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Nesting and breeding attempts of *Cecropis daurica* (Laxmann, 1769) in Tunisia

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Abstract During fieldworks in 2019, a pair of Red-rumped Swallows *(Cecropis daurica)* were seen building their nest (June) and one of them brooding (August). The pair was still present in the area by the end of September, while all other swallows left this breeding area. In June 2020, the nest entrance was destroyed and the nest was occupied by a pair of *Passer* sp. Another nest of *C. daurica* was found in an abandoned building but was completely destroyed. This observation is the first record concerning an attempt and failure of nesting of the species in Tunisia. The nesting area of the Red-rumped Swallow is extended to the Mediterranean in southern Europe and to northwest Africa. The nesting sites are described, and the extension of the nesting area is discussed in this work.

Keywords: *Cecropis daurica*, nesting failure, Kroumiria, Tunisia

Összefoglalás Egy vörhenyes fecske *(Cecropis daurica)* pár fészeképítését (június) és költési kísérletét (augusztus) figyelték meg Tunéziában, 2019-ben. A pár egészen szeptember végéig maradt a területen, miközben más fecskék már elhagyták költőterületüket. 2020 júniusában a fészek bejárata már sérült volt, és valamely verébfaj (*Passer* sp.) foglalta el azt. Később egy elhagyatott épületben egy újabb vörhenyes fecske fészket találtak, de az sajnos teljesen megsemmisült. Ezek az első adatok a vörhenyes fecske tunéziai fészkelési kísérleteire, amelyek sajnos sikertelenek voltak. A faj fészkelőterülete Európában a Mediterráneumra, illetve Északnyugat-Afrikára terjed ki. Jelen tanulmányban a fészkelőhelyek leírásáról és az új területek lehetséges meghódításáról is értekezünk.

Kulcsszavak: vörhenyes fecske, költési kísérlet, elterjedés, Kroumiria, Tunézia

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Introduction

Bird diversity is relatively well known compared to the rest of the vertebrates of Tunisia (Isenmann *et al.* 2005). In the last decade, new species have been observed in the country (Azafzaf *et al.* 2015). Breeding species have also been added to the previously known lists (Ouni *et al.* 2009, Olioso *et al.* 2013).

However, some regions remain poorly studied, at least concerning their ornithological diversity, such as Central Tunisia (non-coastal) and Kroumiria. Indeed, studies made in the two regions are rare (see e.g. Touihri *et al.* 2015), and more or less continuous observations concern only particular habitats, mainly wetlands or those of having relatively easy access. It is also important to emphasize that observations during the breeding season of birds are not frequent, especially during the summer period.

Kroumiria, located in the northwestern part of Tunisia, is the most forested and humid region of the country (Posner 1988). The vast areas of forests are mainly composed of zeen oak *(Quercus canariensis)*, cork oak *(Q. suber)*, kermes oak *(Q. coccifera)* and maritime pine *(Pinus pinaster)*. It should be noted the presence of a small forest of *Quercus afares*, an Algero-tunisian endemic tree in Ain Zana. The umbrella pine *(P. pinea)* has been planted over large areas and tends to be natural in the region (Le Floc'h *et al.* 2010). Kroumiria contains many permanent or temporary wetlands (dams, hill lakes, rivers, wet meadows), as well as the only extended peat bog in Tunisia (Dar Fatma).

Five species of swallows are listed in Tunisia (Isenmann *et al.* 2005). Three of them are regularly breeding. These include the Eurasian Crag Martin *(Ptyonoprogne rupestris)*, the Barn Swallow *(Hirundo rustica)* and the Common House Martin *(Delichon urbicum)*. The other two species, the Sand Martin *(Riparia riparia)* and the Red-rumped Swallow *(Cecropis daurica)* are considered migratory passengers.

The Red-rumped Swallow has a large global distribution area, which covers South-Europe, Asia and Africa (Chişamera 2006). Around the Mediterranean, it breeds from the Iberian Peninsula east to Greece, the Balkans, Cyprus and the Middle East, as well as in Algeria and Morocco (Chişamera 2006, Wilson *et al.* 2006, Pilgrim & Tordoff 2010, Liu *et al.* 2014).

The main objective of this paper is to provide evidence of first nesting and failure of the Red-rumped Swallow in Tunisia, by describing its nesting sites and discussing its potential geographical extension in the country.

Materials and Methods

Study area

The sites where nests have been observed were located in a public plant nursery for the production of forest seedlings and an abandoned factory building located at around 2.5 km west of the nursery. The plant nursery is situated East of Tabarka city and is established on the edge of a forest on coastal dunes (Posner 1988). Original forest of kermes oak only persists on the coast. In the vicinity of the nursery, it has been replaced by pine trees (*Pinus pinea* and *P. pinaster*) and eucalyptus (*Eucalyptus* sp.). Some perennial meadows remain in the vicinity of the site, and are often grazed by livestock (sheep and cattle). More or less extensive wetlands persist in the area, but dry up in summer.

The abandoned factory is located at the edge of a pine forest *(P. pinea)* planted on fixed dunes, just in front of the route attending Tabarka airport. In this area, there were only two houses, but people from the neighbouring localities seem frequent the building, which doors and windows have been snatched by local people.

In both sites, the forest is dense, and the vegetation cover reaches 100% in the natural forests of kermes oak, but in the other types of forests, open spaces, often of small extension, persist. The plantations are several decades old and the trees often have a height exceeding 10 m. In planted forests, the undergrowth vegetation is almost absent, and unplanted areas

are covered by scrubs, dominated by oleaster *(Olea europaea)* and Phoenician juniper *(Juniperus phoenicea)*. The soil is sandy.

