



## CHAPTER I INTRODUCTION

Among the many taxa of demersal sea fishes that were caught by artisanal and commercial fishermen along the shores of the tropical Indo-Pacific regions and neighbouring seas, fishes of the families Leiognathidae and Gerreidae are particularly prominent. They are widely distributed from the Red Sea as well as the Mediterranean Sea, east coast of Africa through India, the Malay Peninsular, Indonesia, the Philippines, Japan, Australia to the Pacific Islands as far east as Tahiti and Hawaii (Pauly and Wade-Pauly, 1981; Jones, 1985 and Wongratana, 1988). They generally account for about one-third or more of the catches made by trawlers, 20.1% by weight of the demersal catches in Southeast Asia in 1976 (Pauly, 1979). In the Gulf of Thailand, they are a dominant element of the coastal fish fauna which formed 28.7% of the catch by weight in 1963, but declined to 7.7% in 1972 as a result of exploitation (Pauly, 1979).

Leiognathids are commonly known as slipmouths, silver bellies, dollar fishes and ponyfishes, the last name referring to the extremely protractile mouthparts, which give the head a horse-like appearance. However, gerreids are known as silver-biddies and mojarras (FAO,

1974; 1984 and Jones, 1985)

Weber & de Beaufort (1931) were possibly the last authors who included the Gerreidae with Leiognathidae this is on the basis of their similarity in appearance, and in particular their posses of highly protractile mouthparts. But at the present, it is agreed among active ichthyologists that the two families should be separated by several decisive characters, e.g., the presence or absence of nuchal spine, the size of scales and the presence or absence of scales on head.

In Thailand, Leiognathidae and Gerreidae are somewhat economic importance, they have been caught mainly by the bottom trawls (Tiews, 1965 and Wongratana, 1968) smaller quantities are caught by a variety of other inshore methods, e.g., set-bag nets, bamboo-stake traps, push-nets, beach seines and dip nets. Some species are found also in coastal shrimp or fish ponds (Wongratana, 1988).

The Thai economic value of these fishes varies greatly and depending upon species and size of the fishes, of which are generally small; from times to times they have been caught in great quantity, in the later case they are usually considered as trash-fish. They are, for this reason, most often remain unsorted and unreported even when being caught by fishery

research vessels. As trash-fish, they usually represent the bulk of food available to larger, more valuable domestic animals especially in the Southeast Asia (Pauly & Wade-Pauly, 1981). However, in many circumstances especially when the catches are, or mixed with certain amounts of larger individuals of some species, e.g., *Leiognathus equulus* (Forsskål), *L. splendens* (Cuvier), *L. fasciatus* (Lacepède), *Gerres abbreviatus* (Bleeker), *G. filamentosus* (Cuvier) and *G. oyena* (Forsskål), they will be sorted for marketing or consumed by people (Davidson, 1976 and Wongratana, 1988)

Recently, Nelson (1984) summarized his leiognathid study in his "Fishes of the World" that there are 21 species, within 3 genera, viz., *Leiognathus* (= *Equula*), *Gazza* and *Secutor* (excepting for *Leiognathus mediterraneus*, which found only in the mediterranean Sea). In Gerreidae [formerly named Gerridae, this was preoccupied by the same family name of insects, water striders, of the order Hemiptera, emendation of the orthography to Gerreidae to eliminate homonym is introduced by Bohlke & Chaplin (1968)], it included about 40 species of 7 genera, viz., *Diapterus*, *Eucinostomus*, *Gerres*, *Parequula*, *Pentaprion*, *Ulaema* and *Xystaema*. Among them, only *Gerres* and *Pentaprion*, with their 12-13 congeners, are genera of the Indo-Pacific regions.

Zoogeographically, Thailand lies within the

center of the Indo-Pacific regions, therefore, it represents the crossroads of the widely distributed and speciose leiognathids and gerreids of the areas. The taxonomic study of these fishes is, however, depended upon the works of many scholars, mainly the Europeans and much less in numbers by the local ichthyologists. However, the taxonomic study of them for Thai researchers or fisheries biologists is badly needed. To initiate and formulate the basic information for the study of "Taxonomy of Ponyfishes and Silver-biddies (Pisces: Leiognathidae and Gerreidae) in Thai Waters" the followings are literature reviews of the groups of the fishes.

#### East and South Africa

In "Additions to the fish fauna of Natal", Regan (1917) studied a small collection made at Durban, sent by Mr.E.C. Chubb, the curator of Durban Museum. In that work, he listed *Equula insidiatrix* under Gerreidae.

