



Research Article

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On the Occurrence, Ecology and Risks of the Egyptian Mongoose (*Herpestes ichneumon* Linnaeus, 1758) in the Gaza Strip – Palestine



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Abstract

The Egyptian Mongoose (*Herpestes ichneumon* Linnaeus, 1758) is one of the most occurring carnivores in Palestine. The current study, which is a part of a big project dealing with wildlife (fauna and flora), aims at providing a modest background on the occurrence, ecology and risks of the Egyptian Mongoose in the Gaza Strip. Direct field observations and meetings and discussions with local people including wildlife hunters were major tools to satisfy the purpose of the study, which lasted 12 years (2007 - 2018). Visits to zoological gardens and animal trade markets were carried out as well. The Egyptian Mongoose occurs in most of the ecosystems of the Gaza Strip that are far away from the populated areas; especially the wadis, Al-Mawasi ecosystem, and the eastern belt of the Gaza Strip. A total number of 30 live and 11 dead specimens were recorded through field surveys. The Egyptian Mongoose was by far, the commonest zoo carnivore, where 33 specimens were encountered at Gaza zoological gardens. Two separate specimens were exhibited for sale at Al-Yarmouk Market in Gaza City. The Egyptian Mongoose is common in swampy habitats of the Gaza Strip, and its occurrence in the sand dune ecosystem seemed to be intermittent. The animal has a wide range of wild preys including small mammals, birds, reptiles and amphibians and insects prevailing within its home range. The animal is well known for its attacks to poultries, and as a result, it was frequently poisoned or killed by farmers and local people. Many minor threats were found to face the species in the Gaza Strip. Finally, the role of the Egyptian Mongoose in controlling the populations of environmental pests, including venomous snakes and commensal rodents should be valued, and as a result, the Palestinian wildlife should be protected and conserved in a sustainable fashion.

Keywords: Egyptian Mongoose; *Herpestes ichneumon*; Ecology; Occurrence; Zoological Gardens; Gaza Strip

Introduction

Palestine lies at a meeting point of three zoogeographical areas (Palaeartic, Afrotropical, and Oriental), which promoted ecosystem, habitat, niche and species diversities. Despite its small area, Palestine (27,000 km²) is home to more than 100 mammalian species; the majority of which are rodents and bats [1]. Carnivores are a capital category of class Mammalia, inhabiting nearly all Palestine ecosystems and habitats. They range in size from the relatively small Marbled Polecat (*Vormela peregusna*, Family Mustelidae) to the relatively large Striped Hyena (*Hyaena hyaena*, Family Hyaenidae). Among these two species, there are more than a dozen of carnivore species of different sizes representing the families of Canidae, Felidae, Mustelidae and Herpestidae [1,2]. The same families of order Carnivora are present in Jordan; a country that is very close to Palestine [3]. These families constitute a capital part of the families prevailing throughout the Palaeartic realm (Felidae, Canidae, Hyaenidae, Ursidae, Viverridae, Mustelidae, Herpestidae and Procyonidae) [4]. Work on mammalian fauna including carnivores, either being small or large, is escalating in the

Arab as well as the Middle East countries such as Jordan [3, 5-13], Egypt [14-16], Turkey [4, 17,18], Arabia [19-24]; Syria [25]; Sudan [26-30], Israel [31-32], Palestine [1,33-40].

The Egyptian Mongoose (*Herpestes ichneumon* Linnaeus, 1758) is one of the most occurring carnivores in Palestine (Figure 1), and is the only carnivore representing the Herpestidae family in the country [1]; [2,35-39,41]. The Egyptian Mongoose is the largest of all African mongooses. It is mainly associated with habitats having rich vegetation prevailing in coastal, estuarine and riparian areas. The species seems to avoid humid forests and extreme deserts [14]. The species is mostly diurnal and has a home range of about 3km² [42]. In Spain, five different calls have been recorded in the free-ranging individuals of the Egyptian Mongoose, and these were related to contact, alarm, aggression, intimidation and pain [43]. As far as the breeding biology is concerned, births of the animal have been recorded almost throughout the year, with one to four cubs are born after a gestation period of 9-10 weeks [44-46].



