The Wolf (Canis lupus) in Palestine . الذئب (كانيس لوبوس لينيوس ، 1758) في فلسطين

Article · December 1990

CITATIONS
0

READS
118

1 author:

Norman Ali Bassam Khalaf-Prinz Sakerfalke von Jaffa
University of Palestine
141 PUBLICATIONS **37** CITATIONS

SEE PROFILE

The Wolf (*Canis lupus*) in Palestine

الذئب (*كانيس لوبوس* لينيوس ، 1758) في فلسطين

By: Norman Ali Bassam Ali Taher Khalaf-von Jaffa

As evidenced by quotations in the Holy Qur'an, the wolf (*Canis lupus* Linnaeus, 1758) coexisted with man in the area of Palestine for thousands of years and was well known as a predator, as we know it from the story of Prophet Yusuf (Joseph). The Reverend Tristram (1884) stated that the wolf is found in every part of Palestine. Wolves still live in over half of Palestine, but have disappeared during the last 40 years from the more densely settled areas. It appears, however, that in some areas their population has increased recently due to easily available food from garbage dumps (Mendelssohn 1982).

The "Israeli" Wild Animals Protection Law of 1954 completely protected almost all wild animals in Occupied Palestine except, among others, the Palestine Golden Jackal (*Canis aureus palaestina* Khalaf, 2008), which was later given complete protection.

The human population of "Israel" in 1979 was 3,830,000 in an area of 20,720 square kilometer, or 185 people per square kilometer. The northern and central part of the country has a much higher human density than Al-Naqab (Negev) Desert (the southern arid part) and the Rift Valley (Jordan Valley, Dead Sea depression and Wadi Araba), where most of the contemporary wolf population lives. Already in the 1930s, wolves had disappeared from the densely settled areas - the coastal plain between Haifa and Jaffa and the mountains between Nablus and Hebron (Al Khalil).

Palestinian wolves are animals of open areas. They have never inhabited the dense Mediterranean scrub forest that covers about 400 square kilometer in Galilee (Jaleel) and on Mount Carmel. According to Shahi (1977, 1983), the Indian *Canis lupus pallipes* Sykes 1831, apparently also do not live in dense forest cover. Because of Palestine's small size, its nature reserves are also small and, thus, are of little use to such wide-ranging animals as wolves. The largest nature reserve in the north, that of Mount Meron (Jabal Al Jarmaq), has an area of about 90 square kilometer, which is largely covered by scrub forest and therefore not suitable for wolves.

Several subspecies of wolves occur in the Middle East. The smallest of all the wolf subspecies, the Arabian *Canis lupus arabs* Pocock, 1934, is found in a large part of the Arabian Peninsula, in Southern Sinai, in Southern Palestine and probably also in Southern Jordan. To the north of the distribution of this subspecies, the Indian *Canis lupus pallipes* occurs, the distribution of which

extends from Palestine through Syria, Southern Iraq, Southern Iran, Kuwait to Southern Pakistan and India. In Palestine two discrete populations of this subspecies have been found, that differ in size and colour and live in different climatic regions.

Prof. Dr. Heinrich Mendelssohn (1983) wrote in his article "Status of the wolf in the Middle East" : "The taxonomic situation of the wolves of Syria and Turkey is not yet well known. Wolves that are larger and darker than typical *Canis lupus pallipes*, but are different from *Canis lupus lupus* or *Canis lupus campestris*, have been found in the Golan. Similar wolves have recently been observed in Eastern Lebanon, close to the Syrian border, and it is possible that the wolves of Turkey and Northern Syria belong to this form".

The existence of wolves in Lebanon is surprising. Lebanon, with a dense human population and an enormous, unrestricted hunting pressure, has very little wildlife left. The jackal (*Canis aureus*) was so far supposed to be the largest wild mammal surviving in Lebanon. In August 1982, however, several wolves were observed by reliable observers, feeding on garbage dumps in the area of Lake Karoun, close to the Syrian border. A few days later ten wolves were seen feeding on a cow carcass in the same area. The wolves of Northern Iran are similar to *Canis lupus campestris* (Mendelssohn 1983).

