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BRIEF REPORT

REVISED *Camptostemon philippinensis*, a new record of endangered mangrove species in the Balikpapan Bay, East Kalimantan, Indonesia

[version 3; peer review: 1 approved, 3 approved with reservations]

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<https://doi.org/10.12688/f1000research.140887.1>Second version: 15 Jan 2024, 12:1394
<https://doi.org/10.12688/f1000research.140887.2>Latest published: 31 Mar 2025, 12:1394
<https://doi.org/10.12688/f1000research.140887.3>**Abstract****Background**

Camptostemon philippinensis, found in mangrove forests in Indonesia and the Philippines, is listed as endangered on the International Union for Conservation of Nature (IUCN) Red List. It is found primarily in isolated mangrove forests in Kalimantan (Indonesian Borneo) and Sulawesi in Indonesia. Despite significant studies on mangrove biodiversity in this region, the occurrence of *C. philippinensis* in Balikpapan Bay, East Kalimantan, is not extensively recorded.

Methods

The study was conducted by exploring the mangrove forests along Balikpapan Bay. The first survey of about 200 km was conducted to observe mangrove vegetation and found one *C. philippinensis* tree. The second survey focused on the area around the first discovered *C. philippinensis* tree to census and record its growth stage and distribution.

Results**Open Peer Review**

Approval Status

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The study recorded a population of 527 individuals of *C. philippinensis* in Pantai Lango Village, East Kalimantan, dominated by seedlings. The high number of seedlings indicates good natural regeneration potential, but the low number of trees indicates intense competition for space in a restricted habitat. This species inhabits a small and restricted area in Balikpapan Bay, in the middle area of Balikpapan Bay, and is associated with other mangrove flora, such as *Rhizophora apiculata*, *Rhizophora mucronata*, *Sonneratia alba*, *Avicennia alba*, *Lumnitzera littorea*, *Osbornia octodonta*, *Ceriops tagal*, and *Xylocarpus granatum*.

Conclusions

C. philippinensis is vulnerable to habitat damage from anthropogenic activities, which could lead to local extinction. Its natural habitat in Balikpapan Bay also has the potential to be under pressure due to the development of Indonesia's new capital city (*Ibu Kota Nusantara*/IKN). It emphasizes the need to understand the ecological role of this protected flora in the natural habitat of protected fauna (the proboscis monkey). Documenting the population of *C. philippinensis* is crucial for conservation efforts, including propagation and understanding its ecological role.

Keywords

Major mangrove, conservation, proboscis monkey, Penajam Paser Utara, IKN

Any reports and responses or comments on the article can be found at the end of the article.



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REVISED Amendments from Version 2

We have made improvements to our manuscript based on the reviewer comments. Several of the following amendments, such as changes in the demographic aspect and improvement of figure 3, also add explanation for it based on reviewer recommendation. We removed Fig. 3B. and revised the DBH categories into 4 groups (<5 cm; 5-15; 15-25, and >25).

Any further responses from the reviewers can be found at the end of the article

Introduction

Camptostemon philippinensis (Vidal) Becc. is an endangered species comprising mangrove forests listed in the endangered category on the IUCN Red List (Duke *et al.*, 2010). This species is one of Indonesia's two protected mangrove species (MEF Regulation Number 106/2018), so it is a high priority for conservation. *C. philippinensis* is a rare mangrove species globally distributed in Indonesia and the Philippines, with an estimated number of mature individuals of around 200 (Duke *et al.*, 2010; Primavera *et al.*, 2004). In Indonesia, this species is only found on the islands of Kalimantan and Sulawesi (Duke *et al.*, 2010) and mainly in isolated mangrove forests (Djameluddin, 2018). That is a lesser-known species, and so far, there are no records of its use by the community. However, the bark and leaves of *C. philippinensis* have the potential to contain anti-melanogenic and antibacterial chemicals (Gadores *et al.*, 2021).

Camptostemon philippinensis is one of three species in the genus *Camptostemon* (Malvaceae) (Beccari, 1886). This species was first published as *Cumingia philippinensis* S. Vidal in 1885, with type specimens originating from the island of Luzon. Beccarii (1886) suggested the move to the *Camptostemon* genus after observing the flower and fruit organs of the early species and discovering that the features in these two organs in *Cumingia* were comparable to those in *Camptostemon*. Van De Brink (1924) reduced the species *C. aruensis* to a synonym for *C. schultzei* based on his observations on the organs of flowers and fruits. That makes *C. philippinensis* and *C. schultzei* very easy to distinguish based on the morphological character of the leaf shape, where the first species has oblong leaf blades and the last species has elliptical leaf shapes. However, molecular studies have not been carried out specifically to support this opinion.

The population distribution of *C. philippinensis* on the island of Borneo is very limited. Previously, records of the distribution of this species in Borneo were only documented on the coast of Berau (Mukhlisi & Sidiyasa, 2014). In Balikpapan Bay, several mangrove floristic studies have been conducted and recorded the richness of mangrove species, ranging from 12 species (Kristiningrum *et al.*, 2019) to 20 species (Warsidi & Endayani, 2017). Although various biodiversity studies have been carried out in the area, the presence of *C. philippinensis* has never been recorded (Kristiningrum *et al.*, 2019; Sayektiningsih *et al.*, 2012, 2020; Toulec *et al.*, 2022; Willard *et al.*, 2022).

Balikpapan Bay is a mangrove ecosystem in East Kalimantan with an area of around 168 km² (Toulec *et al.*, 2022), which is an essential habitat for various species of endangered wildlife, especially Borneo's endemic primate, the proboscis monkey (*Nasalis larvatus*). However, the threat of mangrove forest conversion is still present (Anwar *et al.*, 2021b; Toulec *et al.*, 2022). The study results show that this area has one of the densest proboscis monkey population distributions, with as many as 60 groups (Toulec *et al.*, 2022). On the other hand, mangrove vegetation has a strong interaction with the presence of proboscis monkeys because the monkeys like young leaves, seeds, and mangrove fruit as food sources (Boonratana, 1993). Atmoko (2022) has reported as many as 41 plant species as food sources for proboscis monkeys from several habitats in East Kalimantan. In addition, proboscis monkeys often choose large mangrove trees on the banks of rivers or seas as sleeping trees to avoid predators. However, until now, information on the ecological role of *C. philippinensis* in the proboscis monkey's natural habitats has been limited.

