

A breeding event of Pale Rock Sparrows *Carpospiza brachydactyla* in northeast Jordan

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The Pale Rock Sparrow *Carpospiza brachydactyla* breeds in the Middle East, including Iran and southern Turkey. It is an erratic summer visitor to its breeding grounds, which comprise of arid or semi-arid hills and mountain sides with low scrub. It is a short distance migrant that moves south/southwest to winter in parts of southwest Arabia and eastern Africa (Shirihai 1996, Snow & Perrins 1998).

In Jordan, the species is considered a rare and irregular breeding species and migrant (Andrews 1995). Records of singing males indicate the possibility of localized and irregular breeding in various parts of the country *eg* along the high rift margins from Nebo mountain south to Ras En-Naqab and in the eastern desert between Azraq and Ruweished. There is only one confirmed breeding record and that comes from the southwestern highlands: two singing males and an adult feeding two juveniles at Dana in May 1994 (Andrews 1995, Andrews *et al* 1999).

In spring of 2010, Pale Rock Sparrows were recorded nesting along the shallow wadis of the Ruweished desert in northeast Jordan. This unprecedented record of many breeding pairs followed a relatively wet rainy season with frequent floods during February and late March. We report the results of observations carried out on breeding Pale Rock Sparrows during ecological field work in the Ruweished desert during 2010.

METHODS AND STUDY AREA

The two study areas, Wadi Abu Hifnah (32° 25' N, 38° 17' E) and Wadi Al-Qassab (32° 33' N, 28° 33' E, Plate 1), are located south and southeast of Ruweished town in flat or undulating desert landscape (*c*600 m asl) covered with flint stones (hamada). The average annual rainfall is *c*75 mm falling mainly between November and March. Due to the low average precipitation, vegetation cover is naturally sparse but is usually more dense (above 5% cover) and clustered in microhabitats with favourable conditions *eg* wadi beds and depressions ('run-off hamada vegetation' of Al-Eisawi 1996). Grazing occurs mainly by sheep owned by Bedouins. Wadi Al-Qassab consists chiefly of flat sections that have sandy or rocky banks and the vegetation is dominated mainly by *Achillea fragrantissima*, *Heliotropium* sp and *Deverra triadiata*. Wadi Abu Hifnah is similar to Wadi Al-Qassab, but also includes a marrab: a wide, flat section of several kilometers in length where water flows more slowly, and over a wider area, during floods (Marrab Al-Bgheilah,



Plate 1. Wadi Al-Qassab, Ruweished desert, Jordan, with seasonal pool, May 2010. © Rangeland Department, Ministry of Agriculture



Plate 2. The edge of Marrab Bgheileh, Wadi Abu Hifnah, Ruweished desert, Jordan, May 2010. © Mohammed Janaydeh

Plate 2); vegetation cover in the marrab is very sparse except for the margins and at the wadi mouth, where *Achillea fragrantissima*, *Peganum hermala*, *Ducrosia anethofolia*, *Cleome amblyocarpa* and *Astragalus spinosus* are common plant species. A feature of all wadis in the eastern desert is the formation of seasonal pools in deeper sections after flooding events.

Field visits were carried out during spring and early summer 2010. Wadi Al-Qassab was visited three times, 22–24 April, 31 May–1 June and 5 July; while Wadi Abu Hifnah was visited once during the breeding season, 6–7 May. The sites had previously been visited during May 2009 and January–March 2010. We carried out a total of 11 line transects, 1 km each, within the study wadis and counted all birds including Pale Rock Sparrows. The core of the marrab was excluded from this study as it was nearly devoid of vegetation and apparently unsuitable habitat for most bird species including Pale Rock Sparrow. We calculated the total number of individuals of Pale Rock Sparrows in all transects and frequency of occurrence (transects in which the species was recorded divided by total number of transects). Few Pale Rock Sparrow nests were found incidentally along the line transects, but where activity *eg* singing occurred, the vegetation, mostly consisting of dwarf shrubs, was searched systematically for nests. The identification of the nest as belonging to this species was always verified by observing one of the parents (most probably always the female) leaving the nest while being approached. The species of plant supporting the nest was noted. The proportion of plant species (the number of individual plants/species surrounding nest to a distance of 50 m relative to total number of plants of all species, excluding annuals) was estimated in the plant community in three separate breeding areas that varied in location and vegetation cover (Wadi Abu Hifnah, Marrab Bgheilah, Wadi Al-Qassab). To study the preference for certain dwarf shrub species as nest support, the observed frequencies of nests built in each plant species were then compared with expected frequencies derived from the average proportion of the species in these areas using the χ^2 test.

