

Distribution, seasonality, and movements of cochoas (Genus: *Cochoa*) in India

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Introduction

Of the four species of cochoas in the world, two—the Purple Cochoa *Cochoa purpurea* and the Green Cochoa *C. viridis*—occur in India. They range across much of the Himalayan region, from Uttarakhand and Himachal Pradesh in the western Himalayas of India, through the countries of Nepal and Bhutan, to the eastern states of Sikkim, Arunachal Pradesh, Nagaland, Manipur, Mizoram, Meghalaya, and Assam (Grimmett et al. 2011). However, they are scarce in the western Himalayas, with very few records from Uttarakhand. Their distribution extends further across Myanmar, China, Thailand, Laos, Cambodia, and Vietnam (Collar 2020).

The male Purple Cochoa is purple-grey with a silvery blue crown, while the female replaces the purple with rufous. The Green Cochoa, on the other hand, has a deep green plumage with a silver blue crown, while the female is considerably less green with rusty patches on its wings. Both the species have bluish tails with black terminal bands. Both the species are found in 'moist broadleaved evergreen forest and humid undergrowth in ravines through pine forests' (Rasmussen & Anderton 2012). While the Green Cochoa is said to occur in mid- to top canopy (although they have also been recorded in undergrowth), the Purple Cochoa is mostly found in lower- and middle canopy (Collar 2020). Described from the forests of Nepal, Hodgson (1836) recounts how the residents of Nepal were unfamiliar with the bird, but foresters in that area called it '*cocho*', which was later Latinized to *Cochoa*. Additionally, the *Handbook* notes '*Lonyum-pho*' (Ali & Ripley 1999) as a Lepcha name for the Purple Cochoa, while the Idu Mishmis refer to it as the '*prà prū shré*' (Blench et al. 2018). The only documented local name for the Green Cochoa in India is '*Wa-nye-gilay*' by the Lisu in Namdapha, Eastern Arunachal Pradesh (Srinivasan et al. 2010).

Although the species is sporadically sighted at several locations (Collar 2020), a comprehensive understanding of its distribution in India is lacking. The Purple and Green cochoas are summer migrants in the Himalayas, detected in May–October (Rasmussen & Anderton 2012). Ali & Ripley (1980) noted their breeding season from May to July. Indeed, an observation from Buxa Tiger Reserve, West Bengal, confirms nesting of the Green Cochoa at 1,400 m asl in two subsequent years in May 2013 and 2014 (Rahut 2015). However, limited information on their winter residence (Viswanathan & Naniwadekar 2014), and their

largely silent natures in the non-breeding season warrants a re-examination of their reported seasonal status. The whereabouts of both the Purple and Green cochoas, post-breeding season and up to winter, are largely unknown, and are a significant lacuna in ornithological literature. In fact, the latest State of India's Birds report also notes lack of data to assess trends for both the species (SoIB 2020).

The cochoas have been identified as summer migrants and 'strongly nomadic' (Rasmussen & Anderton 2012), and have also been known to migrate altitudinally (Viswanathan & Naniwadekar 2014). Owing to the unpredictability of fruit availability, frugivores are known to track fruit crops in space and time (Lehouck et al. 2009). Although this is well known for larger frugivores, like hornbills and pigeons, there is no information to conclusively prove the same for cochoas. Through this note, I aim to throw light on the distribution, elevational movement, as well as seasonal trends of the cochoas in India.

Methods

I collected information of both the species from published literature and bibliography (Google Scholar; Pittie 2020) and all available online citizen science portals and literature, including eBird Dataset (eBird 2020), VertNet, and Xeno-canto, and examined their detection throughout the year. Information on specimen records from the Natural History Museum UK was accessed courtesy Dr Alex Bond, senior curator. To make sure there were no duplicates, I manually removed observations from the same date by the same observer obtained from different sources. My database corroborates with already available published literature and guides and does not miss records from any state from where the species has been previously reported. The total number of records from each source is given in table 1 (See additional file).

