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Contents

Cover photo: Short-billed Pelican. © B. Ravichandran.

#239
21 October 2023

New locality record of the Calamaria Reed Snake in Agamalai Hills, Western Ghats, India

The Calamaria Reed Snake *Liopeltis calamaria* (Günther, 1858) is a rare snake recorded in Nepal, Sri Lanka, and India (Uetz et al. 2023).

In India, the species is found in the states of Maharashtra, Tamil Nadu, Andhra Pradesh, Uttar Pradesh, Karnataka, Kerala, West Bengal, Jharkhand, Himachal Pradesh, and Uttarakhand (Bilaskar 2023). Northern Indian and

Calamaria Reed Snake *Liopeltis calamaria* in Kuravankudi, Agamalai. © Kalaimani.

View of Agamalai, Theni. © Kalaimani.

Nepalese population is distinct from peninsular India and Sri Lanka (Amarasinghe et al. 2020).

During a trek to the Agamalai Hills on 13August 2012 at around 1345 h, I came across a Calamaria Reed Snake in a pathway of Kuravankudi Village (10.1105 N, 77.4608 E; 900 m), Theni District, Tamil Nadu, India. This site is within the Theni Forest Division with mixed deciduous habitat. I only observed the snake without disturbing, took photographs and noticed the surrounding habitat having mixed forest patches with grassy habitat.

The snake was resting on the horse dung in a pathway. When disturbed, the snake slowly moved to grassy patches close to the pathway. Further survey is needed to understand this species distribution and ecology.

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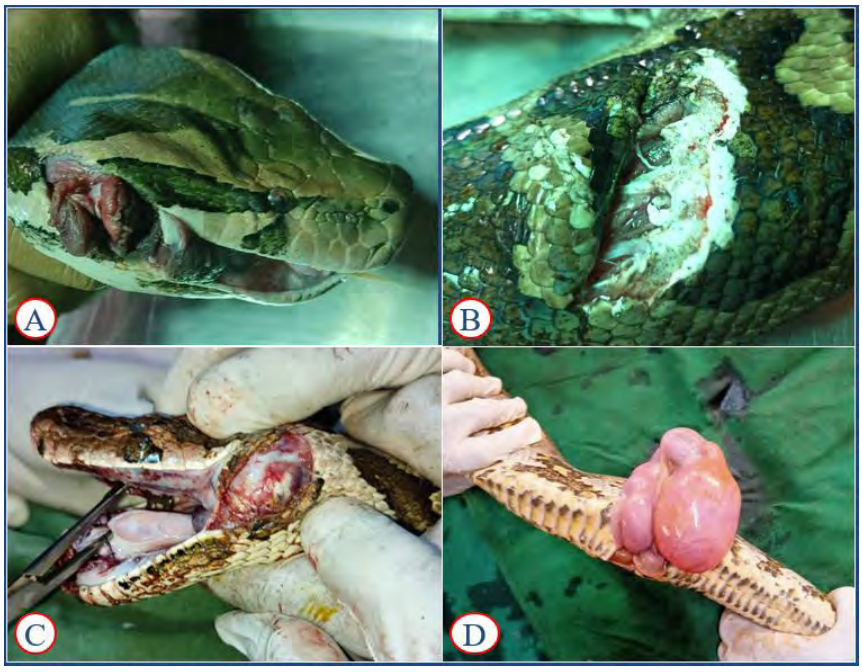
#240
21 October 2023

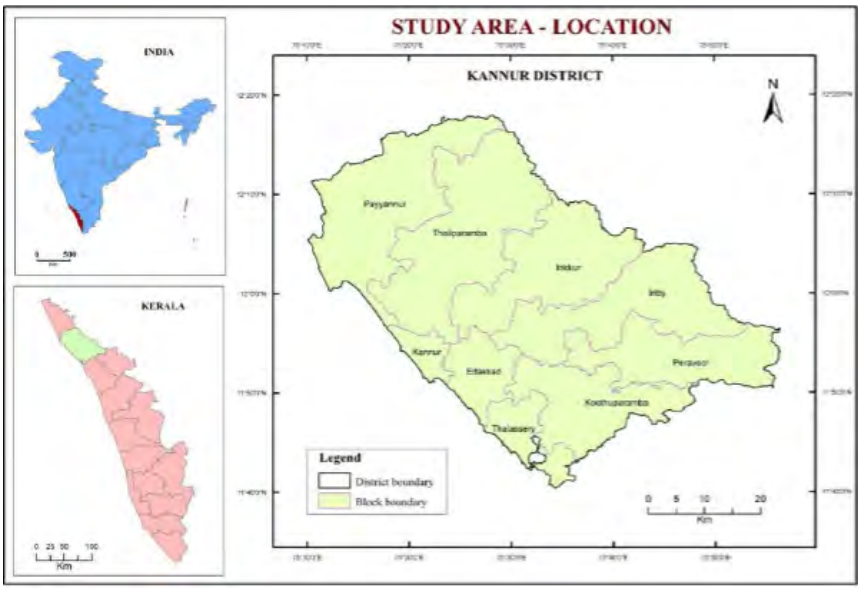
Snake-human conflict: rise in presentation of injured snakes at the Referral Veterinary Hospital in Kannur, Kerala, India

The state of Kerala has a rich diversity of 104 snake species including a few endangered ones (Kerala Forest Department 2021). They inhabit almost all kinds of environments and have a significant ecological impact keeping the local pest population in check and maintaining nature's stability through food webs. Snakes were revered as sacred and their habitats were protected in the past. Presently, these habitats are dwindling causing the snakes to venture out in search of new areas (Roshnath & Divakar 2019). Owing to the easy availability of prey, they at times choose human settlements as hunting grounds. Instances of snakes being killed, snake bite cases and consequent mortality have risen as a consequence (Kerala Forest Department 2020). With the current trend of habitat loss and fragmentation, such incidents might escalate worsening the snake-human conflicts.



Severely lacerated jaw muscles (A), dorsal body wall (B) and skin over jaw (C), and rupture of coelomic cavity with evisceration (D) in Indian Rock Python.

A retrospective evaluation was conducted on cases of snakes presented at the District Veterinary Centre, Kannur, Kerala from different parts of Kannur District during the period from 1 January 2020 to 30 May 2022. This district lies in the northern part of Kerala



The study area.

(11.6669 & 12.8003 N; 75.1669 & 75.9503 E). The district covers around 2,966 km^2 and is bordered on the east by the Ghats of Karnataka's Coorg District, on the south by Kozhikode and Wayanad districts, on the west by the Lakshadweep Sea, and on the north by Kasaragod District. According to 2011 Census, the total population of the district was 2,523,003 (Prasad 2018). Kannur has a complex plant life, with several types of forests such as west coast tropical evergreen forest, west coast semi-evergreen forest, south Indian moist deciduous forest, southern hilltop evergreen forest, plantation crops, and coastal and midland region crops (Kerala Forest Department 2022). The climate is humid, with summer season lasting from March until the end of May. The southwest monsoon follows, which lasts until the end of September. The post-monsoon or receding monsoon lasts from October through November. The coolest climate in the district spans from November through March (Prasad 2018).

A total of 34 snakes were rescued and presented at the hospital following accidental trauma during the period of study. The number of cases increased from seven to 21 during 2021 and already six have been reported by May 2022. The snakes presented were Indian Rock Python *Python molurus* (17), Indian Spectacled Cobra *Naja naja* (7), Russell's Viper *Daboia russelii* (5), Indian Rat Snake *Ptyas mucosa* (2), King Cobra *Ophiophagus hannah* (1), Banded Kukri *Oligodon arnensis* (1), and Indian Sand Boa *Eryx johnii* (1).

Moderate to severe lacerated wounds due to road accidents, trauma from sharp objects and agricultural machineries, and even dog bite were the most common type of injuries encountered in all the species of snakes. Often, the wounds were infected with mucopurulent discharge (Indian Rock Python, Indian Spectacled Cobra, Russell's Viper, Indian Rat Snake, and Indian Sand Boa) or infested with maggots (Indian Rock Python). Punctured wounds over skull, body and trachea were observed in Indian Rock Python, Indian Spectacled Cobra, and Russell's Viper, with concurrent injuries such as severely lacerated wound over body, anterior lower and upper jaw, exenterated teeth and bilateral corneal opacity. Among them, three snakes (Indian Rock Python, Indian

Spectacled Cobra, and Russell's Viper) were presented with streaks of blood in the mouth, trachea and severe internal hemorrhage of which two (Indian Rock Python and Russell's Viper) were in shock during presentation.

