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## On the Hunting of the Common Quail (*Coturnix coturnix* Linnaeus, 1758) Along the Mediterranean Coast of the Gaza Strip – Palestine

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### Abstract:

Palestine is a major route for migratory birds coming from Europe to Africa and vice versa. Both migratory and resident birds are commonly hunted for different purposes using different means in the Gaza Strip. The current descriptive study, which is the first of its kind, aims at introducing information on the hunting of the Common Quail (*Coturnix coturnix* Linnaeus, 1758) in the Gaza Strip, which is a 365 km<sup>2</sup> arid to semi-arid coastal zone lying in the southern part of the Palestinian coast along the eastern shore of the Mediterranean Sea. Since 2015, frequent field visits and discussions with bird hunters and other stakeholders have been carried out to get more information on quail hunting. Annually, hundreds of trammel or mist nets with camouflaging colors, having a height of about 2.5 meters and a distance of 100-200 meters off the coastline, are cleverly placed along the beach to hunt Common Quails and other non-target birds. Guns are used in hunting of quails scattering among inland low-growing vegetation types. The Common Quail is a source of livelihood for dozens of Gazan families, though it does not generate large sums throughout its hunting season. For several reasons, quail hunters claimed that the current quantities of Common Quails reaching the Gaza Strip do not exceed 20% of the amount that arrived 30-40 years ago. Along with the Common Quail, 50 migratory and resident bird species, with passerines making their half, were found to be incidentally caught in quail nets. Because of its feeding and healthy values, the demand of Gazans on Quail and its eggs is increasing day by day, and as a result, quail breeding was found to be a successful task in the Gaza Strip. The goodness of wild quail is many times greater than its farmed counterpart. The price of wild quail is USD 6-7 per pair, while the farmed counterpart is about USD 2 per pair. Finally, bird hunting should be regulated in the Gaza Strip in order to conserve wildlife in a sustainable fashion.

### Keywords:

Common Quail,  
*Coturnix coturnix*,  
migratory birds,  
hunting, trammel  
nets, quail farming,  
Gaza Strip.

## Introduction:

In spite of its small area, Palestine (27,000 km<sup>2</sup>) harbors more than 540 bird species (Perlman and Meyrav, 2009 and Meiri et al., 2019). The country is one of the main routes for migratory birds from Europe to Africa during the months of September and October (autumn migration), as well as their return again at the end of the first quarter of the year (spring migration). The Palestinian coast of the Gaza Strip represents a pathway for many migratory birds, which explains the setting up of nets from the end of summer and early autumn, waiting for the arrival of large numbers of the Common or European Quail (*Coturnix coturnix* Linnaeus, 1758) coming from the Mediterranean Sea to land (United Nations Environment Program – UNEP, 2003). The Common Quail spreads and breeds in central and southern Europe in the summer and migrates in the autumn season heading towards the coasts of North Africa and Western Asia (Figure 1). With the end of the winter season, these birds begin to return to their original home in Europe to begin the mating season (Porter et al., 1996 and Zduniak and Yosef, 2008). The Common Quail is the only long-distance migrant of all the western Palaearctic Phasianidae (Snow and Perrins 1998). It is the smallest European species of the Phasianidae family. It is categorized by the International Union for Conservation of Nature (IUCN) as "least concern" (Magnin, 1991). The bird is of special concern because of its overhunting in the Mediterranean basin (Zuckerbrot et al. 1980; Magnin, 1991 and Brochet et al., 2016). The Common Quail was mentioned in the Holy Quran three times by the name "Al-Salwa" because of its delicious flesh and nutritional values (Zuckerbrot et al., 1980 and Islam and Samsudin, 2014).

Work and reports on the poaching and hunting of the Common Quail and other migrant bird species are available and are increasing day by day worldwide and regionally (Mendelssohn et al., 1969; Zuckerbrot et al., 1980; Magnin, 1991; McCulloch et al., 1992; Baha El-Din and Salama, 1991; Kerely et al., 2001; Heldbjerg and Fox, 2008; Zduniak and Yosef, 2008; Sarant, 2012; Viney, 2012; CABS and LEM, 2013; Welz, 2013; Marwat et al., 2014; Vickery et al., 2014; Brochet et al., 2016; Eason et al., 2016 and Raine et al., 2016). In the Palestinian Territories (West Bank and Gaza Strip), no particular studies have been carried out concerning the Common Quail hunting. Rather, numerous local studies recorded the occurrence of the bird in several environments of Palestine and confirmed its hunting for meat purposes (Euroconsult and IWACO, 1994; MedWetCoast, 2002; UNEP, 2003; Abd Rabou, 2005; 2011a and b; 2019a and b; Yassin et al., 2006 and Abd Rabou et al., 2007a). Abd Rabou (2020a) and Abd Rabou et al (2020) recorded many individuals of the bird preserved at the biology exhibitions of the local universities. More recently, Subaihi (2020) ensured the breeding of the Common Quail in the Gaza Strip as a new healthier and less expensive alternative for Gazans. In Europe, there is some concern about the genetic origin of farm-reared quails. The great reproductive success of quails in farms could be resulted from crosses between wild Common Quails (*Coturnix coturnix*) and domestic Japanese Quails (*Coturnix japonica*), which are sister species to Common Quails and are distributed across eastern Asia (Dere'gnacourt et al., 2002 and Sanchez-Donoso et al., 2012).



