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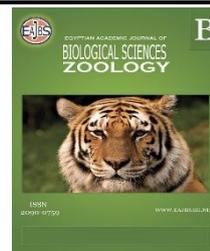
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## Spotted Hyena, *Crocuta crocuta* (Carnivora: Hyaenidae): an unwelcome visitor to Egypt!

Aldoushy Mahdy<sup>1\*</sup>; Samy A. Saber<sup>2</sup> and Said Elkholy<sup>3</sup>

<sup>1</sup> Zoology Departments, Faculty of Science, Al-Azhar University (Assiut Branch), 71524 Assiut, Egypt.

<sup>2</sup> Zoology Department, Faculty of Science, Al-Azhar University, Nasr City, Cairo, Egypt.

<sup>3</sup> Egyptian Wild Explorers, Building 1 Road 256, Maadi, Cairo, Egypt.

\* E-mail : [aldoushy@azhar.edu.eg](mailto:aldoushy@azhar.edu.eg)

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### ABSTRACT

The spotted hyena (*Crocuta crocuta*) ranges throughout the African continent, south of the Sahara. After it was observed in Jabal Elba National Park, southeast of Egypt, an adult male spotted hyena was chased and intentionally killed by local shepherds. As far as we know, this paper is the first record of this species from Egypt. The animal was first observed in Wadi Eis, close to the Sudanese border, on March 16<sup>th</sup>, 2024. It was observed afterwards in Al-Dayeb region, where it killed the lambs of local residents. The tracks of the hyena were also recorded in the Kami Dabbab area on March 23<sup>rd</sup>, 2024. The animal was finally killed in Wadi Yahameib on March 24<sup>th</sup>, 2024. The present paper describes the movement route inside the protectorate and the localities and habitats visited by the animal. It also reviews the conservation status of this species as well as its adaptation strategy to changes in environmental temperature and habitat conditions. We recommend that efforts be made by wildlife conservation authorities to raise awareness about the importance of this species and other carnivorous species among the local community to stop killing such animals.

### INTRODUCTION

The spotted hyena, *Crocuta crocuta* (Erxleben, 1777), is one of the four extant hyena species (Brottman, 2012; East and Hofer, 2013), and it is in a process of dispersal throughout the majority of sub-Saharan Africa (Fig. 1). It was also previously recorded from Eurasia (Werdelin and Solounias, 1991). There is, however, no evidence of its presence in Egypt, Liberia, or Lesotho (Honer *et al.*, 2008). The spotted hyena is a common and social predator that lives in groups and is the second largest carnivore in Africa, after the lion. The spotted hyena also outnumbered all other carnivores on the continent.

The spotted hyena can live close to human settlements (Raycraft, 2024) and has a distribution range that includes semi-desert, savanna and open woodland, dense dry woodland, and mountain habitats in an altitudinal range of 0-4,100m (Honer *et al.*, 2008). On the other hand, it is, absent or present in low density in tropical rainforests and extreme deserts. The animal is both a competent and adaptable hunter (Eloff, 1964; East and Hofer, 2013), a scavenger (Cooper *et al.*, 1999), and hunts primarily at night (Kruuk, 1972). The

spotted hyena is categorized as Least Concern by the IUCN Red List of Endangered Species (IUCN, 2022) and is not included in CITES appendices (UNEP, 2019).



**Fig. 1.** A map showing the present distribution of the spotted hyena. (Adapted from [www.d-maps.com](http://www.d-maps.com))

The goal of this study is to provide insight into the spotted hyena monitoring practices as it makes its first record in Egyptian territory, illustrate the environment in which it was observed, and address the prospect that it may broaden its territory of influence and adjust in response to its scarcity of food.

## MATERIALS AND METHODS

The presence of the spotted hyena in the Egyptian territory was confirmed by personal observations, an escaping animal captured by the camera, and a video taken of a dead animal after it was killed by local shepherds. Literature as well as personal observations was used to gather information about the habitat, flora, and fauna of the locations where the spotted hyena was first observed in Egypt. Based on the recorded point coordinates, a map of the documented route in Egypt was drawn. Information about the livestock prey was provided by locals.

## RESULTS

On February 16<sup>th</sup>, 2024, the first record of a mature male spotted hyena was made in the Wadi Eis area. The individual tracks were traced by local residents of the Basharia tribe. This Wadi (valley) drains water from the Sudan to an area near the village of Al-Adildeeb, about 140 kilometers away. The hyena was also observed in the Al-Dayeb area, 10 kilometers south of Al-Adildeeb. It killed a small lamb and escaped with another. On February 23<sup>rd</sup>, hyena tracks were detected at night in the Kami Dabbab area, 20 km south of Al-Adildeeb and 7 km north of Abou Ramad village. The next day, February 24<sup>th</sup>, a hyena appeared in Wadi Yahameib, about 17 kilometers west of the Abou Ramad village, where it was chased and killed by local residents (Fig. 2). If all these records belong to one and the

