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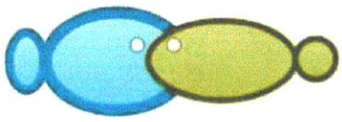

Diversity of penja fish (amphidromous goby) in Leppangan River, West Sulawesi, Indonesia

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Abstract. Penja fish is a group of Gobioidei fish and belongs to amphidromous migratory fish, being present throughout the waters that have access to the river as a route for its migration. One location that is currently still inhabited by this fish group is Leppangan River, West Sulawesi. This study was aimed to determine the species of penja fish (amphidromous goby) within the Leppangan river. Fish samples were collected using trap net and clove oil, further identified based on their morphometric and meristic characteristics. The number of penja fish caught in the Leppangan River was 174 individuals consisting of 6 genera and 9 species. The results of identification of all samples consisted of *Sicyopterus lagocephalus, Sicyopterus longifilis, Stiphodon semoni, Stiphodon atropurpureus, Sicyopus zosterophorum, Smilosicyopus leprurus, Schismatogobius sp, Eleotris fusca* and *Eleotris* sp. Species of *S. zosterophorum* has the largest number of 67 individuals and dominated about 38.5% of the total number of species caught in the Leppangan river during the study. The presence of penja fish in the Leppangan river adds information on the distribution of Gobioidei fish populations, particularly those which migrate amphidromously.
Key Words: Gobioidei, amphidromy, species composition, penja fish.

Introduction. Penja fish is one of the Indonesian fishery commodities that are in great demand as one of the consumption fish that has high economic value. The penja fish migrate amphidromously, so the pattern of life begins with the river then performs a planktonic phase for several months at the sea and returns to the river for its growth and reproduction (McDowall 2007; Keith et al 2008). Penja fish that often be caught by fishermen in every migration season is a group of fish belonging to the suborder Gobioidei consisting of two families namely Gobiidae and Eleotridae. According to Carpenter & Niem (2001), Gobiidae family is the largest of the fish families in marine waters with a maximum size of 30 cm and more than 220 genera and 1500 species have been described, while the family of Eleotridae is estimated to have about 40 genera and 150 species.

West Sulawesi Province is one of the areas along the coast of local fishermen that are active in fishing penja during a new moon. One area that is currently exploited for penja fishery is Leppangan river. Penja fish may be found in almost all rivers that have entrance to marine waters as the path of migration. This study was aimed to determine the diversity of penja fish species settled in the Leppangan river, in addition as one reference material to compare the presence of penja fish species in different locations.

Material and Method. The study was conducted from November 2017 to July 2018 in the Leppangan river, West Sulawesi (Figure 1). Sampling was done using trap net and clove oil, then fish samples were preserved by 70% alcohol and taken to the laboratory to be identified based on their morphometric and meristic characteristics of each species (Sakai & Nakamura 1978; Burhanuddin & Iwatsuki 2003; Keith et al 2015).

Figure 1. Sampling location in Leppangan river, West Sulawesi.

Statistical analysis. The composition of penja fish species is calculated and compared descriptively that is made in graphical form using Microsoft Excel 2016. The composition of the species is calculated by the equation (Fachrul 2007):

$$Sc = \frac{ni}{N} \times 100$$

where: Sc = species composition;
ni = individual composition of each species;
N = individual composition of all fish species.

Results. Based on observations during the study, the total number of penja fishes observed and captured on the Leppangan river were 174 individuals consisting of 6 genera and 9 species (Table 1; Figure 2).

Table 1

Checklist of Penja fish in Leppangan river, West Sulawesi

No	*Family*	*Species*	*N*
1	Gobiidae	*Sicyopterus lagocephalus*	21
2		*Sicyopterus longifilis*	8
3		*Sicyopus zosterophorum*	67
4		*Smilosicyopus leprurus*	12
5		*Stiphodon semoni*	29
6		*Stiphodon atropurpureus*	25
7		*Schismatogobius* sp.	6
8	Eleotridae	*Eleotris fusca*	4
9		*Eleotris* sp.	2
Total			174

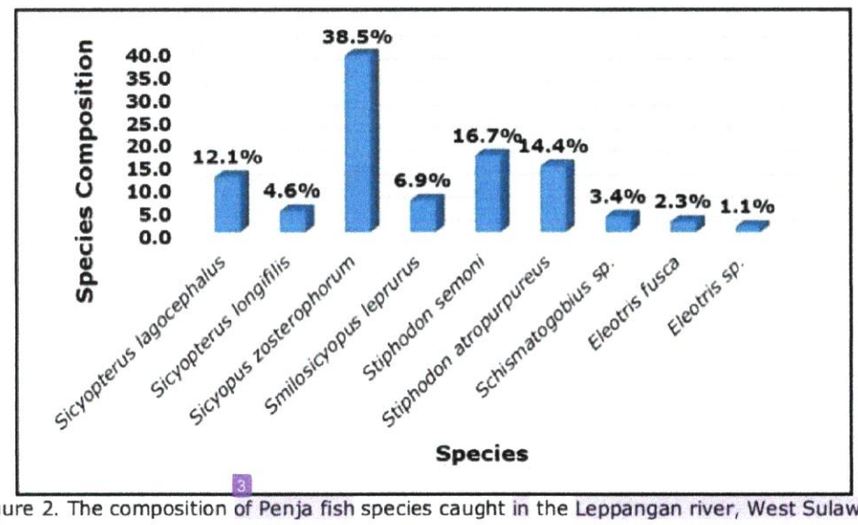

Figure 2. The composition of Penja fish species caught in the Leppangan river, West Sulawesi.

