

**TAXONOMIC STUDY ON THE LANCELETS
FOUND IN THE GULF OF THAILAND, FROM THE
SPECIMENS COLLECTED BY THE NAGA
EXPEDITION IN THE GULF OF THAILAND AND
SOUTH CHINA SEA (1959-1961)**

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(With 1 Table, 4 Figs.)

Introduction

During the Naga Expedition in the Gulf of Thailand and South China Sea (1959-1961), many specimens of lancelets were found in bottom grab samples taken from various parts of the Gulf. There are no previous record of the occurrence of the lancelets in the Gulf region. However, *Webb* (1956 a) has reported two species of *Branchiostoma* from the east coast of Singapore Island.

This paper is to record three species of the *Leptocardii* from the Gulf of Thailand for the first time and to provide a key to those species for future work.

The author wishes to thank Prof. *Supachai Vanij-Vadhana*, Prof. *Kloom Vajaropala*, and Mr. *Kasin Suvatabandhu* for their advice, Prof. *Laung Sri S. Vichakij*, Botany Department, Chulalongkorn University and Dr. *A.H. Banner*, Director Hawaii Marine Laboratory, University of Hawaii, for reading manuscript, Dr. *Edward Brinton*, Scripps Institution of Oceanography, University of California who kindly permitted him to examine the specimens collected during the Naga Expedition, and to Mr. *Surapol Sudara* for the illustrations.

Key of the lancelets found in the Gulf of Thailand.

The following key, in part, has been adapted from *Bigelow* and *Farfante* (1948). It includes one family and two genera not reported from this region; these have been marked with an asterisk.

KEY TO FAMILIES

1. a. Mouth nearly median, with oral cirri; atrial chamber closed, with a series of gill clefts on either side:—
2. a. Gonads developed on either side; both metapleura terminating closely behind atriopore *Branchiostomidae*
2. b. Gonads developed on right side only; both metapleura either terminating closely behind atriopore or with right metapleuron continuous with ventral fin *Epigonichthyidae*
1. b. Mouth on left side, without oral cirri; no closed atrial chamber; gill clefts in a single series along ventral side *Amphioxidae*

FAM. BRANCHIOSTOMIDAE

Key to Genera

1. a. Rostral process, including anterior end of notochord, extending far beyond preoral hood *Dolichorhynchus* Willey*
1. b. Rostral process, including anterior end of notochord, extending only a short distance beyond preoral hood *Branchiostoma* Costa

GENUS BRANCHIOSTOMA

Key to Species

1. a. Total segments of myotome 64-66. *B. belcheri* (Gray)
1. b. Total segments of myotome 51-52. *B. malayana* Webb.

FAM. EPIGONICHTHYIDAE

Key to Genera

1. a. Caudal fin as well as notochord not prolonged; both metapleura terminating a short distance behind atriopore. *Epigonichthys* Peters
1. b. Caudal fin as well as notochord much prolonged; right metapleuron continuous with ventral fin, left metapleuron terminating behind atriopore *Asymmetron*, Andrew

