ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25jun439

Relative Abundance of Landed Fish Family: Scombridae in the Municipality of San Jose, Dinagat Islands, Philippines

Arnel R. Andrin[1*]; Emmy Lou A. Borta[2] (PhD)

[1]General Science Student, College of Teacher Education, Surigao del Norte State University (SNSU), Narciso Street, Surigao City 8400, Philippines.
[2]Professor VI, College of Teacher Education, Surigao del Norte State University (SNSU), Narciso Street, Surigao City 8400, Philippines.

Corresponding Author: Arnel R. Andrin[1*]

Publication Date: 2025/06/12

Abstract: Dinagat Island has rich marine biodiversity; however, little is known of these resources in scientific reports. Family *Scombridae*, comprising tunas, mackerels, and bonitos, plays a vital role in the food security, economic livelihoods, and ecological balance of tropical coastal communities. This study aimed to assess the species composition and relative abundance of landed *Scombridae* species in the Municipality of San Jose, Dinagat Islands, Philippines, from January to October 2024. A total of five species *Katsuwonus pelamis*, *Rastrelliger kanagurta*, *Euthynnus affinis*, *Auxis thazard*, and *Thunnus albacares* were identified and documented using market-based sampling techniques, with direct collaboration from local fisheries personnel. The results revealed that *K. pelamis* dominated the high species landings (60.06%), followed by *R. kanagurta* (24.13%), while the other species represented less than 10% each of catch landings. These findings highlight the predominance of fast-growing, commercially valuable species in local fisheries, reflective of broader regional trends in pelagic fish exploitation. The study provides essential baseline data for local fisheries management and underscores the need for species-specific monitoring, sustainable harvest strategies, and community-based conservation initiatives to safeguard the long-term productivity and ecological health of Scombridae fisheries.

Keywords: *Pelagic Fisheries, Scombridae, Species Abundance, Coastal Biodiversity, Sustainable Fisheries.*

How to Cite: Arnel R. Andrin; Emmy Lou A. Borta (2025) Relative Abundance of Landed Fish Family: Scombridae in the Municipality of San Jose, Dinagat Islands, Philippines. *International Journal of Innovative Science and Research Technology*, 10(6), 236-240. https://doi.org/10.38124/ijisrt/25jun439

I. INTRODUCTION

Family *Scombridae*, such as tunas, mackerels, and bonitos comprising economically and ecologically significant fish species which plays a vital role in sustaining coastal livelihoods and food security in tropical and subtropical regions (Kathirvelpandian et al., 2022). According to TahiLuddiN & Terzi (2021), fish act as a center stage on providing jobs, ensuring food security, increasing export earnings serve as a source of income for fishers. Moreover, Patual et al. (2025) recognized the area as a marine biodiversity hotspot where the diversity and abundance of *Scombridae* species can be observed. With this region it supports numerous fish species like *Scombridae* being particularly prominent due to their role as apex predators and their vulnerability to fishing pressures (Zulfahmi et al., 2022; Jongjaraunsuk et al., 2024).

Recent studies emphasize that these species not only contribute significantly to local fisheries but also serve as indicators of the overall health of marine environments (Taufik et al., 2024). Persistent threats of overfishing, mining, logging activities can cause habitat loss, and climate change threaten their sustainability, making it important to study fish populations and their changes over time (Winner et al 2022 & Quibod et al. 2021). Moreover, the presence of *Scombridae* in local catches indicates a functioning of marine ecosystem; despite of raises concerns about overfishing and sustainability that causes environmental changes impacting their habitats (Zeng et al., 2024; Houk et al., 2021). Opress by Quimpo et al. (2019) understanding the kind of fish species relative abundance is crucial for maintaining the ecological integrity of marine ecosystems, which helps to identify critical habitats and inform conservation strategies. In support, Ajik et al. (2023) emphasize that accurate data on fish landings helps maintain sustainable fishing and prevents overfishing.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25jun439

Despite on its economic and ecological importance, limited scientific data are available on the landed fish species within Municipality of San Jose, Dinagat Islands, specifically focusing on *Scombridae*. Hence, there is a scarcity of the published studies concerning about fish, the researchers aim to fill this knowledge gap by providing a baseline data of the relative abundance of landed *Scombridae* species in the area. With this study could help the local fisheries about fish dynamics and sustainable fishing practices that contributes on biodiversity monitoring efforts in the Philippines.

