

The progress toward the recognition of the class of Myzonts or Marsipobranchiates is indicated in the following synonymy :

THE CLASS OF MYZONTS, OR MARSIPOBRANCHIATES.

Synonyms as class names.

- < Pisces, *Artedi*, Genera Piscium, 1738.
- × Pisces, *Linnaeus*, Systema Naturæ, ed. x, t. 1, p. 239, 1758; ed. xii, t. 1, p. 419, 1766.*
- < Pisces, *Gmelin*, Linn. Systema Naturæ, t. 1, p. 1126, 1788.
- < Ichthyoderes (Ichthyodera), *Geoffroy St. Hilaire, Latreille*, Familles Nat. du Règne Animal, p. 107, 1825.
- < Pisces, *Costa*, Cenni Zoologici Napol., p. 49, 1834. (Includes the genus *Branchiostoma* < class *Leptocardii*—in the class.)
- < Myzontes, *Agassiz*, Contrib. to Nat. Hist. of U. S., v. 1, p. 187, 1857.
- = Marsipobranchia, *Häckel*, Generelle Morphologie der Organismen, B. 2, p. cxx, 1866.
- = Dermopteri, *Cope*, Proc. Acad. Nat. Sci. Phila., [v. 20,] p. 256, 1868.
- = Cyclostoma, *Gegenbaur*, Grundriss der vergleich. Anat., p. 577, 1870.
- = Cyclostomata, *O. Schmidt*, Handbuch der vergleich. Anat., 6. Aufl., p. 259, 1872.
- = Dermopteri, *Cope*, Proc. Am. Assoc. Adv. Sci. 1871, v. 20, p. 320, 1872.
- = Marsipobranchiates, *Gill*, Arrangement Fam. Fishes, pp. ix, 25, 1872.
- = Marsipobranchiata, *Jordan*, Man. Vertebrates Northern U. S., p. 199, 1876.
- = Myzonts (Marsipobranchii), *Wilder*, Proc. Am. Ass. Adv. Sci., v. 24, § B, p. 185, 1876.
- > Hyperotreta, † *Lankester*, Quart. Journ. Micr. Sc., v. 17, p. —, 1877.
- > Hyperoartia, † *Lankester*, Quart. Journ. Micr. Sc., v. 17, p. —, 1877.

Synonyms as subclass names.

- = Marsipobranchii, *Bonaparte*, Nuovi Annali delle Sci. Nat., t. 2, p. —, 1838; t. 4, p. 277, 1840.
- = Marsipobranchii, *Müller*, Abhandl. K. Akad. Wiss. zu Berlin, 1844, p. —, 1846.
- < Dermopteri (*Owen*), *Gill*, Cat. Fishes E. Coast N. A., p. 24, 1861 (Not Dermoptères, *Dun.*, q. = Salmonidæ.)
- < Holoecrania, *Huxley*, Proc. Royal Soc. London, v. —, 1874; Ann. and Mag. Nat. Hist., (4.) v. 15, p. 225, 1875.

NOTE ON THE BDELLOSTOMIDÆ AND MYXINIDÆ.

BY THEODORE GILL.

In 1872, in my "Arrangement of the Families of Fishes," I have recognized two families in the order Hyperotreta, and recently have communicated to Professors Jordan and Gilbert a new generic name for the many-gilled species. I herewith give diagnoses of the family and genera. The distinctions in each case, from the nearest allies, are so evident that the groups do not really need justification. Nevertheless, as others have thought differently, it is not superfluous to add that characters analogous to such as have been used to differentiate the family and genera would be regarded as of great systematic value in the

* The genus *Myxine* was referred to the class Vermes.

† These "classes" are regarded as constituents of a "grade" ("Cyclostoma") contrasting with another (Gnathostoma) including all the vertebrates with jaws.

classes of selachians and true fishes, and the only comprehensible reason why they should not be so regarded in the present case is because the species are few in number. Inasmuch, however, as the function of taxonomy is to express morphological truths, and not the quantities under which a given type is manifested, such reasons appear to be very insufficient.

The synonymy of the order Hyperotreta is appended.

HYPEROTRETA.

Synonyms as orders.