Documentation of the *C. philippinensis* population is important in supporting comprehensive conservation efforts, such as propagation efforts, and understanding its ecological role for the animals around it. More importantly, because some of the Balikpapan Bay areas will be developed as a site for the new Indonesian capital city (*Ibu Kota Nusantara*/IKN), this study can be used as a resource for stakeholders interested in the usage of the area.

Methods

Preliminary study

The development being carried out in IKN as the new capital city of Indonesia has the potential to threaten the mangroves in Balikpapan Bay because the rivers in IKN end in this bay. We explored Balikpapan Bay to observe the mangrove vegetation in general in July 2022, we found a threatened species, *C. philippinensis*. A focused or intuitive-controlled survey was conducted to observe *C. philippinensis*. This approach emphasizes surveying areas with high potential habitat for the target species, relying on the surveyor's experience, field intuition, and readiness to steer the survey (Brewer, 2013). The second survey in March 2023 focused on *C. philippinensis* existence. The survey was carried out

using a boat along approximately 200 km of the coast of Balikpapan Bay. In the first survey, only one *C. philippinensis* tree was found on the shores of Kowangan Island, in the middle of Balikpapan Bay. In the second survey, we focused on the area where *C. philippinensis* had previously been discovered. We explored within a radius of 50 km from the point where the initial tree was found. We used the AvenzaMaps application on a smartphone to navigate and estimate distances in the field and used a Garmin CSx60 GPS receiver to take coordinates. The soil texture was observed *in-situ* following a guideline by [Stuart-Street *et al.* \(2020\)](#).

Study area

The study area was in Balikpapan Bay, covering Balikpapan City and Penajam Paser Utara Regency, where some are part of the IKN Area (0°54'27"S-1°13'59"S and 116°38'06"E-116°50'18"E). This bay is a semi-closed water body with 56 rivers and tributaries ([Kreb *et al.*, 2020](#)). It holds high biodiversity value ([Lahjie *et al.*, 2019](#); [Kreb *et al.*, 2020](#)), including fisheries resources that have been utilized by local communities for more than 150 years ([Lahjie *et al.*, 2019](#)).

Sample collection

A census was carried out by measuring the height and diameter of each *C. philippinensis* tree discovered in the survey area. We also recorded the coordinates of each individual and growth stage based on diameter at breast height (dbh), namely seedlings (germinated seed to <1.5 m in height), saplings (height >1.5 m; dbh <10 cm), and trees (dbh > 10 cm) ([Susilowati *et al.*, 2019](#)). A brief description of the surrounding vegetation was carried out by recording the mangrove species assumed to be associated with *C. philippinensis*. The herbarium specimens of *C. philippinensis* were collected and deposited at Herbarium Wanariset (WAN) and Herbarium Bogoriense (BO). A permit to collect the specimen was obtained from the Directorate General of Nature Resources and Ecosystem Conservation of the Ministry of Environment and Forestry of Indonesia, Number SK 94/KSDAE/SET.3/KSA.2/5/2023.

The herbarium collection of *C. philippinensis* from Indonesia is shown in [Table 1](#).

Biogeographical information about the species was gathered from the herbarium specimens published on the GBIF website (<https://www.gbif.org/>) ([GBIF, 2023](#)). A literature review on the species, genus, or mangrove species that indicated the presence of *C. philippinensis* was also mined to enrich the distribution data and taxonomy information ([Noor *et al.*, 2012](#); [Giesen *et al.*, 2006](#); [Primavera *et al.*, 2004](#)). All data and information were used to identify the distribution and describe the novel record of the species in Teluk Balikpapan, East Kalimantan.

Data analysis

Based on their growth stage (seedling, sapling, and tree), each individual was tallied to calculate their overall number, which is displayed as a percentage graph. The population profile was displayed by the diameter groups. The distribution of *C. philippinensis* was mapped based on the geographical position using [Quantum GIS 3.30](#).

Table 1. Herbarium collection of *Camptostemon philippinensis* from Indonesia.

Collection number	Collector	Year of collection	Location	Coordinates
CNJ 1973	CNJ. Delmaar	1919	Sungai Tajib, Pulau Laut, South Kalimantan	3 15'49.70"S 116 11'25.87"E
2409	G. Kjellberg	1929	Lampia, Luwu, South Sulawesi	2 43'28.59"S 121 05'38.35"E
bb 14450	M. Laleno	1930	Moleo, Gorontalo	0 27'50.03"N 122 00'06.17"E
bb16713	F. Ch. J. Bish	1933	Tolonggano, Donggala, Central Sulawesi	0 46'29.03"S 119 39'58.78"E
bb19520	Johanes Van Zill de Jong	1935	Malili, South Sulawesi	2 46'35.31"S 121 02'28.74"E
TA 100/BO1994030	Tri Atmoko <i>et al.</i>	2022	Balikpapan Bay	1 08'52.65"S 116 44'47.00"E
BSS 755	Bina S. Sitepu <i>et al.</i>	2023	Balikpapan Bay	1 09'16.51"S 116 44'44.06"E

Results

The population of *C. philippinensis* was found on Pantai Lango Village and Kowangan Island in Penajam Paser Utara District, East Kalimantan (Figure 1) (Mukhlisi, 2023; Sitepu *et al.*, 2023). It was found in a narrow area, although the Balikpapan Bay mangrove forest is relatively large. The *C. philippinensis* habitat is on the west shore, in the middle of Balikpapan Bay. Only one individual (height = 2 m, diameter = 15 cm) was found on a small island (Kowangan Island), whereas most others inhabited the mainland's western shore in Pantai Lango. The distance between these two locations is around 500 m.

