



# ZOO'S PRINT

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## *Entonaema liquescens* Moller, a new report to India

*Entonaema* A. Moller is one of the poorly understood genera of family Xylariaceae belonging to Ascomycetes (Rogers 1982). Members of *Xylaria* are major saprophytes found on the dead and decaying parts of the plants (Patel et al. 2018). Western Ghats of Karnataka, India is characterized by the diversity in floristic entities including macro fungi. Survey was conducted Aug–Oct 2019 in central Western Ghats region of Karnataka at Jambekoppa forest locality to explore *Xylaria* members. During the study, an interesting fungi belonging to family Xylariaceae was collected and characterized as *Entonaema liquescens* Moller.

Sporocarp were studied in their natural habitat for their morphology, including colour, size and shape. Geographical ranges were recorded using Garmin 650 GPS. Sporocarp were collected carefully and brought to laboratory using paper bags. Stereo microscope was used to observe the surface of collected species. Anatomical characters like size and shape of perithecia, asci and ascospores were studied using binocular compound microscope. By compelling all the morphological, anatomical characters as well as compared to the standard monographs, the species was identified (Rogers 1981; Leacock 2018).

***Entonaema liquescens* Moller, MB#183350 =*Xylaria splendens* Berk. & M.A. Curtis,**

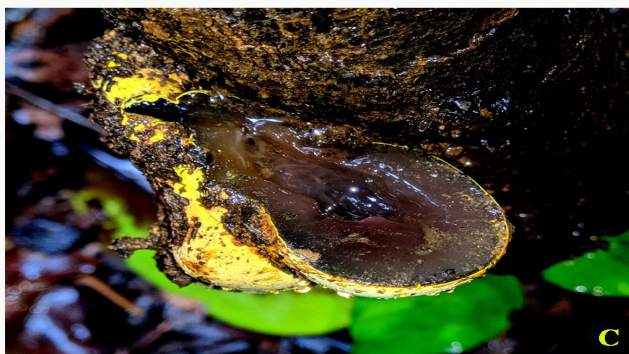
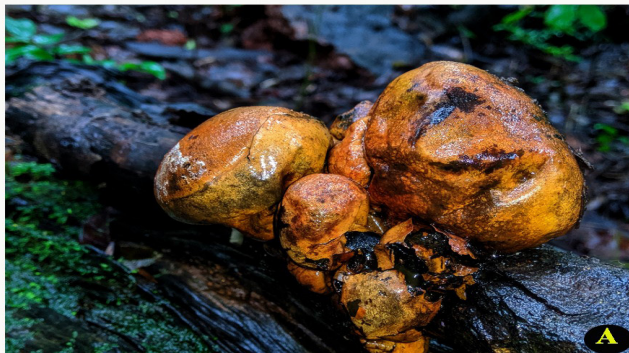
Journal of the Linnean Society. Botany 10: 382 (1869) [MB#189690]

Stromata globose or cerebriform are irregular shaped with short basal connective attached to the substrate, filled inside with watery liquid and becomes hollow on maturity. 1–12 cm diameter × 1–6 cm height; surface of the stroma generally bright-yellow coloured or light-yellow coloured, surface of stroma will lose their colour if handled when it is young, below the coloured conidial deposits are dark surface characterized by the dotted ostiolar openings.

Stroma is characterized by inner gelatinous layer and core is filled with watery liquid which comes out and collapses if we puncture the stromata. Perithecia 0.3–0.5 mm diameter. Asci consists of eight ascospores, measuring 120–150 µm in length. Apical ring turns blue while treated with the Melzers reagent. Ascospores dark brown, ellipsoid with blunt ends, with straight germ slit 11–11.5 × 5–6 µm in size.

***Entonaema liquescens* Moller**, found on unknown dead trees and branches. Place of collection: Jambekoppa forest locality (14.103 N, 75.142 E), Shivamogga District, Karnataka State, India. Date of collection: 30 August 2019. Collector: Nandan Patel K.J and Krishnappa M. Herbarium samples have been deposited in the Departmental





*Entonaema liquescens* Moller: A,B—Stroma | C—T.S. of young stroma | D—Matured stroma showing ostioles | E—Opened matured stroma showing liquid inside | F—Perithecia (5X) | G—Asci (10X) | H—Ascospores (40X).



Herbarium, Department of Botany, Kuvempu University, Shankaraghatta (Accession number KUABMK-186).

Earlier mycologists treated genus *Entonaema* as synonym for some other genus like *Penzigia*, *Sarcoxylon*, and *Glaziella* (Rogers 1982). *E. liquescens* is morphologically differentiated from other Xylariaceae members (Stadler et al. 2008). This species was introduced by Moller in 1901. Later in 1981, Rogers studied genus *Entonaema* with other closely related Xylariaceae members and he commented that this species is distributed widely in forests of Africa, Uganda, Argentina, Brazil, China, Colombia, Mexico, and America. This species is not known from India previously and fairly distributed in study area. Hence, this report stands from India and forms an addition to the fungi of India.

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## Sighting record of Black Eagle from Kitali Lake, Maharashtra, India

The Black Eagle *Ictinaetus malaiensis* (Temminck 1822) is a large diurnal raptor of tropical and sub-tropical mountainous forests (Clark 1994; **Ferguson-Lees & Christie 2001**). It is the monophyletic species, placed in the family Accipitridae. It has two races, *I. m. malaiensis*, found mainly in China and the Indian race *I. m. perniger* is distributed throughout the Himalayan foothills from Kashmir to Arunachal Pradesh, the Western and Eastern Ghats, the highlands of Madhya Pradesh, and the Chhota Nagpur Plateau regions in Odisha and West Bengal (Naoroji 2006; Rasmussen & Anderton 2012).

On the 9 January 2022, during our birdwatching trip to Satbahini foothills, when we were busy taking photographs of the Common Hawk-Cuckoo at a roadside small wetland Kitali pond, we were very surprised to get glimpses of a large black-coloured raptor, perched on *Azadirachta indica*.

Due to vehicular movement on both the sides of the road, the bird got disturbed. It just takeoff from the perched site and passively glided overhead twice. It was a real delight to watch such a passive sail of black raptor, giving me sufficient time to capture



Photo showing location site of Black Eagle over the *Azadirachta indica* on the embankment of Kitali pond. A. Total black with brownish patch on shoulder except, yellow coloured cere and toes. B. Struggling to perch, reveals underparts wings having lighter bars on primaries and secondaries, unique to Black Eagle. C. Perched Black Eagle revealing lighter bars on tail retrices and pale brownish colour at the bottom line of tail. D. Black Eagle glides passively by spreading flat wings.





Site map of Kitali pond among forested hilly ranges and large Ghodazari Lake, showing in inset hydrophytes like *Nelumbo* sp. providing ideal habitat for waterfowl and Jacana's, also surrounded by paddyfields.

photographs in Canon 200D camera. Initially, we thought it to be a Greater Spotted Eagle, but after citing few research articles and referencing through field guides of Grimmett et al. (1999) and Ali & Ripley (2002), it was confirmed as Black Eagle. The body of the bird is entirely black in colour. The beak has yellow cere with a black tip and toes are yellow in colour. A whitish patch is seen at the base of primaries and pale barring on primaries, secondaries and tail coverts.

