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## Updates on the distribution of *Canis aureus* in Saudi Arabia (Carnivora: Canidae)

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**Abstract.** Additional locality records for the golden jackal from Saudi Arabia are given based on camera trappings and a roadkill, along with an updated map of its distribution. Considering the limited distribution of this species, and due to indiscriminate killing of canids in Saudi Arabia, this species should receive high priority for protection.

**Key words.** Golden jackal, range, Middle East, conservation.

### INTRODUCTION

The golden jackal, *Canis aureus* Linnaeus, 1758 has a wide range of distribution extending from Europe to the Middle East, Central Asia, and Southeast Asia, with around ten different subspecies (MOEHLMAN & HAYSEN 2016). In the Middle East, two populations of the golden jackal are recognized; *C. a. syriacus* Hemprich et Ehrenberg, 1833 in Jordan, Syria, and Palestine, and *C. a. aureus* Linnaeus, 1758 in the Arabian Peninsula and Iran reaching as far as Pakistan (GASPERETTI et al. 1985, HARRISON & BATES 1991).

Limited distributional data are available for this species from Saudi Arabia. It was reported from Hofuf, Safwa, Jabal Qarah in the Eastern Province and Laija, Al Jawf Province, in the north of Saudi Arabia (GASPERETTI et al. 1985), and Abo Ali Island, Dauhat Ad-Dafi, and Ras Al-Abkhara (KOCK & NADER 1996) also in the Eastern Province. So far, it has not been recorded from Oman, United Arab Emirates, and Kuwait (SPALTON 2002, CUNNINGHAM 2004, COWAN 2013). HELLYER (2009) reported on two sightings of the jackal from Qatar. The jackal is common along the Euphrates and Tigris basins (GASPERETTI et al. 1985).

In this study, we report on additional localities for the golden jackal from northern and north-western Saudi Arabia, with a map showing the current distribution in the Kingdom.

### MATERIAL AND METHODS

Four photo trap cameras (two Wosoda G200 and two Reconyx Hyperfire 2 Covert IR Camera) were placed near Qa' Sharorah pools near Tabuk for three weeks, and two permanent photo trap cameras (Bushnell Trophy Camera Brown 119736) were placed along a tract of animal activity in Abo Ali Island, Al Jubail Marine Wildlife Sanctuary, for two months.

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## RESULTS

The golden jackal was observed in three localities (Table 1, Fig. 1). Two individuals, an adult female and a juvenile, were recorded using a camera trap placed at Abo Ali Island, Al Jubail Marine Wildlife Sanctuary, Eastern Province, on 17 November 2021 (Fig. 2A). The animals were active at 15:27. The site is situated within a small island connected by a bridge from the mainland and is rich in thick aquatic and coastal vegetation.

A total of six animals were photographed by camera traps in Qa' Sharorah, Tabuk Province, during 13–19 December 2022. Activity period for these individuals lasted from 21:25 to 22:10, one pregnant female was active in early morning at 6:12. Two individuals were observed together and one individual was seen on one and two occasions, respectively. During 12–14 January 2023, at Qa' Sharorah, one male was photographed at 10:10, and two males were seen from 18:42 until 5:38 (Fig. 2B, 2C). Another record from 2021 comes from Domat Al Jandal near a pool



Fig. 1. The golden jackals, *Canis aureus*, captured by camera traps in Saudi Arabia. A. Two animals at Abo Ali Island. B. Adult male at Qa' Sharorah during day-time. C. Adult male at Qa' Sharorah at night-time.

Table 1. Camera traps and record localities for *Canis aureus* in Saudi Arabia

locality	coordinates	date / period	No. of inds.
Abo Ali Island	27°18'57"N, 49°38'21"E	17 November 2021	2
Qa' Sharorah	28°59'22"N, 36°59'03"E	13–19 December 2022	6
Qa' Sharorah	28°59'22"N, 36°59'03"E	12–14 January 2023	3
Domat Al Jandal	29°49'12"N, 39°54'37"E	2022	1
Tabarjal	30°30'40"N, 38°14'10"E	21 November 2022	1

that was formed from sewage treatment plant effluent. A roadkill was found on the highway between Tabarjal and Domat Al Jandal, 100 km NW of Domat Al Jandal, on 21 November 2022. The site is also in close proximity to a small sewage treatment plant and surrounded by farms.