Fowler (1925) reported fishes from Natal, Zululand and Portuguese East Africa. He listed 3 species, viz., *Leiognathus equulus*, *Secutor ruconius* and *Gazza minuta*, under the Leiongathidae with full descriptions for each species.

In "A monograph of the marine fishes of South

Africa" Barnard (1927), he reported 8 species of the fishes namely, *Leiognathus equulus*, *L. insidiator*, *Gazza minuta*, *Xystaema punctatum*, *X. oyena*, *X. acinaces*, *X. oblongus* and *X. rappi*, all included in his family Leiognathidae.

Fowler (1935 a) gave a note on fishes obtained in east Africa, he listed only *Leiognathus equulus* for Leiognathidae, with brief description and size length (=total length).

In "The Sea fishes of Southern Africa" which prepared and compiled by Smith (1965), he provided description, keys and accurate illustrations to cover every important taxonomic character of 5 leiognathids and 6 gerreids. They are, *Secutor ruconius*, *S. insidiator*, *Leiognathus equulus*, *L. elongatus* and *Gazza minuta* for the Leiognathidae and *Gerres punctatus*, *G. oyena*, *G. poeti*, *G. acinaces*, *G. rappi* and *G. oblongus* for the Gerreidae. In 1986, Prof. Margaret Smith, widow of the late Prof. J. L. B. Smith in collaborating with Dr. Phillip Heemstra edited "Smiths' Sea Fishes". In part of leiognathids and gerreids, every species which formerly appeared in the 1965's work was reported with more accurate data and figures.

### Mediterranean Sea and Red Sea

Erazi (1943) described a new species, *Leiognathus mediterraneus* from south eastern region of Turkey on the Mediterranean coast, and compared with other 5 species of ponyfishes occurring in the Red Sea and East Indian Seas, that formerly reported by Günther (1860)

Ben - Tuvia (1953) compiled Mediterranean fishes of Israel and reported *Leiognathus klunzingeri*, the species from the Red Sea through the Suez Canal, as a common fish in the eastern Mediterranean up to the Turkish coasts. Later in 1973, he listed the species as "Lessepsian", migration that forms a main food item of a fish species *Saurida undosquamis* also an immigrant.

Nelson (1984) mentioned that *Leiognathus klunzingeri* was "a former Red Sea endemic"...that"...have passed the tropical Red Sea, through the highly saline Greate Bitter Lake, to the subtropical Mediterranean Sea".

Roux (1986) and Fischer, Schneider and Bauchot (1987, eds.) reported *Leiognathus klunzingeri* from Mediterranean Sea, but stated that this species is immigrant from the Red Sea through the Suez Canal, it inhabits in coastal waters, feeds on bottom invertebrates, spawns during summer months and being distributed in the Mediterranean sea from Tunisia eastwards.

### India and Sri Lanka

In the classic revision of Indian Leiognathidae and Gerreidae made by Day (1875-1878), 10 species of Leiognathidae and 8 species of Gerreidae are reported, namely : *Equula fasciata*, *E. lineolata*, *E. ruconia*, *E. insidiatrix*, *E. edentula*, *E. dussumieri*, *E. splendens*, *E. blochii*, *E. daura*, *Gazza minuta*, *Gerres setifer*, *G. oblongus*, *G. filamentosus*, *G. oyena*, *G. lucidus*, *G. abbreviatus*, *G. poeti* and *Pentaprion longimanus*, respectively. He provided synonyms, full description and a figure for each species.

Mendis (1954) made a list and key for Sri Lanka fishes, in that work he reported 9 species of leiognathids and 4 species of gerreids, namely : *Gazza minuta*, *G. achlamys*, *Leiognathus bindus*, *L. daura*, *L. equulus*, *L. fasciatus*, *L. insidiator*, *L. ruconius*, *L. splendens*, *Gerres limbatus*, *G. setifer*, *G. punctatus* and *G. oblongus*, all are included in the family Leiognathidae. He also gave few synonyms for each species.

In "The marine and fresh water fishes of Ceylon", Munro(1955) reported 12 species of Leiognathidae, namely: *Gazza minuta*, *G. achlamys*, *Leiognathus splendens*, *L. dussumieri*, *L. fasciatus*, *L. equulus*, *L. brevirostris*, *L. daura*, *L. bindus*, *L. lineolatus*, *Sucutor ruconius*, *S. insidiator*, and 6 species of Gerreidae, viz., *Gerreomorpha*

*setifer*, *Pertica filamentosa*, *Gerres oblongus*, *G. abbreviatus* and *G. oyena*. He provided key to species, synonyms, descriptions and localities for each species called by him.

