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A PUGHEADED COBIA (*RACHYCENTRON CANADUM*) FROM THE NORTHCENTRAL GULF OF MEXICO

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ABSTRACT A pugheaded cobia (*Rachycentron canadum*) captured in the northcentral Gulf of Mexico represents the first record of pugheadedness in cobia. The specimen, a 4-year-old gravid female, exhibited considerable distortion of the premaxillary and maxillary bones, with the length of the snout 46% shorter than that of a normal cobia of the same length. The anomaly had no apparent effect on feeding, since the stomach contained a substantial amount of food, and the fish was the same length expected of a normal 4-year-old cobia.

INTRODUCTION

Pugheadedness has been well documented in many species of marine and fresh water fishes (Dawson 1964, 1966, 1971; Dawson and Heal 1976; Burgess and Schwartz 1975). Genetic abnormalities, embryonic development disorders and aberrations induced by environmental variables are probable causes of this type of anatomical anomaly (Gudger 1928, 1930; Mansueti 1960; Schwartz 1965; Rose and Harris 1968; Hickey 1972; Sindermann 1977; Shariff et al. 1986). Mechanical injury is generally discounted as a primary factor. Pugheadedness has not been previously reported in cobia (*Rachycentron canadum*).

MATERIALS AND METHODS

A pugheaded *R. canadum* was captured on 4 May 1991 by hook and line in the northcentral Gulf of Mexico east of the Chandeleur Islands at 88° 45'N, 30° 00'W in 8 meters of water. Fork length (FL), total weight (TW) and sex were recorded for the specimen. Head measurements of the pugheaded specimen and a normal cobia were taken for purposes of comparison and in accordance with the definitions of Hubbs and Lagler (1964). Stomach contents were removed and examined. The stage of gonad maturation was determined by gross examination. Otoliths (sagittae) were excised from the specimen, cleaned, embedded in Spurr medium and sectioned transversely through the primordium using a Beuhler Isomet low-speed saw. Otolith sections (0.7-mm-thick) were examined under a dissecting microscope using reflected light, and the annuli were counted.

RESULTS

The specimen was an adult female, measuring 1110 mm FL and weighing 15.8 kg TW. The fish had a blunt forehead and an abnormally short upper jaw (Figure 1). A sizable groove extended vertically in the exposed anterior portion of the snout. The exposed tongue and lower oral cavity were partially pigmented. There was considerable distortion of the premaxilla and maxilla, and the snout was tucked downward and slightly inward, affecting the vertical opening of the mouth (Figure 2). The lower jaw was unaltered but did exhibit substantial abrasion around the outer edge of the lip. No exophthalmia was noted. Other aspects of external anatomy appeared to be normal. The head of a normal cobia is shown in Figure 3.

Head measurements of the pugheaded specimen and a non-pugheaded one of the same length and sex (collected by the author) are presented in Table 1. The length of the snout was 46% shorter than that of a normal cobia of the same size. A distance of 44 mm separated the anterior tip of the anomalous snout from the anterior tip of the lower jaw. The frontal bones were slightly elevated resulting in a larger interorbital width and a greater head depth than expected in normal specimens. The head shown in Figure 3 is not the head of the fish described in Table 1.

The stomach contained a 89 mm (total length) croaker (*Micropogonias undulatus*) and a large amount of well-digested fish remains.

Otolith analysis revealed a recently completed fourth annulus. The anomalous specimen's length was comparable with the mean length (1139 mm FL) reported for normal female cobia with otoliths showing a recently completed fourth annulus (Franks and McBee 1992). The back-

calculated FL at annuli I (402 mm), II (768 mm) and III (955 mm) was also comparable with mean back-calculated FL reported for female cobia at ages I (493 mm), II (797 mm) and III (991 mm) (Franks and McBee 1992).

The specimen was gravid with normally developed ovaries.

DISCUSSION

The effects of pugheadedness on the individual depend upon the severity of the anomaly (Hickey 1972). Bortone (1972) postulated that such a condition would typically lead to a lack of competitive ability, but that a moderately pugheaded fish could possibly compete on at least an equal level in regard to feeding mechanism. In spite of the deformity, the anomalous specimen's feeding efficiency apparently had not been significantly limited. The fish was quite robust.

The specimen's length at capture and estimated length at earlier ages indicated that the aberration had not altered growth relative to normal cobia, ages I-IV.

Peak spawning for cobia in the northern Gulf of Mexico occurs during April - May (Lotz et al. 1992). The specimen's ovaries were comparable in appearance to gonads from reproductively active female cobia of similar size collected during May.

The head of the specimen is in the Gulf Coast Research Laboratory Museum, Catalog Number GCRL 26632.

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Figure 1. Frontal view of the pugheaded cobia (*R. canadum*).



Figure 2. Head of the pugheaded cobia (*R. canadum*).



Figure 3. Head of a non-pugheaded cobia (*R. canadum*).

PUGHEADED COBIA

TABLE 1

Comparison of measurements of the head of the pugheaded cobia with the head of a non-pugheaded cobia (each fish 1110 mm FL¹).

Measurements	Percentage of FL ¹	
	Pugheaded	Non-Pugheaded
Head length ²	23.8	24.1
Head width	19.8	16.4
Depth of head	20.8	15.9
Least bony interorbital width	13.5	12.7
Length of orbit	2.5	2.4
Length of mandible	9.7	10.2
Snout length	3.6	7.8

¹Fork length (FL) measured from anterior tip of lower jaw to fork of caudal fin.

²Measured from anterior tip of lower jaw to the most distant point of the opercular membrane.

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