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An unusually large congregation of Greenish Warblers *Phylloscopus trochiloides* in Sattal, Uttarakhand, India

Over two hundred Greenish Warblers *Phylloscopus trochiloides viridanus* were observed moving together at Sattal in April 2022. This sighting, of a large flock of *Phylloscopus* warblers migrating together in India, is rare.

On the morning of 20 April 2022, we (a group of nine birders) were birding in Sattal (29.36ºN 79.53ºE; 1,200 m asl), district Nainital, Uttarakhand (Parashar 2022). We saw a large number of Greenish Warblers. The birds that could be clearly seen had a dull green back, and some had a single thin wingbar **[55]**. They had a large and prominent yellowish white supercilium, with a black eye-stripe. The lower mandible was pale in all the birds seen. They matched the subspecies *viridanus*, which is expected in the Western Himalayas. Some birds were singing, while some were calling. Their vocalisations confirmed that they were Greenish Warblers. The nominate *P. t. trochiloides*, seen in Eastern Himalayas and north-eastern India, has darker green upperparts and crown, dusky underparts, and a darker bill (Singal 2016).

The Greenish Warblers were moving through foliage and their numbers were difficult to estimate. The birds were small, drab, moving rapidly, and blended with the leaves. A conservative estimate would be over two hundred birds, but there could be more. All the birds were moving uphill, in the same north-westerly direction. The group was so large that the flock took about 20 minutes to cross us. We also saw 15 Blyth's Leaf Warblers P. reguloides and one Sulphur-bellied Warbler P. griseolus, but the majority were Greenish Warblers.

P. t. viridanus winters in the plains of India, and breeds in North Eurasia, and in the higher altitudes of the Himalaya. It is common and widespread throughout its range. As per eBird records, it is commonly seen at Sattal in April and in November; small numbers are seen in winter, and none in summer. Thus, Greenish Warblers are seen at Sattal during passage migration, and they breed at higher altitudes of 2,700 m to 3,700 m in summer (Bird Count India 2022). Though numbers are highest in Sattal (eBird 2022a) and Nainital District (eBird 2022b) in April, we could not find any reports of hundreds of Greenish Warblers seen together. They are very common passage migrants along the Himalayan foothills, typically in small parties. But they have not been reported migrating in such large, single species flocks, as in this present observation, either along the Himalayan foothills or elsewhere in India.

In India we generally see only small numbers of warblers on passage migration. Were all these (over 200) Greenish Warblers moving together in the same direction - a large group on passage migration? In April, Greenish Warblers would be migrating from the plains of India to Eurasia or the higher reaches of the Himalayan ranges. There are sites along flyways where migrating birds stop to rest or feed. Is Sattal such a place where Greenish Warblers congregate before they migrate farther? Or was this sighting an exception, maybe due to unusual circumstances, like a western disturbance over the Himalaya, that may have held back onward migration for a few days, compelling the warblers to concentrate at a single location, and causing a mass movement when it cleared?


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55. Greenish Warbler at Sattal.

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Greater Racket-tailed Drongo *Dicrurus paradiseus* anting with a Spirostreptidan millipede *Spinotarsus colosseus*

On 8 January 2022, we observed a Greater Racket-tailed Drongo *Dicrurus paradiseus* picking a millipede *Spinotarsus colosseus* from a rotting tree trunk in Kottarakkara (9.01°N, 76.78°E), Kollam, India. Millipedes are commonly perceived as unpalatable and odoriferous, and ignored by most predators. Our initial

