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Abstract: After describing the history of mammalogical research in Algeria from antiquity to the colonial period, and the evolution of mammal fauna from the Palaeocene to the Miocene, the book proposes more detailed information for some species. In the 19th century the cheetah populated probably all the territory of the Algerian Sahara. In the 20th century it was recorded regularly in the mountains of Central Sahara, where it is present until today. It also appeared sometimes along the western border of Algeria reaching the Saharan Atlas to the north. Reported sightings of this period are resumed in a map.

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# MAMMALS OF ALGERIA

WROCLAW — WARSZAWA — KRAKÓW  
ZAKŁAD NARODOWY IMIENIA OSSOLIŃSKICH  
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## 2. HISTORY OF MAMMALOGICAL RESEARCH

### FROM ANTIQUITY TO THE COLONIAL PERIOD

The existence, since the 12<sup>th</sup> c.B.C., of Phoenician settlements on the north-western coast of Africa, and the emergence of Carthage since the 9<sup>th</sup> c.B.C., were the reasons why this region, and thus its animal world, were by no means unknown to ancient scholars. In the 5<sup>th</sup> c.B.C., the Greek scholar HERODOTUS enumerated the animals living on the North African coast: elephants, lions, bears, horned donkeys. The same author mentioned other animals living in the hinterland: small foxes, jackals, hyenas, panthers, antelopes, wild sheep, porcupines as well as three kinds of rats, in which he included hedgehogs. However, according to him, deer and wild boar were not present in Africa.

HERODOTUS' description was subject to numerous commentaries by modern researchers. Particular attention was paid to the meaning of "zegeries", mentioned by the Greek author as a kind of rat. This was supposed to be a reference to gundis (GSELL 1913), hyraxes (JUDAS 1865), rabbits (JOLEAUD 1920), or sand rats (CAUVET 1923). It is interesting to note that HERODOTUS, together with later Roman authors, deny the presence of deer and wild boar in Africa. This gave ground to assumptions that these animals were not introduced there until much later, though, on the other hand, palaeontological evidence would point to their existence in this region since the Pleistocene into the Holocene (Neolithic). The erroneous opinion of the existence of the bear in historic Africa (supported, it is true, by palaeontological evidence from earlier periods), was maintained until the second half of the nineteenth century.

The developing Roman empire soon came into contact with Carthage, which had extended its domination over the whole coast of north-western Africa. The resulting Punic Wars saw an important role for the elephants used by the army of Carthage. On the capture of Carthage in 146 B.C., North Africa became a province of Rome, which included the territory of modern Algeria, bordering on the northern edges of the Sahara. Its importance lay in being the source of wild beasts for the famous circus games, so popular in Rome. For instance, 3,500 animals, most of them of African provenance, were killed on 26 consecutive holidays at the time of Julius CAESAR's rule (SEURAT 1930). It is not surprising, therefore, that a considerable body of information on North African mammals can be found in the works by Roman scholars. STRABON (c. 65 B.C. — 20 A.D.) mentions the presence of elephants, gazelles, lions, panthers, genets, and monkeys in this region. PLINY the ELDER (23 to 79 A.D.) notes that the African elephant is smaller than its Asiatic kin, and that lions and panthers are numerous here. CLAUDIUS AELIANUS (3<sup>rd</sup> century) knew about the existence of gazelles, Barbary sheep (in the mountains of ancient Libya), and caracals. This author also denies the presence of deer and wild boar in this land. SOLIN (3<sup>rd</sup> century) confirms the existence of elephants in Africa — this would suggest their survival there until that time.

Because of its role in the military history of the Antiquity the elephant was of particular interest to ancient authors as well as to their modern commentators (FADHERBE 1867, JOLEAUD 1914, 1931c, DERANYAGALA 1953). As early as the 3<sup>rd</sup> century B.C., elephants were included in the army of Carthage (e.g. at the battle of Zama, 202 B.C.). JUBA the 1<sup>st</sup>, king of Barbary, used them against Julius CAESAR in the battle of Thapsus, 46 B.C. His son and successor, JUBA the 2<sup>nd</sup> left a description of capturing and taming elephants. This constitutes the final evidence for the theory that the elephants used by Carthaginians and kings of Barbary were of local origin, contrary to earlier supposition of their Asiatic provenance.

Intensive hunts, already begun in Antiquity, must have contributed to the decrease in number of North-African large mammals. The elephant has disappeared altogether, a result of its being the object of hunting for games, for ivory, even for its trunk — its gristle was considered a delicacy at that time — as well as for military needs.

Further information on the fauna of Roman North Africa comes from mosaics found in the remains of Roman cities in this region (KÁDÁR 1978). However, vivid cultural contacts within the Roman empire resulted in the fact that local species were represented together with some foreign ones, e.g. bears.

The long period following the fall of the Roman empire, the time of consecutive Vandal (5<sup>th</sup>—6<sup>th</sup> c.) and Byzantine rules, ending with the Arab invasion in the 7<sup>th</sup> c., became a period of decline in both economy and learning in North Africa. The same remains to a large extent true of the next period, that of Arab rule, when a short time of active development of science in the first centuries of Arab splendor in the Near East was followed by another period of decline of learning, itself limited to theology and law. The Maghreb, i.e. the countries of North-West Africa, constantly harassed by wars between rival dynasties, did not develop any significant intellectual centers. At the same time, it was isolated from European science, itself in a period of stagnation.

However, existing commercial relations permitted the export of animals from North Africa to menageries organised at that time in Europe. The royal menagerie of France was receiving lions, camels, jackals, panthers, and porcupines since the 14<sup>th</sup> century. As late as the 18<sup>th</sup> century, the Versailles menagerie received a number of panthers as a gift from the dey of Algiers; when the mob destroyed it (during the French Revolution) in 1792, a lion and several antelopes from North Africa were saved and later transferred to the Paris national museum of natural history, founded in 1793 (SEURAT 1930).

In the 16<sup>th</sup> c., a Moor from Granada known in Europe as Leon Africanus, brought up in Fez, Morocco, later captured and baptised in Italy, published a description of Africa, where he mentioned lions, panthers, monkeys, and camels (AFRICAIN 1956).

From the sixteenth century onwards, Algeria became a part of the Ottoman empire, maintaining, to a large extent, its independence from the central authorities in Stambul. At that time, piracy was one of the main occupations of the local population, which made relations with European countries constantly tense. In spite of that, contacts between Europe and North Africa began to increase. Thomas SHAW, the chaplain of the English trading-post in Algiers left a description of the land, a result of his twelve-year stay there (1738). He noted 27 species of mammals of the region, using

distorted local names, often difficult to identify. Also, among many species undoubtedly present in Africa, other animals were mentioned erroneously, e.g. the fallow deer, the bear, or the mole. Erik BRANDER, the Swedish consul in Algiers between 1753 and 1766, subsequently raised to the ranks of nobility under the name of SKJÖLDEBRAND, made a number of zoological observations and gathered specimens, some of which passed later to Karl LINNÉ. BRANDER was the first to observe the fennec; his drawing of this animal later became the basis for a description of the species by E. ZIMMERMAN in 1780. Jean-André PEYSSONNEL (1694—1758), sent by the king of France to Barbary (as the lands of Maghreb were then called) for research in natural history in 1724, wrote about the numerous lions, tigers, bears, monkeys, as well as deer and wild boars of the region (PEYSSONNEL 1838).

Despite such rather accidental information North Africa, including Algeria, remained a land virtually unknown to European zoology until the beginning of the 19<sup>th</sup> c.

### THE COLONIAL PERIOD

On 14<sup>th</sup> June, 1830, French troops landed near Algiers, beginning in this way a period of invasion and occupation, resulting eventually in the colonisation of Algeria. French rule was initially limited to a small number of footholds on the coast, gradually spreading to encompass, by the mid-19<sup>th</sup> century, the whole of northern Algeria. The conquest of the Sahara went on; the whole area of today's Algeria was brought into submission only in the first years of the 20<sup>th</sup> c. It should be remembered that data on the animal world of the "far South of Algeria" in 19<sup>th</sup> century concern in fact the northern edges of the Sahara, as opposed to the South of present-day Algeria.

The interest in natural sciences, so vivid in the first half of the 19<sup>th</sup> century, was the reason why a number of French army officers, especially engineers and physicians, began to gather and collect specimens for research. These pioneer studies were, for the first ten years, limited to the coast. The activities of Claude Antoine ROZET (1798—1858) were of greatest import for the study of mammals in those first years of French occupation of Algeria. ROZET, an army engineer and a geographer, left a description of his 1830—1833 stay in Oran, of limited value, however, in the domain of zoology (he mentions the presence of wolves and tigers, as well as that of two species of monkeys), his collection of zoological specimens, on the other hand, was of more importance. The description of *Erinaceus algirus* and of *Elephantulus rozeti* was made on the basis of his specimens.

The gradual conquest of Algeria permitted the study of the coastal region by the first scientists. Maurice WAGNER (1813—1887), a German naturalist, visited Algeria between 1836—1838; the report of his journey enumerates 22 species of mammals (WAGNER 1841).

In 1839, on the initiative of Bory de SAINT-VINCENT, a committee for scientific research in Algeria (Commission d'exploration scientifique de l'Algérie) came into existence under the auspices of the Academy of Sciences in Paris. This brought about

an intensification of research. The study of birds and mammals was the charge of LEVAILLANT, who however, soon resigned, and was succeeded by another officer, Victor LOCHE (1806—1863). LOCHE took part in numerous military expeditions into the Sahara, one of them reaching Ouargla. Some minor publications were followed by the work "Histoire naturelle des mammifères" (1867), published after his death. It was based on its author's collection, which was later included in the first museum of natural history in Algeria, officially opened in 1860 as the "Exposition permanente de produits d'Algérie". Sadly, in 1891 the collection was scattered and its specimens, the basis for LOCHE's description of new species, irretrievably lost.

LOCHE's work is of high standard for its time. The author was an amateur, and though he enjoyed many contacts with eminent French zoologists, encountered great systematic difficulties. He described most of the mammal forms of Algeria as new species, thus overrating their differences from European forms, and ignoring species already known from research in North-East Africa identical with those from Algeria. LOCHE's work contains the description of 85 mammal species, including marine and domestic animals; a significant proportion presented as new species. On the other hand, the author gathered a large body of information on the distribution and behaviour of the studied mammals. The work was published with 5 hand-coloured plates, prepared beforehand by LEVAILLANT and bearing his name. The plates represent selected Algerian mammals with new specific names, and must have been done much earlier and known to LOCHE for some time, for he alludes to them in his text, and quotes the names appearing in them as having been given by LEVAILLANT. This gave rise to many misunderstandings concerning terminology; it was impossible to specify the date of publication of LEVAILLANT's plates. Actually, it may be assumed that the plates, though printed earlier and known to some scholars in Algiers, were not generally accessible until their appearance in LOCHE's work. Thus the date of its publication must be assumed as the date of publication of LEVAILLANT's names and, as they are preceded by LOCHE's description, it is the latter which should have priority.