The two snakes presented in severe shock succumbed to death within an hour after presentation. Penetrating wound, following trauma with a sharp pointed object, along the dorsal skull to ventral jaw was observed in an Indian Spectacled Cobra. Rupture of coelomic cavity with subsequent evisceration of internal organs was observed in two Indian Rock Python and two Indian Spectacled Cobra. Among them, the Indian Rock Python with severely devitalized internal organs and the Indian spectacled cobra with fracture of multiple ribs, lacerated lung and multiple lacerated wounds succumbed to death in spite of initiation of treatment. Luxation of the vertebrae was observed in two snakes (Indian Spectacled Cobra and Banded Kukri) following fall from height and the body wedged between objects. Severely lacerated jaw muscles along with luxation of joint between the mandible and quadrate was observed in an Indian Rock Python presented following a road traffic accident.

Immediate medical and/or surgical treatments were adopted in all the cases for the stabilization and management of traumatized patients. Fluid therapy was initiated in all the snakes presented with severe dehydration or in shock, administered either subcutaneously or intracoelomically. Moderate lacerations and punctured wounds were thoroughly lavaged with luke warm normal saline solution under manual restraint. In cases of penetrating wounds and severe lacerations, the scales over the skin around the wounds were clipped. The site was scrubbed with 1% chlorhexidine solution and was aseptically prepared with povidone iodine (5%) solution for application of apposition sutures wherever possible under butorphanol-xylazine-ketamine anaesthesia. Topical maggoticidal agents were used in wounds infested with maggots.

Endotracheal intubation was done during anaesthesia to keep the airway patent and the body temperature was maintained with heating pads. In snakes presented with evisceration, the repositioning of eviscerated abdominal organs and surgical repair of ruptured coelom was resorted to under general anaesthesia. The peritoneum, abdominal muscles and its fascia were apposed in simple continuous suture pattern, using 2-0 polyglactin 910 followed by the skin in horizontal mattress suture pattern using 2-0 monofilament polyamide. The luxated mandible in an Indian Rock Python was reduced and fixed in apposition with the quadrate bone by double loop reinforced surgeon's knot using 1-0 polyglactin 910 followed by apposition of the lacerated right anterior temporalis muscle along with its fascia in simple continuous suture pattern using 2-0 polyglactin 910 and the skin in horizontal mattress suture pattern using 2-0 monofilament polyamide. In snakes with tracheal puncture, the wounds were apposed in simple interrupted suture pattern using 3-0 polyglactin 910 under general anaesthesia. The exenterated teeth were surgically removed. The snakes presented with streaks of blood in oral cavity were in shock and hence could be moped

Table 1. The species of snake and the type of injuries.

	Name of species	No.	Type of injury and number of snakes affected		Status
1	Indian Rock Python *Python molurus*	17	Severely lacerated jaw muscles along with luxation of joint between mandible and quadrate, punctured wound on trachea	1	Released
			Lacerated wounds over body due to road traffic accidents	2	Released
			Lacerated wounds over body following trauma from sharp objects	2	Released
			Lacerated wounds over body following trauma from agricultural machineries	4	Released
			Lacerated wounds over body with mucopurulent discharge	2	Released
			Lacerated wounds over body infested with maggots	2	Released
			Punctured wounds with severely lacerated anterior lower and upper jaw, exenterated teeth and bilateral corneal opacity	1	Released
			Severe lacerated wounds over body, streaks of blood in the mouth, trachea and severe internal hemorrhage with punctured wounds over the skull and trachea	1	Dead
			Rupture of coelomic cavity with subsequent evisceration of internal organs	1	Released
			Rupture of coelomic cavity at multiple areas with subsequent evisceration of devitalized internal organs	1	Dead
2	Indian Spectacled Cobra *Naja naja*	7	Lacerated wounds over body with mucopurulent discharge	1	Released
			Lacerated wounds over body following trauma from sharp objects	1	Released
			Lacerated wound on hood	1	Released
			Streaks of blood in the trachea with severe internal hemorrhage and punctured wounds over the skull and along the cranial and caudal one third of the body. Penetrating wound along the dorsal skull to ventral jaw	1	Released
			Lacerated wounds and rupture of coelomic cavity with subsequent evisceration of internal organs	1	Released
			Rupture of coelomic cavity with fracture of multiple ribs, lung laceration and multiple lacerated wound over body	1	Dead
			Luxation of the vertebrae	1	Released
3	Russell's Viper *Daboia russelii*	5	Severe punctured and multiple lacerated wounds with hemorrhage following dog bite. Snake was in shock	1	Dead
			Lacerated wounds over the body with mucopurulent discharge	2	Released
			Lacerated wounds over body following trauma from sharp objects	2	Released
4	Indian Rat Snake *Ptyas mucosa*	2	Lacerated wounds over body following trauma from sharp objects	1	Released
			Lacerated wounds over the body with mucopurulent discharge	1	Released
5	King Cobra *Ophiophagus hannah*	1	Lacerated wound on hood	1	Released

	Name of species	No.	Type of injury and number of snakes affected		Status
6	Banded Kukri *Oligodon arnensis*	1	Luxation of the vertebrae	1	Released
7	Indian Sand Boa *Eryx johnii*	1	Lacerated wounds with mucopurulent discharge	1	Released

dry under manual restraint. Rest was advised in snakes presented with luxated vertebrae.

Postoperatively, long acting enrofloxacin at the rate of 10 mg/kg body weight and meloxicam at the rate of 0.2 mg/kg body weight were administered intramuscularly in all the cases. Regular dressing of the skin and oral wounds was carried out. The skin wound healed completely by the 4th postoperative week in all the snakes and the sutures were removed. The snakes were kept under captivity by the rescue team during the course of treatment under the supervision of the Forest and Wildlife Department, Kannur Division, Kerala and were later released into the wild after recovery. Among the 34 snakes presented with traumatic injuries, four snakes (Two Indian Rock Python, one Indian Spectacled Cobra and Russell's Viper) succumbed to death in spite of initiation of treatment because of the severity of injury.

The human intervention such as urbanization and industrialization have attributed to severe loss of the forest area and rapid degradation of the natural habitats of snakes (Soga & Gaston 2020; Hiremani et al. 2022). The majority of injuries recorded were from agricultural operations using automated machineries to prepare the soil. The district had a reserve forest area of 207.39 km^2 and vested forest area of 98.90 km^2 in 2009 (Kerala Forest Department 2009). This has shrunk by 55 per cent (114.03km^2) and 39 per cent (38.52 km^2) respectively by 2019 with a staggering loss of 50% of total forest area of the district and is still dwindling at an alarming rate (Kerala Forest Department 2019). When a human sees a snake, they typically assault it out of panic (Burghardt et al. 2009) resulting in severe harm, which account for another cause of death. Road accidents also accounted for a significant share of injuries inflicted on these reptiles (Bhandarkar & Paliwal 2021). The majority of the incidents occurred on roads that ran through snake inhabited forests or similar environments (Filius et al. 2020; Bhandarkar & Paliwal 2021).

Snakes in their native environment regulate the populations of their prey and are the nature's most effective pest controllers especially rodents that can spread diseases and wreak havoc on crops (Mullin & Seigel 2009). On the other hand, they can be prey for a variety of predators, including other snakes. When they are an invasive species in the ecology with little or no control over their population, they might pose a problem. Both the introduction and removal of snakes can have unforeseen effects on an ecosystem. Land clearance for agriculture, urban expansion, and the introduction of domestic pets has put snake species in jeopardy. Thus, in order to reduce human-snake

conflicts and to create a snake-friendly society, organized conservation strategies and initiatives for snake rescue are required. Also, public education and awareness programmes need to be formulated for better knowledge and understanding of snakes and their conservation.