### Malaysia, Singapore and Indonesia

From "Catalogue of Malayan fishes" Cantor (1850) reported *Equula caballa*, *E. bindus*, *E. splendens*, *E. daura*, *E. filigera*, *E. insidiator*, *E. longimana* and *Gazza equulaeformis* for Leiognathidae, and *Catochaenum limbatum* and *C. filamentosum* for Gerreidae. He also provided synonyms, full description, localities with size length for the studied fishes.

Seale, (1910) studied fishes of Borneo and reported 5 species of leiognathids and 5 species of gerreids, namely: *Gazza minuta*, *Equula ruconia*, *Leiognathus blochii*, *L. caballa*, *L. splendens*, *Zystaema punctatum*, *Xystaema kapas*, *X. oyena*, *X. lucidus* and *X. abbreviatus*, respectively. He wrote description for each species and stated that most are common food fishes of Borneo, and also found in the Philippines.

Fowler and Bean (1927) gave a note on fishes obtained in Sumatra, Java and Tahiti. He reported 2 species of Gerreidae, *Gerres filamentosus* and *G. abbreviatus* with brief descriptions.



Fowler (1938) listed the fishes known from Malaya, among many fish names he, reported 11 species of Leiognathidae and 9 species of Gerreidae, namely: *Gazza minuta*, *Leiognathus berbis*, *L. bindus*, *L. daura*, *L. dussumieri*, *L. equula*, *L. fasciatus*, *L. lineolatus*, *L. splendens*, *L. stercorarius*, *Secutor insidiator*, *S. ruconius*, *Gerres abbreviatus*, *G. filamentosus*, *G. kappas*, *G. limbatus*, *G. macrosoma*, *G. oblongus*, *G. oyena*, *G. setifer* and *Pentaprion longimanus*, respectively. The native names, synonyms and localities are given by him for each species.

In Fowler (1939) on "A small collection of fishes from Singapore" he listed 2 species of Leiognathidae and 2 species of Gerreidae, viz., *Gazza minuta*, *Leiognathus stercorarius*, *Gerres oyena* and *G. lucidus*, respectively. He provided their size lengths and localities; he also stated that *L. stercorarius* was originally described as different from *L. berbis* on account of the presence of scales on the chest, it was possible they may have been overlooked in the type or their pockets obliterated.

Fowler (1940) reported fishes which collected from Sumatran Expedition in 1936-1939, in that work he listed 1 species of Leiognathidae and 3 species of Gerreidae, namely: *Leiognathus dussumieri*, *Gerres poieti*, *G. kappas* and *G. filamentosus*, respectively. He provided synonyms, brief descriptions and size lengths of the fishes.

Abe and Haneda (1972) described two new species of leiognathid fishes from Indonesia, namely: *Leiognathus hataii* and *L. aureus*. He stated that these two new species differ remarkably from the other congeners in having a larger luminous organ glittering like gold around the esophagus. According to Pauly and Wade-Pauly (1981) their two species should be attributed to the genus *Secutor* Gistel, but they gave no evidence.

### South China Sea and Japan

Jordan and Seale (1905) studied fishes collected at Hong Kong by Captain William Finch, and only listed *Equula insidiator* for Equulidae (Leiognathidae) with a brief description.

Seale (1914) worked on fishes from Hong Kong, which were collected from the markets. Among other fishes he listed 5 species of Equulidae (Leiognathidae), namely: *Equula insidiator*, *E. ruconia*, *Leiognathus edwardsi*, *L. virgatus* and *L. daura*, all with their size lengths.

Schmidt (1930) studied the fishes from Riu-Kiu Islands, he gave the names of 5 obtained species of Gerreidae viz., *Gerres punctatus*, *G. argyreus*, *G. macrosoma*, *G. subfasciatus* and *G. abbreviatus*, and stated that the fauna are thoroughly tropical and connected with that of the East-Indies, Polynesia, Hawaii and Samoa, and also

with that of Japan.

Herre (1939) collected the fishes from Nanyo, the Japanese Mandated Islands, during the interval from October 1937 - March 1938. He mentioned 2 species of Leiognathidae, *Leiognathus fasciatus* and *L. equulus* and 1 species of Gerreidae, *Gerres abbreviatus*. He also furthered that most of them are distributed in tropical Pacific.

Chu (1957) listed scientific names of fishes from Pescadore Islands which collected by Mr. Tsai at the fish markets and coast of Makum, a maintown of Pescadore Islands. In Leiognathidae he listed, *Leiognathus bindus*, *L. berbis* and *Gazza minuta*, and in Gerreidae he named *Gerres japonicus*, *G. oyena* and *Pentaprion longimanus*, all with size length.

Yoshino and Nishijama (1981) obtained fishes from Sesoko Island, Okinawa. He put *Gerres oyena* in his list of species and stated that the fish is widely distributed in tropical Indo-west Pacific regions, it inhabits in off-reef floor and is a migratory fish.

