

CHAPTER IV
DISCUSSIONS

The used of morphometric and meristic data as taxonomic characters of Leiognathidae and Gerreidae in Thai waters

Depending upon many available literatures mostly from studies of the fishes, directly or indirectly, in many countries as stated in Chapter I and in supplementing with the results of this study, the followings taxonomic characters are likely taken to be discussed.

At the family levels, the identification of all members of Leiognathidae and Gerreidae within the subject of the study are comparable to most of the characters in uses at generic levels and in many cases at the species levels, they are very distinctive and have been used without changed for a long time, eventhough the two families were used to be united as a single family. Species identification of Leiognathidae relies principally on a combination of characters, e.g., body proportion, length of spinous dorsal and anal fins, orientation of mouth, presence or absence of scales on breast, tooth shape and their arrangement, pigmentation patterns, number of total gill rakers and number of tubed scales on lateral line.

Body depth in relation to standard length of Leiognathidae is a useful character for separating many species from other (Fig.31-32). The presence or absence of scales on the breast are important characters for identifying some species (see Fig.3, Tbl.6). Eventually, to the scales of all parts are so easily shed after capture or during preservation, therefore, ones must be particularly careful in examining the minute scales or scale pockets instead.

Tooth shape have commonly been used to separate *Gazza* from other genera of Leiognathidae, all members of this genus have large canine teeth whereas all other leiognathids have much smaller or weaker teeth. From this study, it is clearly shown that the shapes and sizes of teeth are differed distinctively between genera and or some species within the genus *Leiognathus* as well. (Fig.5, Tbl.7)

Gill rakers counts show various degree of overlapping between species of each genus. However, it is clearly shown in Table 2 that *Leiognathus splendens* has decisively more gill rakers than the rest of Thai *Leiognathus*, but being completely similar in the number with *Secutor indicus*.

However, in separating a species of *Leiognathus* from other congeners, this frequency table of distribution

of total gill rakers is more or less vary useful. Incidentally, *Secutor indicius* has comparatively more total gill rakers than *S. insidiator* and *S. ruconius*, the two of which have about the same counts.

Lateral line scale counts (Tbl.3) are from times to times used for charactering many species; but leiognathid scales are small and very easily shed, so thair accurate counts are extremely difficult to obtain. In several cases as shown in Tbl.3, however, the counts are last but not least useful to diagnose some species; this is especially when separating *Secutor indicius* from others.

For Gerreidae, species identifications are generally much easier than those of Leiognathidae. It relies principally on a combination of body shape and its relative proportion, size and shape of fins, number of fin rays as well, transverse scales between fifth dorsal spine and lateral line (Tbl.8) and number of tubed scales on the lateral line (Tbl.5), and pigmentations.

Number of transverse scales between fifth dorsal spine and lateral line is one of the best characters for identifying species of gerreids (Tbl.8) but this character may be only confused in the species of *G. abbreviatus* and *G. poieti*, but these two species can be differentiated by the number of tubed scales on lateral line. From Tbl.5, it

is clearly shown that *G. poietii* has more tubed scales on the lateral line than *G. abbreviatus*. (40-42 against 32-37)

Table 8 Number of transverse scales below fifth dorsal spine to lateral line for gerreids

| Species \ No. of transverse scales | 3 | 3.5 | 4 | 4.5 | 5 | 6 |
|------------------------------------|---|-----|---|-----|---|---|
| <i>Gerres abbreviatus</i> | | | * | | | |
| <i>G. filamentosus</i> | | | | | * | * |
| <i>G. lucidus</i> | * | | | | | |
| <i>G. macracanthus</i> | | | | | * | |
| <i>G. macrosoma</i> | | * | | | | |
| <i>G. oblongus</i> | | | | * | | |
| <i>G. oyena</i> | | * | | | | |
| <i>G. poietii</i> | | | * | | | |

Body proportion is a good character for separating *G. oyena* from *G. oblongus* (see Fig.33). Pigmentation is also a useful character for separating *G. oyena* from *G. macrosoma* (see p.97)

Pentaprion longimanus is the only species of the family that has exceedingly higher number of anal fin

rays than other species, this genus has only that species in Thai waters and in the world (Nelson, 1984). It is, therefore, monotypic (see generic description).

Species of Leiognathidae and Gerreidae found and expected to be found in Thai waters

From this study, it is possibly concluded that there are at least 25 species of ponyfishes and silver-biddies that inhabiting Thai waters. The members of the fishes are distributed in the family Leiognathidae which has three genera, viz., *Gazza*, *Leiognathus* and *Secutor*, and in the family Gerreidae, there are two genera, viz., *Gerres* and *Pentaprion*, as their generic members.

