Biogeographia - vol. XXI - 2000
(Pubblicato il 30 giugno 2000)
Biogeografia dell'Anatolia

Wild cats (Mammalia, Carnivora) of Anatolia. With some observations on the former and present occurrence of leopards in south-eastern Turkey and on the Greek island of Samos

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Key words: mammals of Anatolia, wild felids, *Panthera pardus tulliana* (Valenciennes, 1856), island of Samos.

SUMMARY

Several species of wild felids are still dispersed within the geographical borders of Anatolia. These include *Felis silvestris*, Schreber, 1777, *Felis chaus* Guedenstaedt, 1776, *Caracal caracal* (Schreber, 1776), *Lynx. lynx* (L., 1758), *Panthera pardus* L., 1758, and possibly *Panthera tigris* (L., 1758). Up to the 19th century, also *Panthera leo* (L., 1758), and *Acynonix jubatus* Schreber, 1775, were reported from these territories. The present paper deals with the recent historical diffusion of these species in Turkey. It is based on a review of previous knowledge of Anatolian felids and their history, as well as on the examination of the available materials from museums and private collections. The evidence for the persistence of the Asia Minor leopard, *P. p. tuliana* (Valenciennes, 1856), recently reported from western Turkey and its former occasional occurrence on the island of Samos (Greece) are also discussed.

INTRODUCTION

Among the territories of the Palaearctic Region, Anatolia has been traditionally considered as the westernmost Asiatic range of several species of Eurasian felids, such as lions, tigers and leopards. This biogeographical feature is even mentioned by reports of classical authors, such as Herodotus (5th century B.C.), who described an attack by lions on the camels of King Xerxes' caravan, in the course of the Persian wars (*Histories*, VII, 125). Also Xenophon (5th century B.C.), in his *Kinegeticon* (XI, 1-2), observed that lions, panthers and lynxes were fairly common in Asia Minor, beyond the border between the territories of Bithynia and Misia. The representation of large felids is still a constant within the local framework of traditional arts and crafts (Fig. 1). In fact, the occurrence of cheetahs, lions and tigers is occasionally documented from few areas of the country until very recent historical times, whereas the dispersion of others wild cats, such as *Felis silvestris*, Schreber, 1777, *Felis chaus* Guedenstaedt, 1776, *Caracal caracal*

Fig. 1 - Traditional Eastern Anatolian *kilim* showing, among other animals, the images of tigers and lions (photograph by Marco Masseti).

(Schreber, 1776), *Lynx. lynx* (L., 1758), and possibly *Panthera pardus* (L., 1758), is still reported from several Anatolian areas, although human persecution had largely confined them to isolated areas. The present paper deals with the recent historical diffusion of these species in Anatolia. It is based on a review of previous knowledge of the Turkish wild cats and their history, on contacts with the Forest Department of Antalya, the Samsundag National Park (Izmir), and the Termessos National Park (Antalya), as well as on original data. Museum specimens were examined in the Natural History Museum, London (BMNH), the Termessos National Park Museum, Antalya (TNPM), the Natural History Museum of the Aegean, Samos (NHMA), the Zoological Museum of Tel Aviv University (ZMTU), and some Near-Eastern private collections.

WILD FELIDS OF ANATOLIA

During the 19th century, although the occurrence of the Asiatic cheetah, *Acynonix jubatus venaticus* Griffith, 1821, might have been restricted to Upper Mesopotamia south of Birecik, along the south-eastern border between Turkey and Syria (Dandford, 1879; Danford and Alston, 1880; Kumerloeve, 1967; O'Brien et al., 1986), records of the Asiatic lion, *Panthera leo persica* Meyer, 1826, are reported from the region of Fethiye (Fellows, 1841), the southern bank