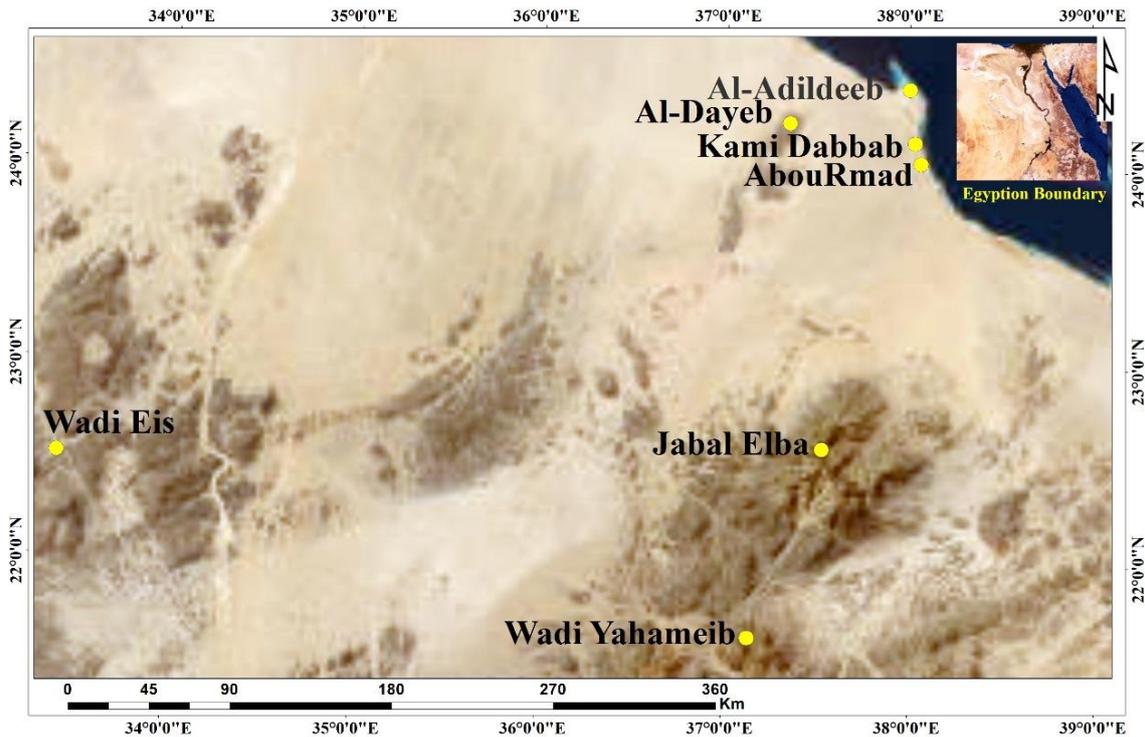
same individual, it means that the hyena traveled a distance of more than 160 kilometers in 8 days (Fig. 3).

All the above-recorded sites are included in Jabal Elba National Park. The whole area is characterized by the presence of several plant forms, including ferns, mosses, and succulents, as well as trees that can grow at higher altitudes. Of these plant forms are the umbrella thorn acacia, *Vachellia* (= *Acacia*) *tortilis*; the desert date, *Balanites aegyptiaca*; the broadleaf hopbush, *Dodonaea viscosa*; the desert nettle, *Forsskaolea tenacissima*; the wild cucumber, *Cucumis prophetarum*; the Italian senna, *Senna italica*; and the moringa tree, *Moringa oleifera*. In Jebel Elba National Park, there are two different kinds of mangrove plants that grow along the coast: *Avicenna marina*, or black mangrove, and *Rhizophora mucronata*, or red mangrove. Both are important ecosystems that are rich in biodiversity and protect the coast from the harsh sea elements.

Back inland, the Wadis and mountains of the protectorate are home to a great number of bird species, including the lappet-faced vulture, *Torgos tracheliotos*; the Egyptian vulture, *Neophron percnopterus*; as well as a number of eagle subspecies. The area also lies along the migratory routes of birds and plays an important role in the survival of many of the world's migratory birds. The mammalian fauna of the area includes the Dorcas gazelle, *Gazella dorcas*; the Cape hare, *Lepus capensis*; the Hyrax, *Procavia capensis*; the Nubian ibex, *Capra nubiana*; and the Ruppell Sand Fox, *Vulpes rueppellii*. Recent observations of a leopard, *Panthera pardus*, in the area were documented by Soultan *et al.* (2015). Herds of domestic goats, sheep, and camels, as well as feral donkeys, are also present in the area.



**Fig. 2.** Photos of a killed spotted hyena in Jabal Elba National Park. The first record of a spotted hyena in Egypt.



**Fig. 3.** A map showing the sites where the spotted hyena was recorded.

## DISCUSSION

The occurrence of the spotted hyena in Egypt's habitat is questionable because the Egyptian territory is beyond the known range of distribution of the species in Africa (Honer *et al.*, 2008).