Figure 1: The Egyptian Mongoose (*Herpestes ichneumon* Linnaeus, 1758) and its distributional map in the world [50].

About its geographical distribution (Figure 1), the Egyptian Mongoose is found mainly in many African countries. It is also found from the Sinai Peninsula to the south of Turkey and on the Iberian Peninsula in southern and central Portugal and south-western Spain [47-50]. There are no major threats facing the Egyptian Mongoose across its range. The species is sometimes considered as a pest, and as a result is subject to killing or deliberate poisoning using rodenticides. In contrast, the species was found to be protected by some African people because it is valued as a predator of snakes [48]. Although the animal is carnivorous, it sometimes eats plant materials like fruits.

Studies on the Egyptian Mongoose in the areas of its global distribution are increasing day by day. Different aspects of the animal occurrence, biology, parasitology, ecology, and behavior have been knocked in different countries like Egypt [51-53], Su-

dan [54], Turkey [18,55,56], and Israel [44,57]. Extensive specialized and very capital studies focusing on the occurrence, biology, ethology and ecology of the Egyptian Mongoose in the Iberian Peninsula have been carried out and referred to throughout the current study and the studies dealing with the animal in its global distributional range [42,43,45,46,58-74]. Particular studies concerning the Egyptian Mongoose in the Palestinian Territories (West Bank and Gaza Strip) are lacking. What is found are studies surveying the vertebrate or mammalian fauna in different ecosystems of Palestine? Hence, the current assay aims at providing a modest background on the occurrence, ecology and risks of the Egyptian Mongoose (*Herpestes ichneumon* Linnaeus, 1758) in the Gaza Strip, Palestine. This study is the first of its kind dealing with the Egyptian Mongoose as a key and an important carnivore in the Palestine environment.

Materials and Methods

The Gaza Strip



Figure 2: A Distributional Map of the Egyptian Mongoose in the Gaza Strip, Palestine.

The Gaza Strip (365km²) is a coastal zone lying in the southern part of the Palestinian coast along the eastern shore of the Mediterranean basin (Figure 2). It is surrounded by occupied Palestinian Territories from the east and north, Egypt to the south and the Mediterranean to the west. It is composed of five governorates: North Gaza, Gaza, Middle, Khan Younis, and Rafah. The Gaza Strip has a population of about 2 million, mostly refugees from the 1948 Nakba. The population density is about 5,500 inhabitants per square kilometer, making the Gaza Strip one of the most densely populated areas in the world [75]. The Gaza Strip is characterized by its semi-dry Mediterranean climate, which is hot in summer and cold in winter. The average temperatures in the Gaza Strip range from 25 °C in summer to 13 °C in winter. The average annual rainfall is 300 mm. The daily relative humidity fluctuates between 65% and 85% in summer and between 60% and 80% in winter. Sand dunes are the main feature of the western part of the Gaza Strip, while the clay and clayey lands predominate in the eastern part [75].

Procedure

The current study, which lasted 12 years (2007 - 2018), is a cumulative in its style. It was based on the following procedures:

- a) The conduction of frequent visits, eco-trips, direct observations and monitoring of wildlife categories, with emphasis on the Egyptian Mongoose, in various ecosystems and areas within the Gaza Strip. The three wadis or valleys of the Gaza Strip (Wadi Gaza, Wadi Beit Hanoun and Wadi Salqa), agricultural orchards, Al-Mawasi ecosystem, and sand dunes in addition to the eastern belt of the Gaza Strip near the political borders with Israel were all frequently visited and studied for their vertebrate fauna. It is worth mentioning that the eastern belt of the Gaza Strip had a special emphasis throughout the current study because it is rich in cereal, vegetable and fruit production, animal husbandries and poultries, and the three major solid waste landfills in the Gaza Strip. All these components of the eastern belt facilitate and promote wildlife occurrence and success; particularly for the medium-sized Egyptian Mongoose.
- b) The carry out of many meetings and discussions with local inhabitants, farmers, owners of animal and poultry pens, and wildlife hunters in order to get more info and to close the gaps regarding the occurrence, ecology and risks of the Egyptian Mongoose in the Gaza Strip.
- c) The follow up of cases of roadkills, intentional killing and poisoning regarding the Egyptian Mongoose were good contributors to the findings of the current study.
- d) The conduction of frequent visits to the zoological gardens of the Gaza Strip to investigate the nature of caged zoo animals, of which the Egyptian Mongoose was an important example.
- e) The use of professional binoculars and digital cameras was of an utmost priority throughout the succeeding stages of

the current study for documentary and confirmatory purposes.

