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## NEW DATA ON DISTRIBUTION OF STRIPED HYENA (*HYAENA HYAENA*) IN THE EASTERN ANATOLIA, IN TÜRKİYE

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### ABSTRACT

*Hyaena hyaena* (striped hyena), one of the rare mammal species in Türkiye, is categorized as “Near Threatened” (NT) by the IUCN worldwide. This species, which is mainly distributed in the Southeastern Anatolian region of Türkiye, has been on the agenda in recent years as a result of traffic accidents. This study, based on a male specimen that died as a result of being hit by a vehicle, gave the first record of the species from Bingöl province in the Eastern Anatolian region.

**Keywords:** Striped hyena, Distribution, Traffic accident, Bingöl, Türkiye.

## 1 INTRODUCTION

*Hyaena hyaena* (Linnaeus, 1758) has spread in most regions of the African continent except for the southern parts, the Middle East, the Caucasus, the Arabian Peninsula, Central Asia, and India [1-4] (Figure 1). Although the striped hyena has a wide distribution area, it is a species in the NT (near threatened) category according to IUCN [5]. In Türkiye, it is mainly found in the south and southeast regions [6].



**Figure 1. Geographic range of *Hyaena hyaena* in the world [4]**

In the last two decades, numerous studies have been conducted on the striped hyena in Türkiye. In the early 21st century, Kasperek et al., [7] reported that the species was on the verge of extinction in their study on the status and distribution of the striped hyena in Türkiye. Akay et al., [1] used geographic information systems (GIS) and remote sensing technologies to monitor and assess the distribution of striped hyena in Hatay-Altınözü. As a result of the study, they stated that the striped hyena was most common in agricultural areas, especially olive groves, followed by maquis shrublands. Akarsu [8] prepared a species action plan for the striped hyena. Çoğal et al., [9] conducted a camera trap and survey study in Hatay province and detected the striped hyena thanks to the camera traps that were set up in the area between Hassa and Reyhanlı districts of Hatay. In addition, Çoğal et al., [10] made an up-to-date assessment of the current status and distribution of the striped hyena in Türkiye.

The present study aims to contribute to the distribution of the striped hyena in Türkiye.

## 2 MATERIAL AND METHODS

The study was based on a male striped hyena specimen that died after being hit by a vehicle on 26.11.2021 on the Bingöl-Erzurum (D950) highway between Çobantaşı and Hacılar villages (39° 04' 49.34" K - 40° 48' 49.07" D). Photographs of the species were taken and the habitat characteristics of the area where it was found were recorded. In addition, the distribution records of the species in Türkiye were updated and presented on the map.

### 3 RESULTS AND DISCUSSION

This is the first specimen-based record of *Hyaena hyaena* (striped hyena) from Bingöl province (Figure 2). A male individual of the species died shortly after being hit by a vehicle on the D950 highway between Çobantaşı and Hacılar villages. The dead individual was taken away by the Bingöl Nature Protection and National Parks Branch Directorate after it was photographed. The general vegetation of the region is covered with openings formed by steppes and forested areas consisting of oak trees in places. However, the *Capra aegagrus* (rock goat) population is intensively observed in the area (Erkan DAVRAN (Bingöl Nature Conservation and National Parks Branch Directorate) pers. comm. 2021).