Independently from the "Commission d'exploration", other researchers worked on mammals in Algeria. Particular attention must be paid to August POMEL (1821—1898). He was deported from France to Algeria for his democratic activities and settled near Oran. In 1856 he published a paper on the mammals of that region, describing some new species. Later, POMEL did pioneer work on the palaeontology of Algerian mammals, though returning to the study of contemporary animals (VILLOT 1957).

From 1847, an increasing number of researchers began to venture into the Sahara bringing to light more information, especially on the larger mammals. Jean Auguste MARGUERITE (1823—1870) led an expedition into Sahara between 1856 and 1857. He is the author of a book on hunting in Algeria; a desert species of cat, *Felis margarita* was named in his honour.

After the period ending with the publication of LOCHE's work the interest in Algerian mammals markedly diminished. Research on this subject was resumed in the eighteen-eighties by Ferdinand LATASTE, who made several journeys to Algeria, collecting mammal specimens from the northern Sahara as well as from the coastal region. The same scientist established contacts with many collectors, who sent him

their own collected specimens. His research resulted in a number of publications containing the description of new species; they were then compiled in the work, "Etude de la faune des Vertébrés de Berbérie (Algérie, Tunisie et Maroc). I. Catalogue provisoire des Mammifères apélagiques sauvages", published in 1885 in Bordeaux. This was followed by a number of detailed studies and, in 1887, by the "Catalogue critique des Mammifères apélagiques de la Tunisie". In spite of its title, the catalogue does include Algerian mammals, introducing some emendations and supplements to the 1885 study.

LATASTE's work constituted a significant step forward as compared with that of LOCHE. It described several species unknown until then (including *Massoutiera mzabi*, *Pachyuromys duprasi* and *Mus spretus*) and others not known to be present in Algeria, and also solved many taxonomic problems by getting rid of unnecessary terminology introduced by LOCHE. The 1885 catalogue contained identification keys and data on the distribution of mammals. Material gathered by LATASTE came on his death into the possession of the British Museum (Natural History) (THOMAS 1919).

In 1905, E. TROUËSSART published his monograph, "Faune des Mammifères de l'Algérie, de la Tunisie et du Maroc". The author had never been to North-West Africa, and his work was but a compilation of earlier results without much new information.

The turn of the century brought about a rise of interest in the fauna of Algeria on the part of British scientists. Between 1884 and 1920, Oldfield THOMAS was pursuing his work on the mammals collected by the expeditions of Edmund LODER, Alfred E. PEASE, Ernst HARTERT and Angus BUCHANAN (e.g. THOMAS 1894b, 1913a, c). His research resulted in descriptions of new species, most of them, however, being just geographical forms of previously known taxa. Several expeditions to Algeria, with the chief interest in its Saharan territories were organized by Baron Walter ROTHSCHILD between 1908 and 1914. Although their main goal was entomological research (study of fleas), they succeeded nevertheless in bringing important data on mammals (e.g. ROTHSCHILD 1913).

A series of publications, most of them under the common title, "Etude de géographie zoologique sur la Berbérie", was being published by Léonce JOLEAUD (1880—1938) between 1913 and 1936. Those studies were devoted either to particular species or to systematical groups of mammals of North-West Africa. As they are chiefly concerned with linguistic, historical, and zoogeographical considerations, lacking original data, their value is limited.

Louis LAVAUDEN's (1881—1935) studies, published between 1925 and 1930, are more original in character. They deal with some species of ungulates and carnivores of Algeria and Tunisia. His book, "Les Vertébrés du Sahara" (1926) is a summary of knowledge of vertebrates of the Sahara at that time.

The period between 1928 and 1936 was a time of particular activity in research on the fauna of Algeria and neighbouring countries by Henri HEIM DE BALSAC (1899—1979). Though chiefly concerned with birds, he took an interest in mammals, especially those of the Sahara, including the Hoggar and Tassili n'Ajers mountain ranges, seldom studied before. This research culminated in the 1936 work "Biogéographie des Mammifères et des Oiseaux de l'Afrique du Nord". It contained a survey of species with a discussion of their systematic position and adaptation to the environment, particularly of the desert species. Remarks on the distribution of

particular species were often generalisations without much evidence in the material available, and the author's main theses on the Afrotropical features of the North African fauna and the lack of adaptive character of some common features in desert animals cannot be accepted. However, the stress laid on the differences between the faunas of the desert regions and that of the non-desert coastal area is a useful feature of this work.

Generally speaking, mammalogical research in Algeria experienced its "golden age" between 1830 and 1885, when the knowledge of the mammal fauna of this region was far more complete than that of the neighbouring countries, less accessible to European scientists. Later on, however, the researchers' interest shifted to other groups of animals within Algeria, and that of European mammalogists to other countries in Africa. It is true of many species that the specimens collected in the 19<sup>th</sup> c. remain the principal research material. The following years did not bring about any programme of mammalogical research, either by institutions or individual researchers. It was only infrequently that new data were gathered, originating either from parasitological studies, or as a result of collections and observations by naturalists of various nationalities travelling through Algeria, or lastly as a consequence of scientific missions to the Sahara, especially its southern parts.

This state of affairs did not change between World War II and the emergence of independent Algeria. The only important event in that period was the beginning of studies in the field post of the Centre de Recherches Sahariennes, initially established at Beni Ounif, and later operating at Beni Abbes. Research on mammals there is mainly the work of Francis PETTER. His numerous publications, completed between 1951 and 1968 and based primarily on his field studies at Beni Abbes, deal with morphology and systematics, especially that of the subfamily Gerbillinae and of hares, as well as their biology and adaptation to the desert environment. Most of those publications have been summed up in his monograph, "Répartition géographique et écologie des Rongeurs désertiques du Sahara occidental à l'Iran oriental" (1961). It discusses the environment, the construction of the burrows, the food, the density of population, the return to the nests and the size of the home range of rodents in the vicinity of Beni Abbes.

A number of scientific institutions distinguished themselves in research on mammals in colonial Algeria. The priority in this domain must be given to the Pasteur Institute of Algiers, operating since 1900 (SERGENT 1964). One of its interests lay in mammal parasites; L. G. SEURAT's study of the parasitic Nematoda was of greatest significance here. Works on parasites often contain information on the distribution of their hosts, e.g. mammals. However, the collected mammal material was not used scientifically and was subsequently lost.

Several scientific societies from Algeria contributed, through the research and publications by their members, to the development of mammalogical studies. Société d'Histoire Naturelle de l'Afrique du Nord, founded in 1909, should be mentioned as that of the greatest impact; its bulletin contains a number of works on mammals. Also, the Société de Géographie et d'Archéologie d'Oran occasionally printed papers on mammals. Local museums, including that of Algiers, Oran and Bougie (now Bejaia) were gathering, though without much regularity, some material on mammals as well.

## THE PERIOD OF INDEPENDENT ALGERIA

On the regaining of independence by Algeria in 1962, the activities of institutions and individual researchers were interrupted. In the first years of the Algerian state, however, the field station at Beni Abbes was still operating in its original form, receiving foreign scientists. For example Martin and Sandra DALY studied the ecology and behaviour of desert rodents, particularly that of *Psammomys obesus* (1975a) and *Meriones libycus* (1975b), and Wilma GEORGE worked on the biology of gundis (1978). The station was later taken over by Algerian authorities without changing its character. Presently, research on the physiology of desert rodents is being pursued there (e.g. Z. AMIRAT, F. KHAMMAR, R. BRUDIEUX 1980).

The activities of scientific societies in Algiers and Oran are being continued. The foundation of university-level schools, other than the universities of Algiers and Oran organised in colonial period, has not yet resulted in research in mammalogy.

A number of foreign lecturers employed at Algerian universities did individual work on mammals. Michel ANCIAUX DE FAVEAUX from Belgium and Jiří GAISLER from Czechoslovakia studied bats; R. LLOZE from France worked on cetaceans and seals, K. DE SMET from Belgium on carnivores and ungulates. Patrick and Janine GOUAT from France were active in the study of gundis, David Milton TAUB from the United States studied *Macaca sylvanus* in Morocco and Algeria.

Nevertheless, the majority of contributions to knowledge of Algerian mammals in the last 20 years are based on earlier study material in European and American museums. These studies revise particular taxa as in the case of Indulis VESMANIS' works on the genus *Crocidura*, W. GENTRY's, Colin P. GROVES' and Jürgen LANGE's studies on the gazelles, C. B. CORBET's and J. HANK's research on *Elephantulus rozeti* as well as studies on rodents by E. L. COCKRUM and H. V. SETZER, H. KAHMAN and G. THOMAS, D. KOCK and David L. HARRISON. I. VESMANIS (1985) recently described a collection of small mammals from Algeria gathered by German travellers.

Algeria does not own any scientific collections of mammals. Small numbers of specimens are exhibited in the regional museums of Oran (KOWALSKI 1979b, LLOZE 1979a), Bejaia and Beni Abbes; while single specimens can be found at the universities of Algiers, Oran and Constantine, and the Institute of Agriculture in El Harrach.

## 3. EVOLUTION OF MAMMAL FAUNA

The following survey includes material concerning the whole of North-West Africa, i.e. the territory of contemporary Morocco, Algeria and Tunisia. Information on evolution of the mammal fauna for the whole Africa has been compiled by MAGLIO and COOKE (1978).

### FROM THE PALAEOCENE TO THE MIOCENE

At the beginning of the Tertiary, in the Palaeocene, the continent of Africa was already similar in its basic outline to its present form. Placentals and Marsupials were already developing there, though knowledge of them is very incomplete. The oldest known African fauna of Eutheria is from the southern part of the Quarzatzate Basin in Morocco (CAPETTA et al. 1978). It includes two species of Palaeoryctidae, representatives of Proviverrinae and Miacidae. As the material excavated is composed of isolated teeth, a closer determination of their systematic status has not been possible.

In Eocene layers of Gour Lazib in the Hammada of Dra, Algeria, a fauna of terrestrial mammals has been found (SUDRE 1975, 1979). It includes *Azibius trecki* (Primates), *Megalohyrax gevisi*, *Titanohyrax mongereaui* and *Microhyrax lavocati* (Hyracoidea), together with *Helioseus insolitus*, the last being of uncertain systematic status. The age of the fauna has been determined as the Early or Middle Eocene.

The Early Eocene locality El Kohol near Brezina, Algeria, yielded a mammal fauna including a representative of the marsupial family Peradectinae, *Garatherium mahboubii* (MAHBOUBI et al. 1983, CROCHET 1984), a member of Hyracoidea, *Seggeurius amourensis* (CROCHET 1986), a creodont *Koholia atlasense* (CROCHET 1988) and a primitive species of Proboscidea, *Numidotherium koholense* (MAHBOUBI et al. 1984a, b, 1986). An Early Eocene fauna has also been found at Chambi in Central Tunisia. It included Marsupialia (*Kasserinotherium tunisiense*), Hyracoidea (cf. *Pachyhyrax*, cf. *Sagatherium*), Macroscelidea (*Chambius kasserinensis*), Insectivora, Chiroptera, Rodentia, and probably Primates (HARTENBERGER, MARTINEZ, BEN SAID 1985, HARTENBERGER 1986, CROCHET 1986) (Table I).