Results and Discussion

Occurrence of the Egyptian Mongoose

The Egyptian Mongoose has many local names such as “Nims”, “Nisnas”, “Sheeba”, “Koa’eba” or sometimes “Abu Al-Khesiat”. The field surveys and the discussions with Gazans revealed that the Egyptian Mongoose has unequal distribution throughout the Gaza Strip; it is totally absent in cities, refugees’ camps and the densely populated areas (Figure 2). The animal was recorded or said to be present in the eastern belt of the Gaza Strip extending from Beit Hanoun in the north to Rafah in the south. This area is mostly an agricultural from a land use point of view. The presence of poultries and animal husbandries promotes the existence of the species because they provide feeding materials composed of mammalian and bird species reared and farmed by the Palestinians there. Moreover, the shy nature of the Egyptian Mongoose makes it a little far away from densely populated areas but proximate to poultries and animal husbandries.

The eastern parts of the Gaza Strip have a relatively richer biodiversity compared to the middle and western areas, as evidenced by the fact that most wildlife hunting, especially birds, occurs in the eastern parts of the Gaza Strip [36,38,39]. Such a biodiversity components promote and enhance the occurrence of the Egyptian Mongoose and other carnivore mammals that are opportunistic in their local existence like the Wild Cat (*Felis silvestris*), Jungle Cat (*Felis chaus*), Red Fox (*Vulpes vulpes*), Golden Jackal (*Canis aureus*) and the Grey Wolf (*Canis lupus*). The majority of these carnivores often enter the Gaza Strip from the occupied Palestinian Territories through earth burrows or gaps in the political fence made by Israel around the Gaza Strip [37]. Residential creeping at the expense of cultivated or naturally vegetated areas in the Gaza Strip is a common factor contributing to the changes in abundance and distribution of wildlife including the Egyptian Mongoose. In this context, D’Andrea et al. [76] pointed out that the alteration and modification of natural habitats into cultivated ones has been changing the composition and abundance of wildlife communities in a Brazilian rural area.

The wadis or valleys of the Gaza Strip are places that are well known for their permanent or temporary water collections, including the wastewater aggregations, which were preferred by and attracted the occurrence of the Egyptian Mongoose [1,14]. The animal was seen many times in singles, pairs or even small groups in the beds, margins or tributaries of the three wadis of the Gaza Strip; especially Wadi Gaza, which separates the Gaza Strip in two halves; north and south. The diversity of agricultural orchards along the Wadi Gaza banks and the previous presence of the wetland ecosystem of Wadi Gaza are two major factors encouraging the potential occurrence of the species there. The presence of thickets, jungles, forested spots, wetlands, agricultural areas, fruit orchards and well-vegetated areas is a key factor promoting the occurrence of the Egyptian Mongoose within the range of its

geographical occurrence in Palestine and neighboring as well as Middle East counties [13-15,22,44,51-53,77].

The intermittent or opportunistic occurrence of the Egyptian Mongoose in Beit Lahia, north of Gaza Strip and Al-Mawasi ecosystem, southwestern of Gaza Strip could be partly attributed to the topographic nature of the two areas, composing of sand dunes which are characterized by their low productivity, having scarce vegetation. It is well known that the presence of thickets, jungles and vegetation cover save animal preys and shelters needed by the Egyptian Mongoose and other wildlife. A few individuals of the Egyptian Mongoose were newly found inhabiting the coastal sand dune ecosystem extending between Alexandria and the Libyan borders [51]. Moreover, the presence of potential preys is an attractive factor for the Egyptian Mongoose. In this regard, the expansion or recolonization of the species in the Iberian Peninsula was interpreted as a reflection of the gradual recovery of rabbits in recent years; preys having a large proportion of biomass ingested by mongooses [67,69].

