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## NOTE

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# Spotted Forms of the Northern Wolffish (*Anarhichas denticulatus*)

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### Abstract

Spotted specimens of the northern wolffish (*Anarhichas denticulatus*) have been observed in the Northwest Atlantic. Some of these are described and compared with observations by other authors on coloration of this species.

### Introduction

Investigations in the Northwest Atlantic during 1946-67 resulted in the capture of occasional specimens of northern wolffish (*Anarhichas denticulatus*); synonymous with (*A. latifrons*, *Lycichthys paucidens*, *L. fortidens*, *L. latifrons*, *L. denticulatus*) which were spotted distinctly enough that, under casual observation, they may be called spotted wolffish. In data gathered at sea, some *A. denticulatus* may thus be recorded as *A. minor*.

Goode and Bean (1896) and Jordan and Evermann (1896) described *A. denticulatus* as a brown form, obscurely spotted with darker patches, and the latter authors added "without dark bars or black spots". Bigelow and Schroeder (1935) described the color of the species as dark brown or greyish brown with indistinct spots of darker color surrounded by pale rings. According to Merriman (1935), a specimen from Banquereau had a uniformly yellowish grey or brown color. Jensen (1948) described the color as chocolate brown with indistinct small spots; correspondents with Jensen from Greenland described it as the brown catfish or as not spotted, but blue-black. Andriyashev (1954) described the coloration as monotonous dark or with large blurred spots. From Barsukov (1959), the general coloration is grey with a bright violet shade or with brown tones of varying intensity almost up to chocolate color. The sides, dorsum and sometimes the top of the head and the dorsal fin are covered by diffuse spots, generally very distinct from the general coloration. The violet shading may explain why one of its common names is the blue catfish. Leim and Scott (1966) reported the color as deep brown with numerous indistinct dark spots, lacking the pronounced spots of the spotted wolffish.

In various illustrations of *A. denticulatus* presented in the literature, the color pattern varies. Schnakenbeck (1933) and Andriyashev (1954) showed the same figure, with faint spots on a greyish background color, from Smitt (1893). Goode and Bean (1896), Jordan and Evermann (1896), Gill (1911), and Leim and Scott (1966) have the same figure, from a drawing by H. L. Todd of a Sable Island Bank specimen, apparently without spots. The figure of Bigelow and Schroeder (1935) shows large darkish (presumably brown) patches on a greyish background. Barsukov's (1959) figure shows no definite pattern and could fit his description of greyish brown in color.

This paper records and extends knowledge related to the northern wolffish with spots distinct enough to be called spotted northern wolffish.

### Results and Discussion

In the course of investigations on *A. denticulatus*, I have noted 23 northern wolffish which were designated spotted northern wolffish. These specimens were typical of northern wolffish in the greater depth of body, shorter head, smaller caudal and pectoral fins, and more jellied flesh than the Atlantic wolffish (*A. lupus*) and the spotted wolffish (*A. minor*), and with the vomerine teeth not extending posteriorly nearly as far as the palatines. The shape of the head was the same as that of northern wolffish, being somewhat more sharply pointed than in the other two North Atlantic species, and the vomerine and palatine teeth were sharply pointed.

Some specimens, illustrating the range of spottiness in the so-called spotted northern wolffish, are

