

Soleichthys siammakuti n. sp.,
a rare sole from the Gulf of Thailand
(Pisces: Soleidae).

By

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With 5 figures.

Abstracts.

The description of a new dextral flatfish, *Soleichthys siammakuti*, is based on two specimens from the Gulf of Thailand. It appears to be the fourth species of the genus, but the first record from Thailand. From the other species of this genus *siammakuti* is distinguished by the presence of bright yellow round spots on the vertical fins and of two white spots on the anterior half of the lateral line. Head and body have 9 light cross bars which are much narrower than the dark interspaces. The holotype is deposited in the Marine Fisheries Laboratory, Bangkok, the paratype in the Senckenberg-Museum, Frankfurt a. M., Germany.

Included in the paper are new records of eight other flatfishes for Thai waters which sums up the number of species of the Heterosomata to 59 from this region.

Introduction.

While making a daily study of the fishes from the Fish Market Organization in Bangkok, Thailand, in connection with the establishment of a fish Reference Collection for the Marine Fisheries Laboratory, Department of Fisheries, the author found on December 21, 1972, an unknown beautiful dextral flatfish. Closer examination revealed the identity of this specimen with another one collected on March 19, 1970, off Prachuab Kirikhan Province, Gulf of Thailand. Both specimens were found as members of a new species belonging to the genus *Soleichthys* which was erected by BLEEKER (1860) and accepted by NORMAN (1928). Formerly this genus had the species *heterorhinos* (BLEEKER 1856) from Amboina, *microcephalus* (GÜNTHER 1862) from Australia, and *tubifera* (PETERS 1876) from Mauritius; the latter two species are known only by the types. This is the first species of *Soleichthys* reported from the Gulf of Thailand, and extending our knowledge of the geographical distribution of this genus.

NORMAN's (1928) revision of the flatfishes of India is the only paper which deals with the species of the genus *Soleichthys*. *S. heterorhinos* with several synonymized species is known from the Indo-Australian Archipelago, the

Andamans and India. Previously the author has not seen any specimens of this genus but due to the exact descriptions of the other species and with the help of the mentioned revision it is reasonable that the two specimens from the Thai waters are specifically distinct and therefore they seem to belong to an undescribed species.

It has to be mentioned that despite to the identity of our specimens with all the main characteristics of the genus *Soleichthys* there are a few disagreements with NORMAN's description. This author states that there are ". . . only the hinder parts of dorsal and anal fin scaly on blind side". In our specimens of the new species those scales are present only on the eyed side. Furthermore he mentions 78-85 anal rays but did not recognize that the species *microcephalus* and *tubifera* which he included into *Soleichthys* have 65-68 anal rays. With anal ray counts of 66-67 our new species belongs to the group with a low number of anal rays.

Acknowledgements.

Royal permission has been requested and graciously granted to name the new species after the Royal Title of His Royal Highness Prince Vajiralongkorn in commemoration of his Investiture Ceremony as the Crown Prince of Thailand which took place in 28 December 1972 during the period of work undertaken on the species. The full title of the Crown Prince in Thai is "Siammakutrajakumarn" and hence the abbreviated latin form of "siammakuti".

It is a great pleasure for the author to thank Dr. W. KLAUSEWITZ of the Senckenberg-Museum, Frankfurt am Main, Germany, for critically reading and correcting this manuscript, and his allowance in depositing the paratype in the museum, and also for his kind making available the original description of *microcephalus* and *tubifera*. The author's grateful acknowledge and thanks are also extended to the Siam Society, under the Royal Patronage, for the loans of some literatures and facilities so that he could render this work to the end.

***Soleichthys siammakuti* n. sp.**

Figs. 1-5.

Specimens: Holotype (uncat.) Reference Collection, Marine Fisheries Laboratory (MFLB), Department of Fisheries, Bangkok, Thailand, coll. Fish Market Bangkok, 21 Dec. 1972; sl 78.5 mm. Paratype: SMF 12650, fish collection, Senckenberg-Museum, Frankfurt a. M., W-Germany, coll. off Prachuab Kirikhan Province, Thailand, Gulf of Thailand, 19 March, 1970; sl 82.4 mm.

Diagnosis: *Soleichthys siammakuti* is distinguished from the other 3 species of this genus in 9 narrow light brown vertical bands on head and body as well as by large bright yellow round spots on dorsal, anal and caudal and two white spots on the lateral line.

