

1 **Unveiling Jharkhand's Nocturnal Avifauna: First Record of**
2 **Jerdon's Nightjar(*Caprimulgus atripennis*) From Jharkhand**
3 **with Spatial Acoustic Evidence from Dalma Wildlife**
4 **Sanctuary.**

5 **ABSTRACT**

6 The Jerdon's Nightjar (*Caprimulgus atripennis*) is a nocturnal aerial entomophagous that
7 is a widespread bird across peninsular India but it remains insufficiently documented in
8 the plateau of eastern India. This study substantiates its existence in Dalma Wildlife
9 sanctuary as a habitat indicator and trophic regulator. In this study, field surveys using
10 paired autonomous sound recordings (combined nocturnal acoustic monitoring) and
11 opportunistic visual encounters which were conducted across these heterogeneous
12 habitats. The findings of this study emphasize the necessity of integrating nocturnal bird
13 species into standardized biodiversity assessment frameworks. When we specifically
14 highlight the value of this bird's occurrence in Dalma wildlife sanctuary we should first
15 mention about its previously documented habitats, first time discovery and original
16 locality. The species was first time described by the surgeon-naturalist Thomas C. Jerdon
17 in his work, *Illustration of Indian ornithology*. Jerdon identified the type locality as the
18 "Ghauts," which is later interpreted as the Eastern ghats (west of Nellore). As a nocturnal
19 insectivore it also does the work of a "guardian of the night" by controlling populations
20 of various insects such as moths, beetles, and other flying insects. Recent sightings in
21 areas like the coastal plains of Tamil Nadu and West Bengal suggest that it may be
22 expanding its range and these are holding true as we have sighted this nocturnal gem in
23 Dalma wildlife sanctuary and these monitoring frameworks are becoming more effective
24 for detecting elusive nocturnal species.

25 **Keywords-** Dalma Wildlife Sanctuary, Cryptic plumage, Acoustics, Nocturnal

26 **INTRODUCTION**

27 Nocturnal birds are poorly documented in ecological studies despite their huge significant
28 roles in the ecosystem functioning and maintenance. Nightjars are nocturnal birds which
29 are cryptic in nature and belonging to the family Caprimulgidae. They are found across
30 the world except Antarctica and are well known for their masters-level of eerie and
31 camouflage and repetitive sounds/calls that often give them their common names.
32 Nightjar's vocalizations are majorly mechanical and repetitive which is ranging from
33 whistling to knocking sounds. There are several species of nightjar have been well
34 documented are Indian Nightjar, European Nightjar, Large-tailed Nightjar, Whip-poor-

35 will/Poorwill and the Savana Nightjar. The Jerdon's Nightjar (*Caprimulgus atripennis*) is
36 discovered by Thomas C. Jerdon hence the name. These nocturnal nightjars are
37 distributed across dry and semi-arid regions of India but is insufficiently documented in
38 eastern India. It is a medium sized bird approximately 26cm in length. It has a large head
39 and a bright white throat, and have a buff and brown consisting plumage. Males show
40 prominent white patches near the wingtips and on the tail edges, but in females these
41 patches are buffy brown. These special surveys results highlighted a strong preference for
42 the location of the species in open-canopy zones with a sparse-understory vegetation
43 which is indicating a strongly associated and structurally complex habitats. The findings
44 of this survey highlight its role as an effective natural insect predator with sensitivity to
45 habitat disturbance, and its value as a bioindicator of ecosystem health. This species
46 serves as a critical ecological sentinel for monitoring environmental integrity. The most
47 distinctive feature is its call – a repetitive, liquid “ch-woo-woo” or bubbling “bwr-wr-wr”
48 that sounds like a wooden plank being beaten. If we compare it with other Nightjars, it is
49 larger than the Indian Nightjar and it has less-streaked crown and smaller wing patches
50 than large-tailed nightjar. They do not build nests. Instead, two marbled eggs are directly
51 on bare ground and the brooding bird's plumage provides protection. This species is well
52 known for its incredible camouflage, often resting silently on the ground during the day
53 and blending perfectly with the soil and leaf litter. Dalma Wildlife Sanctuary provides a
54 mosaic of habitats that is ideal for studying this bird. This study aims to document
55 occurrence, analyze habitat association, and evaluate ecological significance.