Table 1. Number of records from each source

	Purple Cochoa	Green Cochoa
eBird	188	228
Specimens	73	31
Published works	7	5
Xeno Canto	2	0

Results & discussion

Distribution

A comprehensive synthesis of the publicly available records shows plenty of records (Purple- $n=269$; Green- $n=264$) of both the cochoa species. Arunachal Pradesh has the highest number of records for both the species of cochoas, followed by Nagaland, West Bengal, and Assam. There are very few records of the birds from other states of north-eastern India, including Mizoram and Manipur, possibly due to the nascent birding opportunities in these states. Records from the western Himalayas are also scarce

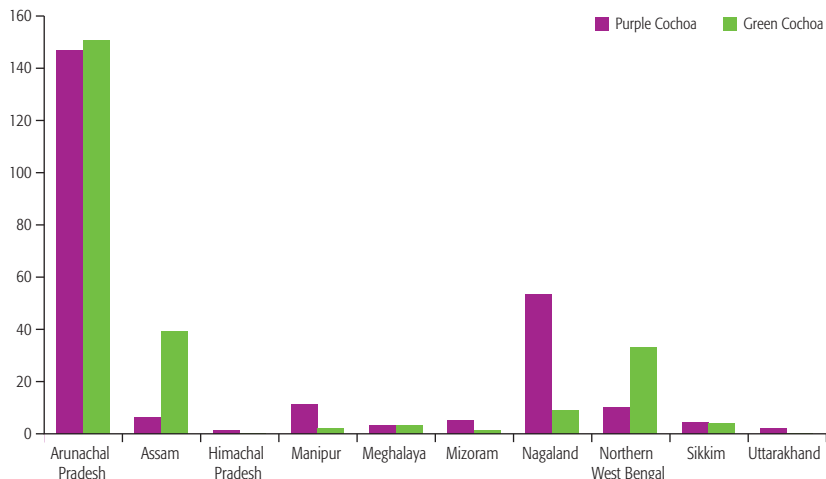


Fig. 1. Number of records of cochoas from each Indian state.

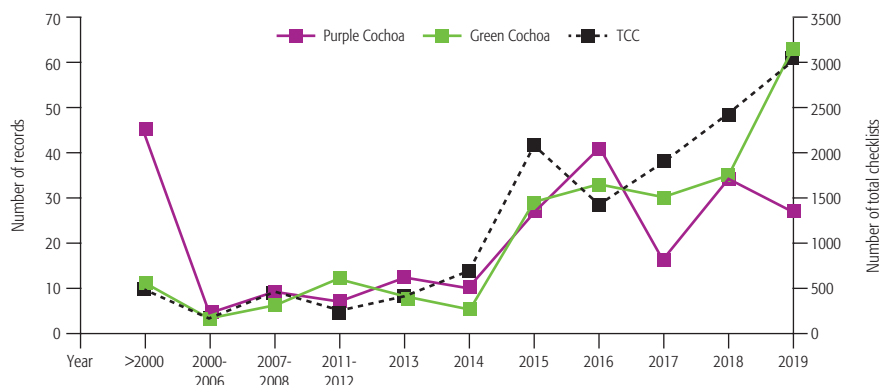


Fig. 2. A record of cochoas over the years – with year bands as in SoIB (2020). The dotted line refers to the total number of eBird checklist in each year bin as an index of birding effort.

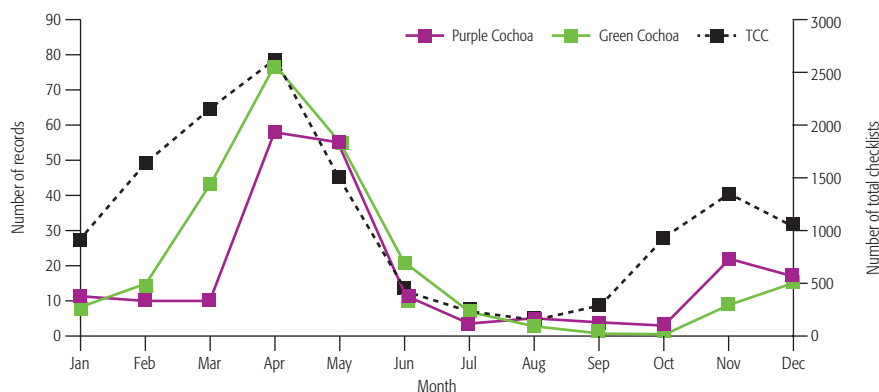


Fig. 3. A seasonal chart with number of observations of cochoas. Dotted lines refer to the total number of complete checklists submitted across all years in the respective months. Records spike more steeply in April than effort (indexed on total complete checklists) and falls together while the non-breeding season spike is more steep for the effort index – indicating that the easier detectability during April when they are calling.