Wolves still occur, as far as is known, in all the countries of the Middle East, but are generally rare, and their distribution is not continuous. They have been eliminated from areas with dense human population. Apparently, Occupied Palestine is the only country in this region where wolves are legally protected. Some countries, such as Jordan, Oman and the United Arab Emirates, have in recent years introduced some restrictions on hunting. It seems that in Jordan and in Oman these regulations are quite well obeyed, but predators are apparently not included in this protection (Mendelssohn, 1983). Such protection of predators would not be acceptable to the public as predators are, except in Palestine, considered generally as pests and killed on sight. Only smaller species, such as jackals and foxes, are not endangered. All the larger species that still exist, such as hyenas (*Hyaena hyaena*), leopards (*Panthera pardus*) and wolves, must be considered as endangered (Mendelssohn 1983).

Prof. Dr. Mendelssohn (1983) continues: "In most countries of the Middle East, wolves feed mostly on livestock carcasses or have to prey on domestic animals, as wild ungulates have been exterminated or are, besides wild pigs (*Sus scrofa*), so rare that they cannot present a food base for wolves. Even in Turkey, where seven species of ruminants were regionally not rare 30 years ago, they are now so rare in most areas, or have been completely exterminated, that wolves cannot rely on them. Wild pigs occur in the northern and more humid areas of this region and are regionally common, but it is not known if wolves prey on this species." In Palestine wild pigs are common, but there are no observations indicating that wolves prey on them.

Scavenging on garbage dumps presents another source of food and the smaller

subspecies of wolves, especially the small *Canis lupus arabs*, feed also on rodents and other small animals.

Mendelssohn (1983) writes: "Wolves are endangered by shooting, as in most countries of this region "everybody carries a gun and shoots at everything" (Kumerloeve, personal communication) and wolves are shot on sight. If they prey on livestock, retaliation poisoning or trapping ensues. Many poisons are available and widely used: Fluoracetamide (1081), Sodiumfluoracetate (1080), Strychnine, as well as pesticides, such as Endrin, Parathion, etc. Rabies is endemic in most countries of the region, and the veterinary authorities carry out poisoning campaigns, using mostly strychnine and 1080, in order to eradicate predators and feral dogs."

Thus the life of the wolf in most areas of the Middle East is precarious because of the unpredictable and unsure supply of food, persecution and antirabies campaigns. Their survival is due to the fact that in most areas of this region the density of human population is still low, and nomadic livestock raising is widespread, with quite a high rate of mortality in the herds, thus supplying carcasses. The human population, however, increases rapidly, and veterinary care of the nomadic herds improves, causing a decrease in the availability of carcasses (Mendelssohn 1983).

The eventual survival of wolves in the Middle East will depend on the slowly developing nature conservation ethic, in which predators ought to be included. As the general attitude is, however, still strongly anti-predator, extensive conservation education is extremely urgent. Legal protection alone is meaningless: In Turkey the leopard (*Panthera pardus tulliana*) and the tiger (*Panthera tigris virgata*) have been protected since 1966, but still every detected specimen is shot and both subspecies are about to be exterminated or have already disappeared (Kumerloeve 1975, Mendelssohn 1983)."

Dr. David L. Harrison (1981) wrote in his book "Mammals of the Arabian Gulf" about the Wolf : "Although the Arabian wolf (*Canis lupus arabs*) is considerably smaller than its northern Eurasian relatives, it is nevertheless strikingly larger than the Jackal, with a total length of about 1140 mm. The general build is like an Alsatian dog, with rather long legs, a short, bushy tail and large ears. The coat is rather short and coarse, variably greyish or yellowish brown on the flanks, with a blackish crest along the spine. The tip of the tail is also black, while the cheeks and underside are usually white. Wolves from the more northerly parts of the peninsula (*Canis lupus pallipes*) are larger and have thicker, more luxuriant coats."