Senou and Kitamura (1982) investigated the fishes at tidal influenced zone of the Kanogawa river, Wakegama Prefecture, Japan, at low tide of spring tides and also at high tide complementally. All the fishes

were caught with dip-net, cast net and fishing. He listed 1 species of Leiognathidae, *Leiognathus nuchalis* and 2 species of Gerreidae, *Gerres filamentosus* and *G. oyena*, all with Japanese name.

Suzuki, Dotsu and Senou (1982) investigated fish fauna of the inland waters of the Yaeyama groups, the Ryukyu Islands. All fishes were collected in rivers, streams, paddy fields and swamps by dip net, cast net, gill net and fishing. He listed 4 species of Leiognathidae and 4 different species of Gerreidae, viz., *Leiognathus equulus*, *L. fasciatus*, *L. lineolatus*, *L. sp.*, *Gerres abberviatu*s, *G. oyena*, *G. sp.1* and *G. sp.2*

### Philippine Islands

Jordan and Seale (1906) reported fishes of the Islands of Luzon and Panay, within the Equulidae (Leiognathidae) he found 5 species, viz., *Equula insidiator*, *E. ruconia*, *Leiognathus fasciatus*, *L. dussumieri* and *Gazza minuta*, and with 2 species in Gerreidae, viz., *Xystaema punctatum* and *Pentaprion longimanus*. He gave brief description and size length for each species and stated that *Equula ruconia* is very similar to *E. insidiator*, but the body is deeper.

Fowler (1918) reported new species and little-known fishes from the Philippine Islands, he described

*Leiognathus philippinus* as new species for the area.

Fowler (1927) noted on Philippine fishes in the collection of the Academy of the Natural Sciences of Philadelphia, he listed 12 species of Leiognathidae and 4 species of Gerreidae, namely: *Leiognathus vermiculatus*, *L. virgatus*, *L. splendens*, *L. equulus*, *L. daura*, *L. philippinus*, *L. stercorarius*, *L. fasciatus*, *Secutor insidiator*, *S. ruconia*, *Gazza minuta*, *G. equulaeformis*, *Gerres abbreviatus*, *G. kapas*, *G. poieti*, and *G. filamentosus*, each with localities and size length.

From "A review of Philippine Menidae and Gerreidae" made by Montilla (1935), based on material deposited in the collection of Fish and Game Administration, Bureau of Science, Manila. He reported 7 species of Gerreidae, viz., *Gerres abbreviatus*, *G. filamentosus*, *G. kapas*, *G. oyena*, *G. oblongus*, *G. baconensis* and *G. macrosoma*, with key to species, synonyms, full descriptions, figures, localities and distribution.

Herre (1936) gave a note on fishes in the Zoological Museum of Stanford University from the Herre 1933 Philippine Expedition, many are new or rare Philippine fishes. In Leiognathidae, he reported 2 species, *Leiognathus brevirostris* and *L. lineolatus*, with brief description and size length. He stated

that these 2 species are new records to the Philippines.

In "A check list of Philippine fishes" made by Roxas and Martin (1937), the authors listed 19 species of Leiognathidae, viz., *Leiognathus blochii*, *L. brevirostris*, *L. dussumieri*, *L. edwardsi*, *L. leuciscus*, *L. lineolatus*, *L. philippinus*, *Equula daura*, *E. equula*, *Gazza achlamys*, *G. minuta*, *G. tapeinosoma*, *Secutor insidiator*, *S. ruconius*, *Equulites bindus*, *E. vermiculatus*, *Eubleekeria splendens*, *Aurigequula longispinis* and *Macilentichthys stercorarius*; and 12 species of Gerreidae, viz., *Gerres abbreviatus*, *G. argyreus*, *G. baconensis*, *G. filamentosus*, *G. kapas*, *G. macracanthus*, *G. macrosoma*, *G. oblongus*, *G. oyena*, *G. poieti*, *G. philippinus* and *Pentaprion longimanus*, each with synonyms and localities.

Herre (1953) made a comprehensive check list of Philippine fishes, he reported 18 species of Leiognathidae and 12 species of Gerreidae, namely: *Gazza achlamys*, *G. minuta*, *Leiognathus berbis*, *L. bindus*, *L. blochi*, *L. brevirostris*, *L. daura*, *L. dussumieri*, *L. edwardsi*, *L. elongatus*, *L. equulus*, *L. fasciatus*, *L. insidiator*, *L. leuciscus*, *L. lineolatus*, *L. ruconius*, *L. splendens*, *L. stercorarius*, *Gerres abbreviatus*, *G. argyreus*, *G. baconensis*, *G. filamentosus*, *G. kapas*, *G. macracanthus*, *G. macrosoma*, *G. oblongus*, *G. oyena*, *G. poieti*, *G. philippinus* and *Pentaprion longimanus*. He stated that *L. stercorarius* may confuse with *L. elongatus*. For gerreid fishes, he

summerized that most are distributed in all tropical seas, some enter rivers.

