

Taxonomic review of the ponyfishes (Perciformes: Leiognathidae) of Taiwan

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Abstract In terms of sheer abundance, taxonomic diversity, and species richness, Taiwan has one of the richest concentrations of ponyfishes in the world. The ponyfishes of Taiwan are reviewed here with 13 species representing 8 of the 9 genera currently recognized. *Equulites laterofenestra* (Sparks and Chakrabarty, 2007) is newly recorded and its distribution is now extended to northeastern Taiwan. Several serially misidentified species and dubious taxa, that have long plagued the taxonomy of this family, are correctly assigned herein.

Keywords Bioluminescence · Leiognathids · Ponyfish · Slipmouths · Taxonomy

Introduction

Leiognathidae is a family of approximately 47 species in 9 genera. They are silvery fish, generally small (<200 mm SL),

and laterally compressed. They derive their common names (ponyfishes or slipmouths) from their highly protractible mouths, which protract either dorsorostrally, rostrally, or ventrorostrally. They have five branchiostegals. Typically, they have 7–9 dorsal-fin spines (the mode is 8) and 15–17 branched dorsal-fin rays (the mode is 16). They have 3 anal-fin spines and 13–15 branched anal-fin rays (the mode is 14; Sparks et al. 2005; Chakrabarty and Sparks 2007, 2008). The third and fourth dorsal-fin spines possess serrations facilitating interlocking with the preceding spine (Seigel 1982). The third anal-fin spine possesses serrations facilitating interlocking with the second spine. This locking system is unique to ponyfishes (Seigel 1982). They have 24 vertebral centra, 10 precaudal and 14 caudal. In Taiwan, ponyfishes are typically restricted to relatively shallow, coastal waters (<160 m) and estuaries where they are caught in huge numbers.

Members of this family all have a unique circumesophageal light organ where bioluminescent bacteria of the genus *Photobacterium* are housed. Many leiognathid species have strong sexual dimorphism related to their light organ system in which males have a larger light organ and associated features to intensify light in photic communication during sexual display (Sparks et al. 2005). Males of some species of leiognathids have transparent patches on their flanks, pectoral, buccal, or gular regions that are used to concentrate light on their bodies.

The taxonomy of ponyfishes has changed dramatically since Shen and Lin (1985) reviewed Leiognathidae and recorded 3 genera and 12 species. Many taxonomic changes have taken place in recent years, including the discovery of novel taxa, requiring an update of the Taiwanese leiognathid fauna.

Several phylogenetic publications reveal that *Leiognathus*, formerly the genus containing the majority of species in the family, was paraphyletic (Ikejima et al. 2004; Sparks and

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Dunlap 2004; Sparks et al. 2005). To remedy this paraphyly, several new genera have been recently established or resurrected: *Aurgiequula* Fowler, 1918 (elevated to generic rank by Chakrabarty et al. 2008); *Equulites* Fowler, 1904 (elevated to generic rank by Chakrabarty and Sparks 2008; Kimura et al. 2008a); *Eubleekeria* Fowler, 1904 (elevated to generic rank by Chakrabarty and Sparks 2008; Kimura et al. 2008b); *Karalla* Chakrabarty and Sparks 2008; *Nuchequula* Whitley, 1932 (elevated to generic rank by Chakrabarty and Sparks 2007; Kimura et al. 2008c); *Photoplagios* Sparks, Dunlap, and Smith 2005 (currently a junior synonym of *Equulites*); and *Photoptoralis* Sparks, Dunlap, and Smith 2005.

Several taxonomic designations of species known from Taiwan and frequently used in the literature have been recognized as dubious identifications. Table 1 shows all leiognathid species listed in several references from Taiwan and their current status. *Leiognathus lineolatus* (= *Equula lineolata* Valenciennes, in Cuvier and Valenciennes, 1835) was recognized by Sparks (2006) as a nomen dubium. The species described and photographed as *Leiognathus lineolatus* in Shen and Lin (1985) is *Photoptoralis aureus*. *Leiognathus brevis* (= *Equula brevis* Valenciennes in Cuvier and Valenciennes 1835) is a junior synonym of *Photoptoralis bindus* (see Chakrabarty and Sparks 2007). However, the species described and photographed as *Leiognathus brevis* in Shen and Lin (1985) is the recently described *Nuchequula mannusella* Chakrabarty and

Sparks 2007. *Leiognathus berbis* is a nomen dubium (Chakrabarty et al., submitted) and the species described and photographed as this species in previous publications are likely female specimens of *Equulites leuciscus*. One additional species *Equulites laterofenestra* (Sparks and Chakrabarty, 2007) is recorded for the first time from Taiwan, expanding its known distribution to northeastern Taiwan.

We hope to clear up taxonomic problems that plague this commercially important taxon in Taiwan and elsewhere with updated descriptions and photographs. The commercial appeal of these taxa may also endanger them as some species are caught by the thousands daily. Proper identification is therefore crucial.

Materials and methods

Standard length (SL) and body depth (BD) are used throughout. Pored scales in the lateral line are counted in series from the dorsal margin of the gill opening to the caudal flexure. Scale counts should be interpreted as approximations, due to high intraspecific variability, irregular arrangement, the deciduous nature of ponyfish scales in preservation, and because small scale size and the degree to which scales are embedded make accurate counts problematic. Ponyfish collections were made by the authors at the following market locations from 2005–2009 (Fig. 1): Beimen market, Tainan County; Budai, Chiayi County (23°22'47.5"N, 120°09'20.3"E)

Table 1 Leiognathid species listed in several references from Taiwan and their status

Species	Shen 1984a	Shen 1984b	Shen and Lin 1985	Chen and Yu 1986	Shen 1993	Chen 1993
<i>achlamys</i>	v		v	v		
<i>berbis</i>	?	?	?	?	?	
<i>bindus</i>	v	v	v	v	v	v
<i>blochii</i>	x <i>nuchalis</i>					
<i>brevis</i>	x <i>mannusella</i>	x <i>nuchalis</i>	x <i>mannusella</i>	x <i>mannusella</i>	x <i>mannusella</i>	
<i>daura</i>	x <i>splendens</i>			?		
<i>elongatus</i>		? <i>aureus</i>		?	?	
<i>equulus</i>	v	v	v	v	v	v
<i>fasciatus</i>		v		v		v
<i>indicius</i>						?
<i>insidiator</i>	v	v	v	v	v	
<i>leuciscus</i>	v	v	v	v	v	?
<i>lineolatus</i>	x <i>aureus</i>	x <i>aureus</i>	x <i>aureus</i>	x <i>aureus</i>	x <i>aureus</i>	
<i>minuta</i>	v	v	v	v	v	v
<i>nuchalis</i>			v	v	v	v
<i>rivulatus</i>		?		?		?
<i>ruconius</i>	v	v	v	v	v	v
sp.	? <i>mannusella</i>					
<i>splendens</i>	v	v	v	v	v	v

