

Evidence of *Birgus latro* (Linnaeus, 1767) population in Surigao del Sur, Mindanao, Philippines

Edgar Dela Fuente Jose* and Jerson Morales Bandorliao

North Eastern Mindanao State University, Lianga Campus, Poblacion, Lianga, Suirgao del Sur, Philippines

*Corresponding author: edjose@nemsu.edu.ph

Received: 07 Oct. 25|| Revised: 14 Mar. 2026 || Accepted: 17 Apr. 2026 || Available Online: 22 Oct. 2026

How to cite:

Jose ED, Bandorliao JM. 2026. Evidence of *Birgus latro* (Linnaeus, 1767) population in Surigao del Sur, Mindanao, Philippines. The Palawan Scientist. 18(2):in-press. <https://doi.org/10.69721/TPS.J.2026.18.2.10>

ABSTRACT

The general distribution pattern of coconut crab or *Birgus latro* (Linnaeus, 1767) shows patchy and insular populations which are influenced by ecological needs and human pressures. Historical records in the Philippines, including global occurrence databases (GBIF 2026) indicate a handful of intermittent sightings of the species in the country. The research note documents a newly recorded population of the *B. latro* in Surigao del Sur, Mindanao, Philippines. Random field surveys and interviews with key informants conducted from October 2024 to April 2025 confirmed the presence of individuals of *B. latro* in three different coastal and islet limestone, ultramafic forests in Surigao del Sur, indicating evidence of a population of the species. This record expands the known population and distribution of *B. latro* in Mindanao, where previous reports suggest a discontinuous national distribution, extending to southern Sulu and Batanes on the Northern Pacific coast and island regions. The finding is significant for both scientific inquiry and conservation, given the vulnerable status of the species within its known population and distribution range in the country. The confirmed population in Surigao del Sur represents an important record that fills the gap in the occurrence and distribution of *B. latro* on the Pacific seaboard of Mindanao, Philippines, which could serve as a basis for localized species and habitat management.

Keywords: beach forest, biodiversity, coastal ecosystem, coconut crab, conservation, islands

The coconut crab *Birgus latro* (Linnaeus, 1767) is known as the largest terrestrial arthropod in the world. It is distributed across tropical Indo-Pacific islands, including several regions of the Philippines (Reyne 1939; Perrucho et al. 2018; Subang et al. 2020; Cumberlidge et al. 2022). Known literature reports of *B. latro* occurrence

in the Philippines have largely been limited to certain localities of Batanes, Bohol, Cagayan (Aparri, Calayan Island, Fuga Island), Camarines Sur (Santa Cruz), Cebu (Banrayan Island, Camotes Island, Mactan Island, Olango Island), Laguna, Marinduque, Mindoro, Palawan (Balabac, Cagayancillo), Romblon (Romblon Island), Sulu, Tawi-Tawi (Bongao) and Dalupiri Island that is either in Cagayan or Camarines Norte. (Reyne 1939; Perrucho et al. 2018; Subang Jr. et al. 2019; Cumberlidge et al. 2022). Occurrence data from the Global Biodiversity Information Facility (GBIF) provided information on the species occurrence from two preserved specimens from the biological collections of the National Taiwan Museum (NTM) and nine specimens from the Smithsonian Museum of Natural History (USNM), which appear to have been collected in the northern Pacific region of the Philippines (GBIF 2026). Additionally, material citations from citizen science iNaturalist provided occurrence geotagged data from three isolated islands, including Negros Occidental, Batanes, and Surigao del Sur, from the present study. Despite its wide historical range, recent studies have documented harvesting and habitat degradation as major causes of population decline, for which the species has been assessed as vulnerable according to International Union for Conservation of Nature (IUCN) criteria (Cumberlidge et al. 2022). Reports of the species from Mindanao have been scarce, with limited published data on its current distribution and population status.