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First observation on multi-male necrophilic amplexus and mass mortality of amplectant adult females in the Common Asian Toads

Necrophilia (i.e., amplexus with dead individual) also known as thanatophilia, necrogamy or davian behavior (Bettaso et al. 2008) and misdirected copulation (Ayres 2010) is an unusual phenomenon reported among a few animal species. Pearl et al. (2005) reported that this type of behaviour appears to be more common among anurans. It is reported that at least 23 species of amphibians, mostly anurans, have exhibited necrophilic behavior, including from the Americas and Europe (Bettaso et al. 2008; Sinovas 2009; Brito et al. 2012; Izzo et al. 2012). Among Asian fauna, Patel et al. (2016) observed an adult male *Duttaphrynus melanostictus* in axillary amplexus with a road killed conspecific female, remarking that it occurs due to improper recognition by males resulting in behavioral mistakes (Bettaso et al. 2008; Sinovas 2009; Brito et al. 2012). Explosive breeding among amphibians also results in multiple amplexus, where more than two individuals

Duttaphrynus melanostictus **(clockwise from top left), showing |A| multi-male amplexus; |B| breeding congregation in rainwater pool; |C| dorsal; and |D| ventral views of dead adult females. © M.C. Sathyanarayana.**

are involved in mating. On rare occasions, multiple males mount a dead female, as observed by Pintanel et al. (2021) in the hylid frog *Scinax tsachila*. Rai (2022) reported this behavior in the Himalayan Toad *Duttaphrynus himalayanus*. Patel & Das (2022) also reported such behavior in *D. himalayanaus*, but strangely, also involving activity of one adult male *D. melanostictus*. In this note, we present our observations on similar, multi-male davian behavior, involving dead female common toads *D. melanostictus*.

During October 2021, we observed a pair of *D. melanostictus* in amplexus in a small artificial pond in Senganthal Park (13.0514 N, 80.2545 E), Avvai Shanmugam Salai, Chennai, India. Later, two to three more males (with bulgy vocal sacs, sometimes vocalising) were observed to congregate and interrupt this pair. A closer observation

revealed no movement on the part of the female, even when multiple males were seen grasping it. For up to half an hour, we waited and continued the visual observation so as to not interrupt the happening. Later, when the amplexus was over, the males parted and the female was seen floating immobile and still on the water surface. Since the female appeared motionless, to confirm if it was alive or dead, we turned it upside down. When turned, it remained still revealing that it had died. The next day, when we resumed our observations at the morning hours, the dead female was seen floating upside down on the water surface. Lack of extendable vocal sac and any keratinous ridges on innermost fingers revealed that it was in deed a female. Its alimentary canal and other viscera were lying out of its body orifices both anteriorly and posteriorly. It is hypothesized that this was probably caused due to excess pressure during mounting by the multiple males. Thus, the female might have most likely died during the single or multiple amplexus. Interestingly, no male was seen to be physically in contact or associated with the floating dead female for amplexus on the second day of observation.

During late October and early November, on six occasions, groups of up to 20 dead *D. melanostictus* with partially distorted body postures were seen floating next to one another in inundated garden pools and water channels. Male toads were also sighted in the same place, but were all alive. When examined closely, the dead toads seen floating together in the rainwater pools, were all without any trace of throat pouch and keratinous black knobs on thumb, thereby confirming their sexes as females. Contrarily, those toads that were seen alive exhibited these sexual morphological characters and were also distinctly smaller in their overall size, compared to the dead females. Continued observations were made during rains in early November and such congregations of dead toads, all females, often accompanied by small groups of males were becoming more or less a commonplace. During our repeated observations on the two sexually dimorphic characters, viz., presence of a single, mid-gular vocal sac and black keratinous ridges on thumb, we were able to certainly identify the gender of the toads that were alive and dead. It was also observed that as the day passed by, the calling vigour and intensity of the competing males dropped lower and lower, perhaps due to the reduced stimulus as a consequence of the reduced presence of adult females.

Davian behaviour is considered an ecological trap since persistent necrophilic males may lose or experience diminished opportunities to successfully reproduce during breeding season (Ayres 2010; Alvarez et al. 2020). It is also reported that necrophilia results in an increased predation risk to the mounting male due to longer time spent in the breeding site hopelessly waiting for the (dead) female to release ova for external fertilisation. Since in this case, the behaviour occurred in daylight (an atypical activity time for *D. melanostictus*) and in shallow water (½ feet depth), the risk of predation was apparently high. Patel et al. (2016) reported a road kill female involved in such an amplexus, thereby also predisposing

the male present atop it, to vehicular traffic mortality. It may also facilitate the infection spread. Pintanel et al. (2021) observed a multiple amplexus involving necrophilia in the Neotropical Hylid Frog *Scinax tsachila*. It is reported that at least 23 species of amphibians mostly anurans have exhibited necrophilia (also see Izzo et al. 2012). As for this case, further studies are required to understand the discrete mechanisms and purpose of the various aberrations from the normal amplexus in *D. melanostictus*.

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Short note on the mating behavior of Red-wattled Lapwing from the Bhal region of Gujarat

Red-wattled Lapwing *Vanellus indicus* is a prominent bird of Asian agricultural lands, and they are medium-sized birds having compact bodies, short and thick necks, and long pointed wings. Red-wattled Lapwing is a carnivorous bird as it sustains a range of insects, snails, and other invertebrates mostly picked from agricultural areas. Hence Red-wattled Lapwing is referred to as a biocontrol agent in controlling insects (Ali & Ripley 1998). Various aspect of Red-wattled Lapwing has been studied in a different parts of India (Kumar et al. 2020), however breeding behaviour has been observed mostly in the agricultural areas and the breeding season of Lapwing has been considered from April to July (Kumar et al. 2020). Here we report mating activity of Red-wattled Lapwing from the Bhal region, which was observed on the evening of 8 February 2022, nearby Kotda Village (21.9700 N, 72.1419 E) Bhavnagar District of Gujarat, near the coast of the Gulf of Cambay. The surrounding area was open

Mating pair of Red-wattled Lapwing. © Shailesh Desai.

but had sparse to moderate *Prosopis juliflora* cover as well as few types of grass species. However, this pair was located nearby a small house.

While interviewing the local people about our ongoing survey of the Indian Grey Wolf *Canis lupus pallipes* conservation Program (IWCP), we suddenly heard the call from Lapwing (first mount), and we found a pair of lapwings in a nearby house in a small plot of *Prosopis juliflora*. After 1–2 minute, they mounted again (second mount) and made the same voice, which was heard in the first attempt, then we paid much attention to third mounting and we also capture in Canon SX70 camera. In between the mounting, they were walking with each other in the same plot and remained indulged in playing with small sticks, and each mount occurred with a gap of 1–2 minutes and each mount continued for less than two to three-second. However, we are not certain if another mounting has occurred before or after our observation. To our knowledge this might be the first behavioural mating note on Red-wattled Lapwing,

hence we are not sure, how many times this mount occurred. However, the breeding period of Lapwing has been considered as April to July (Kumar et al. 2020), whereas we have observed the mating in early February, this could be the difference in habitat or latitudinal and longitudinal or whether or climate change-related variation (Hällfors et al. 2020).

Red-wattled Lapwing is an important bird to the agroecosystem and has been classified as 'Least Concern' by the IUCN Red List. It faces threats from a change in traditional farming, trampling by grazing animals, and dogs (Sethi et al. 2011). Our observation contradicts previous observations of the mating period, which might be due to variation in habitat and environment; however, we recommend further behavioural studies in different areas.

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The Orange-breasted Green-Pigeon: new addition to Dharmapuri District of Tamil Nadu, India

The Orange-breasted Green-Pigeon *Treron bicinctus* is a resident bird to peninsular India. This bird is distributed from West Bengal and Chotta Nagpur southward along the Eastern Ghats, also inhabiting the Western Ghats and associated hill ranges from Kerala northward through Karnataka to Goa and it prefers evergreen and dry deciduous forest types, similar to all other green pigeons, it is gregarious, arboreal, and a frugivore bird (Ali & Ripley 1983). According to Rasmussen & Anderton (2012), this pigeon is resident in the Himalaya and in the large parts of eastern India, Western Ghats and central India.

Orange-breasted Green Pigeon. © Suryaprahasan Raja.