56

57

58 Classification

59 •**Kingdom:** Animalia

60 •**Phylum:** Chordata

61 •**Class:** Aves

62 •**Order:** Caprimulgiformes

63 •**Family:** Caprimulgidae

64 •**Genus:** *Caprimulgus*

65 •**Species:** *C. atripennis*

66

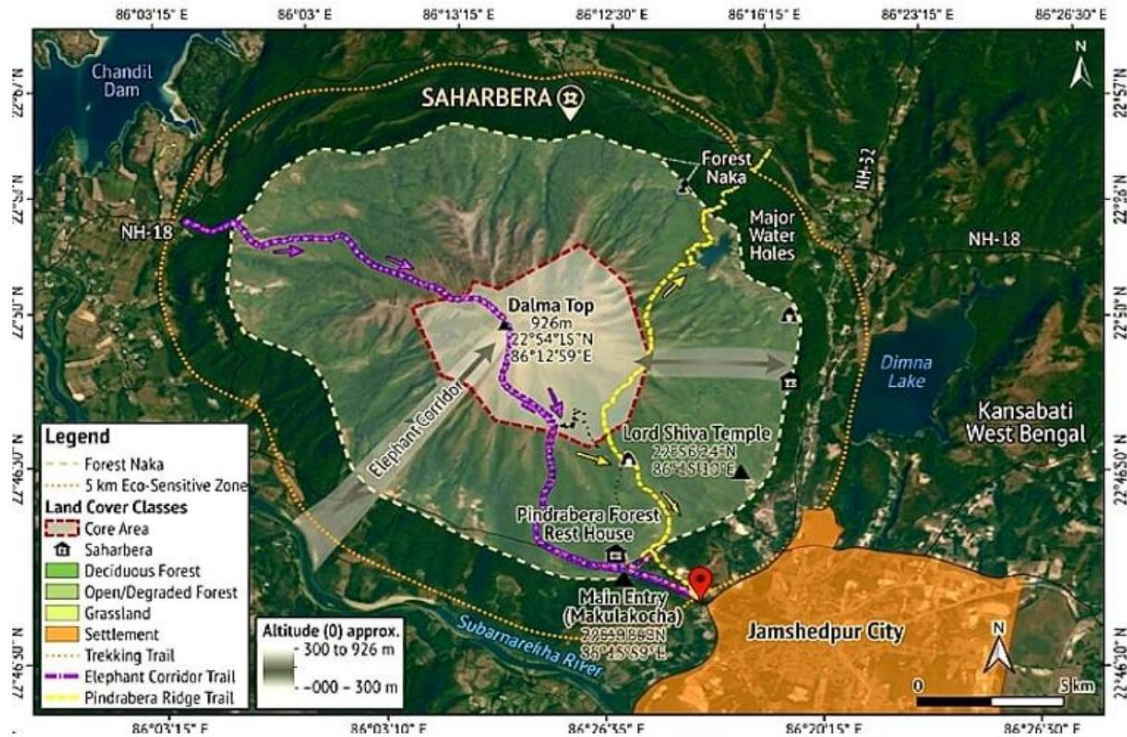
67 Study Area

68 The study was conducted in the vicinity of Dalma wildlife sanctuary, near Jamshedpur, in
69 East Singhbhum district of Jharkhand, in approximately in aradius of 926m which comes
70 under the location of 22°54'LS'N and 86°12'S9'E covering the top and shiva temple
71 area of Dalma wildlife sanctuary. The landscape is marked by mosaics of habitat. The
72 elephant corridor also comes under this habitat. Area of finding Jerdon's Nightjar is
73 Makulakocha and Kadamjhor the call intensity is very high in these reasons when we
74 move in a 500×500 m grid the call intensity is medium to low. Red patches in the map
75 (map no-3) is showing high intensity call and yellow is for moderate intensity and green
76 showing lowest call intensity. The dense habitat matrix provided ambient camouflage and
77 resting ground for the Jerdon's Nightjar, therefore enhancing the ecological relevance of
78 the site for documenting rare or range-edge species occurrences.



79

80 **Image 1**-Map of India showing the location of Jharkhand and Dalma hills(courtesy:
81 *Thakur et al.,2025*).



82

83 **Image 2-** Map of Dalma wildlife sanctuary shows range of study (courtesy: *Thakur et*
 84 *al.,2025*).

