Fish. Comm., xxii., 1904, p. 525, pl. ix., Fig. 16. Orthotype, *C. drachme* Snyder, from Hawaii.
- Eumegistus* Jordan & Jordan, Mem. Carnegie Mus., x., 1, December, 1922, p. 35. Orthotype, *E. illustris* J. & J., from Hawaii.
- Lepidotus* F. de Buen, Not. Res. Inst. Esp. Oceanogr., ii., 1935, p. 102, pl. xxiv., Fig. 48. *Ex Asso*, 1801. Not *Lepidotus* Agassiz, 1833, a genus of fossil fishes (fam. Semionotidae) or *Lepidotus* Leuckart, 1877, Vermes, both preocc. Not *Lepidotus* Petrie, Descript. Sociol. xi., 1925, Anc. Egypt, p. 38, which is possibly "*Lepidosteus*" *niloticus*. Also not *Lepidotus* Bosc., Nouv. Dict. Hist. Nat. ed. 2, xvii., December 27, 1817, p. 475, pl. E. 30, which is a Scombroid fish, *Lepidopus* Gouan, 1770.

The generic name *Brama* has been applied to both fresh and salt water "Brems" by authors, some, like Bleeker, having used it for both. However, F. de Buen has indicated that *Brama* (Ray's Bream) is synonymous with *Lepidotus*, which name is preferred here. The fossil fish genus *Lepidotus* Agassiz is preoccupied.

The typical species of the genus is the English Ray's Bream, whose primary synonyms are detailed below. An allied form from south-eastern Australia and New Zealand is *Lepidotus squamosus* (Hutton), and there are various nominal species from other parts of the world.

LEPIDOTUS BRAMA (Bonnaterre).

(Plate xix., after Willughby.)

- "*Brama marina caudâ Forcipatâ*" Willughby, De Historia Piscium, 1686 app., p. 17, pl. V. 12. "In palude Middelburgensi prope Tesae fluminis aestu maris delatus, . . . Septemb. 18, 1681. Descripsit D. Jo. Johnson."
- "Toothed Gilt-Head" Pennant Brit. Zool., ed. 4, iii., 1776, p. 243, pl. xliii., fig. 114. Near the mouth of the Tees, Yorkshire, England.
- Sparus brama* Bonnaterre, Tabl. Encycl. Meth. Ichth., 1788, p. 104, pl. 50. Fig. 192. English Seas. Not *Sparus brama* Bloch, 1791, preocc.
- Sparus dentatus* Berkenhout, Synops. Nat. Hist. Gt. Brit. & Ireland., ed. 2, i., 1789, p. 74 and ed. 3, i., 1795, p. 74. Britain. Evidently based on Pennant's Toothed Gilt-Head, but "9 rows of teeth" is an obvious misprint for "2 rows of teeth".
- Sparus raii* Bloch, Nat. ausl. Fische, v., 1791, p. 95, pl. cclxxiii. Northern Seas [= Yorkshire, England].
- Lepidotus catalonicus* Asso, An. Cien. Nat. (Madrid), iv., 1801, p. 38. Spain.
- Sparus castaneola* Lacépède, Hist. Nat. Poiss., iv., 1802, pp. 33 & 111. Atlantic Ocean.
- Sparus niger* Turton, Syst. Nat. (Linné), i., 1806, p. 789 and Brit. Fauna 1807, p. 98. Yorkshire (based on Pennant). *Id.* Fox. Synopsis Newcastle. Mus. 1827, p. 233.
- Lepodus saragus* Rafinesque, Carat. n. gen. Sicil., 1810, p. 54. Sicily.
- Scarus imperialis* Desmarest, Nouv. Dict. Hist. Nat., ed. 2, xvii., December 27, 1817, p. 480. *Ex* Cupani MS., Sicily. Same as *Lepodus saragus* Raf.
- Brama marina* Fleming, Hist. Brit. Anim., 1828, p. 210. Type-loc. hereby designated: Mouth of the Tees, England.
- Brama pinna-squamata* Couch, Zoologist, vii., 1849, p. xxvi. Cornwall.
- Chaetodon umbratus* Machado, Cat. Pesces Cadiz., 1857, p. 23. Spain.
- Brama raii* of authors.

The above list is a chronological arrangement of the primary synonyms of Ray's Bream, the full bibliography of that species is too extensive for quotation. The species is usually, but wrongly, termed *Brama raii* since there are two specific names earlier than *raii* and the one to be used is *brama*. Several nominal species of "*Brama*" and even *Taractes* may be the same as Ray's Bream, but for the present they are listed as nominally distinct, as follows: *agassizi* Poey, *asper* Lowe, *australis* Cuvier, *brevoorti* Poey, *chilensis* Gay, *drachme* Snyder, *dussumieri* Cuv. & Val., *illustris* Jordan & Jordan, *japonicus* Hilgendorf, *leucotaenia* Fowler, *longipinnis* Lowe, *orcini* Cuv. & Val., *platycephalus* Matsubara, *princeps* Johnson, *raschi* Esmark, *saussurii* Lunel, *squamosus* Hutton, and *steindachneri* St. & Död.

Thus Ray's Bream and its allies have been recorded from England, Europe, including the Mediterranean, Madeira, North and South America, and the West Indies, South Africa, the Indian Ocean, Philippines, Japan, and Hawaii, Australia and New Zealand. The Australian Museum has specimens of *Lepidotus squamosus* from Lord Howe Id. and a small *Taractes* sp. from Erromanga, New Hebrides, which is withheld for future study. The latter has been recorded as *Brama raii* by Fowler (Mem. Bishop Mus., xi., 1934, pp. 400 and 423).

