

Overview of the leiognathid species in Malaysia

¹Ying G. Seah, ²A. Ghaffar Mazlan, ²K. Das Simon, ³Aziz Arshad,
²Che A. R. Mohamed, and ²Gires Usup

¹ Department of Fisheries Science and Aquaculture, Faculty of Agrotechnology and Food Science, Universiti Malaysia Terengganu, Terengganu, Malaysia; ² Marine Ecosystem Research Centre, Faculty of Science and Technology, Universiti Kebangsaan Malaysia, Selangor, Malaysia; ³ Department of Aquaculture, Faculty of Agriculture, Universiti Putra Malaysia, Selangor, Malaysia. Corresponding authors: Y. G. Seah, ygseah@yahoo.co.uk and A. G. Mazlan, magfish05@yahoo.com

Abstract. The taxonomy of leiognathid species has changed drastically as a result of revisions carried out in recent years. During the same period, new species have also been described. In this study, a taxonomic review and update of leiognathid species present in Malaysian waters was carried out. Leiognathid specimens were collected from the coastal waters of Peninsular Malaysia. All specimens were examined for their internal and external morphological features and osteological features. The leiognathids of Malaysia reviewed here comprised at least 22 species. Malaysia thus has one of the richest assemblages of leiognathid species in the world. *Equulites laterofenestra* (Sparks & Chakrabarty, 2007), *Leiognathus robustus* Sparks & Dunlap, 2004, and *Nuchequula mannusella* Chakrabarty & Sparks, 2007 are new records in Malaysian waters. Some previously described species from Malaysia were erroneously identified. These include specimens misidentified as *Equulites rivulatus* (Temminck & Schlegel, 1845), *Gazza achlamys* Jordan & Starck, 1917, and *Nuchequula nuchalis* (Temminck & Schlegel, 1845). *E. rivulatus* and *G. achlamys* have been recorded in the Western Pacific but these species have not been encountered in Malaysia or in collections held in Malaysia.

Key Words: Leiognathidae, taxonomy, new record, ponyfishes, dubious taxa, Malaysian waters.

Abstrak. Taksonomi spesies ikan kikek telah bertukar secara drastik akibat penyemakan yang dijalankan dalam tahun-tahun kebelakangan ini. Dalam tempoh yang sama, spesies baru juga telah diperihalkan. Dalam kajian ini, pengkajian semula dan pengemaskinian spesies ikan kikek yang wujud di perairan Malaysia telah dijalankan. Spesimen ikan kikek telah dikumpulkan dari perairan pantai Semenanjung Malaysia. Semua spesimen telah dikaji dari segi sifat morfologi secara dalaman dan luaran serta sifat osteologi. Ikan kikek Malaysia yang telah dikaji semula di sini merangkumi sekurang-kurangnya 22 spesies. Malaysia dengan itu merupakan salah satu himpunan spesies ikan kikek yang paling kaya di dunia. *Equulites laterofenestra* (Sparks & Chakrabarty, 2007), *Leiognathus robustus* Sparks & Dunlap, 2004 dan *Nuchequula mannusella* Chakrabarty & Sparks 2007 merupakan rekod baru di perairan Malaysia. Beberapa spesies yang diperihalkan dari Malaysia sebelum ini telah dikenal pasti dengan tidak tepat. Ini termasuk spesimen-spesimen yang telah salah dikenal pasti sebagai *Equulites rivulatus* (Temminck & Schlegel, 1845), *Gazza achlamys* Jordan & Starck, 1917 dan *Nuchequula nuchalis* (Temminck & Schlegel, 1845). *E. rivulatus* dan *G. achlamys* pernah direkodkan di Pasifik Barat tetapi spesies-spesies ini masih belum dijumpai di Malaysia atau koleksi-koleksi yang dimiliki oleh Malaysia.

Kata Kunci: Leiognathidae, taksonomi, rekod baru, ikan kikek, taksa curiga, perairan Malaysia.

Introduction. The taxonomy of leiognathids (Actinopterygii: Perciformes: Leiognathidae) has changed dramatically in recent years. Several studies of leiognathids have been carried out based on morphology (Chakrabarty et al 2008, 2010; Chakrabarty & Sparks 2008; Kimura et al 2000, 2003, 2005, 2008; Sparks 2006ab; Sparks & Chakrabarty 2007; Yamashita & Kimura 2001), or phylogenetic analyses of morphological transformations regarding to light organ system features (Chakrabarty & Sparks 2007; Sparks 2006a), or phylogenetic analyses of DNA sequences (Ikejima et al 2004; Seah et al 2008; Sparks & Dunlap 2004; Sparks et al 2005). These analyses have provided a better understanding of the leiognathids' relationship at the generic and species levels. In addition, new species have also been described. In light of these developments, an update of the leiognathids present in Malaysian waters is needed.