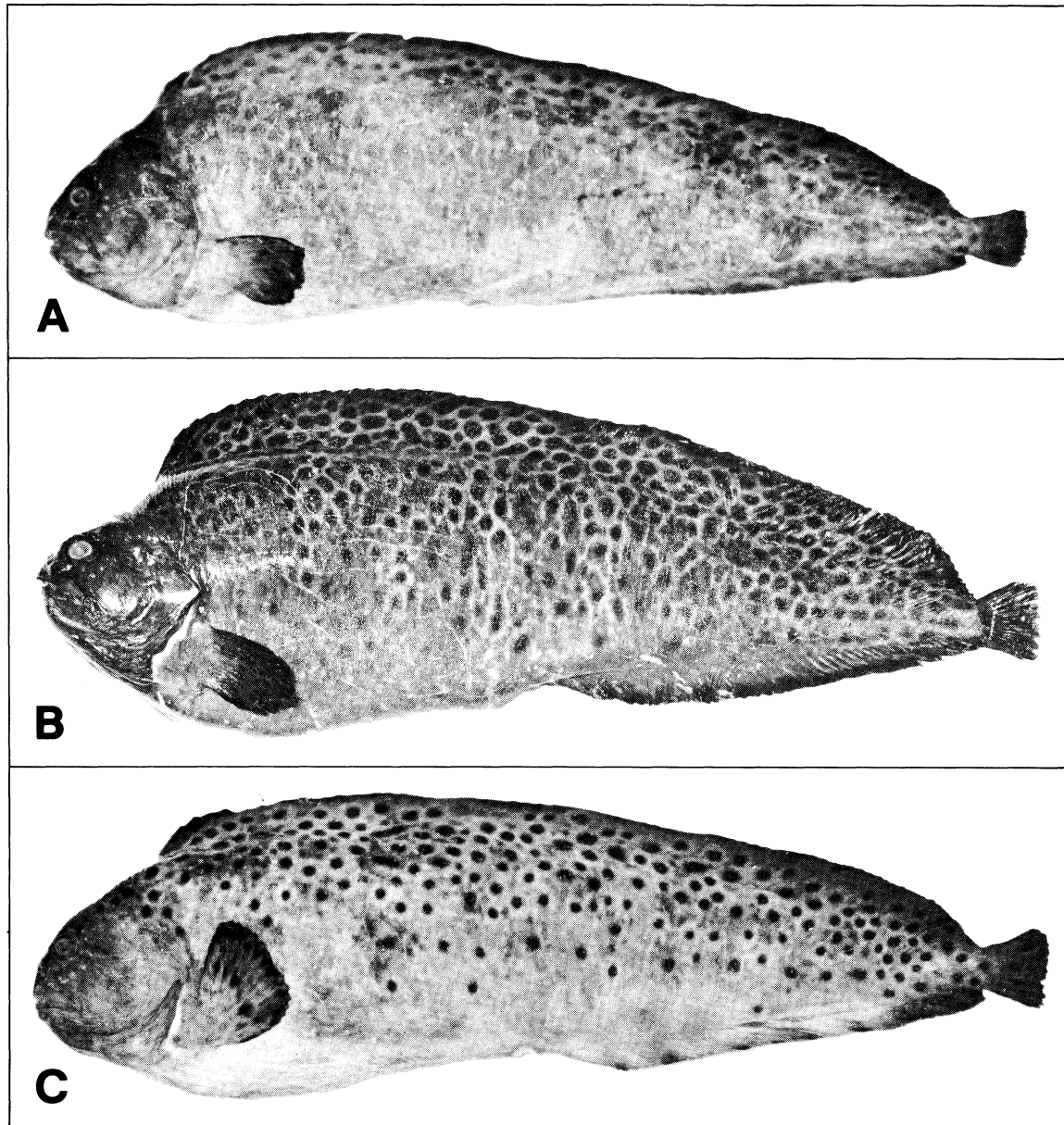


Fig. 1. Spotted forms of northern wolffish (*A. denticulatus*): **A**, 65 cm male from eastern slope of Hamilton Bank (450 m) in August 1956, 80 vertebrae including hypural and 78 dorsal fin rays, **B**, specimen from Newfoundland-Labrador region in 1956 or 1957; **C**, 73 cm female from Northeast Newfoundland Shelf (460 m) in August 1956, 80 vertebrae including hypural and 78 dorsal fin rays.