v Correct record; ? questionable record; x incorrect record

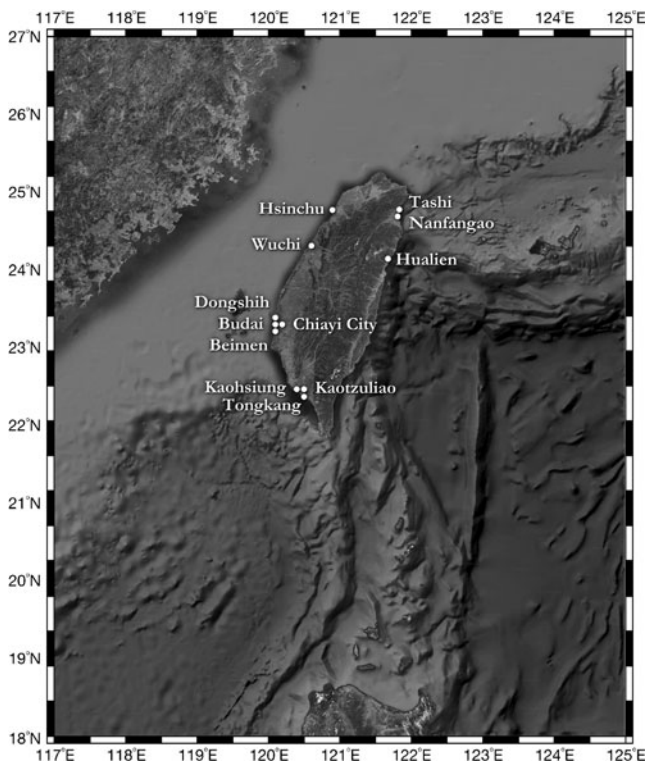


Fig. 1 The collecting localities in Taiwan for this study

and Dongshih, Chiayi County (23°27'11.0"N, 120°08'17.8"E); Chiayi City (23°27'10.1"N, 120°08'19.3"E); East Coast (no exact location); Hsiunchu (24°50'55.4"N, 120°55'13.6"E); Kaohsiung (no exact location; Jianguo Rd.); Kaoziliao, Kaohsiung (22°43'37.9"N, 120°15'18.3"E); Nanfanao, Yilan County (24°34'44.6"N, 121°52'12.7"E) and Tashi, Yilan County (24°56'30.6"N, 121°54'9.4"E); Wuchi fish market, Taichung County (24°17'39.9"N, 120°31'15.5"E); and Tongkang, Pingtung County (22°27'58.3"N, 120°26'38.6"E). Museum acronyms can be found under "A Guide to Fish Collections in the Catalog of Fishes database" on-line version of 9 Sep 2009 (Fricke and Eschmeyer 2009).

Systematics

Key to the Ponyfishes of Taiwan

- 1A. Mouths protract dorsally, strongly laterally compressed 2
- 1B. Mouths protract ventrally or horizontally 3
- 2A. Dorsal pigmentation pattern composed of about 10 vertical bars *Secutor ruconius*
- 2B Dorsal pigmentation pattern composed of large spots and dashes *S. insidiator*
- 3A. Presence of strongly caniniform teeth 4
- 3B. Teeth small, villiform (absence of caniniform teeth) 5

- 4A. Deep bodied (BD>50% SL) *Gazza achlamys*
- 4B. Narrow bodied (BD<47% SL) *G. minuta*
- 5A. Adults obtaining large body size, dorsal pigmentation pattern absent or consisting of vertical lines 6
- 5B. Adults not reaching more than 120 mm SL, dorsal pigmentation pattern present and not as in 5A 7
- 6A. Dorsal pigmentation pattern consisting of yellow vertical lines that become large yellow blotches near the midline, 2nd dorsal-fin spine markedly longer than 3rd *Aurigequula fasciata*
- 6B. Faint or no dorsal pigmentation pattern, 2nd dorsal-fin spine not markedly longer than 3rd *Leiognathus equulus*
- 7A. Prominent black nuchal spot present 8
- 7B. No nuchal marking present 9
- 8A. Dorsal fin with prominent black blotch over more than 1/2 of spinous dorsal fin *Nuchequula nuchalis*
- 8B. Dorsal fin with inconspicuous black melanophores but no prominent blotch *N. mannusella*
- 9A. Males with conspicuous translucent patch in pectoral axel, dorsal pigmentation pattern consisting of thick semicircular, oval markings 10
- 9B. Patch not present or not restricted to pectoral axil, dorsal pigmentation pattern not as in 9A 11
- 10A. Deep bodied (BD>50% SL) *Photopectoralis bindus*
- 10B. Narrow bodied (BD<50% SL) *P. aureus*
- 11A. Body depth more than 2 in SL; no black blotch in the spinous dorsal-fin; second dorsal-fin spine and anal-fin spine remarkably longer than remaining spines 12
- 11B. Body depth less than 2 in SL; a large black blotch in the spinous dorsal-fin; second dorsal-fin spine and anal-fin spine not remarkably longer than remaining spines *Eubleekeria splendens*
- 12A. Vermiculate, with thin wavy lines forming semicircle and oval-shaped pigmentation patterns on the upper flank; an expansive cornucopia-shaped translucent flank patch in males *Equulites laterofenestra*
- 12B. Speckled pigmentation on the upper flank; a triangular translucent flank patch resembling an inverted pyramid in males *Equulites leuciscus*

Aurigequula fasciata (Lacepède 1803) (Fig. 2)

Clupea fasciata Lacepède 1803: 425, 460 (Mauritius. No types known).

Leiognathus fasciatus (Lacepède 1803): Shen 1984b:261. Chen and Yu 1986:529, pl. 18, fig. 2. Chen 1993:100, fig. 397. Chen 2004:79.

Material examined AMNH 15520; AMNH 237140; AMNH 241338; CAS 1872; UMMZ 240504; AMNH



Fig. 2 *Aurigequula fasciata* LSU 13435, slight dorsal view showing unique pigmentation pattern

240597; ASIZP 65202; LSUMZ 13435; NMNSF 00816; USNM 191962; USNM 191966; WHT PC-195; WHT PC-196; WHT PC-197.

Description *Aurigequula fasciata* is a large, robust, and deep-bodied ponyfish. The dorsal and ventral profiles are equally convex. This species has a forward pointing mouth that opens strongly downward when protracted. The lower jaw profile is slightly concave. The mouth can extend about 15–20% of the SL. The greatest BD is reached between the dorsal-fin origin and the pelvic-fin origin. The vertical through the dorsal-fin origin is slightly posterior to the vertical through the pelvic-fin origin. The anal-fin origin is at a vertical with the first or second dorsal fin-ray. The dorsal head profile is strongly concave with a large hump in the nuchal region. There is strong concavity dorsal to the orbit formed by this hump and the slightly convex dorsal profile in the region extends from the mouth to the area dorsal to the orbit. The dorsal ridge of the orbit never reaches the dorsal head outline. The lips are somewhat fleshy but thin. The posterior margin of the maxilla is exposed and reaches the vertical through the anterior margin of the pupil. The teeth are small and villiform. The lateral line is complete and includes about 50 to 60 scales. The chest is asquamate; the entire triangular region between the margin of the opercle, the pectoral-fin base, and the posterior margin of the pelvic fin is asquamate. The remainder of the body is scaled except the head. The nuchal region is fully scaled except along the dorsal-most margin. There is a large axillary scale on both the pelvic and anal fins. The second dorsal-fin spine is markedly longer than the other spines and nearly three times longer than the third. The second dorsal fin-spine is about 70–90% of the BD. The second anal-fin spine is elongate, but not remarkably so relative to the third, (about 30–60% longer), and is between 20–50% of the BD.

Pigmentation The entire body is silvery. The head and asquamate chest region are silvery-white. The fin-spines are silvery. There is a light yellow tint to the membrane of all fins,

particularly the membrane between the anal-fin rays. There is little coloration in the caudal fin. Their dorsal flank has a pigmentation pattern of 10–15 broad yellow vertical lines that extend slightly ventral to the lateral line. Ventral to the lateral line and near the midline of the flank, the lines break into broad rounded dashes. The pectoral-fin axil and the base of the pectoral fin have a strong yellow coloration. The pelvic fins are white. The large axillary scales on the pelvic and anal fins are silvery-white. There is a concentration of melanophores on the snout dorsal to the lips.