The desert wolves of Arabia usually hunt singly or in pairs, and many tales are told by the Bedouin of their cunning in snatching sheep from the flocks. Considering the long-standing enmity of the species with man it is surprising that young wolves can be readily tamed. The species seems to be dependent on water and is therefore not found in the hearts of the deserts. It has occurred, albeit in scanty numbers, throughout the Gulf region from Dibbah, Buraimi and Jebel Hafit in the south to Hofuf, Jabrin and the vicinity of Kuwait in the north

(Harrison 1981).
Measurements: Total length 1140 mm.; Tail 320 mm.; Hind foot 184-197 mm.; Ear 80-92 mm.; Greatest length of skull 184.5-220 mm. (Harrison 1981).
Ellerman and Morrison-Scott (1951) do not state which wolf subspecies occurs in Palestine but, because they include northern Arabia in the distribution area of *Canis lupus pallipes* Sykes 1831, it may be concluded that this subspecies also occurs in Palestine (Mendelssohn 1982). Wolves in Palestine display a wide range of size and colour differences. Tristram (1884) considered them to be larger and stronger than European specimens.
Palestinian wolves are larger and darker in areas of higher rainfall, and smaller and lighter-coloured in arid areas.
Size difference of specimens of the same sex is apparent. For example the condylobasal length (CBL) of the skull for a male near Haifa was 218.4 mm., and for a male from the Naqab, the CBL was 185.3 mm. The distance between collection localities was 250 kilometer (Mendelssohn 1982).
Precipitation in Palestine is highest in the north and west, and decreases toward the south and east. The lower Jordan Valley, the Dead Sea depression, The Naqab Desert and the Wadi Araba are deserts with less than 150 mm. annual rainfall.
The largest wolves are all from areas with more than 400 mm. annual rainfall and a Mediterranean climate and vegetation, whereas the smaller wolves inhabit the more arid areas with less than 400 mm. rain (Mendelssohn 1982).
For Mediterranean *Canis lupus pallipes* wolves, the average CBL for males was 214.5 mm., and for females 203.8 mm. For the Desert *Canis lupus pallipes* wolves, the average CBL for males was 205.1 mm., and for females 193.8 mm. While the Palestinian southern subspecies *Canis lupus arabs* Pocock 1934, has an average CBL for males 192.9 mm., and for females 181.1 mm. (Mendelssohn I982).
In the desert areas (less than 400 mm. rain), two sizes of wolves occur. Most desert wolves are quite uniform in size, but in the most southern area with less than 50 mm. rain, and in southern Sinai, much smaller wolves occur. They not only have smaller skulls, but also smaller bodies. The males had CBLs of less than 200 mm., and the females had CBLs of less than 190 mm.
Although the larger wolves in Palestine can be divided into two size groups separated by the isohyet of 400 mm., they can all be considered *Canis lupus Pallipes*. There is also a considerable difference in the size of the os penis between the local *Canis lupus pallipes* and *Canis lupus arabs*. Whereas the lengths of the os penis of three *Canis lupus pallipes* were 79.7, 81.1 and 81.5 mm., the measurements for two *Canis lupus arabs* were only 68.0 and 69.3 mm.
Wolf size apparently is more influenced by rainfall than by temperature. There is no size difference between wolves from the hot rift valley (mean greater than 23°C) and those from the much cooler Naqab Highlands (mean less than 19°C); rainfall is similar in both areas (Mendelssohn I982).
Nothing is known about the relations between *Canis lupus pallipes* and *Canis lupus*

arabs, that occur together in the southern Wadi Araba in areas with less than 50 mm. rain. Possibly this area was formerly inhabited only by *Canis lupus arabs*, which are probably better adapted to extreme desert conditions. Increasing human development of the area improved the conditions for wolves by providing an easily available source of food at garbage dumps, and by stimulating increase of wildlife near areas of irrigated agriculture. These improved conditions may have enabled the penetration of *Canis lupus pa1lipes* into this area, perhaps competing with *Canis lupus arabs* and supplanting it. If this assumption is correct, *Canis lupus arabs* should disappear from this area in the future. They are now much rarer than *Canis lupus pallipes*. It is not known if the two subspecies interbreed. Neither is information available to indicate whether the two populations share the same habitat, or whether they are spatially or temporally separated (Mendelssohn I982).