Description: Body oblong, eyes on right side (fig. 1); greatest depth of body at thirteenth dorsal ray 2.68-3.09; free portion of caudal peduncle very short, its depth 2.33-2.42 in head. Greatest width at pectoral region 2.6-3.0 in head. Head 5.03-5.97, small, short, much higher than long. Snout 3.94-4.73 in head, obtusely rounded, not overlapping lower jaw. Eyes more or less oval in shape, the upper very slightly in advance of the lower, little separated, horizon-

tal diameter of the lower 3.63-3.9 in head. Interorbital space somewhat flat, 4.5-4.3 in eye, with one or two rows of scales. Postorbital part of head (hind margin of lower eye to posterior margin of opercular membrane) 1.86-2.12 in head. Mouth small with distinct upper and lower labial grooves. Jaws somewhat twisted, on eyed side (fig. 3) 3.9 in head, longer than that of blind side, its posterior end reaching one fourth below anterior margin of lower eye. Teeth very small, as band only posteriorly in jaws of blind side; on eyed side symphysis, vomer and palatine not developed.

Head (fig. 3) on the eyed side with two nostrils close together, anterior nostril remarkably produced into a tentacle-like tube of about equal or little shorter than length of jaw or little shorter than eye; posterior nostril pierced directly in space between root of anterior nostril and anterior lower eye edge.

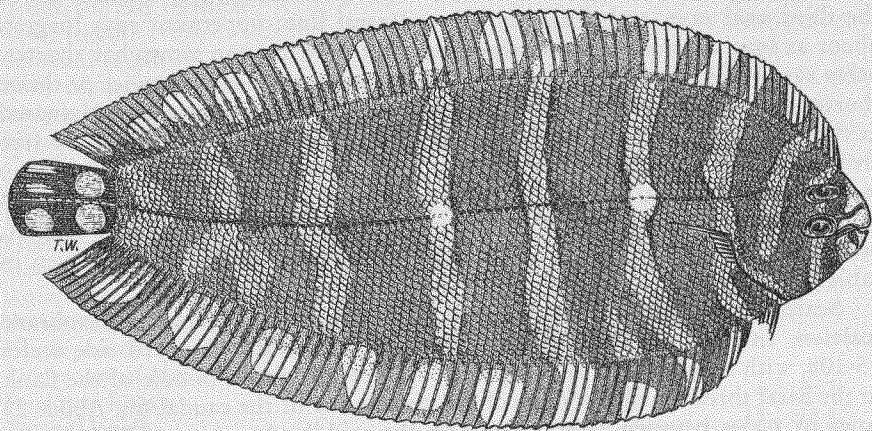


Fig. 1. *Soleichthys siammakuti* n. sp., holotype, 78.5 mm SL, eyed side.

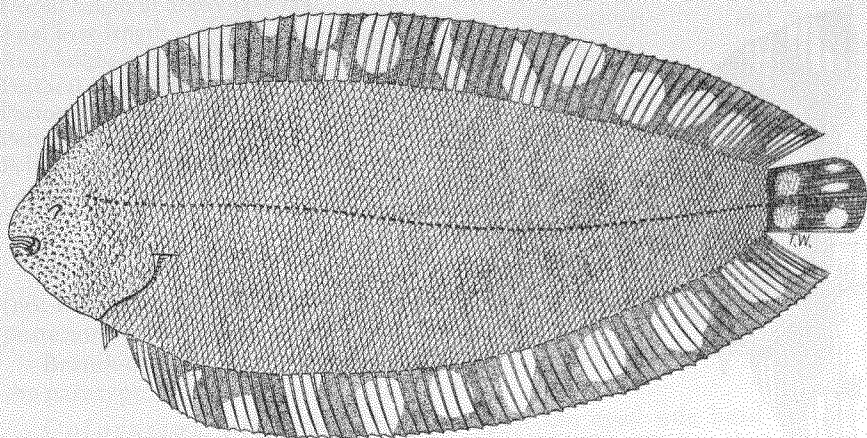


Fig. 2. *Soleichthys siammakuti* n. sp., holotype, 78.5 mm SL, blind side.