Late Eocene age is attributed to the fauna from Bir el Ater on the southern slope of the Nementscha Mts. in eastern Algeria (COIFFAIT et al. 1984). It contained remains of proboscidians (*Moeritherium* sp.), of hyracoids (*Bunohyrax* sp.) and of Anthracotheriidae. *Biretia piveteaui* belonging to catarrhinian primates, is the oldest representative of this family of monkeys so far discovered (BONIS et al. 1988). The site revealed also the oldest specifically determined rodents from the whole of Africa (JAEGER, DENYS, COIFFAIT 1985). Among them were representatives of the family Phiomyidae (*Protophiomys algeriensis*) and Anomaluridae (*Nementschamys lavocati*).

very rare. On the other hand, recent observations and data from the survey of 1985 suggest that it is still present on the whole area of its distribution in Algeria.

According to KOBELT (1886), a premium was paid for killing hyaenas: in 1881 and 1882 196 individuals were killed.

POIRET (1789) noted that hyaenas from Algeria feed on fruits of the palm *Chamaerops humilis* as well as on animals. LOCHE (1867) wrote that hyaenas shelter in caves during the day and are active by night; they feed on live animals and carrion. They approach settlements where their voices can often be heard. According to ANONYME (1960), a family of hyaenas composed of a female and 4 young sheltered 20 km from Beni Abbes. The female killed and ate 12 asses before two young were killed and one captured for the zoo. The female with the remaining young left the region thereafter.

MARES (1859) observed a den of a hyaena in Laghouat. We found a mummified hyaena in a cave near Ain Ouarka, coprolites and bones of prey in another cave, near Brezina.

Family Felidae  
Genus *Acinonyx* BROOKES, 1828  
*Acinonyx jubatus* (SCHREBER, 1776)

(Map 45)

*Felis guttata* HERM.; POMEL 1856

*Felis jubata* ERXLEBEN; LOCHE 1858 a, 1867, DYBOWSKI 1893

*Cynailurus guttatus* HERMANN; LATASTE 1885 a, 1887 b

*Cynailurus jubatus* ZIM.; REGNIER 1960

**Distribution.** In the 19<sup>th</sup> century the cheetah populated probably all the territory of the Algerian Sahara. LATASTE (1885 a) saw a captive specimen in Biskra in 1880, and a skin at a market in Ghardaia. DYBOWSKI (1893) wrote about its presence in the vicinity of El Golea. JOLEAUD (1927 c) noted that it appeared to the south of Bou Saada, HEIM DE BALSAC (1936) informed that, 30—40 years ago, those animals were regularly brought to El Oued and Ghardaia.

On the other hand, information of POMEL (1856) about a specimen from Sebdo is based on an error. LOCHE (1867) mentions the same animal as killed on the northern border of Sahara by an officer stationed in Sebdo.

In the 20<sup>th</sup> century, the cheetah was recorded regularly in the mountains of Central Sahara, where it is present until today. It also appears sometimes along the western border of Algeria reaching the Saharan Atlas to the north.

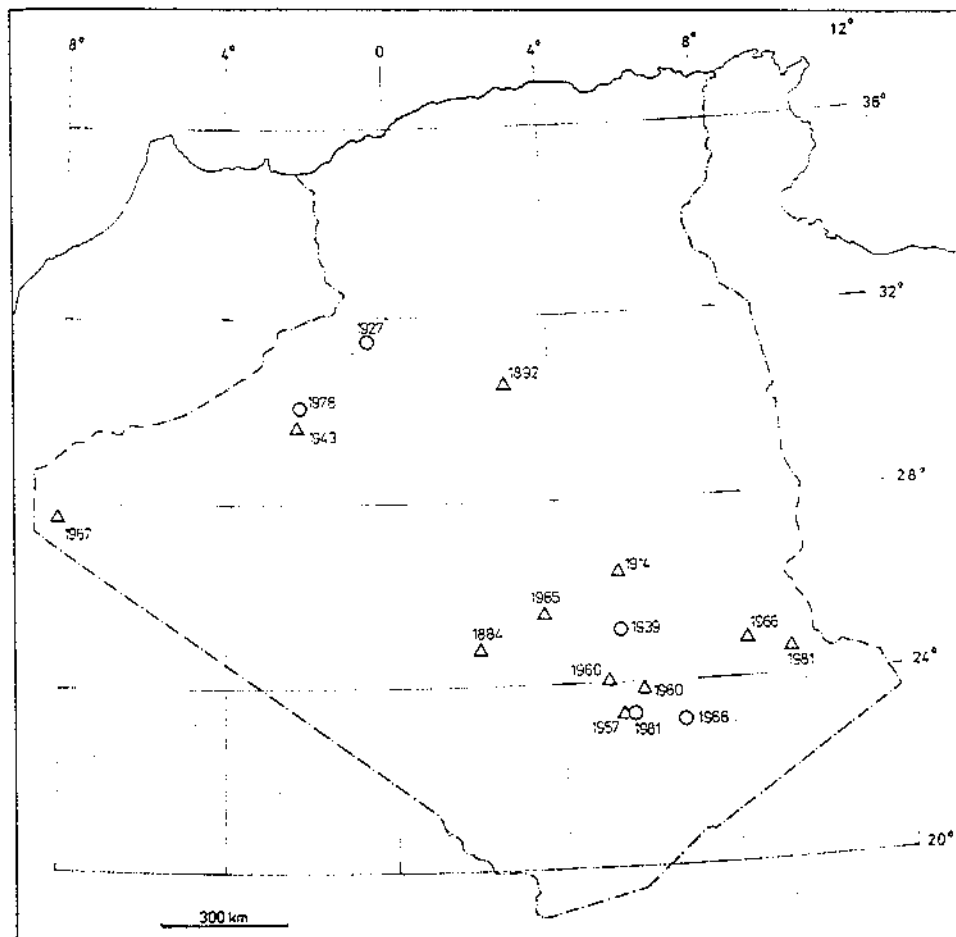
In Mouydir, according to DUPUY (1966 a), the cheetah was seen in its northern part (in Tadjemout) in 1965. MONOD (1931) has never met it in the neighbouring range Adrar Ahnet, but he received information about its presence there in 1884.

In Tefedest, the cheetah was regularly observed in the years 1938—1939 (LHOTE 1946). It lived permanently in the vicinity of Garet el Djenoun, where DEVILLERS (1939) collected a skin. GEYR VON SCHWEPPENBURG (1917) reported observations near

Amguid in 1914. REGNIER (1960) noted that, near Adenek, a cheetah was known for a long time to the local population, and in wadi Telouhat, 15 km E from Ideles, 5 cheetahs inflicted damage among domestic animals in the years 1958—1960.

In the Hoggar, according to REGNIER (1960), the cheetah is quite numerous. 2 were seen in the region of Imadouzen at 2000 m a.s.l. in 1957. 4 others were seen in Tin Tarabine in 1960, one of them was killed. In the region of Atakor, 2 were killed in 1973 (Guide de Sahara 1980). DE SMET informed us that this carnivore was still present in the Hoggar in 1981.

The cheetah is present, according to DUPUY (1966 a), in Tassili n'Ajers: he has seen traces near Zaouatallaz. In 1981, the Management of the Tassili n'Ajers National Park informed us that this carnivore still appears regularly in this region.



Map 45. *Acinonyx jubatus*. Dates of the last record are given

DUPUY (1966 a) also mentioned the presence of the cheetah in the region of Tindouf. SEURAT (1943) wrote about its presence in the Ougarta Mts. and about the appearance of 12 individuals near Figuig, a settlement in Morocco situated on the border with Algeria. HEIM DE BALSAC (1928) gathered information about killing of at least 5 cheetahs in the region between Ain Sefra and Figuig, one of them in wadi Namous. DE SMET (in litt.) informed us that, in 1976, two cheetahs were captured in the vicinity of Beni Abbes and sent to the zoo in Algiers.

**Taxonomic note.** ELLERMAN and MORRISON-SCOTT (1951) list 2 subspecies of *Acinonyx jubatus*: *A. j. jubatus* (SCHREBER, 1776) from sub-Saharan Africa and *A. j. venaticus* GRIFFITH, 1821, described from India, which would also be present in North Africa. SMITHERS (1975) also mentions *A. j. hecki* HILZHEIMER, 1821, described from southern Mauritania. DUPUY (1967 b) lists the cheetah from Algeria under the latter name. It is very doubtful if these subspecies are really different. Also, there is no population of this carnivore living to the north of the Sahara, there is only a penetration, from the south, more or less far into the desert.

**Ecology.** The cheetah is a carnivore of savanna and steppe regions (HEIM DE BALSAC 1936). It is mainly connected with mountain in Algerian Sahara, where it can find more water. According to LOCHE (1867), it mainly kills antelopes and is easy to tame. REGNIER (1960) notes that 5 cheetahs killed more than 30 young camels in the years 1958—1960 in the region of Ideles.

Genus *Felis* LINNAEUS, 1758

*Felis margarita* LOCHE, 1858

(Map 46)

*Felis ocreata marguerittei* LOCHE; TROUËSSART 1905, JOLEAUD 1927 c

*Felis libyca* var. *margarita*; LATASTE 1885 a, 1887 b

*Felis margarita meinertzhageni* POCKOCK, 1938

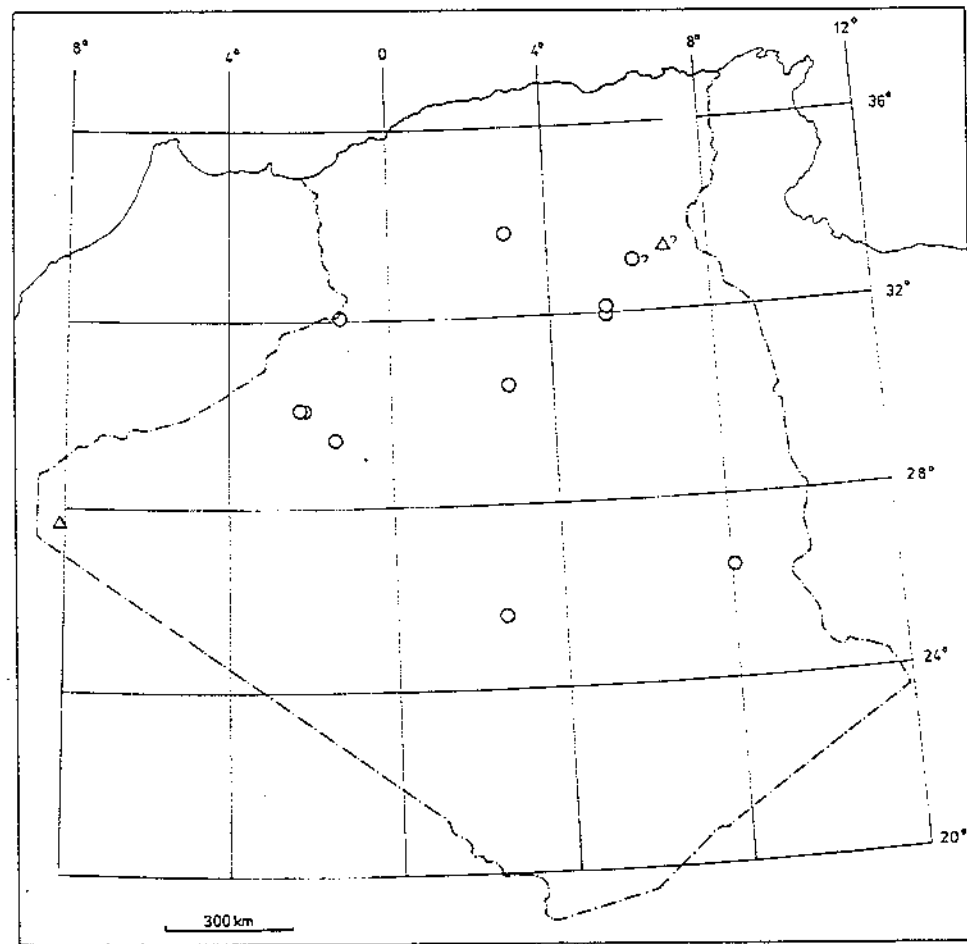
*Felis margarita airensis* POCKOCK, 1938