Based on our observations in Pantai Lango, there were around 527 individuals of *C. philippinensis* that were dominated by seedlings (452 individuals), followed by trees (49 individuals), and saplings (26 individuals) (Figure 2). This demonstrates that even though *C. philippinensis* has a relatively limited range; its natural regeneration potential is functional. However, the number of saplings found was less than the tree stage, and this may be due to competition for space in a limited habitat. Generally, in mangrove forests, the number of seedlings is more abundant than the saplings, and the sapling stage is more numerous than the trees (Islam *et al.*, 2015; Winata *et al.*, 2017).

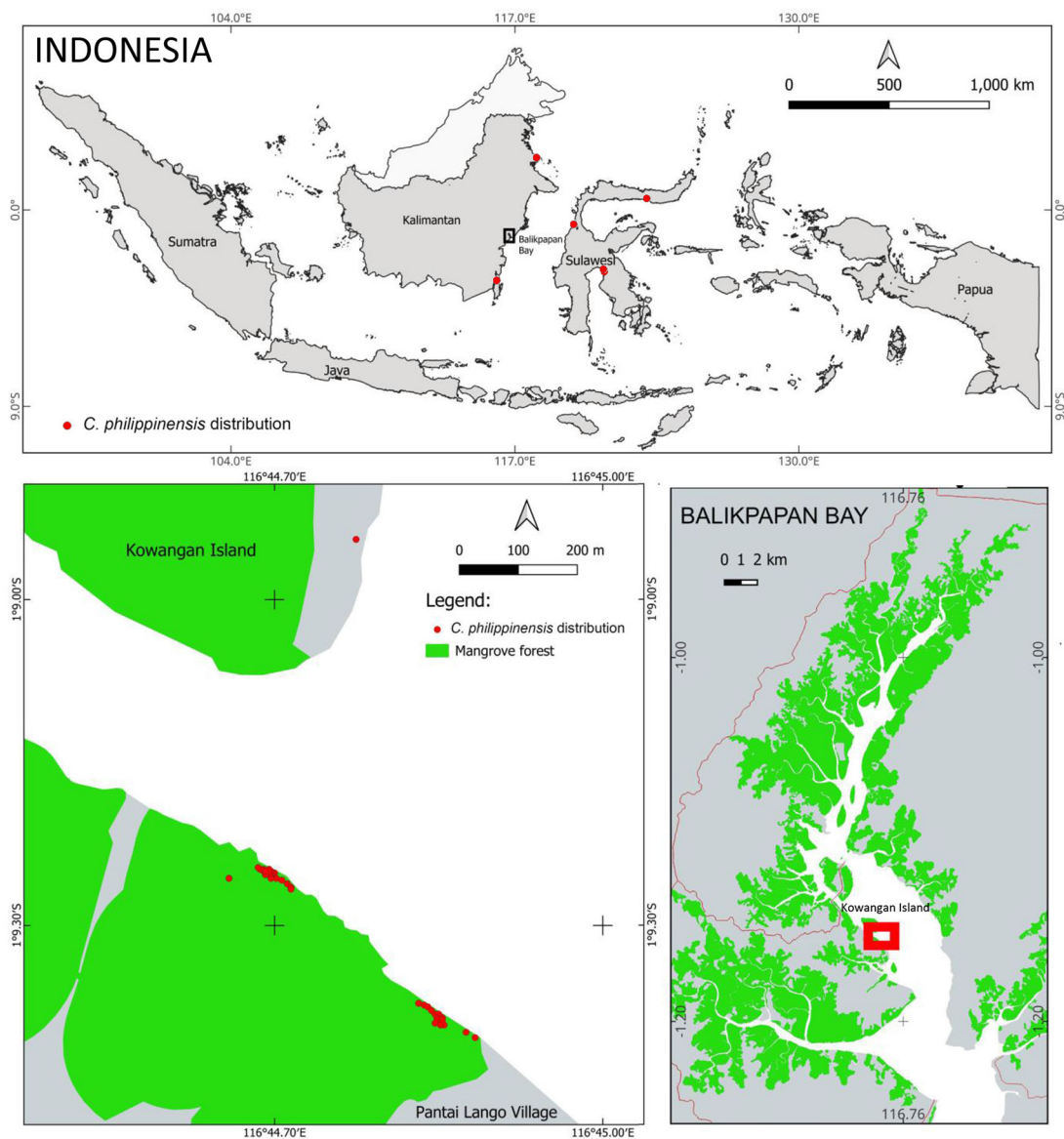


Figure 1. Habitat and distribution of *Campostemon philippinensis* in Balikpapan Bay, East Kalimantan Indonesia.

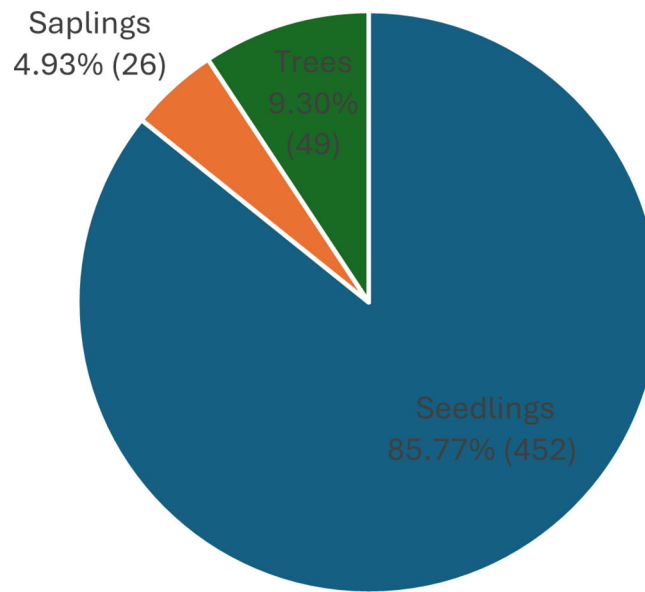


Figure 2. The percentage of the number of individuals of *Camptostemon philippinensis* in Pantai Lango based on the growth stage. (Total n=527 individuals).

