

Status and ecology of the Striped Hyaena, *Hyaena hyaena*, in Jordan

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Abstract. In Jordan, the Striped Hyaena, *Hyaena hyaena*, occurs throughout the country in all zoogeographical regions, without a special preference of habitat types and altitudes. The habitats for this disliked animal must comprise safe refuges. The diet consists mainly of remains of camels, donkeys and horses, but include also remains of cows, dogs, foxes, domestic goats, sheep, Groitied Ghazelles (*Gazella subgutturosa*), and Nubian Ibex (*ibex nubiana*). Human interaction and threats affecting the current populations of *H. hyaena* are also discussed.

Kurzfassung. Die Streifenhyäne, *Hyaena hyaena*, kommt in ganz Jordanien in allen zoogeographischen Regionen vor, ohne besondere Ansprüche an Habitat oder Höhenlage zu stellen. Die Lebensräume dieses in Jordanien unbeliebten Tieres müssen jedoch sichere Rückzugsgebiete besitzen. Die Nahrung besteht hauptsächlich aus Resten von Kamelen, Eseln und Pferden, doch wurden vereinzelt auch Reste von Rindern, Hunden, Füchsen, Ziegen, Schafen, Kropfgazellen (*Gazella subgutturosa*) und Nubischen Steinböcken (*ibex nubiana*) gefunden. Interaktionen mit dem Mensch und die Gefahren für den Bestand der Hyäne werden beschrieben und diskutiert.

Key words: Jordan, Middle East, Striped Hyaena, *Hyaena hyaena*, distribution, conservation, human interaction.

Introduction

Carnivores in Jordan are becoming increasingly threatened mainly by the rapid development in most of the country as a result of urban and agricultural expansions. The Striped Hyaena, *Hyaena hyaena*, additionally suffers from persecution, as it is a disliked animal which local people fear. Within the past 30 years, several hyaena records have been published from Jordan (NELSON 1973, ATALLAH 1977, AMR & DISI 1988, SEARIGHT 1987, MASSETI & COVARELLI 1991, QUMSIYEH et al. 1993, AL YOUNIS 1993, AMR et al 1996, QUMSIYEH 1996, AMR 2000, BUNAIAN et al. 2001), however, no comprehensive study on the status, distribution, ecology and conservation needs of the species was undertaken. The present paper attempts to close this gap.

Material and methods

We reviewed 40 published reports dealing with the mammals of Jordan and neighboring countries and extracted localities indicating records for the Striped Hyaena in Jordan. Also, museum specimens at the deposition of local museums (JNHM: Jordan Natural History Museum, JUNHM: Jordan University Natural History Museum, JUNHM) were examined: JNHM040 (♂ skin & skull), 3.6.1982, Ezmal, Irbid. – JNHM048 (skin), 4.10.1982, Eshatafena, Ajloun. – JNHM051

(skin), 24.10.1982, Eshatafena, Ajloun. – JNHM159 (♀ skin) July 1987, Madaba. – JNHM304 (skin), 5.3.1987, Ibbin, Ajloun. – JUNHM (skin without number), 15.2.1982. Qatranah, Karak. – JUNHM (skin without number and date), Abu Enssair, Amman. – JUNHM038 (skull), 1987, Wadi Arabah.

Field studies targeted two areas; the Eastern Desert and Dana Nature Reserve. The following methods were employed to assess the presence of the Striped Hyaena in the Eastern Desert and Dana Nature Reserve:

- **Spotlighting:** One million candles spotlight was used for spotlighting. Tracks and side roads of known hyaena activity were spotlighted for 2-3 hours per night for 40 days.
- **Daytime transects:** Active dens were identified in areas of known hyaena activity. Caves were excavated in Dana Nature Reserve, Al Dahik, Jawa, Deir Al Kahf and other sites.
- **Baiting stations:** A trial baiting station was set in Al Nwattif area where the Striped Hyaena activity was confirmed. The bait was placed in the afternoon. Other baiting stations were set according to the availability of suitable baits (eg. carcasses of goats or donkeys).
- **Interviews:** Locals inhabiting study areas were interviewed. Seven people were asked if they have encountered hyaenas in the past or recently, believes and relationship with Hyaenas.

