First Records of *Chelmo rostratus* and *Forcipiger longirostris* from the Waters of Taiwan

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Chelmo rostratus (Linnaeus) is known to occur in the coastal waters of southern Japan (Masuda et al., 1975) and appears to be a common butterflyfish from the Philippines to Australia (Fowler and Bean, 1929; Marshall, 1965). However, only one specimen of the species has been collected since the review on Chaetodontidae of Taiwan was undertaken by Shen (1973) in 1968.

Randall (1961) reported three species of the genus *Forcipiger* from the Indo-Pacific area: *F. longirostris* (Broussonet), *F. inornatus* Randall, and *F. cyrano* Randall. Following the discovery by Wheeler (1964) of the type specimen of *F. longirostris* in the British Museum, Randall and Caldwell (1970) concluded that there are only two valid species, namely, *F. flavissimus* and *F. longirostris*. The dark *F. inornatus* was recognized merely as a color phase of *F. longirostris*. All previous records of *F. longirostris* from the waters around Taiwan before Shen (1973) were actually those of *F. flavissimus* (Fowler, 1953; Chen, 1953, 1969; Chen and Chao, 1971; Jones et al., 1972). True *F. longirostris* from Taiwan is reported here for the first time.

All specimens available for the present study were deposited in the Museum of the Department of Zoology, National Taiwan University (NTUM).

Counts and measurements were recorded in the same way as proposed by Hubbs and Lagler (1958) except that the height of head was measured along a vertical line passing through the posterior edge of eye. Meristic measurements were made point-to-point with needlepoint dial calipers to the nearest 0.1 mm, and were expressed in proportions.

Key to species of *Chelmo and Forcipiger* from Taiwan

1. Dorsal with 9 spines (*Chelmo*)..*C. rostratus*
   Dorsal with 11～12 spines (*Forcipiger*)...2
2. Dorsal with 11 spines and 25～26 soft rays; second dorsal spine less than half of the third dorsal spine; snout notedly long, length 3.17 to 3.33 in standard length; interopercular angle acute.....*F. longirostris*
   Dorsal with 12 spines and 22～23 soft rays; second dorsal spine more than half of the third dorsal spine; length of snout 3.55 to 4.07 in standard length; interopercular angle broadly rounded.....*F. flavissimus*

Chelmo rostratus (Linnaeus)
(Japanese name: Hashinaga-chocho-uo)
Fig. 1

Chaetodon rostratus Linnaeus, 1758: 273 (East Indies); Lacepède, 1802: 457 (Batavia).
Chelmo rostratus: Günther, 1860: 36 (Celebes, Singapore, India, Port Essington); Fowler and Bean, 1929: 42 (Philippines); Masuda et al., 1975: 316, fig. B on p. 123 (Japan).
Chelmon rostratus: Bleeker 1877: 22, pl. 369, fig. 2 (Queensland, Cape York); Herre and Montalban, 1927: 12 (East Indies); Weber and de Beaufort, 1936: 20, fig. 8 (Indo-Australian areas); Burgess and Axelrod, 1971: 73 (Philippines).
Chelmon rostratus marginalis: Marshall, 1964: 248, fig. 256 (Australia).

Material. NTUM 02799, 62.3 mm SL, from Tai-tung, on April 1, 1977.

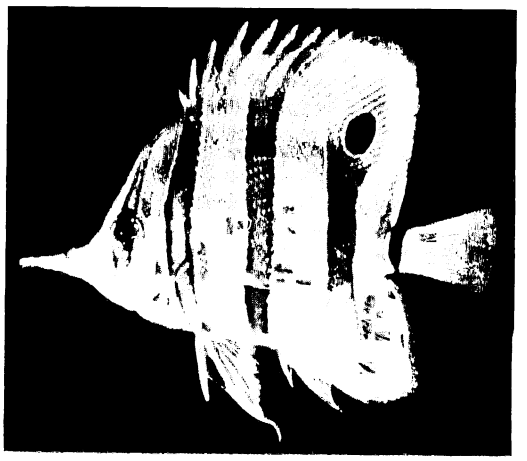


Fig. 1. *Chelmo rostratus* (Linnaeus), NTUM 02799, 62.3 mm SL, from Tai-tung.