The saplings and trees of *C. philippinensis* have an average tree diameter (Figure 3) similar to the flora in the area. The tree was observed in the early of fruiting season in March 2023, we found flowers and unripe fruits (Figure 4).

A population of *C. philippinensis* was found in the middle area of Balikpapan Bay. Our investigation found that the soil texture around the habitat of *C. philippinensis* is predominantly sandy, with moderate to low-intensity sea tides in the area with Balikpapan Bay. A study reported that this area experiences daily semi-diurnal tides, with a tidal range of almost 2.5 m during spring tides and 1 m during neap tides (Anwar *et al.*, 2021a). At our study site, *C. philippinensis* inhabits the second layer of the mangrove zone, where the inundation occurs only during high tide, while the first layer zone is always inundated.

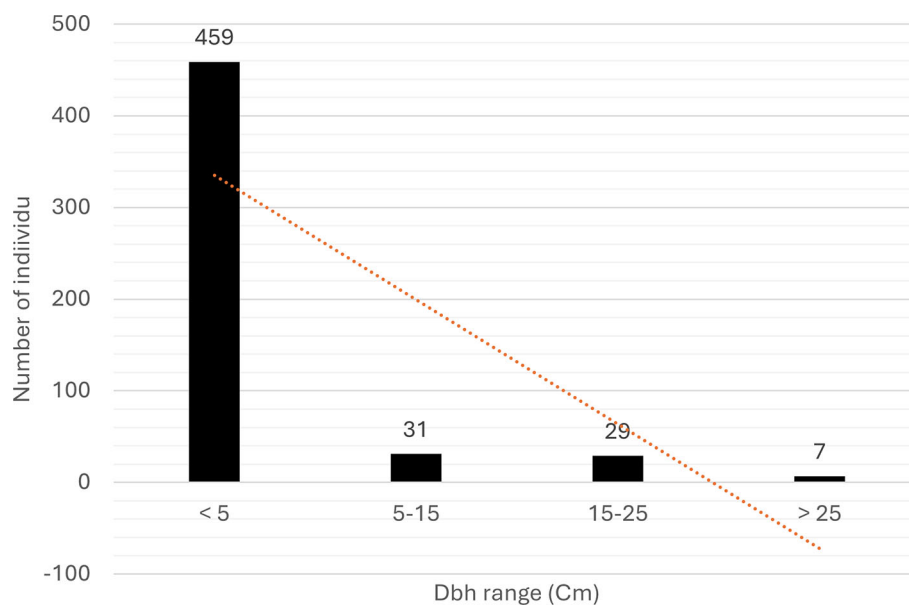


Figure 3. Profile of diameter at breast height (dbh) for trees and saplings of *Camptostemon philippinensis* in Pantai Lango.