This research note documents a newly recorded population of *B. latro* in Surigao del Sur, Mindanao, Philippines. Three local encounters of the species were reported by key informants from 2021 to 2024 in the coastal areas of Barobo, Surigao del Sur. However, only poor-quality pictures were documented. Random field surveys were conducted from October 2024 to April 2025 in the coastal areas and islets of Hinatuan, Barobo and San Agustin, Surigao del Sur, alongside a key informant, an expert hunter-gatherer of the species (Figure 1). Rock crevices and tracks were traced in the sampling sites day and night from 0800 to 2200 h for a total of 16 sampling days. The team comprised one expert hunter-gatherer, two researchers, and three field helpers. The effort confirmed the presence of individuals with various size classes, indicating an active yet threatened population. A total of seven individuals were recorded during this sampling effort, of which one was juvenile (100 grams in weight). Four individuals were captured by locals in Barobo, one individual was recorded in San Agustin, and two individuals were observed in Hinatuan. However, only two adult individuals, a male and a female, were brought and taken for morphometric measurements because specimen collection was not permitted due to the delayed issuance of a gratuitous permit from the Bureau of Fisheries and Aquatic Resources.

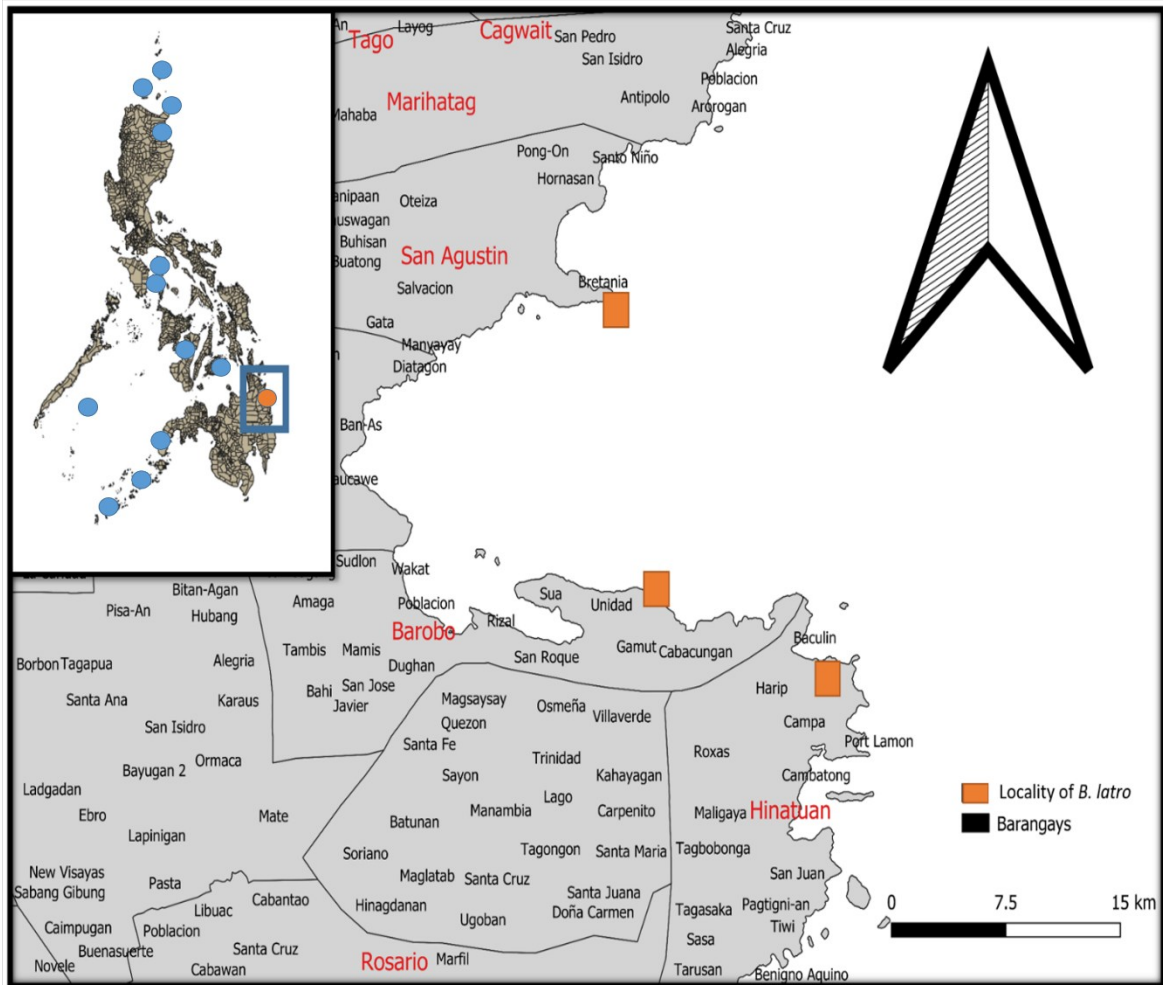


Figure 1. Inset map of the Philippines showing the known and historical distribution records of *Birgus latro* (Linnaeus, 1767) (blue circles) and the new record (red circle) from Surigao del Sur. The main map shows the new sighting locations of the *B. latro* population in the province.

