

EXTENDED DISTRIBUTION OF TWO WOODPECKER SPECIES (*Micropternus brachyurus* and *Picus vittatus*) IN MERU BETIRI NATIONAL PARK, EAST JAVA, INDONESIA

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ABSTRACT

This study discovered extended distribution of two woodpeckers, i.e., the Rufous Woodpecker (*Micropternus brachyurus*) and the Laced Woodpecker (*Picus vittatus*) in Meru Betiri National Park, East Java. The records of *M. brachyurus* were observed three times in Bandalit Resort (9 December 2021, 12 February 2022, and 20 April 2022) and once in Baban Resort on 9 September 2023. These record areas were around the first record area in secondary forest and the edge of plantations (*Albizia*, *Cocos*, and *Ochroma*) that also bordered the Bandalit road. The second record found a single individual foraging in *Mangifera indica*. The record of *P. vittatus* was observed once at Bandalit Resort on 11 February 2024. This species perched on *Cocos nucifera*, *Mangifera indica*, and *Tectona grandis*. Referring to altitude distribution, *P. vittatus* was only recorded at an altitude of 78 m asl., while *M. brachyurus* was more variable in the range of 79–651 m asl. These findings provide an essential update for the bird checklist in Meru Betiri National Park, particularly in the last 10 years ago.

Key words: Meru Betiri National Park, *Micropternus brachyurus*, new records, *Picus vittatus*

INTRODUCTION

Meru Betiri National Park (MBNP) is a conservation area that provides essential habitat for bird communities in the East Java region. There are 214 bird species occupied in several ecosystem types, such as lowland forest, coastal forest, mangrove forest, and plantation, inside this conservation area (Kurnianto et al., 2014). Updating data of bird species in MBNP is also periodically reported in several resorts, including Rajegwesi, Andongrejo, Sanenrejo, Wonoasri (Kurnianto et al., 2022; Sulistiyowati et al., 2023), Sukamade (Dewi & Kurnianto, 2021), and Bandalit (Siddiq et al., 2023b). Furthermore, Kurnianto et al. (2016) reported a new record of white-rumped woodpecker (*Meiglyptes tristis*) in MBNP, which was previously not included in the bird checklist in this area. This species was recorded seven times in several tree vegetation types at MBNP, i.e., coconut, mango, mangrove, rubber, albizia, and jackfruit (Kurnianto et al., 2023). Therefore, there is a probability that other bird species will be discovered in MBNP. As in this study, the existence of two woodpecker species (Picidae), i.e., the Rufous Woodpecker (*Micropternus brachyurus*) and Laced Woodpecker (*Picus vittatus*) was recorded.

The Rufous Woodpecker (*Micropternus brachyurus* (Vieillot, 1818)) is a bird native to South, East, and Southeast Asia. It has a medium-sized body (25 cm), and all its feathers are reddish-brown in color (Taufiqurrahman et al., 2022). This bird is widely distributed in India, Bangladesh, Bhutan, China, Nepal, Sri Lanka, Myanmar, Cambodia, Lao People's Democratic Republic, Thailand, Vietnam, Singapore, Malaysia, and Indonesia (Birdlife International, 2024). In the Greater Sundas, *M. brachyurus* is commonly found in Sumatra and Kalimantan up to 1500 m asl.; however, it is also rarely found in Java and restricted to the West to Central region (Taufiqurrahman et al., 2022). According to previous bird reports at several conservation areas in the East Java region, such as Alas Purwo National Park (Grantham, 2000), Baluran National Park (Winnasis et al., 2011), Meru Betiri National Park (Kurnianto et al., 2014), Bromo Tengger Semeru National Park (Prasetya & Siswoyo, 2017), and Ijen Reserve (Mittermeier et al., 2014; Siddiq et al., 2023a), the species *M. brachyurus* was not reported.