shown in Fig. 1, for comparison with the coloration patterns of Atlantic and spotted wolffish and of normally-colored northern wolffish (Fig. 2). In Fig. 1A, the obvious spotting is on the dorsal fin and its base, with more indistinct blotches on the body. In Fig. 1B, the spots on dorsal fin are more distinct and extend to the caudal peduncle and the upper part of the body. There are also some blotchy areas of coloration on the body, usually with central areas of slightly darker pigment. In Fig. 1C, the spots are more distinct, showing the closest approach to the pattern of the spotted wolf-

fish (Fig. 2B), but the background color in the spotted wolffish is whiter than the greyish background of the northern wolffish, making the spots more distinct in the spotted wolffish. Also, the distinct spots do not extend to the side of the head in the spotted northern wolffish (Fig. 1), whereas they are distinctly present in this location in the spotted wolffish (Fig. 2B).

Most of the so-called spotted northern wolffish were distinct enough from the usual dark brown coloration to be recorded as such without special descrip-

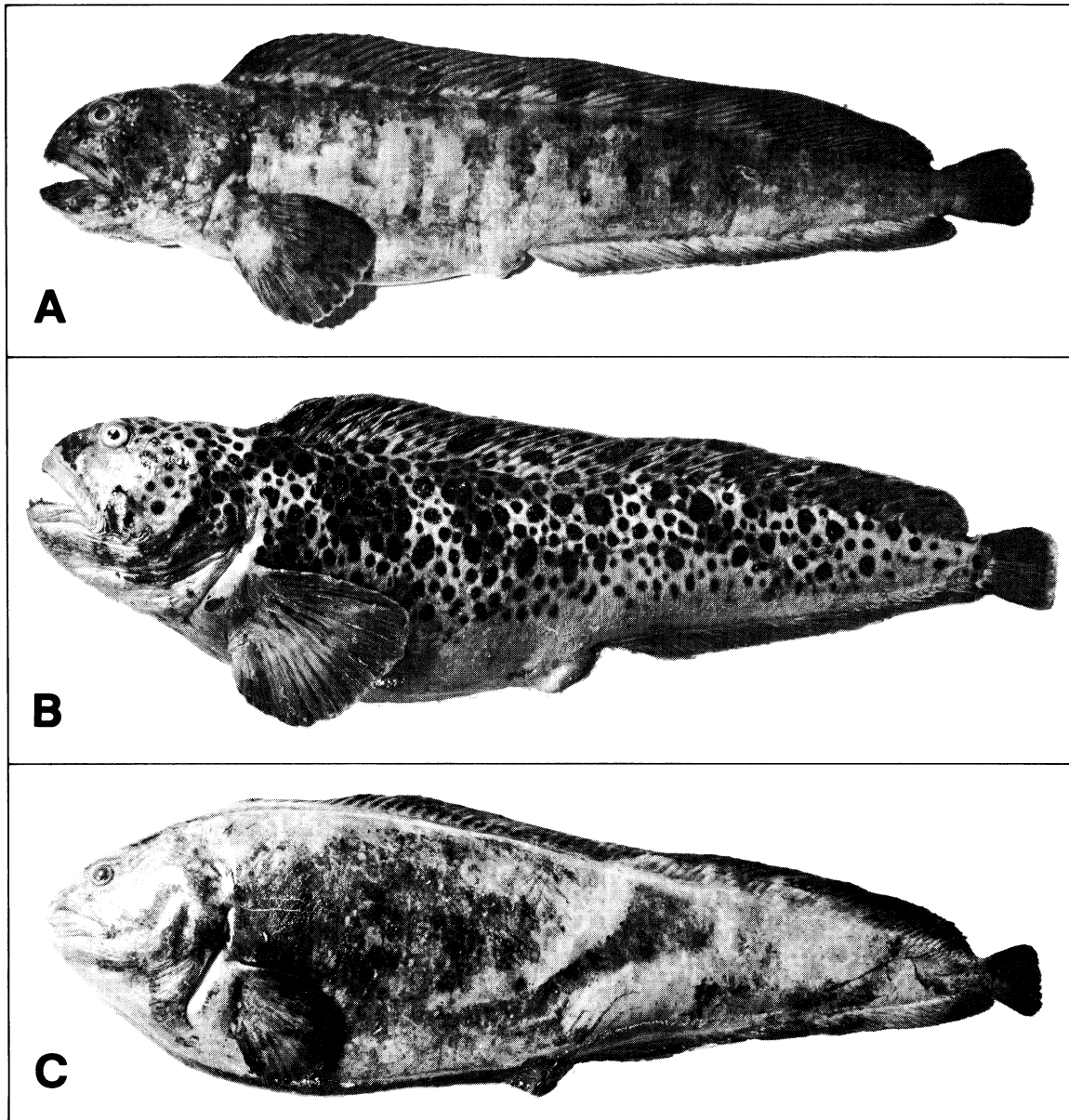


Fig. 2. Three wolffishes of the Northwest Atlantic: **A**, 54 cm female Atlantic wolffish (*A. lupus*) from northern Gulf of St. Lawrence (220 m) in November 1953; **B**, 100 cm female spotted wolffish (*A. minor*) from northeastern Grand Bank in July 1948; **C**, 96 cm female northern wolffish (*A. denticulatus*) from northern Grand Bank in July 1948.

tive notes. Some actual notes taken at the time of examination in the fresh condition follow: This specimen (73 cm F, Fig. 1C) is spotted like a spotted wolffish; there are some spots under the grey, especially on the dorsal fin and its base in typical northern wolffish, but in this fish the spots are much more distinct. Specimen (74 cm F) from Hamilton Bank, 550 m: dark spots all over; spots are somewhat but not quite like those of spotted wolffish. Specimen (91 cm F) from Funk Island Bank, 550 m: definitely spotted on dorsal fin and one-third down the body. Specimen (62 cm M) from Funk Island Bank, 460 m: covered with large spots, not

