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Nesting of blue rock thrush (*Monticola solitarius*) in an Urban area in North Africa

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Abstract

For the first time a nesting success of a Blue Rock Thrush (*Monticola solitarius*) couple was conducted in a residential area of the city center of the municipality of El-Bouni, in the northeast of Algeria. This municipality has a high population density and contains several commercial and industrial areas, which make it a considerable source of disturbance for birds.

In the breeding seasons of 2016, 2017 and 2018 this couple nested in a hole under a roof of a house. This is contrary to the known behavior of this species, which frequents the rocky areas, the steep rocky slopes, the mountain slopes with boulders, the canyons, the valleys, generally in arid lands. The observation of this phenomenon proves the important ability of Blue Rock Thrush to overcome human disturbances in urban areas.

Keywords: blue rock thrush, *Monticola solitarius*, Nesting, Urban Area, North Africa

Introduction

In the Western Palearctic and according to bird guides and works dealing with the ecology of Blue Rock Thrush, it is locally fairly common, nesting sedentary, partial migrant, altitudinal migrator and intercontinental migrant. It frequents rocky environments, steep rocky slopes, and mountainous slopes with boulders, canyons, valleys, rocky shores, ancient quarries, open pit mines, ruins, cliff tops, escarpments, ravines, gorges and rocky plateaus usually in arid lands. It is sometimes found in sparsely vegetated areas, those with trees and bushes sparse, it is skittish, quick to disappear and yet reaches higher altitudes; it can be found up to 2500 meters above sea level. In winter, it can occupy habitats rarely used for breeding, such as olive groves, Grzimek (1973) [12], Beaman & Madge (2003) [2], Heinzel & al. (2004) [14], Cabot & al. (2014) [8], Mullarney & al. (2000) [22], Collar (2015) [10]. In North Africa, most observations have been reported in cliffs, Rocky Mountains, rocky area, Isenmann & Moali (2000) [16] for Algeria and Isenmann & al. (2005) [17] for Tunisia.

Currently, *Monticola solitarius solitarius* which is considered as a rare nesting, sedentary and overwintering bird, is one of the subspecies found in Algeria. The majority of previous sightings of this species in Algeria occurred in the southern part of the country, either during the breeding season or the wintering season, Isenmann & Moali (2000) [16]. Nesting is strongly suspected in South-Saharan massifs such as Hoggar and Tassili, Brehme & al. (1994) [6], has never been conclusively proven. For the north-east of Algeria, the species is less abundant and it is occasionally found in some areas (Benyacoub & Chabi 2000) [3]. Observations in Tunisia show that the species is a sedentary breeder and remains present mainly in all regions of the country, Isenman & al. (2005) [17].

Having undergone a large decline in the 20th century, Blue Rock Thrush number in the western Palearctic are stable but weakened with the absence of evidence of declines or substantial threats. The trend of the European population remains unknown, Cabot & al. (2014) [8]; BirdLife International (2015) [4]. The types of threats of the species may vary from region to another. From 1970 to 1990, the species has declined in Spain and Italy. This phenomenon would be in particular due to the agricultural footprint causing a closing of the areas, new coastal tourist facilities, the overcrowding of the rocky areas, the flood of canyons, gorges for reservoirs, the renovation of old towers, afforestation and regrowth of matorral (Collar 2015) [10]. The species is rare and vulnerable in France and the population is declining in the range. Its abundance is poorly known, it is noted as probable or certain nesting bird (Rocamora & Yeatman-Berthelot, 1999) [24]. Persecution in Malta, including nest theft and bird catching, as

well as human disturbance, has pushed the species into inaccessible coastal areas. Research is needed to investigate the reasons for decline in the areas where causes are not apparent (Tucker & Heath, 1994) ^[25].

Breeding takes place from March to July in northern and western Africa, the nest is laid in a crevice of rock, usually at a height of five meters from the ground, it is in the form of a shallow bowl or rough soil composed of coarse dry herbs, rootlets, moss and leaves, loosely constructed and bordered with fine and soft herbs, rootlets and occasional feathers. Broods are 3 to 6 eggs, Grzimek (1973) ^[12]; Mullarney & al. (2000) ^[22]; Collar, (2015) ^[10].

The Blue Rock Thrush is listed in the "Least Concern" category of the global red list and the red list of birds in France according to the criteria of the International Union for the Conservation of Nature U.I.C.N. (2016) ^[26]. Despite its rarity, it is not included in the list of animal species protected by the Algerian regulation J.O.R.A.D.P. (2012) ^[18].