Laced Woodpecker (*Picus vittatus* (Vieillot, 1818)) is a bird that has been previously reported in the East Java region, such as in Alas Purwo National Park (Grantham, 2000) and Baluran National Park (Winnasis et al., 2011). This species has a green color and a medium-sized body (30 cm) (Taufiqurrahman et al., 2022). This species inhabits evergreen forests, monsoon forests, mangrove forests, secondary forests, plantations, and urban parklands (Landy, 2021; Taufiqurrahman et al., 2022). Globally, *P. vittatus* distributes in China and Southeast Asia, which includes Cambodia, the Lao People's Democratic Republic, Myanmar, Singapore, Thailand, Vietnam, Indonesia, and Malaysia (Birdlife International, 2024). In Indonesia, particularly the Greater Sundas, *P. vittatus* is found in Sumatra, Java, Bali, and Kangean Island (MacKinnon et al., 2010; Taufiqurrahman et al., 2022). However, it is more common on Bali Island up to altitudes of <1000 m asl. (Taufiqurrahman et al., 2022).

This report provides updated information on bird species richness in MBNP, especially the addition of these two species. It also provides preliminary information on the distribution of *M. brachyurus* and *P. vittatus* according to vegetation types and altitude.

MATERIALS AND METHODS

This study was conducted in MBNP, which is administratively located in Jember and Banyuwangi regency. Geographically, MBNP is located on the east-south side of the East Java region (8°20'-33'S, 113°38-58'E). This area covers 52,626.04 ha and consists of 10 resorts, including Wonoasri, Andongrejo, Sanenrejo, Bandalit, Baban, Malangsari, Sumberpacet, Karangtambak, Rajegwesi, and Sukamade (Fig. 1). However, within MBNP, there are also two plantations, PT Bandalit and PT Sukamade, which covers an area of around 2,155 ha. There are several ecosystem types, including coastal forest, estuarine, tropical lowland forest, mangrove forest, and rheophytes (Syarif et al., 2018).

The observation was conducted during 2021–2024 using opportunistic observation through two activities, such as monitoring MBNP staff and birdwatching activities. Monitoring was conducted in December 2021 in Bandealit and September 2023 in Baban by Puji Firmansyah (PF), while birdwatching activities were conducted in February–April 2022 and February 2024 by Arif Mohammad Siddiq (AMS) and Muhammad Kurniawan (MK). Data were recorded in the morning (06.00–09.00 AM) and afternoon (11.00 AM–14.00 PM). Birds were documented using a Canon EOS 60D DSLR camera, a telephoto lens 75–300 mm, a Canon PowerShot SX540 HS DSLR camera, and a Nikon P900 camera.