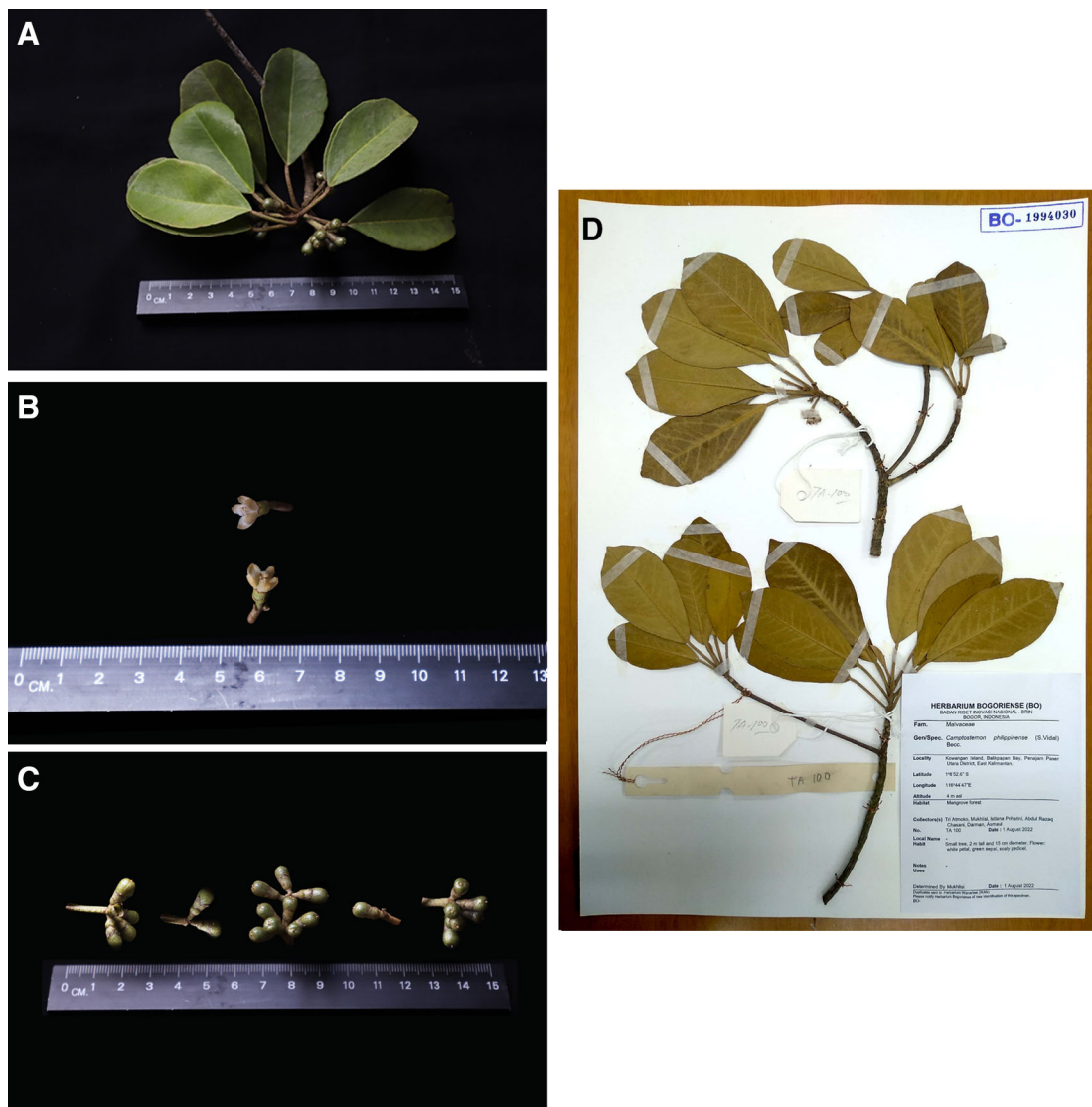


Figure 4. Fruiting specimens of *Camptostemon philippinensis* (A), from Balikpapan Bay the flower (B), the fruit (C), and a herbarium specimen deposited in Herbarium Bogoriense (D). The license mentioned in the Methods section included permission to collect specimens.

Discussion

J. van Borssum Walkes identified *C. philippinensis* in Indonesia in 1962 based on herbarium specimens collected by CNJ Welmaar in 1919 from Pulau Laut, South Kalimantan (Bakhuizen van den Brink, 1924; Troll, 1933). In the following period, it was never recorded in various publications or scientific collections, so it was stated that it was no longer present in Kalimantan and grew only limitedly in the Papua region (Macnae, 1968). However, Noor *et al.* (2012) continued to list this species along with *C. schultzei* as a type of mangrove plant in Kalimantan until publication by Mukhlisi and Sidiyasa (2014) based on botanical records in Tanjung Batu, Berau. While in Sulawesi, it was reported in Bunaken National Park (Djamaaluddin, 2018; Djamaaluddin & Djabar, 2022) and Donggala (Wahyuningsih *et al.*, 2012). In the Philippines, however, this species has reported to be widely spread but less abundant in each population (Primavera *et al.*, 2004).

In a limited habitat, populations of *C. philippinensis* tend to form stands in groups. The population is quite dominant at a certain point in a habitat, but not like *Rhizophora* spp. (Mukhlisi & Sidiyasa, 2014). When compared with populations of other mangrove species in a wider sampling area, the population of *C. philippinensis* is classified as the lowest (Djamaaluddin, 2018; Pototan *et al.*, 2021; Wahyuningsih *et al.*, 2012). Several previous studies have also found a similar phenomenon where the population of *C. philippinensis* is known to be exclusive and limited to a narrow range of habitats (Djamaaluddin, 2018; Djamaaluddin & Djabar, 2022; Mukhlisi & Sidiyasa, 2014). Although all mangrove propagules have

buoyant abilities, which allows seeds to float away by seawater (hydrocory) (Van der Stocken *et al.*, 2019), *C. philippinensis* requires specific ecological compatibility to colonize new habitats.

C. philippinensis often inhabits a small area; its dominant habitat in Balikpapan Bay is restricted to 300 m along the mainland shore. *Rhizophora apiculata*, *R. mucronata*, *Sonneratia alba*, *Avicennia alba*, *Lumnitzera littorea*, *Osbornia octodonta*, *Ceriops tagal*, and *Xylocarpus granatum* are among the mangrove flora associated with this species. The mangrove forest formation in this location has *C. philippinensis* in the second layer, behind the *R. apiculata*, *S. alba*, and *R. mucronata* formations. Meanwhile, one individual of *C. philippinensis* found on Kowangan Island inhabits the shoreline. On Kowangan Island, mangrove vegetation is situated next to a mountainous terrestrial forest in a narrow configuration that is often sparse. *Rhizophora apiculata*, *A. alba*, *Pongamia pinnata*, *Hibiscus tiliaceus*, *Lumnitzera littorea*, and *Osbornia octodonta* are associated with mangrove species on Kowangan Island.

We did not specifically observe the endangered species, proboscis monkeys (*Nasalis larvatus*). However, based on information from the local people (Darman, personal communication, 20 March 2022), he has seen two groups of proboscis monkeys on Kowangan Island and one group in Pantai Lango. Our observations revealed primate bite scars on the leaves of *C. philippinensis*, although we do not have clear evidence of the identity of the species.

Proboscis monkeys are arboreal primates that rely heavily on the presence of the mangrove tree canopy. They often use large and tall trees as sleeping sites at the water's edge.

The average diameter of *C. philippinensis* trees in Balikpapan Bay was similar to that in other locations (Primavera *et al.*, 2004; Pototan *et al.*, 2021). In Banaybanay, Philippines, Pototan *et al.* (2021) found that the average dbh (diameter of breast height) of *C. philippinensis* was 16.25 cm. It can naturally reach heights of 15 m and diameters of up to 50 cm (Primavera *et al.*, 2004).

The threat of *C. philippinensis* populations in Balikpapan Bay is increasing, primarily due to anthropogenic activity. The population is localized in a narrow and extremely limited area; damaging its habitat increases the risk of local extinction (Figure 5). Changes in the status of regions in the mangrove area of Balikpapan Bay and surrounding areas (e.g., the Indonesia's New Capital City area (IKN)) would lead to alterations to the landscape and human population, which could pose a threat to its habitat. Current threats to *C. philippinensis* include the conversion of mangrove forests, environmental pollution, illegal logging, and the development of IKN.



Figure 5. *Camptostemon philippinensis* tree in the shoreline of Pantai Lango close to the community settlement.

Conserving *C. philippinensis* from extinction can be done with several efforts, such as prevention, species and habitat protection and preservation, habitat restoration, and *ex-situ* conservation. Prevention efforts can be carried out through education and outreach to various parties regarding the existence of *C. philippinensis* populations in the IKN area so that their habitat can be maintained. Protecting its natural habitat can be done by establishing a local protected area for the local community. Habitat restoration can be carried out by restoring degraded habitats and raising the number of individuals in their populations.