Field Records of Egyptian Mongooses

As many as 30 live and 11 dead specimens of the Egyptian Mongoose have been encountered in different localities of the Gaza Strip throughout the study period which lasted 12 years (2007 - 2018). The Egyptian Mongoose is mostly diurnal in its lifestyle and daily activities [45,46]. Hence, the observation of live specimens was made easy during the hours of day light starting from sunrise (daybreak) and ending prior to sunset (dusk). In two occasions, the animal was noted in Wadi Gaza and Wadi Beit Hanoun singly or in small groups ranging from three to five individuals forming single files, meaning that each individual almost holding on to the tail of the one in front. In this regard, Ben-Yaacov and Yom-Tov [44] and Palomares and Delibes [65] confirmed that the animal is predominantly solitary, though it may be sometimes

observed in groups. Similar events were recorded by Abd Rabou [36] in Wadi Gaza as well. Most live specimens were seen in the early or late hours of the day. This seems to be consistent with the findings of Palomares and Delibes [45] who pointed out that the peaks of activity of the animals are concentrated at the morning and late afternoon. During the afternoon time, two separate individuals were encountered. One of them crossed a paved road lying between two agricultural orchards in North Gaza in 2012. The second was encountered in an olive farm in Beit Hanoun, North Gaza in 2017. The dead specimens were recorded in different areas of the Gaza Strip including the coastal Al-Mawasi ecosystem, Wadi Gaza, Beit Lahia and near the solid waste landfills lying proximate to the eastern borders of the Gaza Strip. The cause of death was speculated to be poisoning, intentional killing and road killing.

Egyptian Mongoose as a Zoo Animal

The Egyptian Mongoose was, by far, the commonest carnivore mammal prevailing at the private zoological gardens of the Gaza Strip (Figure 3). As many as 33 specimens have been encountered in their cages throughout the study period. Zookeepers claimed that the hunted animals were commonly sold at low prices reaching \$10 - \$20 per live specimen, though they were previously sold at \$30 - \$50 per live specimen as pointed out by Abd Rabou [37,39]. The zoo wire cages were found to harbor one, two or many specimens of the mongooses caught. The caged mongooses were commonly fed by chicken eggs. It is worth mentioning that no red lines are found in the Gaza Strip regarding wildlife hunting. Live traps, locally known as "Maltash", are often baited and then located at the roaming areas and expected tracks of the targeted animals [37]. In Israel, the Egyptian Mongoose was snared in the agricultural areas it prevails in. Most of the traps found were set up by Thai guest workers who were officially introduced to Israel during the last three decades to substitute the Palestinian workers [78].



Figure 3: Egyptian Mongooses are commonly caged in the private zoological gardens of the Gaza Strip.

Egyptian Mongoose as a Trade Animal

The author used to visit the Al-Yarmouk Market at the middle of the Gaza City to survey the pet and wild animals; especially birds, traded there. In two separate and striking occasions, two small wire cages, each containing a single specimen of the Egyptian Mongoose were encountered exhibited for sale at the market in question in 2014 and 2016 (Figure 4). Other cages containing different categories of wild and pet birds, snakes, Greece Turtles

(*Testudo graeca*), Desert Monitors (*Varanus griseus*), Domestic Cats (*Felis catus*), and even the very small Marbled Polecat (*Vormela peregusna*) were commonly noted at the market. Such a phenomenon is commonly found in developing countries; especially the Arab ones, where poverty, unemployment and weak wildlife legislations are dominant problems. In countries like Jordan, Morocco and Saudi Arabia, wild animals are commonly traded at animal markets after being caught using different trapping means regardless to their conservational and ecological status [79-82].



Figure 4: A caged specimen of the Egyptian Mongoose was traded at Al-Yarmouk Market in the middle of the Gaza City in 2014.