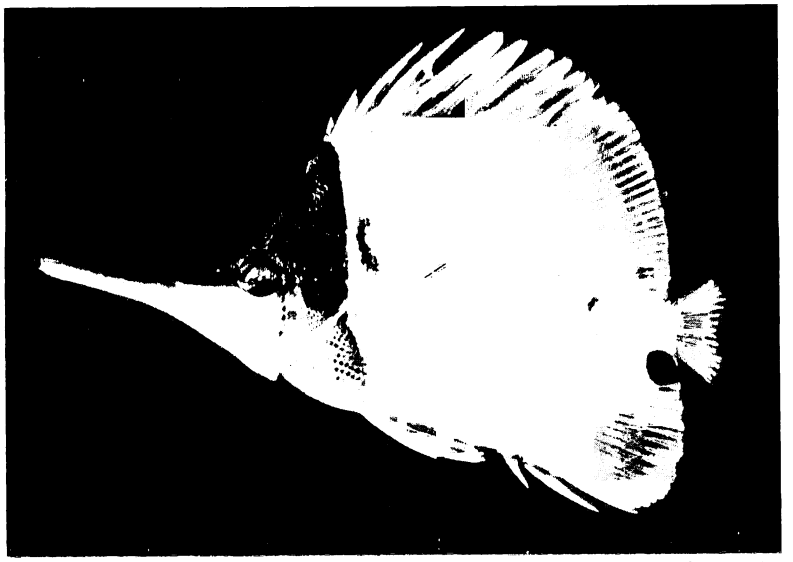


Fig. 2. *Forcipiger longirostris* (Broussonet), NTUM 02797, 131.2 mm SL, from Hung-chun. The two black patches on the side are artifacts.

Description. D. IX, 30; A. III, 19; P_1 15; P_2 I, 5; C. 17. Scale counts 10/46/22. Head length 2.19; height of head 2.32; width of head 3.68; snout length 4.12; length of caudal peduncle 14.83; least depth of caudal peduncle 9.43; dorsal base 1.59; anal base 2.84, all in standard length. Horizontal eye diameter 4.3 and interorbital space 5.68, both in head length.

Color in formalin pearly-white, becoming yellowish posteriorly. Five vertical bands, 4 orange-yellow with dark brown margins and the last one black; the 1st band from nape through eyes to opercular angle; 2nd from base of 1st~3rd dorsal spine, passing posterior part of opercle, to origin of ventral; 3rd from base of 6th~9th dorsal spine to anal origin; 4th from base of 9th~20th dorsal ray through base of 6th~12th anal ray, fading into the yellow of the anal fin. A narrow stripe of orange-yellow with black margins, on mid-dorsal of head, extending from nape to tip of snout. Pectorals dusky with anterior and posterior borders yellowish. Margins of anal and dorsal orange-brown with submarginal greyish band.

Forcipiger longirostris (Broussonet)
Figs. 2 and 4A

Chaetodon longirostris Broussonet, 1782, no pagination (Hawaii).

Forcipiger longirostris: Fowler and Bean, 1929: 45, fig. 2 (in part; Philippines); Randall and Caldwell, 1970: 727, figs. 1~2 (Hawaiian Is., East Indies, Solomon Is., Marshall Is., Guam, Wake I., Comoro Is.).

Forcipiger cyrano Randall, 1961: 60, fig. 5 (Celebes).

Forcipiger inornatus Randall, 1961: 58, fig. 4 (Hawaii); Randall and Caldwell, 1970: 727, fig. 1 (Hawaii, Guam, Comoro Is. Tuamotu Arch.).

Material. NTUM 02797, 131.2 mm SL, 3~8 meter deep, Hung-chun, February 26, 1973; NTUM 02808, 85.5 mm SL, Hou-pi-hu, December 9, 1976.

Description. D. XI, 25~26; A, III, 19; P_1 14~15; P_2 I, 5; C. 17. Scale counts 11~12/65~67/28~29. Head length 2.05~2.10; height of head 3.38~3.74; width of head 5.16~5.57; snout length 3.17~3.33; length of caudal peduncle 20.85~21.16; least depth of caudal peduncle 13.79~14.58; dorsal base 1.71~1.72; anal base 3.32~3.68, all in standard length. Horizontal eye diameter 5.23~6.74; interorbital space 7.53~7.55; gape of mouth 16.56~18.36, all in head length.