Kitali Lake (20.502 N, 79.645 E) is located near forested area of Satbahini hill ranges in Nagbhid. It lies within the buffer area of newly declared 'Ghodazari Sanctuary' by Maharashtra Government.

The Kitali Lake is 16 km northeast of Nagbhid and 94 km south of Chandrapur. This part

of Nagbhid Taluka of Chandrapur District has mixed vegetation of moist and dry deciduous forest interspersed with hill ranges of Shiv Tekdi of Nagbhid, Muktai Hills towards Chimur Taluka and Satbahini Hill nearby study site. Agrarian rural people totally depend upon paddy cultivation for their livelihood. The study site is a perfect wetland habitat for waterfowls like, Grey-headed Swamphen, Bronze-winged Jacana,

Pheasant-tailed Jacana and so many waders as the pond is shallow and occupied by hydrophytes like *Nelumbo* sp.

While going through the published research articles, it was found that, there are only a few published records of the species from Vidarbha region. Black Eagle was reported earlier in Maharashtra from Satpuda hill ranges (Wadatkar et al. 2014), which is about 400 km away from Satbahini Hills.

Although widespread in distribution and enlisted as Least Concern as like other raptors, Black Eagle also shows declining trend (BirdLife International 2022). Earlier, it was a regular winter migrant to forested mountainous ranges and hills in peninsular India, but in the recent past, it is very rare and uncommon to locate them in this part of



eastern Vidarbha and is a vagrant species. It was earlier reported from the core zone of Tadoba Andhari Tiger Reserve by Bayani & Dandekar (2017), but there was no photographic record of this raptor, hence, we conclude that sighting of Black Eagle from this unprotected area is a very significant event and further study is recommended for their protection and conservation.

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# Altitudinal range extension of Indian Peafowl: reviewing its causes and effects

The Indian Peafowl *Pavo cristatus* under order Galliformes was declared as the national bird of India in 1963 (Ramesh & McGowan 2009) and given protection as a Scheduled I species under the Wildlife (Protection) Act, 1972 of India (Anon 1972). They are the largest and the most charismatic birds in the family and hold a significant value in Indian mythology and culture (Baral & Inskipp 2013). The species is a generalist in diet and feeds mainly on seeds, shoots of crops, fruits, insects, and worms (McGowan et al. 2020). Indian Peafowl also feeds on small reptiles & small mammals and they form a major prey base for several predatory birds and mammals; therefore, they hold the prime position in the food web (Kushwaha & Kumar 2016).

Scrub jungles at the forest edges of subtropical and semiarid regions comprise the natural habitat of this species (Ali & Ripley 1987). They also occur abundantly in agricultural fields, near streams and water bodies, and in human habitation (McGowan et al. 2020). Due to their ability to adapt and thrive in non-forested areas and agricultural lands, they are increasingly becoming abundant in urban and outskirt areas. Therefore, this bird species is now considered an agricultural pest in many parts of the country (Senaratna et al. 2019).

The Indian Peafowl has a wide distribution range in India (Ali & Ripley 1987). It occurs naturally in the wild on the mainland of India

(McGowan et al. 2020), but they were also introduced in the Andaman Islands (Ali & Ripley 1987), U.S.A., Europe, Hawaii Islands, West Indies, South Africa, New Zealand, and Australia (McGowan et al. 2020). They mostly reside in low lands with an elevation of around 500 m (Baker 1930) but can be frequently recorded up to 1,200 m in Nepal (Baral & Inskipp 2013). The highest known elevation for the occurrence with confirmed evidence is 1,844 m (Dodsworth 1912) near the Tara Devi Railway station in Shimla. It is known to occur up to 2,000 m (Dodsworth 1912; Ramesh & McGowan 2009), however, there was no confirmed evidence to support this report so far. As per the Handbook of the Birds of the World (McGowan et al. 2020), this bird is known to move up to 2,000 m but no literature is available to confirm the upper limit of the species.

Recently, the Indian Peafowl was reported through a camera trap image captured at 2,622 m in Darjeeling, West Bengal (Thapa et al. 2020). Later, Pradhan & Tamang (2020) also highlighted the presence of the species at around 2,200 m in Darjeeling and provided supporting shreds of evidence that due to habitat loss the species is moving up in the mountains. Whereas, another study by Jose & Nameer (2020), revealed that changes in the temperature and precipitation due to climate change resulted in the expansion of the distribution range of the species in Kerala that is comprising a part of the Western Ghats. Habitat modelling from the known

locations of this species predicted that the distribution range of the Indian Peafowl would expand by up to 55.33% by 2050. Other than that, it is also possible that the local extinction of small predators like jackals may also be contributing to these extensions.

Due to the repercussion of changing environmental conditions, many birds have evolved to adapt in response to the consequences of climatic changes (Gregory et al. 2009), and often these adaptations are in the form of geographical range shifts like these. According to a study by Reino et al. (2009), every 1°C rise in temperature will increase the risk of a new invasion by 47%. However, these adaptive invasive species often benefit from climate change by affecting the native and specialized species (Şekercioğlu 2011) by invading their niche in temperate regions (Reino et al. 2009). These invasive species contribute significantly to the detrimental extinction of specialist species of the landscape (Bellard et al. 2016). For example, the high population of Indian Peafowl in some small Japanese islets leads to the decline in the population of endemic skink *Eumeces kishinouyei* and its sympatric bird species, Japanese white-eye *Zosterops japonicas* (Eguchi & Amano 2004). A careful investigation of species whose ranges are shifting upwards or invading the other habitats will help us understand the pressure of competition on the native population. Also, predictive modelling can help us understand their pattern of invasion and the effect on threatened/endemic species of the region.

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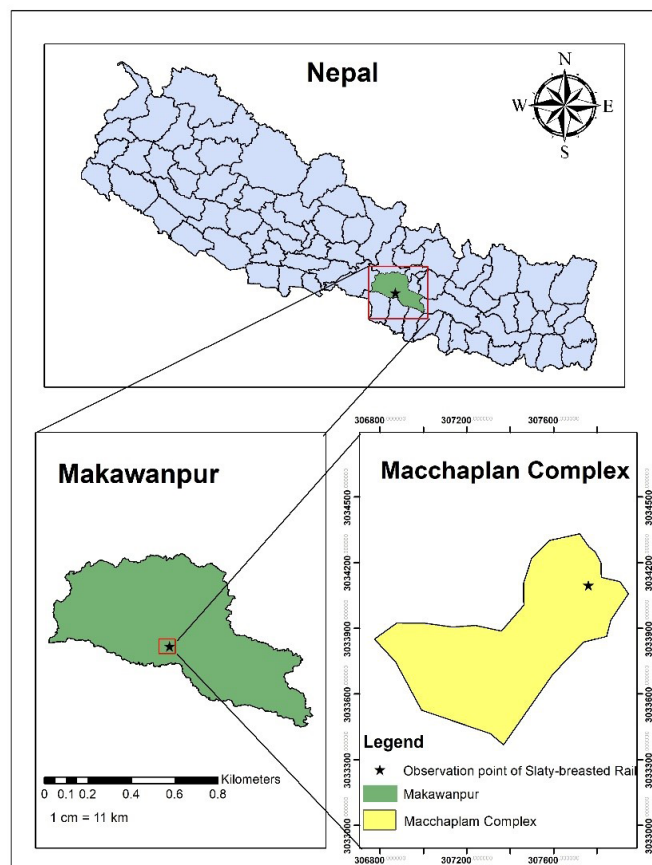
# First sighting of rare Slaty-breasted Rail in Hetauda, Nepal

Slaty-breasted Rail *Lewinia striata* is a water bird of the family Rallidae and are widely distributed resident in southeastern Asian countries (BirdLife International 2022). The adult's head and nape are chestnut, while the foreneck and breast are slate-grey, with white markings and dots on the upper parts, belly, flanks, and under tail coverts (Grimmett et al. 2016). The Slaty-breasted Rail likes deep foliage and forages freely in the morning and evening in marshes, bogs, mangroves, swamps, wet grasslands, and paddy fields (BirdLife International 2022).