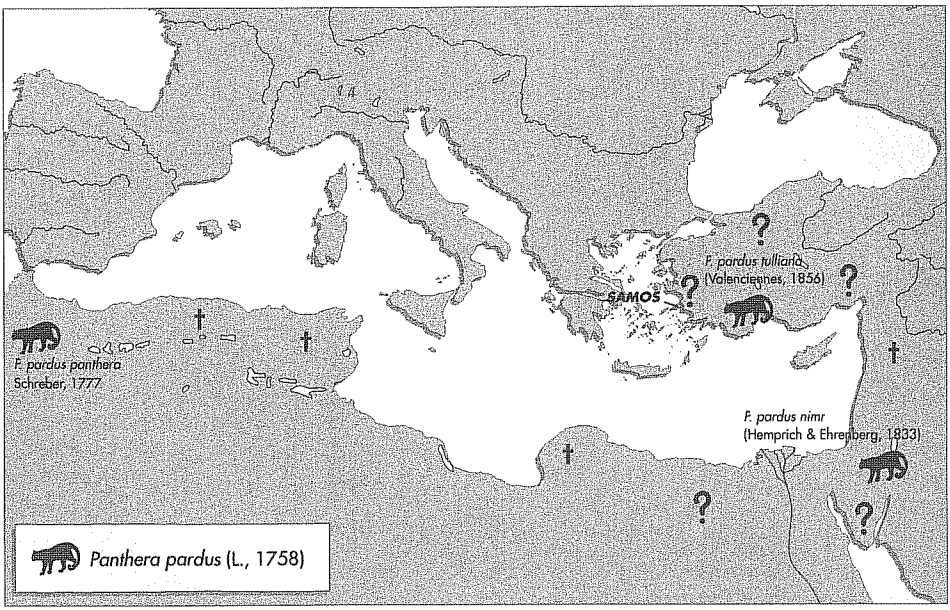

Fig. 2 - Distribution of the leopard, *Panthera pardus* L., 1758 in the Mediterranean region, with the location of the island of Samos (drawing by Sandro Sacchetti).

of the river Esen (Koca Çay, southwestern Anatolia) (Kasparek, 1986; Kasparek and Kasparek, 1990), and the Upper Euphrates valley (Dandford and Alston, 1880; Kinnear, 1920; Kumerloeve, 1967). According to Kasparek (1986), it can be taken as certain that a small population of lions was able to survive in southern Turkey at least until the middle of the 19th century.

Tigers have been reported from the easternmost parts of Anatolia up until the 1970s (Ellerman and Morrison-Scott, 1951; Corbet, 1978; Kock, 1990). In fact, according to Kumerloeve (1956), Baytop (1973 and 1974), and Corbet (1978), isolated populations of the species probably survived until this time in the southern Caucasus and Eastern Asia Minor. The Turkish occurrences of this species are undoubtedly connected with the heartland of the Caspian tiger, *Panthera tigris virgata* (Illiger, 1815), in Transcaucasia (cf. Heptner and Sludskij 1980) and northern Iran (Misonne 1959; Lay 1967), as tigers appeared regularly at Tbilisi until 1922, and in the upper Aras (Araxes) Valley (Mazak 1979). Kock (1990) has recently given a detailed account on the persistence of the species in eastern Turkey: "For Turkey Marchessaux (1978) reports the earliest known observations by the botanist De Tournefort (1717), who encountered tigers at Mt. Ararat in the early 18th century. Mt. Ararat was the westernmost locality known to Blyth (1845, 1863) and Blandford (1876). Sowerby (1938) reports on the appearance of a single tiger near Kars. Baytop (1974) obtained a skin (February 1970) from near Uludere,

Hakkari province, and was informed of the occurrence of tigers in certain other regions of Hakkari and Siirt provinces, especially at Uludere and Sirnak. Kumerloeve (1974) reported on a further tiger skin seen in Uludere in March 1973 originating from E of Hakkari, and on a photograph of a skin from an unknown locality in SE Turkey. It is still not known if tiger reports from eastern Turkey concern local populations, as seems likely for south-eastern Turkey".

According to Hus (1974) and Aymerich (1991), the lynx is still relatively widespread within the Turkish borders, being recorded from several areas in northern, southern and eastern Anatolia. For the former diffusion of this felid see also Kumerloeve (1967), Harrison (1968), and Harrison and Bates (1991). It is probable that specimens from Turkey should be referred to the North Caucasian lynx, *L. lynx dinniki* Satunin, 1915, which differs from *L. l. lynx* (L., 1758), in its slightly larger size (Ognev, 1935; Harrison and Bates, 1991).