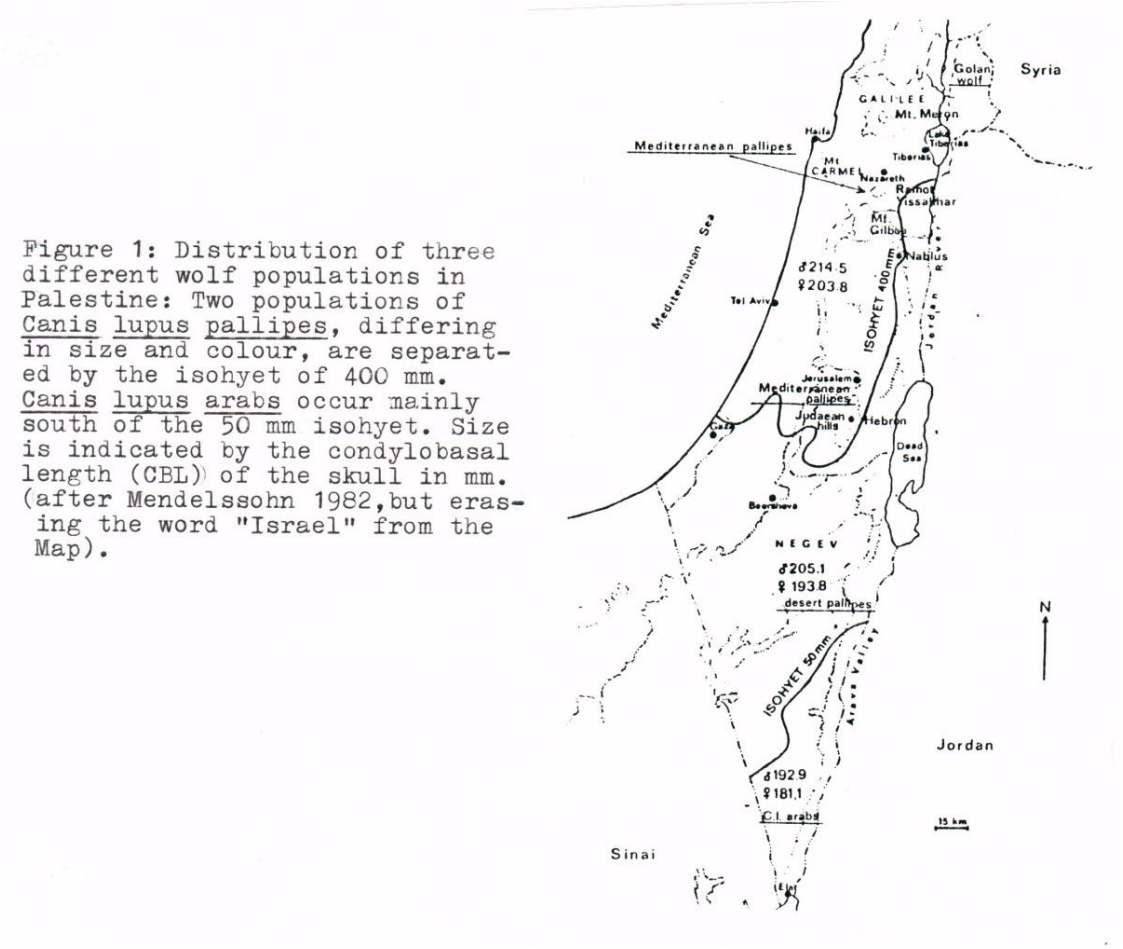


Figure 1: Distribution of three different wolf populations in Palestine: Two populations of Canis lupus pallipes, differing in size and colour, are separated by the isohyet of 400 mm. Canis lupus arabs occur mainly south of the 50 mm isohyet. Size is indicated by the condylobasal length (CBL) of the skull in mm. (after Mendelssohn 1982, but erasing the word "Israel" from the Map).

A similar case is occurring with two hedgehog species in the coastal plain of Palestine, where the European Hedgehog *Erinaceus europaeus*, following agricultural development, is supplanting the Long-eared Hedgehog *Hemiechinus auritus* (Mendelssohn I982).

There still remains the fact that the wolves of the Mediterranean area of Palestine

(greater than 400 mm. rain) are distinctly larger than those of the more arid areas (50-400 mm. rain). The question of whether these two discrete populations should be given separate subspecific status has to remain open until more material from other areas in the Near East can be examined. For the time being, the terms "Mediterranean pallipes" and "Desert pallipes" will be used (Mendelssohn I982).

A very large male from the Syrian Golan, with a CBL of 226.7 mm., and a weight of 32.3 kilogram and a dense, dark winter fur, is certainly quite different from any *Canis lupus pallipes* and looks more like a European wolf.