Ecology of the Egyptian Mongoose

Habitats

Although the Egyptian Mongoose is entirely terrestrial, it is essentially associated with ecological habitats having considerable vegetation in riparian, wetland and coastal environments [44,62,63,86]. The habitats of the Egyptian Mongoose are diverse in the Gaza Strip. Such a diversity makes the animal subject to various food items and preys including rodents, birds, reptiles, amphibians, and insects. The species has been recorded along the three wadis channels, courses and banks (Wadi Gaza, Wadi Beit Hanoun and Wadi Salqa) and the heavily grassed, irrigated and cultivated areas, especially those existing in the eastern parts of the Gaza Strip and Al-Mawasi ecosystem. In these locations, the animal digs its own burrows or underground dens for resting and breeding purposes, though the dense thickets save the same purposes as well [60]. In frequent occasions, the author recorded the Egyptian Mongoose among clumps of the small stands of the Common Reed (*Phragmites australis*) and Tamarisk (*Tamarix nilotica shrubs*) along the Wadi Gaza Nature Reserve and its wetland ecosystem. In eastern parts of the Gaza Strip, the animal is common as well, though water bodies and streams are absent. The expansion of the Egyptian Mongoose into deserts or areas far away from coastal or riparian was reported in Egypt by Kasperek [51].

Feeding

The Egyptian Mongoose is an opportunistic and omnivorous feeder, having diets that may have seasonal variations [60]. Within the Gaza Strip limits, the Egyptian Mongoose has a wide range of preys including small mammals, birds, reptiles and amphibians, insects and other arthropods in addition to plant materials; especially fruits. Table 1 illustrates a list of wild animals living close to the Egyptian Mongoose in the wadis, agricultural orchards and swampy habitats [36,38,39,41,83,84]. These wild animals are expected to form a feeding material to the species. The considerable presence of the species in the areas surrounding the main solid waste landfills existing near the eastern borders of the Gaza Strip may interpret its scavenging role on carcasses and dead animals. A lot of studies were found to describe and investigate the feeding ecology of the Egyptian Mongoose. These studies were largely consistent with the expected feeding items of the animal in the Gaza Strip [44,60,85,86]. In many countries like that of Spain and Nigeria, Feces samples of the Egyptian Mongoose were collected. The samples were found to contain remains of different animal species including rabbits, rats, mice, shrews, wild boars, ducks, egrets, lizards, snakes and toads [64,86]. Feeding of the Egyptian Mongoose on sea turtle eggs and nests in the Gaza Strip is unknown because of the doubts concerning the nesting ecology and behavior of sea turtles on the narrow and crowded sandy beaches

of the Mediterranean in the very populated area of the Gaza Strip. Notes on the predation of mongooses on sea turtle eggs and nests were confirmed elsewhere by Nellis & Small [87].

Table 1: Wildlife species living close to and may be fed on by the Egyptian Mongoose in the Gaza Strip.

| Class | Scientific Name | Common Name |
|---------------------------|----------------------------------|----------------------|
| Mammalia | <i>Rattus rattus</i> | Black or House Rat |
| | <i>Mus musculus</i> | House Mouse |
| | <i>Spalax ehrenbergi</i> | Palestine Mole-rat |
| | <i>Hemiechinus auritus</i> | Long-eared Hedgehog |
| | <i>Lepus capensis</i> | Cape Hare* |
| Aves | <i>Passer domesticus</i> | House Sparrow |
| | <i>Pycnonotus xanthopygos</i> | Yellow-vented Bulbul |
| | <i>Prinia gracilis</i> | Graceful Warbler |
| | <i>Acrocephalus scirpaceus</i> | Reed Warbler |
| | <i>Luscinia svecica</i> | Bluethroat |
| | <i>Turdus merula</i> | Blackbird |
| | <i>Nectarinia osea</i> | Palestine Sunbird |
| | <i>Bubulcus ibis</i> | Cattle Egret |
| | <i>Corvus cornix</i> | Hooded Crow |
| | <i>Vanellus spinosus</i> | Spur-winged Plover |
| | <i>Gallinula chloropus</i> | Common Moorhen |
| Reptilia | <i>Daboia palaestinae</i> | Palestine Viper |
| | <i>Malpolon monspessulanus</i> | Montpellier Snake |
| | <i>Coluber jugularis asianus</i> | Syrian Black Snake |
| | <i>Coluber nummifer</i> | Coined Snake |
| | <i>Chalcides ocellatus</i> | Ocellated Skink |
| | <i>Acanthodactylus boskianus</i> | Bosc's Lizard |
| | <i>Laudakia stellio</i> | Agama |
| | <i>Hemidactylus turcicus</i> | Turkish Gecko |
| <i>Chameleo chameleon</i> | Mediterranean Chameleon | |
| Amphibia | <i>Bufo viridis</i> | European Green Toad |
| | <i>Rana bedriagae</i> | Levant Water Frog |
| | <i>Hyla savignyi</i> | Savigny's Tree Frog |

