

*Neomyxine* n.g. (Cyclostomata) based on *Myxine biniplicata*  
Richardson and Jowett 1951, and further data on the species.

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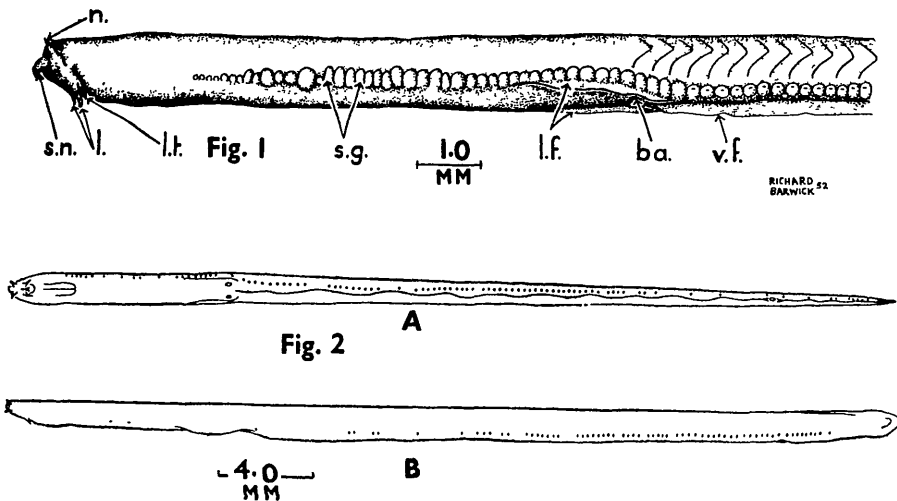
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*Abstract*

*Neomyxine* n.g. based on *Myxine biniplicata* Richardson and Jowett 1951 is distinguished by a slender form, ventral fold reaching to the branchial apertures, paired fin-folds extending from behind the branchial apertures anteriorly, and a mucous gland count which is greater than the number of segments.

THE original account of *Myxine biniplicata* Richardson and Jowett 1951 was based on one large dissected specimen and a second small and damaged specimen. From these, it was obvious that a new myxinid occurred in Cook Strait; but the condition of the material was such as to warrant only a conservative attitude towards its generic status. Since then, I have received through Mr. J. A. Garrick and through the master and crew of the fishing trawler "Maimai" operating out of Wellington, a further eight specimens, some alive, some frozen, some preserved. Examination of these has confirmed the original suspicion that a separate genus should be established with this species as the genotype, and Dr. Carl Hubbs has recommended this step to me. Certainly in spite of the strong general resemblance to *Myxine*, the presence of the additional lateral fin-folds, the high count of mucous pores, and the elongate slender form are characters which are of greater than specific value in other groups. Removing *M. biniplicata* from the genus, leaves a relatively uniform group of species from which the Cook Strait species is sharply set off as above. In the original preserved specimens, the extent of the lateral fin-folds and the origin of the ventral fin-fold were obscured by wrinkling and ridging of the skin so that the ventral fin-fold appeared to extend between and anterior to the branchial apertures. In live material, this fold falls just short of these apertures.

Three specimens were brought alive to the laboratory and placed in a 50-gallon aquarium tank in which the water was kept in circulation. These were generally lethargic, but two escaped from the tank in spite of a glass cover, the third was held alive for some weeks. The live specimen is somewhat faintly flesh-coloured, with faint olive-brown tonings which are not obvious in water, so that the animal appears white suffused with pink largely if not entirely due to the subcutaneous circulation of blood. The mucous glands are white. In preservative, the colour is from faint to a pronounced brown, generally that of coagulated preserved blood. The live animal does not exhibit black or other colours obviously related to chromatophores, and showed no change in colour during the period it was kept alive.



## TEXT-FIGURES

*Neomyxine biniplicata* (Richardson and Jowett) 1951.

FIG 1.—Lateral view of head and pharyngeal region

FIG 2.—Lateral (B) and ventral (A) views of entire animal from a specimen 382 mm total length. ba, branchial aperture; l, lateral, l.t., labial, n., nasal, and s.n., subnasal tentacles; l.f., lateral and v.f., ventral fin-folds; s.g., mucous glands.

In the tank, the animal was quiet over long periods. It then showed no sign of activity other than a persisting pulsation of the body-wall lateral to the pericardial chamber. During such periods, while resting on the bottom, the lateral fin-folds are spread as though pressing against the bottom of the tank, or as though the animal were maintaining its attitude by resting on these folds. Attempts to feed were unsuccessful although fresh and old meat and fish, and even a live fish were offered.