Remarks *Aurigequula fasciata* is uncommon in Taiwan. Specimens were collected from eastern Taiwan off Hau-lian (Apr. 2005) and southwestern Taiwan off Tongkang (Nov. 2008).

Equulites laterofenestra (Sparks and Chakrabarty 2007) (Fig. 3)

Photoplagios laterofenestra Sparks and Chakrabarty 2007:624 (Samar Sea, Carigara Bay, Philippines. Holotype: USNM 387899).

Equulites laterofenestra (Sparks and Chakrabarty 2007): Kimura et al. 200:204.

Material examined USNM 387899, holotype; ASIZP 71571; ASIZP 71572; ASIZP 71573; ASIZP 71574; ASIZP 71575; ASIZP 71576.

Description A comparatively large, shallow-bodied, and laterally compressed species of ponyfish. The dorsal profile slightly more convex than ventral. The lateral snout outline nearly straight, slight concavity present dorsal to orbit. Concavity much less pronounced than in deep-bodied species. The mouth is small and terminal, and directed slightly downward when protruded. The lips are somewhat fleshy. The posterior margin of maxilla is exposed and reaches vertical through anterior part of pupil as well as dorsal portion of lower jaw articulation. The eyes are large and circular (29–34% of head length). The second dorsal-fin spine and anal-fin spine are longest and considerably longer than remaining spines. The bases of spinous portions of both dorsal and anal fins are covered by ridges of tissue lacking scales. The pelvic fin is short and not reaching origin of anal fin when adducted. The caudal fin is deeply forked. The teeth on both oral jaws are long and villiform, and arrayed in narrow band of four to five rows. The chest, fins, and suborbital series are asquamate, scales present in nuchal region and below dorsal-fin origin in

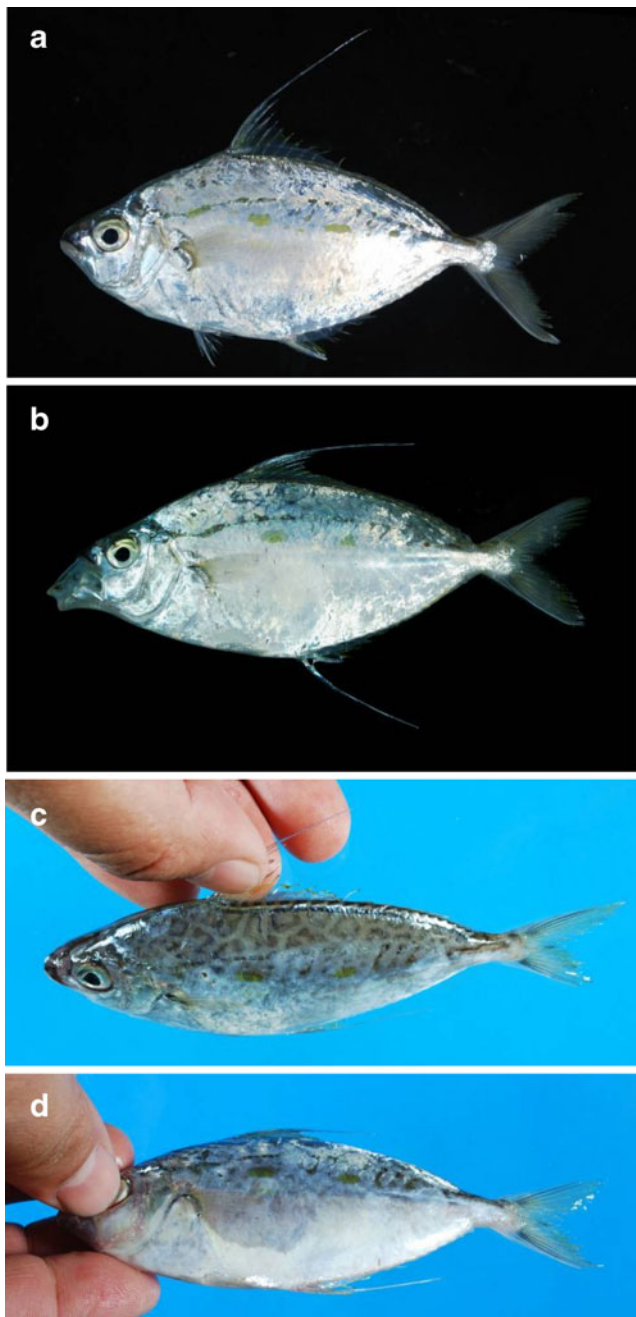


Fig. 3 *Equulites laterofenestra*. **a** ASIZP 71571. **b** ASIZP 71575. **c** ASIZP 71576, slight dorsal view showing pigmentation pattern, and **d** same specimen with slight ventral view showing conspicuous male transparent patch

only some specimens. The lateral line is complete, slightly arched and extends from opercle to posterior margin of caudal peduncle, and comprising about 60 scales.

Pigmentation The entire body is silvery with a vertical series of irregular yellow patches along and below lateral line. Dorsal markings vermiculate, usually comprising short

irregular patterns; sometimes forming oval shapes dorsally and anteriorly. A dark line is present along entire base of dorsal fin and sometimes extending onto dorsal margin of caudal peduncle. Dark blotch, due to concentration of melanophores, present above upper lip (and sometimes includes upper lip) ventral to nasal pores, and extending posteriorly to exposed portion of maxilla. All fins, lips, and interorbital and gular regions otherwise a pale, opaque gray.

Remarks *Equulites laterofenestra* was originally described from the Philippines. Its distribution is now extended to northeastern Taiwan. All Taiwanese specimens were collected from Tashi fish market (Sep. 2009)

The specimens otherwise agree with the original description provided by Sparks and Chakrabarty (2007), except for the extremely elongated second dorsal-fin and anal-fin spines. Most of our specimens (except for those with broken spines) have their second dorsal-fin and anal-fin spines remarkably longer than the third ones.

Equulites leuciscus (Günther 1860) (Fig. 4)

Equula leuciscus Günther 1860:503 (Ambon Island, Moluccas Islands, Indonesia. Holotype: BMNH 1858.4.21.243).

Leiognathus leuciscus (Günther 1860): Shen 1984a:57, fig. 318-8. Shen 1984b:262. Shen and Lin 1985:134, fig. 10. Chen and Yu 1986:529. Shen 1993:344, pl.94-10. ? Chen 1993:100, fig. 398. ?Chen 2004:79.

Material examined BMNH 1858.4.21.243, holotype; AMNH 237149; AMNH 239270; AMNH 240587; AMNH 240589; AMNH 241278; AMNH 241313; AMNH 242666; AMS I.22967001; AMS I.22978004; AMS I.34365015; ANSP 27525 (holotype of “*Leiognathus*”*vermiculatus*); LSUMZ 13158; LSUMZ 13339; NMMSF 01593 (1: 63.0); UMMZ 240125; USNM 76609; USNM 191979; USNM 191991; USNM 307917; USNM 373280; QM.1.878 (holotype of “*Equula*”*longispina*).