C. philippinensis in Indonesia has been listed as a protected plant under government law, and one of its natural habitats on Bunaken Islands has been designated as a conservation area and assigned as a national park. Unfortunately, no report on habitat restoration and *ex-situ* conservation efforts has been made until the present. Therefore, it is necessary to save genetic material from existing populations through seed storage and efforts to propagate both generatively and vegetatively, which can be used as a source of genetic material for habitat restoration or *ex-situ* conservation activities, as well as land rehabilitation. It is also necessary to study the genetic diversity of *C. philippinensis* in Indonesia, especially to determine conservation strategies, evaluate the success of restoration or reintroduction programs in other populations, and maintain genetic variation that will be important for the survival of this species.

Conclusions

This study recorded 527 individuals of *C. philippinensis* found in Pantai Lango Village. This population has a complete structure, including seedlings, saplings, and trees. The large number of seedlings shows that its natural regeneration potency is still significant. However, saplings face challenges in growing into the tree strata, possibly due to intense competition for growing space in the natural habitat, along with other environmental factors. This species is increasingly threatened, mostly due to human activity.

Data availability

Underlying data

Zenodo: All Raw Data of *Camptostemon philippinensis* in Balikpapan Bay, <https://doi.org/10.5281/zenodo.8393832> (Mukhlisi, 2023).

Repositori Ilmiah Nasional (RIN) Dataverse: Data of *Camptostemon philippinensis* in Teluk Balikpapan, <https://hdl.handle.net/20.500.12690/RIN/V8VTQV> (Sitepu *et al.*, 2023).

Data are available under the terms of the [Creative Commons Attribution 4.0 International license](#) (CC-BY 4.0).

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Open Peer Review

Current Peer Review Status:    

Version 3

Reviewer Report 09 May 2025

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Jhonnell P Villegas 

Davao Oriental State University, Mati City, Philippines

The study titled *Camptostemon philippinensis*, a new record of endangered mangrove species in the Balikpapan Bay, East Kalimantan, Indonesia, is generally well-written, and I recommend it for publication as a **Brief Report**. However, I would like to highlight several critical points for the improvement of the manuscript.

1. **Introduction:** The second part of the introduction requires revision. It discusses *C. aruensis*, a synonym of *C. schultzei*, which was not previously introduced, leading to incoherence in the narrative.
2. **Population Estimate:** The author reports documenting 572 individuals of *C. philippinensis*, but the methodology for obtaining this figure is unclear. The manuscript implies an absolute count of 572 individuals, although the actual number could vary. It is essential to include this in the methods section. While the researchers mention a 'census,' there is a need to elaborate on how this was conducted.
3. **Methodology:** The methods section should present the study area first, before all subsections. The term 'preliminary study' could be changed to 'survey' as it discusses the surveys conducted to document the mangrove species. There is also a need to elaborate on the process of identifying seedlings, saplings, and trees. The main identifying characteristics should be presented. Additionally, species identification confirmation by a mangrove taxonomist may be necessary, as this is a claim for a 'new record'.
4. **New Record Clarification:** It is worth noting that Balikpapan Bay has already been mapped in the global distribution range of *C. philippinensis* published in IUCN (Duke et al., 2008). Presenting this as a 'new record' could raise questions about the concept of new species records. It would be more appropriate to report this as the 'first' record in the bay, as this is still an important publication, considering the species is endangered. I request the editorial team to look into this more deeply. If this comment is deemed relevant, I suggest changing the title to "*Camptostemon philippinensis*, the first record of an endangered mangrove species in the Balikpapan Bay, East Kalimantan, Indonesia."
5. **Literature Review:** It is necessary to present existing literature (both gray and published), particularly those that studied mangrove diversity in Balikpapan Bay. This is crucial to demonstrate that extensive surveys have been conducted previously, but only now have the

authors documented *C. philippinensis*.

6. **Discussion:** The discussion section may be enhanced to include information on how this discovery contributes to the global knowledge of the distribution of *C. philippinensis* and how it resonates with the current assessment of the IUCN Red List. Since the latest IUCN Red List assessment for this species was done in 2008, it is critical to briefly discuss how this discovery in the Balikpapan Bay could inform future assessments. The researchers could include recommendations to study the ecological relationships between *C. philippinensis* and *Nasalis larvatus*.
7. **Conclusion:** The conclusion needs enhancement, as it currently only summarizes what has been previously stated in the manuscript. There is a need to expound on the implications of the findings and provide useful recommendations for further research and conservation initiatives.

Is the work clearly and accurately presented and does it cite the current literature?

Yes

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Partly

If applicable, is the statistical analysis and its interpretation appropriate?

Not applicable

Are all the source data underlying the results available to ensure full reproducibility?

No source data required

Are the conclusions drawn adequately supported by the results?

No

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: wildlife ecology, conservation biology, and regenerative futures

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Reviewer Report 08 May 2025

<https://doi.org/10.5256/f1000research.178952.r374527>

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**Rene Rollon**

Institute of Environmental Science and Meteorology, College of Science, University of the Philippines Diliman, Quezon City, Metro Manila, Philippines

I appreciate the authors in addressing each of the general and specific points (mostly as annotations on the earlier version of the manuscript) raised in the previous review. I can now recommend approval of the paper, with the following reservations:

(1) although I still disagree with using the term "new record", perhaps, using "local new record" (as also articulated in the reply) can be allowed. For this, I suggest to include this in the title, or at least, clearly reflected in the Abstract;

(2) on the re-focusing which I suggested earlier, the actions of the authors appeared substantial and can be acceptable;

(3) on Fig. 3, I appreciate the revisions done by the authors, although the "break" on the y-axis which I suggested in my earlier review (see annotation on the manuscript) has not been implemented. I will attach a photo of such a suggestion here, and/or send through email if attachment with this review is not possible.