Color in formalin light yellowish brown. Nape and head dark brown above a horizontal line passing through lower edge of eye and

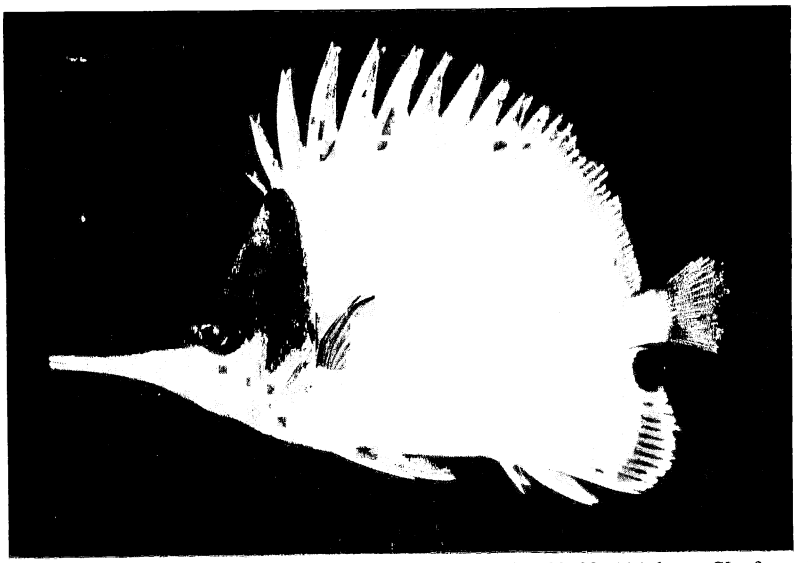
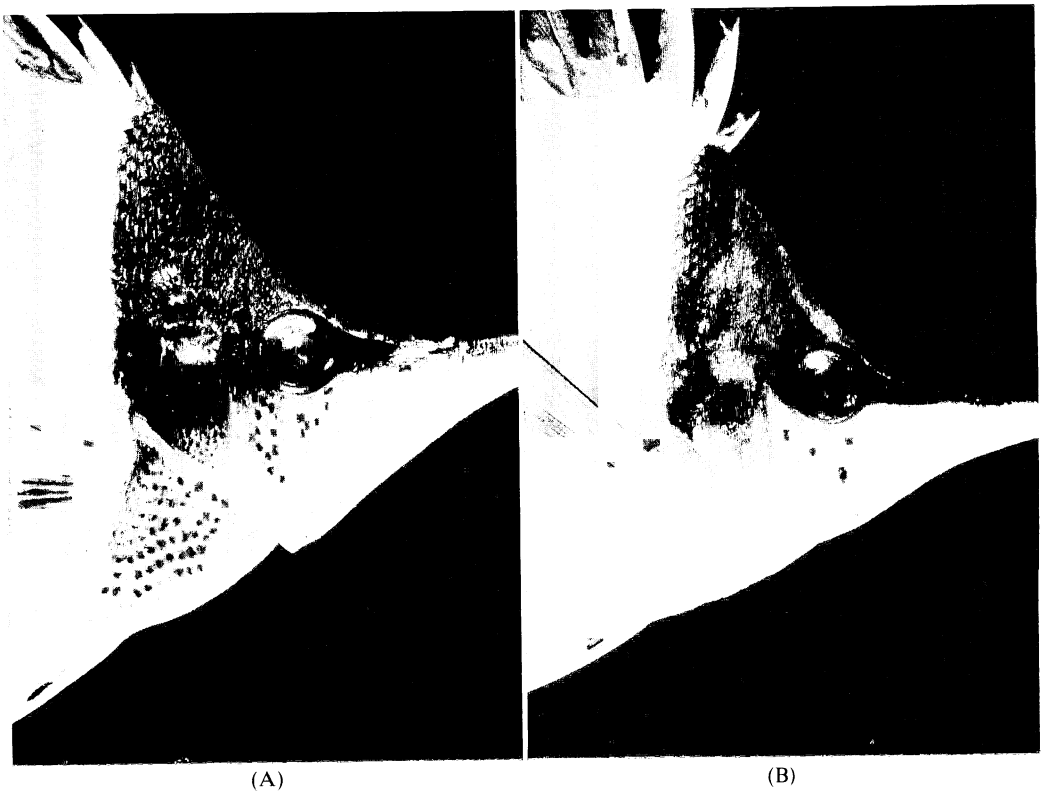


Fig. 3. *Forcipiger flavissimus* Jordan et McGregor, NTUM 02798, 114.6 mm SL, from Hung-chun.