Caracals are largerly limited to the Mediterranean coastal area and its hinterland. This felid is still reported from southern Turkey (Kumerloeve, 1967; Harrison, 1968; Hus, 1974; Stuart, 1984; Gasperetti et al., 1985; Harrison and Bates, 1991) and, most specifically, from the area of the Termessos National Park (Antalya), where recent observations attested the predation of this species upon young fallow deer, *Dama dama dama* (L., 1758) (B. Avgan, 1997, *in litteris*). Anatolian specimens are referred to *Caracal caracal schmitzi*, Matschie, 1912, which on average is smaller than *C. c. caracal* (Schreber, 1776) and has a paler pelage colour (Kumerloeve, 1976; Harrison and Bates, 1991). In the course of the present research, one museum specimen (without catalogue number) was examined in the TNPM.

Possibly with a few exceptions including also some areas of western and eastern Anatolia, the present range of the jungle cat seems to be mostly concentrated along the border between Turkey, Syria and Iraq, where the species especially favours the tall reed beds along rivers, but is also found in thickets and dry woodland (Misonne, 1957; Kumerloewe, 1967; Hus, 1974; Harrison, 1968; Heptner and Sludskii, 1980; Harrison and Bates, 1991). Several recent records attest its survival in south-eastern Anatolia, in the Khabour river valley and in the northern Djezireh, where it figures among the carnivores most skilled at avoiding contact with man, although it inhabits areas densely settled by humans. Specimens from south-eastern Anatolia and the Levant have been referred to the Eastern Mediterranean subspecies, *Felis chaus furax* de Winton, 1898, which is distinguished from the form *F. c. nilotica* de Winton, 1898, dispersed along the Nile valley, by its darker colour and smaller teeth (Osborn and Helmy, 1980). In the course of the present research, five stuffed specimens were examined in a private collection at Basamfasal (Deir-ez-Zor, north-eastern Syria).

The wildcat occurs in deciduous woodland, savannah and steppe zones. It is perhaps the most widely distributed felid in Turkey (cf. Kumerloewe, 1967; Hus, 1974; Harrison, 1968; Gasperetti et al., 1985; Harrison and Bates, 1991).

The subspecies reported from Asia Minor and the Caucasus has been referred to *Felis silvestris caucasica* Satunin, 1777 (Corbet, 1978; Heptner and Sludskii, 1980). As in the case in many other areas of the Western Palaearctic region, the distribution and variation of this species in Anatolia has no doubt been considerably influenced by interbreeding with domestic cats.

At the present time, the status of all these Anatolian felids is uncertain, mostly due to the increasing reduction of their habitat and also to persecution by hunters, trappers and farmers. Well managed protected areas need to be established to assure the long term survival of these species.

LEOPARDS IN THE NEAR EAST

The leopard, in about 30 not always clearly defined subpecies, is distributed in tropical and subtropical Africa and in southern Asia, from the Mediterranean north to Anatolia, east to the Caspian Sea and across the southern periphery of Asia to Korea and Java (Gasperetti et al., 1985). In recent historical times, this felid has been extirpated or definitively reduced to tiny scattered populations along the entire circum-Mediterranean region, from the forests of the Maghreb to the deserts of the Near East (Fig. 2). Despite this, conservationists in the area still hope they can help leopards to survive (cf. Jackson, 1994). In the south-western Mediterranean region, scattered populations and/or single specimens of the North-Western African form *P. p. panthera* (Schreber, 1777) are still locally reported from certain areas of Morocco (Rif, Middle and High Atlas) (Aulagnier and Thevenot, 1986; Aulagnier, 1990; A. Camperio Ciani, 1998 *in verbis*), whereas the species seems to have been extinct for some time in almost all the rest of North Africa (Hufnagl, 1972; Osborn and Helmy, 1980; Le Berre, 1990; Kowalski and Rzebik-Kowalska, 1991). In the light of all this, the extant circum-Mediterranean range of the leopard seems to be limited to the Near-East, from where four subspecies have been reported.

The Sinai leopard, *P. p. jarvisi* Pocock, 1932, characterised by relatively dark ground colour and brown spots, is now extinct and very little material of this form exists in collections. According to Mendelssohn (1989), this population should be considered extinct, very likely since the late 1960s. In the course of the present work two museum specimens were examined in the BMNH (cat. nr. 50.1145 and 29.12.23.1).