#### Australia and Papua New Guinea

McCulloch (1927) compiled the fishes and fish-like animals of New South Wales, he listed 3 species of Gerreidae, viz., *Gerres ovatus*, *G. argyreus* and *G. subfasciatus*. He gave a synopsis key to species, and stated that *G. argyreus* is a tropical species strayed into New South Wales waters.

Based on a review of literature, McCulloch (1929) made a checklist of fish species recorded from Australia, 20 species of Leiognathidae and 18 species of Gerreidae are included, they are, *Gazza equulaeformis*, *Leiognathus equula*, *L. scrulifer*, *L. splendens*, *L. novaehollandae*, *L. interruptus*, *L. spiniceps*, *L. simplex*, *L. lineolatus*, *L. gerreoides*, *L. fasciatus*, *L. decorus*, *L. asinus*, *L. profundus*, *L. ovalis*, *L. nuchalis*, *L. dispar*, *L. devisi*, *L. hastatus*, *L. moretoniensis*, *Gerres ovatus*, *G. argyreus*, *G. abbreviatus*, *G. filamentosus*, *G. clarnleyensis*, *G. profundus*, *G. subfasciatus*, *G. australis*, *G. oyena*, *G. splendens*, *G. philippinus*, *Parequula melbournensis* and *Gerreomorpha rostrata*, respectively, each species accompanied with synonyms.

The leiognathid species in the custodies of the

Queensland and Australian Museums were redescribed by Whitley (1932). He attempted to classify into "recognizable genera". Six genera (among 22 species) are named, they are, *Aurieuquula longispinis*, *Equula asina*, *E.smithursti*, *E.decora*, *E. argentea*, *E. blochii*, *E. simplex*, *E. elongata*, *E. leuciscus*, *E. profundus*, *Equulites hastatus*, *E. moretonensis*, *Leiognathus devisi*, *L. hastatus*, *L. elongatus*, *L. edwardsi*, *Macilentichthys popei*, *M. stercorarius*, *M. leuciscus*, *M. edwardsi*, *Secutor profundus* he gave also the key to species identification.

When published the fishes of the New Guinea Region in 1958 in the form of "A check-list of the fishes of New Guinea incorporating records of species collected by the Fisheries Survey Vessel "Fairwind" during the year 1948 to 1950" Munro (1958) summarized a total of 8 species for Leiognathidae, they are, *Equula decora*, *Equulites novaehollandiae*, *Eubleekeria splendens*, *Leiognathus berbis*, *L. lineolatus*, *L. dussumieri*, *Aurieuquula longispinis* and *Gazza minuta*; and 9 species for Gerreidae, they are, *Gerres oyena*, *G. oblongus*, *G. poeti*, *G. macrosoma*, *G. argyreus*, *G. macracanthus*, *Victor filamentosa*, *Parachurus abbreviatus* and *Ulaema kapas*. In cooperation with the scientific name of each species, synonyms and data collected are given.

According to Munro (1960), on the "Handbook of Australian Fishes", 10 species within 5 genera of



Leiognathidae were presented with detailed description and figure as well as a common name for each species. The names of all species are, *Gazza minuta*, *Secutor ruconius*, *Equula equula*, *E. fasciata*, *E. nuchalis*, *Leiognathus splendens*, *Equulites moretoniensis*, *E. hastatus*, *E. novaehollandiae* and *E. bindus*.

Collette (1983) made a collection of fishes with rotenone from 14 mangrove swamps of New Guinea, they were 2 in the northern Australia, 6 in Papua New Guinea and 6 in Irian Jaya. He listed 3 species of Leiognathidae, viz., *Gazza minuta*, *Leiognathus equulus* and *L. fasciatus*, and 5 species of gerreids, viz., *Gerres abbreviatus*, *G. argyreus*, *G. filamentosus*, *G. macracanthus* and *G. macrosoma*.

A revision of Australian species of the fishes family Leiognathidae was done by Jones (1985). He described 15 species, viz., *Gazza minuta*, *Leiognathus aureus*, *L. bindus*, *L. blochii*, *L. decorus*, *L. elongatus*, *L. equulus*, *L. fasciatus*, *L. leuciscus*, *L. moretoniensis*, *L. smithursti*, *L. splendens*, *L. sp.*, *Secutor insidistor* and *S. ruconius*. He gave species descriptions, figures, comparative distributions of percentage of body depth in standard length against standard length between particular species, he gave also synonyms and geographical distribution for each species. He also provided for the mentioned species.