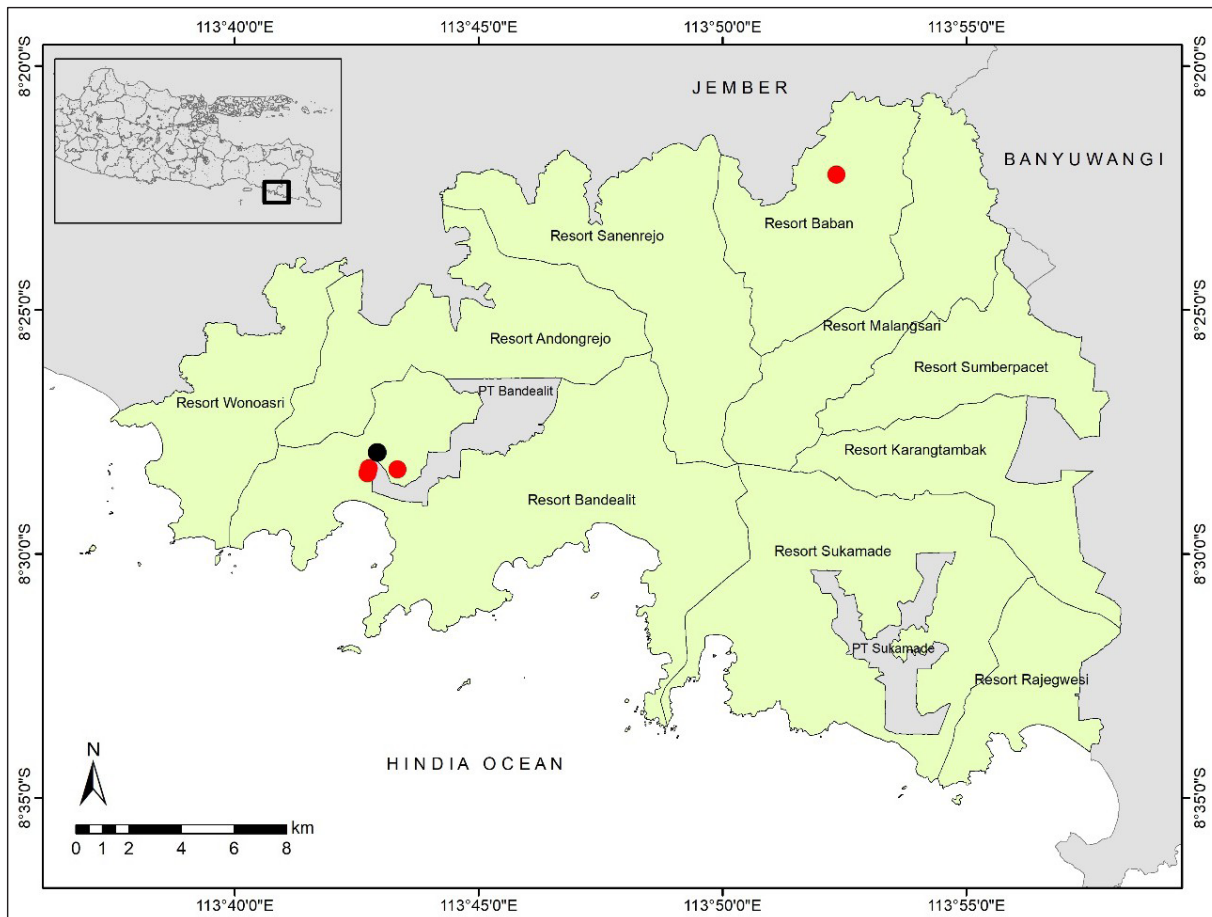


Figure 1. A map of Meru Betiri National Park. Red dots are occurrences of rufous woodpeckers. Black dot is occurrence of laced woodpecker.

Identification and verification processes used morphological characteristics on bird documentation, including body size and color, belly color, back and rump color, beak shape and color, feet color, and other important characteristics. We used the Guideline Book of Birds in Sunda Besar (Sumatra, Java, Kalimantan, and Bali) for this identification (Taufiqurrahman et al., 2022). The occurrence of *M. brachyurus* and *P. vittatus*, including coordinates and altitude, was recorded using the Global Positioning System (GPS) Garmin 64s. Furthermore, these data were used to analyze the altitudinal distribution map of both species in MBNP using ArcGIS 10.7.1.

RESULTS

Based on this study, two woodpecker species (*M. brachyurus* and *P. vittatus*) were encountered at Meru Betiri National Park. There are four confirmed records of *M. brachyurus* in MBNP consist of three sightings in Bandalit Resort and one sighting in Baban Resort (Table 1). Both resorts are approximately 25 km apart and bordered by primary forest and hills. In Bandalit, *M. brachyurus* was first discovered on 9 December 2021 by PF in the secondary forest near settlements and plantations. This species was found in pairs with perching activity in *Ficus septica* (Fig. 2). Further observation, *M. brachyurus* was also observed foraging on *Mangifera indica* (on 12 February 2022), *Albizia chinensis*, and *Cocos nucifera* trees (on 20 April 2022) in Bandalit by pecking its beak several times on the trunk surface of each tree.

These individuals have a medium body size with a dark red-brown color. There are black stripes on the wings, and the upper part slightly widens toward the lower part. Other observed characteristics include a black and short beak, gray eye ring and reddish iris, and gray-brown feet (Fig. 2).

Table 1. Records of Rufous Woodpeckers from Meru Betiri National Park, East Java

Species	Date	Resort	Habitat	Tree Species	Behavior	Σ Ind
<i>M. brachyurus</i>	9 December 2021	Bandalit	Secondary Forest	<i>Ficus septica</i>	Perching	2
	12 February 2022	Bandalit	Secondary Forest	<i>Mangifera indica</i>	Foraging	1
	20 April 2022	Bandalit	Plantation	<i>Albizia chinensis</i> , <i>Cocos nucifera</i>	Foraging	1
	9 September 2023	Baban	Natural Forest	Unidentified	Perching	1
<i>P. vittatus</i>	11 February 2024	Bandalit	Secondary Forest	<i>Cocos nucifera</i> , <i>Mangifera indica</i> , <i>Tectona grandis</i>	Perching, Foraging, calling	2