In Nepal, the Slaty-breasted Rail was once thought to be a vagrant species because there were more than 10 recordings of the species in the nation. It is currently regarded as an extremely rare visitor and likely a rare resident (Inskipp et al. 2021). It is listed globally as Least Concern (BirdLife International 2022), however,



Slaty-breasted Rail *Lewinia striata* in Machhaplan, Hetauda, Nepal.  
© Prasan Shrestha



Map of Macchaplum Complex.

nationally they are listed as Vulnerable because of its small population, loss and degradation of habitat, illegal hunting, and disturbance (Inskipp et al. 2021).

On 16 February 1938, Frank M. Bailey collected one Slaty-breasted Rail as the first record for the country from the Haraincha, Morang District, eastern Terai of Nepal (Bailey 1938). The species is recorded mostly from Chitwan National Park and a few records from Kosi Bird Observatory, Koshi Tappu Wildlife Reserve (Inskipp et al. 2021). Outside the protected areas, one bird was recorded on 10 March 1992, on a small marsh near a temple in Nepalganj, Banke District (Baral 1992), and one bird was photographed in November 2016 on the farmland of Chitwan District which is outside of the Chitwan National Park and its buffer zone (Inskipp et al. 2021).

Machhaplan (Fish Farm) complex lies in the Hetauda Sub-metropolitan city, Makawanpur District, Bagmati Province in central Nepal. The complex sits at a height of 437 m from the sea level and occupies an area of 47.85 ha. This farmland and fish pond area are surrounded by Sal *Shorea robusta* forest. The agricultural land is dominated by paddy fields with dense reeds and marshes. Invasive plant species such as *Eichhornia crassipes*, *Pistia stratiotes*, and *Lantana camera* dominate the area. The complex consists of habitat suitable for various avifauna and is rich in bird diversity (Bhusal 2021).

On 3 March 2022, while bird watching, the authors heard a definite and loud sound emanating from the marshy reeds at 1651 h. We saw a crane-like bird taking off sprinting into the reeds, but it was visible owing to the flattened reeds. They were spotted among thick vegetation of the invasive species *Eichhornia crassipes*, *Pistia stratiotes*, and *Lantana camera*. We spent some time investigating the reeds and found two birds that were initially unconfirmed as Slaty-breasted Rails but were subsequently validated by ornithologists using a photo.

In the following days, an exhaustive search was conducted. Literature and 'eBird' data for the region were also investigated. However, we never saw the bird again. There are no prior records for the occurrence of the Slaty-breasted Rail in and around the area. We may infer from the literature research that the species has a new range record and the first-ever record of sighting in Macchaplan (27.416 N& 85.055 E), Hetauda, Nepal. A Sony a7R IV camera was used to photograph the birds.

A pair of adult Slaty-breasted Rail recorded on its extended range outside the protected areas of Nepal. The Slaty-breasted Rail prefers reedy marshes, mangroves, the borders of village tanks, and flooded rice fields (Ali & Ripley 1987). Macchaplan Complex, Hetauda, Nepal has water sources available throughout the year due to research facilities and fish rearing. Reeds and marshes are abundant which provided an ideal habitat for Slaty-breasted Rail.



Slaty-breasted Rail had not been recorded before in Makawanpur District (Bhusal 2021) or due to its quiet and skulking behaviors, as well as the difficulties in accessing its environment, it is often neglected (Kumar & Kumar 2009). This record shows that this species occurs in Makawanpur District, therefore we can infer that this is the first verified occurrence of Slaty-breasted Rail in Makawanpur District, Nepal. The year-round availability of water has resulted in the establishment of emergent and submerged plants, which has most likely attracted the species (Ameta et al. 2016; Bhusal 2021). The observation of the species occurred during its mating season. Therefore, it may be hypothesized that the species may be seeking appropriate nesting locations under rainfall shortage circumstances (Ameta et al. 2020). The first sighting of this species by us is significant for future research to collect breeding data for the species in the region. Overgrazing, pollution, and firing were observed at the site which are major threats to the species. We urge additional research on comparable prospective sites for population assessment because the population size of the Slaty-breasted Rail is unclear in Nepal (Inskipp et al. 2016).

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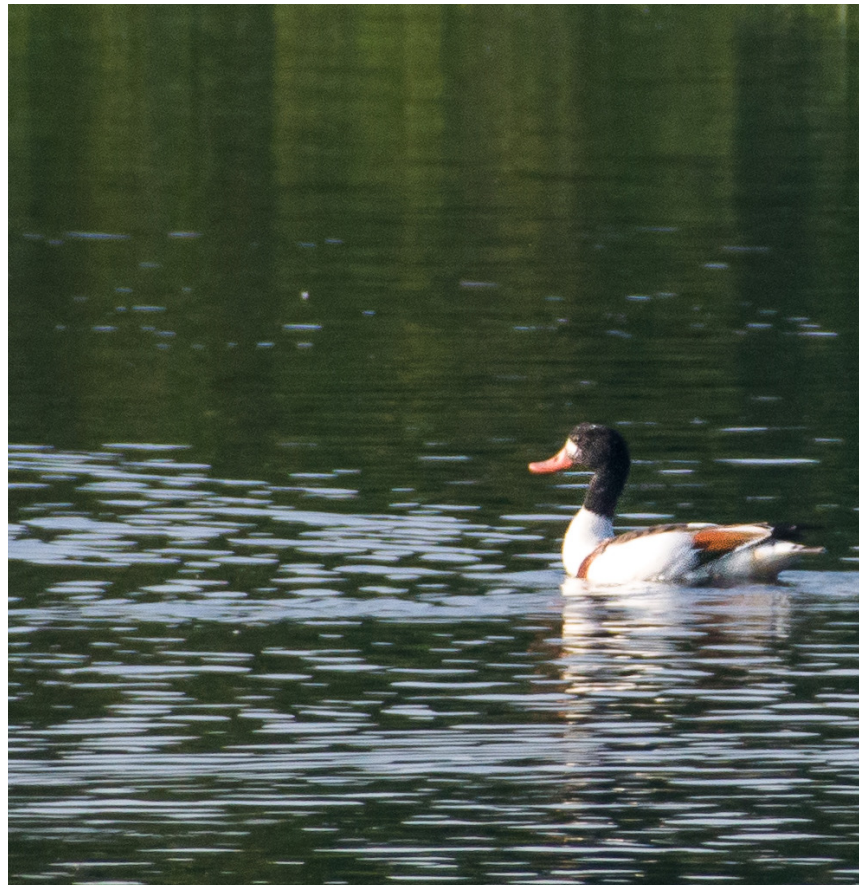
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## First report of Common Shelduck from Satajan Wetland, Assam, India

The Common Shelduck *Tadrona tadrona* is a winter visitor to northern and eastern Afghanistan, southern Sind, in provinces that were part of erstwhile eastern Punjab, currently in Pakistan, up to the Assam Valley (Wadatkar & Wagh 2014).