It is remarkable that the wolves that lived in the Huleh Valley fall well within the range of the Mediterranean pallipes. The Huleh Valley is only a few kilometer distance from the Golan, but about 1,000 meter lower. The amount of rain is about the same in both areas, but the Huleh Valley is much warmer (Mendelssohn I982).

Weights of Mediterranean pallipes wolves: the mean of males 23.6 kilogram; and the mean of Desert pallipes wolves: males 20.1 kg, females 17.0 kg; while the mean weight of *Canis lupus arabs*: males 18.0 kg, a female 12.3 kilogram. It may seem strange that in such a small country as Palestine, only 410 kilometer from north to south, there are three distinct populations of such wide-ranging animals as wolves. There are, however, considerable climatic differences. Perhaps the different populations are well adapted to local climatic conditions. A similar situation is found with the leopard. They formerly occurred in Galilee, and perhaps in other areas in the north, *Panthera pardus tulliana* (now extinct in Palestine), one of the largest of the leopard subspecies. However, in the Jerusalem or Judean Desert and in the Naqab, *Panthera pardus nimr* occurs, one of the smallest subspecies. Perhaps for these two subspecies, the 400 mm. isohyet was also the dividing line. The greatly varying environmental conditions over relatively small distances in Palestine may stimulate the development of differing populations adapted to special local conditions. There is in Palestine four populations of mole-rat *Spalax ehrenbergi* that differ in size, chromosomes and behavior (Mendelssohn I982).

The fur of *Canis lupus pallipes* and *Canis lupus arabs* is very short and thin in summer. The dorsal hair is somewhat longer, even in summer. Perhaps the longer dorsal hair provides some protection from solar radiation in summer if the animals have to be active during hot summer days. The winter coat is longer, but not as long and dense as that of more northern subspecies.

The hair of the summer coat of *Canis lupus pallipes* and *Canis lupus arabs* is about 30 mm. long on the back and about 10 mm. on the sides, but there is much variation. Winter back hairs, particularly from the Mediterranean area, are 45-65 mm. long, those of the saddle 70-100 mm., and those of the sides 20-30 mm. long. Whereas the summer coat has no wool, or only a little between the longer dorsal hairs, the winter coat has a dense wool layer (Mendelssohn I982).

A characteristic feature of many wolves in Palestine is that the pads of the third

and fourth toes are connected from behind. This connection is conspicuous mainly on the forefeet, but if the pads of the forefeet are connected, those of the hind feet are generally connected too. Under favorable conditions, this connection also shows in the tracks and verifies that the track is from a wolf (Mendelssohn I982).

By 1935 there were no wolves in the densely settled areas of the coastal plain and the areas between Hebron (Al Khalil) and Nablus. Between 1950 and 1970, they disappeared from most of northern Palestine and from the areas west of Jerusalem (Al Quds), and in 1980 they were rare in the areas north of Beer Al Sabea (Beer Sheva). They still occur in about half of Palestine in about 70% of the area they inhabited before 1950 (Mendelssohn I982). The total number of wolves in Palestine may be 110-150.

According to many occasional observations, Palestinian wolves are opportunistic feeders, preying on smaller wildlife, rarely on wild ungulates, occasionally killing domestic animals, but often scavenging on livestock carcasses and at garbage dumps. Garbage dumps are good places to see wolves, especially in the desert, as are the feeding stations run by the "Israeli" Nature Reserves Authority (funded by the World Wildlife Fund) (Mendelssohn I982).

Analysis of 15 wolf stomach contents revealed remnants of the following animals: Jirds (*Meriones* sp. sp.), Hares (*Lepus capensis*) and Chukar Partridges (*Alectoris chukar*). Hares seem to be a common prey, bat many apparently are road-killed hares picked up by wolves. Several wolves that had been killed on roads had undigested pieces of hare in their stomachs.

Gazelles (*Gazella* sp.) are occasionally taken, but there is only one observation of wolves hunting gazelle. In the northern Wadi Araba (Arava), three wolves were seen one morning chasing a male dorcas gazelle (*Gazella dorcas* subsp.) which they caught after a chase of about 1 kilometer. As gazelles are diurnal with poor vision at night, they are easily caught at night by wolves.

In the Jerusalem (Judean) Desert and in the Naqab (Negev), wolves inhabit areas in which ibex (*Capra ibex nubiana*) occur, but no cases of predation on ibex are known. Wild pigs (*Sus scrofa*) are very common in northern Palestine and in the Golan, but no cases of preying on pigs have been observed so far (Mendelssohn I982).