*The Cape Hare is very rare nowadays in the Gaza Strip due to habitat destruction and overhunting.

The rare occurrence of the Cape Hare (*Lepus capensis*) in the Gaza Strip (Table 1) because of the local residential creep on the expense of natural ecosystem, habitat destruction, modification and alteration, and overhunting, may exclude it from the list of main diets of the Egyptian Mongoose. The situation is totally different in Spain, where young European Rabbits (*Oryctolagus cuniculus*) constitute main preys. The Black Rat (*Rattus rattus*) is a main prey of the Egyptian Mongoose because of its widest occurrence in the Gaza Strip. Other rodents like the House Mouse (*Mus musculus*) and the Palestine Mole-rat (*Spalax ehrenbergi*) are absolute preys

as well. According to Estes [88], large preys like small mammals and birds are commonly killed by a neck bite, while small preys by a head bite.

The arid to semi-arid nature of the Gaza Strip is a suitable habitat for the occurrence of reptiles (turtles, lizards and snakes) [84]. Many of these reptiles constitute meals for the Egyptian Mongoose. Foraging of mongooses is characterized by intense prey searching. Mongooses, in general, look for foods while their noses close to the ground, inspecting hole for reptile preys including snakes. The Gazans are aware of the ability of the Egyptian Mongoose to attack and feeding on snakes including the poisonous ones. In northern Jordan, the Egyptian Mongoose is called as "Akel Al-Hahya" which means the snake eater [16]. It is worth mentioning that the Palestine Viper (*Daboia palaestinae*) is the most dangerous and venomous snake in the Holly Land (Jordan and Palestine). Most of snake bites in the two countries were attributed to this viper [89,90]. The Egyptian Mongoose is largely unaffected by the venom of the Palestine Viper and the other venomous snakes of the Gaza Strip. According to Ovadia and Kochva [91], the Egyptian Mongoose is resistant to the venoms of the Palestine Viper (*Daboia palaestinae*), Black Desert Cobra (*Walterinnesia aegyptia*) and Black-necked Spitting Cobra (*Naja nigricollis*). It seems that the binding site of the acetylcholine receptors of mongooses is resistant to the α -neurotoxins and sarafotoxins of venomous snakes as revealed by Barchan & Bdolah [92,93].

In fact, the Egyptian Mongoose has a capital ecological role by predating on agricultural and medical pest species, such as rodents, snakes and insects. In Africa, the Egyptian Mongoose is often protected by local people because of its valued predation on venomous snakes. This may interpret why the ancient Egyptians kept these mongooses as pet animals at their dwellings. The feeding of the Egyptian Mongoose on amphibians (restricted in the Gaza Strip to only three anurans as shown in Table 1) and aquatic birds prevailing in the Gaza Strip [83,84] is attributed to the fact that these mongooses are good swimmers. They can forage along the shallow water or wastewater channels and aggregations characterizing the wadis and Al-Mawasi ecosystem of the Gaza Strip. In southern Turkey, analysis of the droppings of the Egyptian Mongoose revealed that birds represent approximately 65% of the animal's diet [55].