II. MATERIAL AND METHODS

➢ *Entry Protocol:*

A research permit was secured at municipal level through a communication letter in the designated permit offices of Bureau of Fisheries and Aquatic Resources (BFAR) and Municipal Agricultural Office in the municipality prior to study.

➢ *Description of the Study Area:*

The study area is located in Municipality of San Jose, Dinagat Islands, Philippines. One station was schedule for all landed catch of fish in the public market area as desired place were the fisherman sold the fish items, in the position documented using a GPS (Global Positioning System) application with the coordinates of 10° 0' 32.64" N, 125° 34' 7.65" E (Figure 1).

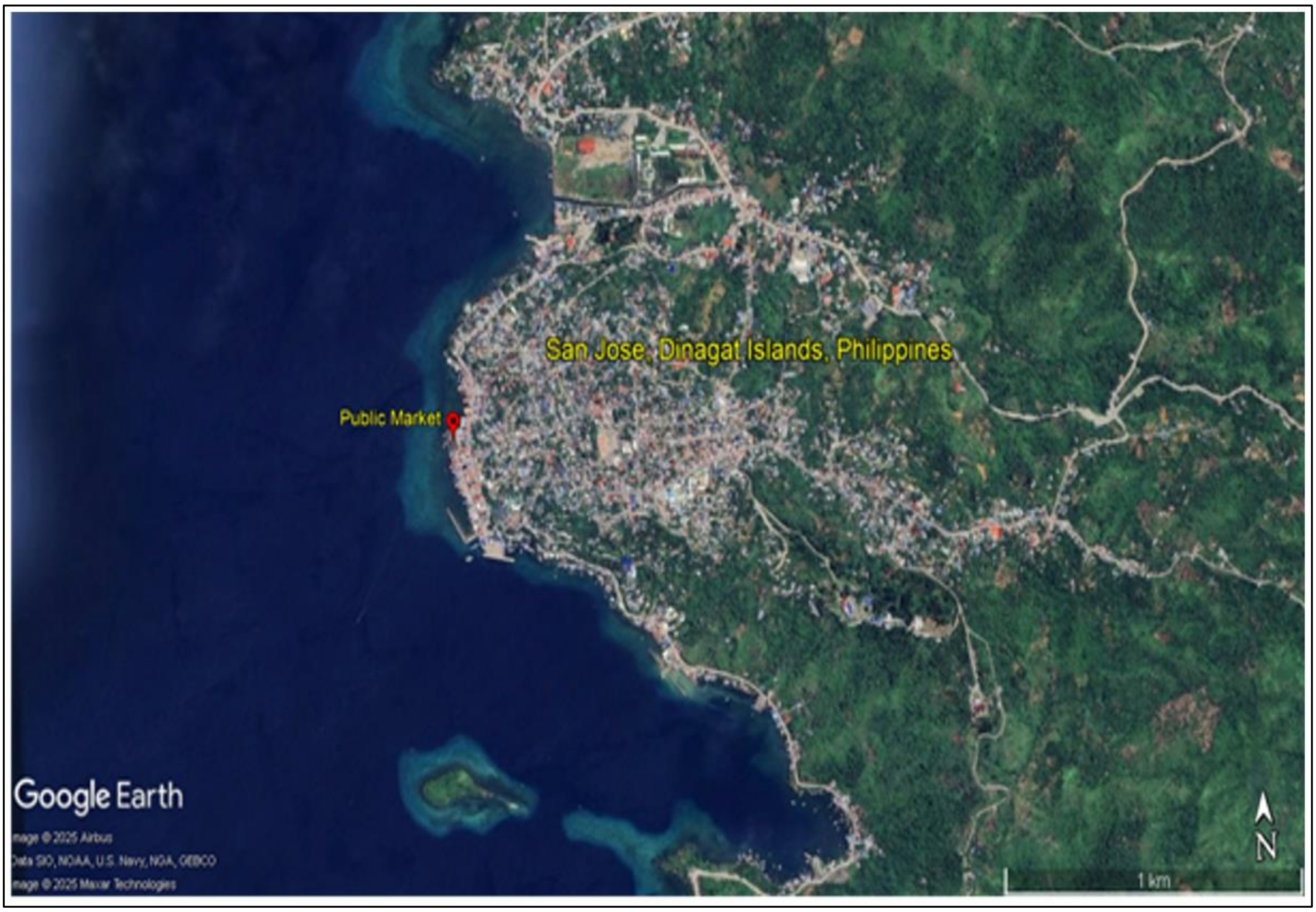

Fig 1 Site Location at Public Market of the Municipality of San Jose, Dinagat Islands, Philippines.