Nostril of blind side a short tubular, remoted from lip, located at about two thirds of eye diameter below third dorsal ray. Gill opening dorsally joined to and terminating opposit mid length of third pectoral ray, and ventrally folded inside to form a pocket, gill membranes of both sides broadly connected with each other and totally free from isthmus. Gill rakers very minute (not counted). Urogenital pore situated between pelvics but closer to anal.

Rays of all fins simple, segmented; except those of caudal, narrowly branched posteriorly. Dorsal 80, originating on upper surface of head at a short distance behind snout or above anterior upper eye margin, posterior rays longer than the rest, about 1.73-2.14 in head. Anal 66-67, originating somewhat on blind side and before pectoral fin base, posterior rays longer, 1.53-1.77 in head; last ray inserted below that of dorsal fin and very close but clearly separated from concurrent caudal rays. Depressed posterior dorsal and anal rays terminating at tips of upper and lower caudal rays. Right pectoral 8 rays, inserted above the third anal rays, and distinctly below lateral line; uppermost rays longest, about as long as snout and eye together, the following one somewhat shorter, other rays rudimentary. Left pectoral 7-8, longest ray more than twice or thrice shorter than that of eyed side. Both pelvics with 5 rays, symmetrical, originated at the same level and just behind lower edge of gill membrane, distinctly free from anal, their bases short, its depressed longest rays reaching to space between second and third anal rays and longer than vertical diameter of eyes. Caudal rays 18, branched at their tips, fin obtusely round behind, middle rays longest, as long as prepelvic distance. All morphometric and meristic data are given in table 1.

Scales on body and head of both sides, snout and opercular membrane scaleless. Interorbital scaled. Lateral lines on both sides. On eyed side scales 95-108, with simple tubes; running from the head along the middle of the flank to the basal three fourths or more of the middle ray of the caudal fin. About 23 rows of scales between lateral line and the middle dorsal rays. Body scales feebly ctenoid, on both sides very much alike. Scales on middle of the body

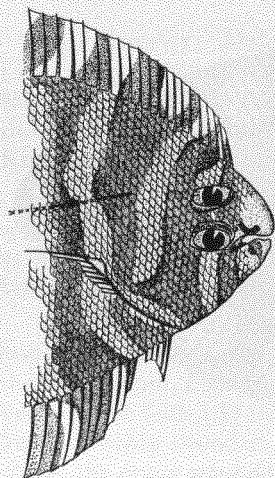


Fig. 3. *Soleichthys siammakuti* n. sp., holotype, head.

Table 1. Counts of meristic characters and measurements (in mm) with their proportional measurements in percent of standard length (in parenthesis) of *Soleichthys siammakuti* n. sp.

Characters	Holotype	Paratype, SMF 12650
Dorsal	80	80
Anal	67	66
Pelvic	right 5, left 5	right 5, left 5
Caudal	18	18
Pectorals	right 8, left 7	right 8, left 8
Scales on lateral line	95	108
Scales between lateral line and middle dorsal ray	23	23
Branchiostegals	4	4
Trunk and tail vertebrae	—	9 + 35 = 44
Total length	91.5 (116.56)	94.0 (114.08)
Standard length	78.5	82.4
Body depth, at 30 th dorsal ray	29.3 (37.32)	26.7 (32.40)
Body width, at pectorals	6.0 (7.64)	4.6 (5.58)
Head length	15.6 (19.87)	13.8 (16.74)
Caudal peduncle depth	6.7 (8.53)	5.7 (6.92)
Snout length, from lower eye edge	3.3 (4.20)	3.5 (4.25)
Horizontal diameter of upper eye	3.8 (4.84)	3.5 (4.25)
Horizontal diameter of lower eye	4.0 (5.10)	3.8 (4.61)
Interorbital width	1.0 (1.27)	0.7 (0.85)
Anterior nasal tube length	3.0 (3.82)	3.5 (4.25)
Postorbital length	8.4 (10.70)	6.5 (7.89)
Upper jaw of eyed side, length	4.0 (5.10)	—
Upper jaw of blind side, length	3.2 (4.08)	—
Predorsal length	5.8 (7.39)	6.2 (7.52)
Preanal length	16.3 (20.76)	15.2 (18.45)
Prepelvic length	11.5 (14.65)	11.6 (14.08)
Prepectoral length (eyed side)	15.7 (20.00)	13.9 (16.87)
Dorsal base length	80.5 (102.55)	79.0 (95.87)
Dorsal height at about 42 nd ray	7.3 (9.30)	8.0 (9.71)
Anal base length	69.0 (87.90)	68.1 (82.65)
Anal height at about 55 th ray	8.8 (11.21)	9.0 (10.92)
Pectoral length (eyed side)	6.8 (8.66)	7.2 (8.74)
Pectoral length (blind side)	1.9 (2.42)	2.8 (3.40)
Pelvic length (eyed side)	3.7 (4.71)	5.0 (6.07)
Pelvic length (blind side)	3.0 (3.82)	4.7 (5.70)
Caudal length	12.0 (15.29)	11.6 (14.08)