Material and Method. Fish collections were made at locations shown in Table 1. An otter trawl net was deployed throughout the study to catch fishes at depths ranging from 15 to 25 m. The trawl was equipped with a 1¼ inches mesh size cod end. Each trawl lasted about 3 hours at a towing speed of 2.0 - 3.0 knots. All specimens collected were then fixed in 10% formalin during the field study and later transferred into 70% alcohol prior to the further study. Counts and measurements generally followed Hubbs & Lagler (1947). Observations of external and internal of morphological features and osteological features were made from fresh and cleared and stained specimens and X-ray photos. Cyanine blue 41 (Acros Organics, USA) was used to stained the specimens in order to examine and count scales and sensory canals. All specimens are kept in the museum of Universiti Kebangsaan Malaysia.

Table 1

The location and date of samplings in Malaysia for this study

<i>Location</i>	<i>Date</i>
Perhentian Island, Terengganu	
N05° 59.863':E102° 46.623' - N06° 04.467':E102° 38.895'	02.09.2006
N06° 00.950':E102° 38.040' - N06° 02.227':E102° 42.119'	03.09.2006
N05° 50.440':E102° 47.240' - N05° 49.963':E102° 48.488'	04.09.2006
Tinggi-Sibu Island, Johor	
N02° 13.830':E103° 59.280' - N02° 12.530':E103° 59.057'	17.07.2007
N02° 15.452':E103° 59.829' - N02° 13.314':E104° 00.099'	18.07.2007
N02° 11.444':E104° 00.441' - N02° 10.945':E104° 02.121'	19.07.2007
Tioman Island, Pahang	
N03° 02.000':E104° 05.490' - N03° 03.988':E104° 03.472'	28.07.2008
N03° 07.792':E104° 03.359' - N03° 02.886':E104° 05.020'	28.07.2008
N02° 47.586':E104° 03.265' - N02° 44.262':E104° 03.721'	29.07.2008
N02° 57.201':E104° 06.105' - N02° 57.773':E104° 12.464'	29.07.2008
N02° 47.031':E104° 02.827' - N02° 44.131':E104° 03.476'	30.07.2008
N02° 40.345':E104° 04.663' - N02° 43.286':E104° 03.532'	30.07.2008
Tanjung Sepat Jetty, Selangor* - N02° 39.446':E101° 33.393'	
Kuala Kedah Jetty, Kedah* - N06° 06.371':E100° 17.298'	
Siti Khadijah Kota Bharu Market, Kelantan* - N06° 07.808':E102° 14.356'	
LKIM Cendering Jetty, Terengganu* - N05° 15.846':E103° 11.055'	
Endau Mersing Jetty, Johor* - N02° 39.494':E103° 37.195'	

* Collections were carried out on more than one occasion

Results and Discussion. Twenty species of leiognathids were identified in the current study (Figure 1). Leiognathid species listed in several references from Malaysia and frequently cited in the literature have been recognized as erroneous identifications and their current status were reviewed and corrected (Table 2).

Four species of leiognathids have been concluded to be dubious taxa, namely *Leiognathus berbisi* (Valenciennes, 1835) (= likely *Equulites leuciscus*, see Chakrabarty et al (2010)), *Leiognathus brevirostris* (Valenciennes, 1835) (= a junior synonym of *Photopectoralis bindus*, see Chakrabarty & Sparks (2007)), *Leiognathus lineolatus* (Valenciennes, 1835) (= nomen dubium, see Sparks (2006a)) and *Leiognathus longispinis* = a junior synonym of *Aurigequula longispinis*, see Sparks 2006b). The species described and photographed as *L. brevirostris* in Atan et al (2010) and Ambak et al (2010) is in fact *Nuchequula gerreoides*. Atan et al (2010) recorded *L. berbisi* and *L. lineolatus* without photographs and thus no further verification of identification can be done.