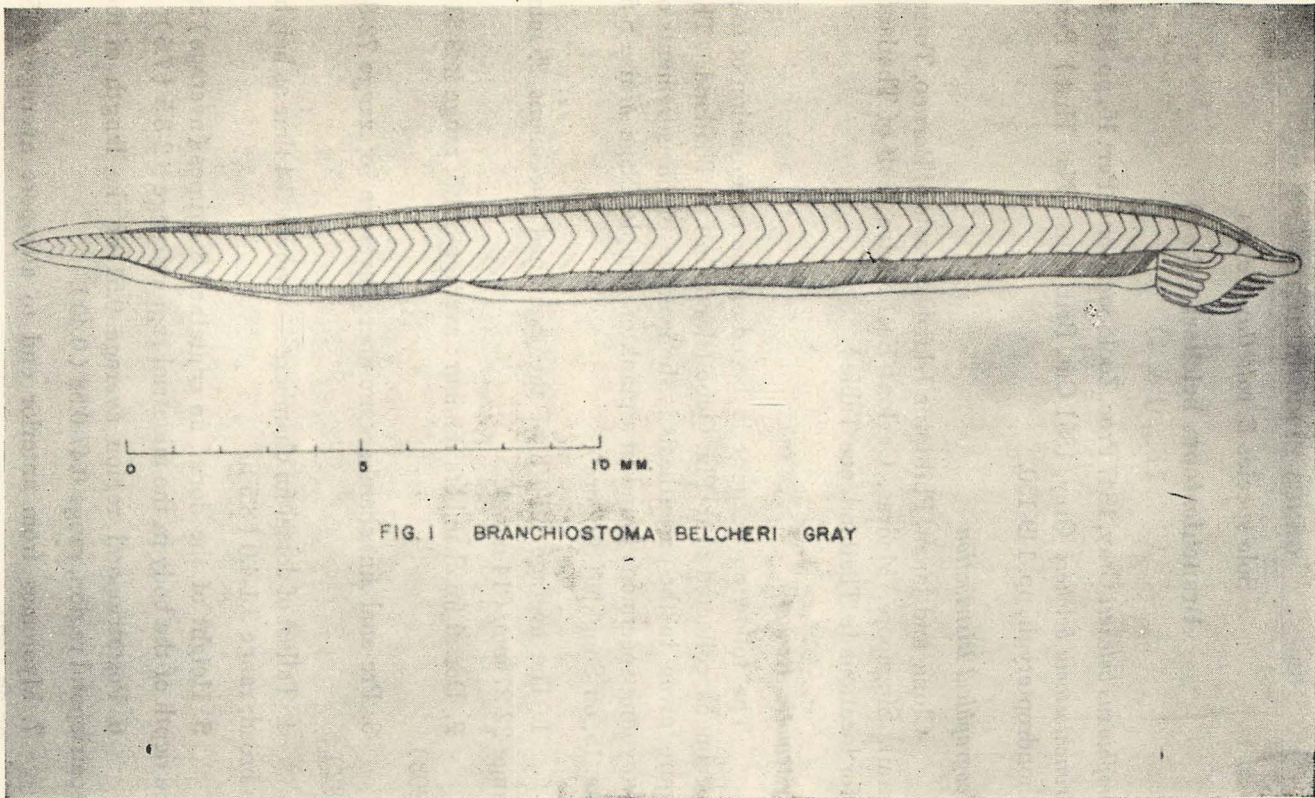


FIG. 1 BRANCHIOSTOMA BELCHERI GRAY

GENUS EPIGONICHTHYS

Sole species *E. cultellus*, Peters**Branchiostoma belcheri** (Gray)

(Fig. 1 & 4)

Amphioxus belcheri Gray, 1847 Proc. Zool. Soc. Lond. Part 15, pp. 35-36
Branchiostoma belcheri Gray, 1851 Cat. Brit. Mus. (Nat. Hist.) Part,
 Chondropterygii, pp. 149-150.

Geographical Distribution

China and Japan, Phillipine Islands, Coasts of Borneo, Torres Strait, Singapore, Madras, Ceylon, East Africa, Gulf of Thailand. (for locations in Thailand, see Table)

Systematic Account

The following account is based on the examination of four specimens collected near Phu Quoc Island Gulf of Thailand. The figure given in the parenthesis is the average of measurements of two young specimens found in a plankton sample, Naga cruise S-5, Sta. 15, off Songkla (Singora).

1. The average length of the examined specimens 25 mm. range 22-27 mm. (14 mm.).

2. Dorsal fin chambers number : average 301.5; range 289-314 (303).

3. Pre-anal fin chambers number : average 78; range 72-84 (82).

4. Tallest of dorsal fin chambers :— average 3.4 time as height as broad; range 3.1-4.0 (3.5).

5. Height of the dorsal fin contained 8.4 times (average) in the depth of the body in the midatrial region, range 8.2-8.5 (7.5).