85

86

87

88 **Image 3-** Map of special acoustic activity of Jerdon's Nightjar in Dalma wildlife
 89 sanctuary

90 **MATERIALS AND METHODS**

91 Study Area: Dalma Wildlife Sanctuary (Jharkhand, India) with dry deciduous forests and
 92 scrubland.

93 *Survey Methods:*The nocturnal acoustic method is a field technique which is used to
 94 identify and monitor nocturnal birds at night by listening to their vocalizations instead of
 95 relying on visual observation. Visual encounter surveys using spotlighting-The visual
 96 encounter spotlighting method is a type of survey technique used to observe and identify
 97 animals, especially nocturnal species, by using a strong light source for example torch
 98 during night-time fieldwork. In this method, researchers move through a study area on
 99 foot or by vehicle and scan the surroundings using a spotlight or torch. The light reflects

100 off the eyes of animals (a phenomenon called eyeshine), making them easier to detect in
101 darkness. Habitat parameter recording (canopy, ground cover,
102 disturbance)Analysis:Habitat preference and ecological roles were assessed qualitatively
103 using field data and literature. Acoustic behavior was also studied



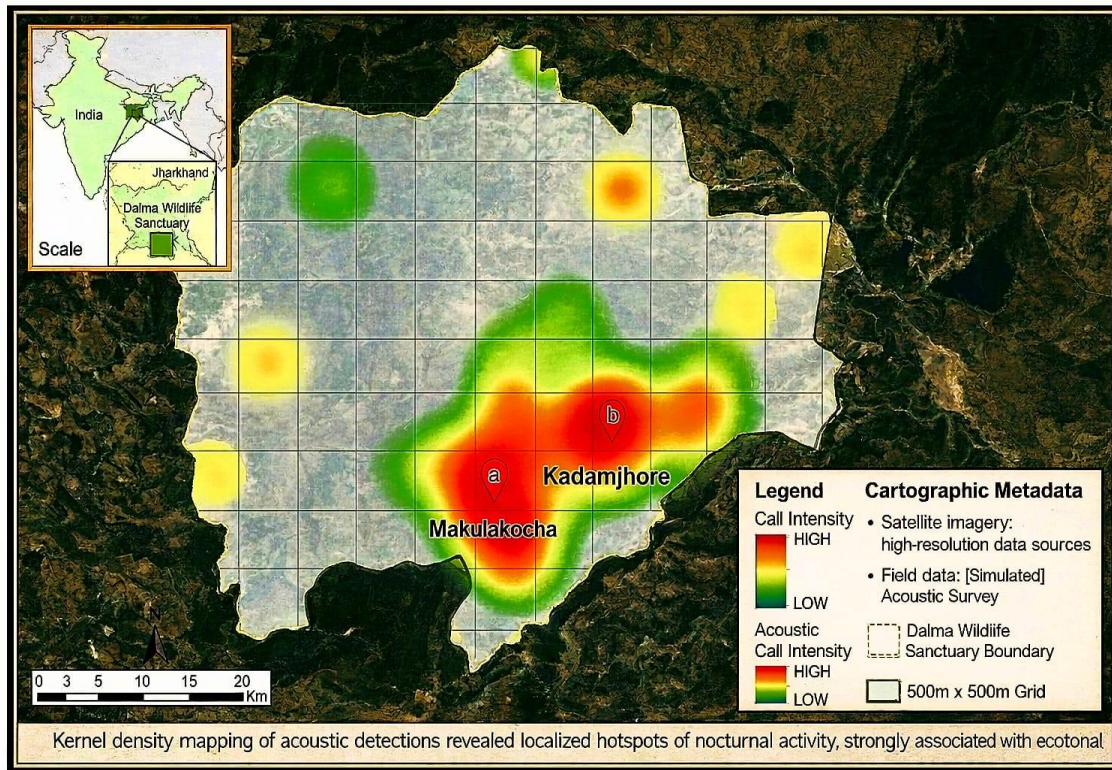
104

105 **Image3-** Jerdon's Nightjar (*C. atripennis*) clicked during field visit

106 SPATIAL ACOUSTIC DISTRIBUTION OF JERDON'S NIGHTJAR ACTIVITY

107 This spatial acoustic survey of Jerdon's Nightjar (*Caprimulgus atripennis*) within the
108 Dalma Wildlife Sanctuary highlights a highly concentrated activity corridor along the
109 southern ecotonal regions where two kinds of habitats meet. Kernel density estimation
110 (KDE) identified two primary high-intensity hotspots which are designated as Site A and
111 Site B these correspond directly to the Makulakocha and Kadamjhore regions. These
112 zones represent the highest frequency of nocturnal vocalizations and these zones are
113 situated within the lower-altitude valley floors and dense buffer vegetation. While
114 secondary moderate and low-intensity signals (yellow and green zones) were recorded
115 sporadically across the interior sanctuary plateau, the significant clustering near
116 Kadamjhore suggests that habitat preference in this landscape is strongly dictated by the
117 specific topographical and microclimatic conditions found at the sanctuary's southern
118 foothills.

Spatial Acoustic Activity of Jerdon's Nightjar in Dalma Wildlife Sanctuary



119

120 **Image 4-** Map of special acoustic activity of Jerdon's Nightjar in Dalma wildlife
121 sanctuary

122

123

124 ECOLOGICAL SIGNIFICANCE

125 Jerdon's Nightjar (*Caprimulgus atripennis*) is an ecologically very important nocturnal
126 bird species which is associated with the open woodlands, scrub forests, and dry
127 deciduous habitats such as those found in Dalma Wildlife Sanctuary. The sanctuary is