Atan et al (2010) and Ambak et al (2010) recorded the occurrence of *Equulites rivulatus* from Malaysia. However, photographic evidence indicated that the specimens are *Equulites leuciscus* and *Equulites stercorarius*, respectively. *E. rivulatus* is easily distinguished from other congeners by the presence of an expansive transparent rectangular lateral flank patch for males, and large round blotches on the upper flank and

thick horizontal bars along the lateral line and slightly above the midline of the flank in both sexes (Ikejima et al 2008). This species has been reported to occur in the Western Pacific but without any given specific distribution (Eschmeyer 2010). It has not been encountered in Malaysia or in collections held in Malaysia. Mohsin & Ambak (1996) and Atan et al (2010) recorded *Gazza achlamys* from Malaysia. This species has also not been encountered in Malaysia or collections held in Malaysia. Mohsin & Ambak (1996) mentioned no specific distribution for this species but reported it existed in the South China Sea, while Atan et al (2010) provided no photograph. Woodland et al (2001) reported that this species do not exist in Malaysian waters except possibly in the northern part of Sabah. Since no sampling was carried out in East Malaysia, these records remain to be verified. Atan et al (2010) and Ambak et al (2010) recorded *Nuchequula nuchalis* from Malaysia. However, this species was reported to occur only in the waters of China, Japan, Taiwan and Korea (Kimura et al 2008). The species photographed as *N. nuchalis* in both references is actually *Nuchequula mannusella*.

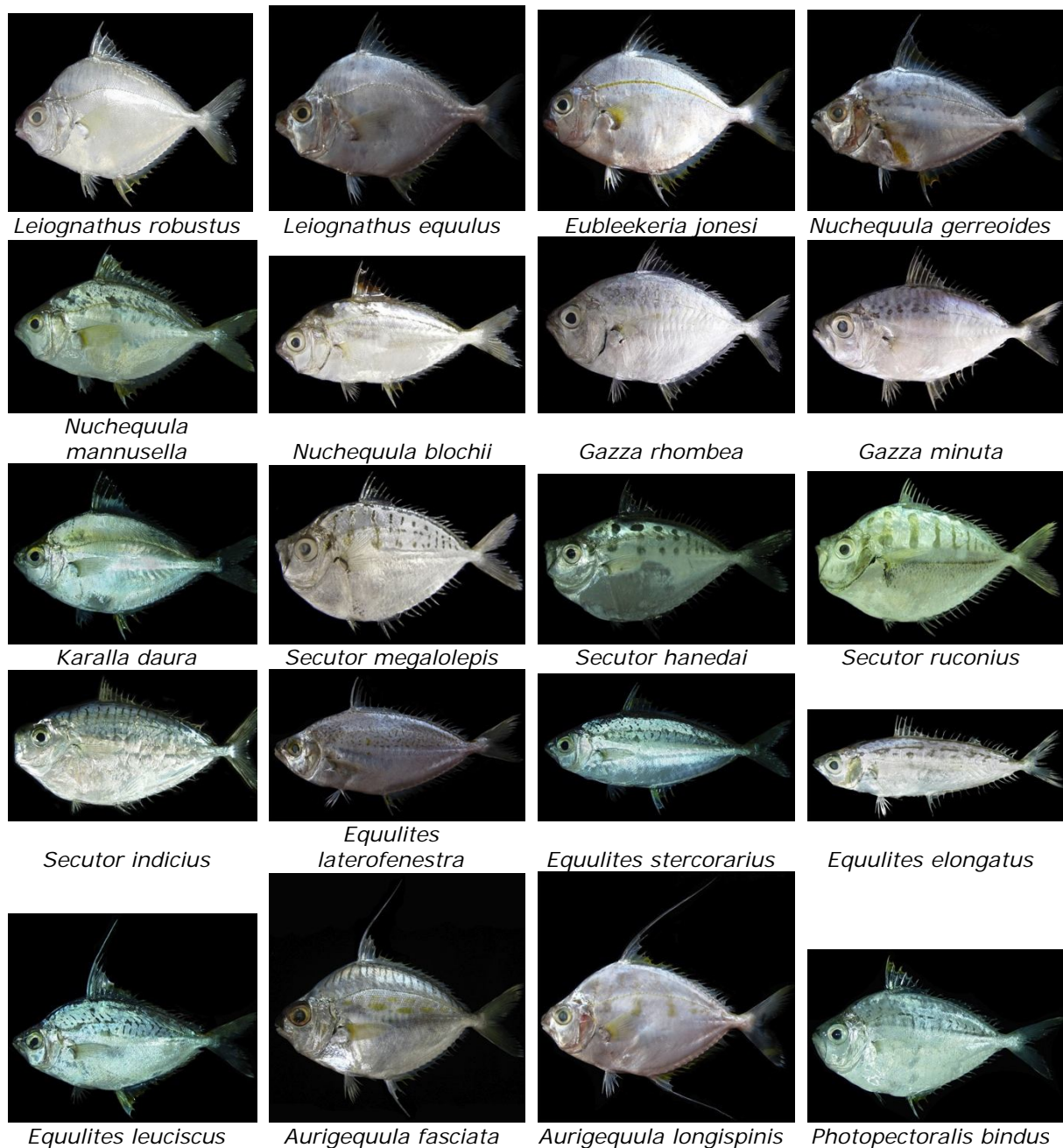


Figure 1. Photographs of leiognathid species from Malaysia in this study.

