

New Record of the Spadenose Shark, *Scoliodon laticaudus* (Carcharhiniformes: Carcharhinidae) from South Sea, Korea

By Hyun-Geun Cho, Seon-Man Kweon* and Byung-Jik Kim¹

Animal Resources Division, National Institute of Biological Resources

¹Biological and Genetic Resources Utilization Division, National Institute of Biological Resources

ABSTRACT The spadenose shark, *Scoliodon laticaudus*, belongs to the family carcharhinidae was described as the first record from Korea based on a single specimen collected from the South Sea of Korea. The species is characterized by having a greatly depressed and trowel-shaped head, a depressed and long snout, triangular pectoral fins, and posterior tip of the first dorsal fin reaching the middle of pelvic fin. We propose a new Korean names of the genus *Scoliodon* and the species *S. laticaudus* as “Nab-jag-ju-dung-i-sang-eo sog” and “Nab-jag-ju-dung-i-sang-eo”, respectively.

Key words : *Scoliodon laticaudus*, Carcharhinidae, first record, description

INTRODUCTION

A small carcharhinid genus *Scoliodon* are represented by Müller and Henle, 1837 with *S. laticaudus* Müller and Henle, 1838 as the type species and characterized by having the tip of the posterior margin of the first dorsal fin almost reaching the mid-base of pelvic fin, a extremely depressed and trowel-shaped head, more compressed and taller caudal peduncle, and more triangular pectoral fins (Müller and Henle, 1838; Springer, 1964; Compagno, 1984, 1988, 2001; Yoshino and Aonuma, 2002; White *et al.*, 2010). In this genus, there have been Indo-Pacific species *S. laticaudus* and *S. macrorhynchus* (Bleeker, 1852) (White *et al.*, 2010; Eschmeyer, 2014).

We found recently a single shark specimen belongs to carcharhinidae from fish collections of NIBR (National Institute of Biological Resources, Korea) donated by Naro High School, Goheung, Korea. It was collected from the Yeosu fish market, Southwestern Korea in 1995, and identified as *Scoliodon laticaudus* Müller and Henle, 1838, showing the widespread Indo-Pacific distribution: that is, from Northeast Africa to Southern Japan (Springer, 1964; Compagno, 1984, 1988, 2001; Nakaya, 1984; Yoshino and Aonumao, 2002). Although four genera with nine species of carcharhinid sharks have been recorded from the Korean coastal waters to date, no reports of the *Scoliodon* species were made (Choi, 2009; Kim *et*

al., 2011). Therefore, we herein describe *S. laticaudus* as the first record from Korea based on a single specimen collected from the South Sea of Korea.

Terminology and method of measurements generally follow those of Compagno (1984, 1988, 2001), and measurements were expressed as percentage of total length. Vertebral terminology, method of counting, and vertebral ratio follow Springer (1964) and Springer and Garrick (1964). Vertebrae was counted by a radiograph.

The present specimen examined is deposited in National Institute Biological Resources (NIBR-P), Korea.

Scoliodon Müller and Henle, 1837

(New Korean name: Nab-jag-ju-dung-i-sang-eo sog)

Scoliodon Müller and Henle, 1837: 114 (type species: *Scoliodon laticaudus* Müller and Henle, 1838).

Head greatly depressed, and trowel-shaped. Snout parabolic or bell-shaped in dorsoventral view, very long, with preoral length greater than internarial space and mouth width. Pectoral fins triangular. Origin of pectoral fins below or only slightly level of fifth gill silt. First dorsal fin free rear tip almost over mid-base of pelvic fin (after Springer 1964; Compagno, 1984).

Scoliodon laticaudus Müller and Henle, 1838

(New Korean name: Nab-jag-ju-dung-i-sang-eo)

(Fig. 1; Table 1)

Carcharias (*Scoliodon*) *laticaudus* Müller and Henle, 1838: 27, Pl. 8 (type locality: India).

*Corresponding author: Seon-Man Kweon Tel: 82-32-590-7151
Fax: 82-32-590-7250, E-mail: Kweonsm@korea.kr



Fig. 1. *Scoliodon laticaudus* from South Sea, Korea, NIBR-P19805, female, 350.0 mm TL.

Scoliodon laticaudus: Springer, 1964: 574, fig. 2 (Singapore); Nakaya, 1984: 5 (Japan); Compagno, 1988: 284 (Indo-Pacific); Randall and Lim, 2000: 569 (China); Compagno, 2001: 534 (Indo-Pacific); White *et al.*, 2010: 61 (India).

Material examined. NIBR-P19805, 349.0 mm in total length (TL), Yeosu fish market, Yeosu-si, Jeollanam-do, Korea, January 1995.

Description. Some proportional measurements are given in Table 1.

