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## First Record of Three Species of Gerreids (Pisces: Perciformes) from the Jaffna Lagoon, Sri Lanka

S. Shutharsan and K. Sivashanthini  
Department of Zoology, University of Jaffna, Jaffna, Sri Lanka

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**Abstract:** The present investigation is an attempt to record three species of gerreids for the first time from the Jaffna lagoon, Sri Lanka. Gerreids are economically important fish found along the coastal regions of Sri Lanka. Seven species namely *Gerres abbreviatus*, *Gerres acinaces*, *Gerres filamentosus*, *Gerres lucidus*, *Gerres oblongus*, *Gerres oyena* and *Pentaprion longimanus* have been recorded in Sri Lankan waters. However, only two species of gerreids, *Gerres abbreviatus* and *Gerres oblongus* have been recorded from the Jaffna lagoon, so far. During the present investigation samples were collected from Pasaiyoor, Kurunagar, Kakkaitteevu and Ponnalai coastal areas from commercial catches by siragu valai, hand nets, hook and line and bottom trawling. The morphometric characters were observed, measured and examined and three new species of gerreids were recorded. Those are *Gerres filamentosus*, *Gerres acinaces* and *Gerres lucidus*. The distinctive features to identify those species and a key for identification discussed in detail in the present study. The record of these species is an important contribution to ichthyofauna of Northern Sri Lanka. The occurrence of these species in the Jaffna lagoon can be explained that they may have migrated due to the environmental changes from the Indian ocean.

**Key words:** Ichthyofauna, siragu valai, *Gerres filamentosus*, *Gerres acinaces*, *Gerres lucidus*

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### INTRODUCTION

Gerreids are economically important food found in the Indo-Pacific region included under family-Gerreidae. Nelson (1994) listed 40 species belonging to 8 genera such as *Diapterus*, *Eucinostomus*, *Eugerres*, *Gerres*, *Paregueila*, *Pentaprion*, *Ulaema* and *Xystaema* in the world waters. Talwar and Kacker (1984) described nine species (*Gerres abbreviatus*, *G. filamentosus*, *G. limbatus*, *G. macracanthus*, *G. oblongus*, *G. oyena*, *G. poeti*, *Gerreomorpha setifer* and *Pentaprion longimanus*) belonging to 3 genera from Indian waters. Research on diversity of gerreids showed ten of the twelve species of mojarras found in the western Atlantic Ocean, to occur regularly in the Indian River Lagoon (Matheson and Gilmore, 1995).

Recently, nine species belonging to 2 genera (*Gerres abbreviatus*, *G. filamentosus*, *G. lucidus*, *G. macracanthus*, *G. oblongus*, *G. oyena*, *G. acinaeces*, *G. setifer* and *Pentaprion longimanus*) have been recorded along the Indian waters (Anonymous, 2000). Ramaiyan and Senthilkumar (1997) reported 5 species belonging to 2 genera from Parangipettai waters. Sivashanthini and Subramanian (2003) reported six species of gerreids belonging to two genera from Parangipettai waters.

Gerreid species from the Indo-Pacific have long been confused taxonomically because of their similar overall appearance and coloration and similar counts, necessitating an urgent taxonomic revision of the group (Woodland, 1983; Iwatsuki *et al.*, 1999a). Three species complexes have recently been erected in the genus *Gerres*: (1) the *G. filamentosus* complex, including *G. filamentosus* Cuvier, 1825,

*G. infasciatus* and *G. macracanthus* Bleeker, 1854 (Iwatsuki *et al.*, 1996; Iwatsuki and Kimura, 1998); (2) the *G. oyena* complex, including *G. baconensis* (Evermann and Seale, 1907), *G. equulus* (Temminck and Schlegel, 1844) and *G. oyena* (Forsskål, 1775; Iwatsuki *et al.*, 1999a) and (3) the *G. setifer* complex, including *G. chrysops* Iwatsuki, Kimura and Yoshino, *G. decacanthus* (Bleeker, 1865), *G. setifer* (Hamilton, 1822) and *G. silaceus* (Iwatsuki *et al.*, 1999b, 2001).

In Japan, populations of gerreids have been identified genetically using Random Amplified Polymorphic DNA Techniques (Miyahara *et al.*, 1999) so also in identifying the *G. oyena* populations from Miyazaki and Okinawa waters. The authors strongly suggested that both populations were constituted by different species although considered as same species all along.