Several studies suggest that the cryptic behavior of the species typically remains hidden in dens during the day and emerges at night to forage, together with localized movements of adults and island-based population structures, support the interpretation that a single observation of a confirmed individual may represent the presence of an active population (Lavery et al. 1995; Sato et al. 2013; Appoo et al. 2021). The present discovery of the *B. latro* population provides the first verified record of the species in this province, extending the known distribution in Northeastern Mindanao, where previous reports were limited to other coastal and island sites. The observed population included both juvenile and adult individuals, suggesting active recruitment and habitat suitability in the area. The measured size of an adult female captured in Hinatuan, Surigao del Sur included a carapace length of 71 mm and width of 68 mm, an abdomen length of 70 mm and width of 56 mm, and a weight of 540 grams (Figure 2A). The adult male captured from Barobo (Figure 2B) measured 37 mm in carapace length, 78 mm in carapace width, 64 mm in abdomen length, and weighed 350 g. The individual from San Agustin, Surigao del Sur

(Figure 2C and D) was not measured, but was approximately of a similar size to the adult female from Hinatuan. This finding is ecologically important as it highlights the potential of northeastern Mindanao to support viable populations of the species. Size-frequency distribution has been used as an indirect indicator of recruitment when direct evidence of reproduction is lacking. The presence of juveniles often indicates an early stage of succession, including larval development and settlement (Fletcher et al. 1991; Brown and Feilder 1991). Juveniles proceed to land after the larval stage, and their survival is influenced by environmental factors that provide habitat suitability for recruitment succession (Drew et al. 2010). Moreover, the record underscores the urgent need for protection measures, since coconut crabs remain vulnerable to human exploitation and habitat loss. It has been noted that coastal people are often dependent on fisheries and gleaning for subsistence (Ardines et al. 2020), and *B. latro* is not exempted even if it is tagged vulnerable.