The second and third records were also found in Bandalit on 12 February 2022 by AMS and 20 April 2022 by MK. These record areas were around the first record area in secondary forest and the edge of plantations (*Albizia*, *Cocos*, and *Ochroma*) that also bordered the Bandalit road. The second record found a single individual foraging in *Mangifera indica*. The third record was also a single individual foraging in *Albizia chinensis*. The distance between the two record areas was relatively close, around 200 m. The canopy cover of these record areas was relatively non-dense. Furthermore, the fourth record was found in Baban on 9 September 2023 by PF. A single individual was observed perching in tree vegetation in a natural forest. This area is slightly far away from plantations and settlements. Therefore, there are differences in habitat characteristics compared with Bandalit. In addition, canopy vegetation in Baban tends to be dense with high tree species richness.



Figure 2. Rufous Woodpeckers in Bandalit perched on *Ficus septica* (A) and *Cocos nucifera* (B).

Furthermore, *P. vittatus* was recorded on February 11, 2024, by AMS in the secondary forest of Bandalit Resort. This species was found in pairs with perching, foraging, and calling activities. Three types of trees were used for activities, i.e., *Cocos nucifera*, *Mangifera indica*, and *Tectona grandis*. The recorded characteristics of *P. vittatus* include medium body size and dominant green body color. In detail, the color of the back is green, the stump is yellow, and the chest is dark yellow with a distinctive motif of thick green lines on the sides of the dark feathers. The eye and malar strip are black, the cheeks bluish, the beak is black, and the legs greenish. For distinction, the crown color of the male is red, while the female is black (Fig. 3).

Species *P. vittatus* was only recorded at an altitude of 78 m asl., while *M. brachyurus* was more variable in the range of 79–651 m asl. (Fig. 4). Intensive observations at MBNP are needed to better understand the local distribution of these two species. This altitude is also thought to affect the existence of food sources for these two species, such as several insect species in the trees, or is also related to trees used as nests. However, further research needs to be done regarding the correlation between the distribution of these two species and altitude.



Figure 3. Laced Woodpecker in Bandealit perched on *C. nucifera*: male (A) and female (B).