➢ *Landed Fish Inventory and Identification:*

Catch sampling was done from January to October 2024 with multiple fishing techniques used by the fisher to catch fish. Sampling was done as soon as the catch was landed in the market by the fisherman. The enumeration of the collected data of fish has direct assistance from the National Fisheries Research Development Institute National Stock Assessment Program (NFRDI-NSAP) personnel assigned in the municipality for the smooth communication that would allow us to count the number of fish they catch per species representation. With this notion, the examination of the landed catch of fish it followed the best practices as same cited study of (Picoy-Gonzales & Reducto 2024). Moreover, a cross verification of the identification was done based on the taxonomic characters of each species following the identification guide of (Froese & Pauly 2024). Additional sources were needed from World Register of Marine Species online database be consulted thoroughly for confirmation of the validity of species names (https://marinespecies.org/).

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25jun439

➢ *Statistical Analysis:*

The gathered data from actual catch sampling were analysed using descriptive statistics using CPUE calculation were data on catch and effort were collected at the landing sites through direct fisher interviews. The information gathered included the date and time of fishing trips, fishing location, total catch per trip (kg), fishing gear used, and effort manifested in the number of fishing hours. The CPUE was calculated using the formula:

$$CPUE = Total\ Catch / Effort$$

CPUE was recorded following the NSAP standard sampling procedure with catch per species, effort exerted, and the number of boat landings recorded using the adapted NSAP fish landing survey monitoring form (NFRDI-BFAR, 2021).

In response to relative species abundance which represents the proportional presence of a species within a community or a sample of that community. It was calculated for each species using the following equation, where n_i number of individuals of the same species and N total number of individuals for all species (Achacoso et al. 2016). P_i was formulated as follows:

$$P_i = (n_i / N) \times 100$$

III. RESULTS AND DISCUSSION

➢ *Species Composition:*

The study revealed a total of 5 recorded landed Scombridae species and their local names (Table 1). The recorded landed catch of Scombridae species includes *R. kanagurta, E. affinis, A. thazard, T. albacares, K. pelamis* (Table 2). As previously reported by Patual et al. (2025), Scombridae species is one genus of marine fisheries that contributes substantially to the great biodiversity in the tropical Indo–Pacific reef environments which play a crucial role in food security and livelihoods.

Table 1 Local names of *Scombridae* species in the landing area

Family name	Scientific name	English name	Local name
Scombridae	*Rastrelliger kanagurta*	Indian Mackerel	Hasa-Hasa
	Euthynnus affinis	Kawakawa/mackerel tuna	Patikan
	Auxis thazard	Frigate tuna	Mangko
	Thunnus albacares	Yellowfin tuna	Tulingan
	Katsuwonus pelamis	Skipjack tuna	Bulis

Table 2 Recorded Landed Catch and species relative abundance *Scombridae Family* in the Municipality of San Jose, Province of Dinagat Islands from January to October 2024.

Family name	Scientific name	Landed Catch (kg)	Relative Abundance (%)
Scombridae	*Rastrelliger kanagurta (Cuvier, 1816)*	1, 328	24.13
	Euthynnus affinis (Cantor, 1849)	459	8.34
	Auxis thazard (Lacepède, 1800)	209	3.80
	Thunnus albacares (Bonnaterre, 1788)	202	3.67
	Katsuwonus pelamis (Linnaeus, 1758)	3305	60.06
Total		5,503	100.00