(not lateral line) with 5-9 (mostly 6) basal radiating striae, and 9-13 weak teeth posteriorly, circuli very fine (fig. 4).

Branchiostegals 4. Vertebrae 9 + 35 = 44 (counted from a radiograph of the paratype, fig. 5).

Coloration (fresh specimen, holotype): On eyed side head and body dark brown, barred with 9 somewhat irregular lighter brown bands, partly with a darker margin, especially near the lateral line. The lighter bands are

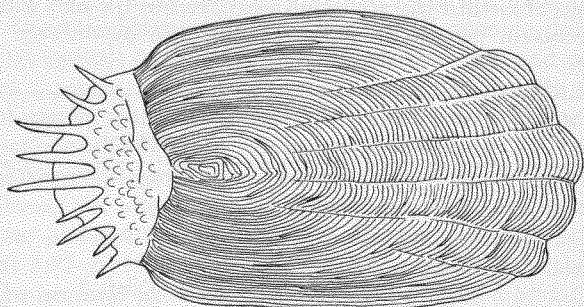


Fig. 4. *Soleichthys siammakuti* n. sp., a scale at middle part of eyed side of the paratype.

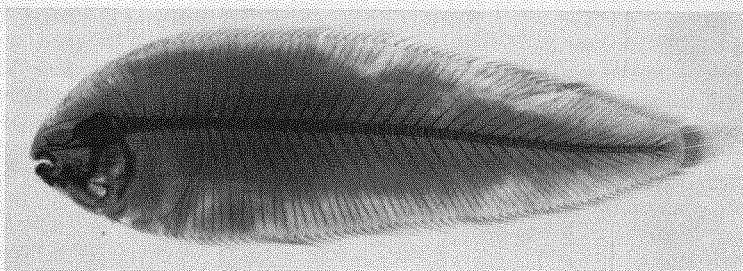


Fig. 5. Radiograph of *Soleichthys siammakuti* n. sp., paratype, SMF 12650, 82.4 mm SL.

much narrower than the dark interspaces, the first runs through the eyes, the last is situated in front of the caudal base. Snout pale, tinged with yellow. The fourth and the sixth light band with a white spot on the lateral line, as large as eye diameter, the second spot less prominent. The vertical fins dark brown with a series of yellowish spots, the anterior more or less prolongations of the light cross bands of the body. Dorsal and anal fin narrowly margined with yellow. Caudal fin with two vertical series of bright yellow spots, the anterior with two, the posterior with three spots. Pectorals very pale yellowish. Pelvics blackish, the outer side of the right fin and the anterior part of the first ray of both fins yellow. Region around the anus whitish. Nasal tentacle or anterior nostril and inside of the mouth black. Gill membrane blackish internally.

On blind side (fig. 2) head and body colorless or bluish white, gill membrane blackish internally. Nostrils, papillae or fringes on snout and along opercular edge milky white. Dorsal, anal and caudal apparently blackish, with indication of pale yellowish round spots, this, corresponding to the yellow spots on eyed side. Pectoral colorless.

Preserved specimen (holotype): Eyed side dark brown, the vertical band a little lighter. The spots on dorsal, anal and caudal light; pectorals hyaline; pelvics largely blackish. Anterior white spot on lateral line still present, the second one no more observable.

Table 2. Characters distinguishing *Soleichthys siammakuti* n. sp. from *microcephalus*, *tubifera* and *heterorhinos*.