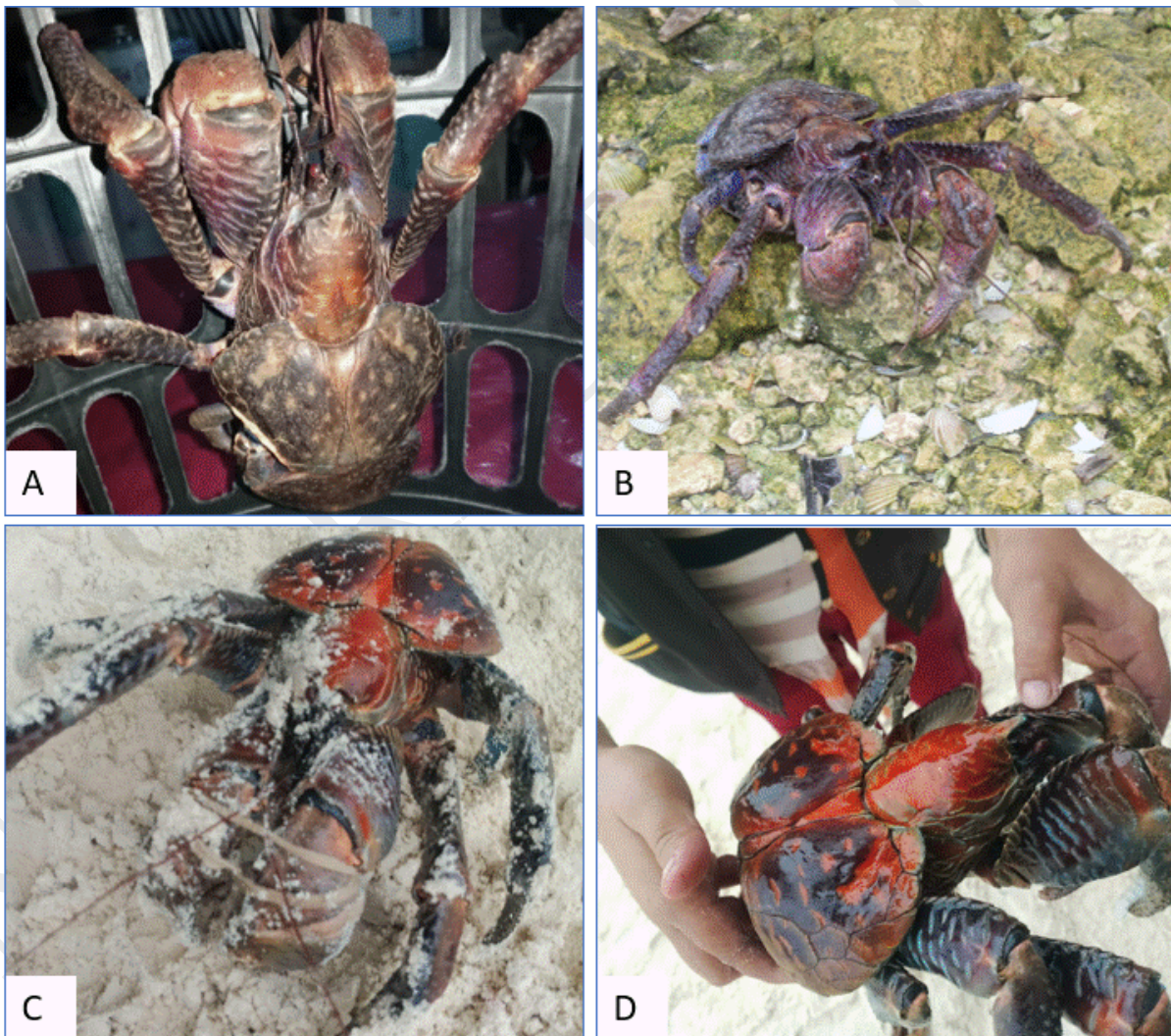


Figure 2. Individual *Birgus latro* documented in (A) Bgy. Harip, Hinatuan; (B) Bgy. Gamut, Barobo; and (C and D) Bgy. Britania, San Agustin, Surigao del Sur.

Interviews revealed that illegal trade exists in one of the sites in this study (Hinatuan), mainly by local and Chinese traders. Although the intensity of illegal trade has not been quantified in this study, this exploitation could pose risks considering the slow growth, delayed maturity, and long lifespan of the species. Targeted collection of large, mature individuals can diminish the reproductive potential and threaten the local populations of the species. In Barobo and San Agustin, Surigao del Sur, the major threat would likely be the expanding coastal development for tourism establishments, where coastal forests are subject to clearing and modifications (Figure 3). These coastal and islet forests are essential habitats for the coconut crabs, providing dens, refuge, and food. Habitat alteration can complicate the reproduction of the species, as it is reliant on an intact ecosystem. Another threat observed, particularly in San Agustin, is the presence of invasive feral cat predators, introduced by locals to the islet where *B. latro* was documented. Feral cats have been known to significantly impact native wildlife on tropical islands. They are known to prey on various vertebrates and invertebrates, contributing to biodiversity loss in island ecosystems (Greenwell et al. 2019). Although adult coconut crabs have few natural predators, juveniles are at risk in the presence of invasive predators, which may reduce the potential of recruitment and survival. These activities, when not regulated or stopped, would alter reproductive succession and replace major habitats for the species, resulting in reduced population replenishment. The finding is significant given the vulnerable status of the species. Several relevant implications include its contribution to national biodiversity inventories, the provision of new opportunities for localized conservation planning and policy, habitat protection, and community-based stewardship initiatives in Surigao del Sur. Targeted research and community-based monitoring programs for the coconut crab populations to track sightings, identify essential habitats, and track illegal harvest/trade can be implemented by the local government units of Barobo, Hinatuan, and San Agustin. Integrated species protection, local land-use, and tourism plans are recommended, including the establishment of coastal forest protection sites, no-take zones, and the control or elimination of invasive predators.