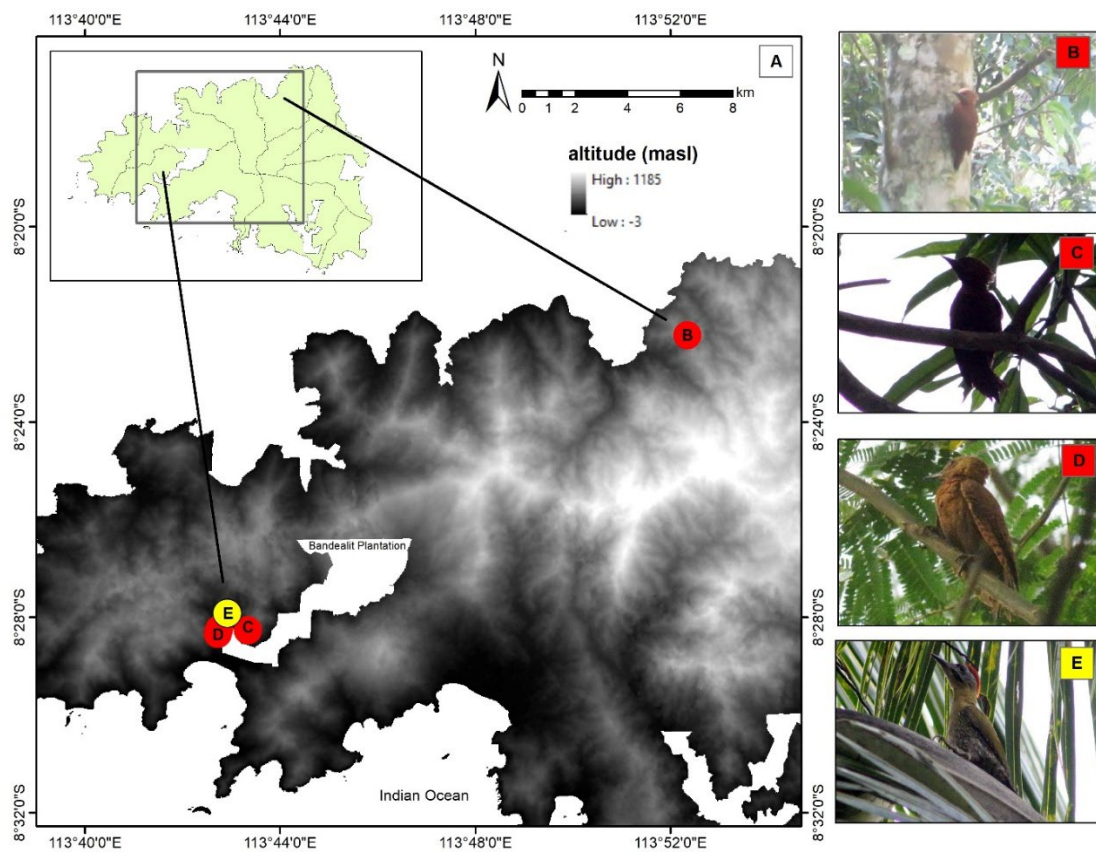


Figure 4. Records of *M. brachyurus* and *P. vittatus* in MBNP, based on altitude (A), *M. brachyurus* at natural forest of Baban Resort (B), secondary forest of Bandealit Resort (C), and plantations of Bandealit Resort (D), *P. vittatus* at secondary forest of Bandealit Resort (E).

DISCUSSION

The presence of these woodpeckers in the MBNP reveals that this conservation area still provides essential habitat for these species. Species *M. brachyurus* was recorded four times in Bandalit and Baban resorts with specific morphological characteristics (Fig. 5). This species was verified as *M. brachyurus* due to its typical morphology: medium body size, dark red-brown color, black stripes on the wings, and a short beak with black color. These characteristics distinguish it markedly from the other woodpecker species that were also found in Bandalit, the checker-throated woodpecker (*Chrysophlegma mentale*) (Kurnianto et al., 2014). This species has distinctive morphological characteristics compared to *M. brachyurus*, which are its larger body size with green color and red on the wings. Taufiqurrahman et al. (2022) also revealed that *C. mentale* has a typical brown crest and thick beak (Fig. 5. A & B).

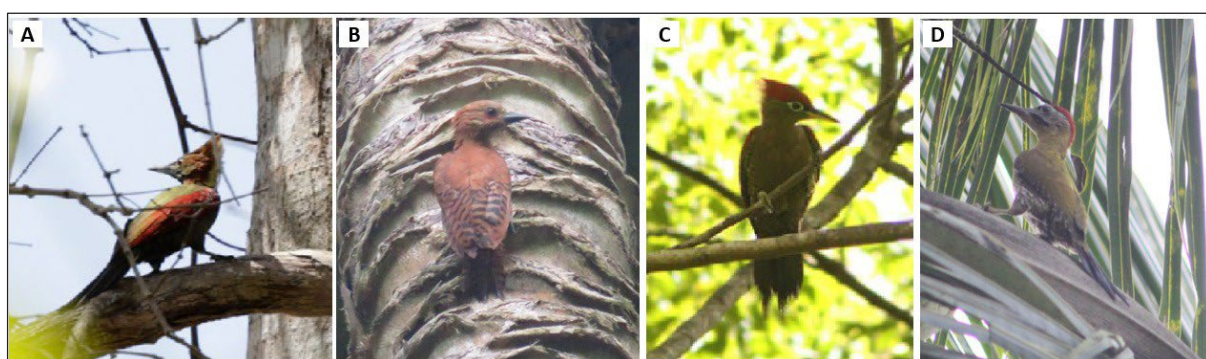


Figure 5. Comparison of documentation records of woodpeckers in the MBNP: *Chrysophlegma mentale* (A), *Micropternus brachyurus* (B), *Picus puniceus* (C), and *Picus vittatus*. Reference photos of A and C: Kurnianto et al., (2014).