All the best!

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Aquatic EcosystemsCoastal Marine Biology and EcologyMangrove and Seagrass EcologyCoastal Resources ManagementEnvironmental Impact AssessmentEnvironmental Sciences

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Reviewer Report 22 April 2025

<https://doi.org/10.5256/f1000research.178952.r374875>

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**Rahman Rahman**

Pattimura University, Ambon, Indonesia

This article provides valuable and timely local insight into the presence of a rare and endangered mangrove species, *Camptostemon philippinensis*, in Balikpapan Bay, East Kalimantan. The findings

significantly contribute to the regional understanding of mangrove biodiversity and conservation priorities, especially in the context of growing anthropogenic pressures due to national development projects. The study is methodologically sound and well-documented, and with a few targeted improvements, it has the potential to meet a high scientific standard suitable for indexed.

To strengthen the manuscript further, I recommend the following revisions:

1. Expand the statistical treatment of demographic data:

- Include basic descriptive statistics (e.g., mean, standard deviation, and range) for key variables such as tree height and DBH (diameter at breast height).
- Consider incorporating a simple analysis comparing the observed size-class distribution with expected patterns in naturally regenerating mangrove populations to provide ecological context to the findings.

2. Clarify sampling limitations:

- Discuss the potential implications of the narrow sampling area (limited to approximately 300–500 meters) on the generalizability of the results across Balikpapan Bay.
- Provide a brief justification for the selection of Pantai Lango as the primary study site over other potential locations within the bay.

3. Enhance the vegetation context:

- Include a table or figure that summarizes the associated mangrove species observed alongside *C. philippinensis* in the study area.
- If available, add information on the relative abundance or frequency of these species to enrich the ecological interpretation of the habitat.

By addressing these points, the manuscript will not only provide a clear and reliable record of *C. philippinensis* in a critical region but also offer a more comprehensive ecological narrative that will be valuable for conservation planning and biodiversity management.

Is the work clearly and accurately presented and does it cite the current literature?

Yes

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Yes

If applicable, is the statistical analysis and its interpretation appropriate?

Partly

Are all the source data underlying the results available to ensure full reproducibility?

No source data required

Are the conclusions drawn adequately supported by the results?

Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Mangrove ecology and its biodiversity, mangrove blue carbon management, mangrove conservation.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Reviewer Report 02 April 2025

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Inocencio E Buot 

Institute of Biological Sciences, College of Arts and Sciences, University of the Philippines Los Banos, Laguna, Calabarzon, Philippines

I appreciate the responses of the authors to my comments. Most of these are alright. I have reservations however, of the phrase "Preliminary study" under Methods?

By preliminary, you mean this was done before the actual field measurements described under "Sample Collection"?

Will "preliminary study be the appropriate subsection title?

I will this part to the editor.

All my other comments had been answered well. I am approving this paper now.

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Botany (ecology and systematics)

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Version 2

Reviewer Report 31 May 2024

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Rene Rollon 

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² Institute of Environmental Science and Meteorology, College of Science, University of the Philippines Diliman, Quezon City, Metro Manila, Philippines

This paper reports on the occurrence of mangrove species *Camptostemon philippinensis*, supposedly a new record in Balikpapan Bay, East Kalimantan, Indonesia. The authors found 527 individuals of the species in one location (Pantai Lango), while only one individual in another (i.e., Kowangan Island, some 500 m away from the former). Of these individuals, seedlings comprised >85% (452), with saplings (4.9%; 26) and trees (9.3%; 49) together accounting for less than 15%. Such demographic profile may be indicative of high mortality rate from seedling - (85.8%) to sapling (4.9%) growth stage, and hence, may be an alarm button for further understanding better its population dynamics, hopefully leading to design concrete management actions to conserve this endangered species in the area.

General comments:

Although the paper, as it is now, indeed appears to be relatively well-written, I found several issues that in my opinion should be resolved before the paper may be considered for indexing:

1. **"new record"**: this paper is reporting the occurrence of *Camptostemon philippinensis* in East Kalimantan, which may indeed be a "new record" for the locality, but not really unexpected (and therefore not of news value) considering that Balikpapan Bay (East Kalimantan) is actually part of the published extant range of this species (see Duke *et al.*, 2010). What would be more interesting to report as "new records" are those occurrences outside the published range. Otherwise, finding 1,000 local "new records" within the known range of the species would result in 1,000 "new record" publications on the species?

In fact, the occurrence of this species far more south of East Kalimantan coast has already been reported (i.e., Pulau Laut; Walkes 1962 based on herbarium specimens collected more than a century ago [1919]) and as also reflected in Fig. 1 (top chart) of this manuscript. Because Balikpapan Bay is located between Pulau Laut and Berau (where occurrence of this species has also been recorded), and also because this bay is located close to the west coast of Sulawesi where this species is also present (Fig. 1, top panel), it should not be surprising to find pocket stands (e.g., Balikpapan Bay) of this species within the range previously established. In my opinion, this finding is not unexpected, and therefore of little news value to readers.

2. **Re-focus**: I would rather like to suggest to re-focus the manuscript from its current "new record" narrative into something like demographic profile of *Camptostemon philippinensis* near its southeastern global distribution limit. For such a reorientation, Fig. 3 would be a critical part of this new narrative. I have scribbled (annotated) as to how this figure could be made more intuitive, but perhaps a lot more information may be needed. For instance, more comparative approaches (e.g., Balikpapan vs. Berau vs. Sulawesi) and then use

statistical tests for these comparisons rather than completely absent as it is now.

3. **Figure 3:** This figure may be improved immensely. Chart A can be interesting, but as it is now, it does not appear intuitive. The Chart is actually showing size-frequency distribution of the species which theoretically, should follow an exponential decay curve. I tried to combine your values (see annotations) and indeed, the Chart can look better, approximating more closely the natural (expected) trend. Chart B as it is now is not really relevant in the “narrative” and may be deleted.