Our team members recorded two Orange-breasted Green-Pigeon in the Vanniyaru Dam beat at Danishpet Range in Dharmapuri District of Tamil Nadu during bird and butterfly survey on 19 December 2021. These birds were photographed by using Nikon Coolpix p900 camera (83X wide optical zoom 24–2,000 mm). Its identification was confirmed by using the field guide of Grimmett et al. (2011). Also, these birds were continuously observed for 30 minutes (1100–1130 h) through Pentax (16×50 mm) binocular at an approximate 50 m distance. The male and female birds can be easily distinguished from their plumage colours. The male has orange breast bordered above by lilac band and yellowish-green forehead merging into pale blue-grey hind crown, nape and the tail is slaty-grey above, underside of the tail was black with grey tip and mantle is uniformly green. Similarly, the female has yellow cast to breast and belly, and grey hind crown and nape. In Sri Lanka, the female pigeons lack pronounced yellow forehead and throat.

The occurrence of this Orange-breasted Green-Pigeon in the Vanniyaru Dam beat of Danishpet Range in Dharmapuri District of Tamil Nadu is the first record in this region. Previously this bird was recorded in Assam (Barua & Sharma 1999, 2005; Choudhury 2006), Arunachal Pradesh (Choudhury 2003),

Odisha (Gopi & Pandav 2007), Uttar Pradesh (Javed & Rahmani 1998), Karnataka (Srinivasan & Prashanth 2006), Uttarakhand (Kaushik 2013), Maharashtra (Hiragond & Gavade 2013; Khare & Thatte 2015). Frederick (2011) reported the species for the first time in the Panna National Park of Madhya Pradesh, and near Chennai in Tamil Nadu.

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A study on the status and diversity of the avifauna in Savadatti, Belagavi District, Karnataka, India

India, as a major centre of biodiversity, harbours approximately 13% of the global avian population (Ali & Ripley 1987; Grimmett et al. 1998). The availability and suitability of bird habitats with respect to vital resources like food, water, and cover may be affected by changes in vegetation composition. Consequently, these changes can have subsequent implications for the variety, abundance, and dispersion of bird populations, and therefore, the evaluation of avian diversity across various habitats in both temporal and spatial dimensions is crucial in understanding the current state of avian communities. Although there have been numerous important field surveys on avian diversity in Karnataka State (Barve & Warrier 2013; Konkal & Ganesh 2014; Bhat et al. 2009), there is currently a lack of published data regarding the status of bird diversity in regions that encompass both semiarid and wetlands ecosystems.

Map of Karnataka showing Belgaum District (A), Savadatti Taluk (B), and study area (C).

Savadatti is a religious town in the Belagavi District of Karnataka State that features semi-arid conditions and a wetland zone. The town is situated between the latitudinal parallels of 15.6092 & 16.1563 N, as well as the longitudinal parallels of 74.8027 & 75.3184 E. It has semi-arid climatic conditions and encompasses a wetland region. Nevertheless, there is a lack of documented information regarding the richness of bird species in

Table 1. Checklist of avifauna in Savadatti region.

	Order	Family	Scientific name	Common name	IUCN Red List status	Food habit
1	Accipitriformes	Accipitridae	*Accipiter badius*	Shikra	LC	CV
2			*Elanus caeruleus*	Black-winged Kite	LC	CV
3			*Haliastur indus*	Brahminy Kite	LC	CV
4			*Milvus migrans*	Black Kite	LC	CV
5			*Pernis apivorus*	European Honey-buzzard	LC	CV
6		Pandionidae	*Pandion haliaetus*	Osprey	LC	CV
7	Anseriformes	Anatidae	*Anas poecilorhyncha*	Indian Spot-billed Duck	LC	H
8	Apodiformes	Apodidae	*Apus affinis*	Little Swift	LC	I
9	Bucerotiformes	Bucerotidae	*Ocyceros birostris*	Indian Grey Hornbill	LC	I
10		Upupidae	*Upupa epops*	Eurasian Hoopoe	LC	I
11	Charadriiformes	Charadidae	*Vanellus indicus*	Red-wattled Lapwing	LC	I
12			*Vanellus malabaricus*	Yellow-wattled Lapwing	LC	I
13		Recurvirostridae	*Himantopus himantopus*	Black-winged Stilt	LC	P
14		Scolopacidae	*Actitis hypoleucos*	Common Sandpiper	LC	I
15	Ciconiformes	Ciconiidae	*Anastomus oscitans*	Asian Openbill	LC	CV
16	Columbiformes	Columbidae	*Columba livia*	Rock Pigeon	LC	G
17			*Spilopelia chinensis*	Spotted Dove	LC	G
18			*Spilopelia senegalensis*	Laughing Dove	LC	G
19	Coraciiformes	Alcedinidae	*Halcyon smyrnensis*	White-throated Kingfisher	LC	CV
20		Meropidae	*Merops orientalis*	Asian Green Bee-eater	LC	I
21	Cuculiformes	Cuculidae	*Cacomantis passerinus*	Grey-bellied Cuckoo	LC	O
22			*Centropus sinensis*	Greater Coucal	LC	CV
23			*Eudynamys scolopaceus*	Asian Koel	LC	O
24			*Taccocua leschenaultii*	Sirkeer Malkoha	LC	O
25	Galliformes	Phasianidae	*Gallus gallus*	Red Junglefowl	LC	O
26			*Gallus sonneratii*	Grey Junglefowl	LC	O
27			*Ortygornis pondicerianus*	Grey Francolin	LC	O
28			*Pavo cristatus*	Indian Peafowl	LC	O
29	Gruiformes	Rallidae	*Amaurornis phoenicurus*	White-breasted Waterhen	LC	O
30			*Porphyrio poliocephalus*	Grey-headed Swamphen	LC	O
31	Passeriformes	Aegithinidae	*Aegithina tiphia*	Common Iora	LC	I

	Order	Family	Scientific name	Common name	IUCN Red List status	Food habit
32	Passeriformes	Alaudidae	*Eremopterix griseus*	Ashy-crowned Sparrow-Lark	LC	I
33		Campephagidae	*Lalage melanoptera*	Black-headed Cuckooshrike	LC	I
34		Cisticolidae	*Orthotomus sutorius*	Common Tailorbird	LC	I
35			*Prinia hodgsonii*	Gray-breasted Prinia	LC	O
36			*Prinia socialis*	Ashy Prinia	LC	O
37			*Prinia sylvatica*	Jungle Prinia	LC	O
38		Corvidae	*Corvus splendens*	House Crow	LC	O
39		Dicruridae	*Dicrurus caerulescens*	White-bellied Drongo	LC	I
40			*Dicrurus leucophaeus*	Ashy Drongo	LC	I
41			*Dicrurus macrocercus*	Black Drongo	LC	I
42		Estrildidae	*Euodice malabarica*	Indian Silverbill	LC	O
43			*Lonchura punctulata*	Scaly-breasted Munia	LC	O
44		Emberizidae	*Emberiza buchanani*	Grey-necked Bunting	LC	O
45		Hirundinidae	*Hirundo smithii*	Wire-tailed Swallow	LC	O
46		Laniidae	*Lanius schach*	Long-tailed Shrike	LC	CV
47			*Lanius vittatus*	Bay-backed Shrike	LC	CV
48		Leiothrichidae	*Argya caudata*	Common Babbler	LC	O
49			*Argya malcolmi*	Large Grey Babbler	LC	O
50			*Argya striata*	Jungle Babbler	LC	O
51		Motacillidae	*Anthus rufulus*	Paddyfield Pipit	LC	I
52			*Motacilla cinerea*	Grey Wagtail	LC	I
53			*Motacilla flava*	Western Yellow Wagtail	LC	I
54			*Motacilla maderaspatensis*	White-browed Wagtail	LC	I
55		Muscicapidae	*Copsychus fulicatus*	Indian Robin	LC	CV
56			*Copsychus saularis*	Oriental Magpie-Robin	LC	CV
57			*Monticola solitarius*	Blue Rock-Thrush	LC	O
58			*Muscicapa dauurica*	Asian Brown Flycatcher	LC	I
59			*Saxicola caprata*	Pied Bushchat	LC	I
60		Nectariniidae	*Leptocoma zeylonica*	Purple-rumped Sunbird	LC	O
61			*Cinnyris asiaticus*	Purple Sunbird	LC	O
62		Oriolidae	*Oriolus kundoo*	Indian Golden Oriole	LC	O
63		Paridae	*Parus cinereus*	Cinereous Tit	LC	I
64		Passeridae	*Passer domesticus*	House Sparrow	LC	G
65		Ploceidae	*Ploceus philippinus*	Baya Weaver	LC	H
66		Pycnonotidae	*Pycnonotus cafer*	Red-vented Bulbul	LC	H
67		Rhipiduridae	*Rhipidura albogularis*	Spot-breasted Fantail	LC	I

