Redescription of the Hawaiian Ladyfish *Elops hawaiensis* from Korea

By Hyuck Joon Kwun, Chung Bae Kang\(^1\) and Jin Koo Kim\(^*\)

Department of Marine Biology, Pukyong National University, Busan 608-737, Korea
\(^1\)Korea Ocean and Fisheries Institute, Busan 608-807, Korea

**ABSTRACT** Redescription of the Hawaiian ladyfish *Elops hawaiensis* was carried out based on four specimens collected from Busan and Gwangyang between 2008 and 2010. This species has a gular plate between the symphysis and isthmus, and the entire premaxillary tooth band is exposed when the mouth is closed. Our Korean specimens of *E. hawaiensis* are characterized by having 65~67 vertebrae, 14 anal fin rays and 95~101 lateral line scales, which values differed slightly from those given in previous studies. Molecular analysis using 480 base pairs of mitochondrial DNA cytochrome \(b\) sequences showed that our four specimens corresponded well with *E. hawaiensis* (99.8~100.0%). Therefore, our results suggest that there may exist regional differences in vertebrae and anal fin ray counts for *E. hawaiensis*.

**Key words**: Redescription, Hawaiian ladyfishes, *Elops hawaiensis*, Korea

**INTRODUCTION**

Family Elopidae under the order Elopiformes are distributed globally in tropical and subtropical areas, and several species belonging to one genus (*Elops*) are recognized in the world (Eschmeyer and Fong, 2010). Of which two species, *Elops machnata* (Forsskål, 1775) and *E. hawaiensis* Regan, 1909 have been recognized in the Indo-Pacific (Whitehead, 1962), and only one species, *E. hawaiensis* has been recorded in Korea and Japan (Alzawa, 2002; Kim et al., 2005). However, taxonomic study of the family Elopidae is poorly-known except for a brief description (Nelson, 2006). Mori (1928) reported *E. machnata* in the Korean waters for the first time without any morphological description. Subsequently, many Korean ichthyologists regarded the species as *E. saurus* (Chyung, 1954), *E. machnata* (Chyung, 1977; Kim, 1983) and *E. hawaiensis* (Youn, 2002; Kim et al., 2005b). None of the previous authors provided any descriptions based on specimens, except the description of leptocephalus of *E. hawaiensis* by Kim et al. (2005a). Therefore, we re-described the morphological characteristics of *E. hawaiensis* adult collected from Korean waters, and also compared mitochondrial DNA cytochrome \(b\) sequences with those of Elopidae spp.

**MATERIALS AND METHODS**

The four specimens of *E. hawaiensis* were collected from Busan and Gwangyang, South Sea of Korea between 2008 and 2010, and were deposited at the Ichthyology laboratory, Pukyong National University (PKU). Counts and measurements were made according to Hubbs and Lagler (2004), with digital vernier caliper to the nearest 0.1 mm. The vertebrae were counted from radiograph (SOFTEX HA-100, Japan), following McBride and Horodysky (2004).

Genomic DNA was extracted from muscle tissue using 10% Chelex 100 Resin (Bio-rad, Hercules). The polymerase chain reaction (PCR) was used to amplify the mitochondrial DNA cytochrome \(b\) gene, following McBride and Horodysky (2004). Nucleotide sequence data reported here have been submitted to the DDBJ/EMBL/GenBank nucleotide sequence databases (accession number HQ157200~HQ157201, HQ616666~HQ616667). Mitochondrial DNA cytochrome \(b\) sequences were aligned using BioEdit version 7 (Hall, 1999), and for the molecular comparisons, we obtained the mitochondrial DNA cytochrome \(b\) sequences of three *Elops* species (*E. hawaiensis*, *E. saurus* and *E. smithi*).
**Elops hawaiensis Regan, 1909**
(Korean name: dang-mycol-chi)

(Fig. 1, Table 1)


**Description.** Counts and proportional measurements are shown in Table 1. Body elongated, compressed. Snout short, slightly pointed and mouth terminal. Maxilla covered side of lower jaw; posterior tip of maxilla beyond posterior margin of eye. Both jaw, vomer and palatine with small conical teeth. Whole premaxillary tooth band exposed when mouth closed. Gular plate present between symphysis and isthmus. Developed adipose tissue covered eye except pupil. Interorbital region concaved. All fins comprise of only soft rays. Axillary scales present at pectoral and pelvic fins. Pectoral fin located at ventral region of body and pelvic fin abdominal, located below origin of dorsal fin. Caudal fin deeply forked, length of both lobes equal. Lateral line extended to caudal fin base in a straight line. Body covered with small cycloid scales, but head exposed.

**Coloration.** When fresh, head and body lustrous silvery white and bluish dorsally. Pupil black, adipose tissue around eyes transparent. Tip of dorsal and caudal fins blackish, a lot of small melanophores present. Pectoral, pelvic and anal fins transparent, yellowish partially. After fixation, head and body lose luster; ventral body, upper jaw, anal fin and base of caudal fin dark yellowish. Adipose tissue semitransparent yellowish. Pectoral, pelvic and anal fins darkish.

**Distribution.** *E. hawaiensis* occurs in Busan (Mori, 1928, 1952; present study), Gwangyang (present study) and Jeju (Kim *et al.*, 2005a) from Korea. It occurs in the Indo-Pacific (Whitehead, 1962), Hawaii (Regan, 1909) and Japan (Aizawa, 2002).

**Remarks.** Two *Elops* species (*E. hawaiensis* and *E.