Discussion. Regular penja fish fishing activities are carried out at the Leppangan River estuary when the fish are migrating from the sea to the river during a new moon, where local people only catch penja fish for consumption at the relatively small postlarva phase with a total size range of 20-40 mm.

The type of fish from the Gobiidae family found in the Leppangan River consists of two subfamilies namely Sicydiinae and Gobionellinae, where subfamily Gobionellinae is represented by one species only, namely *Schismatogobius* sp. And it is known that the number of species that have been reported to date is only 24 species (www.fishbase.org), and six of them are found in Indonesia: *S. bussoni, S. saurii, S. arscuttoli, S. insignus, S. bruynisi*, and *S. risdawatiae* (Keith et al 2017). While the subfamily Sicydiinae has as many as 6 species including *S. lagocephalus, S. longifilis, S. semoni, S. atropurpureus, S. zosterophorum* and *S. leprurus*; Keith et al (2011) states that so far known subfamily Sicydiinae consists of 10 genera including *Akihito, Cotylopus, Lentipes, Parasicydium, Stiphodon, Sicyopter, Sicydium, Sicyopus, Smilosicyopus* and one more genus that has not been described. Ebner et al (2011) states that Sicydiinae is a subfamily of a family of high diversity, Gobiidae, found in the tropics in the Indo-Pacific region.

The existence of penja fish in the Leppangan River adds information about the distribution of the Gobioidei fish population, especially the species that migrate amphidromously, because not all species of Gobioidei migrate. So far based on data according to Carpenter & Niem (2001) there are only two families of Gobioidei suborder (Gobiidae and Eleotridae), while for the family of Gobiidae from 5 subfamilies only two subfamilies are known to migrate amphidromously i.e. subfamily Gobionellinae and subfamily Sicydiinae.

Conclusions. Identification results from all samples obtained included *S. lagocephalus, S. longifilis, S. semoni, S. atropurpureus, S. zosterophorus, S. leprurus, Schismatogobius* sp., *Eleotris* sp. and *E. fusca*. The *S. zosterophorum* species had the highest number of 67 individuals and dominated around 38.5% of the total number caught in the Leppangan River during the study. The results of the research obtained add information about the diversity of Gobioidei fish species, especially those that do amphidromous migration.

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References

Burhanuddin A. I., Iwatsuki Y., 2003 *Trichiurus nickolensis*, a new hairtail from Australia belonging to the *Trichiurus russelli* complex (Perciformes: Trichiuridae). Ichthyological Research 50:270-275.

Carpenter K. E., Niem V. H. (eds), 2001 FAO species identification guide for fishery purposes. The living marine resources of the Western Central Pacific. Volume 6. Bony fishes part 4 (Labridae to Latimeriidae), estuarine crocodiles, sea turtles, sea snakes and marine mammals. Rome, FAO, pp. 3381-4218.

Ebner B. C., Thuesen P. A., Larson H. K., Keith P., 2011 A review of distribution, field observations and precautionary conservation requirements for sicydiine gobies in Australia. Cybium 35(4):397-414.

Fachrul M. F., 2007 [Bioecology sampling method]. Bumi Aksara, Jakarta, 198 pp. [in Indonesian]

Keith P., Hoareau T. B., Lord C., Ah-Yane O., Gimonneau G., Robinet T., Valade P., 2008 Characterisation of post-larval to juvenile stages, metamorphosis and recruitment of an amphidromous goby, *Sicyopterus lagocephalus* (Pallas) (Teleostei: Gobiidae: Sicydiinae). Marine and Freshwater Research 59:876-889.

Keith P., Lord C., Lorion J., Watanabe S., Tsukamoto K., Couloux A., Dettai A., 2011 Phylogeny and biogeography of Sicydiinae (Teleostei: Gobioidei) inferred from mitochondrial and nuclear genes. Marine Biology 158:311-326.

Keith P., Lord C., Maeda K., 2015 Indo-Pacific Sicydiine gobies: biodiversity, life traits and conservation. Société Française d'icthyologie, Paris, 256 pp.

Keith P., Lord C., Darhuddin H., Limmon G., Sukmono T., Hadiaty R., Hubert N., 2017 *Schismatogobius* (Gobiidae) from Indonesia, with description of four new species. Cybium 41(2):195-211.

McDowall R. M., 2007 On amphidromy, a distinct form of diadromy in aquatic organisms. Fish and Fisheries 8:1-13.

Sakai H., Nakamura M., 1979 Two new species of freshwater gobies (Gobiidae: Sicydiaphiinae) from Ishigaki Island, Japan. Japanese Journal of Ichthyology 26(1):43-54.

www.fishbase.org

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