The most recent report of the total number of the local Leiognathidae appeared in the work of Wongratana (1988). In that work, he reported and mentioned names of 17 species of Leiognathidae, and named *Leiognathus dussumieri* and *Gazza achlamys* as two possible species to be found in Thai waters, this was chiefly according to the recorded ranges of their distributions, of which Thailand lies in middle. Interestingly, he added that *L. berbis* was found to be very rare and very few specimens were collected by him in for the collection of the Department of fishery. He also mentioned this species was the first species of Leiognathidae recorded from Thailand. However, no specimens of the species by

Wongratana (1988) were found at the collection of the Department of Fishery and also not a single specimen of these two species were captured during the precession of the present work. Therefore, the previous records of *L. berbis* and *G. achlayms* for Thailand were still doubtedful, but their occurrence in Thai waters are also likely possible.

Distribution of species of Leiognathidae and Gerreidae in Thai waters and the Indo-Pacific regions

All specimens of any species of Leiognathidae and Gerreidae from this study were found or collected or captured in the seas. Only some species, e.g., *Leiognathus brevirostris*, *L. splendens*, *Secutor insidiator* *S. ruconius* and *Gerrés filamentosus* are found occasionally abundant both in the seas and brackish waters or mangrove forests.

Evidentially, it was found during the course of this study that all Thai leiognathid and gerreid species have representatives of specimens that were found or collected along the coasts of the of Gulf Thailand and of the Andaman Sea.

Interestingly, since, *S. indicus* and *L. pan* were introduced as new species in by Monkolprasit (1973) and Wongratana (1988), respectively, from type localities in Thailand, they have never been recorded elsewhere outside

Thailand. However, their endemic status to Thailand are very questionable. This is mainly because *S. indicus* is very common species in Thai waters all year round, whereas *L. pan* is previously and sparsingly found both in the Gulf of Thailand and Andaman Sea.

The following table is presented to show the comparative distribution of Thai leiognathids and gerreids in the Indo-Pacific regions. The information of their distributions outside Thailand was drawn from the literature reviews discussed in Chapter 1.

Table 9 General Indo-Pacific distribution of Thai species
of Leiognathidae and Gerreidae

| Species | Area | East and South Africa | Red sea | India & Sri Lanka | Malaysia, Singapore & Indonesia | Thailand | South China Sea & Japan | Philippines Islands | Australia & Papua New Guinea | Pacific Islands |
|------------------------------|------|--------------------------|---------|-------------------|---------------------------------------|----------|----------------------------|------------------------|---------------------------------|-----------------|
| <i>Gazza minuta</i> | | * | * | * | * | * | * | * | * | * |
| <i>Leiognathus bindus</i> | | | * | * | * | * | * | * | * | * |
| <i>L. blochi</i> | | | | * | * | * | | * | * | |
| <i>L. brevirostris</i> | | * | | * | * | * | * | * | * | |
| <i>L. daura</i> | | * | | * | * | * | * | * | * | * |
| <i>L. elongatus</i> | | * | | * | * | * | * | * | * | |
| <i>L. equulus</i> | | * | * | * | * | * | * | * | * | * |
| <i>L. fasciatus</i> | | * | * | * | * | * | * | * | * | * |
| <i>L. leuciscus</i> | | * | | * | * | * | * | * | * | |
| <i>L. lineolatus</i> | | * | * | * | * | * | * | * | * | |
| <i>L. pan</i> | | | | | | * | | | | |
| <i>L. smithursti</i> | | | | * | * | * | | | * | * |
| <i>L. splendens</i> | | * | * | * | * | * | * | * | * | * |
| <i>Secutor indicus</i> | | | | | | * | | | | |
| <i>S. insidiator</i> | | * | * | * | * | * | * | * | * | |
| <i>S. ruconius</i> | | * | * | * | * | * | * | * | * | * |
| <i>Gerres abbreviatus</i> | | | | * | * | * | * | * | * | * |
| <i>G. filamentosus</i> | | * | | * | * | * | * | * | * | * |
| <i>G. lucidus</i> | | | | * | * | * | | | | |
| <i>G. macracanthus</i> | | | | | | * | | * | * | |
| <i>G. macrosoma</i> | | | | | * | * | * | * | * | * |
| <i>G. oblongus</i> | | * | | * | | * | | * | * | * |
| <i>G. oyena</i> | | * | | * | * | * | * | * | * | * |
| <i>G. poieti</i> | | * | | * | | * | | * | | * |
| <i>Pentaprion longimanus</i> | | | | * | * | * | * | * | | |