



Introduction to the systematics and biodiversity of eels (orders Anguilliformes and Saccopharyngiformes) of Taiwan

HSUAN-CHING HO^{1,2}, JOHN E. MCCOSKER³, DAVID G. SMITH⁴ & KWANG-TSAO SHAO^{5*}

¹National Museum of Marine Biology & Aquarium, Pingtung, Taiwan

²Institute of Marine Biology, National Dong Hwa University, Pingtung, Taiwan

³California Academy of Sciences, San Francisco, California, U.S.A.

⁴Smithsonian Institution, Museum Support Center, Suitland, MD, U.S.A.

⁵Biodiversity Research Center, Academia Sinica, Taipei, Taiwan

*Corresponding author: E-mail: zoskt@gate.sinica.edu.tw

Abstract

The eel fauna (orders Anguilliformes and Saccopharyngiformes) of Taiwan is one of the richest in the world. Recent genetic and morphological studies have improved the taxonomic resolution and increased the known diversity of the eels of Taiwan, and the overall diversity is comparable to that of adjacent marine zoogeographic regions with rich biodiversity, such as Australia and the Philippines. In this special issue, we verified the historical records and examined numerous recently collected specimens, and conclude that the eel fauna of Taiwan is represented by 207 species in 75 genera and 14 families, with several undescribed species still likely to be discovered. The Muraenidae (71 species), Ophichthidae (60), Congridae (29) and Synphobranchidae (17) are the most abundant and species-rich in Taiwanese waters. We add 42 species to the Taiwanese fish fauna, including one new genus and 13 new species. Two further species are newly described, one from the Philippines and one from Indonesia.

Key words: Biodiversity, Pisces, Anguilliformes, systematics, Taiwan

The diversity of fishes of Taiwan

Taiwan lies in the western North Pacific Ocean, surrounded by the Pacific Ocean (east), the Okinawa trough (north), the Taiwan Straits (west), the South China and the Philippine seas (south). The diversity of its geographic features and various current systems (mainly Kuroshio Current) has resulted in a high diversity of marine fishes. Moreover, the small geographic area of Taiwan makes it even more significant in terms of marine fish diversity in the world.

The Taiwan Fish Database (Shao, 2015) lists about 3,100 species of fishes, representing 10% of the world fish species (about 31,000 species according to Eschmeyer, 2015). Allen (1979) recorded the diversity of butterfly fishes (family Chaetodontidae) and angelfishes (family Pomacanthidae) and the number of species of both families in Taiwan would rank them at the top in terms of species-richness. Shao *et al.* (2008) provided a checklist of fishes from southern Taiwan (northern South China Sea), which included 2,133 species of fishes, more than half of the known species from this region. Ebert *et al.* (2013) recorded the high diversity of chondrichthyes, making Taiwan one of the five most species-rich regions in the world.

Historical perspective on eel studies

Günther (1870) was the first to catalogue fishes from Taiwan (mostly collected by Robert Swinhoe), which included five eel species. Jordan & Evermann (1902) reported 186 fish species from Taiwan, including nine eel species (one as a leptocephalus). Two of them, *Anguilla remifera* (= *Anguilla japonica*) and *Gymnothorax*