Apart from the feeding of the Egyptian Mongoose on the expected wild animals shown in Table 1, the presence of the animal in areas rich in poultries and animal husbandries (as the case of the eastern parts of the Gaza Strip) promotes its predation on domesticated and farmed animals. The animal is known among the Palestinians living in the margins to feed on eggs of domesticated as well as wild avian species. Accordingly, the ground nests of many avian species, including the Spur-winged Plover (*Vanellus spinosus*), Chukar (*Alectoris chukar*) and Stone Curlew (*Burhinus oedicnemus*), can be negatively impacted by the mongoose. To crack eggs, the animal throws them between its legs against a rock or wall. In Israel, Ben-Yaacov and Yom-Tov [44] pointed out that

mongooses feed largely on poultry and rodents. In the Jordan Valley and northern Jordan, the mongoose lives near chicken farms and cultivated areas [5]. Such a situation is very disastrous to poor Gazan farmers and families who used to rear chicken, pigeons, geese, ducks, turkeys, rabbits, and other poultries at their homes, farms, orchards and pens. Frequent poisoning and killing cases of the Egyptian Mongoose (Figure 5), Black or House Rat (*Rattus rattus*) and rarely the Red Fox (*Vulpes vulpes*) were recorded in different localities within the Gaza Strip because of the animals' continual attacks to poultries and domesticated animals that may result in potential losses.

Risks

Despite their fascinating reputation for attacking venomous snakes like the Palestine Viper in the Gaza Strip, the Egyptian Mongoose is non-aggressive towards human beings. The expected bites of the animal to wildlife hunters may be treated by the early debridement of wound using antibiotics and other medications. No investigations regarding the role the Egyptian Mongoose in transmitting diseases in the Gaza Strip, though the species was

thought to be a possible reservoir host of *Leishmania donovani*, the causative agent of visceral leishmaniasis (Kala-azar) in eastern Sudan [54]. Mongooses are known as carriers of many human and animal diseases such as rabies and human *Leptospira* bacterium [94]. The very clear risks of the Egyptian Mongoose in the Gaza Strip seem to be associated with its attacks and feeding on wildlife and poultries as previously stated. As a result, poisoning and intentional killing of the animal after being trapped were two control means adopted by Gazans (Figure 5). The role of municipalities, ministries and specialized authorities regarding the mongoose management seems to be lacking and challenging. Like the Egyptian Mongoose, the Small Indian Mongoose (*Herpestes auropunctatus*) caused many declines and extirpations of vertebrates including rabbits in areas of its occurrence [95-97]. Many control methods including live animal cage traps and secondary poisoning have been applied and were found to be challenging [98-101]. More efficient and safe methods and strategies are needed for successful management of mongooses and other mammalian pests should be applied in the Gaza Strip in order to protect the environment and sustain biodiversity.



Figure 5: The Egyptian Mongoose after Being Poisoned using Rodenticides in Bani Suhaila, Southern Gaza Strip.

Threats

The threats facing the Egyptian Mongoose in its distributional range have been discussed in many studies [44,48,49]. No studies were found to deal with this animal and the threats facing it locally. However, several local threats could be deduced from the total ecology of the animal as follows:

- a) The Egyptian Mongoose occasionally falls victim to road traffic collisions and intentional killing by the Gazans, especially farmers.
- b) Overhunting and over-trapping of the species for different purposes, as previously mentioned, may cause localized declines.
- c) It might accidentally be poisoned by carcasses of agricultural vertebrate pests prevailing in the Gaza Strip; especially rodents.
- d) The loss of riverine and wetland habitats (as the case of

the wetland ecosystem of Wadi Gaza) may potentially result in localized declines.

- e) The drainage of absorbents (locally known as Thamelas) of Al-Mawasi ecosystem, a unique coastal ecosystem in southwestern Gaza Strip, for conversion to arable land or eradication of mosquitoes and annoying arthropods may constitute a local threat.

In conclusion, the occurrence of Egyptian Mongoose is crucial within the various ecosystems of the Gaza Strip. It plays a capital role in ecological balance through controlling the environmental pests prevailing there and causing harm to public health and agricultural production. This role should be respected and valued by the Gazan community. Protection of wildlife resources and their ecological habitats in a sustainable manner is very essential in the harsh environment of the Gaza Strip which faces continual challenges made by the Israeli Occupation and the low environmental awareness of Gazans.

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