6. Postatrioporal region average 0.51 of the length of the preatrioporal region, range 0.47-0.58 (0.40).

7. Myotomes from anterior end to atriopore average 36.5, range 36-37 (37).



0 5 10mm.

FIG. 4. DIAGRAMATIC DRAWING OF BRANCHIOSTOMA BELCHERI
FOUND IN THE PLANKTON SAMPLE OF CRUISE S-5, ST. 15

8. Myotomes from atriopore to anus average 18.5, range 18-19 (18).

9. Myotomes posterior to anus 10 (10).

10. Total myotomes average 65, range 64-66 (65).

The following characteristics also assist in the recognition of this species. The dorsal fin is little higher in the posterior part than the anterior and it is separated from the rostrum by posterior rostral notch. Some of the dorsal fin chambers are subdivided by dorsal fin rays. In the mature specimens caudal fin runs smoothly into preanal fin with very little of the terminal notch. However, the young specimens from plankton samples show a rather distinct notch in both upper and lower lobes (Fig. 4.). The preanal fin is narrow and its chambers extend beyond half its width. The anus is situated more advance of the center of the lower lobe of the caudal fin. The tentacular cirri are prominent even in the long preserved specimens.

BRANCHIOSTOMA MALAYANA, WEBB

(Fig. 2)

Branchiostoma malayana, Webb, 1956 Proc. Zool., Lond. 127 (1): 121-123, Fig. 1.

Geographical Distribution

Extreme eastern end of the Island of Singapore, Gulf of Thailand. (for locations in Thailand, see Table)

Systematic Account

The following diagnosis is based on examination of ten specimens collected from Koh Lan Island on Naga cruise S-2, Dec. 15th 1959

1. Maximum length of specimens examined 24 mm., minimum length 17 mm

2. Dorsal fin chambers average 208.5, range 200-218.

3. Preanal fin chambers number: average 60.4, range 56-63.

4. Tallest of dorsal fin chambers average 2.0 as high as broad.

5. Height of dorsal fin contained 10.26. times (average) in the depth of the body in the midatrial region, range 10.0-10.5,