While investigating gerreid fishes in Jaffna lagoon, Sri Lanka the authors recognized three species of gerreids such as *Gerres filamentosus*, *Gerres acinaces* and *Gerres lucidus* for the first time. Seven species of Gerreids have been recorded in Sri Lanka, so far. Those are *G. abbreviatus*, *G. acinaces*, *G. filamentosus*, *G. lucidus*, *G. oblongus*, *G. oyena* and *Pentaprion longimanus* (Anonymous, 1995). However, only two species of gerreids, *G. abbreviatus* and *G. oblongus* have already been recorded, from the Jaffna lagoon, Sri Lanka (Sivashanthini and Subramanian, 2002), so far. In the present study, the above mentioned three new species of Gerreids have been identified.

## MATERIALS AND METHODS

Samples were collected from July to December 2007 from the landing centers such as Passaiyoor, Kurunagar, Kakkaitteevu and Ponnalai (Fig. 1). *Gerres filamentosus* was recorded for the first time among the catches collected from Ponnalai landing center by nets on 19 July 2007. *Gerres acinaces* collected from the Passaiyoor and Ponnalai landing centres on 26 July 2007 and 14 August 2007 respectively. *Gerres lucidus* was collected from Ponnalai landing centers on 04 December 2007. Counts and measurements generally followed Hubbs and Lagler (1947) and Woodland (1983, 1986). Institutional codes follow Leviton *et al.* (1985). Additional institutional abbreviations are as follows: University of Jaffna (UOJ), Department of Zoology (ZOO). The macroscopic and morphometric measurements were taken in laboratory and the sample was then fixed in 10% formalin. The materials preserved in the Zoology laboratory of Jaffna University with the catalogue numbers,

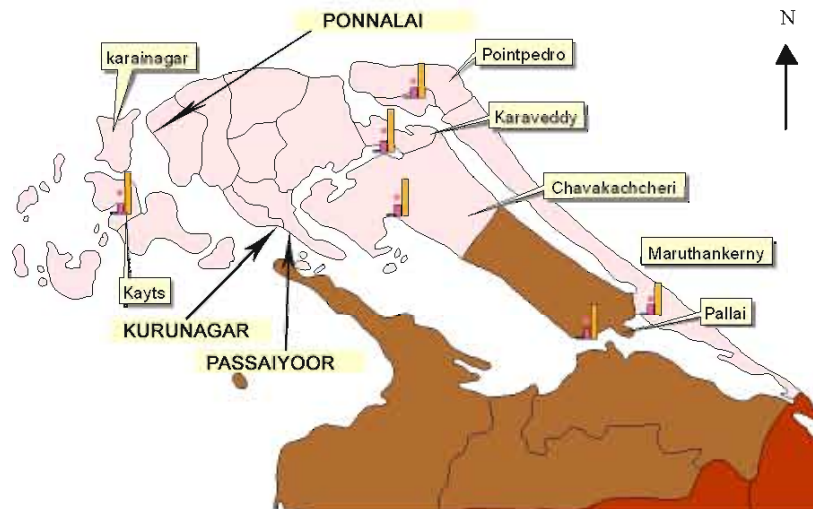


Fig. 1: Figure showing the collection sites

*G. filamentosus* : UOJ/ZOO/GF/2007  
*G. acinaces* : UOJ/ZOO/GA/2007  
*G. lucidus* : UOJ/ZOO/GL/2007

For morphometric identification the following measurements were taken for those specific new species: Total length, fork length, standard length, depth, head length, snout length, anterior point of snout to first dorsal spine, eye diameter, scale count, caudal fin length, body color, level of pectoral fin, spines and rays of anal, caudal, pelvic, pectoral and dorsal fins. Length measurements were taken in centimeters with two decimal place correction by using measuring board and measurement tape. Weight measured in grams by electric balance with two decimal place correction.

## RESULTS AND DISCUSSION

For *Gerres filamentosus*, second dorsal spine laterally compressed, produced into a filament, whose tip extends and past the level of first anal spine. It's body depth contained 2 to 2.5 times in standard length in larger specimen, up to 3 times in smaller specimen, mouth small, strongly protrusible, fine teeth in jaws, second dorsal spine laterally compressed, produced into a filament, whose tip extends past level of first anal spine (filament often damaged) greater than head. Third dorsal spine laterally compressed, as long as distance from tip of snout to preopercular margin, Pectoral fin long, tip of depressed fin reaching to level of origin of first anal spine, 2nd anal fin spine much shorter than fin base, Caudal deeply forked, its longest rays 3 times the length of median rays. Color silvery, with 7 to 10 columns of ovoid spots on upper portion of sides, coalescing as bars in small specimens. Body compressed and elevated. Pectoral fin long, tip of depressed fin reaching to level of origin of first anal spine. On lateral line 44 to 47 scales. External morphology of *G. filamentosus* is shown in Fig. 2.

