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A New Species of *Gobiomorphus*

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Abstract

A new species of *Gobiomorphus* is recorded from high country, and the identity of *Gobiomorphus basalis* existing in upland lakes is verified.

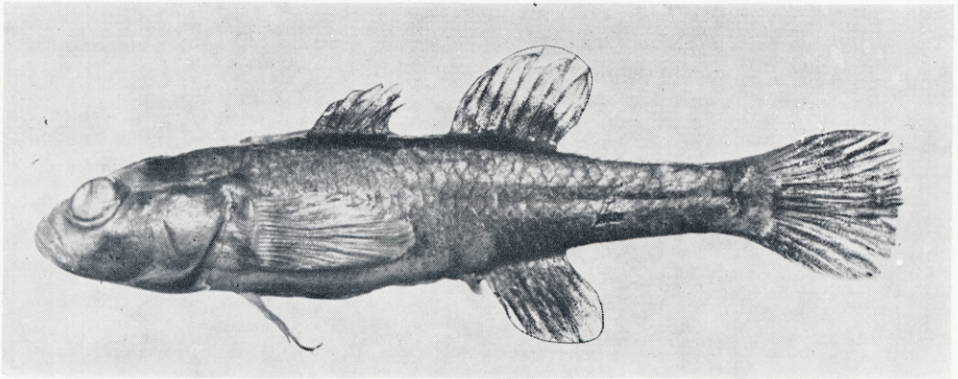
THE subject of the present paper is of particular interest for two reasons: it reduces the distinctions between typical *Gobiomorphus* and New Zealand representatives of the genus *Philypnodon*, and was found at a higher altitude than species of either genus had been recorded from. The latest definition of *Gobiomorphus* (Stokell, 1941) records the base of the pectoral fin as being scaled, but in the present fish the pectoral base is naked as in *Philypnodon*. The opercles carry only a few scales, and the anterior part of the body is less completely scaled than in other species. The predorsal scales commence perpendicular from the posterior of the eyes or somewhat to the rear of this point. The cheeks are naked. In a recent paper (1959) I have commented on the affinity of local *Philypnodon* with typical *Gobiomorphus*, and it must be noted here that the present fish brings the two groups still closer together. Whether they should be merged either directly or through some system of subgeneric classification is a question not for present decision. The occurrence of the new fish at an altitude of 3,400ft suggests that other significant discoveries may be made in equally unpromising country still to be worked, and indicates the desirability of leaving the taxonomic position free from unnecessary complications.

The altitude at which the present fish was discovered is much greater than that of any other species of this genus, and exceeds the recorded maximum of *Philypnodon breviceps*, hitherto regarded as the highest ranging eleotrid in New Zealand. Most species of *Gobiomorphus* are lowland-dwelling, the only one previously known to attain a moderately high altitude being *G. basalis*. This fish occurs most plentifully at river mouths, both within and above tidal influence, but in some localities it has been found far inland. The discovery of the new upland species necessitated a verification of identity of *G. basalis* occurring at abnormal altitudes, the more so as in most instances only a few specimens had been examined. New material was collected and data on the two most important numerical characters, the vertebrae and the first dorsal fin rays, are recorded in Table I. The highest water in which *G. basalis* is known to exist is Lake Alexandrina (2,323ft), but the natural occurrence of the fish is open to question, as the local Acclimatisation Society claims to have introduced "bullies" to this water by direct transference