All the above localities are situated around waterbodies near Abo Ali Island or open pools formed from sewage treated water as in Qa' Sharorah, Tabarjal, and Domat Al Jandal. Thick vegetation of aquatic plants such as *Typha* sp. dominates the entire areas, along with other halophytic trees including *Tamarix aphylla*. The golden jackal is a nocturnal species and often forages on carrions and small mammals. It prefers areas with open waterbodies, surrounded by reeds. In this communication, *C. aureus* was observed during day- and night-time at Qa' Sharorah and during day-time at Abo Ali Island. Other associated species found along with *C. aureus* included the red fox, *Vulpes vulpes* and Blanford's fox, *Vulpes cana* at Qa' Sharorah.



Fig. 2. The golden jackal at the Wildlife Shelter Unit at Al Thumamah (NCW), Saudi Arabia.



Fig. 3. Map of Saudi Arabia showing the record localities of the golden jackal, *Canis aureus*. Published localities in black circles, new localities in red circles. Legend: 1 – Tabarjal, 2 – Lajja, 3 – Domat Al Jandal, 4 – Qa’ Sharorah, 5 – Dauhat Ad-Dafi, 6 – Ras Al-Abkhara, 7 – Abo Ali Island, 8 – Safwa, 9 – Jabal Qarah, 10 – Hofuf.

Three healthy golden jackals (two females and one male) were sheltered in the Wildlife Shelter Unit at Al Thumamah (NCW), but unfortunately without known specific localities of their origin (Fig. 2). Hair and blood samples were taken from the three animals for further molecular studies.

## DISCUSSION

The present records increase the distribution range of this species further to the north and northwest of Saudi Arabia (Fig. 3). The closest population from the northern Saudi Arabian population is in Azraq oasis in Jordan (AMR 2012). It lies about 170 km north of Tabarjal. In the eastern part of the country, *C. aureus* populations are confined around the Eastern Province and its vicinity (GASPERETTI et al. 1985). This area is a farmland with palm trees and other vegetable crops. It is difficult to track down the origin of this population, however, the closest population in southern Iraq is about 420 km from the Al Jubail area southwards (ABBAS & HUSSAIN 2015).

The golden jackal is a generalist species, feeding mainly on carrions of domestic ungulates, fruit, birds, small mammals and other invertebrates as well as garbage (BORKOWSKI et al. 2011). In the study areas, *C. aureus* probably feeds on aquatic birds and other small mammals. We

have evidence on its diet in the three locations. In captivity at the Wildlife Shelter Unit at Al Thumamah, it was fed on chicken and other meat. MACDONALD (1979) conducted a detailed study on the golden jackal around the Dead Sea in Palestine as well as its behaviour and interactions both within and between groups. Groups consisted of 10–20 individuals per group and occupied a specified territory. They were also observed during day- and night-times.

In Egypt, *Canis (aureus) lupaster* Allen, 1939, was found to inhabit floodplains with lush and cultivated areas around the Nile. This population does not venture into arid deserts around the Nile, and is more attached to irrigated and human-inhabited areas (SALEH & BASUONY 2014).

Concerning the limited distribution of this species, and due to indiscriminate killing of canids in particular in Saudi Arabia (ALOUFI & AMR 2018), *C. aureus* should receive high priority for protection. Luckily, the golden jackal was reported previously from Abo Ali Island (KOCK & NADER 1996), located within Al Jubail Marine Sanctuary, thus it is protected *in situ*. This population seems to be still surviving 27 years after its initial discovery by KOCK & NADER (1996). Further studies should be carried out along the eastern coastal region to identify other possible sites of *Canis aureus*. It is also recommended to conduct a genetic study on both the eastern and the western populations and compare them with animals from adjacent countries (i.e., Jordan and Iraq).

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