

## Notes on the Rostral Organ of Anchovies (Family Engraulidae)

Gareth Nelson

(Received October 24, 1983)

Fishes of the family Engraulidae, numbering about 150 species, are distinctive in having a prominent snout and inferior mouth. In most but not all species the gape of the jaws extends posteriorly to beyond the eye, and the suspensorium is posteriorly inclined. This combination of characters produces a gestalt that renders specimens of most species recognizable at a glance as anchovies, even though identification to species may prove difficult.

In particular, the snout of anchovies has long been recognized as distinctive, and in identification keys has been described as "pig-like" (e.g., Whitehead, 1972). The distinctiveness of the snout is directly related to the occurrence of a structure termed a "rostral organ" (of

Tretyakov, 1938, whose preliminary description of the rostral organ of *Engraulis encrasicolus* is extended by the details presented below). The organ is a modification of the sensory-canal system of the head, and incorporates neuromasts of the supraorbital and, apparently, ethmoidal canals. The organ is paired, and the left and right sides interconnect by a commissure. The number and arrangement of neuromasts within the organ is constant in the few species so far examined. Because these species represent all major groups of anchovies, the neuromast pattern will probably be found fairly constant within other species of the family (Fig. 1).

The eight neuromasts of each rostral organ occur thus: neuromast R1 lies on the dorsal surface of the nasal bone, which overlies the nasal organ; neuromasts R3-5 lie in a row on the medial wall of the organ, in semi-enclosed spaces toward the front of the snout; R2 and R6-7 lie in a row more posteriorly, on the medial wall of the main cavity of the organ;

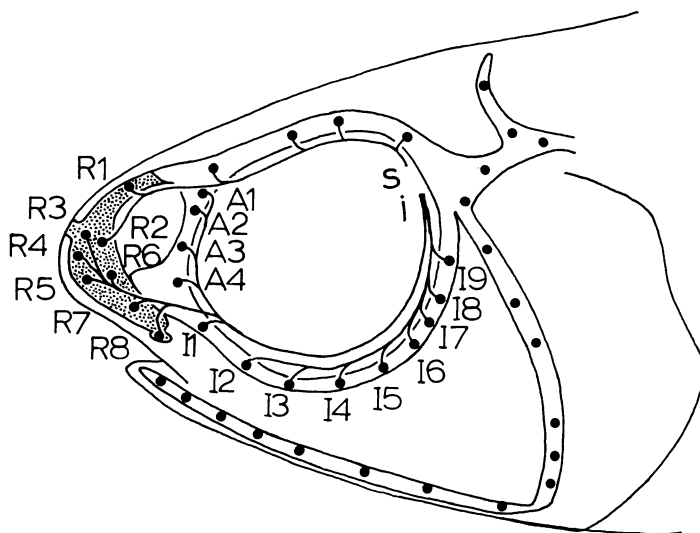


Fig. 1. Diagrammatic representation of the cephalic sensory-canal system of the anchovy, *Anchoviella lepidentostole* (55 mm SL, AMNH 40906), showing position of neuromasts (black dots) of rostral organ (stippled), innervation of rostral and other neuromasts, and other parts of the sensory-canal system. R1-8, neuromasts of rostral organ; A1-4, neuromasts of antorbital canal interconnecting supraorbital and infraorbital canals; I1-9, neuromasts of infraorbital canal; i, infraorbital and s, supraorbital branches of trigeminal (V) nerve. The same disposition of neuromasts was observed by gross dissection in the rostral organ and antorbital canal of adult specimens of *Coilia grayi* (AMNH 37035), *Thryssa dussumieri* (AMNH 55148), *Thrissina baelama* (AMNH 54626), *Stolephorus indicus* (AMNH 43476), *Encrasicolina purpurea* (AMNH 49421), *Engraulis encrasicolus* (AMNH 44411), and *Anchoa mitchilli* (AMNH 45173).

R8 lies within a small, semi-enclosed space between the premaxillary and maxillary bones. The commissure between left and right sides is situated near neuromast R3. The lumen of the organ is separated by membrane from the lumen of the supraorbital and infraorbital canals.

Innervation of the neuromasts of the rostral organ is by way of the supraorbital (R1-2) and infraorbital (R3-8) branches of the trigeminal (V) nerve. Innervation by way of the infraorbital branch, and the commissure between left and right sides, suggest that some or all of neuromasts R3-8 represent those normally enclosed within the ethmoidal canal of clupeid and other lower teleostean fishes (Wohlfahrt, 1937).

Anchovies are distinctive among lower teleostean fishes also in having, posterior to the nasal organ, a well developed antorbital canal interconnecting the supraorbital and infraorbital canals. In the few species so far examined there are four neuromasts (A1-4) in the antorbital canal, all innervated by way of the infraorbital branch of the trigeminal (V) nerve.

The lumen of the rostral organ is large and comprises much of the volume of the snout. The neuromasts of the organ are large relative to those of the rest of the cephalic canal system.

The extreme development of the rostral part of the canal system, the large size, constant number, and distinctive arrangement of the neuromasts contained in it, and its separation by membrane from the rest of the sensory canal system suggest that the rostral organ has a discrete function.

#### Literature cited

- Tretyakov, D. K. 1938. Seismosensory canals of the Clupeidae. *Zool. Zhur.*, 17: 763-776.  
Whitehead, P. J. P. 1972. A synopsis of the clupeoid fishes of India. *J. Mar. Biol. Assoc. India*, 14: 160-256.  
Wohlfahrt, T. A. 1937. Anatomische Untersuchungen über die Seitenkanäle der Sardine (*Clupea pilchardus* Walb.). *Zeit. Morph. Okol. Tiere*, 33: 381-411.

(Department of Ichthyology, American Museum of Natural History, New York, New York 10024, USA)

#### カタクチイワシ類の rostral organ

Gareth Nelson

カタクチイワシ科魚類に特異ないちじるしく突出した吻部に発達する rostral organ の形態について比較検討した。この器官の形態学的諸特徴から、これが独自の機能を有することが示唆された。