**Figure 1** Main migration paths of the Common Quail (*Coturnix coturnix*) to and from the West Palearctic [Source: European Union, 2009]

The Gaza Strip, which lies at the southwestern corner of Palestine, is home to a considerable number of bird fauna; both resident and migratory. The diversity of landscapes, ecosystems, habitats and niches promoted such an occurrence of bird fauna (MedWetCoast, 2002; UNEP, 2003 and Abd Rabou, 2005). During autumn migration of each year, the Gazans set trammel nets along most of the Mediterranean coast of the Gaza Strip, which extends for more than 40 km. A large number of the Common Quail is commonly captured or trapped by these nets (UNEP, 2003). The nets also illegally capture other migratory and resident birds, which are then killed or sold to pet shops, animal markets or zoos (Abd Rabou 2011a and b). In fact, there are no red lines in the Gaza Strip towards quail hunting in particular or poaching and hunting of other birds in general. Hence, the current descriptive study aims at introducing information on the hunting of the Common Quail (*Coturnix coturnix* Linnaeus, 1758) in the Gaza Strip. The importance of this study comes from the fact that it is the first of its kind and style in dealing with and focusing on the Common Quail as a bird loved by most Gazans.

## 2. Materials and Methods:

### 2.1. Gaza Strip

The Gaza Strip (365 km<sup>2</sup>) is an arid to semi-arid coastal zone lying in the southern part of the Palestinian coast along the eastern shore of the Mediterranean Sea (Figure 2). It has five governorates: North Gaza, Gaza, Middle, Khan Younis, and Rafah. The local average annual rainfall is 300 mm. 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 (Euroconsult and IWACO, 1994 and UNEP, 2003). Nowadays, the Gaza Strip has a population of about 2.25 million, with the population density reaching 5,500 inhabitants per square kilometer, making the Gaza Strip one of the most densely populated areas in the world (Abd Rabou, 2019b). A lot of Gazans have been engaged in bird and wildlife hunting throughout the Gaza Strip; some of whom erect their trammel net 100 – 200 meters off the coastline in autumn seasons to catch the Common Quail and other categories of birds.



**Figure 2** A map showing the geographic position of the Gaza Strip

## 2.2. Procedure

Since 2015, many field visits have been held in the early hours of the morning to places of erecting trammel nets along the Mediterranean beach of the Gaza Strip, which extend for approximately 40 km from Beit Lahia in the north to Rafah in the south, to observe and monitor the hunting of Common Quails and other non-target birds in the Gaza Strip. Discussions with local people and stakeholders including bird and quail hunters and breeders have been carried out to get more information on quail hunting and rearing in the Gaza Strip. During the field visits, binoculars and digital cameras were commonly used for observations and documentation. Animal markets, pet shops and zoological gardens (zoos) have been visited as well to study their quail and bird content. Many available local, regional and international guide books have been referred to in order to identify the non-target bird species incidentally falling in quail nets (Goodman and Meininger, 1989; Baha El-Din and Atta, 1990; Harrison and Greensmith, 1993; Porter et al., 1996; Shirihai, 1996; Abu Shammalah and Baha El-Din, 1999 and Cottridge and Porter, 2000).

## 3. Results:

### 3.1. Net Setting Up Along the Gaza Strip Shore

At the beginning of autumn season of each year, all people passing through the coastal road of the Gaza Strip, extending from north to south, see hundreds of nets, at a distance of 100-200 meters off the coastline, cleverly placed along the beach, marking the start of the Common Quail hunting season in the Gaza Strip (Figure 3). The color of the threads of hunting nets is tilted to a transparent white to camouflage the birds so that they cannot be seen while approaching them. The hunting season for these migratory birds is usually accompanied with the passage patterns of the species across the coast of the Gaza Strip. Generally speaking, the passage of the Common Quail across the western

coast of the Gaza Strip gradually increased in volume from late August, and eventually tapered off during the mid of October each year.

