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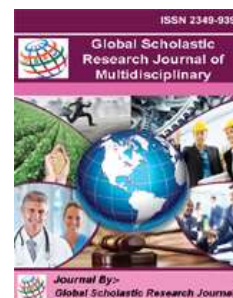
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**PRIMARY SURVEY OF THE STRIPED HYAENA, *HYAENA HYAENA*,
(LINNAEUS, 1758), (CARNIVORA: HYAENIDAE) STATUS IN THE WEST BANK
GOVERNORATES. PALESTINE**

I.M.ALBABA¹

¹Freelance Consultant & Researcher, Halhul -Hebron Governorate-West Bank-Palestine

Abstract

The field work along with the literature review, many of them from the 19th and early 20th centuries, shows that the Striped Hyaena, *Hyaena hyaena*, has apparently always been distributed with rare status in Palestine. The field surveys show that the species still survives in some West Bank and Gaza strip governorates. The direct encounter of hyaena by Palestinians is documented in all kind of media over the past years. The newest encounter with animals was documented by various types of media late in July, 2015 in Hebron Governorate. Now a day the Striped hyaena in Palestine is highly threatened. The paper aims at surveying the status of striped hyaena and the main threatening threats in the West Bank Governorates of Palestine.

Keywords: Striped hyaena, Mammalia, Carnivores, Biodiversity, Palestine.

Introduction

The striped hyena (*Hyaena hyaena*) is a large carnivore that prefers rocky and open landscapes (Hofer 1998); (Reiger 1979;1981) within semiarid and arid ecosystems. (Leakey et.al. 1999); (Mendelssohn and Yom-Tov 1999); (Wagner 2006).

The geographical range of distribution of the Striped Hyena, *Hyaena hyaena* (Linnaeus, 1758) North and East Africa, Turkey to India and Central Asia (IUCN 2012). The Middle East including the Arabian Peninsula, the Levant, Iraq, Iran, In the Middle East and the Caucasus in particular, the distribution is now patchy in most places as the result of a decline which has occurred over the past decades(Max Kasperek 2004).

In Palestine, the Striped Hyena, distributed in all habitats including the coastal zones, desert, the Jordan valley and the central high lands zones. (Pocock 1934) considered the eastern Mediterranean forms of *Hyaena* as a sub-species (*Hyaena hyaena syriaca*). In his writing (Bodenheimer 1958) reported the widespread distribution of hyaena in the historical Palestine, especially the surrounding area of Jerusalem.

as far as the striped hyaena diets concern, (Atallah 1967) reported the presence of different animal's bone near the dens of hyaena, Including Bones of (Camels, dogs, donkey, sheep, goats, and birds).

Generally speaking, studies on vertebrate biodiversity in the occupied territories (West Bank and Gaza Strip), is limited compared to that in the nearby areas of Palestine and Jordan; Palestinian research in general still lags behind (Qumsiyeh and Isaac 2012).The mammals diversity of Palestine were studied in the past by some researchers like the pioneer Palestinian Zoologist, Sana Atallah. (Atallah 1977; 1978) who did a number of studies concern with faunal diversity from 1960 till 1970. The first detailed studies on the mammals of Palestine were carried out by Mazin Qumsiyeh (1996). Recent publications addressed the conservation of large carnivores such as the Striped Hyena, *Hyaena hyaena* (EQA,1999). Majority of these studies were entirely based on indirect approach of survey likewise literature surveys or using samples available at the only natural museum of Talita school of Bethlehem Governorate, that has been donated by the first Palestinian zoologist, Dr. Sana Atallah.

Over the past few years, the West Bank Governorates have witnessed environmental changes, including habitat modification due to political regime of Israel, agricultural development in the form of water abstraction, population increase and herd grazing, which eventually affected the carnivores of these areas. Due to the previously listed facts, all the animals inhabiting Palestine have been negatively affected by these problems. Significant declines invertebrate biodiversity in Bethlehem governorate area noticed by (Qumsiyeh. et.al.2014).

The present study focuses on the status of the Striped Hyaena, *Hyaena hyaena*, (Linnaeus, 1758) in the West Bank Governorates, as well as addressing the major threats affecting this Species.

Materials and Methods

1.Study site:

The West Bank is mostly located on the Central highlands of Palestine, just above the Jordan valley. It is composed of four climatically differentiated zones. The semi-coastal zone, which

is a narrow strip extending at 100-300 m above sea level, in the North-Northwest corner, comprises of Jenin, Qalqilia and Tulkarem districts; soil is mostly alluvial and loam; the annual rainfall is 600 mm. The second climatic zone is Central highlands, which is mountainous rock and hilly area rising up 1,027 m above sea level, includes the area from Jenin Southwards until Hebron district and receives annual rainfall around 400 mm. The third zone is Eastern slope zone, comprises of steep mountains with little rainfall (150-300 mm) and represents the semi-desert climate, as a transitional area between Mediterranean and desert. The fourth climatic zone is the Jordan valley and lies 390 m below sea level (PIALES 1996).

