

Filling the gap of *Turdus nigrescens* (Aves: Turdidae) distribution, first record in Barva Volcano, Costa Rica

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The Sooty Thrush (*Turdus nigrescens*) is an endemic bird species from Costa Rica and western Panama highlands (Ridgely & Gwynne Jr.1989, Stiles & Skutch 1989). It inhabits open areas, forest edges and páramo in the Central Volcanic and Talamanca mountain ranges above 2500 m (Stiles & Skutch 1989, Garrigues & Dean 2007). The Central Volcanic mountain range represents an east-west oriented row of about 80 km of volcanic cones, formed by Poás (2708 m), Barva (2900 m), Irazú (3432 m) and Turrialba (3340 m) volcanoes (Alvarado-Induni 2000).

This robin is very abundant along all its range distribution, but it has not been previously reported in the Barva Volcano, a volcanic massif in the Central Volcanic mountain range (Chavarría 2006, G. Barrantes unpub. data, J.E. Sánchez com. pers.), although Stiles & Skutch (1989) and Garrigues & Dean (2007) report this species in this place in their respective bird field guides. Because the Sooty Thrush presence in Barva Volcano is contradictory, our objectives are to provide the first documented record of this species in the massif, and to present two possible hypotheses to explain the presumed absence of this species in this massif.

On the morning 13 July 2008 (05:35 h), we observed and recorded the call of an adult of Sooty Thrush (Fig. 1) in the main entrance of Barva Volcano sector of Braulio Carrillo National Park (10°08'N, 84°07'W), at 2800 m a.s.l. The bird was foraging on the floor of an open, grassy area, with scattered bushes, near a forest edge. Then, it flew inside the forest. This habitat is similar to that described for the same species in other sites, where it is common, as in Talamanca Mountains and Irazú Volcano (Stiles & Skutch 1989).

Two evidences endorse the presence of the Sooty Thrush in Barva Volcano. First, during

glacial periods (Pleistocene epoch) the lowest limit of highland vegetation descended, creating a continuous belt of suitable habitat for highland birds between Central Volcanic and Talamanca mountain ranges (Barrantes in press). This likely allowed birds to move between these two mountain ranges. Although evidence of the presence of Sooty Thrush in Barva Volcano during this period lacks, the presence of other highland bird species with similar habitat requirements of those of the Sooty Thrush (e.g. *Catharus gracilirostris*, *Pezopetes capitalis* and *Basileuterus melanogenys*) in the area suggests that this species likely also occurred in this massif (Wolf 1976, Stiles & Skutch 1989, Barrantes 2005, Chavarría 2006, Garrigues & Dean 2007). And second, the Sooty Thrush is present and highly abundant in both Poás and Irazú volcanoes, and Barva Volcano is located between these two massifs. If individuals of this bird were able to inhabit not only Poás and Irazú volcanoes, but Turrialba Volcano and Talamanca mountain range as well, it is unlikely that the Sooty Thrush was never present in the Barva Volcano.

Barva Volcano's last recorded activity was 8050 years ago (Alvarado-Induni 2000), and this long period of inactivity has permitted regeneration of a dense high Montane forest on the summit of this massif. Barva Volcano forest is similar to that of Poás Volcano, but having longer extensions of mature forest of oaks and other native trees and plants, mainly because the more activity in Poás Volcano keeps larger open areas. It is noticeable that activity in Poás, Turrialba and Irazú volcanoes have been taking place at least for two centuries (Alvarado-Induni 2000). Volcano activity is possibly the main cause that keeps open areas around the volcano tops, which is the primary habitat used by the Sooty Thrush (Stiles & Skutch 1989, Garrigues &

Dean 2007). In Barva Volcano open areas are scarce, what is possibly associated with the low activity of this volcano during the last 8000 years. The open areas above 2500 m represented a less than 0.5 ha of total area of volcano top (Table 1). Meanwhile, in other volcanoes areas above 2500 m where the Sooty Thrush is present, volcanic and human activity keep more than 33% of appropriate habitat for the Sooty Thrush (Table 1).

If the Sooty Thrush was present in Barva Volcano, the reduction of appropriate habitat by natural regeneration could have influenced negatively population sizes in the area until it was extinguished. In the other hand, the possibility of this thrush arriving in Barva massif from the other volcanoes is low, considering that Barva and Irazú, and Barva and Poás volcanoes are separate by mountain passes of 21.7 km and 9.6 km of distance at 2500 m of altitude, respectively. These mountain passes may work as topographic barriers that limit the movement of individuals between volcanoes, as proposed for other highland bird species as the Black-and-yellow Silky-Flycatcher (*Phainoptila melanoxantha*, Barrantes & Loiselle 2002), the Black-billed Nightingale-Thrush (*Catharus gracilirostris*, Sánchez 2006), and the Sooty-capped Bush-Tanager (*Chlorospingus pileatus*, Chavarría 2006), isolating the populations between massifs. Given that, we propose that the absence of the Sooty Thrush in Barva Volcano is related to the lack of recent volcanic activity that has eliminated the possibility of a suitable habitat, and that the mountain passes likely avoid the re-colonization of this species from neighbouring populations, as those of Irazú and Poás volcanoes.

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Table 1. Land uses above 2500 m height in Central Volcanic Mountain Range. Sooty Thrush keeps populations in Irazú-Turrialba and Poás volcanoes, but not in Barva. * Habitats not used by Sooty Thrush to inhabit. Areas were estimate using the land used layer to Costa Rica 1992 (ITCR 2004)

Land uses	Barva (ha)	Irazú-Turrialba (ha)	Poás (ha)
Primary Forest*	1721.5	3976.7	284.8
Secondary Forest*	10272.4	3698.4	
Selected cutting Forest		1353.8	522.2
Grassland	<0.1	1091.4	115.2
Bushes areas	<0.1	170.1	
Farms		1221.2	
Total	11993.9	11511.7	922.2

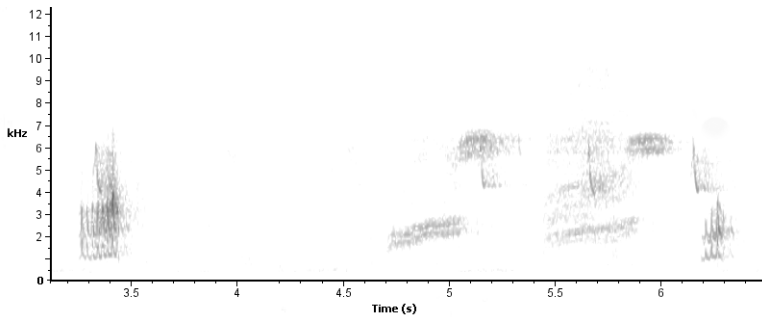


Figure 1. Spectrogram of Sooty Thrush call recorded in Barva Volcano on 13 July 2008.