Specific comments:

I also have several specific comments as annotations on the manuscript - please see the PDF file linked [here](#).

All the best!

Is the work clearly and accurately presented and does it cite the current literature?

Yes

Is the study design appropriate and is the work technically sound?

Partly

Are sufficient details of methods and analysis provided to allow replication by others?

Yes

If applicable, is the statistical analysis and its interpretation appropriate?

Not applicable

Are all the source data underlying the results available to ensure full reproducibility?

No source data required

Are the conclusions drawn adequately supported by the results?

Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: aquatic ecosystems; coastal marine biology and ecology; mangrove- and seagrass ecology; coastal resource management; environmental impact assessment; environmental sciences

I confirm that I have read this submission and believe that I have an appropriate level of expertise to state that I do not consider it to be of an acceptable scientific standard, for reasons outlined above.

Author Response 04 Mar 2025

Abdul Razaq Chasani

We appreciate your willingness to review the publication and provide valuable advice and we accept the inputs with some improvement in the paper

Respond to general review points 1-3.

1. We agree that this publication uses the term "**new record**" for the local new record; however, we will maintain the term to emphasize that this is the first time *C. philiphinensis* scientifically reported from Balikpapan Bay, when previous studies in a similar area have not recorded this species (Warsidi & Endayani, 2017, Kristiningrum et al., 2019; Sayektiningsih et al., 2012, 2020; Toulec et al., 2022; Willard et al., 2022). It should be noted that Balikpapan Bay is a very large mangrove ecosystem reaching 168 km² that is facing the threat of ecosystem change due to the construction of Indonesia's new capital city. The term is also used to attract stakeholders and or policymakers to pay attention to and maintain the existence of this population and their habitat. In this publication, we also add suggestions regarding conservation strategies for this species.
2. We accept reviewer feedback by making changes on demographic aspects.
3. We improve figure 3 and add an explanation for it based on reviewer recommendations. We removed Fig. 3. B. and revised the DBH categories into 4 groups (<5 cm; 5-15; 15-25 and >25)

Detail of response from the reviewer comment attached in the PDF linked [here](#). Thank you for your comment and review, we improved the article based on the reviewer comments.

Competing Interests: No competing interests were disclosed.

Competing Interests: No competing interests were disclosed.

Reviewer Report 23 February 2024

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I am approving the latest revision of the manuscript.

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Botany (ecology and systematics)

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Reader Comment 03 Apr 2025

John Paul Pacyao

Approved

Competing Interests: No competing interests were disclosed.

Version 1

Reviewer Report 10 November 2023

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Inocencio E Buot

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General comments

1. The paper is very well written actually.
2. This is a good report as new occurrence record, but I am suggesting some more information if possible.
3. The first paragraph under methods should have a subsection title since all the rest that follows have. Would that be reconnaissance perhaps?
4. I think Study Area should come first as a subsection under Methods so that the authors can discuss why focus in that mangrove forest when there are so many in Indonesia? This discussion is lacking under Study Area. Were there clues or hints that they could spot the species in the area? Were the first herbarium documentations playing a key role in leading them to the area of investigation?
5. The herbarium specimens used for biogeographic studies were not tabulated with details of

the exsiccata. I would suggest having that to add veracity of the information. And even all the vouchers examined and mentioned in the results and discussions.

6. There was no statement in the method on the use of drone to start of the reconnaissance survey. That could have been resorted to first, before ground truthing and spotting the tree using a boat. But so long as there was a thorough ground truthing anyway, that would be fine.
7. In the results, I expect the details of the exsiccata of the herbarium vouchers collected by the authors from the study area and deposited at Herbarium Wanariset (WAN) and Herbarium Bogoriense (BO). If voucher photographs are available, it would be great to see one here in this paper. And of course, photos of the plant are wanting with details of the different organs preferably with measurements, so that readers would not have reservations of its identity.
8. Fig 1 seems to include only field data? Would you not consider including here the distribution record of the species as documented in the herbarium collections in the past as mentioned in the discussion portion of the paper?
9. In the discussion, there was no mention of the currently gathered data except for the reference to Fig. 5. Hence, it would appear a review paper since the data collected were not cited well.

I commend the authors for doing this study and writing the paper. I hope to see this revised and published soon.

Is the work clearly and accurately presented and does it cite the current literature?

Yes

Is the study design appropriate and is the work technically sound?

Yes

Are sufficient details of methods and analysis provided to allow replication by others?

Partly

If applicable, is the statistical analysis and its interpretation appropriate?

No

Are all the source data underlying the results available to ensure full reproducibility?

Partly

Are the conclusions drawn adequately supported by the results?

Yes

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Botany (ecology and systematics)

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 04 Dec 2023

Abdul Razaq Chasani

1. Thank you for providing a review and comments on this paper.
2. We added more information as suggested.
3. A subsection title (preliminary survey) was added under the methods title.
4. The Study Area subsection moved to the first subsection, followed by the Preliminary Survey subsection.
The study area selection has been discussed in the methods and discussion section. The study area is an essential ecosystem located in an area that could be affected by the development of Indonesia's new capital city, so the general mangrove survey is important. A single *Campostemon philippinensis* tree was spotted during the preliminary survey, collected as an herbarium, and confirmed as *C. philippinensis*. A second survey was then conducted to find other *C. philippinensis* trees in the nearby area.
5. We added the exsiccate and the figure of the herbarium. We also added a map and a table to list the herbarium collection from Indonesia.
6. We did not use a drone for the survey; all of the surveys were conducted on a boat, traveling from upstream to downstream and back.
7. We added the figures of the herbarium deposited in BO and provided the figures of the flower (Fig. 4b) and fruit (Fig. 4c).
8. We have revised Figure 1 and added the distribution record of the species. *Campostemon philippinensis*
9. The present study has described the data collection in paragraphs 2 and 3.
10. We have revised our manuscript and provided more information as reviewer suggestions.

Competing Interests: No competing interests are disclosed

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