For *Gerres acinaces*, 2nd anal spine fairly strong, much longer than eye diameter. Caudal fin deeply forked and very long, its longest ray longer than either pectoral fin or head. Scales on lateral line 42 to 44 to base of caudal fin and 3 to 5 more on scaly sheath on caudal fin base. 4.5 to 5.5 scale rows between lateral line and base of 5th dorsal spine. Depth contained 2.5 to 2.9 times in standard length. It consist slender body. Color Olive green above to silver below, columns of dark ovoid spots below lateral line, as many as 5 spots below highest part of lateral line. External morphology of *G. acinaces* is shown in Fig. 3.



Fig. 2: External morphology of *Gerres filamentosus*



Fig. 3: External morphology of *Gerres acinaces*



Fig. 4: External morphology of *Gerres lucidus*

For *Gerres lucidus*, 3 row scales between lateral line and 5th dorsal spine. Length of caudal fin two times of median ray of caudal fin. Pectoral fin short. Orange color in anterior part of Pelvic and Anal fin. Dark black color between 2nd to 5th dorsal spines. Depth contained 2.3 to 2.7 times in standard length, Pectoral fin short, tip of depressed fin reaching to level of anus but not to level of first anal spine, 2nd anal fin spine strong and shorter than anal fin base. Lateral line scales 33 to 35 to base of caudal fin and 3 more pored scales on scaly sheath on base of caudal fin, Color silvery, dusky dorsally. Four diffuse, dark saddles along back, extending down sides to mid line. External morphology of *G. lucidus* is shown in Fig. 4.

Several similar studies were held along the world waters by different researchers. Iwatsuki and Kimura (1998) originally described *Gerres infasciatus* (non-banded whipfin mojarras) on the basis of three specimens collected from Samut Prakan, northern Gulf of Thailand, western Central Pacific (Iwatsuki and Kimura, 1998). *Gerres infasciatus*, was characterized by having the first and second soft dorsal fin ray tips yellow in fresh specimens. Very recent investigations of *Gerres* species from the Indian Ocean resulted in eight examples of *G. infasciatus* that were recorded from Chennai, Tamil

Nadu, India (Fukuhara *et al.*, 2006) and it was reported for the first time from Indian Ocean. Compared to other gerreid species collected from the Indian Ocean, *G. infasciatus* could be easily distinguished from the most similar species *G. filamentosus* (Iwatsuki *et al.*, 1996).

Chakraborty, A. and Iwatsuki, Y paid two visits to India and confirmed that *G. infasciatus* was the most abundant gerreid species in a number of markets in Chennai (Madras) compared to similar species of the *G. filamentosus* complex: *G. filamentosus* and *G. macracanthus*. However, specimens of *G. infasciatus* were neither collected nor observed at other localities along the east and west coast of India, including the vicinity of the Ganges River Mouth (West Bengal), Trivandrum, Mangalore and Mumbai (Bombay).

In a study, performed by Iwatsuki *et al.* (2007) *Gerres japonicus* Bleeker, 1854 and *Gerres subfasciatus* Cuvier in Cuvier and Valenciennes, 1830, are redescribed and *Gerres akazakii* sp. nov. (Japanese endemic), *Gerres ryukyuensis* sp. nov. (Okinawa I., Japan) and *Gerres shima* sp. nov. (Indo-Malayan region, including the Andaman Sea, Southeast Asia, Southern China and Taiwan and Ryukyu Is., Japan) are described. *Gerres ovatus* Ganther, 1859 and *Gerres kapas* Bleeker, 1854, are recognized as junior synonyms of *G. subfasciatus* and *Gerres oyena* (Forsskal, 1775), respectively.

Iwatsuki *et al.* (2001) studied the taxonomic status of *Gerres limbatus* Cuvier in Cuvier and Valenciennes, 1830 and *G. lucidus* Cuvier in Cuvier and Valenciennes, 1830. The two species were reassessed as the same species, the latter corresponding to young of the former, on the basis of examination of their eight syntypes and other comparative specimens. Distinguishing morphological characters of these species are also studied clearly. The authors further specified that these species were recorded from the southern and western coasts of India including Sri Lanka, the Malay Peninsula, Gulf of Thailand and Indonesia, becoming rare in occurrence eastward. The Indian species misidentified as *Gerres poieti* (sic) by Cuvier in 1830 was described as a new species, *Gerres phaiya*, of the *Gerres erythrourus* species complex by Iwatsuki and Heemstra (2001).

## CONCLUSION

Those three species have been recorded for the first time in the Jaffna lagoon. There were no previous records in the northern region of Sri Lanka for these species. Thus the record of these species is an important contribution to ichthyofauna of Northern Sri Lanka. The occurrence of these species in the Jaffna lagoon can be explained that they have migrated due to the environmental changes from the Indian Ocean. Further studies to record more gerreid species from the northern region of Sri Lanka is very much essential to have a complete record of diversity of this species.

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