Sainsbury et al. (1985) made an illustrated guide to the sea fishes of Northern and North-Western Australia, in that work they reported 14 species of Leiognathidae, viz., *Gazza minuta*, *Leiognathus splendens*, *L. equulus*, *L. fasciatus*, *L. smithursti*, *L. leuciscus*, *L. elongatus*, *L. moretoniensis*, *L. sp.*, *L. blochii*, *L. decorus*, *L. aureus*, *L. bindus*, *Secutor insidiator*, each with full description, size length and figure.

### Pacific Islands

"The fishes of Oceania" which compiled by Fowler (1928) was primarily the result of an examination of the fishes stored in the Bernice P. Bishop Museum of which then embracing some 14,000 specimens. In the part of Leiognathidae, he reported 8 species, viz., *Leiognathus equula*, *L. dussumieri*, *L. smithursti*, *L. berbis*, *L. fasciatus*, *Secutor insidiator*, *Gazza minuta* and *G. equulaeformis*. For Gerreidae, 9 species, namely: *Gerres abbreviatus*, *G. acinaces*, *G. argyreus*, *G. macrosoma*, *G. kapas*, *G. oyena*, *G. poieti*, *G. gigas* and *G. filamentosus* are given, all species are with full descriptions.

When Fowler (1932) reported the fishes obtained from Fiji, he listed 1 species of Leiognathidae, *Leiognathus equula* and 1 species of Gerreidae, *Gerres macrosoma*. He stated that *G. macrosoma* is the new

recorded species for Fiji.

Fowler (1944) listed the names of fishes that obtained in the New Hebrides and southwest Pacific Islands by Dr. Edward J. Jackson, he reported 2 species of Leiognathidae and 2 species of Gerreidae, viz., *Aurieuquula fasciata*, *Gazza minuta*, *Synistius argyreus* and *Pertica filamentosa*, respectively.

Recently, the "Micronesian Reef fishes" was studied by Myers (1991), the presentation is in the form of a practical guide to the identification of the coral reef fishes of the tropical central and western Pacific. Myers found 3 species of Leiognathidae and 5 species of Gerreidae, namely : *Gazza achlamys*, *Leiognathus equulus*, *L. stercorarius*, *Gerres argyreus*, *G. abbreviatus*, *G. filamentosus*, *G. oblongus* and *G. oyena*. He noted that the leiognathids occur commonly in schools over muddy or sandy inshore waters, generally away from coral reefs, but the gerreids inhabit shallower sandy areas of coral reefs as well as silty areas.

### Thailand

P. Bleeker was placed among pioneers who had studied Thai fishes in 1885 he reported only *Leiognathus splendens* and *L. gerroides* in his " Sixieme notice sur la faune ichthyologique de Siam ".

In the report of fishes of the Tale' Sap, Peninsular Siam; Hora (1924) listed *Leiognathus equulus* and *Gazza minuta* for Leiognathidae, and *Gerres filamentosus* and *G. lucidus* for Gerreidae.

Fowler (1934-1937) studied and identified fishes from Thailand for his "Zoological results of the third de Schauensee Siamese Expedition", he listed 12 species of Leiognathidae, viz., *Leiognathus equulus*, *L. blochii*, *L. splendens*, *L. fasciatus*, *L. bindus*, *L. daura*, *Secutor insidiator*, *S. ruconius*, *Gazza minuta*, *G. equulaeformis*, *Macilenticthys berbis* and *M. leuciscus*, and 5 species of Gerreidae, viz., *Gerres abbreviatus*, *G. kappas*, *G. oblongus*, *G. filamentosus* and *G. setifer*.

Suvatti (1950) made a "Fauna of Thailand", in the part of fishes he concluded the previous works of Bleeker (1865), Hora (1924), Weber & de Beaufort (1931) and Fowler (1934-1937), and finally reported 12 species of Leiognathidae, viz., *Leiognathus berbis*, *L. bindus*, *L. blochi*, *L. daura*, *L. dussumieri*, *L. equulus*, *L. fasciatus*, *L. insidiator*, *L. splendens*, *Gazza equulaeformis* and *G. minuta* and 6 species of Gerreidae, viz., *Gerres abbreviatus*, *G. kappas*, *G. macrosoma*, *G. oblongus*, *G. poeti*, *G. punctatus* and *G. setifer*, with Thai common names, synonyms and localities.