Along the shores of the Dead Sea, and in the Negev desert, a second subspecies, the Arabian leopard, *P. p. nimr* Hemprich and Ehrenberg, 1833, still exists. With a normally pale coat, this is one of the smallest taxon of leopard, only the Somali subspecies being smaller (Fig. 3). To the south, the range of this subspecies spans to the eastern and southern Arabian peninsula (Harrison, 1968; Gasperetti et al., 1985; Harrison and Bates, 1991). In the southern Levant, the entire population of the Arabian leopard can be estimated at perhaps no more than a few dozen of

specimens. Notwithstanding the protection it enjoys, the Arabian leopard is seriously endangered because of its small number, the restricted area of suitable habitat and possible conflict with humans and development (Mendelssohn, 1989).

A third subspecies, the Persian leopard, *P. p. saxicolor* Pocock, 1927, is reputed to be still dispersed from the mountains of eastern Anatolia to Baluchistan, throughout northern Persia (Ellerman and Morrison-Scott, 1951; Kasparek and Kasparek, 1990). This is a large form with thick pelage and the general colour darker than that of *nimr*. The rosettes are bigger, finer rimmed, more annular, and deep chocolate brown in colour. Three museum specimens were examined during the present work in the BMNH (cat. nr. 36.4.14.3, 52.1253, and 37.11.9.1). According to Harrison and Bates (1991), in eastern Turkey, this form would appear to intergrade with the western Anatolian subspecies, the Asia Minor leopard, *P. p. tulliana* Valeciennes, 1856.

THE ASIA MINOR LEOPARD, *PANTHERA PARDUS TULLIANA* VALENCIENNES, 1856

In his paper on the intraspecific variations of the leopard and the validity of its subspecies, Leyhausen (1991) stated that *P. p. tulliana* was definitely a subspecies, clearly distinct from the geographically adjacent subspecies *P. p. saxicolor*, and *P. p. nimr*. A detailed description of the coloration and fur pattern of *P. p. tulliana* was given by Valenciennes (1856), who described this subspecies on the basis of the examination of one specimen obtained from the type locality of Ninfi, 40 kms. east of Izmir: "L'animal aussi grand que nos plus grandes Panthéres africaines, a le pelage cendré ou gris lègérment roussâtre, peu chargé de taches en larges roses ou cercles mal fermés sur les flancs ; sur les épatules et sur les cuisses elles sont un peu plus petites ; à partir du poignet ou du tarse, les taches deviennent des gros points noirs, que l'on retrouve sur la téte et un peu sur le cou. Les taches en roses arrondies se continuent sur le dos de la queue. Celle-ci, très-caractéristique, est plus longue que le corps entier de l'animal; le poil fin qui la recouvre s'allonge de plus en plus à mesure qu'il s'approche de l'extrémité, de sorte que le dernier tiers de la queue de cette Panthére est plus gros ou plus touffu que la racine: c'est précisément le contraire de ce qui existe chez toutes les autres Panthéres indiennes ou africaines dont nous avons parlé. La distance du bou de nez à sa racine ou à la hauter du nez est aussi un peu plus longue. Cet ensamble de caractères nous parâit suffusant pour bien reconnâitre cette Panthére, très distincte de toutes celles que nous avans signalées plus haut".

As reference material, in the course of this research, one museum specimen was examined in BMNH (cat. nr. 34.5.14.1), collected in 1931 on Mt. Kavajahissar in the mountains S.E. of Kuluk, on the south-western coast of Asia Minor. The colour of the middorsal region of this specimen tended to be decidedly tawny, darker than that of *P. p. nimr*, with the rosettes large in diameter, widely spaced and thin-