Fig. 4 *Equulites leuciscus* AMNH uncat., slight ventral view showing conspicuous male triangular transparent patch

Description *Equulites leuciscus* is a medium sized and elongate ponyfish. The dorsal and ventral profiles are equally convex. The snout is pointed and the head is small. The lower jaw profile is straight. The mouth protracts strongly ventrally. The dorsal head profile is straight from snout to orbit, and weakly sloping from orbit to dorsal-fin origin. The lips are thin and not fleshy. The posterior margin of the maxilla is exposed and reaches the vertical through the anterior part of the orbit. The teeth are small and conical. The head is asquamate; whereas, the remainder of the body (including the nuchal region) is scaled. In males, an expansive triangular, translucent patch, forming more or less an equilateral triangle, is present on the midflank. The base of the triangle is located slightly ventral to the midline of the body, with which it parallels, and the vertex is located slightly dorsal to the anal-fin origin. Both the second dorsal- and anal-fin spines are the longest, but not markedly longer than the third.

Pigmentation The entire body is silvery. Pigmentation pattern on the dorsal flank comprises dark, thin transverse lines that follow the contours of the myomeres. In addition, small circular blotches are present throughout this region, although these blotches are concentrated along the dorsal margin of the flank.

Remarks *Equulites leuciscus* is not a rare species. It was collected abundantly at three sites Wuchi (Nov. 2008), Kaoziliao (Mar. 2007), and Chaiyi (Mar. 2006). The variation in shape and pigmentation pattern observed in this species may be evidence that this taxon is a complex of several species.

Eubleekeria splendens (Cuvier 1829) (Fig. 5)

Equula splendens Cuvier 1829:212 (Chennai, India, Neotype: RMNH 1441). *Leiognathus splendens* (Cuvier 1829): Shen 1984a:57, fig. 318–11. Shen 1984b:262. Shen and Lin, 1985:130, fig. 6. Chen and Yu 1986:529. Shen 1993:345, pl.95–3. Chen and Fang 1999:150. Chen 1993:101, fig. 401. Chen 2004:79. Kimura et al. 2005:285.

Material examined AMNH 239262; AMNH 239263; AMNH 239267; AMNH 239268; AMNH 239273; AMNH 241282; AMNH 241339; AMNH 242616; AMNH 242617; AMNH 242639; AMNH 242649; AMNH 242677; AMNH 242681; ANSP 59963; ANSP 27530; ANSP 47486 (holotype of “*Leiognathus philippinus*”); ANSP 47487; ASIZP 57566; ASIZP 57611; ASIZP 57614; ASIZP 57689; ASIZP 60224; ASIZP 61726; ASIZP 62099; ASIZP 62269; ASIZP 63260; ASIZP 64230; ASIZP



Fig. 5 *Eubleekeria splendens*, LSU 13302, note black mark over top half of the spinous dorsal fin

64676; ASIZP 64807; ASIZP 64923; ASIZP 64984; CAS 1485; CAS 38789; CAS 56438; CAS 56441; LSUMZ 13157; LSUMZ 13338; MNHN A-6724; UMMZ 191202; UMMZ 240130, USNM 190258; USNM 190263; WHT PC-136; WHT PC-137; WHT PC-166; WHT PC-191.

Description *Eubleekeria splendens* is a robust and rhomboid shaped ponyfish. The dorsal and ventral profiles are equally convex. The snout is short. The mouth opens slightly downward when protracted. The lower jaw profile is straight. The mouth can extend about 8–15% of the SL. The greatest BD is reached between the dorsal-fin origin and the pelvic-fin origin. The dorsal- and pelvic-fin origins are located along the same vertical. The anal-fin origin is at a vertical with the last dorsal-fin spine. There is a slight concavity at the orbit preceding a slight rise in the dorsal head profile to the dorsal-fin origin. The dorsal head profile is slightly convex. The eyes are large and the dorsal ridge of the orbit may extend to the dorsal head outline (more so in smaller individuals). The lips are thin and not fleshy. The posterior margin of the maxilla is exposed, reaching between the verticals of the anterior margin of the orbit and the pupil. The teeth are small and villiform. The lateral line is complete and includes about 40–50 scales. The chest is fully scaled; the nuchal region is scaled except along the dorsal margin. Most of the remainder of the body is scaled except the head. The second and third dorsal- and anal-fin spines are not markedly different in length; whereas, the first spines are greatly reduced in length. The second dorsal-fin spine is about 30–40% of the BD.

Pigmentation The entire body is a silvery-white, particularly ventral to the midline of the flank. The membrane of the spinous region of the dorsal fin has a conspicuous black

blotch over the dorsal half. The dorsal flank pigmentation pattern is composed of dark vertical vermiculate lines that form zigzags (or curves). There is a thin silvery line at the midline, which is sometimes dashed. The pectoral-fin axil is black. There is a strong yellow-orange tint to the lateral line scales, particularly in larger individuals. The pelvic fins are white. There is a black marking on the snout dorsal to the lip.

Remarks Specimens of *Eubleekeria splendens* from Taiwan appear more elongate than those from other regions on average. However, they have the characteristic black dorsal-fin blotch and scalation pattern described for this species (Kimura et al. 2008b). These fish were collected in Wuchi (Mar. 2006, Nov. 2008), Nanfanao (Mar. 2007), Kaoziliao (Mar. 2007), and Tongkang (Dec. 2005).

Gazza achlamys Jordan and Starks 1917 (Fig. 6)

Gazza achlamys Jordan and Starks 1917:446, pl. 45 (Colombo, Sri Lanka. Holotype: FMNH 58939). Shen 1984a:57, fig. 318-13. Shen and Lin 1985:128, fig. 2. Chen and Yu 1986: 529. Shen 1993:343, pl.94-3. Kimura et al. 2000: 7, fig. 8.

Material examined AMNH 241288; ASIZP 61256; ASIZP 65681; ASIZP 65682; ASIZP 65683; ASIZP 65684; CAS-SU 21652, paratype, 1 ex.; CAS-SU 22853, paratype, 1 ex.; LSUMZ 13156; UMMZ 240128; UMMZ 240132; UMMZ 240139.

Description *Gazza achlamys* is a robust and deep-bodied ponyfish with a large head. The dorsal and ventral profiles are about equally convex. The lower jaw profile is concave.



Fig. 6 *Gazza achlamys*, WHT uncat., reddish tint to fins are an artifact and artificial

The mouth can extend about 15–20% of the SL and protracts forward. The snout is short. The greatest BD is reached between the dorsal-fin origin and the pelvic-fin origin. The dorsal- and pelvic-fin origins are located along the same vertical. The anal-fin origin is at a vertical from the last dorsal-fin spine. The dorsal head profile is straight. The lips are thin and not fleshy. The posterior margin of the maxilla is exposed and reaches the vertical through the anterior margin of the pupil. The anterior-most teeth are large and caniniform. The lateral line is complete and includes about 40–45 scales. The eyes are large. There are no scales on the chest or nuchal region and most of the remainder of the body appears scaled except the head. The dorsal- and anal-fin spines are weak. The second and third dorsal- and anal-fin spines are about equal in length and the first spines are greatly reduced in length. The second dorsal-fin spine is about 40–50% of the BD; whereas, the second anal-fin spine is about 35–40% of the BD.

Pigmentation The entire body is silvery. The membrane of the spinous region of the dorsal fin has concentrated melanophores, from about 1/4 the length of the second dorsal spine to its distal margin. There is no obvious dorsal flank pigmentation pattern. There is a black region along the posterior margin of the lower jaw in some specimens. The pectoral-fin axil is black. The anal-fin spines are yellowish, and the membrane of the fin is clear. The pelvic-fin axillary scale is large and silvery.