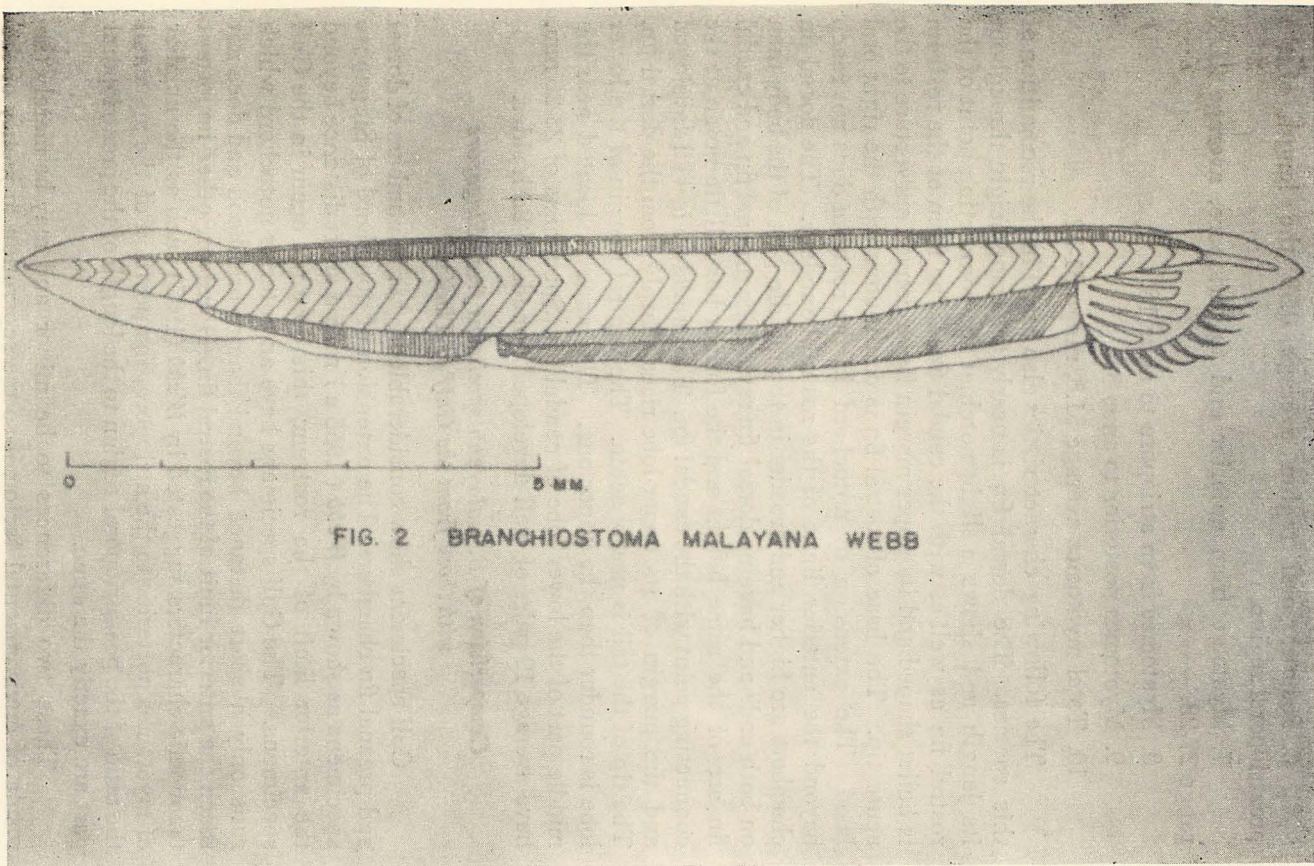


FIG. 2 BRANCHIOSTOMA MALAYANA WEBB

6. Postatrioporal region average 0.59 the length of the preatrioporal region.

7. Myotome from anterior end to atriopore, average 27.83 range 27-28.

8. Myotomes from atriopore to anus 16.

9. Myotomes posterior to anus 8.

10. Total myotomes average 51.8, range 51-52.

The following characteristics also assist in the recognition of this species. The dorsal fin is nearly the same height throughout its length and shows a slight notch at the connecting point of the rostral fin as well as with the caudal fin. The form of the rostrum is bullet shaped and its upper margin has a convex curvature to the acute tip. The base of rostral fin is continuous with the right oral hood. The extension of notochord in the rostrum does not reach beyond the anterior limit of the rostral boundary. The dorsal fin chambers are higher and broader in the middle part of the body than on both ends and have no dorsal fin rays. The preanal fin and caudal fin are of the same height and the former has a little notch at the connecting point with the caudal fin. The caudal fin is well developed and the margin of its upper lobe rises sharply from the dorsal fin. The tip of the tail is nearly acute. The ventral margin of the lower lobe is rounder than the upper one. The anus is located near the middle part of the lower lobe of caudal fin. Specimens of 23-26 mm. have average 19 pairs of well developed gonads on both sides.

*Comparison of B. malayana specimens from Singapore
with those from the Gulf of Thailand*

Gulf specimens show considerable higher in numbers of dorsal and preanal fin chambers. The extension of notochord of Singapore specimens as shown by *Webb* (1956 a) runs a short distance beyond the anterior limit of the rostrum; this does not occur in the Gulf specimens. The Gulf specimens have an anterior notochord which runs only a short distance beyond the pre-oral hood and does not reach the anterior limit of the rostral fin. However, other important taxonomic characters suggested by *Webb* (1955) such as the number of myotomes posterior to the atriopore, the position of the anus and the ratio of the postatrioporal region to the length of the preatrioporal part are exactly the same.

These two differences to be minor and may be merely the result of environmental factor; if so the separation to justify of the two described forms into separate species is unjustified.

EPIGONICHTHYS CULTELLUS, PETERS

(Fig. 3)

Epigonichthys cultellus, Peters, 1876 Monatsber. Kon. Preus. Akad. Wiss. Berlin. pp. 322-327. Pl. 1, 5 Fig.