**Distribution.** It is very probable that the sand cat, widely distributed in the deserts of Africa and Asia, is present in the whole Algerian Sahara. Records about its presence in particular localities are nevertheless scarce and, in these cases in which no specimens were gathered, they may concern also *Felis silvestris*.

The maps of distribution of *F. margarita* in North Africa are to be found in RONNEFELD (1969), SCHAUENBERG (1971) and CORBET (1978). DUPUY (1966 a) compiled a map of distribution in Algeria, which, however, is based only on the supposition that the species populates sandy regions, and not on particular records.

**Records.** 1. Beni Abbes, specimen in the collection of the local museum, skull described (SCHAUENBERG 1974); 2. Beni Ounif, skin of a specimen captured in the vicinity in 1930 (HEIM DE BALSAC 1936, 1949); 3. El Golea, rare in the vicinity, skin gathered (DYBOWSKI 1892), terra typica of *F. m. meinertzhageni* (POCKOCK 1938), figure of skin and skull of the holotype (HALTENORTH 1953), dimensions of 2 specimens, one

holotype of *F. m. meinertzhageni*, another from MNHN (HEMMER, GRUBB, GROVES 1976); 4. El Oued (DE SMET, data from a questionnaire of 1985); 5. Hassi-in-Mheguis, female in the museum in Beni Abbes from "Hassi-in-Mheguis, Saoura", but, on p. 925, origin of this specimen determined as: "Hassi-in-Mheguis, Tassili de l'Ahnet, à 175 km au NE d'Ouallène (VERNER in litt.) CRZA, XII, 1968", photograph of a live specimen (SCHAUENBERG 1974); 6. Hassi Issebilene, damaged skin received in 1925, deposited in the museum of Grenoble (LAVAUDEN 1928); 7. Kerzaz, region of, captured in 1957, lived in the zoo in Beni Abbes (DUPUY 1966 a); 8. Laghouat, skins in MNHN (HEIM DE BALSAC 1936), data concerning a specimen in this museum (SCHAUENBERG 1974), description and dimensions of skull and skin of the same specimen (HEMMER, GRUBB,



Map 46. *Felis margarita*



GROVES 1976), photographs of the skin and skull (HALTENORTH 1953); 9. Mazzer near Beni Abbes, skull in MNHN (HEMMER, GRUBB, GROVES 1976); 10. Ngoussa, terra typica of *F. margarita*, drawing of a specimen (LOCHE 1858 b); 11. Tindouf, vicinity of, present according to "VERNET, in litt., 17.X.1971" (SCHAUENBERG 1974); 12. Between Zelfana and Ouargla, observation of a specimen killed on the road (DE SMET, in litt., 1981); 13. "Zihoua" (= Zaouia) NE of Touggourt, 2 young collected in 1908 for parasitological research (FOLEY 1922).

SCHAUENBERG (1971) reported that on 14.5.1930, Jardin des Plantes in Paris received 2 live specimens from southern Algeria, which soon perished. In a later paper (1974), he did not mention this information. RONNEFELD (1969), when discussing the distribution, list the Hoggar as a part of the area of *F. m. airensis*; this seems to be a mistake.

**Morphology.** Description, dimensions and drawing of the holotype were published by LOCHE (1858 b) and repeated by him in 1867. LAVAUDEN (1928) described some external characters. POCOCK (1938) gave the diagnosis, dimensions and drawings of the holotype of *F. m. meinertzhageni* from El Golea. Descriptions, dimensions and illustrations of specimens from Algeria are in the works by HALTENORTH (1953), SCHAUENBERG (1974) and HEMMER, GRUBB and GROVES (1976).

The holotype of *F. margarita* was in the collection of LOCHE, but later disappeared. One stuffed specimen was in the museum at Beni Abbes. In MNHN we found 2 skins: from Laghouat and from Mazzer near Beni Abbes. The holotype of *F. m. meinertzhageni* is in BM(NH).

**Taxonomic note.** *F. margarita* was described by LOCHE in 1858. TROUESSART (1905) suggested the change of the specific name to "*marguerittei*" because the name was created in honour of general MARGUERITTE; according to the rules of zoological nomenclature this change is not valid. LATASTE (1885 a, 1887 b) expressed the opinion that *F. margarita* is only a form ("varietas") of *F. libyca*; TROUESSART (1905) and JOLEAUD (1927 c) recognize it as a subspecies of *F. ocreata*. LAVAUDEN (1928) and all later zoologists are convinced that it is a separate species.

Until 1938, no specimen besides the holotype was known from Africa. In this year, POCOCK published a description of a specimen from El Golea, which, according to him, represents a new subspecies, *F. m. meinertzhageni*. In the same paper he described another subspecies, *F. m. airensis* from In-Abbangert in Niger.

HALTENORTH (1953) lists 3 subspecies of *F. margarita* from Africa. SCHAUENBERG (1974) and later HEMMER, GRUBB and GROVES (1976), on the basis of the study of all the accessible material, come to the conclusion that there is only one African subspecies of *F. margarita*.

**Ecology.** There are no data on the biology of the sand cat in Algeria. There is a general belief that it is connected with sand deserts; nevertheless, all specimens from Algeria are from the regions devoid of extensive sand dunes. DUPUY (1967 a) observed a captive specimen: it was active by night, efficiently captured rodents and lizards, but was helpless in capturing birds.

*Felis serval* SCHREBER, 1776

(Map 47)

*Felis constantina* FORSTER, 1780

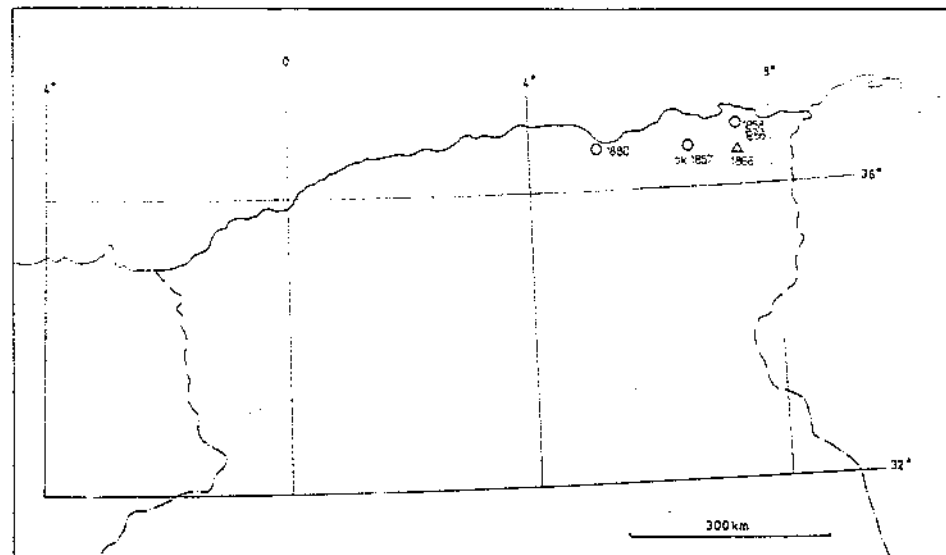
*Felis constantinensis* LINK, 1795 (nomen nudum)

*Felis caracal algericus* J. B. FISCHER, 1829

*Leptailurus serval* (SCHREBER, 1776); HEIM DE BALSAC 1936

**Distribution.** The serval became extinct in Algeria probably about the end of the 19<sup>th</sup> century, latest records documented by specimens being from 1880 (LATASTE 1885 a, 1887 b). LOCHE (1858 a) mentioned a specimen from Fetzara Lake, TACZANOWSKI (1869) wrote about a serval captured in Ain Mokra situated on the shore of this lake and mentioned the presence of the serval near Guelma. LEVAILLANT (in LOCHE 1867) prepared a drawing of the animal, which, according to LOCHE (1867) originated from the region of Constantine and was deposited in MNHN. LOCHE stated that the serval is rare in the province of Algiers, more common in that of Constantine. LATASTE (1885 a) gathered 2 specimens (skins and skulls) from Bejaia in 1880. The local museum in Bejaia still exhibits a stuffed specimen of the serval.

All later records from Algeria concern undocumented observations or only represent suppositions and are all very doubtful. According to SALEZ (1954), this species is probably extinct, but may have survived locally. According to DUPUY (1966 a, 1967 b), latest observations are from 1930 and were made between Annaba and the Tunisian frontier. Numerous authors until recent time mention the presence of the serval in Algeria, but they simply repeat data from the 19<sup>th</sup> century (TROUESSART



Map 47. *Felis serval*. Dates of the last record are given

1905, SEURAT 1924, HEIM DE BALSAC 1936, ALLEN 1939, SMITHERS 1975, 1978, CORBET 1978).

DE SMET (in litt.) has sent a survey to rangers all over Algeria and received information that serval was observed in the region between Tichi and Amizour river and in El Kala, while another was killed in Boghni. None of these records was documented; the survival in Algeria of this species, totally isolated from its sub-Saharan population during more than a hundred years, while no specimen of this conspicuous carnivore have ever reached a zoologist, seems to be totally impossible.

**Morphology.** LOCHE (1867) gave description and dimensions of a specimen from Algeria and remarked its differences from the South African specimens. A drawing prepared by LEVAILLANT (in LOCHE 1867) is the only published illustration.