(A) (B)

Fig. 4. The thorax of *Forcipiger longirostris* is characterized by rows of dark-brown spots (A); in *F. flavissimus* these spots are absent (B).

anterior to a vertical from origin of dorsal fin to base of pectoral fin. Interorbital space yellowish and spindle-shaped with a bisecting dark brown stripe extending towards tip of snout. Tubular portion of snout pigmented dorsally as an anterior extension of the triangular dark brown area of the head. Seven to nine rows (number variable) of dark brown spots running obliquely on thorax. A black spot two-thirds as large as eye on outer posterior part of anal fin.

Comparison. The color patterns of *F. longirostris* and *F. flavissimus* are very similar. However, *F. longirostris* is noted for a number of oblique rows (7~9 rows in specimens examined) of dark brown spots on the thorax (Figs. 4, A and B), and a mid-dorsal black stripe on the interorbital space (Randall, 1961: fig. 6).

Lateral line scale counts show an overlap of the ranges for the two species (Table 1). Though the count of scale rows above the lateral line is 11~12 for *F. longirostris* (Table 2), it is risky to say conclusively that this character effects safe separation from *F. flavissimus*.

Fin ray counts reveal some differences (Table 3). *Forcipiger longirostris* has 11 dorsal spines while *F. flavissimus* invariably possesses 12. Besides, there are more soft rays in the dorsal and anal fins of *F. longirostris* than in those of *F. flavissimus*. In addition to having a smaller gape (Fig. 5), a longer snout (Fig. 6), and a serrated preopercular margin as noted by Randall (1961), *F. longirostris* is distinguished from *F. flavissimus* by a more laterally compressed head (Fig. 7) and an acute interopercular angle (Figs. 4, A and B). The second dorsal spine of *F. longirostris* is contained more than twice in the third dorsal

Table 1. Counts of lateral line scales of *Forcipiger longirostris* and *F. flavissimus* from Taiwan.

Species and locality	Lateral line scales									
	65	66	67	68	69	70	71	72	73	74
F. longirostris										
Hung-chun	1									
Hou-pi-hu			1							
F. flavissimus										
Hung-chun				1	3	3		1		1
Hung-tsai-kung						1				
Hou-pi-hu			1				1	1		1
Pai-sa						1				
Wan-li-tung			1							

Table 2. Counts of scale rows above and below lateral line of *Forcipiger longirostris* and *F. flavissimus* from Taiwan.

Species and locality	Scale rows									
	above l. l.					below l. l.				
	11	12	13	14	15	28	29	30	31	32
F. longirostris										
Hung-chun	1					1				
Hou-pi-hu		1					1			
F. flavissimus										
Hung-tsai-kung				1					1	
Hou-pi-hu				2	2			1	3	1
Pai-sa				1				1		
Wan-li-tung			1				1			

Table 3. Fin ray counts of *Forcipiger longirostris* and *F. flavissimus* from Taiwan. C, principal caudal rays.

Species and locality	D							A				P_1		P_2		C
	XI	XII	22	23	24	25	26	III	17	18	19	14	15	I	5	17
F. longirostris																
Hung-chun	1						1	1			1	1		1	1	1
Hou-pi-hu	1					1		1			1	1		1	1	1
F. flavissimus																
Hung-chun		10	2	7	1			10	2	8		3	7	10	10	10
Hung-tsai-kung		3		2	1			3	1	2		1	2	3	3	3
Hou-pi-hu		6		4	2			6	2	4			6	6	6	6
Pai-sa		1			1			1		1			1	1	1	1
Wan-li-tung		2			2			2		2			2	2	2	2