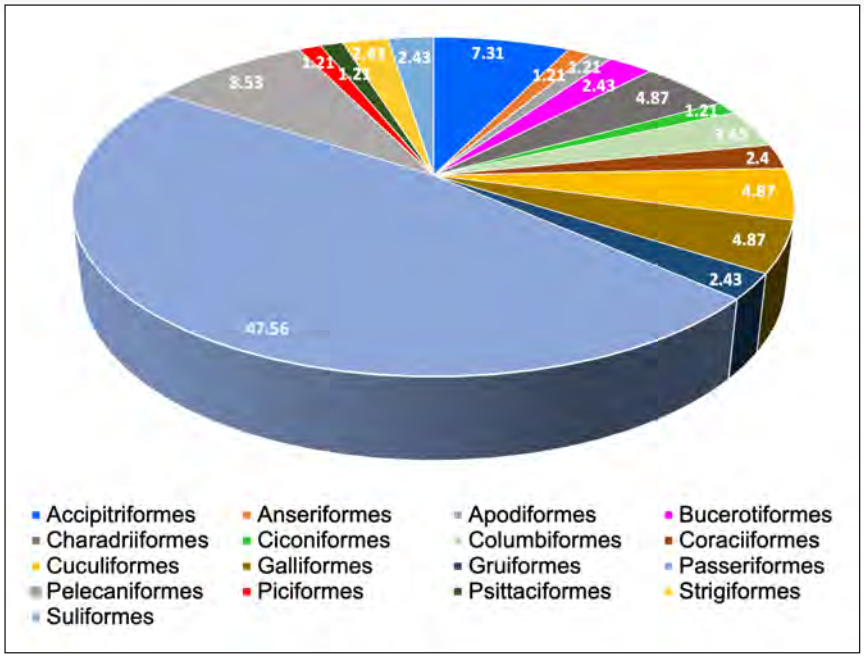
	Order	Family	Scientific name	Common name	IUCN Red List status	Food habit
68	Passeriformes	Sturnidae	*Acridotheres tristis*	Common Myna	LC	O
69			*Sturnia pagodarum*	Brahminy Starling	LC	O
70	Pelecaniformes	Ardeidae	*Ardea alba*	Great Egret	LC	CV
71			*Ardea cinerea*	Grey Heron	LC	CV
72			*Ardea intermedia*	Intermediate Egret	LC	P
73			*Ardeola grayii*	Indian Pond-Heron	LC	CV
74			*Bubulcus ibis*	Cattle Egret	LC	I
75			*Egretta garzetta*	Little Egret	LC	CV
76		Threskiornithidae	*Threskiornis melanocephalus*	Black-headed Ibis	NT	CV
77	Piciformes	Megalaimidae	*Psilopogon haemacephalus*	Coppersmith Barbet	LC	F
78	Psittaciformes	Psittaculidae	*Psittacula krameri*	Rose-ringed Parakeet	LC	H
79	Strigiformes	Strigidae	*Athene brama*	Spotted Owlet	LC	CV
80			*Bubo bengalensis*	Rock Eagle-Owl	LC	CV
81	Suliformes	Phalacrocoracidae	*Phalacrocorax fuscicollis*	Indian Cormorant	LC	P
82			*Microcarbo niger*	Little Cormorant	LC	P

P—Piscivore | O—Omnivore | I—Insectivore | H—Herbivore | G—Granivore | CV—Carnivore | F—Frugivore | NT—Near Threatened | LC—Least Concern.

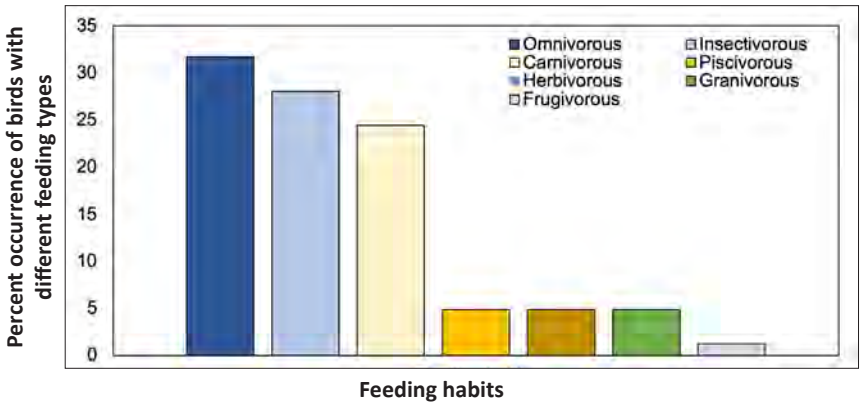
this geographical area. The primary aim of this study is to record and analyse the variety and current status of bird species in Savadatti town, located in the Belagavi region of Karnataka State. The fieldwork was conducted twice per month over a span of 10 months, from October 2021 to July 2022. The avian species were systematically observed in their natural ecological setting across an area of 4.20 square kilometres, commencing in the early hours of the morning and extending until the late hours of the evening. The study was mostly conducted using the visual-encounter methodology. The birds were photographed using a DSLR camera (Canon, 18 megapixels) and identified up to the lowest possible taxonomic level with the help of field guides (Woodcock 1980; Ali & Ripley 1983; Grimmett et al. 1998; Ali 2002).

The present study documented the occurrence of 82 species, belonging to 17 orders and 43 families in Savadatti town, Belagavi District, Karnataka (Table 1). Among these, Passeriformes were dominated with 39 species (47.56%), followed by Pelecaniformes with seven species (8.53%), Accipitriformes with six species (7.31%), Charadriformes, Galliformes, and Cuculiformes with four species each (4.87% each), Columbiformes with three species (3.65%), and Bucerotiformes, Coraciformes, Gruiformes, Strigiformes, and Suliformes with two species each (2.43% each). On the other hand, the orders such as Anseriformes, Apodiformes, Ciconiformes, Piciformes, and Psittaciformes consisted of only one species each (1.21% each).

The food habit serves a crucial role in ensuring the survival of all species. In the present study, omnivorous birds comprised the largest



Pie chart showing percent distribution of different avian orders in Savadatti region.



Bar diagram showing percent occurrence of birds with different feeding habits in Savadatti region.

proportion (31.70%), followed by insectivorous (28.04%), carnivorous (24.39%), piscivorous, herbivorous and granivorous (4.87% each), and frugivorous (1.21%) species. Due to the abundance of food in grasslands, arid regions, and wetland habitats, omnivorous and carnivorous birds can be found throughout the year, whereas insectivorous birds are primarily observed in the late winter and early summer. In open woodlands, avian species such as Shikra, Black Kite, and European Honey-buzzard (Accipitridae) were observed, while Red-wattled Lapwing and Yellow-wattled Lapwing (Charadridae) were spotted in agricultural fields. On marshy lakeshores, other birds such as Black-winged Stilt (Recurvirostridae), Indian Spot-billed Duck (Anseriformes), and Common Sandpiper (Scolopacidae) were frequently observed. Passeriformes birds were abundant in herbaceous, shrubby, and tree-covered regions, whereas Pelecaniformes and some Gruiformes were observed near the riverbanks, possibly due to the reservoir's year-round water supply. Some birds, such as the Asian Openbill (Ciconidae), were seen during the winter, but migration was observed in early summer.

The number of species with the IUCN Red List status of 'Least Concern' was much greater than the number of species listed as 'Near Threatened' (Table 1). During the survey period, rare sightings of birds such as the Black-headed Ibis (Threskiornithidae), Gray Francolin (Phasianidae), and Rock Eagle-Owl (Strigidae) were recorded. Nevertheless, human activities such as gaming and hunting, the conversion of grasslands to cultivable land, etc., appear to be a considerable threat to

the birds in this region. Therefore, conservation programmes must be implemented in this region before these birds become rare and endangered.

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Recollection of *Syzygium diospyrifolium* from Assam after 109 years

Assam is often considered as the platform that comprises of both Himalayan and Indo Burmese biodiversity components. In regard to this, several interesting plants of southeastern Asian origin have been recorded from this region due to similar habitat and physical structures.