2. Survey of Hyaena.

The study was carried out from April 2014-August 2015. A combination of literature and field surveys were used in order to compile information on hyaena. A review of very few literature records, available from the 19th and early 20th centuries was made. In this study we decided to make use of different available tools like, the use of simple and locally modified digital camera trapping which proved to be a useful method for direct assessment as well as for generating data on species. This tool has been very successful and widely used in wildlife ecology, inventory, population dynamics, species richness, population density, habitat use, activity pattern, behavioral ecology and even studies on animal damage (Carthew & Slater 1991), (Cutler & Swann, 1999), (Varma et al., 2006); (Lyra-Jorge et al., 2008); (Tobler et al. 2009), which are of importance for evaluation of conservation efforts (McCarthy et al. 2008) and (William 2006). For most of the study period, we set foot-step camera traps opportunistically across the study area at locations where striped hyenas had recently been seen directly or by identifying remaining of hyaena (scats, hairs). The other reason to set up our foot-step camera traps was the news of any incident between man and hyaena in the selected sites within the West Bank governorates. We set traps at each site for a minimum of three nights. We set up three sites on a given night, with 100m to 1km between sites. seven sites were selected in four governorates (Hebron, Bethlehem, Ramallah and the Jordan Valley) which mean a 21 traps in total.

Results and Discussion

The study area (the West Bank) is mostly located on the Central highlands of Palestine, just above the Jordan valley, whereas natural forest, agricultural fields, and irrigated crops are found. A significant decline in the mammals in general noticed in our literature survey, especially with regards to hyaena in Bethlehem governorate (Qumsiyeh, et.al. 2014).

The camera traps revealed only one hyaena's male image near wadi Alquf forest reserve. The shot indicated that the animal was marking the area using his own urine in may 15th.2015. The Striped Hyena is very rare even in the southern parts of Palestine. Camera traps denied the locals' claim about a usual direct encounter of the animal.

Based on the overall finding, hyena numbers were higher in southern governorates of the West Bank, maybe because this area of greater availability of hilly terrain and a greater degree of protection offered by the forest used caves as dens and rocky terrain.

Hyaena in Palestine faces several threats due to logging, stone and marble quarries, forest fires, hunting and animal routine poisoning. Shepherds practice poisoning to kill predators that attack their domestic animals. Hyaena appeared in the local media since the year 2010, more than 10 times. Almost in all cases the result was the same when an animal got killed by

different means. Majority of these cases were in Hebron governorate when at least four hyaenas got killed, followed by Nablus governorates when two hyaenas got killed also, then followed by Jericho when one hyaena got killed, and lastly case was when tens of hyenas attacked the people of Bani Zeid-Ramallah governorate in September, 2009, but there were no killed animals.

Our diverse survey tools which included interviews with people, in four governorates indicated that hyaenas are well-known among local people. In Palestine, there is a folk belief that witches ride Hyaenas, increasing their un-popularity, and reducing their chance to survive if they are encountered. Other threats include loss and fragmentation of habitat due to quarrying for stone, and expansion of settlements and Israeli by-pass roads as well as the segregation wall of Israel due to which home range and habitats are drastically reduced for hyaena and all other animals. According to the IUCN assessment, hyaena's regional status in (2011) is endangered, but the global status is near threatened (2008). This information indicates that hyaena is more threatened regionally than globally.

Conclusions

The study findings have led to some conclusions about the hyaena status and its threatening threats.

It could be concluded that any of the studied locations can be utilized by hyaena as normal habitat, if the important threatening factors can be overcome by increasing and diversifying the population of plantations. The striped hyena (*Hyaena hyaena*), despite being a threatened species, frequently occurs in human-dominated areas in all governorates of Palestine in the past as indicated by earlier studies. Our results suggest that striped hyenas, despite the ability to adapt to human-modified landscapes, disturbance, still it is crucially require natural habitats free of anthropogenic disturbances to serve as refuge for source populations.

Also our study confirmed the decline of solitary hyaena in all sites targeted by our research. Hyaena encounter or direct sighting by communities were very rare. This study proved that striped hyaena numbers, habitats, and densities could be rigorously monitored for crucial and immediate conservation purposes. Thus, the creation of more refuge for hyenas across Palestine governorates is a key conservation need identified from this study. We strongly recommend cooperation of different local and international competitive entities to enhance the public awareness and to enforce the environmental laws and legislations to protect nature and wildlife in Palestine.

The study results and subsequent conclusion are in agreement with many regional studies.

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