- < Cyclostomi, *Bonaparte*, Giorn. Accad. di Scienze, v. 52 (Saggio Distrib. Metod. Animali Vertebr. a Sangue Freddo, p. 41), 1832.
 < Helminthoidei, *Bonaparte*, Nuovi Annali delle Sci. Nat., t. 2, p. 133, 1833; t. 4, p. 277, 1840.
 = Hyperotreta, *Müller*, Abhandl. K. Akad. Wiss. zu Berlin, 1844, p. —, 1846.
 = Hyperotreti, *Bonaparte*, Cat. Metod. dei Pesci Europei, pp. 9*, 92*, 1846.
 < Cyclostomata, *Fitzinger*, Sitzungber. K. Akad. der Wissensch. (Wien), B. 67, 1, Abth., p. 57, 1873.

BDELLOSTOMIDÆ.

Synonymy.

- = Bdellostomidæ, *Gill*, Arrangement Families Fishes, p. 25, 1872.
 Petromyzontidæ gen. *Bonaparte*, etc.
 Myxinidæ gen., *Günther*, *Putnam*, etc.

Hyperotreta with the branchial apertures separate (6–11) and lateral, debouching directly on the sides.

POLISTOTREMA.

Synonymy.

- = Polytrema, *Girard*, Report U. S. Naval Expt. to Chili, v. 2, p. 251, 1854, (provisional name, not of *Ferussac*, 1822, nor *Risso*, 1826.)*
 = Polistotrema, *Gill* with *Jordan & Gilbert*, Proc. U. S. Nat. Mus., v. 4, p. 39, 1851.
 Gastrobranchus sp., *Lacépède*.
 Heptatrema sp., *Curier*.
 Bdellostoma sp., *Müller*, *Girard*, *Günther*, *Putnam*.

Bdellostomids with an increased number of branchiæ (about 10 or 11 on each side) and the base of the tongue between the seventh or eighth pair of gills.

* "It is to be regretted that *Duméril's* appellation of *Heptatrema*, by referring to a point of organic structure subjected to variations, could not be retained to designate these fishes generically. If that name be restricted to the species provided with seven respiratory apertures, then each species would constitute a genus by itself; that with six of these apertures ought accordingly be called *Hexatrema*; then *Heterotrema* when six are observed on one side and seven on the other; *Heptatrema* when seven; and finally *Polytrema* for the species described farther on.

"Considering, however, the structure of the mouth, both internally and externally, we would not hesitate in uniting them all under the well appropriate name of *Bdellostoma*, suggested by Professor *Müller*."—*Girard*, *op. cit.*

Two species have been indicated, but whether they are really distinct remains to be established. Both are represented in the U. S. Nat. Mus., but the Chilian form is in very poor condition.

POLISTOTREMA DOMBEYII.

Synonymy.

- 1798—Gastrobranchus Dombey, *Lacépède*, Hist. Nat. des Poissons, t. 1, p. 531, pl. 23.
 1829—Heptatremes Dombeyii, *Curier*, Règne Animal, 2. ed., t. 2, p. 405.
 1834—Bdellostoma Dombeyii, *Müller*, Abhandl. Akad. Wiss. zu Berlin, p. 80.
 1851—Bdellostoma Dombeyii, *Gray*, Cat. Specimens Fishes in Brit. Mus., pt. 1, p. 149.
 1854—Bdellostoma polytrema, *Girard*, Proc. Acad. Nat. Sci. Phila., v. 7, p. 199.
 1854—Bdellostoma polytrema, *Girard*, Report U. S. Naval Exped. to Chili, v. 2, p. 252, pl. 33.
 1870—Bdellostoma polytrema, *Günther*, Cat. Fishes. Brit. Mus., v. 8, p. 512.
 1874—Bdellostoma polytrema, *Putnam*, Proc. Bost. Soc. Nat. Hist., v. 16, p. 166 (156).
 1881—Polistrotrema Dombeyi, *Gill with Jordan and Gilbert*, Proc. U. S. Nat. Mus., v. 3, p. 458, 1881.

POLISTOTREMA STOUTII.

Synonymy.

- 1878—Bdellostoma Stoutii, *Lockington*, Am. Nat., v. 12, p. 793.
 1881—Polistrotrema Dombeyi pt., *Gill with Jordan and Gilbert*, Proc. U. S. Nat. Mus., v. 3, p. 458; v. 4, pp. 18, 29, 1881.

Habitat.—California.

“Eleven gill openings on each side; ten teeth on the anterior and nine in the posterior series. 15½ inches long. Eel River, Humboldt County.

“It is rather singular that this fish, which is abundant in Eel River, and is sold for food, and also occurs in this harbor, should hitherto have escaped notice. I believe it to be the only species of its genus hitherto found on the Pacific coast of North America; and it differs from *Bdellostoma polytrema*, a species which occurs along the coast of Chili, both in the number of the gill openings and that of the teeth, *B. polytrema* having fourteen of the former and twelve of the latter in each series.”—*Lockington.*”

A specimen was received, 1866, at the Smithsonian Institution from Dr. Canfield, and on comparison with *B. polytrema* could not be satisfactorily diagnosed.

