Morphological changes during silvering of Japanese eels (*Anguilla japonica*) in different habitats from freshwater to the spawning area

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The Japanese eel *Anguilla japonica* is an important fisheries species that uses various habitats ranging from freshwater to coastal marine areas in East Asia where it is harvested for food and is grown in aquaculture. Some parts of its biological characteristics have been studied in few areas, but its final stages of maturation in the ocean are poorly known. The morphological changes that occur during silvering were studied in detail in eels from the Kyushu region of southern Japan, and these were compared to those of some of the first anguillid eels ever collected at their spawning area. The changes in 28 morphological characteristics including the typical traits of body coloration, eye diameter and pectoral fins were studied during early maturation from the yellow to silver eel stage in eels collected in freshwater, brackish and coastal marine habitats to examine differences in these characteristics between maturation stages. A total of 236 wild eels were collected from river (198 individuals) and coastal sea (27 individuals) habitats and were compared to mature spawning condition eels (11 matured individuals) from their spawning area near the West Mariana Ridge to learn about the process of sexual maturation. The specimens collected from river and coastal sea areas were divided into 168 yellow and 57 silver eels by their body color. Yellow and silver eels showed significant differences in anterior nostril tube length, height of anterior part of the dorsal fin and width of the lower jaw in females and males, and for eye index in males; and significant differences were observed between silver and matured eels. The height of lips (upper and lower), upper jaw length, and pectoral fin length were not different between silver and matured eels, possibly because these morphological characteristics are related to the stopping of feeding activity or adaptations for their long migration. More information about the whole maturation process of *A. japonica* and other anguillid eels may help to better understand the reproductive biology and causes of population declines of these fisheries species.