Total vertebrae 165; body vertebrae 110, caudal vertebrae 55. Teeth rows 25/24, four series of teeth functional; upper teeth 12+1+12, lower teeth 11+2+11. Proportion of percentage in TL: precaudal length 75.8, pre-second dorsal length 64.9, pre-first dorsal length 36.7, head length 23.9, pre-branchial length 19.4, preorbital length 10.8, preorbital length (horz.) 10.1, preoral length 9.5, prenarial length 8.1, prenarial length (horz.) 6.1, prepectoral length 23.9, prepelvic length 47.2, snout-vent length 49.1, preanal length 59.6, interdorsal space 19.4, dorsal-caudal space 19.4, pectoral-pelvic space 19.6, pelvic-anal space 6.7, anal-caudal space 7.4, eye length 1.9, eye height 1.5, intergill length 4.5, interorbital space 9.3, nostril width 1.8, internarial space 6.2, anterior nasal flap length 0.5, mouth length 4.8, mouth width 5.9, upper labial furrow length 0.3, lower labial furrow length 0.8, vent caudal length 32.4, first gill silt height 2.2, third gill silt height 2.5, fifth gill silt height 2.3, head height 7.4, trunk height 9.1, tail length 6.5, caudal peduncle height 4.5, head width 10.3, trunk width 8.2, tail width 4.5, caudal peduncle width 2.1, pectoral length 9.9, pectoral anterior margin 10.0, pectoral base 5.9, pectoral height 7.7, pectoral inner margin 5.6, pectoral posterior margin 8.1, pelvic length 7.2, pelvic anterior margin 4.5, pelvic base 5.6, pelvic height 2.6, pelvic inner margin 2.1, pelvic posterior margin 3.9, first dorsal length 12.4, first dorsal anterior margin 11.9, first dorsal base 8.9, first dorsal height 6.4, first dorsal inner margin 4.1, first dorsal posterior margin 6.5, second dorsal length 6.7, second dorsal anterior margin 3.6, second dorsal

base 3.3, second dorsal height 2.1, second dorsal inner margin 3.8, second dorsal posterior margin 3.5, anal length 10.9, anal anterior margin 5.3, anal base 7.9, anal height 2.2, anal inner margin 2.9, anal posterior margin 6.5, dorsal caudal margin 22.4, preventral caudal margin 8.7, lower postventral caudal margin 3.3, upper postventral caudal margin 11.0, caudal fork width 6.1, caudal fork length 8.5, subterminal caudal margin 4.9, terminal caudal margin 4.3, terminal caudal lobe 7.1, second dorsal midpoint-pelvic origin 5.5, second dorsal insertion-anal insertion 1.1, first dorsal midpoint-pectoral origin 12.8, first dorsal midpoint-pelvic origin 5.0, pelvic midpoint-first dorsal insertion 3.8, pelvic midpoint-second dorsal insertion.

Head extremely flattened, trowel-shaped. Snout very depressed, parabolic or bell-shaped, and long. Nostrils moderate with large incurrent apertures and anterior nasal flap as short, and low ridge. Eyes circular and small without posterior notches. Spiracle absent. Mouth narrowly arched and moderated. Labial furrow on both jaws very short; upper furrow much shorter than lower one. Five gill silts moderate in size; third gill silt a little larger than others. Gill rakers absent. Upper and lower teeth with strongly oblique, blade-like cusps, without cusplets or serrations. Pectoral fins small and triangular, not falcate; anterior margin slightly convex and posterior margin slightly concave. Pelvic fins small, triangular; its anterior margin almost straight and posterior margin somewhat concave. First dorsal fin small, triangular; its anterior and posterior margin convex and slightly concave, respectively. Origin of first dorsal fin located behind rear tip of pectoral fin. Tip of posterior margin of first dorsal fin almost over mid-base of pelvic fins. Second dorsal fin very small, low. Second dorsal fin origin located behind anal fin origin. Anal fin long with a relatively long base. Caudal peduncle markedly compressed. Caudal fin relatively moderate with short terminal lobe.

Color in alcohol. Body uniformly yellowish grey with blackish margin in all fins.

Distribution. Known from Indo-West Pacific: Tanzania, Pakistan, India, Sri Lanka, Malaysia, Singapore,

Table 1. Proportional dimensions in percent of total length of *Scoliodon laticaudus*