The genus *Syzygium* Gaertn. (Myrtaceae) is represented by ca. 84 species from India while ca. 34 species are recorded from northeastern India (Shareef & Kumar 2020; Dey et al. 2022; POWO 2023).

Syzygium diospyrifolium (Wall. ex Duthie) S.N. Mitra was first described by J.F. Duthie as *Eugenia diospyrifolia* based on the specimens collected by N. Wallich's collector F. De Silva from "Montes Sillet" (present day Sylhet region of Bangladesh) and Griffith from Khasia mountains (Duthie 1878). The latter collection has not been located in any herbaria so far (Byng et al. 2015).

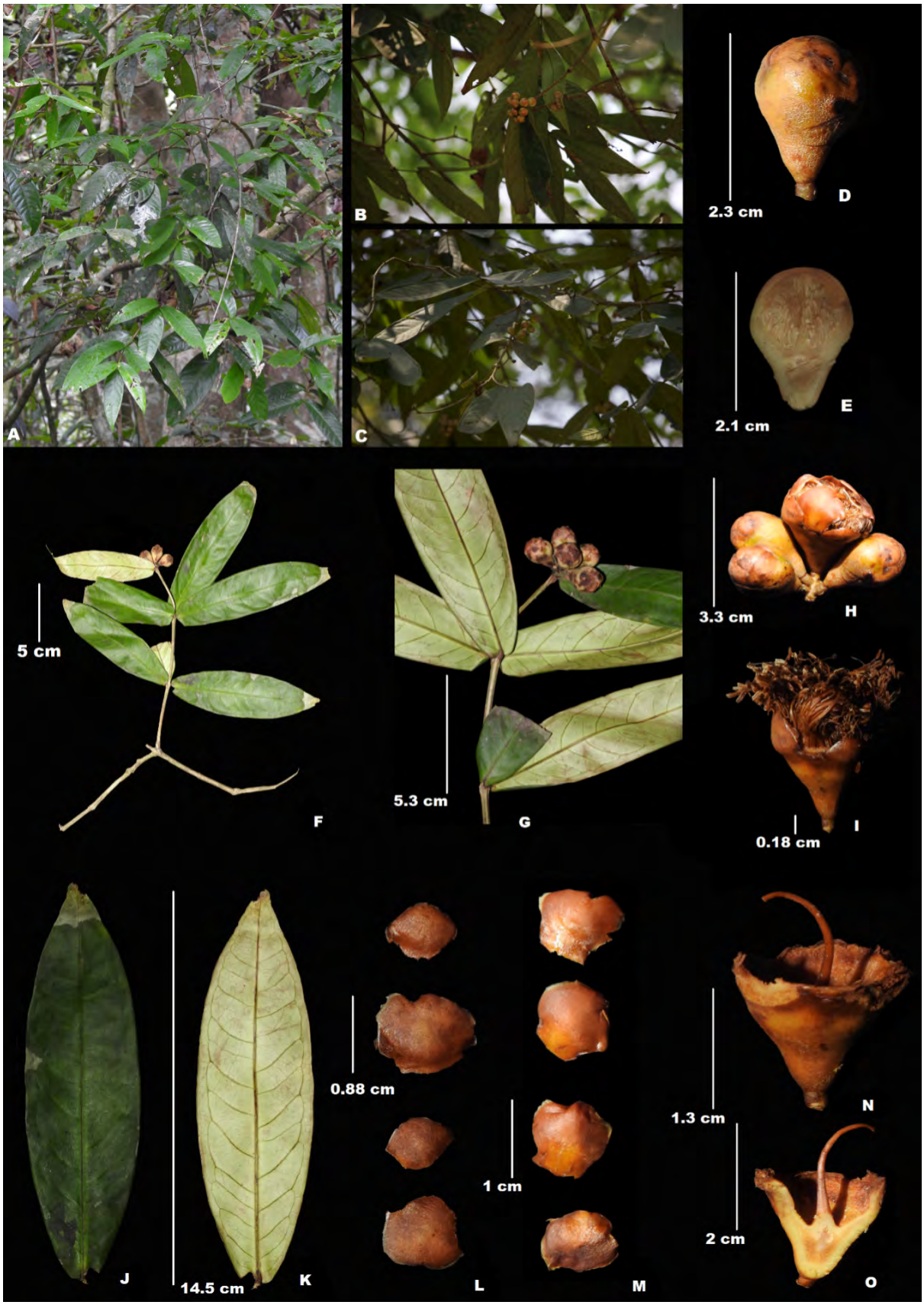
Upon consultation at CAL and ASSAM herbaria, the authors observed that the species has been collected from Sylhet District, Bangladesh and Khasi-Jaintia Hills, Meghalaya by several subsequent workers inferring that the species is quite common in the respective areas. However, considering the geographical boundaries of the present-day Assam, the species has only been collected once by U.N. Kanjilal (Coll. No. 1729) in 1912 from Rengma Reserve of greater Sibsagar District, Assam.

During a revisionary work of the genus *Syzygium* in Assam, the authors came across an interesting jambolan species growing near the Borajan forest of Tinsukia District. After thorough consultation with the original protologue, type specimens and additional literature like Kanjilal et al. (1938), Balakrishnan (1981), Haridasan & Rao (1985), Singh (2002), and Soh & Parnell (2015), the species was identified as *S. diospyrifolium* (Wall. ex Duthie) S.N. Mitra. It is a recollection of the species from Assam after a gap of 109 years.

The present article provides a detailed morphology of the species with field photographs and illustrations for better identification. The voucher specimens are deposited at the ASSAM herbarium, Shillong and Gauhati University Botanical Herbarium (GUBH) for future references.

Syzygium diospyrifolium (Wall. ex Duthie) S.N.Mitra, Indian Forester 99: 100 (1973)
Eugenia diospyrifolia Wall. ex Duthie in Hook.f., Fl. Brit. Ind. 3: 472 (1878)
Jambosa diospyrifolia (Wall. ex Duthie) C.E.C.Fischer, Rec. Bot. Surv. India 12: 95 (1938)

Type: Bangladesh. Silhet, *Wallich* Cat. No. 3617 K [barcode K000793889 (digital image!)]; isolectotype K [barcode K000793888 (digital image!)], BM [barcode BM001122720 (n.v)]. Lectotype designated by Byng et al. (2015).



Syzygium diospyrifolium A–C—Habit | D–E—A bud | F–G—Flowering twigs with ternate leaves | H—Inflorescence | I—Complete flower | J–K—Leaves | L—Sepals | M—Petals | N—Hypanthium | O—L.S. of hypanthium.

Description: Arborescent to tree; stem brachiate at the crown, bark whitish grey, smooth; *branchlets* slender, light brown, 0.2–0.3 cm diameter, internodes terete-angled, nodes triangular to opposite; leaves usually ternate in young leafy branchlets at tip, opposite in old flowering branchlets, sub-sessile, sub-coriaceous, glabrous, oblanceolate to oblong-elliptic, acuminate tip, often caducous, 12–28 x 4–10 cm, sub-cordate base, midrib with lateral nerves distinct on ventral surface, 14–18 pairs, intramarginal vein lopped, 0.3–0.5 cm from the margin, outer intramarginal vein present, faint, petiole 0.3–0.4 cm long; inflorescence 3–5 flowered, rarely more, strictly terminal, compactly fascicled at the apex of branchlets, 3–3.5 cm long, peduncle short, buds globular, 2.1–2.3 cm; flowers 2.8–3.5 x 1.7–2 cm, whitish-pink, pedicel short, pedicel 0.1–0.2 cm; hypanthium pyriform, depressed, mouth wider, base narrowed, pinkish-green, intra-staminal disc slightly corky, 1.3–1.5 x 1.5–1.7 cm; calyx lobes 4, free, unequal, 0.6–0.88 x 0.8–1.15 cm, greenish-white, thick, prolate to oblate, persistent; petals 4, free, equal, 0.7–0.9 x 0.9–1.1 cm, pinkish-white, semi-coriaceous, semi-orbicular, caducous; stamens numerous, brownish-white, anther *ca*. 0.25 cm long, dorsifixed; style white, persistent, arcuate, 2–5 cm long, tip often caducous, base broad; fruits not seen.

Phenology: Flowering April to May. Fruiting not seen.