The Common Shelduck previously has been recorded from Assam from Dibru-Saikhowa National Park and Biosphere Reserve (Choudhury 2006) and from Deepor Beel, the only Ramsar site (Lahkar et al. 2009).

Satajan Wetland (27.20806° N, 94.05167° E), is a freshwater natural wetland occupying a protected area of 39 acres and the maximum depth of water in winter is around 6.5 m (Gogoi et al. 2019). Satajan is located in Lakhimpur District, Assam and is 7 km from North Lakhimpur Town. About 87 species of seasonal, migratory



Common Shelduck *Tadrona tadrona* at Satajan Wetland.  
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and residential birds were recorded from this wetland (Bhaduri et al. 2022). This wetland plays an important role in accommodating flora as well as fauna, which have a significant role in maintaining and functioning of ecosystem. The local community is also dependent on this wetland for resources. It acts as

a reservoir during flood in monsoon seasons, giving relief to the local community.

We visited the Satajan Wetland on 24 November 2020 for a casual birding trip. At around 0720 h, we saw one unusually coloured individual coming from south direction and landing in the wetland. We took





Common Shelduck *Tadorna tadorna* in flight at Satajan Wetland.  
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photographs of the bird in flight as well as in resting for record and carefully observed the bird through binoculars. The bird was coloured with greenish-black head and largely white body with chestnut breast-band and had a red bill, and pink legs and feet.

We identified the bird as an adult female Common Shelduck because it lacked the frontal knob (Grimmett et al. 2016), had a white stripe on its forehead and was considerably smaller and duller coloured, with the chestnut breast feathers edged with black vermiculation. (Ali & Ripley 1978).

The species has not been recorded previously from Satajan. This is the first record of citation of the species not only for Satajan Wetland but also for Lakhimpur District.

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## Rufous-throated Thrush resighted in Shimla District, Himachal Pradesh, India



Rufous-throated Thrush at Seri, district Shimla, Himachal Pradesh.  
© Rupali Thakur

The Rufous-throated Thrush *Turdus ruficollis* is a regular winter visitor in India that breeds in south-central Siberia, northern Mongolia, and northwestern China (Collar 2019). Its distribution in the subcontinent ranges from Pakistan and adjacent plains from the Indus Valley through Nepal, India (Sikkim, Arunachal Pradesh, Nagaland, Manipur, Assam), Bhutan, and Bangladesh. The altitudinal range varies from 3,000 to 4,200 m as we move from Himalaya in the west to Sikkim in the east (Ali & Ripley 1981).

During a bird survey in February 2022 at Seri Village (31.110 N, 77.073 E), Shimla District, Himachal Pradesh, we sighted a

Rufous-throated Thrush in an area occupied by shrubs and few trees. There are only a few records of Rufous-throated Thrush from Himachal Pradesh. It has been reported from different parts of Kangra, Lahaul, and Spiti districts (Abhinav & Rawal 2019); two individuals were shot after a snow storm at Chamba District (Marshall 1884) and Goller (2011) photographed one individual from Prashar Lake, Mandi District.

In the past decade, the species has been recorded from the states surrounding Himachal Pradesh based on eBird records: Uttarkashi (Sondhi 2022) and Nainital (Warr 2019) in Uttarakhand, Suhail et al. (2020)



reported the presence of this species from Jammu & Kashmir. However, many studies on avian communities have been carried out within other states neighbouring Himachal Pradesh, but none of them, for example, Kumar & Sahu (2019) and Ahmed et al. (2014) have reported the sighting of Red-throated Thrush.

The last record of Rufous-throated Thrush from Shimla was by Bhardwaj (2003), afterward, several avifaunal surveys (Mattu & Thakur 2006) have been conducted in Shimla and adjoining districts in Himachal Pradesh, but no study has reported the presence of this species. For example, Mattu & Thakur (2006) reported 70 species from the Shimla District but not this species. Hence, our record of Rufous-throated Thrush is after 19 years from the district. The nearest earlier record of the species (Kumar 2022) is from Udaipur in Lahaul Spiti, Himachal Pradesh, which is about 180 km north-west of Seri.

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## Release of captured Bengal Slow Loris in Patgaon Village, Assam



Habitat where the slow loris was released.



The slow loris in the cage.



The slow loris just after release.



Map showing the location.

Slow Loris is a nocturnal, cryptic, and arboreal primate and it is categorised as Endangered in IUCN Red List (Nekaris et al. 2020). So far, it is the only strepsirrhine group of primates found in northeastern India (Das et al. 2015). It is listed in Schedule I, Part A, of the Indian Wildlife Protection Act of 1972, as amended in August 2022. Slow Loris are known to feed on plant bark, gum, fruits etc. Its range is only known through sporadic reports and a few scientific

investigations (Nekaris et al. 2008). The mixed deciduous forests, semi-evergreen forest and tropical evergreen rainforests are all home to this species (Nekaris et al. 2020). However, lack of information regarding the ecology remains a matter of concern on its further study. The aim of this note is to report the occurrence of Slow Loris in Khar Bakhar, Patgaon Village near Ratanpur Beat office under Kamrup West Division of Kamrup District, Assam, India.



A young female individual of Bengal Slow Loris weighing about 3kg was captured in a household at Khar Bakhar, Patgaon Village near Boko of Kamrup District (between 25.996 N latitude and 91.356 E longitude). The animal was captured when it intruded in the kitchen of the household at 2300 h on 06 June 2022. Local people had requested the forest officials to release it back in the wild and as per public demand it was released in the nearby forest area of Patgaon under Bamunigaon range office of Kamrup West Division.

Although, the Bengal Slow Loris is under threat because of its habitat loss, illegal trade, use in traditional medicines and to keep it as pets (Nekaris et al. 2008), yet villagers are deeply connected to the forest ecosystem and are more aware about conservation of the forest. From a study on Bengal Slow Loris in the China border, Nijman et al. (2014), found the illegal trading of this endangered species at Mong La market, Myanmar and said it was traded for meat along with their body parts being used as Asian traditional medicine. On the contrary, the positive thing here is that though most of the local people are less educated, yet they never eat such animals or use it in traditional medicines.

As informed by officials of beat office as well as the villagers, one slow loris that was older than this one was also found at another villager's household approximately one year back in the same area and was released back to a nearby forest. The public is more aware and it will be a positive indication

for conservationists. If conservation programmes are implemented in the near future, public support will be one of the most beneficial factors.

More public awareness efforts among local inhabitants in the area, with a particular emphasis on early reporting of sightings, injuries, and rescues to local forestry personnel are recommended. The slow loris conservation efforts in this study area which lies near Meghalaya border should be taken intensively, so that it will help in knowing the proper niche, food habit along with the breeding behaviour of this primate. This occurrence report of the Bengal Slow Loris in the area will help the wildlife conservationists and concerned authorities to take up appropriate conservation measures through community participation.