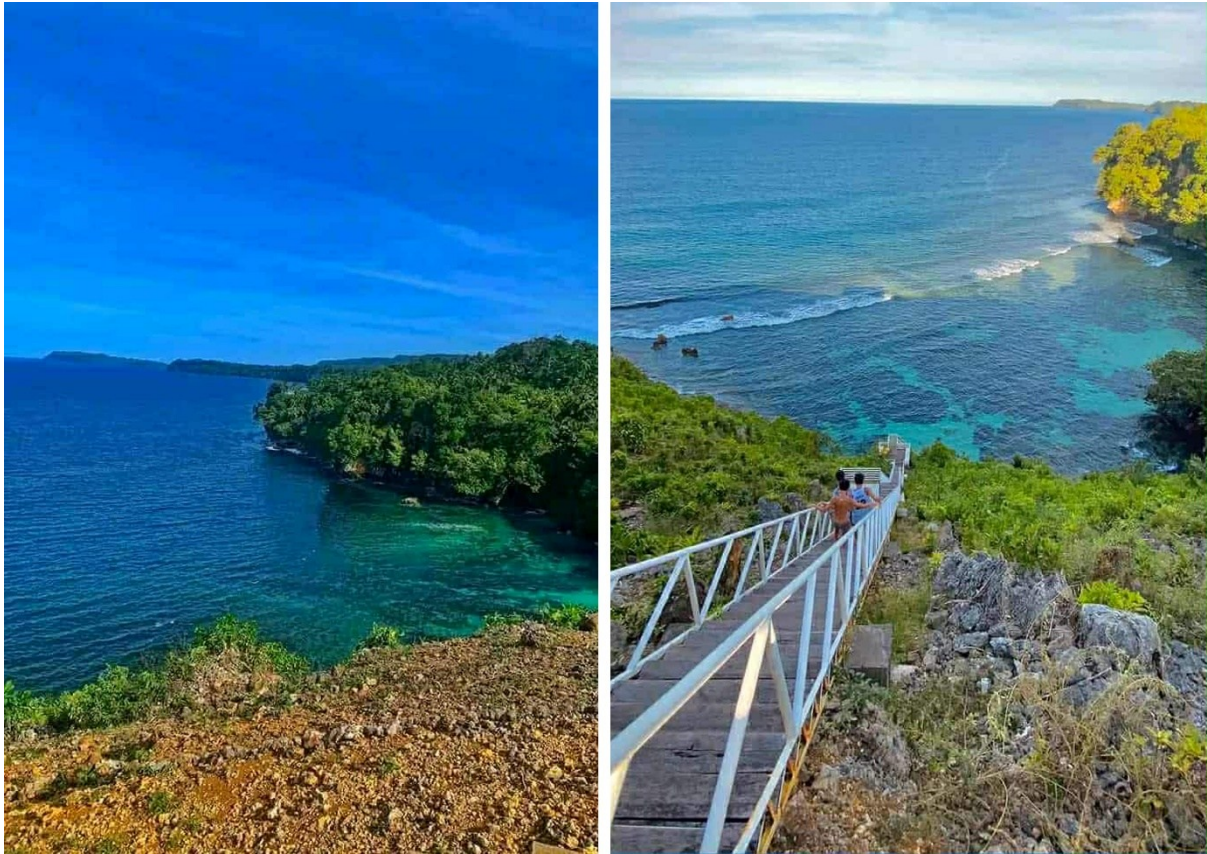


Figure 3. Images showing coastal forest clearing and development activities in one of the sightings in Barobo, Surigao del Sur. Left image is a forest clearing while the right image is the stairway going to the the sea, alongside with a young secondary growth vegetation, built and used for tourism activities. We assumed that the area is a forested prior to the resort development as depicted by the nearby coast in the images.