Ancient bird observations in Algeria have shown that Blue Rock Thrush is observed for the first time in Hoggar and Tassili by Meinertzhagen (1934) ^[21]. Others have confirmed that this species inhabits rock environments in the Aurès, where it rises up to 2300 meters, and in the Saharan Atlas, Burnier (1979) ^[7]; Ledant & al. (1981) ^[20]. The first mention of nesting in Algeria goes back to the year 1962, Blondel (1962) ^[5]. In the Tassili, during the breeding season, an adult male was observed several times carrying food to a scree at Djanet without being able to find a nest. In winter (September / October to March / April), it is also observed on the reliefs

and in the oasis of the Sahara, Niethammer (1963) ^[23], Yeatman (1965)^[27], Dupuy (1966) ^[11], Laferrère (1968)^[19], without confirming it was an observation of sedentary or passing visitor individuals.

According to Heim de balsac & Mayaud (1962) ^[13]; Caston (1954) ^[9]; Isenmann, (1986) ^[15] Blue Rock Thrush commonly nests in places in rugged locations throughout North Africa, from the Mediterranean and Atlantic shores to the Saharan Atlas. It is absent in the Great Plains, the breeding season starts at the end of April until the end of May. The egg-laying size of 4 to 6 eggs gives us an average (4.90 ± 0.57). At 100 km from our site to the east is Tunisia. In this neighboring country, the species is observed as sedentary nesting in the cliffs, from the north coast to the pre-Saharan reliefs, but the only observation in winter was made in a rock environment in the Sahara.

Apart for a few rare observations in Algeria, the species has not been the subject of any work; this article is a preliminary study to identify the status of the species in the region.

Materials and Methods

The study area on which we found a couple of Blue Rock Thrush, is located in the municipality of El-Bouni 4 km from the capital of the wilaya of Annaba, in the northeast of Algeria (Figure 1). The city of El-Bouni is limited to the east and south by the plain of Annaba, to the north by the Mediterranean and to the west by the Edough massif, it is crossed by the corridor of the valley of Seybouse, it contains the marsh of Bousseadra.

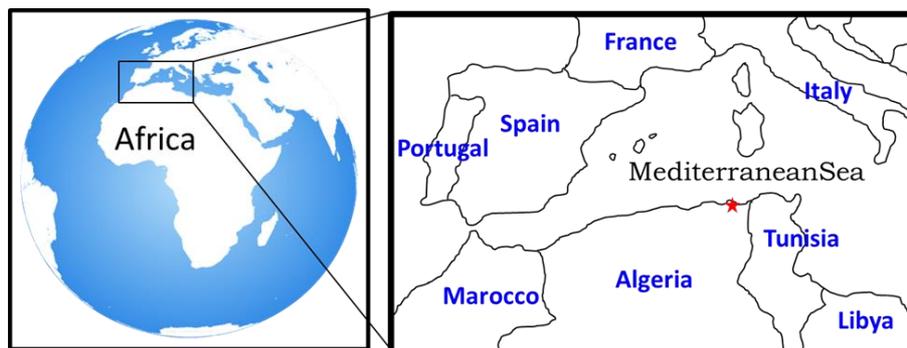


Fig 1: Location of the study site (El-Bouni, Northeast of Algeria)

We followed the couple during the breeding season of the years 2016, 2017 and 2018. For taking pictures of the nests, the couple and the place of nest installation ($36^{\circ} 50'52''N$; $7^{\circ} 44'33''E$), we used a camera brand Canon (Power Shot SX20-IS, Zoom 20X) (Figure 2).



Fig 2: Localisation de l'endroit de nidification dans le centre de la ville d'El-Bouni.

Results and Discussion

One day in March 2016, a Blue Rock Thrush couple appeared in a residential district in the downtown of El-Bouni municipality, and moving between the houses and gardens of the district. We had the opportunity to observe the couple during the nesting season. The difference between the male and the female being very clear thanks to the blue color carried by the male (Figure 3). Surveillance was set up from time to time, and the monitoring lasted several weeks, without knowing why this site was chosen. We discovered the place frequented by the couple more than other places; it consists of a ground floor dwelling in which lives a family of five persons, and an upper floor whose construction was unfinished; roofs and walls have holes. The monitoring showed that this couple was building a nest because the two partners brought in turn twigs and dry herbs collected in the small gardens of nearby houses.



Fig 3: The male and the female of Blue Rock Thrush in the nesting location.)

- A.** The female on the window of the house.
- B.** The male on the terrace of the house.
- C.** The female in the garden of the house.
- D.** The male in the garden of the house.