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## An observation of Indian Fox feeding on Rat Snake and Hedgehog in a degraded habitat of Gujarat



The photographic evidence of Indian Fox feeding on Rat Snake and Indian Hedgehog.

Indian Fox *Vulpes bengalensis* a mesocarnivore of the Indian subcontinent is distributed in various habitats of India except the Western Ghats (Desai & Dharaiya 2022). The Indian Fox prefers semi-arid landscape and short grassland or scrub, thorn thickets or dry deciduous forests to make a den with multiple openings to ensure their protection (Desai et al. 2021). The species is listed as Schedule II under the Indian Wildlife Protection Act (1972) and classified as Least Concern (LC) according to the IUCN Red List assessment (Jhala 2016). Being an omnivore, their diet mainly includes insects, small rodents, monitor

lizards, ground nesting birds, their eggs and some selected fruits such as *Ziziphus* sp., *Mangifera indica*, *Syzygium cumini*, *Diospyros montana* (Manakadan & Rahmani 2000; Desai & Dharaiya 2022). Based on the field observation, Johnsingh (1978) reported, foxes feeding on the freshly voided pellets of sheep. It is also found that the diet of Indian Fox varies depending upon the availability of food within its habitat that make them opportunistic feeders (Vyas et al. 2016). In the present note we report the feeding on Rat Snake and Indian Hedgehog by Indian Fox based on field observations.



The northern Gujarat region covers 16% of the total semi-arid forest of Gujarat that administratively classified into five districts (Patan, Mehsana, Sabarkantha, Aravalli, and Banaskantha) (Gajera & Dharaia 2011). The area has semi-arid climate that falls into biogeographic zone 4 and can be further classified into Ravine thorn forest: 6B/C2 (Champion & Seth 1968). The area almost dries up during the hot summer, whereas the monsoon is short with an annual rainfall of 600–750 mm.

During our field survey on 25 March 2021 in Vagadipolo, one of the degraded habitats of Mehsana District (23.937 N; 72.526 E, forest of Vithoda Village), we found an adult female fox with two pups wandering around the bushes of Ziziphus plant. After careful examination by binocular (Olympus, 10x50), we observed that the female fox was chasing a Rat Snake and killed it by her strong bites and sharp claws. It was noticed that her pups were continuously following the mother like they were learning how to capture the prey.

Just after two days (27 March 2021), we found the skin of a Hedgehog at one of the openings of the fox den. After careful examination of the exoskeleton, we found that all the visceral organs and muscular parts were consumed by the fox. These two observations reveal the opportunistic feeding behaviour and wide range of its diet including a reptile as well as a small mammal like a hedgehog. A similar observation of Indian Fox feeding on venomous Saw-scaled Viper and hedgehog in Kutch by Vyas et al. (2016) and Home & Jhala (2009), respectively,

has been reported previously. Both our observations were recorded in the month of March which is the breeding season of Indian Fox (Manakadan & Rahmani 2000), when a fox possibly requires to feeds on protein rich food.

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# Observations on nesting biology of a potter wasp in West Bengal, India

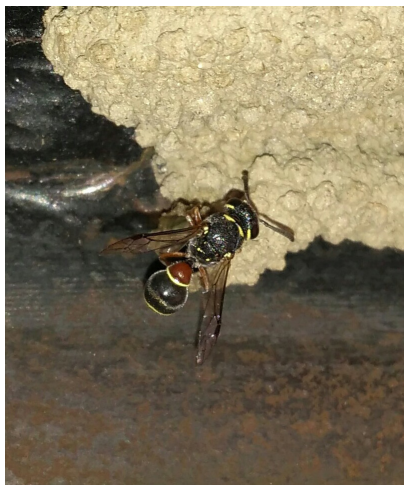
*Paraleptomenes miniatus* (de Saussure, 1855) (Hymenoptera: Vespidae: Eumeninae) is one of the six species of genus *Paraleptomenes* Giordani Soika, 1970 reported from India, out of the 11 globally known species under this genus (Kumar et al. 2014; Bai et al. 2022). Members of the subfamily Eumeninae are commonly known as potter wasps (Kumar et al. 2020). Globally, there are three subspecies of *Paraleptomenes miniatus*, which are *P. m. mephitis* (Cameron, 1901), *P. m. miniatus* (de Saussure, 1855), and *P. m. nigrithorax* Giordani Soika, 1994 (Yeh & Lu 2007; Kumar et al. 2014; Pannure et al. 2016).

Krombein (1978, 1991) studied the life history, nests and nest associates of *P. m. mephitis* (as *P. mephitis*) in Sri Lanka. This wasp constructs mud nests in sheltered situations, such as beneath covered walkways, house eaves and verandah roofs and the nests consist of tubes placed side by side against a flat surface, with the outer end of the tubes curved away from the substrate (Krombein 1991). Natural history of the Eumeninae is poorly studied in India and for most species, nothing is known about their biology, behaviour, prey associations, and hence conservation status (Kumar et al. 2020). In the present

study, nesting biology of *P. m. miniatus* from West Bengal is observed and documented. Photographs of the observations were taken by a Lenovo K33a42 smart phone. The potter wasp was identified as female *P. m. miniatus* from field observations and photographs by following characters: body black; legs reddish-brown variegated with yellow; clypeus long and pyriform; yellow marks on each side of clypeus at base, a vertical spot above clypeus in interantennal space, at emargination of eyes, a line behind them, ventral side of scape and two spots on dorsal side of pronotum, a spot anteriorly and another posteriorly on tegula, parategula, two spots on either sides of scutellum and metanotum, a spot on mesepisternum; scutellum convex; metanotum very oblique; petiole (1<sup>st</sup> metasomal segment) in dorsal view narrower than 2<sup>nd</sup> metasomal segment, wider apically than basally; maximum width of petiole about equal to its median length; fundamental colour of petiole red ferruginous, with a transverse yellow band apically (Yeh & Lu 2007; Kumar et al. 2014; Pannure et al. 2016).

Field observations were made on the nesting biology at Panihati (22.699 °N, 88.370 °E), North 24 Parganas District, West





Dorsal view of the female potter wasp.



Lateral view of the female potter wasp on its nests.



Frontal view of the female potter wasp head.



1<sup>st</sup> (right one) and 2<sup>nd</sup> (left one) nest.



1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> nest.



Addition of 4<sup>th</sup> nest.



Construction of the 5<sup>th</sup> nest.



Five nests.



A cuckoo wasp (Chrysidae) on the nests.



Table 1. Details of nests from construction to adult emergence.

Nest Number	Starting of nest construction (Date)	Completion of nest construction (Date)	Time span (from date of starting to completion)	Emergence of adult wasp from nest (Date)	Time span (from date of completion of nest building to emergence)
1	-	-	-	31.iii.2020	-
2	-	25.iii.2020	-	07.iv.2020	14 days
3	25.iii.2020	01.iv.2020	8 days	14.iv.2020	14 days
4	01.iv.2020	10.iv.2020	10 days	25.iv.2020	16 days
5	10.iv.2020	17.iv.2020	8 days	02.v.2020	16 days

Table 2. Details of the reusing of own nests by the female *Paraleptomenes miniatus miniatus*.