The 15 occurrence records of *B. latro* can be categorized according to the source of evidence. Currently archived GBIF database for Philippines that comprising 11 preserved museum specimens housed in the National Museum of Natural History (Smithsonian Institution, USNM) provide the oldest (USNM 1073361, 1909) evidence with a verified island locality, comprising eight individual specimens tagged to be collected in Maculabo Island, Gulf of Lagonoy, Camarines Sur. USNM 29047 provides too broad locality information (North Pacific Ocean), which is imprecise to assign just for Philippine locality, unless that there are additional catalogue information or evidence of the collection within the Philippines. National Taiwan Museum (TMC) collection (TMCD000003) mentions Three Wise Kings Islands, Philippines, which, historically and currently do not match any places in the modern Philippine island names. The museum also noted that the locality remains unresolved and that it corresponds to a locality in New Zealand rather than the Philippines, suggesting an error or outdated translation. The TMCD000717 confirms the specimen originated from the Philippines but no usable locality for distributional mapping. The 11 research-grade, iNaturalist observations, represents three distinct localities:

Danjugan Island Sanctuary, Negros Occidental (five observations); Itbayat Island, Batanes (two observations); and; Surigao del Sur (four observations from the current study); confirming persistent of extant populations in these regions. Localities from published and historical literatures (Reyne 1939; Perrucho et al. 2018; Subang Jr. et al. 2019; Cumberlidge et al. 2022) that include of Batanes, Bohol, Cagayan (Aparri, Calayan Island, Fuga Island), Camarines Sur (Santa Cruz), Cebu (Banrayan Island, Camotes Island, Mactan Island, Olango Island), Laguna, Marinduque, Mindoro, Palawan (Balabac, Cagayancillo), Romblon (Romblon Island), Sulu, Tawi-Tawi (Bongao) and Dalupiri Island, that are not represented in the GBIF, may use to supplement verified occurrence records, but requires further validations as they are lacking contemporary observations and georeferenced records. Dalupiri is an ambiguous locality that is pertaining to either Dalupiri Island in the Babuyan Islands or in Northern Samar as literatures did not mention specific locality. This cannot be assigned with confidence as a distribution record of the species, or it can represent both localities when verified and updated data and information are available. Interestingly, Maculabo Island may represent the earliest and precise locality of the species in the Philippines based on museum voucher and currently available through public information. This provides a benchmark of the species occurrence more than just another historical record that modern occurrence data can be compared. Apparently, there had been no recent occurrence records from the Bicol region in the current GBIF dataset, highlighting the value of resurveys to determine whether the species is still present in the area. This information, alongside with these latest discovery of the species in Surigao del Sur, fills major geographic gaps in the documentation of the species distribution in the country. This record provides the first verifiable evidence of the species in the province of Surigao del Sur and demonstrates a possible extant population in the Pacific seaboard of Mindanao.

FUNDING

The research did not receive any external funding. All phases of the research were conducted independently by the authors utilizing their own resources.

GENERATIVE AI STATEMENT

The paper was originally conceptualized and written by the author, while an AI tool such as Grammarly (free version) was used only for editing and improving the readability of the manuscript. AI tools were not used to generate data and interpret the results. AI-generated text edits were strictly evaluated by the authors for consistency.

ETHICAL CONSIDERATIONS

Research permits were secured from the local government units of the study sites in the form of endorsement resolutions. These documents were then utilized to secure a gratuitous permit from the Bureau of Fisheries and Aquatic Resources, the issuance of which has not yet been released as of this time.

DECLARATION OF COMPETING INTEREST

The authors declare that there are no competing interests among the authors of this manuscript.

ACKNOWLEDGMENTS

The authors are grateful to the key informants for sharing their expertise and sighting reports. We likewise extend our gratitude to the two anonymous reviewers who gave insightful efforts in the improvement of the manuscript. In-kind supports from Northeastern Mindanao State University and Western Philippines University are greatly acknowledged. Field surveys were made successful with the company of Jerson Arcenas, Ian Jay Bergantin and Andrea T. Miranda. Photo credit to Jureden Rufin of *B. latro* from Bgy. Britania, San Agustin, Surogao del Sur.