Hunters take advantage of worn out fishing trammel nets that are not suitable for fishing in order to erect them through wooden or iron poles fixed to the ground to catch the migratory Common Quail. Common Quails arrive exhausted and tired to the shores of the Gaza Strip, after traveling long distances of more than three thousand kilometers to rest on land, and collide with nets that extend over large areas of the sea shore, get stuck inside and fall prey there. As soon as some Common Quails fall into the nets, the hunters begin to remove them from the nets carefully, and put them in metal cages or sealed bags waiting for buyers who roam with their cars and motorcycles in order to get these delicious birds. Although the number of caught birds reaches from two to twenty spouses per a hunter, some days come during which hunters do not catch any bird. Rather, the hunters sometimes find birds of prey, not suitable for eating, that fell into the nets. Although trammel nets are the main method of quail hunting in the Gaza Strip, the use of guns to hunt quails and other birds is a common practice as well. Quail escaping the nets and landing among agricultural crops and low-growing herbaceous plants were found to be subject to shooting by guns by highly skilled bird hunters.



**Figure 3** *Hunting of the Common Quail (Coturnix coturnix) along the Mediterranean coast of the Gaza Strip*

### **3.2. Importance of Common Quail Hunting**

The Common Quail is a source of livelihood for dozens of Gazan families exhausted by the Israeli siege, low socio-economic standards, poverty and unemployment. Although the Common Quail is a simple and seasonal source of livelihood for Gazan families who used to hunt it annually, some consider it just a hobby because it is not enough to sustain a livelihood, and it can not be relied upon, especially as it does not generate large sums throughout the season. It is worth mentioning that Common Quails that are destined to avoid netting prefer to live in grassland and low-growing crop lands in the Gaza Strip. Gazan farmers ensured the presence of the bird among their plantations, while bird hunters, who used to trap passerines, stated that they usually see the bird among the low-growing herbaceous plants prevailing everywhere in the Gaza Strip.

Some Gazans pointed out that they often face difficulties when they do not find the numbers of quails they want to buy with more than one quail hunter due to the lack of hunting, as most of the hunters have their cages empty, and they have not succeeded in catching anything. Some hunters complain about Common Quails coming out of the sea and flying at a higher altitude than their fishing nets whose height is no more than 2.5 meters, which reduces the chances of them, falling into the nets.

### **3.3. The Scarcity of Locally Caught Common Quails**

Some quail hunters claimed that in the past years, the flocks of the Common Quail came in abundance to the shores of the Gaza Strip, and they used to catch large quantities of them, exceeding 500 birds, during one season. Some of them recalled that what was caught from the Common Quail in the second half of the Twentieth Century was sold cheaply in the markets and roads, as the cages were full of hunted birds. They added that the current quantities of the bird that arrive the Gaza Strip do not exceed 20% of the amount that arrived 30-40 years ago. Meetings and discussions with quail hunters and other stakeholders pointed out that these birds have begun to recede and disappear as a result of different factors as follows:

1. The high numbers of hunters, in light of the lack of job opportunities and their directive to hunt these birds in search of a source of livelihood for their families.
2. Overhunting has caused the disappearance or extinction of many beautiful species of birds from the Gaza Strip, such as partridges, goldfinches, doves, sparrows and quails .
3. The number of Common Quails reaching the Gaza Strip during their migration decreased due to their population declines in Europe.
4. The change of these birds to their migration direction towards Egypt, especially Sinai, Port Said and Alexandria.
5. The environmental factors play a major role in reducing the arrival of these birds to the Gaza Strip, in light of the increase in urbanization, residential expansion and scarcity of agricultural areas.
6. The strong air currents and the rise of sea waves to high levels lead to a reduction in the opportunity for the Common Quail to reach the shores of the Gaza Strip and collide with nets. In such conditions, the birds fly at very high levels, in search of other areas where they can settle.
7. The climate change is a global environmental issue affecting the global bird and other wildlife migrations including the Common Quail.

### **3.4. Non-target Birds Fall into Quail Nets**

Bird hunting is a common phenomenon in the Gaza Strip and the other Palestinian Territories. No red lines regarding bird poaching and hunting are respected locally and as a result, all bird species have the opportunity to be captured. The primary quarry of erecting trammel nets 100-200 meters off the Gaza Strip coastline is the Common Quail, but the nets are indiscriminate, resulting in a wide

range of other non-target migrant and resident bird species also being incidentally caught (Figure 4). Some of bird hunters were found to release some of these non-targeted birds, but the majority feels lucky having these birds falling in their nets. They take them home to be eaten or sold later to other bird traders or to pet shops, animal markets or zoos prevailing in the Gaza Strip. Table 1 illustrates 50 bird species falling in quail nets as noted by the author himself or by quail hunters met. These birds belong to 12 orders and 29 families. The half (50%) of these birds was passerines, i.e., belonging to order Passeriformes; the biggest order among bird orders known worldwide.