Rofen (1963) made a handbook of the food fishes

of the Gulf of Thailand and reported 7 species of Leiognathidae, viz., *Leiognathus equulus*, *L. splendens*, *L. fasciatus*, *L. brevirostris*, *L. daura*, *L. elongatus*, *Secutor ruconius* and *S. insidiator*, and 4 species of Gerreidae, viz., *Gerres abbreviatus*, *G. filamentosus*, *G. poieti* and *Pentaprion longimanus*, all with common names, detailed descriptions, fisheries and use, with photographs for some species. He stated that most are common inshore fishes around the Gulf of Thailand. They are caught throughout the year by trawls and bamboo stake traps, usually seen in the fish markets and being a low price. Thai prepare them steamed, fried, boiled with vegetables and as fish meal and duck food.

Tiews (1965) investigated bottom fish resources in the Gulf of Thailand and recommended the study of distribution of demersal fish along the Thai coast. In that work of his, he stated that among the catch per unit of effort by species, the most abundant group of fish was belonged to the family Leiognathidae (include Gerreidae). Its average catch was 71.5 kg/hr (1963/1964) against 53 kg/hr (1961). The best catches were made at the depths between 31-40 m, but unregularly distributed.

Monkolprasit (1966) listed species of marine tidal and sea shore fauna of Klong-Wan area that were studied and identified by T. Wongratana, S. Sontirat and P. wongrat. In that work they are 8 species of Leiognathidae,

viz., *Gazza minuta*, *Leiognathus daura*, *L. elongatus*, *L. equulus*, *L. fasciatus*, *L. insidiator*, *L. lineolatus* and *L. splendens*. The specimens were collected from different habitats such as the tidal stream, mangrove swamp, village sea shore and partly from purchasing from Klong-Wan village market. Large part of the collection were juveniles.

Banasopit and Wongratana (1967) made a check list of fishes that were collected and identified mostly by the second author and kept at the reference collection maintained at the Marine Fisheries Laboratory, Bangkok, they listed 12 species of Leiognathidae, viz., *Gazza minuta*, *Leiognathus bindus*, *L. blochi*, *L. brevirostris*, *L. daura*, *L. elongatus*, *L. equulus*, *L. fasciatus*, *L. leuciscus*, *L. smithursti*, *L. splendens*, *Secutor insidiator* and *S. ruconius* and 4 species of Gerreidae, viz., *Gerres abbreviatus*, *G. filamentosus*, *G. oyena* and *Pentaprion longimanus*, with Thai, English and scientific names.

Kuhlmorgen-Hille (1968) prepared an illustrated field key to the fish of the family Leiognathidae in the Gulf of Thailand. The drawings had been done from fresh specimens observed by him right upon the catches on board the Thai Department of Fisheries Research Vessels "Pramong 1", "Pramong 2" and "Asa", 13 leiognathids were listed, they are, *Gazza minuta*, *Secutor ruconius*, *S. insidiator*, *Leiognathus elongatus*, *L. brevirostris*,

*L. smithursti*, *L. fasciatus*, *L. leuciscus*, *L. splendens*, *L. daura*, *L. lineolatus*, *L. bindus* and *L. equulus*, with 1 undescribed species.

Wongratana (1968) made a check list of 380 fishes caught during the trawl surveys in the Gulf of Thailand and off the coast of the Malay Peninsula. Among them he listed *Gazza minuta*, *Leiognathus bindus*, *L. brevirostris*, *L. daura*, *L. elongatus*, *L. equulus*, *L. fasciatus*, *L. leuciscus*, *L. smithursti*, *L. splendens*, *Secutor insidiator*, *S. ruconius*, and 1 undescribed species; for Leiognathidae, *Gerres abbreviatus*, *G. filamentosus*, *G. oyena* and *Pentaprion longimanus* for Gerreidae. He gave synonyms and variously stated that they are common, often appearing in trawl catches, or seldomly seen.

Wongratana (1972, unpublished paper) studied sea fishes from Thailand kept in the Biologische Anstalt, Helgoland, Hamburg, Germany. He identified 3 species, viz., *Leiognathus daura*, *L. equulus* and *L. fasciatus* for Leiognathidae; and 3 species, viz., *Gerres abbreviatus*, *G. filamentosus* and *Pentaprion longimanus* for Gerreidae, each with synonyms and stated that they are common in the Gulf of Thailand and adjacent seas.

Monkolprasit (1973) introduced *Secutor indicus* as a new species from Thailand, by comparing with Thai specimens of *S. ruconius* and *S. insidiator*.

Sukhavisidh (1978, mimeographed) comparatively studied leiognathid fishes, *Leiognathus brevirostris*, *L. blochi* and *L. sp.* from Thailand. She stated that these species have dark brown saddle blotch on the nape and irregular blackish patterns on back. She gave a table of comparison for scales on breast, height of second dorsal spine and the position and number of yellow blotches.