Nest Number	Date of reclosing of the nest	Date of adult emergence	Time span
2	25.iv.2020	10.v.2020	16 days
4	04.v.2020	17.v.2020	14 days

Table 3. Measurements of the different nests of the female *Paraleptomenes miniatus miniatus*.

Nest Number	Length (millimetres)	Width (millimetres)	Diameter of nest mouth (millimetres)
1	20	~3	2
2	20	3	~2.5
3	19	3	~2.5
4	20	3.5	3
5	20	4	2.5

Bengal, India from 20 March to 17 May 2020. Panihati is a part of Gangetic plains biogeographic zone with an elevation of about 13 m and total area of 19.38 sq.km. On 20 March 2020, the author found one completely constructed mud nest and one incomplete mud nest attached together side

by side at the ventral surface of a black-coloured iron frame at the author's residence. This iron frame was a part of a collapsible gate and was horizontally placed at about 1.8 m height from the ground. An adult female *P.m. miniatus* was observed carrying an insect larva with it at 1359 h and entering into



# Bugs R All

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the incomplete second mud nest through the open nest mouth. Then after some time, came out from the nest by walking backward. Nests of this potter wasp were tube-shaped, with the nest mouth outwardly curved from the iron substratum. Five nests were constructed by the female potter wasp, which were attached and parallel to one another, on the iron substratum. Nest building took place from morning to afternoon. At night, the female wasp was observed to take rest inside an incomplete nest, by facing its head towards the nest's open mouth. Complete nest building took 8–10 days. Each completely constructed nest's mouth was closed by mud. Adult wasps emerged from nests on 14<sup>th</sup> or 16<sup>th</sup> days, from the date of completion of nest building. The female was observed to reuse its own 2<sup>nd</sup> and 4<sup>th</sup> nest for egg laying. The 5<sup>th</sup> nest was constructed in opposite direction with respect to the other four nests. Each nest tube had two cells, separated by a transverse mud wall at the middle.

Details of nest building, emergence, reusing of nests, and measurements of different nests are presented in Tables 1–3. On 14 May 2020, at 1002 h, an adult Chrysididae (Cuckoo wasp) was observed walking and entering into the open-mouthed nests, from which an adult *P. m. miniatus* already emerged. Chrysidids are known nest associates of *P. m. mephitis* (Krombein 1991).

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## Asian weaver ants attack a dung beetle



**Group of Weaver ant (*Oecophylla smaragdina*) attacking dung beetle**

*Oecophylla smaragdina* (Fabricius) is an Asian Weaver Ant that can be found as far west as India, as far north as Taiwan and mainland China, and as far south as Australia's tropical zone (Azuma et al. 2006). Weaver ants, such as the African species *O. longinoda* (Latreille), are arboreal but can be found foraging on the ground occasionally (Dejean et al. 2007). They are voracious foragers who attack practically every organism that comes in contact with them. Farmers have used the species for biological pest management because of its predatory characteristics

(Huang & Yang 1987). They eat a variety of invertebrates, including beetles, flies, and other hymenopterans (Tsuji et al. 2004; Kusters & Belcher 2004).

I saw a troop of weaver ants fighting a dung beetle during the night at Athgharia Village, Nalbari District, Assam. The dung beetle was attracted to light during the night, and a colony of weaver ants quickly attacked the dung beetle. This was the first time I had noticed such an active hunt in the surroundings.



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# New record of an eastern Himalayan endemic species *Agapetes bhutanica* from Chirang Reserve Forest, India

The genus *Agapetes* was named by George Don in 1834 from the Greek word ‘*agapetos*’ meaning showy flowers. After George Don, detailed investigation of the genus was done by C. B. Clarke (1882) who recognized 26 species which were published in J.D. Hooker’s *Flora of British India*. However, at present the genus comprises of 100–109 species across the world and distributed in northeastern India, Bangladesh, China, Laos, Malaysia, Myanmar, Nepal, Bhutan, Thailand, and Vietnam (Banik 2014; POWO 2021). The genus is represented by 57 species including 17 endemics in India (Banik 2014). In India, members of this genus are restricted to occur in the eastern Himalaya (Arunachal Pradesh, Sikkim, & West Bengal) and northeastern India (Assam, Meghalaya, Manipur, Nagaland, & Mizoram).

As a part of botanical collections in Chirang Reserve Forest under Kokrajhar District in Assam, the authors came across a species of beautifully flowered specimens which were belonging to the genus *Agapetes* D.Don ex G.Don in the family Ericaceae. A few populations were spotted on the trunk of *Syzygium formosum* (Wall.) Mason along a stream over tiny stones bedrock in a humid place of Ultapani Forest. After critical examinations of authentic herbarium specimens housed at CAL, ASSAM

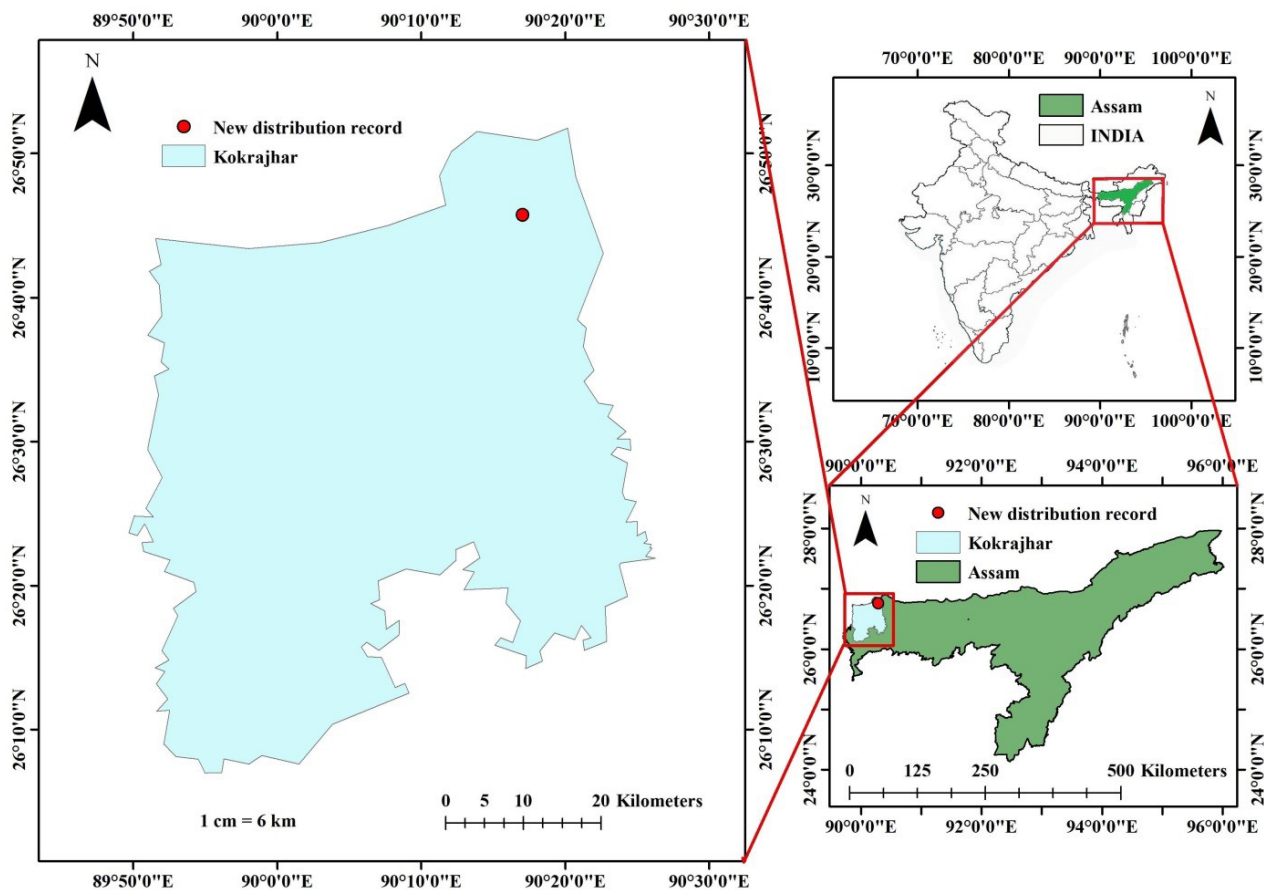
and consultation of relevant literature (Balakrishnan & Chowdhury 1966; Sengupta 1973; Long & Rae 1991; Banik 2014), these specimens were identified as *Agapetes bhutanica* N.P. Balakr. & Sud. Chowdhury.