Hofer and East (1993, 1995) indicated that spotted hyenas adjusted their space-use strategy in response to significant variations in food sources. This tactic was first hypothesized for Hyenas of Serengeti, Tanzania. The results show that when migratory prey density drops, the *Nobrowii* hyena clan in the heart of Etosha, Namibia, switches to larger territories (Trinkel *et al.*, 2004). Significant problematic consequences, connected with the management of this species, may also result from such temporal variation in the territorial strategy. A comparative study between spotted hyenas and lions provided the most likely explanation for this phenomenon (Jones *et al.*, 2021). They concluded that hyena populations might be most at risk of decline in areas with warming summer temperatures and increasing aridity.

Although spotted hyenas are not considered threatened species at the moment (IUCN, 2022), things could, however, change in the future. Several environmental factors could play important roles in this respect. Drought, for example, could have drastic effects on the food chains in the habitats where spotted hyenas live. Conflict between humans and hyenas is also common whenever the two are competing for resources (Raycraft, 2024). Deforestation brings people and hyenas into closer quarters, and hyenas that prey on livestock are not likely to be treated like good neighbors. Spotted hyenas are still shot, poisoned, and trapped, even in protected areas of their range. Some individual hyenas are even shot as targets of sport hunting (Honer *et al.*, 2008).

Education is needed to dispel the poor public perceptions of this useful carnivore. The spotted hyena depends on anthropogenic wastes for food and can remove pathogens that pose health risks to humans and livestock, thereby saving lives and money. More investigations are needed to determine how spotted hyenas could extend their home range

to the north to arrive in Egypt and the extent to which hyenas are able to respond to changing ecological conditions.

**Declarations:**

**Ethical Approval:** Not applicable.

**Conflicts of Interest:** The authors declare that they have no competing interests.

**Informed consent:** All the authors of this manuscript accepted that the article is submitted for publication in the Egyptian Academic Journal of Biological Sciences, B. Zoology, and this article has not been published or accepted for publication in another journal, and it is not under consideration at another journal.

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### ARABIC SUMMARY

#### الضبّع المُرَقَط (*Crocuta crocuta*) (اللوامح: الضبعيات): زائر غير مرحب به في مصر !

الدوشي مهدي<sup>1</sup> وسامي أ. صابر<sup>2</sup> وسعيد الخولي<sup>3</sup>

<sup>1</sup> قسم علم الحيوان، كلية العلوم، جامعة الأزهر (فرع أسيوط)، أسيوط، مصر

<sup>2</sup> قسم علم الحيوان، كلية العلوم، جامعة الأزهر، مدينة نصر، القاهرة، مصر

<sup>3</sup> مستكشف بري، مبنى 1 طريق 256، المعادي، القاهرة، مصر

ينتشر الضبّع المُرَقَط (*Crocuta crocuta*) في جميع أنحاء قارة أفريقيا بالمنطقة الواقعة جنوبي الصحراء الكبرى. وبعد رؤيته في محمية جبل علبة الوطنية بجنوبي شرق مصر في غير أماكن توزيعه وانتشاره، طارد بعض الرعاة المحليين ذكرًا بالغًا من الضبّع المُرَقَط وقتلوه. وعلى حدّ علمنا، يعتبر هذا هو التسجيل الأول لهذا النوع في مصر. ويُعدّ هذا البحث هو الأول من نوعه في التحقق من وجود الضبّع المُرَقَط بمصر. ففي يوم 16 مارس 2024، تم رصد الضبّع المُرَقَط لأول مرة في وادي إيس، بالقرب من الحدود السودانية، ثم شوهد لاحقًا في منطقة الدنّيب القريبة من قرية أبو رَماد حيث افترس حملانا يمتلكها الرعاة المحليين. يرصد هذا العمل تتبعًا لطريق هجرة هذا الحيوان النادر ومواطن تواجده، وذلك من خلال الاعتماد على تقى الأثر والمشاهدة العينية والمعلومات من المجتمع المحلي. فقد تم تسجيل أثره بمنطقة كامى دباب بتاريخ 23 مارس 2024 ليلاً. ولكنه في نهاية المطاف، قُتل نهاراً في وادي يهيمب بمدخل جبل علبة في 24 مارس 2024م. وإلى جانب هذا الرصد المتفرد، تستعرض هذه الورقة المسار الذي اتبعه الحيوان في حركته داخل المحمية، وتقدم وصفاً للأماكن والبيئات التي زارها، كما توضح الوضع الحالي للضبّع المُرَقَط وتقدم مقترحا للحفاظ على هذا الحيوان أكل اللحوم واستراتيجية للتكيف مع التغيرات المناخية وحالة الموائل الطبيعية التي يعيش فيها. وتوصي الورقة بالقيام بتوعية السكان المحليين من جانب الجهات المسؤولة عن حماية الحياة الفطرية وذلك عن طريق التوعية بأهمية هذا النوع وغيره من الصواري النادرة حتى لا يتم قتلها مستقبلاً وكيفية التعامل معها.