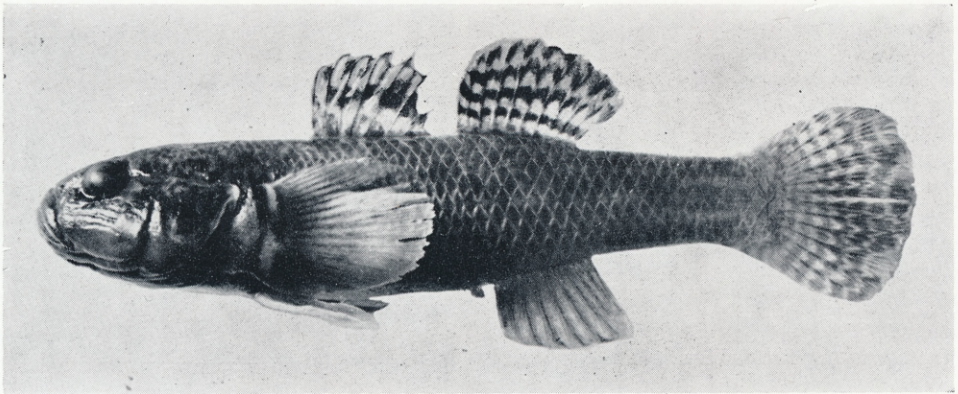
from the estuary of the Opihi River. No ichthyological survey of the lake was made before the transfer, and the identity of the fish introduced was not determined. Twenty specimens collected from Lake Alexandrina in December, 1960, all had the pectoral base scaled, the opercles well scaled over more than half their area, and the scales on the dorsal surface extending forward of the perpendicular from the posterior of the eyes. Sixteen of these specimens had 29 vertebrae and four had 30. The first dorsal fin ray counts are three specimens with VI, fourteen with VII, and three with VIII. A group of twenty from the mouth of the Opihi was constant in the possession of 29 vertebrae, and contained only two variants from the dominant number in first dorsal ray counts: two specimens had VI and eighteen had VII.

The differences revealed by these comparisons tend to discredit the suggestion that Lake Alexandrina was colonised by transference of the fish from the mouth of the Opihi, but are not of themselves sufficient to amount to a definite negation. It is significant, however, that no *Philypnodon breviceps* could be obtained from Lake Alexandrina, as this fish occurs in Lake Ohau (1,720ft) where there are no *Gobiomorphus*. These two lakes are in the same drainage basin, and even if the presence of *Gobiomorphus* in Lake Alexandrina is attributed to artificial introduction the absence of *Philypnodon* is still unexplained.

The two fishes occur at Lake Georgina (1,680ft) in the Rakaia River basin, where the possibility of artificial introduction of *Gobiomorphus* cannot be ruled out, although there is no record or tradition that it was effected intentionally. It is possible, however, that many years ago some live-bait fisher took up a can of "bullies" to fish Lake Georgina, and released his unused baits in the lake. If this actually occurred the fish could be expected to have come from the mouth of the Selwyn River, as this was the headquarters of this method of catching trout. The circumstances are not suggestive of a natural occurrence of the fish, as in this valley of many lakes, *G. basalis* is known from only Lake Georgina, which usually is isolated from other waters. Had the fish emigrated to Lake Georgina by way of the Rakaia River it could be expected to have colonised Lake Coleridge also. If the movement occurred while these waters were in their present condition the fish would have had to pass through Lake Coleridge, and if it dated back to the period when Lake Coleridge was discharging at the south-eastern end Lake Georgina would have been united to it. A group of twenty specimens from Lake Georgina had the pectoral base scaled and the general squamation of typical *basalis*. As shown in Table I the vertebral counts of these fish and a similar group from the mouth of the Selwyn River cover the same range of variation, but the frequency of variation differs greatly between the two waters. In the Georgina group there are only two variants from the dominant number of vertebrae, but in the group from the Selwyn there are nine. A very similar position exists in the first dorsal ray counts. The range of variation is the same in the two waters, but the Georgina group has only three variants while the Selwyn group has nine. On this evidence it appears unlikely that the stock of *G. basalis* inhabiting Lake Georgina came originally from the mouth of the Selwyn, but the much closer agreement of the Georgina figures with those for the mouth of the Opihi opens the possibility of transference from some estuary on the sea coast. While the origin of *G. basalis* is as obscure at Lake Georgina as at Lake Alexandrina the circumstances of the two occurrences differ somewhat. At Georgina the fish is associated with *Philypnodon breviceps* which is of almost universal occurrence in the other lakes in the Coleridge basin, none of which is known to carry *Gobiomorphus*.



Gobiomorphus alpinus. Total length 59 mm. Bowscale Tarn.



Gobiomorphus basalis. Total length 96 mm. ~~In two streams~~
L.2. stream.

TABLE I.—Number of Vertebrae and First Dorsal Rays in *Gobiomorphus* from Various Localities.