I am indebted to Mr. R. Barwick for Fig. 1.

Nani and Gneri (1951) have based a new genus *Notomyxine* on "*Myxine*" *tridentiger* Garman which they show possesses in addition to the pair of branchial apertures a separate opening from the oesophageo-cutaneous duct. This third aperture is posterior to the others. They present a figure (their Fig. 6) which is most valuable. In it, they show the ventral aspect of three species of *Bdellostoma*, a species of *Paramyxine*, *Myxine garmani* and *Notomyxine tridentiger*. The two latter have a strong resemblance in general proportions, in the level of the paired branchial apertures, the extension of the ventral fin-fold anteriorly so that it falls short of but nearly reaches the level of the branchial apertures, etc. Representing *M. biniplicata* in a similar manner, it appears as a more slender animal having a proportionately longer tail, with the ventral fin-fold reaching to the branchial apertures, and with the unique lateral fin-folds. Accordingly I propose this species as the type of a new genus in the Myxinidae, as follows:

NEOMYXINE n.g.

Slender myxinids having one pair of external branchial apertures, the left the larger, and no separate aperture from the oesophageo-cutaneous duct; the ventral fin-fold reaching to the branchial apertures; a pair of symmetrical lateral fin-folds extending from close behind the branchial apertures anteriorly

lateral to the apertures; mucous glands everywhere more numerous than the segments, crowded and not circular in outline, median teeth of both series, bifid distally;

Genotype: *Myxine bimPLICata* Richardson and Jowett, 1951.

ADDITIONAL DATA AND CORRECTIONS TO THE DESCRIPTION OF *Neomyxine bimPLICata* (RICHARDSON AND JOWETT)

The following data is drawn from seven specimens ranging in total length from 320 mm. to 412 mm. An eighth specimen, received frozen, of 345 mm. was cleared in hydrochloric acid which for a time revealed the mucous glands, and the count from this specimen is included below in that section. This cleared specimen showed rays in the caudal and anal fins, in the latter to the posterior margin of the cloacal aperture, and a complete absence of rays from the pre-cloacal (ventral) fin-fold

The distance from the tip of the rostrum to the first gland in the mucous gland series is from 23% to 29% of the distance from the tip of the rostrum to the rear margin of the branchial aperture. The latter distance, the length of the head and pharynx combined, is from 23% to 26% of the total length. The abdominal region taken here as from the posterior margin of the branchial aperture to the posterior margin of the cloacal aperture, is from 57% to 66% of the total length; but of the seven specimens, six fell in a range of from 57% to 61%. The caudal region, which was measured from the posterior end of the cloacal aperture to the tip of the tail, was 13.6% to 16.5% of the total length. The sectional dimensions are difficult to describe. With this series of specimens laid out, it is obvious that two are deeper and heavier in the body than are the other five, and this extra depth is shown over the greater length of the body, but otherwise there are no particular features which distinguish these two specimens from the others. At the same time, this difference when expressed in percentages of the various body regions is not great. The five specimens range in length from 320 mm. to 412 mm. and in these the depth of the body at the level of the branchial aperture is from 11.0 mm. to 13.0 mm., the width at this point being from 9.0 to 11.0 mm.—i.e., some 2.0 mm. to 3.0 mm. less than the depth. The depth is from 12.4% to 15.6% of the length from the tip of the rostrum to the posterior margin of the branchial aperture. The other two specimens are 343 mm. and 370 mm. in length, within the range of the above. The depth at the branchial aperture is in the smaller, 13.0 mm. and 15.0 mm. in the larger which is 16.0% and 17.0% of the length of the head and pharynx combined. The width at this level does not show the same variation but falls within the range of from 11.5% to 13.2% for all seven specimens. The depth of the body in the abdominal region appears greater than at the rear of the pharyngeal region; but this is due to the presence of the ventral (pre-cloacal) fin-fold. In all specimens, the depth of the body in the abdominal region measured within 1.0 mm. of the depth at the rear of the pharynx. The depth of the ventral fold in the five more cylindrical specimens is 16.8% to 23% of the depth of the body. In the smaller of the two deeper-bodied specimens, this fold is but little more, being 26.5% of the depth, but in the specimen which is 370 mm. long, the fold is 40% of the total depth at this level. The collectors did not remark on these differences and there is the probability that this extremely deep ventral fold may be a consequence from preservation.