Wolf predation on livestock occurs mainly with the larger Mediterranean wolves, but is not common. They prey on sheep and beef cattle calves. Zebu calves are very rarely killed by wolves.

Wolves of the Mediterranean area also feed on small animals, as shown by stomach contents and scats. A female that had been conditioned to people because she pair-bonded with a domestic dog, was observed catching and eating a hare, and she was often seen catching and eating voles (*Microtus guentheri*) weighing 25-40 g.

The desert pallipes do not prey on large livestock. Predation on sheep in this area is rare, but the Bedouin consider wolves as predators of their black goats which

are smaller than sheep, and in the southern Naqab and Sinai, weigh only 12-25 kilogram. Hairs of the black Bedouin goats have been found in wolf scats collected in this area, but it is unknown whether they were from kills or carrion (Mendelssohn I982).

The desert pallipes tend to approach settlements and people more than do the Mediterranean wolves. In a desert kibbutz (communal agricultural Israeli settlement), wolves entered the cowsheds at night and moved among cattle and calves without molesting even the youngest calves. However, they entered a hen-house and killed chickens. In another desert kibbutz, the wolves visited the area of the hen-houses at night and caught escaped chickens, but entered a hen-house and killed 10 hens when a door was left open. Their main food at both places, however, was chicken carcasses and offal that they scavenged from the garbage dump. These wolves react eagerly to the cheeping of chicks and were attracted from about one kilometer by these cheeps, both live and tape-recorded. Altogether, Palestinian wolves do not suffer from lack of food, as almost all specimens that could be examined were in prime physical condition (Mendelssohn I982).

Wolves and hyenas (*Hyaena hyaena syriaca*) meet quite often at garbage dumps, carcasses and feeding stations. Wolves generally make way for the hyenas which are larger, adults weighing 25-40 kilogram. In one observation, however, a group of wolves drove a hyena from a carcass.

Wolves feeding on carcasses during daylight may meet vultures. One pair of wolves was feeding on a carcass at a feeding station in the morning. Eight griffon vultures (*Gyps fulvus fulvus*) from a nearby colony arrived, but did not approach the carcass until the wolves had departed. In another case, a lone wolf fed one morning on a carcass at another feeding station. Seventeen griffon vultures arrived and tried time and again, to approach the carcass, but were chased away each time by the wolf. They too had to wait until the wolf had departed (Mendelssohn I982).

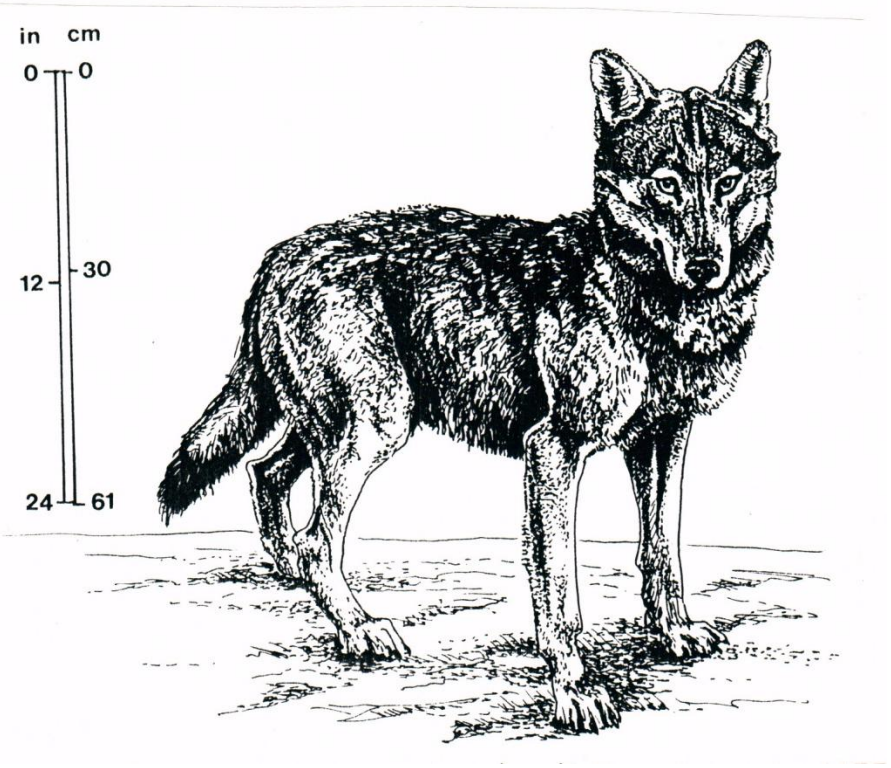
In deserts, where wolves are relatively common, jackals (*Canis aureus syriacus*) occur only in a few localities. It is believed that jackals are more dependent on water since they are found, particularly in the desert, only near human settlements where water is available. It may, however, also be the easy availability of food that attracts jackals to settlements. Desert wolves, on the other hand, have been observed up to 50 kilometer from the nearest water. Possibly they drink only infrequently and husband their body water efficiently. In the few Mediterranean areas where both species occur, wolves are rare and probably cannot influence jackal populations. Cases of direct interactions between wolves and jackals have not been observed, but wolves probably dominate (Mendelssohn I982).