**Taxonomic note.** In the German edition of the work by BUFFON, FORSTER (1780) created the name *constantina* for a specimen of a cat from Constantine, or rather from the province of Constantine; this specimen was described by BUFFON (who did not give it a scientific name) on the basis of a report of BRUCE, who has seen it. CABRERA (1932) was of the opinion that this name referred to *F. libyca* (= *F. silvestris*). ALLEN (1939) also recognized *constantina* as a name of a subspecies of *F. libyca*. POCOCK (1944), however, after studying the report of BRUCE, the basis for creating this name, came to the conclusion that it was a description of a serval. ELLERMAN and MORRISON-SCOTT (1951) name therefore the North African population of the serval *F. serval constantina* FORSTER, 1780. The name *F. constantinensis* LINK, 1795 and *Felis caracal algericus* J. B. FISCHER, 1829 are based on the description by BUFFON and are as such synonyms of the name given by FORSTER.

It is quite possible that the North African population of the serval, isolated from the sub-Saharan one was different. Some differences are given by LOCHE (1867), but he did not take into account individual variability.

**Ecology.** The species was connected with the northernmost, rather humid part of Algeria. Nothing is known about its biology in its North African range.

*Felis silvestris* SCHREBER, 1777

(Map 48)

*Felis caligata* TEMM.; POMEL 1856

*Felis libycus* OLIVIER; LOCHE 1858 a, 1867

*Felis catus* LINN.; LOCHE 1858 a, 1867

*Felis ocreata* GMELIN; SEURAT 1917, 1919

*Felis ocreata mauritana* CABRERA; LAUDAUDEN 1928

*Felis libyca sarda* LATASTE, 1885; POCOCK 1944

*Felis silvestris libyca* FORSTER, 1780; HALTENORTH 1953

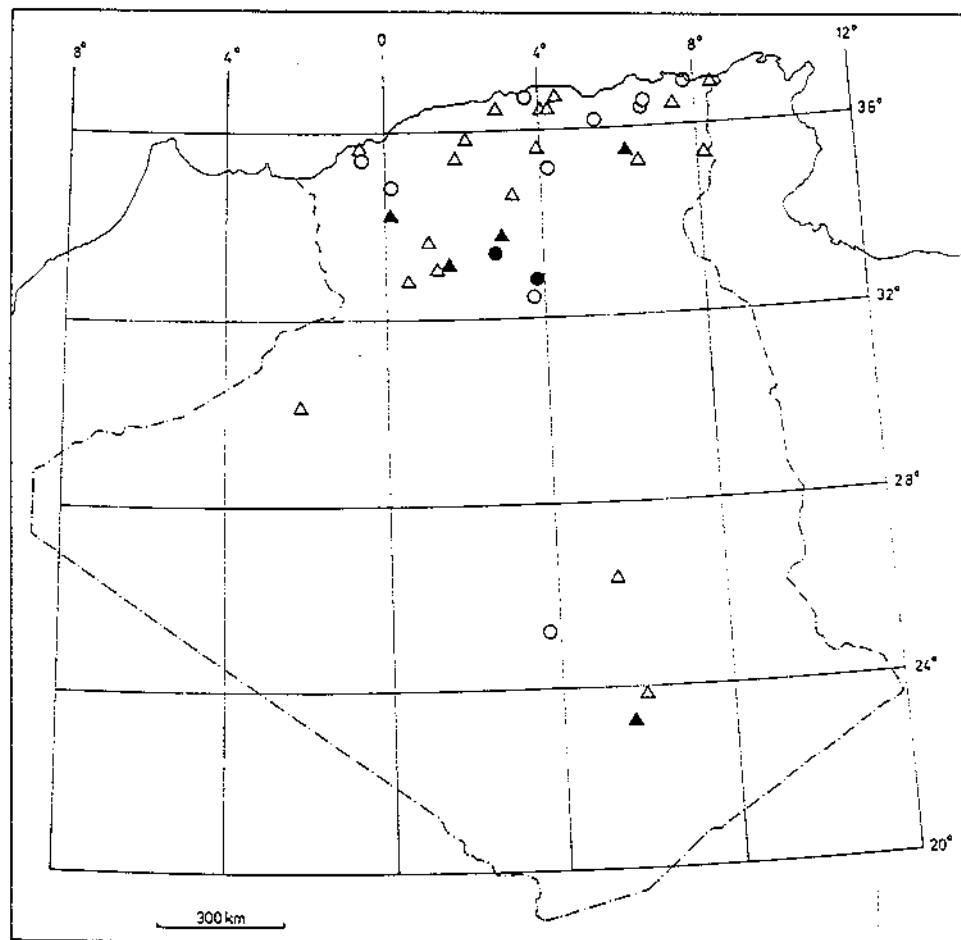
*Felis silvestris sarda* LATASTE, 1885; HALTENORTH 1953

*Felis chaus*; MEINERTZHAGEN 1934, DUPUY 1967 b

**Distribution.** The wild cat inhabits the northern part of Algeria, from the coast to the northern belt of the Sahara. It is also present in the mountains of central Sahara (Hoggar, Tassili n'Ajers). It is probably still present in its whole original range.

Original records. 1. Ain el Orak, killed on the road, fragments of skull collected, 27.6.1980; 2. Arbauats, visual observation of *F. COMINARDI* 8.1.1982; 3. Assekrem, visual observation, 6.2.1983; 4. Batna, information from hunters; 5. Berriane, killed on the road, skin collected, 22.11.1982; 6. N of Kreider, killed on the road, 23.11.1982; 7. S of Laghouat, killed on the road, 18.2.1982.

Other records. DE SMET's data are from a questionnaire of 1985. 1. Ain el Orak (DE SMET); 2. Ait Oubane near Lalla Kedidja (DE SMET); 3. Algiers, specimen (LOCHE 1867), specimen (POCOCK 1951); 4. Amguid, traces (GEYR VON SCHWEPENBURG 1917), sighted (DUPUY 1966 a); 5. Annaba, specimen (LATASTE 1887 b), parasites (SEURAT 1917), description of a skull (POCOCK 1951, HALTENORTH (1953)); 6. Arak, skin bought (MEINERTZHAGEN 1934), data on the skin now preserved in BM(NH) (POCOCK 1951)



Map 48. *Felis silvestris*

(see p. 303); 7. Arbal near Tafaraoui, skull in MM (KOWALSKI 1979 b); 8. Atakor in Hoggar (DE SMET, data from 1973); 9. Azazga (DE SMET); 10. Beni Abbes (SEURAT 1943); 11. Beni Imloul (DE SMET); 12. Beni Ounif, skull in MNHN; 13. Blida (DE SMET); 14. Bou Saada, parasites (SEURAT 1919); 15. Brezina (DE SMET); 16. Constantine, description and illustrations of a specimen (HALTENORTH 1953); 17. El Abiod Sidi Cheikh (DE SMET); 18. El Bayadh (DE SMET); 19. El Kala (DE SMET); 20. Guelma (TACZANOWSKI 1869); 21. Ideles (REGNIER 1960); 22. Khar Mt. near Oran (LATASTE 1885 a); 23. "Khoua el Joussi on Algerian Sahara", specimen (LOCHE 1867) (locality not found); 24. Mergueb (SELLAMI, BELKACEMI, SELLAMI 1989); 25. Msila, forest, near Oran (DE SMET); 26. Mzab (TRISTRAM 1860), specimen (POCOCK 1951, HALTENORTH 1953); 27. Saida (DE SMET), skull in MM (KOWALSKI 1979 b); 28. Senalba Mts. near Djelfa (TRISTRAM 1860), killed (KHIREDDINE 1976); 29. Sersou near Mahdia (DE SMET); 30. Setif, parasites (SEURAT 1917); 31. Sidi Hadj Aneur (DE SMET); 32. Stitten (DE SMET); 33. Tala Gulief (DE SMET); 34. Tebessa (DE SMET); 35. Teniet el Had (DE SMET); 36. Tikjda near Lalla Kedidja (DE SMET); 37. Zighout Youcef, specimen (SCHWANGERT 1943, HALTENORTH 1953).

**Morphology.** The specimen collected near Berriane, a male, has the following dimensions: head and body 520, tail 280, hind foot 120, ear 70.

**Description and dimensions** of a specimen from North Algeria were given by LOCHE (1867). Specimens collected from Algeria were used for the studies concerning the variability of this species in its African or global range (SCHWANGERT 1943, POCOCK 1944, 1951, HALTENORTH 1953).

A drawing of the entire animal was prepared by LEVAILLANT (in LOCHE 1867). HALTENORTH (1953) published photographs of 2 specimens from Constantine and their skulls.

**Specimens.** BM (NH) keeps 2 skulls from Annaba, a specimen from Mzab and 2 from the vicinity of Algiers. According to LAUDAUDEN (1928), in MNHN there are numerous specimens from North Africa, among them from Algeria (e.g. from Beni Ounif). A stuffed specimen and 2 skulls from northern Algeria can be found in MM (KOWALSKI 1979 b). MAK has a specimen from Zighout Youcef and 2 other stuffed with their skulls preserved separately from Constantine (HALTENORTH 1953).

**Taxonomic note.** For a long time, there was an argument about the specific appearance of the wild cats from North Africa. In older publications they were usually called *Felis libyca* or by other names first given to the wild cats of Africa. The existence of specific differences between the African *F. libyca* and the Eurasian *F. silvestris* was accepted by ALLEN (1939), ELLERMAN, MORRISON-SCOTT (1951), SMITHERS (1975), and others. HALTENORTH (1953) presented reasons for the conspecificity of both forms, and later systematists recognize the African wild cats as a subspecies of *F. silvestris*.

Another problem is, whether one or two subspecies of wild cats exist in Algeria. LOCHE (1858 a, 1867) listed them under two specific names, *F. libycus* and *F. catus* (among the synonyms of the latter he mentioned *F. silvestris*). He described his "*F. catus*" but did not mention any particular locality or any specimen. He wrote that this animal lives in forested regions and is rare. After him also TRISTRAM (1860) mentioned two species: *F. libyca* living in Mzab, and *F. catus*, common in Senalba Mts. in the Saharan Atlas.

LATASTE (1885 a) was of the opinion that *F. silvestris* does not belong to the Algerian fauna, but that there are several forms of wild cats in North-West Africa.

LAUDAUDEN (1928), in a paper specially devoted to the wild cats of Algeria recognized 2 forms: one in coastal regions, which he calls *F. ocreata mauritana* CABRERA, 1906, and the other, *F. o. ocreata* GMELIN, 1791 in the Saharan Atlas and neighbouring regions.

POCOCK (1944, 1951) once more studied the problem, basing on scarce specimens from BM (NH). According to him there are 2 subspecies of wild cats in Algeria. One is present in the north, lives in forests, is dark in colour, identical with populations living on Mediterranean islands and should be called *F. libyca sarda* LATASTE, 1885. The second one, in the south, lives on the desert, is pale, and should be called *F. l. libyca* FORSTER, 1780. His opinion is shared by HALTENORTH, who studied more specimens. It seems proved that the populations of the wild cat living in the north of Algeria are different from those from the steppe and semidesert regions more to the south.