The unique lateral fin-folds which extend on either side of the branchial apertures commence at a level between the 29th to 35th of the mucous gland series which is from 75% to 89% of the distance between the tip of the rostrum and the posterior margin of the branchial apertures—i.e. they commence at or in the last quarter of the length of this region. In four of the specimens, this is between 83% to 85% of this distance which is probably the more correct range since, as described in the original account, preservation tends to produce a folding of the skin extending these fin-folds anteriorly so that in the preserved specimen an accurate origin cannot be reliably determined. Some variation in the level of origin is possibly indicated in relation to the mucous glands. Where these could be determined, the fin-fold originated at a level 80% as by count of pores of the glands in the head and pharyngeal series. The length of the folds is equal to the space occupied by 9 to 12 glands and ranges from 19.5% to 27.0% of the distance between the tip of the rostrum and the rear margin of the branchial apertures. In none do the fins meet behind the branchial apertures or join the ventral precloacal fold. The latter has been extended between and anterior to the branchial apertures in three specimens, but in life it has its origin immediately posterior to these apertures and extends to the cloacal aperture at a uniform height. There are no rays in this fold. There is no indication of a median dorsal ridge or fold on the abdominal region in life. The dorsal margin of the caudal commences above the 6th to 11th last mucous gland, 54% to 78% of the distance between the rear margin of the cloacal aperture and the tip of the tail, but in five of the specimens this is 54% to 60% of this distance, suggesting that in the two specimens where this was 72% and 78% the true length of this fin may have been altered by preservation. This fold and the anal fold contain rays; in the latter rays are present to the margin of the cloaca.

The determination of the number of mucous glands was not possible in all specimens, and in particular these were obscure in three specimens brought ashore frozen; but in one of the latter treated with hydrochloric acid, the pores and glands become obvious during metaproteinization when the body tissues had swollen and become partially transparent. A full count of glands on both sides was possible with four specimens. These showed an average of 164 on the left, ranging from 152 to 171; and an average of 168 on the right side, ranging from 159 to 175. In these, the count of the right side exceeded that of the left by 3 to 7. Complete counts were possible on the left side of two other specimens. These were 148 and 170. Using all available data from these specimens, the number of glands in the various body regions can be summarised as follows:—

- (a) Pharyngeal region, number of glands back to the anterior edge of the branchial aperture, on left side (7 specimens), ranging from 36 to 44, with an average of 40; right side (5 specimens), 36 to 45, and an average of 40.
- (b) Abdominal region, number of glands from anterior edge of branchial aperture to anterior edge of cloacal aperture, on the left side (6 specimens) ranging from 91 to 107, with an average of 100; on the right side (6 specimens), a range of 96 to 105, with an average of 103.
- (c) Caudal region as taken from the anterior margin of the cloacal aperture and counted to the last gland, on the left side (8 specimens), a range of 20 to 24 and an average of 21; on the right side (7 specimens), a range of 20 to 23, and an average of 21.

Accordingly it is now possible to describe the mucous gland formula for this species as consisting in specimens from 320 to 412 mm. in length as 36 to 45 + 91 to 107 + 20 to 24 and a total range of 147 to 176. The data from these do not indicate constant increase in the number of glands with size. A specimen 320 mm. in length had 171 glands on the left and 175 glands on the right. Another 382 mm. had only 162 and 165 glands; while one 345 mm. long had 152 and 159 glands.

The mucous gland formula contrasts strongly with that reported in the *M. glutinosa* complex. If we consider the formula for *M. glutinosa* as reported by Bigelow and Schroeder (1948) which includes the ranges described for *M. capensis* and *M. australis*, we find that the range in variation in the number of glands in the several regions of the body in *M. glutinosa* is comparable with that in *N. bimphicata*. The formula for *M. glutinosa* is 26 to 33 + 53 to 70 + 11 to 13, totalling 80 to 116. The range in the head and pharyngeal region is 7, in the abdomen, 17; in the caudal region, 2; and in total numbers, 26. With *N. bimphicata*, in spite of the greater number of glands in the series 36 to 45 + 91 to 107 + 20 to 24 = 147 to 176, the range in each region is only 9 + 16 + 4, and 29 in the total number, so that the distinctive value of this higher count is quite clear.

In three specimens, the mucous gland series were interrupted on both sides of the body, the abdominal series ending before the anterior margin of the cloaca and there being a gap equal to about two glands before the commencement above the cloacal aperture of the caudal series.

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