Branchiostoma cultellum, Guenther, 1884 Report Zool. Coll. H.M.S. Alert, Brit. Mus. 1884.

Asymmetron cultellum, Andrew, 1893 Stud. Biol. Lab. Johns Hopkins Univ. Vol. 5. No. 4. pp. 213-247.

Geographical distribution Borneo; Prince of Wales Island, Torres Straits; Australia; Thursday Island; Ceylon; Gulf of Thailand. (for locations in Thailand, see Table)

Systematic Account

The following diagnosis is based on the study of four mature specimens collected from the Gulf of Thailand.

1. The average length of the examined specimens 14 mm., range 10-17 mm.
2. Dorsal fin chamber numbers; average 237, range 228-253.
3. Preanal fin chamber numbers; average 24.6, range 22-26.
4. Tallest of dorsal fin chambers; average 2.85 times as high as broad range 2.7-3.0.
5. Height of the dorsal fin contained 8.03 time (average) in the depth of the body in the mid atrial region, range 7.1-9.14
6. Postatrioporal region 0.38 (average) the length of the preatrioporal region : range 0.3-0.45.
7. Myotomes from anterior end of atriopore : 31.
8. Myotomes from atriopore to anus; average 13.5, range 13-14.
9. Myotomes posterior to anus; average 9, range 8-10.
10. Total myotomes; average 53.5, range 52-54.
11. Gonads on the right side of the body average 14.3, range 12-16 and begins from the 9th segment of myotome.

The following characteristics also assist in the description of this species. The body is stout and no caudal process. The rostral fin is short and round at the end. Its base runs continuously with the right oral hood. The oral tentacles are ornamented with

