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Migratory Sites of Kashmir Flycatcher *Ficedula subrubra* in Nilgiris and its Migratory Status in India

Nizamudheen Moinudheen[1*] & Arockianathan Samson[2]

1) Independent Researcher, The Nilgiri, Tamil Nadu, India.
2) Department of Zoology and Wildlife Biology, Government Arts College, Udhagamandalam 643 002, The Nilgiris, Tamil Nadu, India. Email: kingvulture1786@gmail.com

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Introduction

The Kashmir Flycatcher *Ficedula subrubra* is endemic to the Indian subcontinent. This bird species is declining globally and IUCN Redlist categorised this species as Vulnerable (Bird Life International 2016). Jammu & Kashmir Government set to declare Kashmir Flycatcher as a new official bird. The Kashmir Flycatcher breeds in the northwest Himalaya, the Neelum Valley and Kazi Nag Range in Pakistan, Kashmir and the Pir Panjal range in India (Bates & Lowther 1952; Henry 1955; Roberts 1992). This species migrates south to winter chiefly in the hills of central-southern Sri Lanka, and also the southern Western Ghats, particularly in the Nilgiri Hills north of the Palghat Gap, India (Zarri 2003; Zarri & Rahmani 2004), and also Siruvani Reserve Forest and Silent Valley National Park in the Nilgiri Biosphere reserve (Sashikumar *et. al.* 2011). It occurs on passage in Nepal and as a vagrant in Bhutan. It was formerly common within its restricted breeding range, but its population has declined in many areas. It breeds from May–June in temperate mixed deciduous forests, between 1,800–2,700 m asl. It nests in natural hollows and holes, most commonly low down in *Perrottetia* trees, and also willows. It winters in gardens, tea estates, forest edge and disturbed areas within forest, generally above c.750 m asl. In Nilgiris, a short time study was done on wintering records of Kashmir Flycatchers during the years of 2001 to 2002 (Zarri & Rahmani, 2004). They mentioned that on the Nilgiri Plateau, it winters mainly in wattle (*Acacia* sp.) plantations (Zarri & Rahmani 2004). Pair-bonds appear to be maintained throughout the winter, and winter territories are occupied in successive years, suggesting strong winter site-fidelity (Zarri & Rahmani 2004). This paper focuses on observations of the Kashmir Flycatcher and migrating sites in Nilgiris and details on migratory status in India.

* Corresponding: *moinulepido@gmail.com*

Observation

On 12 October 2020, we recorded a pair of Kashmir Flycatcher in Wellington eucalyptus forest plantation, Coonoor, Nigiris, Tamil Nadu, India (Fig. 1). Continuous monitoring was carried out to check the birds' presence in that area. The pair was recorded until 28 March 2021 at surroundings of the same area. Most of the time, the pair spent on foraging for food until the end of the migration. It feeds on insects and caterpillars (Fig. 2). Usually this pair was not easily spotted because they are very active birds. It shares a small area and will remain at the same place until it leaves that area, but does not share food and location with any of the birds found in the Nilgiris. Its functions are seen in a slightly unique way and this pair was hide under small trees and inside branches. During the first four months of the study, no changes were observed in the bird. In the fifth month, a new change was observed in the throat area of the (Fig. 3).

Status and migratory sites in Nilgiris

The migratory sites of Kashmir Flycatcher in Nilgiris was analysed using eBird data from 1974 to 2021. Totally, 131 observations were took into the consideration of analysis. This shows that the Kashmir Flycatcher was first recorded in the year of 1974 in Nilgiris, followed by 1988, 1999, 2003, and after 2011 it was continuously recorded until 2021 in Nilgiris. Analysing the migratory records of Kashmir Flycatcher during the last 10 years showed that it was frequently recorded only in Nilgiris, compared to other migratory sites in India (Table 1). Generally, the Kashmir Flycatcher stays in six month of their migration period in Nilgiris, arrival in the months of October (n=10) and November (n=13) and departure in the months of February (n=29) and March (n=13) in Nilgiris. The frequency of number of birds was observed as single bird (n=101), two birds (n=27), three

birds (n=2) and six birds (n=1). Most of the observations were in tea plantations (n=91), near human habitation (n=34) and in forest areas (n=6). The migration records of Kashmir Flycatcher were done in Kotagiri area (n=98), followed by Ooty (n=23), Avalanche (n=7), Coonoor (n=2) and Upper Bavani (n=1) areas of Nilgiris (Fig. 4).