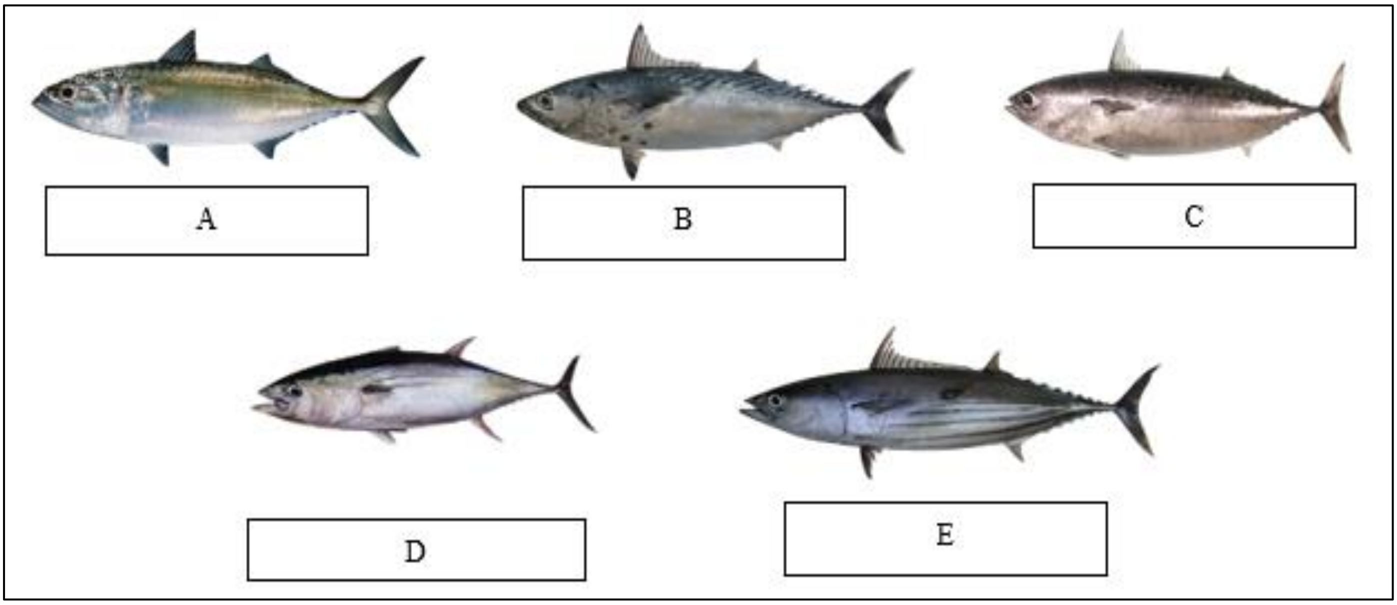

Fig 2 Representative species from *Scombridae Family*. A) *Rastrelliger kanagurta* Cuvier, 1816; B) *Euthynnus affinis* Cantor, 1849; C) *Auxis thazard* Lacepède, 1800; D) *Thunnus albacares* Bonnaterre, 1788; E) *Katsuwonus pelamis* Linnaeus, 1758.

➢ *Species Relative Abundance*

Among the recorded landings of *Scombridae* species it found out that *Katsuwonus pelamis* (Linnaeus, 1758) accounting for the highest relative abundance at 60.06%, followed by *Rastrelliger kanagurta* (Cuvier, 1816), or Indian mackerel, constituted 24.13% of the catch, *Euthynnus affinis* (Cantor, 1849), *Auxis thazard* (Lacepède, 1800) and *Thunnus albacares* (Bonnaterre, 1788), showed relatively catch volumes of 8.34%, 3.80% and 3.67% respectively. These results highlight their significant contribution to regional fisheries, both in biomass and ecological importance (Eggertsen et al., 2024). With the study of Da Cunha-Neto et al. (2022), state that skipjack tuna is widely recognized for its global commercial demand and resilience due to its fast growth and early maturity. Constitutes the remaining species Marsac et al. (2024), highlights that yellowfin tuna species is often a target of industrial offshore fisheries, which may explain its comparatively lower representation in localized catch data as same *E. affinis* and *A. thazard*. Collectively, the data not only reflect species-specific abundance but also mirror broader trends in tropical pelagic fish exploitation. The dominance of smaller, fast-growing species like *K. pelamis* and *R. kanagurta* suggests a fishery adapted to shifting stock dynamics and market pressures. Sustainable management of these species is essential, given their role in food security and economic stability in coastal communities.