It should be noted that the city of El-Bouni is densely populated (145941 habitants) with density of 1569,26 h/km² and contains several commercial and industrial areas (steel industry, metallurgy, chemistry, mechanic, electronic, glass, wood, paper, agroalimentation spare part, drinks and Building material) which make it a considerable source of disturbance for birds, especially during their breeding season. The study area has a presence of a large human movement, residents,

walkers and buyers, throughout the year with peak attendance in summer A.N.I.R.F. (2013) ^[1]. These factors may be unfavorable to normal reproduction of the species. We know that the disturbance prevents the sustainable installation of the species according to its behavior, but the attractiveness of the site for the couple was apparent on the spot.

At the end of April of the same year, we observed the upper floor of the house, and we saw in the center of one of the rooms the remains of meals and relatively fresh feces lying scattered on the floor (Figure 4-A). Just above we noticed an opening with a diameter of 7 cm in a slot of the roof at 6 meters height in which the couple built their nest. This was well installed inside the voids of the roof safe from danger.

The activity monitoring of the couple was not easy to do due to its behavior, because it is a skittish bird, very clever to hide behind the walls. The couple members have never been observed close to each other. And we could not see either the eggs or the chicks because of the tight diameter of the hole (Figure 4-B).

In January 2019, in order to complete the construction of the upper part of the house which will be partly destroyed, we were allowed to scrutinize other parts of the nest that was previously inaccessible to get. (Figure 4-C). We found that the nest was prolonged inside (Figure 4-D) with a cup in the center with two extensions in two opposite sides and consisted of a set of small leaves, fine stems, rootlets and mosses, carpeted inside with finer elements and feather fillings (Figure 5).



Fig 4: Placement of the nest in the house.

- A.** Remains of meals and fresh feces scattered on the floor.
- B.** Hole where the nest is located.
- C.** Revealed nest inside the roof.
- D.** Nest emplacement in the roof.



Fig 5: The shape and components of the nest.

The originality of this article lies mainly in the discovery and observation of this species in its life cycles for the first time in the region. The exceptionality of this phenomenon is therefore

illustrated by the presence of a rare species in an urban area (El-Bouni municipality), renowned for its high population density and high commercial and industrial intensity. The

habitat occupied by the Blue Rock Thrush couple that we have described is not identical to that mentioned by the various researchers mentioned previously. These references mention that this bird prefers open habitats and lives mainly in rocky mountains areas up to 2500 meters altitude away from areas of human activity Beaman & Madge (2003) [2], Grzimek (1973) [12], Heinzel & al 2004 [14], Mullarney & al (2000) [22]. Knowing that infrastructures and human disturbance are among the most threatening factors for nesting sites and disrupt the reproductive cycle. So it is important to know why the species found in these new sites an alternative place to their usual breeding site. Even the choice of nest support is unusual. The only similarity with the natural environment of origin remains this form of crevice in the roof. We could not see the young birds in the site neither in the chick stage nor the juvenile stage, except the parent couple, with the total absence of the latter in the wintering period. Among the bird species that regularly frequent the site during nesting season are the Common Bulbul (*Pycnonotus barbatus*), Red Throat (*Erithacus rubecula*), African Blue Tit (*Cyanistes teneriffae*), House Sparrow (*Passer domesticus*), Barn Swallow (*Hirundo rustica*), Common House Martin (*Delichon urbicum*), Rock Dove (*Columba livia*) and Eurasian Collared Dove (*Streptopelia decaocto*).

Conclusion

There have been no recorded observations of Blue Rock Thrush in Algeria for several decades, and nesting of this species has not been recorded since 1990, Brehme & al, (1994) [6]. The previous references have been recorded in the crevices of the slopes of the Rocky Mountains, contrary to what is recorded in this article, for the first time a nesting is recorded in a house of a populated district. To date, it does not appear that cases of breeding on occupied human buildings have been reported in Algeria. We can conclude that this bird species has begun to invade urban areas. Currently, to our knowledge, we have no answer to this specific question, it would be interesting to see if the species could adapt with other ecological factors. We therefore propose to contribute by this work to the enrichment of the documentation on the nesting of this species in the north-east of Algeria.

This article proves the important ability of Blue Rock Thrush to overcome human disturbances in urban areas. Measures to conserve bird nesting habitat should be put in place during architectural construction work. There are fears of constructing buildings that have a direct or indirect negative impact on bird with rupestral characteristics such as Blue Rock Thrush.

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