Table 1. Migratory sites of Kashmir Flycatcher in India (Fig. 5).

State	No. of observations	Recorded places / county	Average elevation (m)	Observation frequency of individuals	Recorded months	Recorded years	Range type (migration/ breeding)
Jammu & Kashmir	44	Anantnag	1,601	1	May, June, July, August	1971, 1974, 1979, 1984, 2011, 2021	Breeding
		Badgam	1,610	1	August	2015	Breeding
		Baramula	1,593	1-2	May, June & July	1982, 2011, 2018	Breeding
		Ganderbal	1,619	1	June	2015	Breeding
		Kupwara	1,615	4	May	2021	Breeding
		Shopiyan	2,057	1	September	2019	Breeding
		Srinagar	1,585	1-4	April, May, June, July & August	1978, 1982, 1987, 2001, 2003, 2015, 2016, 2017, 2018, 2019, 2021	Breeding
Himachal Pradesh	5	Sirmaur	1,532	1-4	March & April	2016, 2018	Migration
Haryana	2	Gurgaon	217	1	January	2020	Migration
		Yamunanagar	255	2	April	2019	Migration
Punjab	1	Ludhiana	247	1	April	2021	Migration
Uttarakhand	2	Dehradun	640	1	October	2015	Migration
		Garhwal	1,650	1	April	2008	Migration
Uttar Pradesh	1	Agra	170	1	December	2016	Migration
Madhya Pradesh	1	Indore	550	1	November	2015	Migration
Gujarat	2	Rajkot	128	1	November & January	2011, 2014	Migration
Maharashtra	2	Amravati	343	1	December		Migration
		Pune	560	1	December	2015	Migration
Karnataka	12	Bangalore	920	1	October, November, December and March	2013, 2016, 2018, 2019, 2020	Migration
		Chamrajnagar	662	1	October	2011	Migration
		Ramanagara	747	1	October & November	2017, 2018	Migration
Kerala	9	Idukki	1,200	1	November , December, January, March & April	2012, 2014, 2016, 2017, 2019	Migration
		Palakkad	84	1-2	December	2002, 2009	Migration
Tamil Nadu	131	Nilgiris	1,800	1-6	October, November, December, January, February & March	1984, 1988, 1999, 2003, 2011,2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022	Migration