Distribution: India (Assam, Meghalaya, and Mizoram), Bangladesh, Cambodia, Malaysia, Myanmar, Thailand, Vietnam.

Habitat: Terrestrial, mainly found along tropical wet evergreen forest growing in close association with other forest flora.

Specimens examined: Bangladesh, Mt. Sylhet, s.d., N. Wallich 3617 A (barcodes HUH01143301, HUH01143302, HUH01143303 digital images!); Mont. Sillet, s.d., N. Wallich 3617 K (barcode K001119836 digital image!); India, Assam: Sibsagar, Rengma Reserve Forest, 16.04.1912, U.N. Kanjilal 1729 (CAL 167875!, ASSAM 10807!); Tinsukia, Borajan Village, 27.04.2021, D. Dey DDS02 (GUBH!); Tinsukia, Borajan Village, 21.05.2021, D. Dey DDS36 (ASSAM!).

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A new distribution record of the macrofungus *Galiella rufa* from Assam

Galiella rufa (Schwein.) Nannf. & Korf is a macrofungus also known as the Rubber Cup, the Rufous Rubber Cup, or the Hairy Rubber Cup, in the family Sarcosomataceae, order Pezizales, class Pezizomycetes, phylum Ascomycota, and kingdom Fungi. The fruit body of *G. rufa* is not considered edible in North America but it is edible in Malaysia. The macrofungus produces several interesting natural products. *G. rufa* produces several structurally related hexaketide compounds that have attracted attention for their biological properties: pregaliellalactone and galiellalactone (Köpcke et al. 2002a). The compounds have anti-nematodal activity to kill nematodes (Köpcke et al. 2002b). These compounds have been shown in laboratory tests to inhibit the early steps of the biosynthetic pathways induced by plant hormones known as gibberellic acids, and they also inhibit the germination of seeds of several plants (Hautzel & Anke 1990). So, the species is very important from medicinal point of view.

A–F—Different developmental stages of *Galiella rufa* | G—Vertical section of macrofungus |H—An ascus showing eight ascospores | I—Measurement of an ascospore. © Girish Gogoi.

The fruit body was found in the campus of ICFRE-Rain Forest Research Institute (RFRI), Jorhat, Assam on 21 June 2023 on a heap of dead and decaying twigs of trees. The geographical position where the macrofungus was found

is 26.7808 N & 94.2933 E, and 118 m. This is the first distribution report of *Galiella rufa* from Assam. The macrofungus was collected by the first author and micromorphological study was done in the Mycology Laboratory of ICFRE-RFRI, Jorhat. The specific epithet *rufa* means "rusty" or reddish-brown" that refers to the colour of the hymenium. In the initial stage the fruit bodies of *G. rufa* was closed and roughly spherical that looks like a puffball. Later on the puffball like fruit body opened in the shape of a shallow cup, and reached diameters of 1.5–5.5 cm wide. The height of the fruit body ranges 2–7 cm. The margin of the cup is curved inwards and irregularly toothed; the teeth are lighter colour than the hymenium. The interior surface of the cup, which bears the spore-bearing surface (the hymenium) is reddish-brown to orange-brown. The exterior surface is blackish-brown, and covered with hairs that measure 7–8 µm long that give it a felt-like or hairy texture. Stipe mostly lacking but sometime a pseudostipe extending downward to 4 mm. The flesh of the fruit body lacks any distinctive taste or odour, and is grayish, translucent, gelatinous, and rubbery. The vertical section of the macrofungus shows water inside the fruit body.

Galiella rufa was found saprobic, and can grow solitarily, more usually in groups or in clusters on decaying twigs, and dead wood. The macrofungus is found in midwest and eastern North America (Seaver 1942). The species is also found in Malaysia (Abdullah & Rusea 2009). The asci bear eight ascospores and the spores were found thin-walled, ellipsoid-subfusoid, hyaline, with narrowed ends, and covered with fine warts. The dimensions of the spores were of 12–22.8 x 8–12.1 µm. The length of the asci was 200–250 µm. The paraphyses were found cylindrical, septate, slender, and threadlike.

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Report on the Himalayan Langur Project (HLP) Workshop

In late September of this year, the Himalayan Langur Project (HLP) proudly organized a series of informative workshops featuring HLP coordinator, Vishal Ahuja. The workshops took place on the 27th, 29th, and 30th of September in the picturesque locales of Khajjiar (Kalatop-Khajjiar Wildlife Sanctuary), Bharmour (Kugti Wildlife Sanctuary), and Bhandal (Gamgul Siyabehi Wildlife Sanctuary), respectively.

The audience comprised dedicated staff members, including forest rangers and forest guards, hailing from the wildlife division and the territorial division. Additionally, several village heads participated in this enlightening series of workshops.

The settings for these workshops varied, with Khajjiar and Bhandal taking place within the forest rest houses, while Bharmour saw its workshop conducted at the interpretation center.

HLP team in Bharmour. © P. Kritika.

Introduction of the organization and the project by Vishal. © P. Kritika.

Workshop conducted in Khajjiar. © P. Kritika.

Vishal explaining the human animal negative interaction to Bhandal forest officers. © P. Kritika.

HLP team with the forest officers in Khajjiar. © P. Kritika.

Vishal Ahuja kicked off each workshop by introducing the Himalayan Langur Project and the organization's comprehensive efforts spanning over 11 years. Attendees received an insightful overview of the threatened landscape, its diverse flora and fauna, and an important revelation regarding the local communities' heavy reliance on nearby degraded forest patches for essentials such as fuelwood and fodder. This highlighted the considerable pressure these patches face and the urgent need for restoration, crucial for both the livelihoods of the communities and the conservation of wildlife.

A pivotal outcome of the project was the taxonomic clarification of the species and the popularization of the name – The Chamba Sacred Langur, as the first-ever specimen was described in Chamba by R.I. Pocock. The distribution survey of *Semnopithecus ajax* was introduced, emphasizing the negative interactions stemming from crop raiding. The project's focus on finding solutions to these issues and conducting outreach programs with local communities was elucidated. Vishal Ahuja elaborated on the extent of crop damage during a season, underlining the need for community awareness regarding the damage caused. Vishal then detailed the vegetation sampling phase in Kalatop-Khajjiar Wildlife Sanctuary, where 247 plant species were identified, including crucial native plant species preferred by langurs and other wildlife.

The suggestion to encourage the cultivation of these vital species in department nurseries was made, as the existing supply is limited. Moreover, the project's nursery setup was introduced, highlighting the necessity of producing more saplings for rewilding degraded and abandoned patches. The significance of mixed broad-leafed forests was emphasized, as they provide seasonal fruits, ensuring an increased and balanced food source for wildlife, thus reducing negative interactions to some extent.

Challenges encountered during the pilot plantation project were discussed, particularly the impact of uncontrolled grazing on natural regeneration. Stakeholder-driven initiatives and protective measures such as fencing were suggested to enhance the success of these efforts. The importance of public outreach was emphasized, encouraging engagement with forest departments, local communities, schools, and the value of past workshops.

In response to questions from the audience, Vishal addressed concerns related to apple orchards, emphasizing the need for holistic effort for protection of orchards and conservation of langurs & habitats throughout the year due to the absence of territorial boundaries in wild animals' home ranges. The workshops concluded with gratitude expressed for the invaluable support from the forest department and a commitment to continued collaboration for the betterment of both the species and the communities.

P. Kritika, Zoo Outreach Organisation / Wildlife Information Liaison Development Society, Coimbatore.

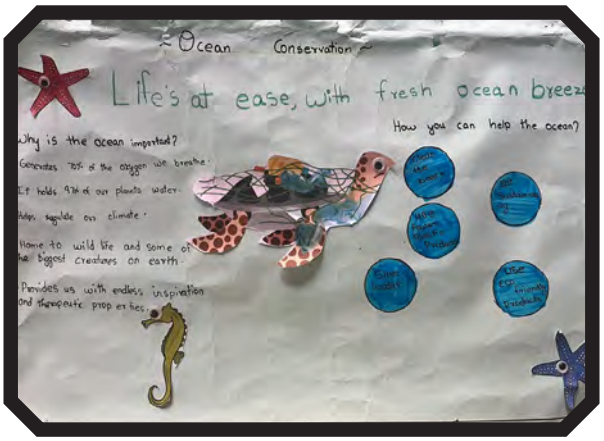
Celebrating Dr. Srinivasulu: Our Beloved Friend Named Best Teacher

Prof. C. Srinivasulu heads the Wildlife Biology and Taxonomy Lab at the Department of Zoology, Osmania University, and is the Director of the Centre for Biodiversity and Conservation Studies, OU. He has been associated with ZOO for over two decades and is also a research affiliate of ZOO. He has led many major research projects funded by DBT, DST, UGC-UKIERI, DST-UKIERI, and BCI. He has successfully guided 11 PhD scholars. He is the regional IUCN RedList expert on South Asian bats and has contributed to many RedList Assessments.