and mostly dated (Hussain & Waltner 1976; Jamdar 1984). The most recent record of the Purple Cochoa from the western Himalayas was from Chamba, Himachal Pradesh (Shah et al. 2016). The Green Cochoa has only been reported as a vagrant in Uttarakhand (Mohan & Sondhi 2017). The number of sightings in each state is given in Fig. 1. There is no noticeable difference in the detection rates of Purple and Green cochoas across the years (Fig. 2)—the spike for the Purple Cochoa before 2000 is due to Walter Koelz's collection expedition to the Naga Hills in 1950. The noticeable rise in the number of detection of both cochoas

post 2014 must relate to an increase in birdwatching in areas that were earlier inaccessible or less frequently visited and the consequent data accumulation on eBird (www.ebird.org). This is also evident in the overall rise in birding efforts across the years. It is also interesting to note the similar distribution of both the cochoas in Arunachal Pradesh, which has been similarly noted in Grimm et al. (2020).

Seasonality

As expected, there is a significant spike in the number of records from March–May (Fig. 3). However, what is noteworthy is that there are a lot of records of both the species from winter, November–February (Purple – 30.3%; Green – 19.4%). The distribution of records collated in this report shows the occurrence of both cochoas in at least some numbers throughout the year, suggesting they may be resident year round. The higher detection during March–May is most likely attributable to higher vocal activity during the breeding season, which also explains the relative non-detection in the non-breeding season when these birds are mostly silent. The sluggish nature of both the species (Robson 2008) may also explain the paucity of information. Additionally, the lack of any sightings during post-monsoon may largely be because of limited reporting in habitats they are found in, owing to inclement weather that renders both tourism and field work difficult. Additionally, a reduction in vocalization post-monsoon may also be a reason for a fall in cochoa records, as evident from the steep decline of complete checklists vis-à-vis the number of records of cochoas. The higher detections in March–May, and in winter, may thus be attributed to both its breeding behaviour as well as increased birdwatching efforts in the states they are found in.

Elevation and movement

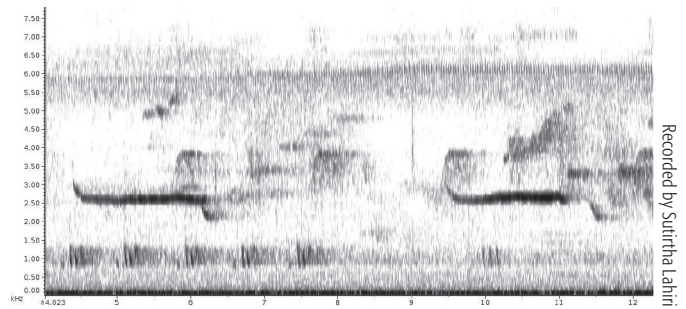
Although cochoas are generally known to reside at altitudes between 1,000 m and 3,000 m asl (Rasmussen & Anderton 2012; Ali & Ripley 1980), records from lower altitudes are of particular interest. Previously, the Purple Cochoa has been recorded at an altitude of 400 m asl in Thailand, and at 500–600 m asl at Namdapha Tiger Reserve, Arunachal Pradesh (Viswanathan & Naniwadekar 2014). There is also a record of the Purple Cochoa from Dhaka in 1990 (<https://ebird.org/checklist/S60682581>) from an altitude of 5 m asl. The Green Cochoa, on the other hand, is regularly seen at lower altitudes. It has been recorded at an altitude of 150 m asl (Velho 2011; Naniwadekar pers. comm., July 2020) from Pakke Tiger Reserve, Arunachal Pradesh. It has also been recorded in lowland areas of Assam, including Jeypore Reserve Forest (Saikia et al. 2011), Nameri National Park, and Kaziranga National Park (Pritam Baruah, *pers comm.*, July 2020). This is well substantiated in Fig. 1, which shows considerably more records of the Green Cochoa from Assam, most likely due to its propensity to occur in lower altitudes.