Bone and skull remains were collected from hyaena dens in Dana Nature Reserve, at Jawa and at Tall al Ashqaf. Remains were first separated into three groups (skulls, limbs and horns) and then identified to the species level as possible.

Results

Cranial features

Skull robust, with well developed sagittal crest and the braincase is characteristically depressed laterally (Fig. 1–3). Interorbital region is broader than the postorbital region, being longer, narrower and deeper. Zygomatic arches very massive and the mandibles are short and massive. First upper premolar short and without function, lower first premolar absent. Carnassials set back for maximum efficiency, with the upper ones extremely powerful.

Examined skulls (JNHM040 and JUNHM038) have the following dimensions (in cm): Greatest length of skull 24-24.6; Condylbasal length 21.4-21.7; Basal length 20.2-20.5; Brain case breadth 6.2-6.2; Interorbital constriction 4.8-4.9; Zygomatic breadth 15.2-14.7; Diastema length 0.9-0.8; Maxillary tooth row length 8.9-8.6; Anterior palatal foramin 1.1-1.2; Posterior palatal foramin 11.1-11.1; Tympanic bullae length 3.4-4.1; Mandibular diastema 0.8-1.1; Mandible length 16.5-17.4; Mandibular tooth row length 7.4-7.1.

Field observations

Spotlighting. The Striped Hyaena was encountered at only at one occasion in Al-Aal, Tafilah in 18.6.2004

Daytime transects. A total of 30 active dens were identified in Jawa (10), Dana Reserve (6), Tall Al- Ashqaf (4), Tall Humaylan (4), Jebel el Aritein (3), Wadi al Uwaynid (2), Faydat al Dahikiyah (1). Foot prints of Haynes were spotted in Dana Nature Reserve. All excavated dens were located in rocky and remote areas. The entrance is usually about 1-1.5 m wide and a gallery that may extend several meters deep (Fig 4). Some caves are long and over 10 m deep. Bones are usually accumulated in one corner of the den. In one occasion, scattered

bones were found at the entrance of the den. Foot prints of the hayaena were confirmed in all visited dens.

Baiting stations. This method yielded negative results in all baiting stations.

Interviews. Hyaena presence was confirmed by all seven interviewees in Qa'a Adahik, Shaumari, Deer Al-Kahif, Jawa, Al-Safawi, Al-Ariteen and Wadi Araba. In the seven interviews, all interviewees agreed that there were more animals in the past than now.

Past and present distribution pattern

Fig. 4 shows the past and present distribution of the Striped Hyaena in the country. We could use 14 literature records, 29 records from field surveys, and 17 positive identifications by local people. Results of the current survey show that the Striped Hyaena is widely distributed all over the country. Hyaenas were not confined to certain types of habitats or altitudes. Records of the species have been collected from various habitat types ranging from extremely dry desert habitats to Mediterranean forest habitats. Availability of rocky areas suitable for use as a den, food resources and water are determining factors for its distribution. Field observations and interviews with locals indicated that hyaenas prefer wild and remote areas. These areas provide safe refuge for these disliked animals.

Diet composition

Skulls, skeletal parts and horns of at least 9 species were found. Larger species (camels, donkeys and horses) showed the highest percentage of bone remains. Also, cows, dogs, foxes, domestic goat, sheep, *Gazella subgutturosa* and *Ibex nubiana* remains were recovered and showed the lowest percentage. The high proportion of livestock and dog remains in the bone accumulations indicate a significant dependence of the striped hyaena on domestic animals. The presence of both very large species such as the camels and smaller sized carnivores shows the scavenging behaviour of the Striped Hyaena. The bone assemblage suggests that the species in Jordan is mainly scavenger, depending on dead animals that it drags to its den. Dead camels, donkeys and other caprines are often found in the desert and they are displaced or removed away within few days into dens.