Remarks *Gazza achlamys* was never collected by the authors in Taiwan; however, they were observed in collections.

Gazza minuta (Bloch 1795) (Fig. 7)

Scomber minutus Bloch 1795:110, pl. 429, fig. 2 (Tranquebar, India. Holotype: ZMB 1670).



Fig. 7 *Gazza minuta*, LSUMZ 13352

Gazza minuta (Bloch 1795): Shen 1984a:56, fig. 318-2. Shen 1984b:261. Shen and Lin, 1985:127, fig. 1. Chen and Yu 1986:529. pl. 18, fig. 5. Shen 1993:343, pl.94-4. Yamashita et al. 1998:276, figs, 1B, 2B, 3B, 4B, D, 5B. Chen 1993:99, fig. 394. Chen 2004:78.

Material examined AMNH 220748; AMNH 237136; AMNH 240654; AMNH 241279; AMNH 241286; AMNH 241289; AMNH 241321; AMNH 241342; AMNH 241362; AMNH 241365; AMNH 242613; AMNH 242668; AMNH 242678; ASIZP 58766; ASIZP 58886; ASIZP 59327; ASIZP 60455; ASIZP 60975; ASIZP 66603; ASIZP 66616; ASIZP 66629; ASIZP 67245; LSUMZ 13352, LSUMZ 13365, LSUMZ 13575; UMMZ 191542; UMMZ 240126; UMMZ 240140; UMMZ 240141.

Description *Gazza minuta* is an elongate and robust (i.e., not laterally compressed) ponyfish with a large head. The ventral profile is slightly more convex than the dorsal. The mouth protracts forward and can extend about 15–20% of the SL. The lower jaw profile is straight. The snout is short. The greatest BD is reached between the dorsal-fin origin and the pelvic-fin origin. The pelvic-fin origin is slightly anterior to the dorsal. The anal-fin origin is at a vertical from the last dorsal-fin spine. The dorsal head profile is straight. The lips are somewhat fleshy. The posterior margin of the maxilla is exposed and reaches the vertical through the anterior margin of the pupil. The most anterior teeth are large and caniniform. The lateral line is incomplete, with typically less than 40 scales. The eyes are large. There are no scales on the chest or head but the remainder of the body is scaled. The dorsal- and anal-fin spines are weak. The second and third dorsal- and anal-fin spines are about equal length and the first spines are greatly reduced in length.

Pigmentation The body is silvery-white. The pelvic-fin spine is silvery. The dorsal flank pigmentation pattern is light gray and composed of some wide round blotches visible in some individuals. There is a black region along the posterior margin of the lower jaw in some specimens. The pectoral-fin axil is black and sometimes a line is formed from this area onto the ventral margin of the operculum forming an upside down “j” shape. The dorsal and anal-fin membranes are yellowish.

Remarks *Gazza minuta* is abundant and was collected in Wuchi (Mar. 2006, Nov. 2008), Dongshih (Nov. 2008), Tashi (Nov. 2008), Nanfanao (Mar. 2007), Kaoziliao (Mar. 2007), East Coast (Mar. 2006), Kaohsiung (Dec. 2005).

Leiognathus equulus (Forsskål 1775) (Fig. 8)

Scomber equula Forsskål 1775:58, xii (Luhaiya, Yemen, Red Sea. Lectotype: ZMUC P48219, dry skin. Paralectotypes: ZMUC P48220, dry skin).

Leiognathus equulus (Forsskål 1775): Shen 1984a:57, fig. 318-5, 318-6. Shen 1984b:261. Shen and Lin 1985:130, fig. 5. Chen and Yu 1986:529, pl. 18, fig. 1. Shen 1993:344, pl.94-9. Chen and Fang. 1999:149. Chen 1993:99, fig. 396. Chen 2004:79. **Material examined** ZMUC P48219, lectotype (dry skin; photographs and radiographs examined); ZMUC P48220, paralectotype (dry skin, photograph and radiograph examined); ZMB 8756 (holotype of “*Leiognathus*” *edentulus*); AMNH 59535; AMNH 88039; AMNH 237139; AMNH 239258; AMNH 239265; AMNH 239271; AMNH 239280; AMNH 241297; AMNH 241304; AMNH 242134; AMNH 242620; AMNH 242672; AMNH 242878; AMNH 241300; AMNH 243523; AMNH 243524; AMNH 243525; AMNH 243527; ASIZP 57300; ASIZP 57690; ASIZP 61988; ASIZP 61990; ASIZP 63370; ASIZP 64843; ASIZP 64932; ASIZP 65074; ASIZP 65075; ASIZP 65689; ASIZP 65690; CAS 57306; CAS-SU 35627; CAS-SU 38781; LSUMZ 13301; LSUMZ 13362; LSUMZ 13443; MNHN A-6723; UMMZ 191520; UMMZ 235029; UMMZ 238805 (in part); UMMZ 240133; UMMZ 240502; UMMZ 240503.

Description *Leiognathus equulus* is a large, robust, and deep-bodied ponyfish. The dorsal and ventral profiles are equally convex. This species has a forward pointing mouth that opens strongly downward when protracted. The lower jaw profile is concave. The mouth can extend about 15% of the SL. The greatest BD is reached between the dorsal-fin origin and the pelvic-fin origin. The vertical through the dorsal-fin origin is slightly posterior to the vertical through



Fig. 8 *Leiognathus equulus*, LSUMZ 13301

the pelvic-fin origin. The anal-fin origin is at a vertical with the first soft dorsal-fin ray. The dorsal head profile is straight with a strong hump in the nuchal region. The dorsal ridge of the orbit never reaches the dorsal head outline. The lips are somewhat fleshy, but thin. The posterior margin of the maxilla is exposed and extends between the verticals of the anterior part of the orbit and the pupil. The teeth are small and villiform. The lateral line is complete and includes about 50 to 60 scales. The chest is asquamate; the entire triangular region between the margin of the opercle, the pectoral-fin base, and the posterior margin of the pelvic fin is asquamate. Most of the remainder of the body is scaled except the head. The nuchal region is asquamate along the dorsal margin. The asquamate region broadens near the posterior margin of the nuchal spine in a curve. There is a large axillary scale on the pelvic and anal fins, within which the spines can be retracted. The second dorsal- and anal-fin spines are elongate relative to the third, but not dramatically so. The second dorsal-fin spine is about 50% longer than the third and is about 40% of the BD. The second anal-fin spine is also about 40% of the BD. The first spine in both the dorsal and anal fins are greatly reduced in length. There is a concentration of melanophores on the snout dorsal to the lip. There is a strong concentration of guanine on the head and asquamate region on the dorsal margin of the nuchal region, creating a solid, smooth, armor plate-like appearance.

Pigmentation The entire body is silvery with a yellowish tint to most of the body posterior to the head. The head and asquamate chest are silvery-white. The dorsal flank has either no pigmentation pattern or some thin vermiculate gray vertical lines that extend to about the midline of the flank. The pectoral-fin axil is black, but there is no pigment at the base of the pectoral fin. The fins are white to yellowish in color.

Remarks *Leiognathus equulus* is the most common ponyfish found at markets in Taiwan. This species was collected in Wuchi (Nov. 2008), Chaiyi (Nov. 2008), Dongshih (Nov. 2008), Budai (Mar. 2007), Nanfanao (Mar. 2007), Kaoziliao (Mar. 2007), Taichung (Mar. 2006), Chaiyi (Mar. 2006), Kaohsiung (Dec. 2005).