**Table 1 Non-target birds falling incidentally into quail nets during autumn seasons in the Gaza Strip**

Family	Scientific Name	Common Name
<b>Order: Pelecaniformes</b>		
Ardeidae	<i>Ixobrychus minutus</i>	Little Bittern
<b>Order: Gruiformes</b>		
Rallidae	<i>Gallinula chloropus</i>	Moorhen
	<i>Crex crex</i>	Corncrake
	<i>Porzana porzana</i>	Spotted Crake
<b>Order: Charadriiformes</b>		
Charadriidae	<i>Charadrius hiaticula</i>	Ringed Plover
	<i>Charadrius alexandrinus</i>	Kentish Plover
Scolopacidae	<i>Calidris temminckii</i>	Temminck's Stint
	<i>Calidris minuta</i>	Little Stint
	<i>Calidris alba</i>	Sanderling
<b>Order: Falconiformes</b>		
Falconidae	<i>Falco tinnunculus</i>	Kestrel
	<i>Falco naumanni</i>	Lesser Kestrel
	<i>Falco subbuteo</i>	Hobby
<b>Order: Accipitriformes</b>		
Accipitridae	<i>Buteo buteo</i>	Common Buzzard
	<i>Elanus caeruleus</i>	Black-winged Kite
	<i>Milvus migrans</i>	Black Kite

Family	Scientific Name	Common Name
<b>Order: Columbiformes</b>		
Columbidae	<i>Spilopelia senegalensis</i>	Laughing Dove
	<i>Streptopelia turtur</i>	European Turtle Dove
<b>Order: Bucerotiformes</b>		
Upupidae	<i>Upupa epops</i>	Hoopoe
<b>Order: Piciformes</b>		
Picidae	<i>Jynx torquilla</i>	Eurasian Wryneck
<b>Order: Caprimulgiformes</b>		
Caprimulgidae	<i>Caprimulgus europaeus</i>	Eurasian Nightjar
<b>Order: Cuculiformes</b>		
Cuculidae	<i>Cuculus canorus</i>	Common Cuckoo
<b>Order: Coraciiformes</b>		
Alcedinidae	<i>Alcedo atthis</i>	Common Kingfisher
	<i>Halcyon smyrnensis</i>	White-breasted Kingfisher
Meropidae	<i>Merops apiaster</i>	European Bee-eater
Coraciidae	<i>Coracias garrulus</i>	European Roller
<b>Order: Passeriformes</b>		
Alaudidae	<i>Galerida cristata</i>	Crested Lark
Oriolidae	<i>Oriolus oriolus</i>	Golden Oriole
Sturnidae	<i>Acridotheres tristis</i>	Common Mynah
Hirundinidae	<i>Hirundo rustica</i>	Barn Swallow
Muscicapidae	<i>Luscinia svecica</i>	Bluethroat
	<i>Oenanthe hispanica</i>	Black-eared Wheatear
	<i>Oenanthe oenanthe</i>	Northern Wheatear
	<i>Oenanthe isabellina</i>	Isbelline Wheatear

Family	Scientific Name	Common Name
	<i>Muscicapa striata</i>	Spotted Flycatcher
Motacillidae	<i>Motacilla alba</i>	Pied Wagtail
	<i>Anthus cervinus</i>	Red Hroated Pipit
	<i>Anthus spinoletta</i>	Water Pipit
Passeridae	<i>Passer domesticus</i>	House Sparrow
Pycnonotidae	<i>Pycnonotus xanthopygos</i>	White-spectacled Bulbul
Nectariniidae	<i>Cinnyris osea</i>	Palestine Sunbird
Laniidae	<i>Lanius collurio</i>	Red-backed Shrike
	<i>Lanius nubicus</i>	Masked Shrike
Paridae	<i>Parus major</i>	Great Tit
Cisticolidae	<i>Prinia gracilis</i>	Graceful Prinia
Phylloscopidae	<i>Phylloscopus collybita</i>	Chiffchaff
	<i>Phylloscopus trochilus</i>	Willow Warbler
Sylviidae	<i>Acrocephalus arundinaceus</i>	Reed Warbler
	<i>Sylvia curruca</i>	Lesser Whitethroat
	<i>Sylvia atricapilla</i>	Blackcap
Fringillidae	<i>Serinus serinus</i>	European Serin

### 3.5. Why Do Gazans Breed Quails?

The demand of Gazans for purchasing the Common Quail and its eggs increases in spite of the bird's small size, as it is rich in vitamins and minerals that folk doctors often prescribe to a number of Gazan patients for treatment of various diseases. The popularity of quail breeding in the Gaza Strip (Figure 5) comes as a result of the following advantages as stated by quail breeders and hunters in addition to other stakeholders working in the Ministry of Agriculture:

1. The Common Quail is a fast and cheap source for the production of animal protein from meat and eggs, and it plays a major role in reducing the avian meat crisis in the Gaza Strip .
2. The Common Quail is able to adapt to several breeding patterns and with various environmental conditions, as it can live in batteries or cages or even on the ground or indoors.