The taxonomic position of wild cats living in the region of Hoggar and Tassili n'Ajers is not clear, because there are no specimens (particularly skulls) from that part of Algeria in museums. The skin bought by MEINERTZHAGEN in Arak (see p. 303), preserved in BM (NH) is, according to POCOCK (1944), similar to those of the forest population from the north. POCOCK (1944) and HALTENORTH (1953) suppose that there is a relic population in the mountains of central Sahara. Observations of large wild cats in the Hoggar mentioned by DUPUY (1966 a, 1967 b), as well as our own observation of a rather large and well-marked specimen near Assekrem point to the same conclusion.

**Ecology.** The wild cat is still rather common in Algeria. It inhabits very different environments, from the sea-level to the elevation of more than 2000 m a.s.l. (in Hoggar). According to REGNIER (1960), about 5 are caught annually in Ideles in the Hoggar.

It is mainly nocturnal, but we observed it in Assekrem in full daylight.

SEURAT (1913 b, 1914 a, 1917, 1919) studied internal parasites (Nematoda).

Genus *Lynx* KERR, 1792  
*Lynx caracal* (SCHREBER, 1776)  
(Map 49)

*Felis caracal* SCHREBER, 1776; LOCHE 1858 a, 1867, LATASTE 1885 a  
*Caracal caracal* (SCHREBER, 1776); RONNEFELD 1969  
*Felis caracal* var. *algira* WAGNER, 1841  
*Caracal berberorum* MATSCHIE, 1892

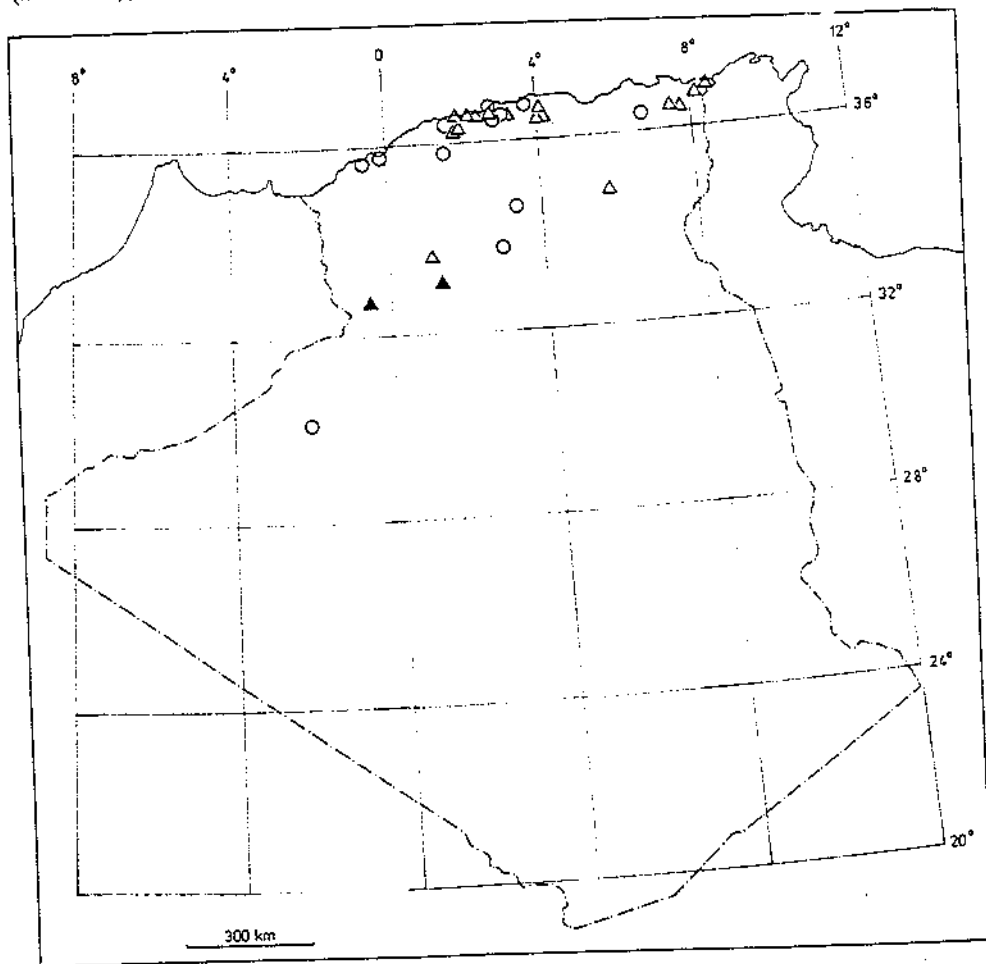
**Distribution.** The caracal inhabits the northern part of Algeria from the coast to the Saharan Atlas and the northernmost belt of the Sahara. In the west, along the Saoura valley, it reaches as far south as Beni Abbes.

DE SMET (in litt. 1985) received information about traces of the caracal seen near guelta Amais in Tassili n'Ajers, and about the presence of this animal in Ideles in the Hoggar region. Zoologists and travellers have never mentioned its presence in these mountains before, and never gathered information about it from the Tuaregs. It is very probable that the records concern the cheetah or the wild cat. On the other hand, the penetration of the caracal into the southern Algeria from its sub-Saharan range is not impossible.

The caracal seems to be still present, in limited number, in the whole original area of its distribution in northern Algeria, as suggested by quite numerous recent observations.

Original record. We were informed by F. COMINARDI that, in the last few years, he observed *L. caracal* near Ain Sefra and Brezina.

Other records. DE SMET's data are from a questionnaire of 1985. 1. Ain Defla (LAURENT 1937 b); 2. Ait Oubane near Lalla Kedidja (DE SMET); 3. Bainem near Algiers (DE SMET); 4. Beni Abbes, specimen (LAVAUDEN 1937 c); 5. Birkhadem near Algiers, specimen (LOCHE 1858 a, 1867); 6. Biskra, observation (LOCHE 1867); 7. Blida, observation (LAVAUDEN 1926 c); 8. Bouchegouf, in 1975 (DE SMET); 9. Bougarra near El Arba (DE SMET); 10. Bou Mehni (DE SMET); 11. Cap Falcon near Oran, killed in 1945 (DE SMET); 12. Cheffia (DE SMET); 13. Chenoua Mt. near Tipasa, in 1979—1980 (DE



Map 49. *Lynx caracal*

SMET); 14. Chrea near Blida (DE SMET); 15. Constantine, drawing of a specimen (LEVAILLANT in LOCHE 1867); 16. Djelfa, specimen (LOCHE 1858 a, 1867); 17. El Abadia near Kherba (DE SMET); 18. El Arba, specimen (LOCHE 1867); 19. El Bayadh (DE SMET); 20. El Kala (DE SMET); 21. Gouraya, region of (LAURENT 1937 b); 22. Guelma (TACZANOWSKI 1869); 23. Halloula, lake, near Tipasa, observation (LOCHE 1867); 24. Kolea, observation (LOCHE 1867); 25. Laghouat, specimen (LATASTE 1885 a, 1887 b); 26. Lalla Kedidja (DE SMET); 27. Macta, killed in 1980 (DE SMET); 28. Meftah near El Arba (DE SMET); 29. Menaceur near Cherchel (DE SMET); 30. Msila, forest, near Oran (DE SMET); 31. Ouarsenis, specimen from 1954 in MNHN (STUART 1984); 32. Sidi Ali bou Nab near Tizi Ouzou (DE SMET); 33. Staoueli, terra typica of *Caracal berberorum*, specimen in NHMB (MATSCHIE 1912); 34. Tacheta, killed in 1979 (DE SMET); 35. Tala Gulief (DE SMET); 36. Tikjda near Lalla Kedidja (DE SMET); 37. Tizi Franco (DE SMET); 38. Zeralda near Staoueli (DE SMET).

Maps of distribution in Africa were published by RONNEFELD (1969) and STUART (1984).

Morphology. WAGNER (1841 a) published a drawing of a specimen from Algeria. LOCHE (1867) submitted a description and dimensions. The latter work also includes a plate presenting the caracal prepared by LEVAILLANT. MATSCHIE (1892) is the author of the description of "*Caracal berberorum*" based on a specimen from the Berlin museum.

In MM there are 2 skulls and a skin of caracal from the Oran province (KOWALSKI 1979 b).

Taxonomic note. The species was first described from South Africa under the name *Felis caracal*. Different zoologists include it into the genus *Felis*, *Lynx*, or a monospecific genus *Caracal*.

In 1841, WAGNER created the name *F. caracal* var. *algira* for a specimen of the caracal from Algeria. In 1892, MATSCHIE named a new species, *Caracal berberorum*, on the basis of a specimen from Constantine. Later, he was able to state that the specimen, preserved in NHMB, originated in fact from Staoueli. In the opinion of CORBET (1978) there is no reason to divide the species *Lynx caracal* into subspecies.

POIRET (1789) mentions the lynx and the caracal from Algeria as two different species; according to him, lynx lives in forests. DE SMET (in litt. 1986) also seems to share this opinion. So far there is, however, no convincing evidence for the existence of two different lynxes in Algeria.

Status and ecology. In the middle of the 19<sup>th</sup> century, the caracal was common in Algeria. WAGNER (1841 a) states that it is numerous in the region of Algiers. According to TRISTRAM (1960), it is very numerous "wherever there is wood". The same opinion is shared by LOCHE (1867).

DUPUY (1966 a) states that since a caracal was killed in Beni Abbes no records of its presence in Algeria have been registered and that the animal is probably extinct. In all probability, this author, who worked in the Sahara, overlooked information from the northern part of the country.

Its distribution suggests that the caracal inhabits forest and thickets. According to LOCHE (1867), this carnivore hunts partridges, hares and other small mammals and birds.

Genus *Panthera* OKEN, 1816  
*Panthera leo* (LINNAEUS, 1758)

*Felis leo* LINNAEUS, 1758

*Felis leo barbarus* FISCHER, 1829

*Felis leo nigra* LOCHE, 1867

**Distribution.** Today extinct in Algeria, where it inhabited, until the 19<sup>th</sup> century, the coastal region, the Tell Atlas, and the Aures. There are no data on its presence further to the south.