Nuchequula mannusella Chakrabarty and Sparks 2007 (Fig. 9)

Nuchequula mannusella Chakrabarty and Sparks 2007:5, Figs. 4, 5A (Tungshih Fish Market, 23°27'01"N, 120°08'19.3"E, Chaiyi County, Taiwan. Holotype: AMNH 238753)



Fig. 9 *Nuchequula mannusella*, AMNH uncat

Leiognathus brevirostris (non Valenciennes 1835): Shen 1984a:57, fig. 318-7. Shen 1984b:262. Shen and Lin 1985:131, fig. 7. Chen and Yu 1986:529, pl. 18, fig. 3. Chen and Fang, 1999:148.

Leiognathus nuchalis (non Temminck and Schlegel 1845): Chen 1993:100, fig. 399. ?Chen 2004:79.

Leiognathus sp.: Shen 1984a:57, fig. 318-12.

Material examined AMNH 238753; AMNH 238754, paratypes; AMNH 238755, paratypes; AMNH 238756, paratypes; AMNH 238757, paratypes; AMNH 238758, paratypes; AMNH 238759, paratypes; AMNH 238760, paratypes; AMNH 238761, paratypes; AMNH 238762, paratype; AMNH 238763, paratypes; AMNH 238764, paratype; AMNH 238765, paratypes; ASIZP 62322, paratype; ASIZP 60823, paratype; ASIZP 59839; ASIZP 65686; LSUMZ 13303.

Description *Nuchequula mannusella* is a medium sized rhomboid-shaped ponyfish. The dorsal and ventral profiles are equally convex. The greatest BD is reached between the dorsal-fin origin and the pelvic-fin origin. The dorsal- and pelvic-fin origins are located along the same vertical. There is a concavity above the orbit, formed by the exposed rising dorsal aspect of the supraoccipital crest (i.e., nuchal spine). The anal-fin origin is located at the vertical from the last (= eighth) dorsal-fin spine. The mouth is terminal and directed strongly ventrally when extended. The lower jaw is deep and the lateral profile is strongly concave. The lips are thin and only somewhat fleshy. The posterior margin of the maxilla is exposed, reaching the vertical through the anterior part of pupil and the dorsal portion of the lower jaw articulation. The exposed part of maxilla is nearly perpendicular with the mouth when retracted. The supra-orbital ridge bears small spines. There are two short and stout postnasal spines present dorsal to the orbit and posterior to the nasal pores. The first dorsal-fin spine is much shorter than the other spines, 15–20% of the second spine.

The length of the second and longest dorsal-fin spine is about 40% of BD, and not conspicuously longer than the third or fourth spines. The teeth are villiform and arrayed in a narrow band of three to five poorly differentiated rows. The chest and fin bases are asquamate. Some specimens possess scales on the cheek and in the interpelvic region. There are scales present in the nuchal region to the ventrum (not including the chest), which extend posteriorly to the caudal peduncle and onto the caudal fin. The lateral line is complete and includes about 55 scales.

Pigmentation The entire body is silvery. The leading edge of the dorsal fin is black. The spinous region of the dorsal fin is yellow from about 3/4 the length of the second dorsal spine to the distal margin. The entire dorsal fin is yellow distally. The ventral lobe of the caudal fin bears significantly more yellow along its posterior margin than the dorsal lobe. The spinous portion and entire distal margin of the anal fin are yellow. The base of the pectoral fin is yellow. The yellow areas on the fins in some specimens have a reddish hue. The buccal area (mouth, lower jaw) and the region dorsal to the orbit are translucent, but sometimes reddish. There is a dark brown or black saddle-shaped, triangular nuchal marking. The pectoral-fin axil is black. The dorsal flank markings comprise dark vertical bands that vary from broad and straight to vermiculate and wavy, or that form a zig-zag pattern. The dorsal markings are most prominent above the lateral line. There is a dark blotch present above the upper lip anterior to the nasal pores. The pectoral-fin axil is black or dark brown. There are scattered melanophores present ventrally on the body.

Remarks Eschmeyer and Fricke (2009) currently list *Nuchequula manmusella* as a junior synonym of *Nuchequula gerreoides* (Bleeker, 1851) based on a personal communication from S. Kimura. Although Kimura et al. (2008c) recently reviewed this genus, no types of *N. manmusella* were examined and no publication by S. Kimura has been published regarding the status of this species. Therefore, *N. manmusella* is currently a valid species. This species was collected from Wuchi (Nov. 2008), Hsiunchu (Mar. 2006), and Chaiyi (Mar. 2006). It was not as common in November as it was in March, and is never particularly abundant.

Nuchequula nuchalis (Temminck and Schlegel 1845)
(Fig. 10)

Equula nuchalis Temminck and Schlegel 1845:126, pl. 67, fig. 1 (Japan. Holotype: RMNH 1287).



Fig. 10 *Nuchequula nuchalis*, AMNH uncat

Leiognathus nuchalis (Temminck and Schlegel 1845): Shen and Lin 1985:133, fig. 8. Chen and Yu 1986: 529. Shen 1993:345, pl.95-2. Sparks and Chakrabarty 2007:18, fig. 5B, 6C, 9. Kimura et al. 2008c:39.

Leiognathus blochii (Valenciennes 1835): Shen 1984a:57, fig. 318-10.

Material examined RMNH 1287, holotype; AMNH 34861; AMNH 238766; AMNH 238767; AMNH 239164; AMNH 239165; AMNH 239166; AMNH 239167; AMNH 239168; AMNH 26819; AMNH 239266; AMNH 26819; ASIZP 59831; ASIZP 65691; CAS-SU 4757; LSUMZ 13300; UMMZ 240143.

Description *Nuchequula nuchalis* is a medium sized rhomboid-shaped ponyfish. The mouth is terminal and directed ventrally when extended. The teeth are villiform and arrayed in a narrow band of 3 or 4 poorly differentiated rows. Body depth ranges between 40–50% of SL. The length of the second dorsal-fin spine is around 35–40% of BD; whereas, the length of the second anal-fin spine is about 20–30% of BD. In lateral view, a weak concavity is present dorsal to the orbit. The lateral line is complete and is parallel with the shape of the back. The lips are somewhat fleshy. The dorsal- and pelvic-fin origins are located along the same vertical. The anal-fin origin is located on the vertical from the eighth dorsal-fin spine. There are 16 rakers on the lower limb of the first gill arch. Scales are absent on the chest, head and nape but present elsewhere on the flanks. The profile of the lower jaw in lateral view is slightly concave. Two postnasal spines are present dorsal to the orbit and posterior to the nasal pores. The supraorbital ridge is serrated.

Pigmentation The body is silvery, approaching white in the area posteroventral to the pectoral-fin base. There are two narrow, yellow-green stripes on the flanks. One stripe

straddles the lateral line and another is near the midline, extending from the opercle to the caudal peduncle. There is a mustard yellow to light yellow tint to all of the fins, particularly distally. There is more yellow on the edge of the ventral lobe of the caudal fin than there is on the dorsal lobe. There is a distinct black marking between the second and fifth spines of the dorsal fin. The second through fifth spines are silvery. The nuchal marking is black and triangular or rounded. Light yellow zig-zagging lines are present on the dorsal flanks in life, but they rarely extend below the lateral line. There is a concentration of melanophores dorsal to the mouth and anterior to the orbit. There are scattered melanophores ventral to the midline except for a mitten-shaped melanophore free region posteroventral to the pectoral-fin base.