especially, however, like those of spotted wolffish. Specimen (144 cm M) from Placentia Bay, Newfoundland: very dark brown color and spotted dorsally. Specimen (96 cm M) from southeastern Grand Bank: spots on dorsal half of body.

Vertebral numbers, including hypural, in 10 of these spotted northern wolffish were 78(2), 79(2), 80(4) and 81(2), and dorsal fin-ray numbers in 8 specimens were 76(1), 77(1), 78(4), 79(1) and 80(1). The ranges of vertebral numbers and dorsal fin-ray numbers are approximately similar to those in 10 specimens of

young northern wolffish from the southern Newfoundland area (78–81 vertebrae and 76–78 dorsal fin rays) (Grigor'ev, 1983), and to those in northern wolffish from the Barents Sea (78–82 vertebrae and 76–81 dorsal fin rays) (Barsukov, 1959). The ranges for these spotted northern wolffish are higher than those for spotted wolffish (*A. minor*) from the Northwest Atlantic (74–80 vertebrae and 74–77 dorsal fin rays) (Templeman, 1986), and are still higher than those for Atlantic wolffish (*A. lupus*) from the Northwest Atlantic: (72–78 vertebrae and 71–77 dorsal fin rays) (Templeman, 1984).

Lühmann (1954) described "interspecific forms between *A. minor* and *A. lupus*". It is probable that some of these were spotted northern wolffish (*A. denticulatus*). He described these intermediate forms as "having a basic coloration usually considerably darker than that exhibited by *A. minor*. Occasionally, the spots become indistinct and their borders dissolve even more strongly than in the case of the small-spotted forms of *A. minor*. Examined against the light, the skins of the specimens of the intermediate type appear spotted only by way of a suggestion, and in some cases the skins exhibit only foggy, shadow-like spots". This description of the coloration would be valid for some of the spotted forms of *A. denticulatus*. Also, the range of vertebral numbers in Lühmann's "interspecific" forms was 76–82. The lower part of this range is included within the ranges for both *A. lupus* and *A. minor* but the upper part (above 80) is included only in the *A. denticulatus* range.

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