rimmed. Its tail tended to be bushy. The peculiarities of *P. p. tulliana* were also outlined by Pocock (1930 and 1935) and Mendelssohn (1990), who observed that the Anatolian *taxon* was one of the largest or even the largest of all the leopard subspecies. Valenciennes (1856), described *P. p. tulliana* in honour of Marcus Tullius Cicero, the Roman administrator of the province of Cilicia who provided the first historical information on the leopards of Asia Minor in 100 BC. Although *P. p. tulliana* was nowhere common, its former range extended from the mountains of western Turkey south to the coastline of the Tauros mountains and south-eastern Anatolia (Danford and Alston, 1880; Tortonese, 1948; Ellerman and Morrison-Scott, 1951; Banoglu, 1958; Harrison, 1968; Kumerloeve, 1967 and 1971; Borovali, 1986; Kasparek and Kasparek, 1990; Harrison and Bates, 1991; Ulrich and Riffel, 1993). In other Anatolian areas too, few records are available for its occurrence, such as the adult male killed near Beypazari (85 km WNW from Ankara), reported by Kumerloeve (1976). To the south, the distribution of this subspecies formerly reached south-western Galilee, the Golan and Mount Hermon, where it is reputed to have become extinct in 1965 (Mendelssohn, 1989). In Syria, the last specimen of the taxon was killed in 1963, in the surroundings of the village of Bab Janné (Sloenfeh), on the Alauwit Mountains at about 20 km from the Turkish border (A. Hamud and S. Zahoueh, *in verbis*). As reported by several authors, such as Pocock (1930), Tortonese (1948), Banoglu (1958), Kumerloewe (1967 and 1971), and Borovali (1986), even during the 20th century, the Anatolian leopard occurred in the coastal mountainous district of south-western and southern Turkey. It has been presumed that this felid vanished from its last western Anatolian strongholds before the late 1970s (cf. Mendelssohn, 1989; Kasparek and Kasparek, 1990; S. Güsar, 1997, *in verbis*). But, there are rumours that something has survived.

In fact, the Asia Minor leopard appears to survive in Turkey in spite certain claims that the taxon is extinct (Ulrich and Riffel, 1993; Jackson, 1994). Riffel (1990) was the first who supposed that *P. p. tulliana* had not disappeared. During several visits to southwestern Anatolia between 1985 and 1992, new information has been obtained by two German biologists, B. Ulrich and M. Riffel. The finding of fresh fecal pellets in spring 1992 indicated the survival of the species in the Temessos National Park (Ulrich and Riffel, 1993). The possibility that these faeces might have belonged to some other species can be ruled out by the strong cat-like odour and the size. Their odour and fresh appearance indicated that they had been deposited not long before. Ulrich and Riffel made a cautious estimate that they were no more than one to two weeks old. Unfortunately, no food marks were visible in the surroundings. According to the same authors, recent reports of leopards are not restricted to the Termessos area but have also come from the south of the Lycian peninsula and the vicinity of the town of Alanya: a leopard was shot near Kas in 1989 and a recent sighting of one specimen in the vicinity of Alanya was reported in 1991. In the light of these data, it seems that a scattered population of the Asia

Minor leopard exists in eastern Lycia and in parts of western Lycia, between Finike, Antalya and Alanya and other areas to the west of Lycia (Ulrich and Riffel, 1993; Jackson, 1994; Ulrich, 1994). According to Kasparek (1986), many parts of southern Turkey have remained very remote until recent times, and even now are difficult of access. Thus, it is hardly surprising that leopards have been able to survive in these areas rather than in other parts of Anatolia. Although, for example, local hunters claim that leopards still may exist in the area the Samsundag National Park, in Eastern Anatolia, recent scientific investigations reveal that the last reliable information dated back to the late sixties (Ulrich and Riffel, 1993), or perhaps the early seventies (Avci, 1978). This protected area is situated on the Dilek peninsula, south of the town of Kusadasi, within sight of the Greek island of Samos. It covers an area of approximately 11,000 ha consisting mainly of Mediterranean scrubland and pine forests (Ulrich and Riffel, 1993). Until a few decades ago, the Samsundag National Park was famous as one of the better-known strongholds of the Asia Minor leopard, so much so as to justify the choice of the felid's image as its logo.

THE SHORES OF SAMOS. CONCLUDING REMARKS

One stuffed adult leopard is today on display in a showcase of the Natural History Museum of the Aegean, located in the village of Mytelenii, on the Greek island of Samos (Fig. 4). This specimen previously belonged to the Town Council (Nomarkia), and has been on exhibit for several decades. It presence is surrounded by myths and legends. On the label of the case, it is classified as *kaplani*, with the explanation that this is Samian terminology indicating a species of panther. In reality, the word comes from the Turkish term *kaplan*, commonly used in Anatolia to indicate the tiger, and erroneously also the leopard (cf. Danford and Alston, 1880). On the basis of available information, it is not possible today to ascertain the real age and the origin of this exhibit. It has been said that the leopard was killed on the island between the years 1870 and 1880, but there is no evidence that this dating is correct. The title of one of the most famous novels of the contemporary Samian writer Alki Zei, "Το καπλανι της βιτρίνας" (="The *kaplani* of the showcase"), was inspired by this exhibit. Speaking of her childhood, the author described this *kaplani*, and since she was born in 1936, we can presume that the leopard is quite old.