Table 2

The status of leiognathid species listed in several references from Malaysia and conclusions drawn from the present study

References ► Species ▼	This study	Mansor et al (1998)	Kong (1998)	Mohsin & Ambak (1996)	Tan et al (1996)	Atan et al (2010)	Ambak et al (2010)
<i>Aurigequula fasciata</i>	+			c		c	c
<i>Aurigequula longispinis</i>	+						c
<i>Equulites elongatus</i>	+			x	x	x	x
<i>Equulites laterofenestra</i>	+			<i>E. stercorarius</i>	<i>E. stercorarius</i>	<i>E. stercorarius</i>	<i>E. laterofenestra</i>
<i>Equulites leuciscus</i>	+	x <i>E. aterofenestra</i>		x <i>E. laterofenestra</i>	c	x <i>E. laterofenestra</i>	x <i>E. laterofenestra</i>
<i>Equulites rivulatus</i>						x <i>E. leuciscus</i>	x <i>E. stercorarius</i>
<i>Equulites stercorarius</i>	+						
<i>Eubleekeria jonesi</i>	+						
<i>Eubleekeria splendens</i>		x <i>E. jonesi</i>	c	c		x <i>E. jonesi</i>	x <i>E. jonesi</i>
<i>Gazza achlamys</i>				?		?	
<i>Gazza minuta</i>	+	c	c	c		c	c
<i>Gazza rhombea</i>	+						
<i>Karalla daura</i>	+	c		c		c	c
<i>Leiognathus berbis</i>						?	
<i>Leiognathus brevirostris</i>						x	x
<i>Leiognathus equulus</i>	+	c	c	c	c	<i>N. gerreoides</i>	<i>N. gerreoides</i>
<i>Leiognathus lineolatus</i>						c	c
<i>Leiognathus robustus</i>	+					?	
<i>Leiognathus smithursti</i>		x <i>A. longispinis</i>		x <i>A. longispinis</i>	x <i>A. longispinis</i>		
<i>Nuchequula mannusella</i>	+						
<i>Nuchequula blochii</i>	+						
<i>Nuchequula nuchalis</i>						x <i>N. mannusella</i>	x <i>N. mannusella</i>
<i>Nuchequula gerreoides</i>	+						
<i>Photopectoralis bindus</i>	+			c	c	c	c
<i>Secutor hanedai</i>	+						
<i>Secutor indicus</i>	+						c
<i>Secutor insidiator</i>				c		x <i>S. indicus</i>	
<i>Secutor megalolepis</i>	+						
<i>Secutor ruconius</i>	+		x <i>S. hanedai</i>	c		c	c

c = Correct record; x = incorrect record; ? = questionable record; + = specimen caught

Conclusion. Several books that are often referred to as reference guides by the local communities contained numerous misinformation. The inaccurately represented species illustrations and scientific names have contributed to frequent misidentifications. The taxonomy of leiognathids was reviewed and correctly assigned in the present study. The data available showed that Malaysia harbours one of the richest assemblages of leiognathid species in the world with at least 22 species representing all the genera currently recognized.

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Authors:

Ying Giat Seah, Department of Fisheries Science and Aquaculture, Faculty of Agrotechnology and Food Science, Universiti Malaysia Terengganu, 21030 Kuala Terengganu, Terengganu D. I. Malaysia, e-mail: ygseah@yahoo.co.uk

A. Ghaffar Mazlan, Marine Ecosystem Research Centre, Faculty of Science and Technology, Universiti Kebangsaan Malaysia, 43600 UKM Bangi Selangor D. E., Malaysia, e-mail: magfish05@yahoo.com

K. Das Simon, Marine Ecosystem Research Centre, Faculty of Science and Technology, Universiti Kebangsaan Malaysia, 43600 UKM Bangi Selangor D. E., Malaysia, e-mail: skdas_maa@yahoo.com/simon@ukm.my

Aziz Arshad, Department of Aquaculture, Faculty of Agriculture, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia, e-mail: azizarshad@putra.upm.edu.my

Che Abd Rahim Mohamed, Marine Ecosystem Research Centre, Faculty of Science and Technology, Universiti Kebangsaan Malaysia, 43600 UKM Bangi Selangor D. E., Malaysia, e-mail: carmohd@ukm.my

Gires Usup, Marine Ecosystem Research Centre, Faculty of Science and Technology, Universiti Kebangsaan Malaysia, 43600 UKM Bangi Selangor D. E., Malaysia, e-mail: gires@ukm.my

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