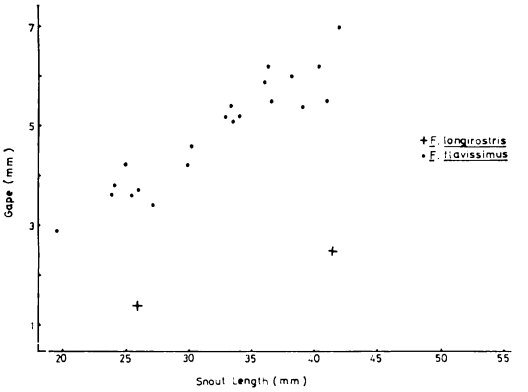


Fig. 5. Relationship of gape of mouth to snout length of *Forcipiger longirostris* and *F. flavissimus* from Taiwan.

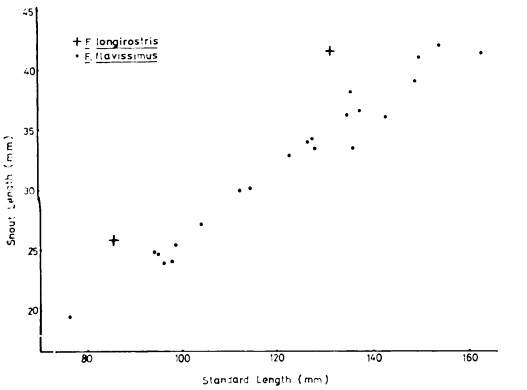


Fig. 6. Relationship of snout length to standard length of *Forcipiger longirostris* and *F. flavissimus* from Taiwan.

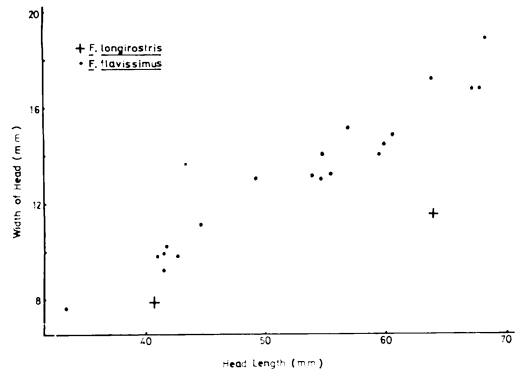


Fig. 7. Relationship of width of head to head length of *Forcipiger longirostris* and *F. flavissimus* from Taiwan.

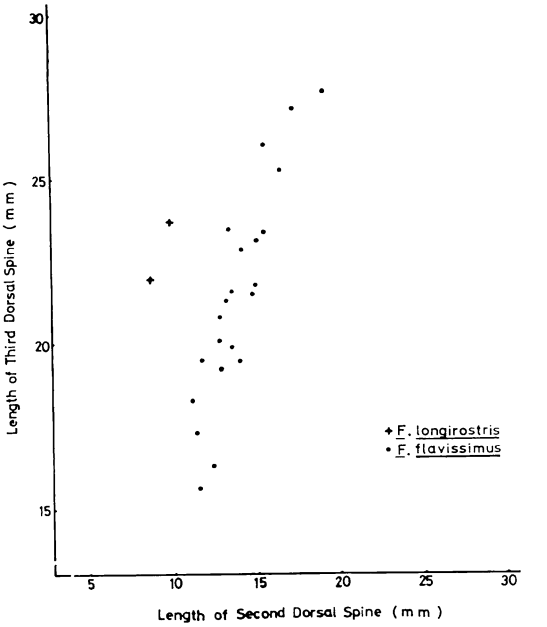


Fig. 8. Comparison of the length of 2nd dorsal spine with that of 3rd dorsal spine of *Forcipiger longirostris* and *F. flavissimus* from Taiwan.

spine (2.37～2.49), but that of *F. flavissimus* attains a length at least half as long as the third dorsal spine (1.32～1.65). This is another distinctive difference (Fig. 8).

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台湾から初記録のハシナガチョウチョウウオと *Forcipiger longirostris*

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Chelmo rostratus (Linnaeus) ハシナガチョウチョウウオおよび *Forcipiger longirostris* (Broussonet) が台湾から初めて記録された. *Forcipiger longirostris* と *F. flavissimus* Jordan and McGregor フエヤッコダイの比較を行ない，これら3種の検索表を作成した.

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