HEPTATREMA.

Synonymy.

- = Heptatrema, *Duméril* fide authors; * (possibly in his “Dissertation sur les Poissons Cyclostomes,” which I have not seen.)
 = Les Heptatrèmes, *Duméril*, Cuvier Règne Animal, 2^e ed., t. 2, p. 405. 1829.
 = Bdellostoma, *Müller*, Abhandl. K. Akad. Wiss. zu Berlin, 1834, p. 79, 1836; 1838, p. 173, 1839; 1841, p. 111, 1844.
 < Bdellostoma, *Girard*, Report U. S. Naval Exped. to Chili (provisional name), v. 2, p. 251, 1854.

* This genus was not proposed in the “Zool. Anal.” as Gray and Girard indicated, nor in the 1st ed. of Cuvier’s Règne Animal.

- > Hexatrema, *Girard*, Report U. S. Naval Exped. to Chili (provisional name), v. 2, p. 251, 1854.
- > Heterotrema, *Girard*, Report U. S. Naval Exped. to Chili (provisional name), v. 2, p. 251, 1854.
- > Heptatrema, *Girard*, Report U. S. Naval Exped. to Chili (provisional name), v. 2, p. 251, 1854.

Bdellostomids, with typically 7 (sometimes 6) pairs of branchial apertures and the base of the tongue between the anterior pair of gills.

MYXINIDÆ.

Synonymy.

- = Missinidi, *Rafinesque*, Indice d'Ittiologia Siciliana, p. 49 (order), 1810.
- < Cyclostomia, *Rafinesque*, Analyse de la Nature, p. 94, 1815.
- = Suceurs, *Curier*, Règne Animal, t. 2, p. 116, 1817.
- = Diporobranchia, *Latreille*, Fam. Nat. du Règne Animal, p. 112, 1825.
- < Myxinidae, *Gray*, List Spec. Fish Brit. Mus., part 1, Chondropteygii, p. 145, 1851.
- < Myxinidæ, *Bonaparte*, Cat. Metod. dei Pesci Europei, pp. 9*, 92*, 1846.
- < Myxinoidei, *Bleeker*, Enum. sp. Piscium archipel. Indico, p. xxxiii, 1859.
- < Myxinidæ, *Günther*, Cat. Fishes Brit. Mus., v. 8, p. 510, 1879.
- = Myxinidæ, *Gill*, Arrangement Fam. Fishes, p. 25, 1872.
- < Gastrobranchi, *Fitzinger*, Sitzungsber. K. Akad. der Wissensch. (Wien), B. 67, 1. Abth., p. 58, 1873.

Hyperotreta with the branchial sacs (6 pairs) opening by ducts confluent behind into one which opens below on each side of the median line.

MYXININÆ.

Synonyms as subfamily.

- = Myxinia, *Rafinesque*, Analyse de la Nature, p. 94, 1815.
- = Gastrobranchini, *Bonaparte*, Giorn. Accad. di Scienze, v. 52 (Saggio. Distrib. Metod. Animal. Vertebr. a Sangue Freddo, p. 41), 1832.
- = Gastrobranchini, *Bonaparte*, Nuovi Anuali delle Sc. Nat., t. 2, p. 133, 1838; t. 4, p. 277, 1840.
- = Myxinnii, *Bonaparte*, Cat. Metod. dei Pesci Europei, p. 92*, 1846.

MYXINE.

Synonymy.

- Myxine, *Linnaeus*, Syst. Nat., t. 1, p. —, * 1758.
- Myxine, *Retzius*, K. Vet. Acad. Nya Handl. Stockholm, v. 11, pp. 110-114, 1790.
- Gastrobranchus, *Bloch*, Allg. Naturgeschichte der Fisches, t. 12, p. 66, 1795.
- Gastrobranchus, *Bloch*, Systema Ichthyologie, ed. *Schneider*, p. 534, 1801.
- Myxine, *Müller*, Abhandl. K. Akad. Wissensch. Berlin, 1834-1843 (passim).

For the most recent and important information respecting the species of this genus, the "Notes on the genus Myxine, by F. W. Putnam" (Proc. Boston Soc. Nat. Hist., v. 16, pp. 127-135, 1874), should be consulted.

* Myxine is referred by Linnaeus to the class Vermes.