The species is distributed in India (West Bengal) and Bhutan and hitherto unrecorded for Assam (Kanjilal et al. 1939; Barooah & Ahmed 2014). This species is closely allied to *A. odontocera* (Wight) Benth. & Hook.f., but it differs from it in having glandular hairs on pedicels and calyx (vs. glabrous pedicels and calyx in *A. odontocera*), light pink or whitish corolla (vs. dark red corolla in *A. odontocera*). Voucher specimens of collected species are deposited at ASSAM (Eastern Regional Centre, Shillong, Botanical Survey of India), and along with the field note book at Bodoland University Botanical Herbarium (BUBH!), Kokrajhar, Assam. The photographs were taken under stereo microscope Leica EZ4 HD camera. Distribution map of the species was prepared using QGIS 3.4.

## Taxonomic treatment

***Agapetes bhutanica* N.P. Balakr. & Sud. Chowdhury** in Reinwardtia 7(3): 287. 1966; Sengupta in Rec. Bot. Surv. India 20: 136. 1973; D.G. Long & Rae in Grierson & D.G. Long, Fl. Bhutan 2(1): 403. 1991; Banik & Sanjappa in Sanjappa & Sastry, Fasc. Fl.



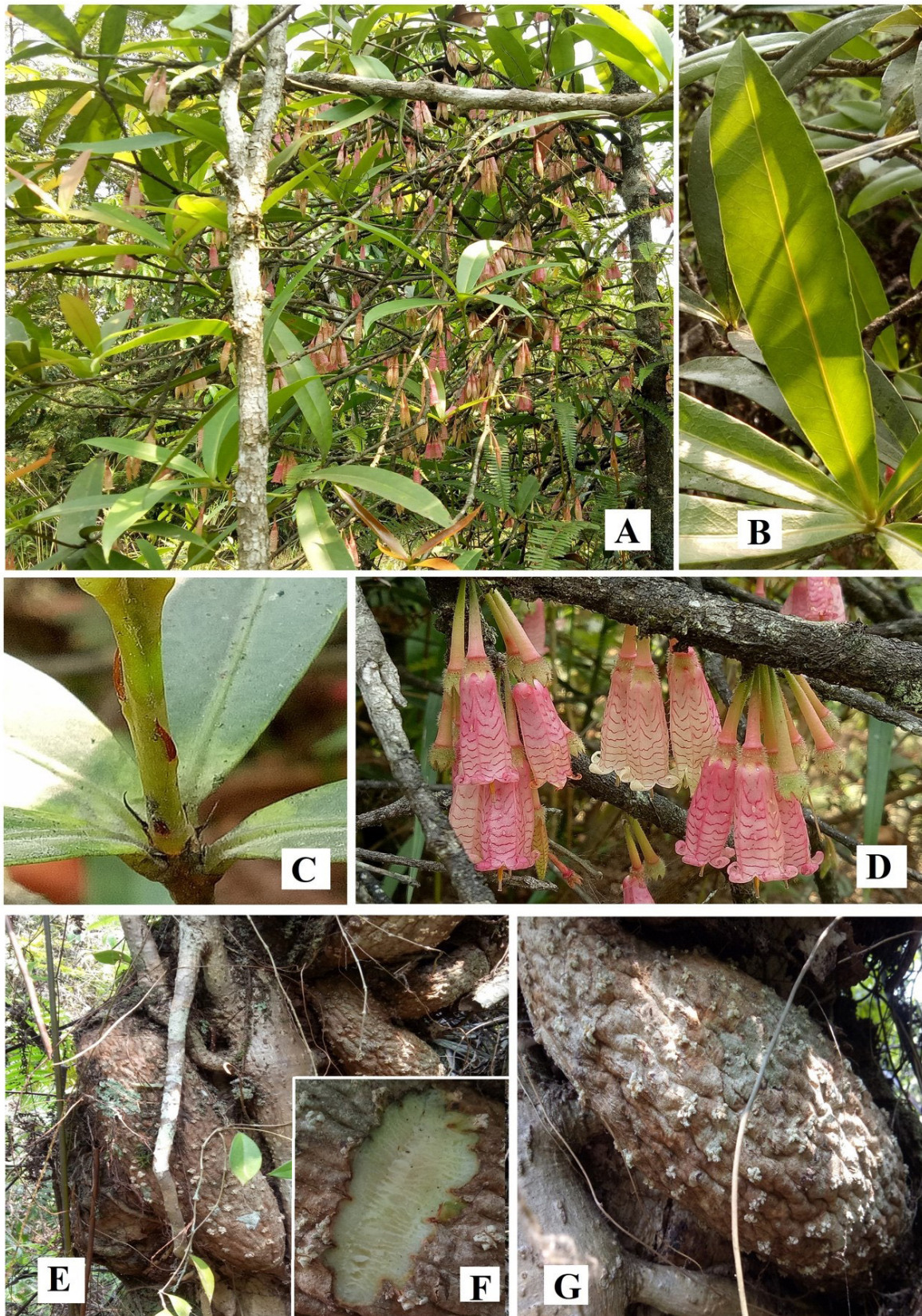


**Distribution map of *Agapetes bhutanica* N.P.Balakr. & Sud.Chowdhury in Assam.  
Prepared by Sanswring Basumatary.**

India Ericaceae 25: 262. 2014 (Figures 1 & 2). Epiphytic shrub; stem terete, smooth when young, rough when old, lignotubers basal, amorphous, rough, white inside, soft, while brownish-grey, lenticellate at maturity; branches spreading, terete, 6–15 mm in diameter, lenticellate when old, young branchlets bluntly angled, greenish; cataphylls scattered on young branchlets, linear-lanceolate, c. 0.5–1 × 0.2 cm, dark brown, apex pointed; leaves pseudo-whorled, 4–6 in each, 3–8 cm apart; lamina linear-lanceolate to occasionally narrowly oblanceolate, 8–17 × 1.5–3 cm, glabrous, attenuate to cuneate at base, acute to

