

Growth, mortality and exploitation rate of *Pampus argenteus*, *Parastromateus niger* and *Scomberomorus commerson* in Sebatik Waters, Indonesia

ABSTRACT

Growth, mortality and exploitation rate of *Pampus argenteus*, *Parastromateus niger* and *Scomberomorus commerson* in Sebatik Waters, Indonesia. Biodiversitas 21: 5363-5372. The economic revenue of the local government of the Indonesian Sebatik Island relies much on the exploitation of its rich marine biodiversity. One of the important economic activities is the capture fisheries of commercially important fishes such as the white pomfret (*Pampus argenteus*) and black pomfret (*Parastromateus niger*), and mackerel fish (*Scomberomorus commerson*). The current study aims to estimate the growth, condition factor, and exploitation rate of the fish species for developing sustainable fishery management. Fish samplings were conducted in the Sebatik Waters, Nunukan District, North Kalimantan Province, Indonesia from June to July 2020. The fish were caught using gillnet at daytime (pomfrets) and nighttime (mackerel), respectively. Then, 82, 73, and 83 specimens of white pomfret, black pomfret, and mackerel were randomly selected for the length-weight relationship, condition factor, and exploitation rate analysis, respectively. The results revealed that the size distribution of the white pomfret population in the coastal waters of Sebatik Island ranged from 220.0 to 351.0 mm, black pomfret ranged from 231.0 to 362.0 mm and mackerel, ranged from 242.0 to 432.0 mm. All the fish species exhibited negative allometric ($b < 3$) weight and length relationship with moderate to strong correlation. About 50% and 53.42% of the white pomfrets and black pomfrets were characterized by thin body shape. However, 49.40% of the mackerels were characterized by fat body shape. The asymptotic length (L_{∞}) for white pomfrets was recorded at 359.133 mm; k value of 0.0427 mm/year with r -value of 0.9918 and the t_0 value of 1.11/year. For black pomfret, the L_{∞} was estimated at 370.22 mm; k value of 0.043 mm/year with r -value at 0.9919 and the t_0 value of 1.104/year. For mackerel, the L_{∞} value was estimated at 492.724 mm, k -value of 0.0246 mm/year with r -value of 0.9634, and the t_0 value of 1.322/year. The total mortality, fishing mortality and natural mortality (Z , F , and N , respectively) and exploitation rate (E) for white fish were recorded at 113.76%, 80.58%, 33.18%, and 70.83%, respectively. For black pomfret, it recorded 113.15% (Z), 79.97% (F), 32.75% (N) and 70.67% (E). For mackerel, it recorded 109.87% (Z), 66.29% (F), 43.58% (N) and 60.33% (E). The high exploitation rate ($>50\%$) and fishing mortality ($>60\%$) of all the fish species analyzed in this study indicate that there is a sign of overfishing to these fish resources in the coastal waters of Sebatik island. Hence, sustainable fishing management is

timely needed to prevent depletion of these important fishery resources. Such management can include fishing restrictions for small-sized and first mature fish, close fishing season, and strict requirement for fishing permits.