	Present study	White <i>et al.</i> , (2010)	Springer (1964)	
	Female (n=1)	n=7	Male (n=5)	Female (n=8)
Total length (mm)	350	169 ~ 524 (323)	165 ~ 484 (317.2)	153 ~ 542 (370.4)
Head length	23.9	23.7 ~ 29.1 (25.4)	–	–
Pre-first dorsal length	36.7	35.1 ~ 38.8 (36.8)	34.7 ~ 40.6 (37.5)	35.1 ~ 40.8 (37.6)
Preoral length	9.5	7.7 ~ 11.1 (9.2)	7.4 ~ 11.2 (9.0)	8.3 ~ 10.5 (9.3)
Prenarial length	8.1	7.2 ~ 9.1 (8.0)	–	–
Prepectoral length	23.9	24.0 ~ 26.4 (24.8)	20.9 ~ 28.4 (24.0)	22.4 ~ 27.4 (24.2)
Prepelvic length	47.2	45.2 ~ 48.4 (46.5)	44.4 ~ 49.6 (46.6)	44.8 ~ 48.8 (47.0)
Preanal length	59.6	56.7 ~ 59.9 (58.3)	59.4 ~ 62.3 (60.4)	57.7 ~ 61.5 (60.0)
Eye length	1.9	1.5 ~ 2.2 (1.9)	1.4 ~ 2.7 (2.1)	1.0 ~ 3.3 (1.9)
Internarial space	6.2	4.9 ~ 6.9 (6.0)	5.0 ~ 7.0 (6.0)	4.8 ~ 7.2 (5.9)
Mouth length	4.8	4.9 ~ 5.6 (5.1)	4.5 ~ 6.7 (5.6)	4.8 ~ 6.1 (5.1)
Mouth width	5.9	6.0 ~ 7.0 (6.8)	5.7 ~ 7.5 (6.7)	5.6 ~ 7.8 (6.6)
Upper labial furrow length	0.3	0.2 ~ 0.6 (0.4)	0.1 ~ 1.1 (0.4)	0.1 ~ 0.4 (0.2)
Lower labial furrow length	0.8	0.8 ~ 1.2 (1.0)	0.7 ~ 2.8 (1.4)	0.4 ~ 1.1 (0.8)
Anal base	7.9	8.0 ~ 9.3 (8.9)	7.0 ~ 8.4 (7.7)	6.9 ~ 8.2 (7.7)
Origin of second dorsal fin-origin of anal fin	5.5	4.6 ~ 6.2 (5.5)	–	–

Thailand, Java, Borneo, China, Taiwan, and Japan (Compagno, 2001). In the present study, the species was obtained from fish local market facing to the South Sea of Korea.

Remarks. The present specimen was not compared with original description or type specimen of *S. laticaudus* for strict identification to species. However, the our material from the Korean waters is characterized by having greatly depressed and trowel-shaped snout, triangular pectoral fins, posterior tip of first dorsal fin almost over mid-base of pelvic fin in close association with the original figure of *Scoliodon laticaudus* made by Müller and Henle (1838). Their proportional measurements and meristic counts also fit into the subsequent description of Springer (1964) and White *et al.* (2010) (Table 1). Although slight differences can be seen in some morphometrics, e.g., mouth length, mouth width, and anal base, between our result and the morphological data by White *et al.* (2010), these could be explained as intraspecific variation considering the data given by Springer (1964) (Table 1). Therefore, we identified the specimen collected from Korea as *S. laticaudus*, and proposed a new Korean name of the genus *Scoliodon*, and *S. laticaudus* as “Nab-jag-ju-dung-i-sang-eo sog”, and “Nab-jag-ju-dung-i-sang-eo”, respectively.

Springer (1964) recognized *Scoliodon laticaudus* as senior synonym of *S. macrorhynchus*. However, White *et al.* (2010) mentioned DNA sequence divergence between them, and morphologically differentiated *S. laticaudus* (425 and 524 mm TL) from *S. macrorhynchus* (426 ~ 562 mm TL, n=10) in having a longer head (23.7 ~ 24.0 vs. 21.3 ~ 23.0% TL) and prepectoral length (24.1 vs. 20.1 ~ 22.7% TL), and a slightly shorter length of anal fin (11.4 ~ 12.1 vs. 12.4 ~ 14.1% TL) in adult, and shorter length (4.6 ~ 6.2% TL in *S. laticaudus* vs. 6.0 ~ 9.1% TL in *S. macrorhynchus*) from the origin of

second dorsal fin to the origin of anal fin in all specimens. Although our result well correspond with diagnostic characters of *S. laticaudus* given White *et al.* (2010), both the molecular and morphology analyses are needed for more strict species identity in the future through collection of additional specimens of *S. laticaudus* from Korea.

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*Scoliodon*속 어류의 1 미기록종, *Scoliodon laticaudus*

조현근 · 권선만 · 김병직¹

국립생물자원관 동물자원과, ¹유용자원활용과

요 약 : 우리나라 남부연안에서 채집된 1개체 (전장 350.0 mm)의 표본을 근거로 흉상어과에 속하는 *Scoliodon laticaudus*를 한국미기록종으로 기재 · 보고한다. 본 종은 머리가 매우 납작한 삼모양이며 주둥이가 길고 납작한 점 가슴지느러미가 삼각형이며 제 1 등지느러미 후단이 배지느러미 중앙부분까지 도달하는 특징이 있다. 본 속과 종의 신한국명으로 각각 “납작주둥이상어속”과 “납작주둥이상어”를 제안한다.

찾아보기 낱말 : *Scoliodon laticaudus*, 흉상어과, 한국미기록종, 기재