3. The Common Quail has a short maturity period; after 35 days of hatching they can be sold as meat for consumption. This reduces the investment period, while it produces eggs in abundance, at a rate of 250 - 300 eggs per year per a female.
4. The Common Quail is not expensive to be farmed. The capital involved in raising quails is low compared to investment in similar projects such as raising chickens or turkeys.
5. The Common Quail does not take up a large area, so one square meter can accommodate 80 – 100 quail birds. This is a large number compared to its farm-raised counterparts.
6. The Common Quail, which is locally farmed, has low price; compared to other birds. This is an encouraging opportunity for many consumers to eat it and include it in their meals .



**Figure 4 Non-target bird species incidentally caught by quail nets: (A) Little Bittern (*Ixobrychus minutus*), (B) Blackcap (*Sylvia atricapilla*), (C) European Serin (*Serinus serinus*), (D) Spotted Corncrake (*Porzana porzana*), (E) White-spectacled Bulbul (*Pycnonotus xanthopygos*), (F) Northern Wheatear (*Oenanthe oenanthe*), (G) European Turtle Dove (*Streptopelia turtur*) and (H) Masked Shrike (*Lanius nubicus*).**

7. The Common Quail is somewhat resistant to diseases and is not affected by the seasons of the year.
8. The culture of the Gazan population in consuming farmed quails is expanding day by day.
9. The Common Quail farming increases the creation of new job opportunities, especially for young people and university graduates who suffer from poverty and unemployment.

10. The Common Quail produces residues that are commonly known among the Gazans as efficient agricultural fertilizers.



**Figure 5** *Quail breeding in the Gaza Strip.*

### **3.6. Perception of Gazans towards Wild and Farmed Quails**

When the Gazans; especially those found purchasing the wild quails were asked about the difference in price and taste between wild and farmed quails, most of them admitted that the difference in price between wild and farmed quails is very big. The price of wild quail is between USD 6 – 7 per pair, while the price for farmed quail does not exceed USD 2 per pair. The taste of wild quails is in no way can it compare with the farmed. They added that the Common Quail holds the distinction of being one of the birds mentioned in the Quran, referenced in the story of Moses and the exodus from Egypt. When Allah provided the Israelites with food in the desert, it came in the form of manna and quails falling from the sky.

## **4. DISCUSSION**

Palestine (27,000 km<sup>2</sup>) is a Middle East country having a strategic geographic position at the meeting point of Asia, Africa and Europe continents. Its climate, landscape, ecosystem and habitat diversities encourage bird and other wildlife diversities including migratory forms (Qumsiyeh, 1996). In light of these facts, Palestine plays as a stopover point for migratory bird fauna prior to continuing their annual migration from Eurasia to Africa and vice versa (UNEP, 2003). The Common Quail (*Coturnix coturnix*) is an important member of the Phasianidae family occurring in Palestine and hence the Gaza Strip (Abu Shammalah and Baha El-Din, 1999; Abd Rabou, 2005; 2011a and b; 2019a and b; 2020a; Perlman and Meyrav, 2009; Khalilieh, 2016 and Abd Rabou et al., 2020). Several species of pheasants and partridges are extremely important to humans, with some of which have been widely used as game birds for hunting. For example, the Chukar (*Alectoris chukar*) is commonly poached and hunted by the Palestinians of the West Bank and Gaza Strip (MedWetCoast, 2002; Abd Rabou, 2005; 2020b and Abd Rabou et al., 2007a). Similar to pheasants, the birds comprising the family Columbidae were found to be poached and hunted in the Gaza Strip as pointed out in the recent study of Abd Rabou and Abd Rabou (2019).

Bird hunting and trade are a common phenomenon in many countries worldwide, especially the developing ones such as Jordan, Lebanon, Saudi Arabia and Egypt (Baha El-Din and Salama, 1991; Baha El-Din et al., 1996; Eid et al., 2011; Viney, 2012; CABS and LEM, 2013; El-Moghrabi, 2013; Welz,

2013; Aloufi and Eid, 2014; Brochet et al., 2016; Eason et al., 2016; Eid and Handal, 2018). Birds in many Mediterranean and Middle East countries are illegally killed and/or taken primarily for food, sport and for use as cage-birds or decoys (Yom-Tov, 2003 and Brochet et al., 2016). The Gaza Strip suffers from the Israeli occupation measures represented by political and military constraints. As a result, a great number of wildlife species are commonly poached, trapped or hunted. Environmental laws and legislations are poorly dealt with. No governmental interventions have been made or adopted to regulate bird and wildlife poaching and hunting. One visit to animal markets like that of Al-Yarmouk in the middle of the Gaza City will show the kinds and numbers of animals caught by bird hunters and even normal people (Abd Rabou, 2019a and b and Abd Rabou and Abd Rabou, 2019). Netting of the Common Quail is an apparent phenomenon in the autumn months in the Gaza Strip and the Sinai Peninsula in Egypt (Mendelssohn et al., 1969; Euroconsult/IWACO, 1994, MedWetCoast, 2002, UNEP, 2003; Abd Rabou, 2005; Youssef and Mansour, 2014 and Eason et al., 2016). The Common Quail is fully protected in many European countries. It is furthermore listed in the Red Data Books of many other countries (European Union, 2009).