IV. CONCLUSIONS

A total of 5 species from *Scombridae* family of fish and it found that *Katsuwonus pelamis* dominated the fish landed catch in study area comprised for 60.06% of total landings, followed by *Rastrelliger kanagurta* at 24.13% while the remaining species *Euthynnus affinis*, *Auxis thazard*, and *Thunnus albacares* showed lower relative abundances. These findings reflect regional trends in tropical fisheries, where fast-growing, resilient species like skipjack and Indian mackerel support local food security and economic stability. Sustainable management is essential to maintain the ecological balance and ensure the long-term viability of these vital fishery resources.

FUTURE SCOPE

Provincial and municipal fisheries management authorities are recommended to introduce species-specific monitoring and sustainable fishing controls to ensure the long-term sustainability of target *Scombridae* species, particularly *Katsuwonus pelamis* and *Rastrelliger kanagurta* as well other fish species. Strengthened data collection on catch composition, fishing effort, and seasonal variations will support science-based decision-making. In addition, engaging local fisherfolk through capacity building and community-based management programs can enhance compliance and promote the conservation of ecologically and economically important pelagic species in the area.

ACKNOWLEDGEMENT

The authors would like to express their gratitude to Surigao del Norte State University for the opportunity to serve as educator-researcher. Special appreciation is also extended to the Bureau of Fisheries and Aquatic Resources (BFAR), Officer in Dinagat Islands for facilitating a connection with the head of National Fisheries Research Development Institute National Stock Assessment Program (NFRDI-NSAP) personnel assigned in the municipality. We would like to thank the head office of the mention agencies, for granting permission and their valuable support to conduct this study.

➢ *Conflict of Interest*

The authors declare no conflict of interest.

REFERENCES

[1]. Achacoso, S. C., Walag, A. M. P., & Saab, L. L. (2016). A rapid assessment of foliage spider fauna diversity in Sinaloc, El Salvador City, Philippines: a comparison between habitats receiving different degrees of disturbance. *Biodiversity*, *17*(4), 156–161. https://doi.org/10.1080/14888386.2016.1258331

[2]. Ajik, J., Palla, R., Lorque, F., Palla, S., GOMES, D., Armada, N., … & Tahiluddin, A. (2023). Influence of colors on the catching performance of artificial lures of multiple troll line in bongao waters, tawi-tawi, philippines. The Philippine Journal of Fisheries, 264-276. https://doi.org/10.31398/tpjf/30.2.2022-0040

[3]. BFAR. (2024): Philippine fisheries profile 2023. Bureau of Fisheries and Aquatic Resources. https://www.bfar.da.gov.ph/

[4]. Da Cunha-Neto, M. A., Hazin, H. G., & Da Silva, G. B. (2022). Age and growth of skipjack tuna (Katsuwonus pelamis) in the western equatorial Atlantic based on dorsal spines analysis. Boletim Do Instituto De Pesca, 48. https://doi.org/10.20950/1678-2305/bip.2022.48.e686

[5]. Eggertsen, L., Luza, A. L., Cordeiro, C. a. M. M., Dambros, C., Ferreira, C. E. L., Floeter, S. R., Francini-Filho, R. B., Freire, K. M. F., Gasalla, M. A., Giarrizzo, T., Giglio, V. J., Hanazaki, N., Lopes, P. F. M., Longo, G. O., Luiz, O. J., Magris, R. A., Mendes, T. C., Pinheiro, H. T., Quimbayo, J. P., . . . Bender, M. G. (2024). Complexities of reef fisheries in Brazil: a retrospective and functional approach. Reviews in Fish Biology and Fisheries, 34(1), 511–538. https://doi.org/10.1007/s11160-023-09826-y

[6]. Froese R., Pauly D. (Eds.). 2024 Fish Base: World Wide Web electronic publication. https://www.fishbase.org/

[7]. Houk, P., Lemer, S., Hernandez-Ortiz, D., & Cuetos-Bueno, J. (2021). Evolutionary management of coral-reef fisheries using phylogenies to predict density dependence. *Ecological Applications*, *31*(7). https://doi.org/10.1002/eap.2409