The rufous woodpeckers were recorded in the Bandalit and Baban, which indicates that this species is a resident in of the area. The habitat types occupied by *M. brachyurus* in MBNP, i.e., natural forest, secondary forest, and plantations, presume that it prefers open habitat characteristics. In the case of Bandalit, this species was actually found in habitats close to settlements. Taufiqurrahman et al. (2022) also revealed that *M. brachyurus* in the Greater Sunda region prefers open forests, secondary forests, forest edges, and plantations. Globally, this species is also found in wetlands habitats, including bogs, marshes, swamps, fens, and peatlands (Birdlife International, 2016). The presence of *M. brachyurus* in these habitat types is thought to be foraging areas, socialization areas, or nesting areas. Several types of insects from the genus *Crematogaster*, *Pheidole*, *Oecophylla*, and Isoptera groups are the main food of this species (Taufiqurrahman et al., 2022; Gunasekara et al., 2023).

Picus vittatus is also verified by typical characteristics including medium body size, dominant green body color, black eyes, and malar strip. Compared to its sister species, the crimson-winged woodpecker (*P. puniceus*) that was also recorded in Bandalit (Kurnianto et al., 2014), it has distinctive morphological features. Species *P. puniceus* has green and red color in the body, and adults have a red crest with yellow on the tip (Fig. 5. C & D). Furthermore, in body size comparison between these species, *P. puniceus* is smaller (25 cm) than *P. vittatus* (30 cm) (Taufiqurrahman et al., 2022).

Species *P. vittatus* is also certainly a resident bird in MBNP. Its presence in the Bandalit ecosystem, which has mixed forests including primary, secondary, and plantations, is a habitat congruence for this species. Birdlife International (2024) revealed that this species in Indonesia is a native species that inhabits secondary forests, coastal forests, plantations, rural gardens, and urban areas. The Bandalit area has a natural ecosystem consisting of primary, secondary, and coastal forests and it borders a plantation area, so it is possible to be a foraging area for this species. However, further research is needed to prove this assumption. Furthermore, this species is also relatively rare, as found in Alas Purwo National Park in the rare category (Grantham 2000). On the other hand, both species have a declining population trend in nature, according to the International Union for Conservation of Nature's (IUCN) Red List. Birdlife International (2024) states that habitat loss is the main factor in the population decline of these two woodpecker species. Moreover, illegal trade is also a potential threat to woodpecker populations in the wild. According to Chng et al. (2018), *M. brachyurus* was listed at a trade bird market in Jambi, Sumatra. On the other hand, *P. vittatus* was not reported across bird markets in Indonesia.

The existence of both species is crucial in the ecosystem, hence their pivotal role as consumers in the trophic levels. Picidae groups eat insects and other arthropods as their primary food (Taufiqurrahman et al., 2022). According to additional records of this result, currently, there are 12 Picidae species, consisting of 10 woodpecker species (*Dryocopus javensis*, *Mulleripicus pulverulentus*, *Picoides moluccensis*, *Dendrocopos analis*, *Hemicircus concretus*, *Meiglyptes tristis*, *C. mentale*, *P. puniceus*, *P. vittatus*, *M. brachyurus*) and two flameback species (*Dinopium javanense*, *Chrysocolaptes strictus*) in Meru Betiri National Park. Each species distributes in various habitats at several resorts, including Bandalit, Sukamade, and Sumberpacet; particularly *D. analis* was reported in all resorts at Meru Betiri National Park (Kurnianto et al., 2014). Thus, this result contributed to the additional information of the new extended distribution of *M. brachyurus* and *P. vittatus* in the East Java Region, especially in the MBNP. Both records of *M. brachyurus* and *P. vittatus* in Bandalit and Baban Resort revealed that birds in MBNP are increasing to 217 species, compared to 215 species in the previous report (Kurnianto et al., 2014; Kurnianto et al., 2016).

This information is certainly essential for MBNP managers, and contributes to the updating bird diversity in the MBNP area. Furthermore, it is also possible that there will be other records of several bird species that were not previously recorded in this conservation area. Therefore, monitoring activities by MBNP staff and birdwatching activities by researchers or birdwatchers need to be carried out periodically, especially in several potential habitats. Based on the previous studies, several areas in MBNP have never been explored, such as Malangsari, Sumberpacet, Karangtambak, and other resort areas with difficult access. Thus, each prospect area needs to be investigated.

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