Netting was and is still the main method used in quail hunting in the Gaza Strip, while the use of guns is a main means of hunting birds including inland quails and other wildlife species. In European, Asian and African countries; the Common Quail is hunted with guns by dedicated specialists with dogs (European Union, 2009). In Malta, a technique was previously applied in hunting the males of the Common Quail. This is simply by throwing a square net over cut vegetation, after attracting the birds to it with a device mimicking the female call (European Union, 2009). No sign indicating the use of MP3 recordings of quail calls to attract birds to nets in the Gaza Strip. Such technique was used in Egypt and it results in massive trapping of the Common Quail and other birds (Baha El-Din et al., 1996 and Eason et al., 2016). In fact, quail hunting in Egypt is massive and hence disastrous. According to Eason et al. (2016), estimates of 3.4 million quail were captured in northern Sinai during the migration season of 2012. They added that if capture rates were similar along the rest of the Egyptian coast, which is similarly covered by nets during autumn migration, then the estimates would suggest 12.9 million quail captured in 2012 in Egypt. For these astonishing figures, Viney (2012) and Welz (2013) sound warning over Egyptian trapping that kills millions of birds as they migrate from Europe into Africa. Welz (2013) went on to quote an American author who made it clear that Egypt is the world's most dangerous place to be a migratory bird.

In each year, the autumn migration of birds introduces a diversity of bird species coming from a broad to the Gaza Strip of Palestine; of which the Common Quail is the loveliest by the Palestinians because of its meat (UNEP, 2003 and Marwat et al., 2014). The poverty and unemployment crises facing the Gaza Strip in addition to hunting hobby made hundreds of Gazans to use the worn out fishing nets that are not suitable for fishing to erect them 100-200 meters off the coastline through wooden or iron poles fixed to the ground to catch the migratory Common Quail. Even people who are interesting in wildlife hunting in inland locations were found to use such old and worn out fishing nets. It is worth noting that the Israeli pursuits of Gazan fishermen at the coastal marine waters of the Mediterranean Sea, in addition to the pollution of the sea coast with solid waste, are working to destroy fishing equipment and nets (Abd Rabou et al, 2007b and Abd Rabou, 2013), making them unfit for use in fishing. Such reasons made quail hunters relying on these nets for quail netting. Quail hunters are commonly poor people who used to depend upon this seasonal hunting in order to sustain a livelihood. The whole phenomenon is nowadays not feasible as it does not generate large sums throughout the season. The physical distancing between nets erected in front of the coastline is very important as it allows migratory birds including the Common Quail to escape and avoid netting. For this reason, it is logic for someone to encounter Common Quails living among the low-growing crops and other vegetation types in the Gaza Strip (MedWetCoast, 2002 and Abd Rabou, 2005). The consumption of the Common Quail and its eggs is healthy and well known worldwide and in Egypt (Eason et al., 2016) as a very close neighboring country to Palestine. Nutrition experts confirm that quail eggs help in the treatment of digestive disorders, such as gastritis and duodenal ulcers, as well

as help in treating anemia, increasing the level of hemoglobin, and removing toxins and heavy metals from blood (Subaihi, 2020).

All Gazans, especially bird hunters, acknowledge that the current quantity of the Common Quail reaching the Gaza Strip is a fraction to the amount that arrived in the second half of the Twentieth Century though Mendelssohn et al. (1969) revealed declines of the migrant Common Quail populations in Israel and Sinai. Even the reasons stated by the Gazans seemed to be logic. It is worth mentioning that a great deal of wildlife species inhabiting the Gaza Strip have been seen in low numbers as their populations and habitats were threatened by anthropogenic factors including the Israeli physical barriers and political sieges. The chronic political and military tensions imposed by the Israeli occupation on the Palestinian communities in both the West Bank and the Gaza Strip generated big crises threatening the Palestinians' lives. Political Israeli blockades, closures and frequent Israeli military sweeps and wars in addition to the construction of the Apartheid Israeli Wall in the West Bank of Palestine, all were factors encouraging the emerging of poverty, unemployment and low socio-economic standards among the Palestinians, especially the Gazans. Such circumstances promoted a considerable slice of the Palestinian community towards wildlife hunting including quail hunting and exerting more pressure of the harsh and fragile environments the Palestinians owe.