Feral dogs have replaced wolves in Palestine where wolves have disappeared. These feral dogs are crossbreeds between pariah dogs, which are no longer pure in Palestine, and imported European breeds, mainly alsatians. They subsist

mainly by scavenging on garbage dumps and killing lambs, sheep and goats. These predations are often ascribed to wolves. They may kill 10, 15 or more animals in one night, mostly by biting them in the throat. Once, three dogs killed 70 kids and goats in one night. Often, feral dogs do not feed on their victims. It is believed that where wolves are decreasing, they may hybridize with domestic dogs (Mendelssohn I982).

Like other information on the life history of wolves in Palestine, knowledge of wolf pack size and composition is based on casual observations. Harrison (1968) stated that the wolves of the arid regions of the Arabian Peninsula hunt singly or, at most, in pairs. Tristram (1866) stated that in Palestine he never saw two wolves together. In fact, almost all depredations on livestock during the last 45 years have been carried out by single wolves, or a pair (Mendelssohn 1982).

Any group size, from single specimens to groups of 12, has been seen by reliable observers, with larger groups being seen only rarely. In late summer, autumn and winter when the grown cubs accompany their parents, family groups of up to a pair of adults and five cubs are quite often seen (Mendelssohn I982).



The Wolf (*Canis lupus pallipes*). (after Roberts, 1977).

Palestinian wolves breed in winter and whelp in spring. According to the dentition of young cubs collected in the Wadi Araba in summer, the cubs are born there from early to mid-April. A female *Canis lupus pallipes* originating from that area and kept at the Wildlife Research Centre of Tel Aviv University (WRCTAU), came into estrus during the second half of January, and whelped

between the end of March and the beginning of April. Because she had been kept isolated for several years at the Tel Aviv Zoo, she began to breed only in 1977 at six years of age. She bore four cubs (all males) in 1977, six cubs (4 males, 2 females) in 1978, and a single male cub in 1979 (Mendelssohn I982).
There is only one observation on the time of reproduction in northern Palestine. A female in the last stages of gravidity was shot on 29 April 1952 at the hill range of Ramot Yissakhar. It may be, therefore, that reproduction in the Mediterranean area takes place somewhat later than in the desert (Mendelssohn I982).
Wolves in Palestine can live more than 8 years. It is reported that sex ratios in wolf populations are unequal. It is possible that the preponderance of males in Palestinian wolves is a real one, but it could also be that the females are more cautious than the males in relation to such mortality factors as road accidents, poisons and traps. The seemingly higher mortality rate of males in Palestine could either reflect a preponderance of males in litters, or greater caution on the part of females (Mendelssohn I982).
The wolves in Palestine are protected by the "Israeli" Wild Animals Protection Law of 1954; but they are poisoned illegally if they prey on live-stock. Wolves are only occasionally shot in Palestine. Al-Hamdu Lillahi Rabi Al-Alameen.