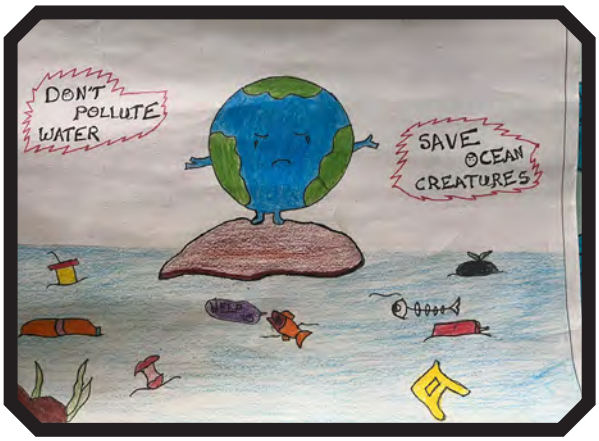
On 5th September on the occasion of Teacher's Day, he was bestowed the Telangana State Best Teacher Award by the Honorable Home Minister Shri. Md Mahmood Ali, Smt. P. Sabita Indra Reddy the Education Minister, Shri Naveen Mittal Commissioner Collegiate Education, Prof. Limbadri, Chairman Telangana State Council of Higher Education along with VC Osmania University Prof. D. Ravinder, and VC MG University Prof. Gopal Reddy.

CAMPAIGN POSTERS FOR OCEAN LITERACY BY STUDENTS OF CS ACADEMY

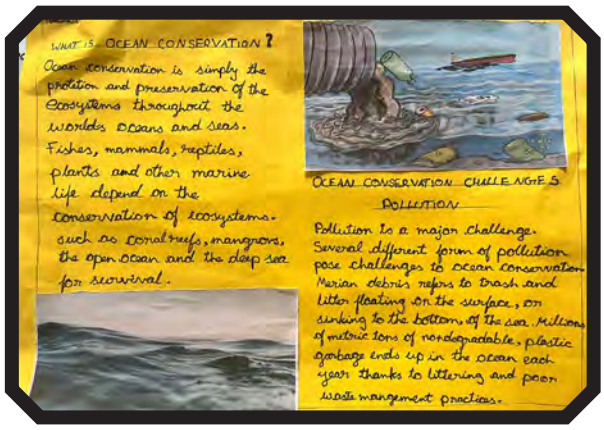
In the endeavour to promote ocean literacy, an understanding on the ocean's influence on you, and your influence on the ocean the CS Academy has proudly served as an associated partner for the 1OCEAN project of Zoo Outreach Organisation with the recent contribution of campaign posters crafted by enthusiastic class 6 students. Below highlighted are some of the campaign posters.



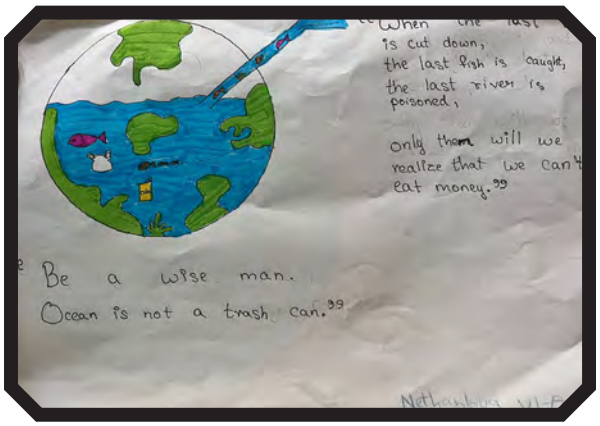
Life is at ease with fresh ocean breeze.



Don't pollute water, save ocean creatures.

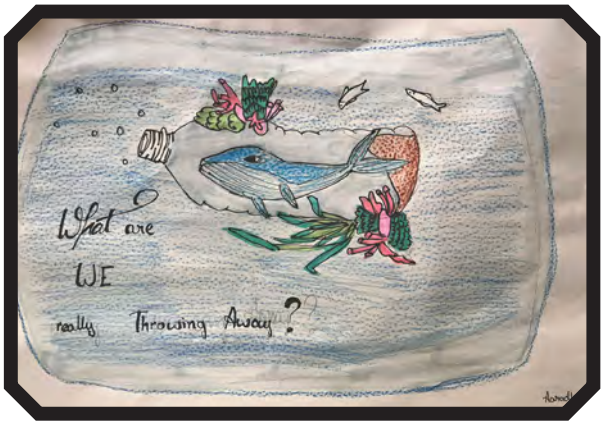


Ocean conservation and challenges.

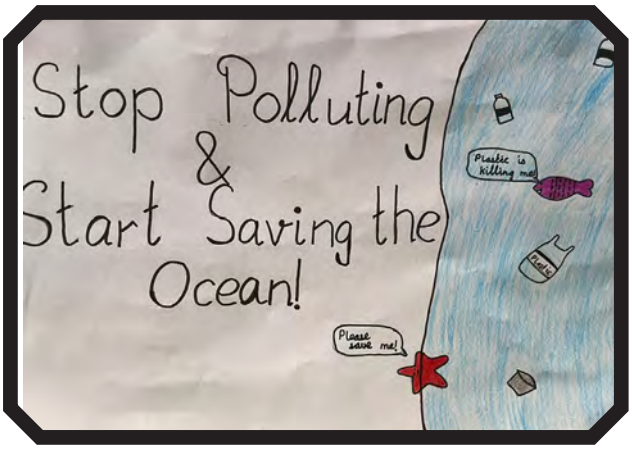


Be a wise man, ocean is not a trash can

Too much litter can make the ocean bitter

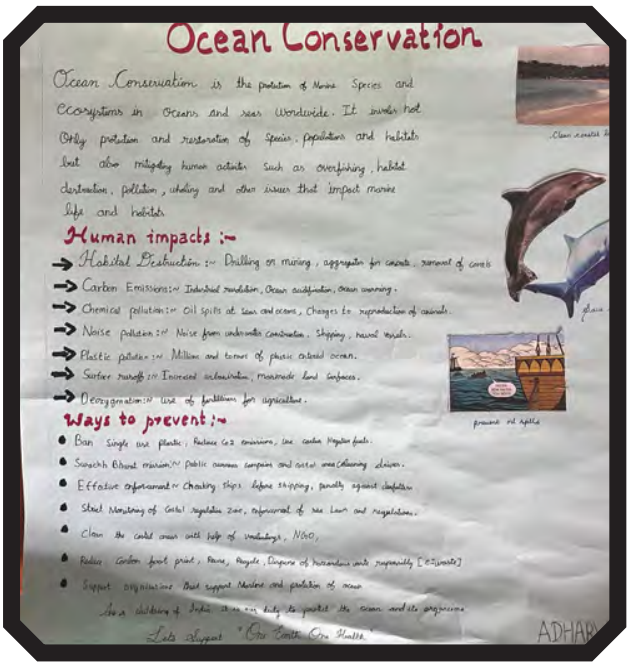


What are we really throwing away?



Stop polluting and start saving the ocean.

Save Ocean.



Ocean Conservation.

Please keep sea plastic free.

In conclusion, the CS Academy's active role as an associated partner in the 1OCEAN project, showcased through the creative and enthusiastic contributions of class 6 students in the form of campaign posters, highlights the school's dedication to advancing ocean literacy. Their commitment to environmental education is a commendable step towards fostering a deeper understanding of our connection to the ocean and the importance of its conservation for generations to come.

ZOO'S PRINT

Communicating science for conservation

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We welcome articles from the conservation community of all SAARC countries, including Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka and other tropical countries if relevant to SAARC countries' problems and potential.

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