The decline of many wildlife populations in their breeding grounds in Europe demonstrated itself in the quantities of migratory species reaching their destinations. Hence, it could be accepted as claimed by many Gazans that the number of Common Quails reaching the Gaza Strip during their migration season decreased because of population declines in Europe due to anthropogenic causes that were stated by many authors (McCulloch et al., 1992; Puigcerver et al., 1999; Burfield, 2004; Sanderson et al., 2006; Heldbjerg and Fox, 2008; European Union, 2009 and Raine et al., 2016). In Poland, as a European country, the agricultural intensification which is accompanied with the use of agrochemicals was found to cause declines in the populations of the Common Quail (Kosicki et al., 2014). Such declines of the Common Quail in northern latitudes have stimulated the release of Domestic Japanese Quail (*Coturnix c. japonica*) as game birds in different European countries. The Japanese Quail exists in the wild in Asia, but is best known in its domestic form in Europe, Asia, North America and India, where it is farmed for meat and egg production (Guyomarc'h et al. 1998).

In fact, the claims of some Gazans that the Common Quail changes the directions of its migration routes to the coasts of Egypt seem to be not logic, as the Egyptian coasts are crowded with severe hunting operations for quails and other migratory birds. There are no red lines towards hunting birds of all kinds despite the instructions woven by the competent Egyptian authorities concerned with hunting specific kinds of birds with specific mechanisms. Both the modest height of about 2.5 meter of erected trammel nets and the physical distancing among these nets along the Gaza Strip coast may have an advantage in permitting considerable numbers of the Common Quail to escape netting and find safe inland areas to settle and rest in. In fact, the use and application of chemical pesticides is intensive and extensive in the Gaza Strip as pointed out by Abd Rabou and Al-Agha (1998) and Abd Rabou et al. (2002). This is because agriculture is the backbone of the Palestinian economy there. These pesticides were known to negatively impact different wildlife categories (Abd Rabou, 1996 and 2020c) including omnivorous birds such as Common Quails and many others (Abd Rabou et al, 2007a).

As far as the environmental and climatic factors, including the climate change issue, are concerned, they are determinants to waves of the Common Quail reaching the Gaza Strip and other coastal areas worldwide. According to Huisman (2006), there are several factors causing this decline in Europe, such as habitat destruction because of agricultural intensification and application of pesticides which limit the amount of chick food, and overhunting. In Texas of USA, Bridges et al. (2001) pointed out that both the Scaled Quail (*Callipepla squamata*) and Northern Bobwhite (*Colinus virginianus*), are

likely to be stressed by the impacts of climate change and precipitation patterns and the populations of both bird species have declined concurrently with increasing global temperatures. In fact, adequate rainfall is very crucial to provide food, moisture and vegetative cover for birds. This simply means that habitat quality may suffer in the wake of drier conditions and increasing frequency and intensity of droughts dictated by climate change condition as pointed out by Guthery et al. (2000). From a hybridization point of view as a factor that lowers the reach of Common Quail to Middle East countries of Africa and Asia including Palestine, it was stated that European quails are potentially threatened by hybridization, caused by the release by hunters of Japanese Quails and hybrids. In fact, this hybridization was believed to be one of the causes for the increasing number of birds not migrating to Africa in winter (Barilani et al., 2005 and Huisman, 2006).

The primary goal of erecting nets 100-200 meters off the Gaza Strip coastline in the autumn season of each year is the hunting of the Common Quail as stated by all quail hunters. Such indiscriminate nets may result in a wide range of other non-target bird species and even bats being incidentally caught as well. In fact, the list of birds fallen in quail nets; with the half of them are passerines, seems to be longer than those illustrated in Table 1. This is simply because that quail hunters were not aware of the names of all birds captured and as a result, the list is surely incomplete. However, these non-target birds seem to be more or less analogous to the birds netted along the coasts of the Sinai Peninsula of Egypt in autumn seasons in terms of their species hunted but not their quantities (Elhalawani, 2016). Tens of bird species, with the bulk is passerines, were found to fall incidentally in the nets targeting Common Quails in Egypt (Eason et al., 2016). The economic benefits received from quail hunting in the Gaza Strip covers basic subsistence for some Gazans, while bird hunting in the Egyptian coasts varies from representing a major income supplement to covering basic subsistence. As a result, the magnitude of bird hunting in the Egyptian coasts is threatening to migratory bird ecology (Baha El-Din and Salama, 1991; Eason et al., 2016 and Elhalawani, 2016). Doves; especially the Turtle Dove (*Streptopelia turtur*) and Laughing Dove (*Streptopelia senegalensis*) were among the most birds falling in the nets of Common Quail. Having these doves captured by nets represents a good opportunity for Gazans who target these birds all over the Gaza Strip for meat and eggs (Abd Rabou and Abd Rabou, 2019). The Corn Crake (*Crex crex*), which was classified as near threatened on the IUCN Red List because of its serious declines in Europe, was recorded along with the Spotted Crake (*Porzana porzana*) to incidentally caught in quail nets. Similarly, the same bird was recorded by Baha El-Din et al (1996) and Eason et al. (2016) as one of the main trapped birds along the Mediterranean coast of Egypt.