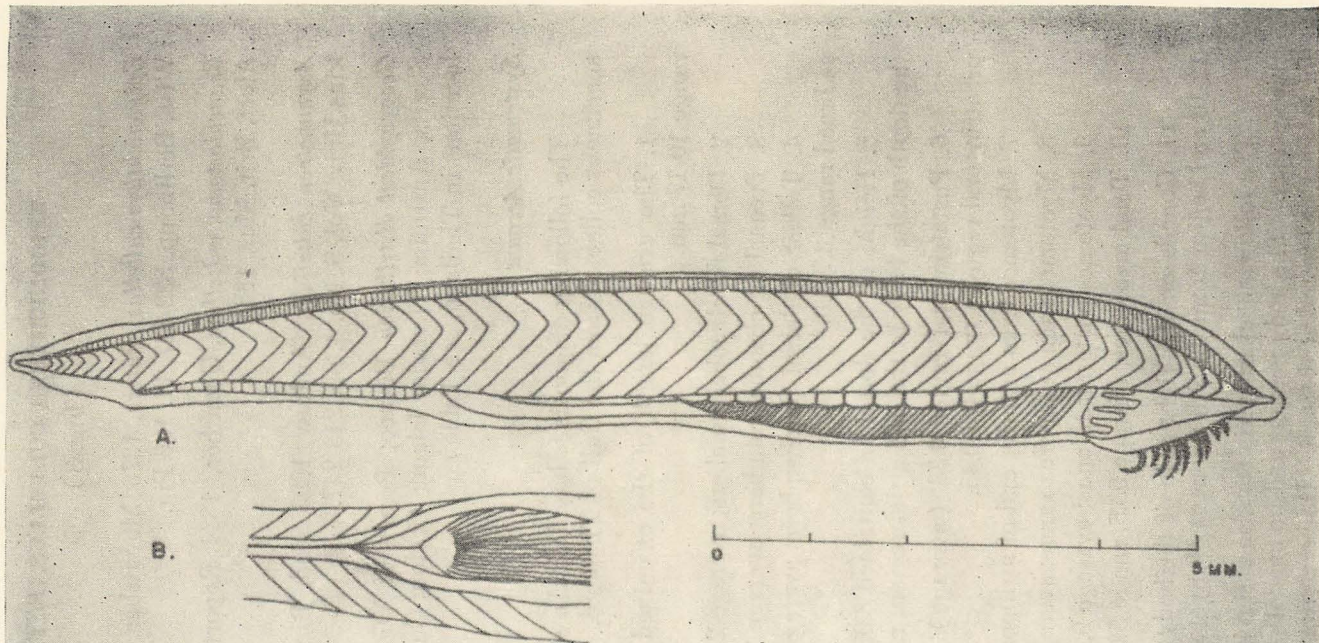


FIG. 3 *EPIGONICHTHYS CULTELLUS* PETERS

A. RIGHT SIDE SHOWING GONADS

B. VENTRAL SIDE SHOWING THE TERMINATION OF BOTH METAPLEURA

tentacular cirri. The dorsal fin is higher anteriorly than the posterior. Both metapleura terminate behind atriopore (*Fig 3, B.*). The ventral fin chambers are low and small in numbers. The gonads appear on the right side of the body only. The anus situated in the middle. The caudal fin shows no distinct connecting point with dorsal and ventral fins.

Discussion

This species had been placed in genus *Branchiostoma* by *Guenter* (cite from *Andrew 1893*), in genus *Asymmetron* by *Andrew* (1893) and this name was accepted by many authors (*Herdman 1904*, *Grasse 1948*). It is important here to discuss the taxonomic criteria of this species.

Peters (1876) was the first who described this species from the specimens collected from Borneo. His short descriptions were not too clear and the later accepted important taxonomic criteria such as the myotome formula, the number of dorsal and ventral fin chambers were not mentioned. However, his two illustrations were clear and showed all of the important characters of this species such as the total number of myotomes. The appearance of gonads on the right side of the body and the jointing of both metapleura behind the atriopore, and so on.

By judging from *Peter's* descriptions, it was impossible to put this species in the genus *Branchiostoma* since it had gonads only on the right side of the body and it seemed unreasonable to put this species in the genus *Asymmetron* by the appearance of this only one character. There are many other characters in which *E. cultellus* differed from *Asymmetron* group such as its well developed of ventral fin chambers, and its lack of a caudal process. In *Asymmetron* only the right metapleura is confluent with the caudal fin and the left terminates behind atriopore, but in *E. cultellus* both metapleurae joint together behind atriopore and a ventral fin chamber develops between them. As these characteristics clearly separate *Peter's* species from the genus *Asymmetron*, the author prefers to retain *Peter's* original name; *Epigonicthys cultellus*,

Table I.
Locations and Species of Lancelet Found in the Gulf of Thailand.

Cruise	Naga Bio-Station	Depth m.	Lat.	Long.	Gear	Species-Found
S-2	—	25	12°15'00" N	100°43'30" E	Bottom Trawl	B. malayana
S-5	—	18	07°20'30" N	100°54'30" E	Plankton net 1m.	B. belcheri
S-7	—	29.5	12°20'00" N	100°35'30" E	Plankton net 1m.	E. cultellus
S-9	60-1004	25.6	12°21'30" N	100°36'00" E	Petersen Grab	B. malayana E. cultellus
	60-1006	25.6	12°39'00" N	100°36'13" E	"	B. malayana E. cultellus
S-9 a	60-1020	25.6	12°27'05" N	100°28'30" E	"	B. malayana E. cultellus
	60-1024	27.4	12°08'40" N	100°32'20" E	"	E. cultellus
	60-1073	31.1	12°08'18" N	100°35'06" E	"	B. malayana
	60-1087	27.4	12°18'20" N	100°29'24" E	"	B. malayana E. cultellus
S-10	61-001	36.6	12°33'36" N	100°46'30" E	"	E. cultellus
	61-007	29.3	10°28'24" N	103°16'12" E	"	B. malayana
	61-109	27.4	9°40'00" N	103°43'48" E	"	E. cultellus B. malayana E. cultellus
	61-115	21.9	9°59'36" N	103°33'48" E	"	B. malayana
	61-121	21.9	10°12'42" N	103°55'15" E	"	B. malayana
	61-125	11.0	10°12'42" N	103°55'15" E	"	B. belcheri

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