LEPIDOTUS SQUAMOSUS (Hutton).

Choetodon sp. Taylor, Te Ika a Maui., ed. 1, 1855, p. 410 and ed. 2, 1870. p. 628, Fig. —. New Zealand.

Toxotes squamosus Hutton, Ann. Mag. Nat. Hist. (4), xvi., November 1, 1875, p. 313 and Trans. N. Zeal. Inst., viii., May, 1876, p. 210. Cook Strait, New Zealand. *Id.* Flower & Bean, Bull. U.S. Nat. Mus., 100, viii., 1929, p. 34.

Brama raii Castelnau, Proc. Linn. Soc. N.S. Wales, iii., 1879, p. 352 (Sydney N.S. Wales) and of Australasian authors, not of Bloch. *Id.* Waite, Edible Fish. N.S. Wales, 1908, p. 10. *Id.* Phillipps, N.Z., Journ. Sci. Tech., vii., 4, 1924, p. 246, fig. — (New Zealand records). *Id.* Griffin, Trans. N.Z. Inst., lix., 1928, p. 378, pl. lix., fig. 4 (N.Z.). *Id.* McCulloch, Austr. Mus. Mem., v., 1929, p. 194.

Brama rayi McCoy, Prodr. Zool. Vict., dec. xiv., 1887, p. 127, pl. cxxxiii. (Portland, Victoria).

Brama japonica Day, Fish. Gt. Brit. & Ireland, i., 1880, p. 114. New Zealand. Not *B. japonica* Hilgendorf, from Japan.

Brama squamosa Speight, 46th. Ann. Rept. Canterbury Coll., 1918 (1919), p. 40 (New Brighton, New Zealand). *Id.* Bigelow & Schroeder, Bull. Mus. Comp. Zool. Harvard, lxix., 1929, p. 42.

Toxotes (Amblytoxotes) squamosus Weber & de Beaufort, Fish. Indo-Austr. Archip., vii., 1936, p. 195.

The Australasian representative of the English Ray's Bream, of which an excellent account and figure have been given by McCoy. It has been recorded from Victoria, New South Wales, New Zealand, and Lord Howe Island.

Mainly distinguished from the new species to be described hereunder by having eighty or more transverse rows of scales on the body and usually a couple of enlarged teeth near front of mandibles.

TARACTES MILTONIS, *sp. nov.*

(Plate xix., upper figure.)

Br. 7. D. iii., 33; A. ii., 24; P. ii., 19; V. i., 5; C. 20 et lat. brev. Scales 45 in longitudinal series, counting along the mid-line to last large scale at base of caudal; 15 above and 11 below the median series. Lateral line absent. 35 predorsal scales.

Head, body, scale, and fin characters agreeing excellently with the detailed description of the allied *Taractes princeps* (Johnson) recently given by Bigelow and Schroeder (Bull. Mus. Comp. Zool. Harvard, lxix., 2, February, 1929, p. 45 and plate —) but is of slightly larger size and is distinguished by having the eye-diameter about one-fourth, instead of about one-fifth the length of the head; anal lobe considerably shorter than head; comparatively longer pectoral and ventral fins; distance from ventral origin to anal origin notably less than length of head; different gill-rakers, etc.

Profiles of head and of interorbital space strongly convex. Opercles entire. Several rows of strong hooked teeth in jaws and on palatines; vomer edentulous. Eleven long spinose gill-rakers on lower part of first gill-arch. Pseudobranchiae well developed. Pectoral fin longer than head. Ventrals small, situated below pectoral base. Anterior rays of dorsal and anal fins falciform, their posterior rays shorter and free from membranes, like finlets. Caudal fin lunate, preceded by deep scaled pits above and below.

Colour (in alcohol) largely smoky-greyish, relieved with yellowish on the centres of many scales. Fins mostly blackish, with yellowish-white tips to the finlet-like rays. Most of pectorals yellowish. Tips and bases of ventrals white; remainder black. A crescentic whitish margin to the black tail. Scales on fins iridescent pearly. Eye uniform light blue.

Described and figured from the holotype of the species, a specimen three feet in total length and weighing 29 lb. When received at the Museum, the tail had been separated from the body and the fish had been gutted and preserved in alcohol. Austr. Mus. Regd. No. 1A. 7695.

Locality.—Hooked on a crab bait off the rocks at a beach near Milton, southern New South Wales, early in September, 1938, by Mrs. J. Keane, and presented to the Australian Museum through Mr. T. C. Roughley, B.Sc., F.R.Z.S., of the Technological Museum, Sydney.

Table of measurements.—

Length from snout to end of upper caudal lobe	915 mm.
Length to end of mid-caudal rays	780
Standard length (to last vertebra)	720
Depth	390
Head	200
Snout	50
Eye, horizontal axis	52
Eye, vertical axis	60
Interorbital	72
Least depth of caudal peduncle	45
Length of lower caudal lobe	200+
Length of upper caudal lobe	200+
Length of pectoral	258
Length of ventral	55
Ventral origin to anal origin	163
Height of dorsal	168
Base of dorsal	375
Height of anal	140
Base of anal	280
Upper jaw	99
Length of premaxillary	90
Postorbital	100
Anterior nostril 22 mm. before eye; posterior nostril 9 mm. long and 9 mm. from eye.	