Locality	No. of Specimens	Vertebrae				First D. Rays			
		27	28	29	30	V	VI	VII	VIII
Lake Alexandrina	20		16	4		3	14	3	
Mouth of Opihi	20		20			2	18		
Lake Georgina	20		1	18	1	2	17	1	
Mouth of Selwyn	20		4	11	5	2	11	7	
Upokororo	20			19	1			20	
Mouth of Waiau	6			6				6	
Mouth of Awarua	20			20		1	19		
Bowscale Tarn	15	1	10	4		3	9	3	

The next highest waters from which *G. basalis* has been obtained are tributaries of Lake Gunn (1,575ft) in the Waiau River basin, in Southland. The fish occurs throughout Lakes Manapouri and Te Anau and in numerous waters tributary to them. All eleotrids obtained from this extensive area are *Gobiomorphus* and are scaled in the manner typical of *basalis*. The only waters within the Waiau drainage basin in which *Philypnodon* has been found are tributaries that join the Waiau below the lakes. Only a few specimens from the Lake Gunn area have been examined, but they conform to the specifications of the substantial group from the Upokororo, Lake Te Anau (700ft) recorded in Table I. This group contains only one variant in vertebral counts, and the number of first dorsal rays is constant. Only six specimens from the mouth of the Waiau were available, but a substantial group from tidal water at the mouth of the Awarua on the west coast was dissected and the data recorded in Table I. The former group is free from variants and the latter contains only one. A single fish differs from the generality in having only VI first dorsal rays. The close agreement between Te Anau and coastal specimens suggests that interchange of stock takes place between the two localities or has done so in recent times. The explanation of natural occurrence is supported by the very wide distribution of the fish in the Te Anau basin.

While these investigations establish the distinctness of the Bowscale Tarn fish from *Gobiomorphus basalis* existing at high altitudes in various localities they do not solve the problem of the origin of these upland-dwelling *basalis* except in the Te Anau area.

In this locality the fish is obviously of natural occurrence, but whether the Alexandrina and Georgina fish are so or have been introduced is uncertain and may never be known. A point of interest is the high frequency of variation in specimens from the Selwyn River, which flows into a large brackish lagoon, compared with those from open estuaries.

Gobiomorphus alpinus n.sp.

B.6. D.V.–VII (usually VI) I 8–10. A. I 7–9.

Vertebrae 27–29 (usually 28).

Cheeks, interorbital space and pectoral base naked, opercles irregularly scaled for less than half their area, predorsal scales commencing perpendicular from rear of eyes or posterior to this point, breast scaled. Scales imbricated on trunk and tail, 36–38 from pectoral base to posterior limit of scale covering, 14 around tail. Teeth in jaws in villiform bands, up to 7 wide, those in the outer row moderately

enlarged in upper jaw, slightly in lower. Mouth inclined, the lower jaw prominent, premaxillary and maxillary extending about to perpendicular from anterior of eye. Rows of papillae on snout, interorbital space, cheeks and opercles, those on the lower edge of cheeks small, in single row, those below cheeks larger and more widely spaced, in single row, a well defined furrow above eye containing a single, usually interrupted row of papillae. No large open pores on head. Gill openings narrow, isthmus broad, genital papilla large. Head 3.2–3.7 in standard length, depth 4.2–4.7 in same, least depth of caudal peduncle. .38–.47 of peduncle length. First dorsal fin inserted at .38–.41 of the standard length, separated from the second by 2–4 scales, both rounded in outline, anal originating perpendicular from 3rd–5th ray of second dorsal, rather pointed in form, its height greater than its basal length. Caudal fin rounded in outline.

Colour blackish or dark grey on back and sides, abdomen light grey or whitish, fins blackish or dusky, usually a dull yellow band across the base of the pectoral.

Maximum total length observed, 61 mm.

Variation: Of fifteen specimens dissected one has 27 vertebrae, ten have 28, and four have 29. The first dorsal fin ray counts are three with V, nine with VI, and three with VII. The second dorsal figures are two with I 7, three with I 8, and ten with I 9. It is unusual, in meristic characters, to find the dominant number at one extremity of the variation range.

The species is named on account of the altitude at which it occurs.

TYPE. A specimen 59 mm in total length in the Dominion Museum, registered number 3109.

TYPE LOCALITY. Bowscale Tarn, Tarndale, Marlborough, altitude 3,400ft.

Differs from *G. gobioides* in having the cheeks naked, and from this species, *G. radiata* and *G. basalis* in having the opercles only sparsely scaled, the pectoral base naked, and normally 28 vertebrae.

DISTRIBUTION. The fish has been taken only from Bowscale Tarn, but it can be expected to occur in other tarns and lakes in the same locality. The only other native fish collected from Bowscale Tarn was *Galaxias lynx*.

ACKNOWLEDGMENTS

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