The nursery is attended only by its staff, and the work during the dry season is reduced almost solely to the irrigation of seedlings. Disturbances are very small. The space reserved for the nursery is fenced and is not used by the surrounding populations. It is always guarded. The nursery has a water point that provides all its needs. It is linked to an aerial pool where water is stored for future use. Often, the pool overflows and pours water on the ground, forming a small permanent wetland where the Red-rumped Swallows were seen extracting the mud necessary for the construction of their nest (see below).

The abandoned factory is located near small wetlands and a river, dry in summer, but water stays in interspersed ponds along the watercourse. The substrate is sandy or loamy, and in these areas, the vegetation is specific to meadows (*Typha domingensis*, *Equisetum telmateia*, *Juncus* sp. etc.). Trees are specific to wetlands and river borders *(Alnus glutinosa, Fraxinus angustifolia, Nerium oleander, Vitis vinifera, Hedera algeriensis, Populus alba, Tamarix africana)*. Some other plant species are only localised and rare in the region *(Ulmus minor, Salix atrocinerea, Vitex agnus-castus)*. These wetlands are frequently grazed by herds of cows and wild boars.

In order to ensure an inventory and monitoring of the animal biodiversity of Kroumiria, regular fieldworks in the last two decades were carried out in various natural habitats of the region (pine and oaks forests, meadows, streams and wetlands).

Field visits were made mainly in the mornings, during the hot season (spring and summer), but they were made all day long otherwise. No night trips were made. Summer trips were reduced, because of heat, and were most often carried out to sites previously identified, to monitor particular species, including amphibians, reptiles or birds. In summer, the sites visited were mostly located at high altitudes, in undisturbed wetlands or in areas where certain species have been spotted at least once. Exploration trips of little known areas were also made but at much lower frequencies.

Result and Discussion

On the 14th of June, 2019, a routine visit to the nursery was done. Two unusual swallows were seen extracting mud from a small pond and dropping it a little further into an open shed. The two swallows were building a nest. They were photographed remotely during mud extraction in order to avoid their disturbance. The birds were later identified as Red-rumped Swallows.

Two months later, on the 16th of August, the site was revisited in the morning. The nest has been completed with its characteristic form and access tunnel. It was placed near the roof of an open shed used for the storage of nursery equipment, at a height of about 4 m. An individual entered and stayed there for at least 30 minutes, a sign that it was incubating eggs. This is probably the second brood. On the wall, there were only wasp nests. No other nest of swallows was present. The nest was not approached, so as not to disturb the bird.

Later, on the 27th of September, the pair of Red-rumped Swallow was still present. It was seen entering the nest for a short time, and then made many visits separated by short time intervals. No sound came from the nest. At this period, nesting swallows in the region left to their wintering areas. This delay of departure may be explained by the need to rear the last brood of the season. The absence of young at the entrance of the nest and chick calls could be explained by the fact that they were still too small.

In 2020, a visit was made to the nursery (on the 15th of June), but the swallow nest was found occupied with a pair of *Passer* sp., with its tunnel destroyed. This finding encouraged additional explorations in the vicinity of the nursery in order to look for the presence of possible other swallow nests and, on the 25th of June, a destroyed nest was found in front of an abandoned factory. It was at a height of about 3m, over its entrance. Occupation of Red-rumped Swallow nests by sparrows was also reported from India (Samson *et al.* 2017). All other explorations in the surroundings of the nursery were not successful.

In North Africa, the Red-rumped Swallow is known to breed in Morocco and Algeria (Heim de Balsac & Mayaud 1962, Etchecopar & Hue 1964, Isenmann & Moali 2000, Barreau & Bergier 2001, Bergier & Thévenot 2006). In Tunisia, the species is known only during migration (Thiollay 1977, Isenmann *et al.* 2005).

The nesting period of the Red-rumped Swallow in Tunisia seems to be late as the clutches are reported at the end of April in Morocco (Heim de Balsac & Mayaud 1962, Barreau & Bergier 2001) or in May (Etchécopar & Hüe 1964) and the spring migration in Tunisia is noted between mid-March and mid-May (Isenmann *et al.* 2005). Indeed, it is possible that the nest in the nursery was built after the destruction of the nest found last June. Around the Mediterranean, nesting is known between the months of April and September (de Lope 1980, Prodon 1982, Bazán 2007). Unlike its congeners, the Barn Swallow and the Common House Martin, the species nests individually or in small groups (Isenmann & Nicolau-Guillaumet 1992, Barreau & Bergier 2001).

The shape of the nest is very characteristic of the species, with its access tunnel and closed incubation chamber (de Lope 1980, Chişamera 2006, Bazán 2007). The location of the observed nest seems unusual for the species, known to build its nest in caves, cisterns, cave ceilings, rock clefts, and under bridges (Ferry 1961, Géroudet 1979, Prodon 1982, Vallée 1983, Chişamera 2006), although some authors report nesting in abandoned buildings (Fasola *et al.* 1997, Barreau & Bergier 2001). The Red-rumped Swallow has bred in a regular used underground car park in Hungary (Balatonfüred) (Bodor 2017). Potential nesting sites of the Red-rumped Swallow are not lacking in the region. Other nests may exist and stay unnoticed due to lack of exploration (Orta & Romero 1990, Moali & Isenmann 1991). The hypothesis of a second clutch is very likely. In fact, a second clutch is not rare for the species (Heim de Balsac & Mayaud 1962, de Lope 1980).

The presence of the species in Tunisia could be linked its expansion in the Mediterranean region (Isenmann & Nicolau-Guillaumet 1992, Sanz *et al.* 2015). The start of establishing nesting population from the actual birds and descendants is likely as long as fidelity to the nesting site is noted for this species (de Lope 1980). Therefore, the possible new nesting site was not found, and additional searches should be done in at least the neighbouring sites (bridges, dams, airport buildings).

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