At the time of the visit of WAGNER (1841 a) in Algeria, the lion was already exterminated near Algiers, rare near Annaba and in the vicinity of Oran, and numerous in the region of Constantine. TACZANOWSKI (1869) was of the opinion that it was common in the region of Batna; he saw lions and their traces in Bou Arifa. LOCHE (1867) reported its presence from the Atlas, Djurdjura Mts., the province of Constantine, and vicinity of Fetzara Lake; according to him single specimens entered Algeria from Morocco. In the eighties of the 19<sup>th</sup> century the lion was already rare; LATASTE (1885 a) never came across it during his travels through Algeria. In his later work, LATASTE (1887 b) reports that according to official data 202 lions have been killed (none in the Oran province, 29 in Algiers province, 173 in Constantine province) in Algeria between 1873 and 1884. 16 lions were killed in 1880, 6 in 1881, 4 in 1882, all in the province of Constantine. KOBELT (1886) writes that the lion is near extinction. According to the majority of zoologists (LAVAUDEN 1926 a, JOLEAUD 1927 c, SEURAT 1924, 1943) the last male was shot in Souk Ahras in 1891, the last lioness in Batna in 1893. TROUSSERT wrote as late as 1905 that the lion is rare in the province of Oran and more numerous in the province of Constantine, but he is evidently repeating older data. DE SMET (1982) writes that the last lion was killed in the vicinity of Bejaia in 1912, but no convincing evidence for this statement is given.

**Morphology.** BLAINVILLE and DUCROTAY (1839—1864) included a male lion and 2 lionesses from Algeria in their list of studied animals; they published drawings of a skull and a skeleton. GÉRARD (1855) recognized three species of lions in Algeria: a black, fallow and grey. The black lion is slightly smaller, it weighs 275—300 kg, is sedentary and does not migrate. Two others differ only by the colour of the mane. LOCHE (1867) described as a separate variety *Felis leo nigra*, a lion with a black mane, which, according to him, is larger than the fallow one and more stocky in build. According to KOBELT (1886), the Arabs discern three colour varieties of the lions and have particular names for each one of them; the North African lions differ from other populations of this animal by a long mane reaching the belly.

Specimens of the extinct lion from Algeria are probably in many natural history museums. DUVERNOY and LERBOULLET (1840—1846) mentioned a skin of a lioness from Algeria once offered to the king of France. In MM there is a skull of a lion from the Aures Mts. (KOWALSKI 1979 b). ROTHSCHILD (1922) mentioned a skeleton of a young lioness killed in 1890 near Annaba, preserved in the Laboratory of Geology of the University of Algiers.

**Taxonomic note.** The first scientific name for the lion was given by LINNAEUS in 1758. As the place of origin LINNAEUS mentioned generally Africa. J. A. ALLEN (1924) was of the opinion that specimens of lions in Europe at that time originated from North-West Africa and therefore designated this region, and exactly Constantine in Algeria, as terra typica. FISCHER in 1829 named one of the varieties of the lion *Felis leo barbarus*: the basis of his diagnosis is a description by F. CUVIER of a lion captured between Annaba and Constantine. LOCHE (1867) described *Felis leo nigra* as a distinct variety existing in the same area as the typical one.

All these names were given to the specimens from one region and are therefore synonyms. If we recognize the differentiation of the species *Panthera leo* into several subspecies, then the extinct population from North-West Africa belongs to the nominative subspecies, *Panthera leo leo* (LINNAEUS, 1758).

**Ecology.** The lion inhabited in Algeria in the 19<sup>th</sup> century forested regions, which at that time were preserved mainly in the mountains. Its population was diminishing since the beginning of the European colonisation, as it was hunted as a precious game and as a pest. A bonus was paid for each killed individual.

PEYSSONNEL (1724) (cited after SEURAT 1930) wrote that lions from the vicinity of El Kala prey on wild boars and red deer. GÉRARD (1855), who was a famous lion-hunter in Algeria at that time, gathered numerous data on the biology of these animals, based on his own observations and other information. The young are born at the end of January. Males are in 1/3 more numerous than females. Sometimes several males accompany a lioness; fights among them have been observed. There are 1—3 young in a litter, both parents take care of them. At the age when they change milk teeth for permanent ones (around 3 months of age) many young females die. At the age of about 6 months the young leave the place where they were born and begin to nomadise. At the age of 8 months to one year the whelps begin to hunt independently; those aged 2 years are able to attack large animals (horses, camels). Not before the age of 3 years do they leave their parents and form pairs; they attain their definite size at the age of 8 years.

Lions hunt exclusively by night. Only rarely do they attack wild boars, their most common prey are domestic animals; they attack people. When a pair keeps together, the lioness begins to roar: her call is composed of a dozen or so of short calls, of diminishing loudness, separated by intervals of a few seconds. The male and the female roar alternately. After a quarter of an hour the series of roars is repeated. During hot weather lions roar less, during courtship more than usual. Lions live for up to 30 or 40 years. GÉRARD was of the opinion that, although the lion is not numerous (in the province of Constantine there are about 30 individuals), it is a great nuisance; the author advised its extermination. He also described his adventures during lion-hunting in Algeria.

*Panthera pardus* (LINNAEUS, 1758)

(Map 50)

*Felis leopardus*; WAGNER 1841 a

*Felis pardus* L.; LOCHE 1858 a, 1867

*Felis panthera* SCHREBER, 1777

*Felis palearia* CUVIER, 1832

*Felis pardus barbarus* BLAINVILLE, 1843

*Felis pardus antiquorum* GRIFFITH, 1828; TROUSSERT 1905

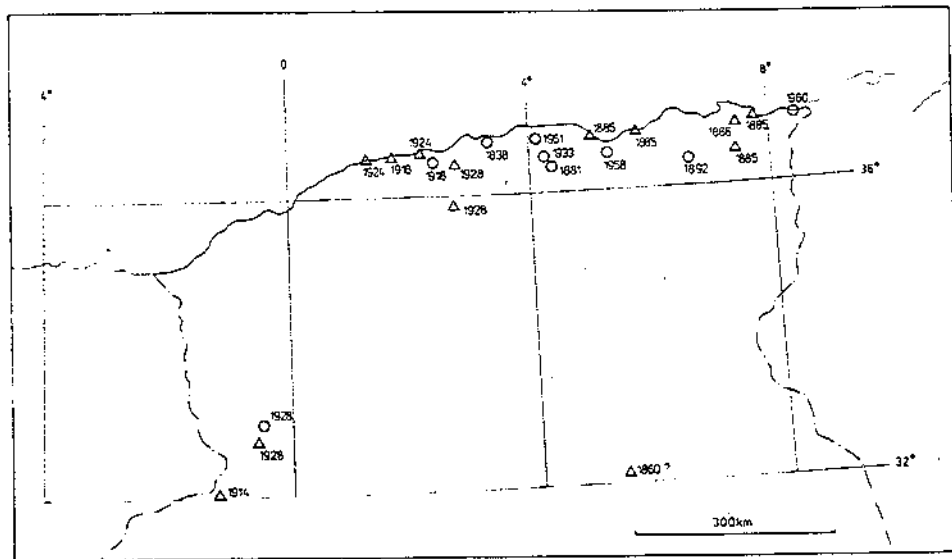
Distribution. Now extinct in Algeria. In the 19<sup>th</sup> century the leopard was common in northern Algeria, mainly in the forested zone along the coast and in the Tell Atlas. To the south the area extended to the Saharan Atlas and probably as far as the northern fringe of the Sahara. The leopard was more numerous in eastern than in western Algeria.

In 1928 HEIM DE BALSAC wrote that the leopard is rare in northern Algeria, where it lives in the coastal zone, exceptionally invading the Tell Atlas; it is rather common in the Saharan Atlas on the border of Algeria and Morocco (e.g. in Aissa Mts., where it is permanently present).

Later, in 1954, SALEZ stated that the leopard is extinct in Algeria, but from time to time there has been information about it in newspapers and one was found dead in 1951 in Tizirt. DUPUY (1966 a) is convinced that several are still living in the forests of Kabylia, but himself has only seen one in Takouch in 1958 (one year earlier another one was killed in this region).

According to DE SMET (1982) the last leopard in the region of El Kala was killed in 1960.

Records. 1. Ain Mokra, in 1866 (TACZANOWSKI 1869); 2. Ain Sefra, in 1927, 6 killed in the region (HEIM DE BALSAC 1936); 3. Aissa Mts. near Mekalis, killed (HEIM DE BALSAC 1928); 4. Annaba (LATASTE 1885 a); 5. Bejaia (LATASTE 1885 a); 6. Boudjellil, killed about 1881 (KOBELT 1886); 7. Cherchel (SEURAT 1924); 8. Chiffa, gorges, near Blida, observed (HEIM DE BALSAC 1928); 9. S of Constantine, specimen (JENTINK 1892);



Map 50. *Panthera pardus*. Dates of the last record are given

10. Damous, extinct before 1918 (LAURENT 1937 b); 11. Djurdjura Mts., 2 stuffed specimens preserved at the National Park (DE SMET 1982); 12. El Kala (LATASTE 1885 a), last killed about 1960 (DE SMET 1982); 13. Guelma (LATASTE 1885 a); 14. Jijel (LATASTE 1885 a); 15. Kefrida near Kerrata, killed in 1957 (DUPUY 1966 a); 16. Ksar el Boughari, observed (HEIM DE BALSAC 1928); 17. Melias Mts. near Beni Ounif, observed (WERNER 1914); 18. Merad, killed in 1918, parasites (SEURAT 1919); 19. Ngoussa, traces (TRISTRAM 1860); 20. Reghaia, data from 1838 (WAGNER 1841 a); 21. Takouch near Kerrata, seen in 1958 (DUPUY 1966 a); 22. Tenes (SEURAT 1924); 23. Tizirt, according to newspapers found dead in 1951 (SALEZ 1954).

Morphology. WAGNER (1841 a) published a drawing of the leopard, LOCHE (1867) contributed a description and dimensions of Algerian specimens. According to SEURAT (1919) the leopard killed in Merad had a total length of 2.5 m and weighed above 80 kg.

Taxonomic note. The species *Panthera pardus* (LINNAEUS, 1758) was described on the basis of a specimen from Egypt. The panthers from Algeria were described as new taxons under the names: *Felis panthera* SCHREBER, 1777, *Felis palearia* CUVIER, 1832 and *Felis pardus barbarus* BLAINVILLE, 1843. TROUSSERT (1905) uses the name *Felis pardus antiquorum* GRIFFITH, 1827.

ALLEN (1939) and ELLERMAN and MORRISON-SCOTT (1951) determine the leopard from North-West Africa as a distinct subspecies, *Panthera pardus panthera* SCHREBER, 1777. CORBET (1978) is of the opinion that, as a result of a high mobility of these carnivores, "there are unlikely to be many discrete races" and lists all leopards from North Africa in the nominative subspecies.

Ecology. According to LATASTE (1887 b) the following numbers of leopards were killed in Algeria: in 1880 — 112, in 1881 — 71, in 1882 — 48. In the period between 1.1.1873 and 24.2.1884, 1214 were killed in the whole of Algeria. 152 of them in the Oran province, 262 in Algiers province, 704 in Constantine province. In later years the number of leopards diminished very quickly.

According to KOBELT (1886) the leopard mainly kills wild boars, rarely domestic dogs, exceptionally goats. GÉRARD (1855) listed porcupines among its prey. In his opinion the leopard is difficult to hunt and dangerous for hunters, but LOCHE (1867) wrote that it is easy to tame.

The leopard was hunted for skin and for the prize paid for its killing by colonial administration. The hunting was responsible for its extermination (HEIM DE BALSAC 1928).