128 dominated by Sal (*Shorea robusta*) forests and it is rich in insect diversity which provides
129 suitable habitat conditions for this species (Grimmett *et al.*, 2011). Jerdon's Nightjar
130 plays a very significant ecological role as an insectivore which is feeding primarily on
131 nocturnal insects like moths and beetles and thereby helping in regulate insect
132 populations and maintain ecological balance (Ali & Ripley, 1983). It also shows strong
133 ecological association with ground-level habitats where this bird rests and breeds and
134 relying on camouflage to blend with leaf litter and dry soil which is reflecting its
135 adaptation to forest floor environments (Cleere, 1998). In Dalma Wildlife Sanctuary the
136 availability of diverse vegetation along with undisturbed habitats and abundant prey
137 supports its survival and distribution and making it an integral component of the local

138 food web and avifaunal diversity (Champion & Seth, 1968). Thus, the presence of
139 Jerdon's Nightjar indicates a stable and healthy ecosystem with adequate prey availability
140 and minimal disturbance. Ecologically like the Indian Courser the Jerdon's Nightjar also
141 plays a pivotal role as a predator of insects within food webs, contributing to top-down
142 regulation of terrestrial arthropod populations (Thakure *et al.*, 2026).

143 RESULT and OBSERVATIONS

144 Jerdon's Nightjar (*Caprimulgus atripennis*) was mostly recorded in forest skirts,
145 scrubland habitats, and open canopy areas which is indicating a strong preference for
146 semi-open landscapes instead of dense forest interiors. These habitats are characterized
147 by open canopy conditions (less than 50% cover) and sparse vegetations which provide
148 suitable microhabitats that can facilitate both foraging and camouflage. Edge habitats as
149 in particular, support higher insect abundance because of the interface between the forest
150 and open land which is making them ideal feeding grounds for this nocturnal insectivore.
151 The species exhibits distinct behavioral adaptations such as low and silent flight while
152 foraging, which allows it to efficiently capture flying insects close to the ground.
153 Additionally, it practices ground roosting which is relying on its cryptic plumage to blend
154 with dry soil and leaf litter, and thereby avoiding predation during the day. Jerdon's
155 Nightjar is the most active during peak insect activity hours at dusk and dawn which is
156 aligning its feeding behavior with prey availability. These ecological and behavioral traits
157 highlight its specialization for edge-dominated and low-disturbance habitats which
158 emphasize its role in controlling nocturnal insect populations within ecosystems such as
159 the Dalma Wildlife Sanctuary.



160

161 **Image 5-** Jerdon's Nightjar (*Camprimulgus atripennis*) observed during field study.