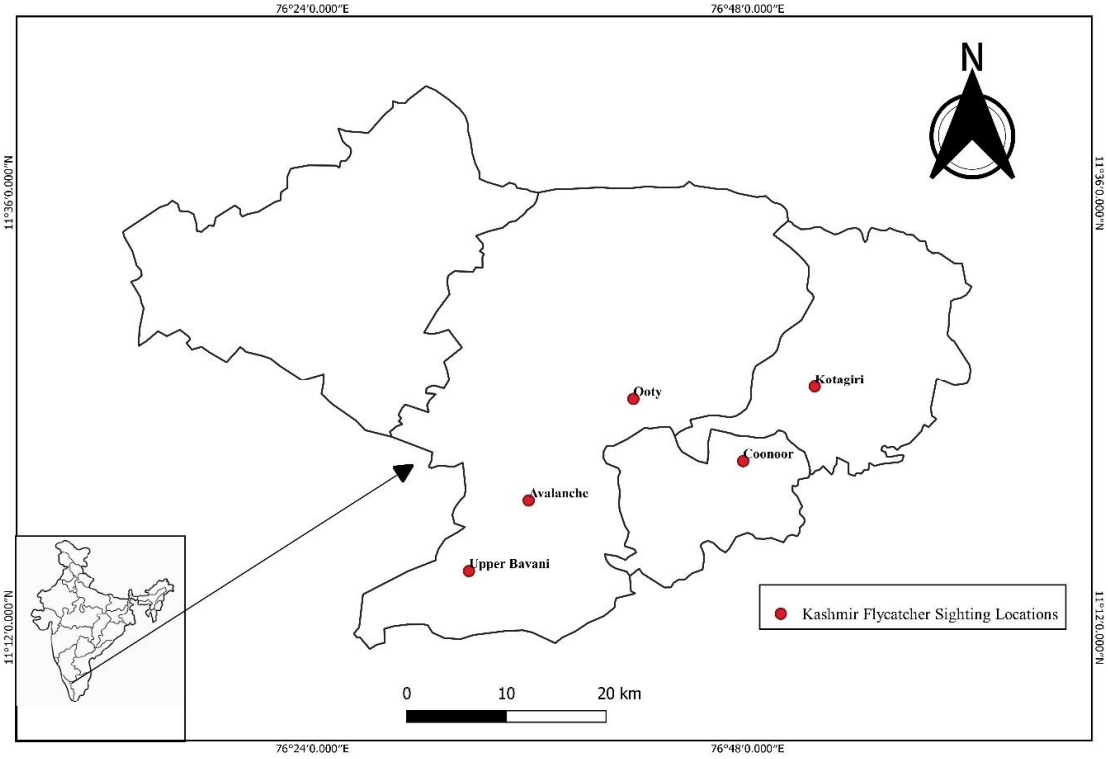

Fig. 4. Kashmir Flycatcher migratory sites in Nilgiris, India.

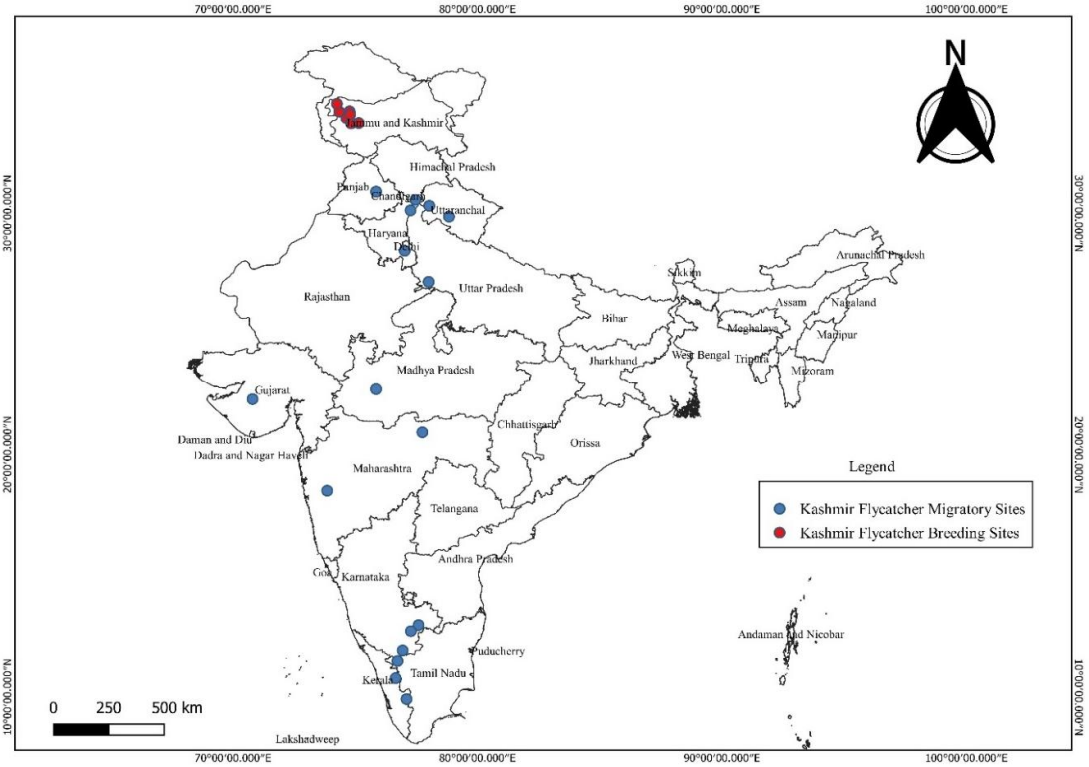

Fig. 5. Migratory and breeding sites of Kashmir Flycatcher in India.

Fig. 1. Adult male with field characteristics.

Fig. 2. Kashmir Flycatcher feed on insects and caterpillars

Fig. 3. A new type of plumage in the throat area.