Characters	<i>microcephalus</i> , after original description of GÜNTHER (1862)	<i>siammakuti</i> n. sp.	<i>tubifera</i> , after original description of PETERS (1876)	<i>heterorhinos</i> , after several previous authors
Dorsal	79	80	85	87-98
Anal	65	66-67	68	72-87
Pelvics	—	5-5	4	4-4
Caudal	—	18	—	16-18
Pectorals	11	Right 8, left 7-8	9	Right 8-9, left 8
Lateral line	90	95-108	102	105-122
Depth in SL.	2-75	2-679-3-0861	2-857	2-7-3-5
Head in SL.	Nearly 6	5-032-5-971	7-5	4-84-6-666
Interorbital space	Very close together	4-5-43 in lower eye diameter	Narrow	Contiguous
Anterior nasal tube	As long as eye	Shorter than eye	As long as eye	Slightly longer than eye
Upper jaw length in head	—	3-83-3-9	—	2-79-3-11
Longest dorsal ray in head	—	1-72-2-05	—	2-17-2-21
Longest anal ray in head	—	1-53-1-77	—	2-29-2-37
Longest caudal ray	8-5 in SL.	1-3-1-8 in head, 6-54-7-1 in SL	—	1-3-1-35 in head
Longest pectoral ray in head	Not much shorter than head	1-92-2-29 or scarcely shorter than snout and eye	Well developed	1-6-2-7 or as long as snout and eye
Depth of caudal peduncle in head	—	2-33-2-42	—	3-27-3-89
Scales on dorsal and anal fins	—	Only on eyed side posteriorly	—	Only on blind side posteriorly
Extension of Lat. l. onto caudal	—	To near tip of the fin	—	To basal third or half of the fin
Pigmentation	Brown with 11-13 dark crossbands, broader than interspaces; the first on the snout, the second immediately behind the eyes, the last across the root of the caudal; vertical fins black.	Dark brown, with 9 light brown crossbands, much narrower than interspaces; 3 on head and 6 on body, snout yellowish; two small white spots on the anterior half of the lateral line; vertical fins with large bright yellow spots and yellow margins.	Greyish brown, overall with large dark patches; middle part of fins whitish, dorsal and anal fin edges largely bordered with dark; caudal broadly black terminally; tips of all fins narrowly white.	Olive, with irregular blackish cross-bands, about 7 on head and 16 on body; most of the latter are geminate, curved, extending on the dorsal and anal fins; vertical fins with yellow margins.
Distribution	Australia	Gulf of Thailand	Mauritius, Indian Ocean	Widely distributed in Indo-Pacific

Relationship: The four known species of the genus *Soleichthys* can be distinguished due to the following key:

1. Dorsal 79-80, anal 65-67, Lat. l. 90-108; with cross bands, the darker much broader than lighter crossbands 2
 — Dorsal 85-98, anal 68-87, Lat. l. 102-122; with many irregular blackish cross bands or with large dark cloudy markings 3
2. Brown, with 11-13 dark cross bands, vertical fins black *microcephalus*.
 — Dark brown, with 9 lighter bands, vertical fins with large bright yellow spots, 2 small white spots on the lateral line *siammakuti*.
3. Head 7.5; dorsal 85, anal 68; everywhere blotched with large dark markings
 *tubifera*.
 — Head 4.84-6.66; dorsal 87-98, anal 72-87; with 20-22 narrow transverse lines on head and body *beterorhinos*.

The differentiating specific criteria of the 4 species are given in table 2.

Since the species of *Soleichthys* more or less resemble in color pattern and size to *Synaptura altipinnis*, *cornuta*, *quagga* and *zebra* which do also exist off Thailand or in the Indo-Pacific, one can distinguish *Synaptura* due to the confluence of the caudal fin with the dorsal and anal fins whereas in *Soleichthys* they are separated.

Vernacular names: Thai — Pla bai mai, Pla ta deo.

Zoogeography: Concerning the flatfishes of Thai waters it should be mentioned as a final comment that after the work of PUNPOKA (1964) the author has collected and identified many fishes of the Heterosomata. The following species are new records from the Gulf of Thailand:

Arnoglossus intermedius (BLEEKER)

Arnoglossus microstoma (WEBER)

Arnoglossus tapeinostoma (BLEEKER)

Asseraggodes filiger (WEBER)

Leops kitaharae SMITH & POPE, this species was erroneously identified as *L. guentheri* ALCOCK by the author.

Cynoglossus kopsi (BLEEKER)

Cynoglossus oxyrhynchus (BLEEKER)

Cynoglossus polytaenia (BLEEKER)

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