Wongratana (1982 a) compiled economic sea fishes for local use, He listed 11 species of Leiognathidae (1 undescribed), viz., *Gazza minuta*, *Leiognathus bindus*, *L. brevirostris*, *L. daura*, *L. elongatus*, *L. equulus*, *L. fasciatus*, *L. leuciscus*, *L. smithursti* and *L. splendens*, and 4 species of Gerreidae, viz., *Gerres abbreviatus*, *G. filamentosus*, *G. oyena* and *Pentaprion longimanus*., all with Thai common names.

Wongratana (1982 b) studied his fishes collected from shallow and deep sea bottom trawls and deep sea traps which made during the Andaman Cruise of the "Nagasaki-Maru", during 1-14 November 1981. All fishes were collected off Thai coast in the range of water depths of 31-420 m., along with his 256 species within 91 families, 6 species of Leiognathidae and 3 species of Gerreidae were included, namely: *Gazza minuta*, *Leiognathus bindus*, *L. leuciscus*, *L. lineolatus*, *L. smithursti*, *Secutor insidiator*, *Gerres abbreviatus*, *G.*



*filamentosus* and *G. oyena*, respectively.

Wongratana (1982 c) made a collection of bait fishes from night-light and lift-net experiments in Phang-Nga Bay, Andaman Sea, Thailand, to gather informations for the development of local pole-and-line tuna fishing. The fishes caught during the course of investigation comprised 44 species belonging to 18 families, among them, 3 species of Leiognathidae, viz., *Gazza minuta*, *Leiognathus bindus* and *Secutor insidiator*, were listed.

On the account of the stomach contents of *Secutor ruconius* and *S. insidiator*, which were collected in the Gulf of Thailand, Suwanrampha (1982) stated that the two species are predacious with similar food habits. The major food items found included copepods, cirripedes, ostracods, chaetognaths, polychaetes, shrimp larvae and lucifer larvae, but the principal identifiable components of all sampling categories are adult calanoid copepods.

Monkolprasit et al. (1987) compiled the names of fishes of Thailand previously reported by many taxonomists. She listed 21 species of leiognathids and 10 species of gerreids, viz., *Leiognathus sp.*, *L. berbis*, *L. bindus*, *L. fasciatus*, *L. insidiator*, *L. leuciscus*, *L. lineolatus*, *L. ruconius*, *L. smithursti*, *L. splendens*,

*Secutor indicus*, *S. insidiator*, *S. ruconius*, *Gazza equulaeformis*, *G. oblongus*, *G. oyena*, *G. poeti*, *G. punctatus* and *G. setifer*, with Thai common names and localities.

Wongratana (1988) described a new species, *Leiognathus pan* from Thailand, with comments on 17 Thai leiognathids (only *L. berbis* and *Gazza achlamys* are doubtedful species for Thailand but they were included by him). He stated that the new species, chiefly distinguishable from its congeners in having scaly breast, a dark blotch on nape, four series of broken longitudinal lines on sides dorsally, and upper half of spinous dorsal fin between second and sixth spines with a prominent dark patch.

Finally, Bangkok Fish Marketing Organization (1992) made a compilation of economic fish names of Thailand with a list of 12 species of Leiognathidae and 2 species of Gerreidae, viz., *Gazza achlamys*, *Leiognathus bindus*, *L. splendens*, *L. smithursti*, *L. fasciatus*, *L. equulus*, *L. berbis*, *L. stecorarius*, *L. lineolatus*, *L. leuciscus*, *Secutor insidiator*, *S. ruconius*, *Gerres abbreviatus* and *G. filamentosus*, with Thai and English common names, size length and figure.

## Objectives

To collect new materials, with more appropriated field data, of leiognathids and gerreids from different major locations along the 2,775 km. coastline of Thailand, and in addition to the available local museum specimens, they will form a basic for the taxonomic study of Thai genera and species of the fishes. And with the study of reliable taxonomic literature of the fishes from the Indo-Pacific countries, it is hoped that all the obtainable comparative data that put under a single cover will provide up-to-date information for identifying any catch size fish of all local species with certainty. This is to eradicate at least some identify problems in the study of species composition of marine biota among Thai biologists and students.

## Expected results

1. To make known the comparative diagnostic character for differentiation of the genera and species of all local leiognathids and gerreids.

2. To make known the local distribution, abundancy, rarity, and historical study of Thai species of the fishes.

3. To make available readily comparative informations, e.g., frequency tables, graphs, figures and keys for biologists and students of the groups.