Family Phocidae  
Genus *Monachus* FLEMING, 1822  
*Monachus monachus* (HERMANN, 1779)

(Map 51)

*Phoca monacha* HERMANN; LOCHE 1858 a  
*Phoca monachus* HERMANN; LOCHE 1867  
*Monachus albiventris* BODD.; DIEUZEIDE 1927

successive students; as late as 1978 CORBET cited it among valid subspecific names, as available for now-extinct bear population from North Africa.

It is almost certain that the bear became extinct in North Africa before the Antiquity and that it has surely been absent there since the Modern times. The name *crowtheri* is not valid as it was created either on the basis of an invention or of a specimen of bear of European origin. In this connection it is worth quoting that in the second half of 19<sup>th</sup> century LATASTE (1885 a) has seen a tame bear in Algeria which — as he was informed — originated from Poland.

*Mustela erminea* LINNAEUS, 1758

LOCHE (1867) noted that the stoat has never been found in Algeria. His work, posthumously published, was completed a couple of years earlier, so he could not know that BM(NH) purchased from a Mr PARZUDAKI, in 1856, a collection of allegedly Algerian origin. It contained specimens which were described by GRAY (1865) as a new form of the stoat, "*Mustela erminea* var. 1 *africana*". The name *africana* was preoccupied and therefore THOMAS (1895), on the basis of one of the specimens, originating from "environs d'Alger", created a new subspecific name *Putorius ermineus algericus*. He noted that the specimens are different from other subspecies of *M. erminea* known to him, but remarked that "contrary to the usual rule, the southern (Algerian) form is characterized by a particularly short tail".

This new form was the subject of a lot of discussion and taxonomic rearrangements, particularly by CABRERA (p. 141). Much later, CORBET (in COETZEE 1977, CORBET 1978) demonstrated that the collection purchased in 1856 contained other European species subsequently never found in Africa. The specimen of the stoat was also evidently not of Algerian origin.

The species has never been later recorded from Africa. It is also absent from Mediterranean islands and from the southernmost parts of Europe.

*Mustela putorius* LINNAEUS, 1758

LOCHE (1858 a) mentioned "*Putorius communis*" among the mammals, the presence of which in Algeria was reported to him, but which he himself was unable to find in this country. In his work of 1867, this species was already described among other Algerian mammals and the author stated: "il est peu rependu en Algérie, quelques individus ont été capturés dans les environs d'Orleansville et la dépouille qui figure dans les galeries de l'Exposition, provient d'un individu tué près de Djelfa par le docteur REBOUD".

LATASTE (1885 a) mentioned *Putorius putorius* after LOCHE, but did not find the animal in Algeria himself. Neither was it recorded during subsequent studies, and later authors do not mention it among Algerian mammals.

The ferret (*Mustela putorius furo* LINNAEUS, 1758) is a domestic form of the polecat, bred since the Antiquity. The Roman scholar STRABO writes that ferrets originate from North Africa; this may, however, be only a reference to the domestic stock bred in this

part of the Roman empire. LOCHE (1867) mentioned that it was bred in Algeria as it was in Europe, but was not found wild. His specimen of polecat might have thus been feral ferret.

*Crocota crocota* (ERXLEBEN, 1777)

The range of this species, widespread in sub-Saharan Africa, reaches as far as Senegal in West Africa. LAVAUDEN (1926 c) mentioned that the species appears as far north as Hoggar and Tassili n'Ajers and is well known to the Tuaregs living in these regions. The knowledge of the animal to the Tuaregs, which migrate regularly far to the south, is not itself a proof that it reaches mountain ranges in south Algeria: it has never been recorded inside the frontiers of this country. The presence of stranded individuals in the southernmost regions of Algeria is nevertheless not impossible.

*Felis chaus* GUELLENSTAEDT, 1776

MEINERTZHAGEN (1934), an ornithologist who visited southern Algeria in 1931, mentioned in his report (p. 538) that in Arak he "purchased some jackal and cat skins from the natives". In the same paper, on p. 545, he refers to the presence of *Felis chaus* in the Hoggar. As the note about the skin bought in Arak is the only one concerning the wild cat in his paper, it seems evident that he refers to this specimen when speaking of *Felis chaus*.

In the list of North African mammals in the book by HEIM DE BALSAC (1936, p. 44) "*Felis chaus* subsp." is mentioned as known from Arak, evidently on the basis of MEINERTZHAGEN's note.

The specimen purchased by MEINERTZHAGEN reached BM(NH) and was described by POCOCK in 1944. It was a male skin in rather poor condition and belonged to *Felis libyca* (p. 157). According to POCOCK (1944) it was rather dark and that is probably the reason of the erroneous first determination by MEINERTZHAGEN.

DUPUY (1966 a, 1967 a, b), on the basis of MEINERTZHAGEN's information, cited by HEIM DE BALSAC took it for granted that *F. chaus* is present in Algeria. He mentioned a report by an European who told him about seeing a large cat near Amguid in the region of Tassili n'Ajers. DUPUY was of the opinion that it also was *F. chaus*.

There is so far no evidence of the presence of *Felis chaus* in Algeria. This would seem also very improbable as this species is connected with marshes, and its African area comprises only Egypt (mainly Nile valley and delta).

Artiodactyla

*Cervus dama* LINNAEUS, 1758

No fossil remains of fallow-deer are known from North-West Africa. Ancient scholars, when writing about African animals, usually state that there is no deer there, some of their remarks were however interpreted as concerning fallow-deer. According

## 7. TAXA FIRST DESCRIBED FROM ALGERIA

The list contains species-group names of taxa the type locality of which is situated in Algeria. Only names relating to extant taxa of mammals are included. For each order entries are listed alphabetically according to the generic taxon in which each name was proposed.

The name of the author and the date of publication (followed by a letter if more than one publication appeared in a particular year) permit to find the title of the work in which the name was published in the bibliography. The scientific name is followed by the actual name of the type locality. The name of species to which the taxon belongs in the opinion of the authors of the present work is given with paginal reference to the discussion of its taxonomic position.

## Insectivora

*Crocidura heljanensis* VESMANIS, 1975. T.I. (type locality) Oran. *Crocidura russula* (HERMANN, 1780), see p. 57.

*Erinaceus algirus* LEREBoulLET, 1842 (in: DUVERNOY and LEREBoulLET 1842). T.I. Algeria. *Erinaceus algirus* LEREBoulLET, 1842, see p. 52.

*Erinaceus deserti* LOCHE, 1858 a. T.I. Algeria. *Paraechinus aethiopicus* (EHRENBERG, 1833), see p. 49.

*Pachyura pigmaea* LOCHE, 1867. T.I. Ain el Ibel. Species dubia, probably *Crocidura*, see p. 56.

*Sorex agilis* LOCHE, 1867. T.I. Algeria. Species dubia, probably *Crocidura*, see p. 56.

*Sorex mauritanicus* POMEL, 1856. T.I. Oran Province. Species dubia, probably *Crocidura*, see p. 56.

## Chiroptera

*Asellia tridens diluta* ANDERSEN, 1918. T.I. El Golea. *Asellia tridens* E. GEOFFROY, 1813, see p. 66.

*Pipistrella minuta* LOCHE, 1867. T.I. Messaad. Species dubia, probably *Pipistrellus*, see p. 105.

*Pipistrellus kühlii pallidus* HEIM DE BALSAC, 1936. T.I. Algerian Sahara. *Pipistrellus kühlii* (NATTERER, 1819), see p. 105.

*Pipistrellus kühlii saharae*, HEIM DE BALSAC, 1936 (nomen nudum). T.I. Algerian Sahara. *Pipistrellus kühlii* (NATTERER, 1819), see p. 105.

*Plecotus auritus saharae* LAURENT, 1936. T.I. El Golea. *Otonycteris hemprichi* PETERS, 1859, see p. 100.

*Rhinolophus acrotis schwarzi* HEIM DE BALSAC, 1934 b. T.I. Djanet. *Rhinolophus clivosus* CRETZSCHMAR, 1828, see p. 72.

*Rhinolophus algirus* LOCHE, 1867. T.I. Algeria. Species dubia, see p. 70.

*Rhinolophus (Euryalus) meridionalis* ANDERSEN and MATSCHIE, 1904. T.I. Algeria. *Rhinolophus euryale* BLASIUS, 1853, see p. 73.

## Carnivora

*Canis aureus algirensis* WAGNER, 1841 b. T.I. Algeria. *Canis aureus* LINNAEUS, 1758, see p. 124.

*Canis vulpes* var. *atlantica* WAGNER, 1841 a. T.I. Mitidja plain. *Vulpes vulpes* (LINNAEUS, 1758), see p. 135.

*Caracal berberorum* MATSCHIE, 1892. T.I. Staoueli (see MATSCHIE 1912). *Lynx caracal* (SCHREBER, 1776) see p. 161.

*Felis caracal* var. *algira* WAGNER, 1841 a. T.I. Algeria. *Lynx caracal* (SCHREBER, 1776), see p. 161.

*Felis caracal algiricus* J. B. FISCHER, 1829. T.I. Constantine Province. *Felis serval* SCHREBER, 1776, see p. 156.

*Felis constantina* FORSTER, 1780. T.I. Constantine. *Felis serval* SCHREBER, 1776, see p. 156.

*Felis constantinensis* LINK, 1795 (nomen nudum). T.I. Constantine. *Felis serval* SCHREBER, 1776, see p. 156.

*Felis leo* LINNAEUS, 1758. T.I. Constantine (see J. A. ALLEN 1924). *Panthera leo* (LINNAEUS, 1758), see p. 163.

*Felis leo barbarus* FISCHER, 1829. T.I. Algeria (between Annaba and Constantine). *Panthera leo* (LINNAEUS, 1758), see p. 163.

*Felis leo nigra* LOCHE, 1867. T.I. Algeria. *Panthera leo* (LINNAEUS, 1758), see p. 163.

*Felis margarita* LOCHE, 1858 a. T.I. Ngoussa. *Felis margarita* LOCHE, 1858, see p. 154.

*Felis margarita meinertzhageni* POCOCCO, 1938. T.I. El Golea. *Felis margarita* LOCHE, 1858, see p. 154.

*Felis palearia* CUVIER, 1832. T.I. Algeria. *Panthera pardus* (LINNAEUS, 1758), see p. 165.

*Felis panthera* SCHREBER, 1777. T.I. Algeria. *Panthera pardus* (LINNAEUS, 1758), see p. 165.

*Felis pardus barbarus* BLAINVILLE, 1843. T.I. Algeria. *Panthera pardus* (LINNAEUS, 1758), see p. 165.

*Genetta bonaparti* LOCHE, 1867. T.I. Bouzareah. *Genetta genetta* (LINNAEUS, 1758), see p. 145.

*Hyaena vulgaris barbara* BLAINVILLE, 1844. T.I. Oran. *Hyaena hyaena* (LINNAEUS, 1758), see p. 149.