Although passerines were the most falling birds in the Common Quail nets, they were the most targeted birds by bird hunters and even children using different trapping means in the Gaza Strip. Pet shops, animal markets and zoos are good places for someone to gain information on the magnitude and species diversity of passerines in the Gaza Strip. In addition to netting via Common Quail nets, birds were also poached and trapped using various net types in the inland regions of the Gaza Strip. The use of mist nets wrapped over bushes, shrubs and trees to target passerines is somewhat restricted to and noted in a few places such as Wadi Gaza in the middle of Gaza Strip (Abd Rabou, 2005), Al-Mawasi ecosystem in southern Gaza Strip (Abd Rabou, 2019b) and scattered bushy and agricultural areas beside the eastern borders of the Gaza Strip (Personal Observations). In Egypt, which is a very close neighboring country to the Gaza Strip, different capturing means for birds are applied. Trammel nets, mist nets placed over trees and shrubs to catch perching and song birds, lime sticks, air rifle, shot guns, call devices and sharaks (noose harnesses) for the catch of birds of prey were all found to be used depending on bird categories (Eason et al., 2016 and Elhalawani, 2016). Eason et al. (2016) pointed out that 24% of birds captured in the trammel nets used to capture Common Quails were species other than quails. Such relatively high percentages of non-quail birds captured in north Sinai and the Gaza Strip and even in other coastal areas of Egypt put some pressure on bird ecology in the area. Moreover, the incidental capture of animals like snakes (Figure 6) and bats was stated by bird hunters. It is worth mentioning that bats (order Chiroptera) and

snakes (order Squamata) are highly represented fauna in Palestine and Jordan (Qumsiyeh, 1996 and Disi, 2002).



**Figure 6** *Incidental catch of the Montpellier or Arabian Rear-fanged Snake (*Malpolon monspessulanus*) by quail nets in southern Gaza Strip.*

Quail is one type of poultry that is very popular in the Gaza Strip. The high demand of Gazans on animal protein promoted many Gazans to raise the Common Quail in private farms scattered along the Gaza Strip. No doubts that the ease of raising the bird locally, the ability of the bird to live and breed in captivity in addition to the political and socio-economic conditions afflicting the Gaza Strip, encouraged some Gazans to acquire and raise it at both homes and farms in order to obtain income that secures their families' sustenance. All Gazans ensured that quails caught through nets erected on the Mediterranean coast exceed those farmed locally in terms of shape, taste and quality. For this reason, rich Gazans often go to the quail hunting places early in the morning to buy them from their source. The situation is different for large Gazan families which have limited income; they are satisfied with buying locally farmed quails to meet their livelihood. In general, the prices of both wild and farmed quails, although they are different, are within the reach of most interested Gazans, so they can buy and obtain them easily. The trade of wild and farmed Common Quail is very popular in the markets of the Gaza Strip. In fact, the wild taste is very good and in no way can it compare with the farmed. According to Tunsaringkarn et al. (2013), quails are inexpensive forms of animal protein, contain all amino acids needed for human health, and provide many vital minerals and vitamins such as B1. They are tasty and have high nutritional values and low-fat contents. It is very common to hear Gazans saying: Is it not enough that God Almighty mentioned the Common Quail in several verses in the Holy Quran for the goodness of its flesh or meat?

All the reasons stated by Gazans to justify quail breeding in the Gaza Strip seem to be logic. The low socioeconomic standards of Gazans made some of them to adopt quail breeding projects, which were sometimes supported by non-governmental organizations (NGOs) spreading in the Gaza Strip; aiming at creating new job opportunities in times the whole Gaza Strips suffers from socioeconomic issues. In fact, the capital needed here is less expensive compared to investments in other poultry categories. One square meter can support the raising of at least 80 quail birds. The residues of birds are commonly efficient as agricultural fertilizers compared to the manure produced by farmed mammals. So, the use of quail residues may lower the investments allocated for agriculture. It is well

known that agriculture is the backbone of the economy of the Gaza Strip. In conclusion, the weak implementation of environmental legislations and laws promoted wildlife poaching and hunting in the Gaza Strip and allowed a lot of Gazans to practice this profession with no restrictions. With regard to the Common Quail, it is necessary to set determinants that regulate the work of this seasonal hunting, and force hunters to adhere to them and punish violators.

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