Remarks *Nuchequula nuchalis* was collected in Wuchi (Nov. 2008), Chaiyi (Mar. 2006), and Tongkang (Mar. 2006). This species was not as common in November as it was in March 2008 and it is never particularly abundant.

Photopectoralis aureus Abe and Haneda 1972 (Fig. 11)

Leiognathus aureus Abe and Haneda 1972:3, pl. 1, figs. 1B, 2B (Ambon fish market, Ambon, North Maluku, Moluccas, Indonesia. Neotype: YCM-P 35792). Kimura et al. 2003:223, fig. 3.

Leiognathus lineolatus (non Abe and Haneda 1972): Shen and Lin 1985: 136, fig. 12.

Material examined AMNH 239274; AMNH 239278; AMNH 239282; AMNH 241276; AMNH 241285; AMNH 241287; AMNH 241290; AMNH 241350; AMNH 242622; AMNH 242656; AMNH 242657; AMNH 242675; AMNH 242680; ASIZP 58693; ASIZP 59294; ASIZP 59495; ASIZP 61705; LSUMZ 13436; UMMZ 240129; UMMZ 240309; USNM 373277.



Fig. 11 *Photopectoralis aureus*, LSUMZ 13436

Description *Photopectoralis aureus* is an elongate and medium-sized ponyfish. The ventral profile is more convex than the dorsal. This species has a short snout. The mouth extends forward when protracted about 10–15% of the body length. The lower jaw profile is straight. The greatest BD is reached between the dorsal-fin origin to just behind the pelvic-fin origin. The pelvic-fin origin is slightly anterior to the vertical through the dorsal-fin origin. The anal-fin origin is at a vertical with the last dorsal-fin spine. The dorsal head profile is straight. The lips are thin and not fleshy. The posterior margin of the maxilla is exposed and reaches the vertical through the anterior margin of the orbit. The teeth are small and villiform. The lateral line is incomplete and does not reach the caudal fin, there are about 40 scales. The chest and nuchal region are asquamate; the remainder of the body is scaled except the head. The second and third dorsal- and anal-fin spines are about the same length; whereas, the first spines are greatly reduced in length.

Pigmentation The entire body is silvery-white. In males with a flank patch, the region behind the pectoral fin is translucent and bean shaped; whereas, in females it is covered in silvery-white guanine as is the remainder of the body. Often the black portions of the light organ are visible through the transparent patch, particularly in preserved material. The dorsal 1/2 of the spinous dorsal-fin membrane is yellowish. There is less guanine on the dorsal part of the body than ventrally, with a concentration at the midline of the flank. The dorsal flank pigmentation pattern comprises thick semi-circle markings sometimes forming full circles or oval shapes. These markings are dark gray in color. The posterior margin of the maxilla is black.

Remarks *Photopectoralis aureus* was common in Taiwanese markets and very often found with its congener *P. bindus*. It was collected by the authors in Tongkang (Dec. 2005, Mar. 2006, Nov. 2008), Yilan (Mar. 2007), Kaoziliao (Mar. 2007), East Coast (Mar. 2006), and Kaohsiung (Feb. 2006).

Photopectoralis bindus (Valenciennes, 1835) (Fig. 12)

Equula bindus Valenciennes in Cuvier and Valenciennes 1835:78 (Vizagapatam, India. No types known).

Leiognathus bindus (Valenciennes 1835): Shen 1984a:57, fig. 318-4. Shen 1984b : 262. Shen and Lin 1985:133, fig. 9. Chen and Yu 1986: 529, pl. 18, fig. 4. Shen 1993:344, pl.94-6. Chen 1993:99, fig. 395. Chen 2004:79.



Fig. 12 *Photopectoralis bindus*, LSUMZ 13439

Material examined AMNH 239283; AMNH 239288; AMNH 241279; AMNH 241310; AMNH 241319; AMNH 241323; AMNH 241327; AMNH 241351; AMNH 241358; AMNH 241361; AMNH 242614; AMNH 242615; AMNH 242621; AMNH 242706; AMNH 242707; AMNH 249275; AMS I.34367021; ASIZP 57299; ASIZP 57565; ASIZP 57686; ASIZP 58713; ASIZP 59288; ASIZP 59496; ASIZP 59840; ASIZP 61693; ASIZP 61964; ASIZP 66612; CAS 51097; LSUMZ 13439; UMMZ 240131; UMMZ 240142; USNM 373284; MNHN A-6763(syntype of “*Equula*” *brevirostris*). *Photopectoralis cf. bindus*: AMNH 237147.

Description *Photopectoralis bindus* is a deep-bodied and relatively laterally compressed ponyfish. The ventral profile is much more convex than the dorsal. This species has a short snout. The mouth extends forward when protracted about 10–15% of the body length. The lower jaw profile is straight. The greatest BD is reached between the dorsal-fin origin and the pelvic-fin origin. The dorsal- and pelvic-fin origins are located along the same vertical. The anal-fin origin is at a vertical with the last dorsal-fin spine. The dorsal head profile is straight. The lips are thin and not fleshy. The posterior margin of the maxilla is exposed and reaches the vertical through the anterior margin of the orbit. The teeth are small and villiform. The lateral line is incomplete; it includes about 40 scales. The chest and nuchal region are asquamate; the remainder of the body is scaled except the head. The second and third dorsal- and anal-fin spines are about the same length; whereas, the first spines are greatly reduced in length. The second dorsal-fin spine is 35–40% of the BD. The second anal-fin spine is about 20–25% of the BD.

Pigmentation The entire body is silvery-white with some yellowish pigment on the head. In males with a flank patch, the region behind the pectoral fin is translucent; whereas, in females it is covered in silvery-white guanine as is the

remainder of the body. The pectoral-fin axil is yellow with some melanophores. There is a strong concentration of melanophores on the snout dorsal to the mouth. The dorsal 1/2 of the spinous dorsal-fin membrane is yellow/orange. The region ventral to the orange pigment is lined with melanophores. The dorsal-fin spines are silvery. There is some light yellow pigment on the caudal, pectoral and anal fins. There is less guanine on the dorsal part of the body than ventrally, with a concentration at the midline of the flank. The dorsal flank pigmentation pattern comprises semi-circle markings sometimes forming full circles or oval shapes. These markings are dark gray in color.

Remarks *Photopectoralis bindus* was commonly found in Taiwanese markets and very often found with its congener *P. aureus*. It was collected in Tongkang (Dec. 2005, Mar. 2006, Nov. 2008), Tashi (Mar. 2007), Kaoziliao (Mar. 2007), and East Coast (Mar. 2006).

Secutor insidiator (Bloch 1787) (Fig. 13)

Zeus insidiator Bloch 1787:41, pl. 192, figs. 2–3 (Surat, India. Syntypes: ZMB 1676).

Secutor insidiator (Bloch 1787): Shen 1984a:58, fig. 318-15a, b. Shen 1984b:261. Shen and Lin 1985:129, fig. 4. Chen and Yu 1986:529. Shen 1993:345, pl.95-4.

Material examined AMNH 239272; AMNH 239276; AMNH 239285; AMNH 241281; AMNH 241294; ASIZP 57684; ASIZP 59442; ASIZP 60454; ASIZP 62110; ASIZP 65042; LSUMZ 13467; CAS 29894.