REFERENCES

- Appoo J, Cagua EF, van der Crommenacker J, Burt A, Pistorius P, Taylor F, Richards H, Haupt P, Doak N, Fleischer-Dogley F, and others. 2021. Population dynamics of coconut crab (*Birgus latro*) in Aldabra Atoll, Seychelles. Marine Ecology Progress Series. 665:103-113. <https://doi.org/10.3354/meps13672>
- Ardines RB, Mecha NJFM, Dolorosa RG. 2020. Commonly gleaned macro-benthic invertebrates in a small offshore island of Cawili, Cagayancillo, Palawan, Philippines. The Palawan Scientist. 12:102-125. <https://doi.org/10.69721/TPS.J.2020.12.1.08>
- Brown IW, Fielder DR. 1991. The coconut crab: Aspects of the biology and ecology of *Birgus latro* in the Republic of Vanuatu. Australian Centre for International Agricultural Research Monograph. 8:1-136. <https://ageconsearch.umn.edu/record/118052/files/8.pdf>
- Cumberlidge N, Caro T, Watson-Zink VM, Naruse T, Ng PKL, Orchard M, White T. 2022. Troubled giants: The updated conservation status of the coconut crab (*Birgus latro*). Raffles Bulletin of Zoology. <https://doi.org/10.26107/RBZ-2022-0001>
- Drew MM, Harzsch S, Stensmyr M, Erland S, Hansson BS. 2010. A review of the biology and ecology of the Robber Crab, *Birgus latro* (Linnaeus, 1767) (Anomura: Coenobitidae). Zoologischer Anzeiger - A Journal of Comparative Zoology. 249(1):45-67. <https://doi.org/10.1016/j.jcz.2010.03.001>
- Fletcher WJ, Brown IW, Fielder DR, Obed A. 1991. Structure and dynamics of population. In: Brown IW, Fielder DR, editors. The Coconut Crab: Aspects of biology and ecology of *Birgus latro* in the Republic of Vanuatu. Goana Print, Fychwick. 61-86.
- GBIF (Global Biodiversity Information Facility). 2026. Occurrence search: *Birgus latro* in the Philippines. Global Biodiversity Information Facility. [accessed 2026 Mar 14]. <https://www.gbif.org/occurrence/seaaaarch?q=birgus%20latro&continent=ASIA&country=PH>
- Greenwell CN, Calver MC, Loneragan NR. 2019. Cat gets its term: A case study of predation on a threatened coastal seabird. Animals. 9(445):1-15. <https://doi.org/10.3390/ani9070445>
- Lavery S, Moritz C, Fielder DR. 1995. Changing patterns of population structure and gene flow at different spatial scales in coconut crab (*Birgus latro*). Heredity. 74:531-541. <https://doi.org/10.1038/hdy.1995.75>
- Perrucho CA, Calicdan-Villara MA, Encarnacion AB, Morales MC. 2018. Biological aspects of berried coconut crab (*Birgus latro*, Linnaeus, 1767) from the islands of Batanes Province, Philippines. Symposium Proceedings, Kuroshio Science. 12(1):42-48.
- Reyne A. 1939. On the food habits of the coconut crab (*Birgus latro* L.), with notes on its distribution. Archives Néerlandaises de Zoologie. 3:283-320. <https://doi.org/10.1163/036551639X00345>
- Sato T, Yosada K, Abe O, Shibuno T, Takada Y, Dan S, Hamasaki K. 2013. Growth of coconut crab (*Birgus latro*) estimated from mark-recapture using PIT tags. Aquatic Biology. 19: 143-152. <https://doi.org/10.3354/ab00517>
- Subang BP Jr, San Juan RG, Ventura GFC, Aspe NM. 2020. An annotated checklist of the commonly harvested crabs (Crustacea: Decapoda) from marine and brackish water ecosystems of Palawan, Philippines. Journal of Environment and Aquatic Resources. 5:61-82. <https://doi.org/10.48031/msunjea.2020.05.05>

ROLE OF AUTHORS: EDJ - data gathering, analysis and writing of the manuscript; JMB – data gathering, securing permits and writing of the manuscript

Responsible Editor: Dr. Roger G. Dolorosa