162 **DISCUSSION**

163 The species shows strong association with ecotonal habitats and it serves as a habitat
164 indicator as well as it maintains the ecosystem by regulating the insect populations. It
165 plays a key trophic role as a nocturnal insectivore, functioning as a micro-level apex
166 predator in insect food webs. Sensitivity to disturbance highlights conservation
167 importance. Presence indicates habitat quality and ecological balance in Dalma Wildlife
168 Sanctuary. The surveys and observations on Jerdon's Nightjar (*Camprimulgus atripennis*)
169 in the Dalma Wildlife Sanctuary reveals a clear ecological niche for edge habitats, scrub
170 areas, and open canopy regions, which can be inferred in the context of habitat fitness
171 and resource availability. Such kind of semi-open environments typically support a
172 higher abundance and diversity of nocturnal insects, especially at forest-grassland
173 interfaces and thereby providing optimal foraging conditions for insectivorous birds. The
174 affinity for open canopy (<50%) and selection of low-density vegetation suggests that
175 dense forest interiors may limit agility and reduce hunting efficiency for a species
176 adapted to low and aerial feeding. From an ecological point of view the presence of
177 Jerdon's Nightjar in these habitats reveals a very well-functioning ecosystem with
178 sufficient insect populations and comparatively low disturbance levels. However, the
179 edge habitats are also more vulnerable to various anthropogenic pressures such as
180 grazing, deforestation and habitat fragmentation. Therefore, the species can serve as a

181 bioindicator of habitat quality, and its long presence in Dalma Wildlife Sanctuary
182 indicates the importance of conserving mosaic landscapes that integrates scrub and open
183 forest patches. Overall, these findings are consistent with the previous studies on nightjar
184 ecology and reinforcing the species and its reliance on structurally simple habitats and
185 role in maintaining insect population balance.

186 ACKNOWLEDGEMENT

187 Authors extend their sincere thanks to entire forest teams and official for their efforts in
188 conservation of the Dalma Wildlife Sanctuary and the area in its proximity. Authors
189 extends their heartfelt gratitude to *Dr. K.K. Sharma*, renowned ornithologist and
190 professor from Kolhan region. Authors would further like to thank *Mrs. Gauri Guria* and
191 *Mrs. Soma Sarkar* for their unwavering support, regular motivation and assisting the field
192 surveys. Last but not the least authors acknowledge the support of *Akash Jaiswal*
193 (wildlife activist) for getting along in the wildlife surveys and studies.

194

195 CONFLICT OF INTERESTS: No conflict of interests.

196 REFERENCES

- 197 1.Cleere, N. (1999). Nightjars.Holyoak, D. (2001). Nightjars and their allies.Fischer &
198 Lindenmayer (2007). Landscape ecology.Prugh et al. (2009). Mesopredator
199 dynamics.Boyles et al. (2011). Ecosystem services of insectivores.(Additional references
200 can be formatted as per journal requirement)
- 201 2.Sarkar, Prosenjit & Thakur, Shivam & Paramanik, Priyanka & Priya, Shalu & Mahato,
202 Padmabati & Verma, Renuka & Riya, & Kumar, Dr & Gupta, Hari & Kumar, Dinesh &
203 Chakrabarty, Bipul (2025). A Comprehensive Study Diversity and Status of Avifauna in
204 East Singhbhum, Jharkhand, India. International Journal of Enhanced Research in
205 Science Technology & Engineering. 14. 144-176. 10.55948/IJERSTE.2025.041
- 206 3.Ali, S., & Ripley, S. D. (1983). *Handbook of the Birds of India and Pakistan (Vol. 4)*.
- 207 4.Grimmett, R., Inskipp, C., & Inskipp, T. (2011). *Birds of the Indian Subcontinent*.
- 208 5.Champion, H. G., & Seth, S. K. (1968). *A Revised Survey of the Forest Types of India*.
- 209 6. Sarkar, Prosenjit & Thakur, Shivam & Kumar, Amar & Ansari, Saba & Pankaj, Smitha
210 & Banker, Ajinkya. (2026). New and Noteworthy: First Confirmed Record of the Indian
211 Courser (*Cursorius coromandelicus*) from Jharkhand, India. II. 504. 10.35629/4494-
212 1101504507.

213 7.PROSENJIT SARKAR, SHIVAM THAKUR, PRIYANKA PARAMANIK, SABA
214 ALAM ANSARI, SMITHA PANKAJ, (2026).Documenting nocturnal avifauna: First
215 record of the Large-tailed Nightjar (*Caprimulgus macrurus*) from Dalma Wildlife
216 Sanctuary, Jharkhand.<https://doi.org/10.56975/ijvra.v4i3.701953>

UNDER PEER REVIEW IN IJAR