[8]. Jongjaraunsuk, R., Taparhudee, W., Sirisuay, S., Kaewnern, M., Dulyapurk, V., & Janekitkarn, S. (2024). Transfer Learning Model Application for Rastrelliger brachysoma and R. kanagurta Image Classification Using Smartphone-Captured Images. *Fishes*, *9*(3), 103. https://doi.org/10.3390/fishes9030103

[9]. Kathirvelpandian, A., Chowdhury, L. M., & Kumar, M. S. (2022). Species-specific molecular signatures for the commercially important scombrids using mitochondrial gene analysis; a tool for fisheries management. *Journal of Asia-Pacific Biodiversity*, *15*(4), 481–487. https://doi.org/10.1016/j.japb.2022.07.005

[10]. Marsac, F., Everett, B., Shahid, U., & Strutton, P. G. (2024). Indian Ocean primary productivity and fisheries variability. In *Elsevier eBooks* (pp. 245–264). https://doi.org/10.1016/b978-0-12-822698-8.00019-6

[11]. Patual, C., Sarsale, J., Siega, M., & Sarsale, A. M. (2025). Catch assessment of marine fishes in Cabalian Bay, Philippines: composition, abundance, gear, and catch rate. *Croatian Journal of Fisheries*, *83*(2), 55–69. https://doi.org/10.2478/cjf-2025-0007

[12]. Picoy-Gonzales, R. M., & Reducto, C. O. (2024). The Small-Scale Tuna Fishery in Leyte, Philippines: fishing gears, practices, catch rate and composition. Marine Science and Technology Bulletin, 13(4), 282–295. https://doi.org/10.33714/masteb.1523579

[13]. Quibod, M. N. R. M., Alcantara, K. N. L., Bechayda, N. A., Estropia, C. J. C., Guntinas, J. B., Obin, M. a. H. A., Raymundo, R. M., & Soniega, E. P. (2021). Terrestrial vertebrates in modified landscapes in northeastern Mindanao, Philippines. Journal of Animal Diversity, 3(3), 72–85. https://doi.org/10.52547/jad.2021.3.3.6

[14]. Quimpo, T. J. R., Cabaitan, P. C., Go, K. T. B., Dumalagan, E. E., Villanoy, C. L., & Siringan, F. P. (2019). Similarity in benthic habitat and fish assemblages in the upper mesophotic and shallow water reefs in the West Philippine Sea. Journal of the Marine Biological Association of the United Kingdom, 99(7), 1507–1517. https://doi.org/10.1017/s0025315419000456

[15]. TahiLuddiN, A., & Terzi, E. (2021). An overview of fisheries and aquaculture in the Philippines. Journal of Anatolian Environmental and Animal Sciences, 6(4), 475–486. https://doi.org/10.35229/jaes.944292

[16]. Taufik, M., Restiangsih, Y. H., Ma'mun, A., Hidayat, T., Wagiyo, K., Panggabean, A. S., Nurulludin, N., & Prihatiningsih, N. (2024). Ichthyoplankton Biodiversity in the Indonesian Fisheries Management Area-573 in 2015. *IOP Conference Series Earth and Environmental Science*, *1350*(1), 012018. https://doi.org/10.1088/1755-1315/1350/1/012018

[17]. Winner, B., Switzer, T., Keenan, S., Purtlebaugh, C., Christiansen, H., & Davis, J. (2022). A habitat-based, fishery-independent survey using actively fished hooked gear successfully characterizes reef fish populations in the eastern Gulf of Mexico. North American Journal of Fisheries Management, 42(6), 1575-1594. https://doi.org/10.1002/nafm.10846

[18]. Zeng, X., Cui, M., Yu, H., Pan, X., Zheng, P., & Wei, F. (2024). Phylogenetic relationships analysis of the family Scombridae (Actinopterygii, Scombriformes). *Israeli Journal of Aquaculture - Bamidgeh*, *76*(2). https://doi.org/10.46989/001c.94824

[19]. Zulfahmi, I., Apriansyah, M., Batubara, A. S., Kautsari, N., Sumon, K. A., Rahman, M. M., & Nur, F. M. (2022). Commercial marine fish species from Weh Island, Indonesia: Checklist, distribution pattern and conservation status. *Biodiversitas Journal of Biological Diversity*, *23*(4). https://doi.org/10.13057/biodiv/d230432

[20]. ***https://marinespecies.org/