References and Internet Websites:

Ellerman, J. R. and Morrison-Scott, T. C. S. (1951). Checklist of Palaearctic and Indian Mammals 1758 to 1946. Trustees of the Brit. Mus. Pub. London. pp. 810.
Harrison, David L. (1968). The Mammals of Arabia. Volume 2. Ernest Benn Limited, London.
Harrison, David L. (1973). Some comparative features of the skulls of wolves (*Canis lupus* Linn.) and pariah dogs (*Canis familiaris* Linn.) from the Arabian Peninsula and neighboring lands. Bonner Zoologische Beiträge, Herausgeber: Zoologisches Forschungsintitut und Museum Alexander Koenig, Bonn (24): 185 – 191.
Harrison, David L. (1981). Mammals of the Arabian Gulf. George Allen & Unwin, London. pps. 92.
Harrison, D. L. and P. J. J. Bates (1991). The mammals of Arabia. 2nd ed. Harrison Zoological Museum Publication.
Khalaf, Norman-Ali B. (1984). The Long-eared Hedgehog (*Hemiechinus auritus*) in the Arabian Peninsula. Gazelle: The Palestinian Biological Bulletin. ISSN 0178-6288. Second Year, No.5, May 1984. pp.1-18. (In Arabic).
Khalaf, Norman Ali B. (1987). The Sinai Leopard (*Panthera pardus jarvisi*) in Palestine. Gazelle: The Palestinian Biological Bulletin. ISSN 0178-6288. Federal Republic of Germany. Fifth Year. Number 12. February 1987. pp.1-9.
Khalaf-von Jaffa, Norman Ali Bassam (1990). The Wolf (*Canis lupus*) in Palestine. Gazelle: The Palestinian Biological Bulletin. ISSN 0178-6288. Eighth Year, Number 20, December 1990, Jumada Al Thani 1411 AH. pp. 1-11. Rilchingen-Hanweiler and Bonn-Bad Godesberg, Federal Republic of Germany. http://animals-of-palestine.webs.com/the-wolf-in-palestine
Khalaf-von Jaffa, Dr. Norman Ali Bassam (2013). Fauna Palaestina – Part Three. Zoological Studies in Palestine between 2005 – 2012 / Fauna Palaestina - Teil Drei. Zoologische Studien in Palästina zwischen 2005 – 2012. ISBN 978-9950-383-35-7. Erste

Auflage / First Edition : July 2013, Shaaban 1434 H. 364 pages (English Part 350 Pages and the Arabic Part 14 Pages). Publisher: Dar Al Jundi Publishing House, Jerusalem, State of Palestine. http://dr-norman-ali-khalaf-books.webs.com/faunapalaestinapart3.htm

Khalaf-Sakerfalke von Jaffa, Prof. Dr. Sc. Norman Ali Bassam Ali Taher (2013). The Two Wolf Subspecies (*Canis lupus arabs* Pocock, 1934) and (*Canis lupus pallipes* Sykes, 1831) in Palestine. Gazelle: The Palestinian Biological Bulletin. ISSN 0178 – 6288. Number 107, November 2013, Muharram 1435 AH. pp. 1-29. Dubai and Sharjah, United Arab Emirates. http://flora-fauna-palestine.webs.com/palestinewolf1.htm

Kumerloeve, H. (1975). Die Säugetiere (Mammalia) der Türkei. Die Säugetiere (Mammalia) Syriens und des Libanon. Veröffentlichungen der Zoologischen Staatssammlung München.18:69-225.

Mendelssohn, H. (1982). Wolves in Israel. In: Harrington, F. H. & Paquet P. C. (Eds.), Wolves of the world. Noyes Publications. New Jersey.

Mendelssohn, H. (1983). Status of the wolf in the Middle East. Acta Zool.Fennica 174: 279-280.

OCR Online. Convert scanned documents to text. http://www.ocronline.com/

Roberts, T. J. (1977). The Mammals of Pakistan. Ernest Benn Limited, London. pps. 361.

Tristram, H. B. (1866). Report on the Mammals of Palestine. P. Z. S. London 1866: 84-93.

Tristram, H. B. (1866). The Land of Israel; a Journal of Travels in Palestine, undertaken with special reference to its physical character. Soc. For promoting Christian Knowledge Pub. London. pps. 649.

Tristram, The Reverend Henry Baker (1884). The survey of western Palestine. The fauna and flora of Palestine. The Committee of the Palestine Exploration Fund, London, 1884.

Vesey Fitzgerald, D. F. (1952) Wild Life in Arabia. Oryx 1: No.5.