Migratory status in India

Migratory status of the Kashmir Flycatcher in India was analysed using eBird data from 1971 to 2021. Totally, 212 records were took into the consideration of analyses. The result showed that the Kashmir Flycatcher was observed in 12 states and 24 county/districts. Except their breeding ranges (Jammu & Kashmir n=44), Kashmir Flycatcher was observed in 11 states for their migration movements (n=168). The breeding rage elevation ranged 1,583–2,057m asl (avg. 1,668.6). On the other hand, the migration rage elevation ranged 128–1,800m asl (avg. 688.5). The frequency of number of birds observed, ranged 1–4 individuals in breeding range and 1–6 individuals in migration range. The Kashmir Flycatcher was observed from April to September in their breeding range and from October to April in migration range. Results of migration records showed that maximum records were observed in Tamil Nadu (n=131), followed by Karnataka (n=12), Kerala (n=9), Himachal Pradesh (n=5), Haryana, Uttarakhand, Gujarat and Maharashtra (n=2) and Punjab, Uttar Pradesh and Madhya Pradesh (n=1) (Fig. 4).

Discussion

Kashmir Flycatcher is a little known bird species in Indian region, and so far only few studies were available on its distribution and migration records (Karthikeyan & Athreya 1993; Zarri & Rhamani 2004; Ganpule 2012). The present study revealed that the distribution of Kashmir Flycatcher except from their breeding range (Jammu Kashmir), it was recorded in 11 states and 24 county/districts for their migration movement in India. Out of these 11 states, frequent records were observed in Tamil Nadu, Karnataka, Kerala and Himachal Pradesh. In other states, only one or two records were observed showing these sites being utilized as a stopover points during the migration period. The selection of migration sites showed that elevation plays a major role. The frequent observation of migration sites, especially in Tamil Nadu, Karnataka, Kerala and Himachal showed that the elevation ranged from 747–1,800m asl. Considering their breeding rage, Kashmir Flycatcher lives in higher elevation areas 1,500–2,000m asl, so they preferences also the same as in migration ranges. The study revealed that the Kashmir Flycatcher spent more than four months (May to August) in their breeding grounds, on the other hand, it spent eight months (September to March) on migration grounds in India.

The Nilgiris district has a mountainous vegetation structure as well as connective junction of Eastern Ghats and Western Ghats mountains in Southern India. Climatic structure is quite pleasant in nature in the mountains to support numerous forms of life in nature.

Nilgiris is a quite fascinating habitat for numerous winter visitor birds. Kashmire Flycatcher is one among the prominent species as well as regular winter visitor to Nilgiris region. Our study clearly indicates that it has been recorded continuously from 2011 to 2022 (eBird 2022). The migration arrivals starts in October and ends in March, it's hardly spent more than six months as a winter migration in Nilgiris region confirmed by records. Comparing the all migration records in Indian region of Nilgiris showed this area is important as a regular spot for their migration. Based on these observations, we find some clues for this study to support the selection of this region as a prompt migration spots for the Kashmir Flycatchers. Generally Kashmir Flycatcher as a higher elevation species in nature breeds in Jammu and Kashmir region. It spent more than six months for their breeding rages viz. April to September, these months are appropriate for breeding seasons, after the winter starts the climate conditions influenced for the migrations. Nilgiris generally has mountainous vegetation as well as winters (11˚C to 25˚C) really quite equals to Jummu & Kashmir vegetation as a summer seasons (14˚C to 30˚C). These results are clearly stated that temperature plays a major role for migration of Kashmir Flycatcher in the Nilgiris because of same climatic factors as well mountainous vegetation and elevations also are important criteria for selection of Nilgiris as a prominent migration spots in India. Kashmir Flycatcher quite shies in nature. It is always hiding in the bushes and the activity is very high in the early morning and late evening times. Most of the observations were observed in tea estates in Nilgiris. Tea estates provide an excellent habitat for wintering Kashmir Flycatchers for food as well as shelters. In Nilgiris, quite few studies are available for their presences, namely Zarri & Rahmani (2005) recorded the Kashmir Flycatcher in different localities in Nilgiris and they recorded 16 individuals of Kashmir flycatcher in Nilgiris. Zarri & Rahmani (2004) did a study on wintering records of Kashmir Flycatchers during the years of 2001 to 2002. They mentioned that in the Nilgiri Plateau, it winters mainly in wattle (*Acacia* sp.) plantations.

The present study is a really an eye opener for the migration pattern as well as migrating sites of Kashmir Flycatcher in India. Further studies are highly warranted to find out the complete migration structure as well as migrating population of the Kashmir Flycatcher in Indian regions.

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