Unfortunately, the Samian exhibit is an unnatural shape because it has not been very skilfully stuffed, and it hardly recalls the shape of a living specimen. The measurements that it was possible to take are the total length (235 cm) and that of the tail (90 cm), and prove that this specimen is a large one. But, the skin of felids is extremely elastic so that the original dimensions could have been altered during the taxidermic procedure. The coat colour has deteriorated due to bad conditions of preservation, and also due its prolonged display under the strong Mediterranean daylight. The hair of the skin is worn in patches and not enough remains to show

Fig. 3 - Adult female of Arabian leopard, *Panthera pardus nimr* Hemprich and Ehrenberg, 1833 (photograph by Marco Masseti).

that the general colour was originally tawny or buff on the back and paler on the flanks, where it could have merged into the white of the belly. In fact, the entire surface of the coat now displays a uniform pale and faded colour. The dark-brown rosettes along the flanks and on the back are, however, large (about 3-4 cm diameter each), widely spaced and thinly rimmed, with the centres slightly darker than the ground tint. The coat is fairly short and full, and the tail is decidedly bushy. In terms of the colour and coat pattern, this leopard would appear to belong to subspecies *tulliana*, as described by Valenciennes (1856), Pocock (1930) and Leyhausen (1991), and to be clearly distinct from the eastern Anatolian subspecies (cf. Harrison, 1968; Harrison and Bates, 1991). It has also been said that the animal passed to Samos from the opposite coast of Turkey, swimming across the channel that separates the island from western Anatolia: the leopard might have reached the island either as a consequence of the flooding of the Menderes (Maiandros) river, or of a fire that burned the wooded shore of Asia Minor. In fact, on Samos, there is a deeply-rooted traditional belief referring to swimming leopards from Anatolia in various periods. This belief was also reported by the French botanist Joseph P. de Tournefort, in the account of his travel in the Greek archipelago published in Paris in 1717, who confirmed the truth of this legend, observing that: "Il y passe quelques tigres qui viennent de terre ferme par le Petit Boghas". *Petit Boghas* was the name used at the time to indicate the narrow channel separating Samos from Asia Minor.

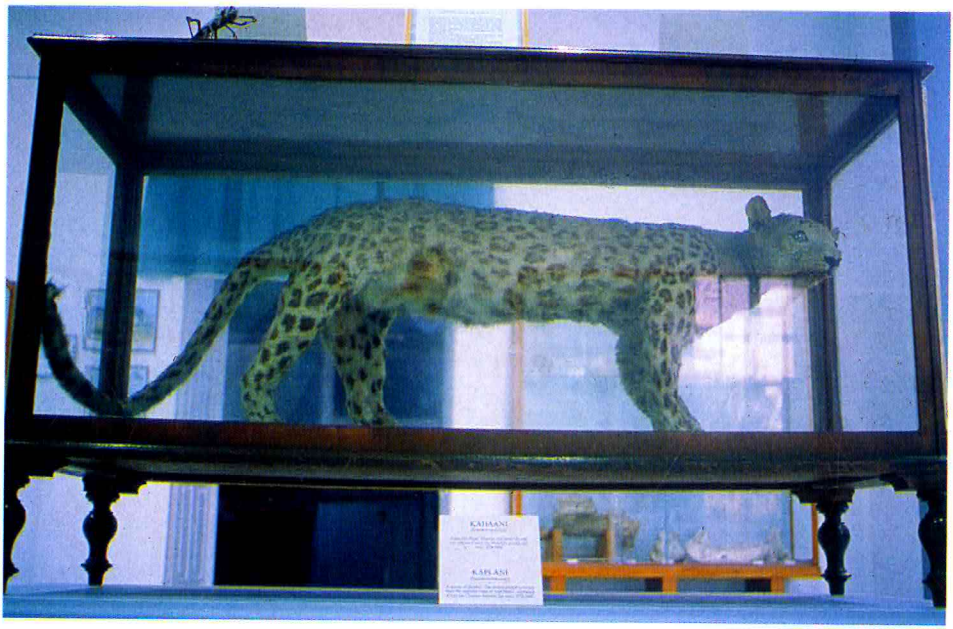

Fig. 4 - The stuffed specimen of Asia Minor leopard, *Panthera pardus tulliana* Valeciennes, 1856, on display at the Natural History Museum of the Aegean (Samos, Greece) (photograph by Marco Masseti).