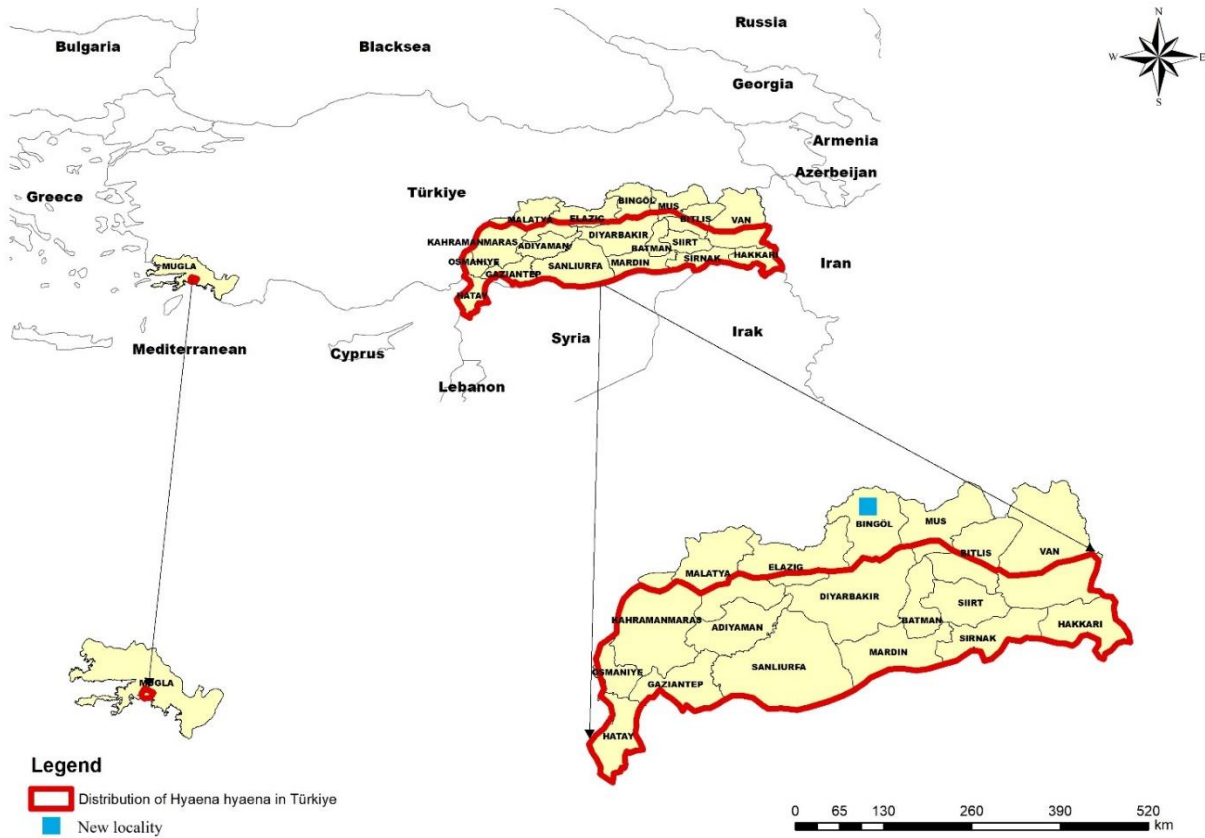


**Figure 2. Male individual killed as a result of vehicle collision**

As a habitat, striped hyenas prefer steppe as well as arid, mountainous and rocky areas with sparse shrub forests [10-11]. In Türkiye, striped hyenas were generally found at altitudes below 600 m. In Hatay province, their lowest distribution was found at an altitude of 400 m, while their highest distribution was found at altitudes above 1000 m in the Bolkar Mountains [7]. Mills and Hofer [12] reported that the species was distributed in areas up to 2100 m in the

Caucasus, 2250 m in Iran, 2500 m in India, and 3300 m in Pakistan. In the present study, striped hyenas were found at altitudes between 1600 m and 1890 m.

Kasperek et al., [7] stated that the striped hyena has always been a rare species in Türkiye in the literature records from the 19<sup>th</sup> century to the early 20<sup>th</sup> century. However, the researchers have stated that its natural habitat extends from the south of the Marmara region to the Aegean and Mediterranean coastline and Southeastern Anatolia and emphasized that the records of the species from Central Anatolia and Eastern Anatolia are not reliable. In their study, Çoğal et al., [10] updated the distribution of the species by giving records after 2004. The researchers stated that the population of the species decreased significantly especially in the Anatolian part of the Marmara Region and the Mediterranean Region, and today it lives as small remnant populations in provinces such as Izmir and Manisa only in the Aegean Region in Western Anatolia. Figure 3 shows the distribution map of the species.



**Figure 3. Distribution of *Hyaena hyaena* in Türkiye**

Deaths caused by vehicle collisions have a negative impact on mammalian species [13]. In Türkiye, the striped hyena, which has been frequently observed in the Southeastern Anatolian region in recent years, has come to the fore especially as a result of vehicle collisions.

Considering the distribution records of striped hyena provided by ođal et al. [10], the mortality rate due to vehicle collision was recorded as 41% (n= 33).

The food range of the striped hyena, which is a carnivorous species that generally feeds on carrion, is quite wide [14]. The recent increase in the population density of species such as rock goats in Eastern and Southeastern Anatolia Regions suggests that carnivorous species such as striped hyenas find it easier to find food. As a matter of fact, considering that the area where the deceased individual was found after being hit by a vehicle in Bingöl is also rich in rock goat populations, it believed that the striped hyena has come to the interior of the Eastern Anatolia Region in search of food. However, with the change in climate characteristics as a result of global warming, it is likely that species adapted to the desert climate will gradually spread towards the northern regions.

Striped hyena is one of the rare mammal species in Türkiye. Striped hyena has come to the agenda in recent years, especially with vehicle collisions and we have knowledge about its spread. There is a need for large and comprehensive studies to identify the striped hyena in its natural habitat and to determine its population status in Türkiye.

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### **Statement of Research and Publication Ethics**

The study is complied with research and publication ethics.

### **Artificial Intelligence (AI) Contribution Statement**

This manuscript was entirely written, edited, analyzed, and prepared without the assistance of any artificial intelligence (AI) tools. All content, including text, data analysis, and figures, was solely generated by the authors.

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