Variations in Meristic Characters of *Nematalosa nasus* from Iraqi and Kuwaiti Waters

L. A. J. Al-Hassan

(Received March 15, 1986)

A clupeoid fish *Nematalosa nasus* (Bloch), inhabiting the Gulf of Aden, Arabian Sea, Hongkong (Whitehead, 1972) is considered an important commercial fish in these regions. This species enters the Shatt al-Arab River in spring and sometimes reaches further north to the Hor al-Hamm mar marsh (Whitehead, 1965). The species is found year round in Khor al-Zubair, the north west extension of the Arabian Gulf.

*N. nasus* is caught in the Shatt al-Arab and Khor area and is estimated to contribute 50% of the combined annual clupeoid production.

Variations in meristic characters have been used as a basic tool in separating populations of different fish species (Seymour, 1959; Anthony, 1968). Meristic differences between populations of fishes may be influenced by genetic or environmental factors, or both (Bailey and Gosline, 1955). Different workers attributed the difference in meristic characters to environmental factors such as light, temperature and dissolved oxygen during the period from fertilization to hatching (Taning, 1952; Wallace, 1973; Kwain, 1975).

This study was undertaken to determine whether one or more populations of *N. nasus* occur in Iraqi and Kuwaiti waters by analyzing variations in meristic characters.

![Map showing the study area.](image-url)
Material and methods

Adult specimens of *N. nasus* collected by beach seines from the Shatt al-Arab River, Khor al-Zubair and Kuwaiti water were studied (Fig. 1).

Meristic characters examined included number of vertebrae, abdominal scutes, and pectoral, dorsal and anal fin rays. Vertebral counts were made from specimens prepared by boiling the whole fish prior to counting. Vertebral number included the total segments between, but not including, the basioccipital and hypural. Counts of abdominal scutes and fin rays were done under a dissecting microscope. Ray counts included all rays. In some cases fin rays were stained with alizarine red and comparisons made of counts before and after staining.

All five variables were compared using least significant difference (LSD) test (Snedecor and Cochran, 1967). The meristic variables were then subjected to cluster analysis (WPGM) using average of distance coefficients (Blackith and Reyment, 1971).

Results

Distribution of the five meristic characters studied are shown in Fig. 2. Dorsal and pectoral fin rays proved to be the least variable of the five meristic characters examined.

Comparison of the means showed highly signifi-