On the 26 March 2019 at 0930 h, while walking a transect in Jeypore Reserve Forest (150 m asl), Assam, two of us (SL, Abir Jain, and our field assistants—Khageshwar and Bablu) heard a single note flute-like call, unlike any we had previously heard in the forest. Jeypore Reserve Forest and Dehing Patkai Wildlife Sanctuary together represent the largest lowland evergreen forest patch (c.200 sq. km) contiguous with the foothills of Patkai Hills in Assam. Being familiar with the call, I instantly recognized it as that of a cochoa, and soon located an adult male Purple Cochoa. The bird was perched at a height of about 15 m from the ground on a *Ficus* tree. After about two minutes of being still, it flew off into a different tree further away. Although it was brief, we managed to take some photographs of the bird [141]. We returned to the same site two days later, on 28 March, to look for the bird again and make an audio recording of its vocalization, if possible. Fortunately, we did get to see a fleeting glimpse of the bird, and managed to get a recording as well (Fig. 4). Interestingly, we heard another individual calling from close by, but could not locate it. On subsequent visits, however, we were unable to detect the species. Although the record from Dhaka in 1990 was much lower, this is the lowest altitude record in my database for the Purple Cochoa in India, as well as along the areas where it is resident (Lahiri 2019a, b).



Sutirtha Lahiri

141. Male Purple Cochoa photographed at Jeypore Reserve Forest.



Recorded by Sutirtha Lahiri

Fig. 4. Vocalization of male Purple Cochoa at Jeypore Reserve Forest.

Although (Ali & Ripley 1980) documented the cochoas as omnivores giving broader and more general descriptions of their feeding habits, recent studies and observations (Viswanathan & Naniwadekar 2014) have substantiated that fruits, especially large-seeded, are an important part of their diet. It is, thus, possible that although they may not be strictly frugivorous, the cochoas are opportunistically moving in search of fruits and could be detected particularly in the lower altitudes (Robson 2008). The record of the Purple and Green cochoas at lower altitudes might suggest that tracking fruit resources may be one of the reasons for their seasonal migration to lower altitudes.

Interestingly, both the species of cochoas may be making these movements depending on fruiting phenology. Limited information from India suggests that the Purple and Green cochoas feed on- *Litsea* sp., *Beilschmiedia assamica*, *Alseodaphne patiolaris*, *Machilus* sp., *Prunus ceylanica*, *Canarium strictum*, *Phoebe* spp. (Viswanathan & Naniwadekar 2014; Velho 2012), *Ficus drupacea*, and *Aglaia* sp., The Green Cochoa has also been recorded to feed on *Prunus ceylanica* in December 2016, *Pygeum ceylanica* and *Beilschmiedia* sp., at Pakke Tiger Reserve, Arunachal Pradesh. (February 2017) (Rohit Naniwadekar, *pers. comm.*, July 2020), and *Litsea* sp., at Eaglenest Wildlife Sanctuary, Arunachal Pradesh, in April 2011 (Umesh Srinivasan, *pers. comm.*, July 2020). Most tropical fruiting trees seasonally fruit (Datta & Rawat 2003), and the feeding of cochoas on these species may broaden our understanding of their movement patterns.

During our observations in Dehing Patkai, *Beilschmiedia assamica* and *Magnolia montana* were fruiting on the same trail. Furthermore, the Purple Cochoa was observed on a *Ficus* sp., which bore unripe figs. While we could not record any feeding observations, we believe that its presence at that time may be linked to the fruiting of these trees.

Conclusion

In conclusion, I provide evidence that the Purple and the Green cochoas are resident species and corroborate Ali & Ripley (1980) throughout their range in north-eastern India, with highest number of observations from Arunachal Pradesh. Although they are present throughout the year, the higher records of the cochoas in the breeding season is likely because they are highly vocal and easily detected, and also because of higher birdwatching activities. Although both the cochoas are usually found in higher altitudes (1,000–3,000 m asl), there have been a few records of the species straggling to lower altitudes, possibly following fruiting patterns. It is also worth noting that eBird efforts over the years have been significant in deriving much of the patterns we see in

the trends of both the species of cochoas. Increasing efforts and data would help us to get more valuable information about the natural history of the two species.

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In Memoriam

HEINZ LAINER

(1943 – 2020)

In Memoriam

ULHAS RANE

(1947 – 2020)

In Memoriam

BHAVBHUTI MUKUNDRAY PARASHARYA

(1955 – 2020)