Description *Secutor insidiator* is a moderately elongate to deep-bodied, and strongly laterally compressed ponyfish. The ventral profile is much more convex than the dorsal. It has an upwardly turned mouth and the lower jaw is straight



Fig. 13 *Secutor insidiator*, LSUMZ 13468

and nearly vertical; the lower jaw profile is at a right angle with the remainder of the body. The mouth can extend about 15–20% of the SL. The snout is very short. The greatest BD is reached between the dorsal-fin origin and the pelvic-fin origin. The dorsal- and pelvic-fin origins are located along the same vertical. The pelvic fins are very short. The anal-fin origin is at a vertical with the last dorsal-fin spine. The lips are thin and not fleshy. The posterior margin of the maxilla is exposed, reaching a vertical through the anterior part of the orbit. The teeth are small and villiform. The lateral line is incomplete, extending from the posterior margin of the opercle and terminating anterior to the caudal peduncle. The lateral line includes about 40 scales. The eyes are small (about 35% of SL). There is a strong concavity dorsal to the orbit, formed by the exposed rising dorsal aspect of the supraoccipital crest (i.e., nuchal spine) which extends from dorsal to the orbit to the dorsal-fin origin. There are no scales on the chest or nuchal region the remainder of the body is scaled. The second and third dorsal- and anal-fin spines are about the same length. The second dorsal-fin spine is about 35% of the BD and the second anal-fin spine about 25% of the BD.

Pigmentation The entire body is silvery. The membrane of the spinous region of the dorsal fin is black from about 1/4 the length of the second dorsal-fin spine to the distal margin of the fin. There are dark vertical markings comprising short vertical dash-like objects. There is a stripe of melanophores at the midline of the flank. There is a black region in the posterior margin of the lower jaw and ventral to the orbit. There is a black line of concentrated melanophores extending from the pectoral-fin axil to about the posterior margin of the pelvic fin.

Remarks *Secutor insidiator* is often collected with its congener *S. ruconius* but it is more rare than that species. It was collected in Tongkang (Dec. 2005, Mar. 2006, Nov. 2008), Chaiyi (Mar. 2006), and Beimen (Mar. 2006).

Secutor ruconius (Hamilton 1822) (Fig. 14)

Chanda ruconius Hamilton 1822:106, 371, pl. 12, fig. 35 (Ganges River estuaries, India. No types known).

Secutor ruconius (Hamilton 1822): Shen 1984a:57, fig. 318-14. Shen 1984b:261.

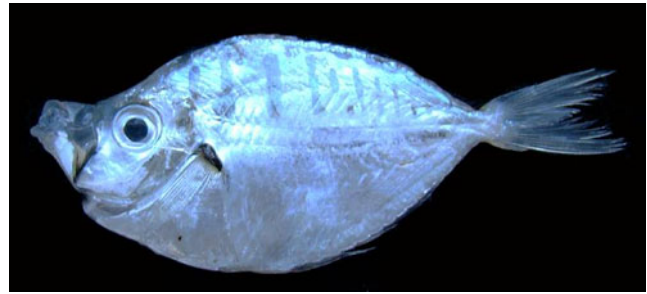


Fig. 14 *Secutor ruconius*, LSUMZ 13353

Shen and Lin 1985:128, fig. 3. Chen and Yu 1986:529, fig. 6-129(5). Shen 1993:346, pl.95-5. Chen and Fang 1999:151. Chen 1993:101. Chen 2004:80.

?*Secutor interruptus* (non Valenciennes 1835): Mochizuki and Hayashi 1989:87.

Material examined AMNH 241322; AMNH 239260; AMNH 239277; AMNH 239293; AMNH 239289; ASIZP 57625; ASIZP 60453; ASIZP 60524; ASIZP 61952; ASIZP 62115; CAS-SU 29895; LSUMZ 13159; LSUMZ 133553; UMMZ 225240.

Description *Secutor ruconius* is a strongly laterally compressed and deep-bodied ponyfish. The ventral profile is much more convex than the dorsal. It has an upwardly turned mouth and the lower jaw is straight and nearly vertical; it is at a right angle with the remainder of the body. The mouth can extend about 15–20% of the SL. The snout is very short. The greatest BD is reached between the dorsal-fin origin and the pelvic-fin origin. The dorsal- and pelvic-fin origins are located along the same vertical. The pelvic fins are very short. The anal-fin origin is at a vertical with the first dorsal-fin ray. There is a very strong concavity at the orbit preceding a rise in the dorsal profile of the head to the dorsal-fin origin. The anterior half of the body up to the vertical through the dorsal-fin origin, is nearly circular. The lips are thin and not fleshy. The posterior margin of the maxilla is exposed, and is directly anterior to the orbit. The teeth are small and villiform. The lateral line is incomplete. The lateral line includes about 30–40 scales. The eyes are small. There are no scales on the chest, head or nuchal region the remainder of the body is scaled. The second dorsal- and anal-fin spines are slightly (20–40%) longer than the third spines. The second dorsal-fin spines are about 30–40% of the BD, and the second anal-fin spine about 10–20% of the BD.

Pigmentation The entire body is silvery. The membrane of the spinous region of the dorsal fin has concentrated melanophores from about 1/4 the length of the second dorsal spine to the distal

margin of the fin. There are broad dark gray vertical markings comprising about 10 long vertical bars. The dorsal pattern is a greenish yellow. There is a black region in the posterior margin of the lower jaw and ventral to the orbit. There is a black line of concentrated melanophores extending from the pectoral-fin axil to about the posterior margin of the pelvic fin. The base of the dorsal fin has a strong silvery guanine line.

Remarks The taxonomic history of *Secutor ruconius* is complicated. Eschmeyer and Fricke 2009 currently recognize this species as valid. No types exist and some refute whether the original description refers to a member of *Secutor* (Mochizuki and Hayashi, 1989). This genus requires a revision to sort out problematic taxa that is beyond the scope of this paper. *Secutor ruconius* is often collected with its congener *S. insidiator* but it is much more common than that species. It was collected in Wuchi (Nov. 2008), Dongshih (Nov. 2008), Nanfanao (Mar. 2007), Taichung (Mar. 2006), Beimen (Mar. 2006), East Coast (Mar. 2006) and Tongkang (Dec. 2005).

Questionable records

Karalla daura (Cuvier 1829)

Shen (1984a) first recorded this species (as *Leiognathus daura*) from Taiwan. However, we identify the specimen in his photo to be *Eubleekeria splendens*. Chen and Yu (1986) recorded this species but provided no photographs. *Karalla daura* is the only leiognathid with large fleshy lips, which was not mentioned by Chen and Yu (1986). The black dorsal-fin blotch present in this species often causes it to be confused with *Eubleekeria splendens* or *Nuchequula nuchalis* which have a similar marking. This species was described from Indian waters by Cuvier, and was collected in Indonesia (Java) and Sri Lanka (P. Chakrabarty in 2008) and in Vietnam (by all three authors in 2010), but it has not been encountered in Taiwan or in collections held in Taiwan.

Secutor indicus Monkolprasit 1973

Although several authors recorded this species (Chen 1993, 2004; Mochizuki and Hayashi 1989) from Taiwan, this species has not been encountered in Taiwan or in collections held in Taiwan.

Equulites elongatus (Günther 1874)

This is a questionable record of a species described from Indonesia. A similar species, *Equulites rivulatus*, is

described from Japan but not encountered by the authors in Taiwan. Many of the specimens we encountered labeled *Leiognathus elongatus* were in fact juvenile *Photopectoralis aureus*, which can be rather elongate, particularly in younger individuals.

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