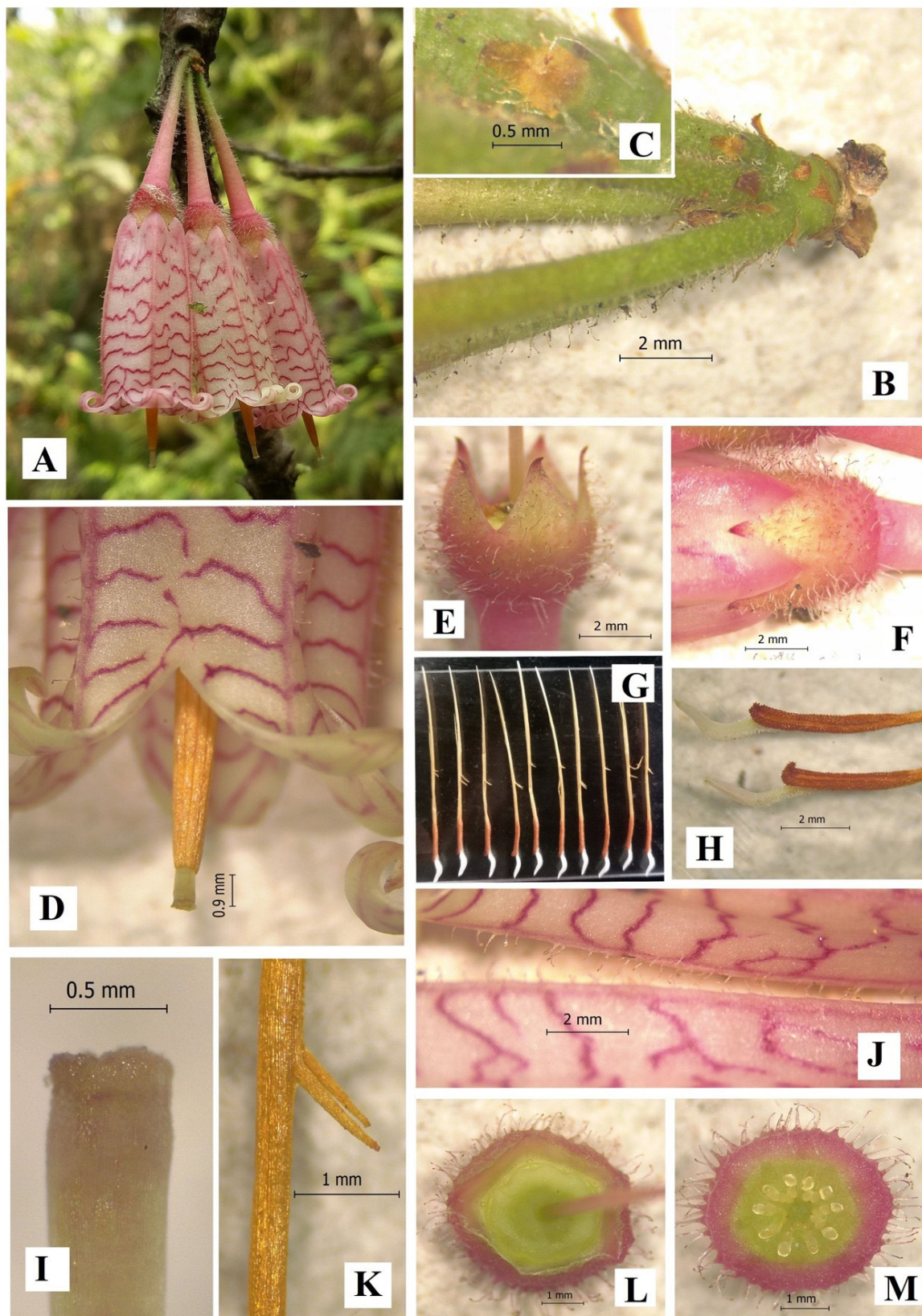
shortly acuminate at apex, margin undulate, subentire or obscurely crenate; midrib raised, thick, smooth; lateral nerves 15–23 pairs, anastomosing with intramarginal nerves; petioles 1–3 mm, green. Inflorescence corymbose, subfasciculate, 4–12 flowered, arising from leafless old branches; peduncle reduced, almost lacking or 1 mm beset with pinkish-white glandular hairs; bracts ovate to linear-subulate, minute, margin with glandular hairs, brown; pedicels 1.5–1.8 cm long, pale green to pink (base to apex), gradually enlarged towards apex, densely glandular hairs towards base; calyx 5-lobed, lobes splitting to middle, connate at base,





*Agapetes bhutanica* N.P. Balakr. & Sud.Chowdhury. A—Habit | B—Leaf | C—Cataphylls on young branchlet | D—Flowers | E—Lignotubers on habitat | F—Cut of Lignotuber | G—Lignotuber with lenticels. © Sanswring Basumatary & Sanjib Baruah.





*Agapetes bhutanica* N.P. Balakr. & Sud.Chowdhury. A—Flowers | B—Pedicels with glandular hairs | C—Bracts | D—Matured floral apex with stamens beak and style | E—F—Calyx | G—Stamens | H—Filaments and anthers | I—Stigma | J—Corolla nerves with glandular hairs | K—Spur | L—Apical view of ovary | M—Transverse section of ovary. © Sanswring Basumatary.

triangular ovate, c. 2–1.6 mm, pinkish to pale green, densely glandular hairs outside; corolla 2.5–3.0 cm long, (in buds 5-angled at apex) tubular at base, 5–7 mm in diameter, slightly enlarged upwards, 8–11 mm in diameter, pinkish-red wavy transverse lines, glandular hairs on nerves outside, lobes 5, c. 6–8×4–5 mm, revolute at apex; stamens 10 in 2 rows, 5 alternating with another 5; filaments linear, incurved, c. 2.5 × 0.8 mm, puberulous, white; anther including tubules c. 2.5 mm long; anther 4–5 mm long, linear-oblong, verrucate, dark brown; tubule c. 2 cm long, golden-yellow, glabrous, spurred at bellow middle of tubule; spur c. 0.7–1 mm long, recurved at c. 45° angled; style filiform, longer than stamens, glabrous, c. 2.9 cm long, pale green; stigma discoid, capitate

**Flowering:** March–May.

**Fruiting:** July–August.

**Habitat:** Epiphyte on the trunk of of *Syzygium formosum* in moist deciduous forest along with mosses, lichens (foliose), and epiphytic Orchidaceae members viz., *Bulbophyllum* spp., *Calostylis rigida*, *Eria lasiopetala* at altitudes ranging 100–500 m.

**Distribution:** India (West Bengal, Assam is being reported in this work), Bhutan.

**Specimens examined:** India, Assam, Kokrajhar District, Chirang Reserve Forest, Ultapani, 27.488 N, 90.663 E, 180 m, 20 March 2021, S. Basumatary & S. Baruah 0371 (ASSAM, BUBH!). Bhutan, eastern Bhutan, near Deothang, on the road to Tashiglang, 800 m, 29 March 1965, N.P.

Balakrishnan 41943A (holo-CAL!); N.P.

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