Human interaction

Different parts of the hyaena are commonly used to cure physical and mental diseases among the Bedouins and villagers in Jordan. Many superstitions and legends are associated with the Striped Hyaena. It is strongly believed that hyaenas release substances that hallucinate a person, drag him to its den and eat him alive. Most interviewees agreed on the fact that hyaenas do not attack humans; they scavenge instead. Some other myths persist among local people including the idea that hyaenas are able to change their sex. Female hyaenas possess enlarged clitorises that cause confusion with the male genital organs. The fact that it is difficult to separate sexes of adult hyaenas may explain why some people believe that hyaenas can change their sex.

Discussion

The Striped Hyaena is widely distributed in the Middle East, where three subspecies occur; the southern Arabian *H. h. sultana*, the northern, *H. h. syriaca* and *H. h. hyaena* of southern Iran (HARRISON & BATES 1991). The subspecific variations are not sharply well defined among these different subspecies, however, the northern subspecies is the largest. (HARRISON & BATES 1991). The distribution of hyaenas in Jordan is not correlated with the four major biogeographical zones, but is found throughout the country. In Arabia, hyaenas were more common in eastern mountains with scattered localities in the heart of the Arabian Peninsula (NADER & BÜTTIKER 1982, GASPERETTI et al. 1985). The presence of rocky habitat that provides a shelter for the animal limits its distribution. MACDONALD (1975) found that middens frequented by hyaenas are located on wadi banks of soft crumbling sediment or in stony deserts.

In Jordan, animal bones excavated from hyaena dens in the eastern desert of Jordan revealed camels, donkeys, sheep, goat, dogs and others small mammals (KUHN, pers. com.). KERBIS-PETERHANS & HORWITZ (1992) studied bone assemblage recovered from a den of the Striped Hyaena in Palestine and reported that the hyaena is a scavenger and feeds on remains of domestic animals (equids, camels and caprines) that died naturally. They also found that the hyaena preys on small mammals, birds, reptiles and arthropods. However, LEAKEY et al. (1999) studied the diet of the Striped Hyaena in northern Kenya and concluded that hyaenas predate on small livestock and demonstrate an opportunistic behaviour, which enables them to survive as the largest carnivore in this marginal environment.

The Striped Hyaena is associated with several superstitions. AL YOUNIS (1993) compiled several stories on hyaenas and man in Jordan. For instance, it is strongly believed that man is the favoured food for this animal, where it drags its victim to be eaten at leisure. Indiscriminate killing of the Striped Hyaena is practised in Jordan as well in Saudi Arabia due to these beliefs (NADER & BÜTTIKER 1982, BUNAIAI et al. 2001).

As with many other carnivores in Jordan, hyaenas are under the continuous pressure of several threats that directly or indirectly affect its occurrence and abundance. These include habitat alteration and destruction, and persecution (poisoning, killing and hunting). A total of 12 hyaenas were found killed or poisoned during the study. Hyaenas are also caught for medicinal purposes or to make some money out of selling them. Several dens were destroyed by the locals.

According to Jordan's wildlife legislations, the Striped Hyaena is protected, and hunting, trapping, or trading in this wild species or any of its parts is prohibited. The Royal Society for Conservation of Nature (RSCN) has taken the initiative and leading role by establishing a network of protected areas that represents various ecosystems in the country. Today, six protected areas have been established. The Striped Hyaena has been recorded in five of these (Dana Nature Reserve, Mujib Nature Reserve, Ajloun Woodland Reserve, Shaumari Wildlife Reserve and Wadi Rum Protected Area).

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Figs. 1–3: Lateral, dorsal and ventral views of *Hyaena hyaena* skull from Jordan (JUNHM038).

Fig. 4: Entrance of a den used by hyaenas in Jawa, Wadi Rajil.

Fig. 5. Past and present distribution of the Striped Hyaena in Jordan.