Table 1. List of birds anting with millipedes

Sl. No.	Species	Country	Reference
1	Little Shrike-thrush *Colluricincla megarhyncha parvula*	Australia	Sedgwick (1946)
2	Black-throated Shrikebill *Clytorhynchus nigrogularis*	Fiji Islands	Clunie (1974)
3	Jungle Myna *Acridotheres fuscus*	Fiji Islands	Clunie (1976)
4	European Robin *Erithacus rubecula*	England	Thomas (1982); Eyles (1983); Cramp (1988); Harrup (1992)
5	Grey-winged Trumpeter *Psophia crepitans*		Sherman (1996)
6	Pale-winged Trumpeter *Psophia leucoptera*	Northern South America	Sherman (1996)
7	Strong-billed Woodcreeper *Xiphocolaptes promeropirhyncus*	Belize	Parkes et al. (2003)
8	White-collared Woodcreeper *Xiphocolaptes albicollis*	Brazil	Sazima (2009)
9	Javan Myna *Acridotheres javanicus*	Singapore	Chong (2017)

assumption that the bird had mistakenly picked up the millipede was proved wrong as it perched on a tree and started pecking on the millipede. The bird pierced the millipede and rubbed its beak on its' body periodically to wipe the beak clean. We captured the behaviour with a camera **[56]** and could understand that the bird was wetting its beak with the millipede's body fluid and spreading it on its' feathers. It applied the fluid under both wings, belly and breast. The preening behaviour lasted for about five minutes, after which the bird flew off (https://drive.google.com/file/d/110-AX3Ka8NXQ59wKeVmA5P4wT6G7h2n1/view?usp=drivesdk).

Sancia Morris

56. Greater Racket-tailed Drongo *Dicrurus paradiseus* pecking the Spirostreptidan millipede *Spinotarsus colosseus*.

Stresemann (1935) first described anting in German as "einemsen", which Ali (1936) translated into English as "anting". Many birds are known, to wipe themselves with ants, fruits or other scent-laden materials (Simmons 1966). This behaviour, often called "anting," whether ants are used or not, generally is thought to transfer to the plumage substances that deter ectoparasites (Simmons 1966) or pathogenic microbes (Ehrlich et al. 1986). Several species of birds and mammals practicing anting using natural (plants and arthropods) and human made materials have been reported. (Campbell 2000; Parkes et al. 2003; Weldon et al. 2006; Laska et al. 2007; Morrogh-Bernard 2008; Lynch Alfaro et al. 2012; Jeferson et al. 2014). It is possible that the use of certain kinds of ants indicates the importance of the chemicals they release. Some cases of anting involved the use of millipedes or Puss Moth caterpillars, as these too are known to release powerful defensive chemicals (Clunie 1976). Over 200 species of bird have been known to ant (Clayton et al. 2010). Anting possibly also supplements the bird's own preen oil. Avian preen oil has been hypothesized also to act as an info-chemical (Müller et al. 2020) in odour-mediated intraspecific communications (Soini et al 2013), or as a deleterious cue that misleads heterospecifics by way of olfactory crypsis (Grieves et al. 2022). Crypsis, the avoidance of detection through camouflage (Stevens & Merilaita, 2009), can also involve olfactory concealment (Ruxton, 2009). Modulating body odours might be an option for birds to evade olfactorily searching nest predators. Potter (1970), Willis (1972), Lunt et al. (2004), opine that anting could be multifunctional and these functions are not mutually exclusive.

Compared to the anting with ants, anting with millipedes is much less common, as only seven bird species are reported to use these latter arthropods for anting (Parkes et al. 2003). Sazima (2009) added one species to this handful of millipede users. Chong (2017) reported a Javan Myna *Acridotheres javanicus* in Singapore, using a millipede for anting (Table 1). Millipedes are renowned for the production of toxic and noxious secretions such as benzoquinones, alkaloids, hydrogen cyanide, and benzaldehyde (Blum & Woodring 1962, Wheeler et al. 1964), most of them known as predator-deterrents (Eisner & Meinwald 1966). One of the hallmarks of the millipede order Julida (as well as their closest relatives Spirobolida and Spirostreptida) is the synthesis of quinone-based defensive secretions (Ilić, et al. 2019).

This is the first report of a Greater Racket-tailed Drongo anting with a millipede. Here the spirostreptidan millipede used by the bird may serve one or many of the following functions: repellent or deterrent against microbes, ectoparasites, other harmful animals, and aids olfactory crypsis.

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