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Different Morphology of Sagittal Otoliths of *Cephalopholis* Spp. from Southern Thailand

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Summary

The sagitta morphology of three species of *Cephalopholis* from southwest coast of Thailand is studied by scanning electron microscope. The distinguishable morphology of sagitta e.g. shape, ostium and cauda of sulcus, rostrum, antirostrum, dorsal depression, ventral depression and exisura are described. The oblong, ovate and elliptic is sagitta shape of *C. argus*, *C. miniatus* and *C. formosa*, respectively. The sulcus type is heterosulcoid. The morphology of sagitta of these coral reef fish is different from that of inshore species. The different sagitta morphology of these fishes are species specific and possibly related to environmental factors and biological factors.

Keywords: morphology, sagitta, sulcus acusticus, *Cephalopholis*, crystals

The three species of genus *Cephalopholis* (*C. argus*, *C. miniatus* and *C. formosa*) are fishes in order Perciformes, family Serranidae, which are found throughout the Southeast Asia and Indo-Pacific. The *C. argus* and *C. miniatus* live in cave and crevice of coral reef, while *C. formosa* live in inshore [1]. The sagittae are the largest pair of otoliths, which are located in the inner ear of bony fish. They act as the transmitters of mechanical stimuli to the cilia of the macula inserted in the sulcus (sulcus acusticus). Environmental factors could affect the morphology of sagitta and crystals on sulcus. The purpose of this study is to investigate morphology of sagitta of fish from different habitats of southwest coast of Thailand. The sagittal otoliths were removed from skulls of fishes, cleaned, air dry and stored in vials. Morphology of sagitta was studied by scanning electron microscope (JEOL, JSM-6400). The otolith terminology are named after Smale et al. [2].

The sagitta shape of *C. argus*, *C. miniatus* and *C. formosa* are oblong, ovate and elliptic, respectively. The rostrum and antirostrum of sagitta in each fish species are well developed, smaller in *C. formosa* but larger and elongate in *C. argus* and *C. miniatus*. The sulcus type is heterosulcoid with ostial opening in all species. The ostium and cauda of sulcus in both *C. argus* and *C. miniatus* are deeper, elongate and well-defined. The dorsal depression above cauda of *C. argus* is oval and deep, in contrast, it is oval and shallow in *C. formosa* and elongate and narrow in *C. miniatus*. The ventral depression of *C. miniatus* is absent but that of *C. argus* and *C. formosa* is elongate and oval, respectively. The excisura in *C. argus* is moderate with shallow notch while it is large with deep and wide angle notch in *C. miniatus* and absent in *C. formosa*. The long, small and entire anterior margin is unique character of *C. formosa* but the high, large and irregular posterior margin is specific character of *C. miniatus*.

The different morphology of sagitta among these three fish species may be associated with differences in environmental factors and biological factors. The results of this study reveal that the morphology of sagitta of fish from cave and crevices of coral reef (*C. argus* and *C. miniatus*) is different from that of inshore species (*C. formosa*). The similar results have been reported and employed as a tool for identification of fish species and habitats of fish by many researchers [3-7].

References

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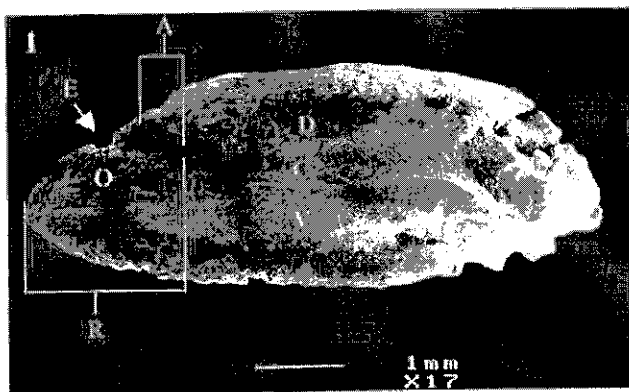


Fig. 1 The sagittal otolith of *Cephalopholis argus*
 Shape: oblong
 Rostrum (R): large and elongate
 Antirostrum (A): long and large
 Sulcus (O and C): heterosulcoid, ostial
 Cauda (C): elongate, deep, straight and flexed
 Ostium (O): large and elongate
 Dorsal depression (D): oval and deep above anterior cauda
 Ventral depression (V): elongate
 Excisura (E): narrow

Fig. 2 The sagittal otolith of *C. miniatus*
 Shape: ovate
 Rostrum (R): wide and round
 Antirostrum (A): short
 Sulcus (O and C): heterosulcoid, ostial
 Cauda (C): deep, straight and much flexed
 Ostium (O): deep, oval and moderate
 Dorsal depression: narrow, shallow and elongate
 Ventral depression: absent
 Excisura (E): large, notch very deep and wide angle
 Posterior margin (P): high, large and very irregular

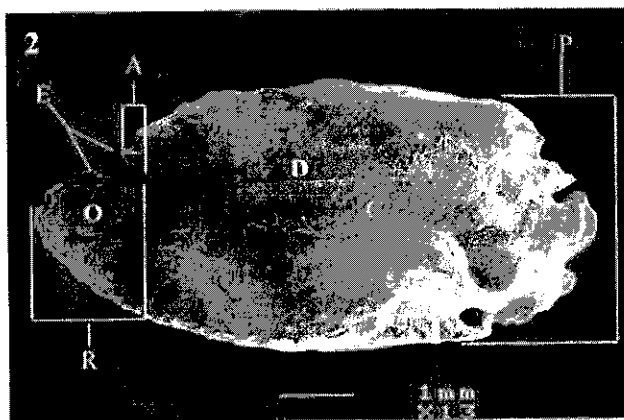


Fig. 3 The sagittal otolith of *C. formosa*
 Shape: elliptic
 Rostrum (R): small and short
 Antirostrum (A): minute
 Sulcus (O and C): heterosulcoid, ostial
 Cauda (C): shallow and narrow middle cauda
 Ostium (O): small
 Dorsal depression: oval and shallow above anterior cauda
 Ventral depression: oval posterior cauda
 Excisura: absent
 Anterior margin (N): long, small and entire