RESULTS AND DISCUSSION

A total of 12 nests and more than 45 different individual Pale Rock Sparrows including many singing males, were recorded in the study areas April–early June, mainly close to seasonal pools with a relatively high density of dwarf shrubs. The frequency of occurrence of Pale Rock Sparrows was nearly 82% along the wadis and Marrab margins close to the wadi mouth. The highest density of Pale Rock Sparrows was 14 individuals and 4 nests along one transect (1 km).

Most nests were being built or in the egg-laying stage May–early June, except for one nest at Wadi Al-Qassab that had apparently a full clutch of 5 eggs and was probably in the incubation phase. At the same time, other resident birds *eg* Temminck's *Eremophila bilopha*, Thick-billed *Ramphocoris clotbey* and Bar-tailed Larks *Ammomanes cinctura* had completed their first brood, with some apparently starting a second. The last visit to Wadi Al-Qassab, in July, did not produce any records of Pale Rock Sparrows indicating a sudden departure of birds after concluding their broods or possibly premature abandonment due to the drying out of water pools.

Table 1. Plant species used by Pale Rock Sparrows as nest supports in the Ruweished desert in 2010, total number of nests in each plant species, and χ^2 test statistic for comparing between expected (based on plant species relative abundance) and observed frequencies (E = expected, O = observed).

Plant species	Number of nests	
<i>Astragalus spinosus</i>	8	$\chi^2 = 32.8, p < 0.01$ (O > E)
<i>Echinops</i> sp	2	$\chi^2 = 4.5, p > 0.05$ (O = E)
<i>Achillea fragrantissima</i>	1	$\chi^2 = 6.1, p = 0.05$ (O < E)
<i>Heliotropium</i> sp	1	$\chi^2 = 0.5, p > 0.05$ (O = E)



Plate 3. Nest of Pale Rock Sparrow *Carpospiza brachydactyla* in *Astragalus spinosus*, Wadi Al-Qassab, Ruweished desert, Jordan, May 2010. © Mohammed Janaydeh



Plate 4. Nest of Pale Rock Sparrow *Carpospiza brachydactyla* in *Heliotropium* sp, Wadi Al-Qassab, Ruweished desert, Jordan, May 2010. © Mohammed Janaydeh

All nests were built in dwarf shrubs, within 2–40 cm from the ground (Plates 3 & 4). Nests were cup-shaped and very similar in structure to the nests of Desert Finches *Rhodospiza obsoleta* breeding in Jordan (Khoury *et al* 2009). The plant species that were used to support nests are given in Table 1. The Pale Rock Sparrows showed a significant preference to build their nests within the spiny dwarf shrub *Astragalus spinosus* as the observed frequency of nests in this plant species exceeded the expected frequency derived from the plant's relative abundance (Table 1). Another thorny plant, *Echinops* sp, was selected for nest building where available though it had a very localized and patchy distribution. Although *Achillea fragrantissima*, which has no thorns or spines, was the dominant dwarf shrub at the study sites, it was selected only once by a pair of Pale Rock Sparrows as a nest support. This particular individual *Achillea* was large and located hanging on the upper edge of a steep bank, thus being relatively inaccessible to ground-dwelling nest predators. We identified during this survey at least two potential ground-dwelling nest predators at the study areas—Red Fox *Vulpes vulpes* and Desert Monitor *Varanus griseus*. For a bird species that usually nests in low vegetation, building nests within thorny vegetation is probably the best way to protect the nest from predators. This species appears to breed only if water (seasonal pools), sufficient food and dwarf shrubs which provide cover and/or protection are available in spring and was not recorded breeding in the study areas in the previous breeding season (2009) which followed a relatively dry winter.

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