However, de Tournefort's account was probably not based on an eye-witness observation, but was rather inspired by the oral testimony of the local people. This explains the confusion between tigers and leopards, which was probably due to an incorrect translation of the term *kaplani*. In any case, since the distance of the island from the mainland is no more than 1.7 km, it cannot be excluded that leopards could have reached the island by swimming, at various times. These felids are good swimmers and could have come from the Samsundag range which, as already observed, up until the early 1970s was reputed to be the last Western Anatolian stronghold of the species (cf. Kumerloeve, 1971; Ulrich and Riffel, 1993)

The island of Samos is characterised by specific zoogeographical features linked to its peculiar geographical location. Samos is, for example, the only island of the Eastern Aegean still inhabited by a well developed population of jackals, *Canis aureus* (L., 1758) (Ioannidis and Giannatos, 1991), whereas the Mediterranean chamaleon, *Chamaleo chamaleon* L., 1758, is also reported from Chios (Werner, 1935 and 1938; Ondrias, 1968). But, it seems that the populations of chamaleon in Samos are healthier and more numerous than in any other Greek area in which they occur (Ioannidis et al., 1994). Furthermore, field signs and records of the occurrence of wild boars, *Sus scrofa* L., 1758, have been reported from the island since the early 1990s. It is also said that this species reached Samos by swimming from the opposite Anatolian coast, where boars are still reputed as the commonest

ungulates of the Samsundag range. Moreover, Samian hunters confirm that this type of wild game was not deliberately introduced onto the island.

ACKNOWLEDGEMENTS

While writing this paper I have been fortunate in having had the help o many friends and colleagues. I am particularly grateful to B. Avgan, Ankara (Turkey), A. Camperio Ciani, Univeristà di Padova (Italy), G. Carpaneto, Università di Roma (Italy), J. Clutton-Brock. London, T. Dayan, Tel Aviv University, S. Güsar, Samsundag National Park (Izmir, Turkey), D.L. Harrison, Harrison Zoological Museum, Sevenoaks (England), A. Hamud, Forestry and Grazing Institute, Latakia (Syria), Y. Ioannidis, Goulandris Natural History Museum (Athens, Greece), M. Kasparek, Heidelberg (Germany), S. Karakaya, Forest Department of Antalya (Turkey), H. Mendelssohn, Tel-Aviv University (Israel), A. Vigna Taglianti, Università di Roma (Italy), and S. Zahoueh, University of Aleppo (Syria). Special thanks are due to Vera Eymorfoutsikos, Natural History Museum of the Aegean (Samos, Greece), who kindly allowed me to examine the embalmed Samian leopard.

REFERENCES

AULAGNIER S., 1990 - Zoogéographie et statut des carnivores suavages du Maroc. Vie Milieu, **40** (2/3): 150-155.
AULAGNIER S., THÉVENOT M., 1986 - Catalogue des mammifères suavages du Maroc. Trav. Inst. Sci. Rabat, Sér. Zool., 41: 1-164.
AVCI O., 1978 - Dilek Yarimadasi Milli Parki. Unpub. MS for Dilek Yarimadasi Milli Park Şefi, Orman Fakültesi, Istanbul Üniversitesi: 4 pp.
AYMERICH M., 1991 - Situacion del lince boreal en Europa. Quercus, 61: 13-16.
BANOGLU N.A., 1958 - Turkey, a sportsman's paradise. The Press, Broadcasting & Tourisme Department, Ankara: 63 pp.
BAYTOP T., 1973 - Neue Beobachtung über die Verbreitung des kleinasiatischen Leoparden (*Panthera pardus tulliana*) in der Türkei. Bonn. Zool. Beitr., **24**: 183-184.
BAYTOP T., 1974 - La présence du vrai tigre, *Panthera tigris* (Linné 1758) en Turquie. Säugetierk. Mitt., **22** (3): 254-256.
BLANDFORD W.T., 1876 - Eastern Persia, an account of the journey of the Persian boundary commission 1870-71-72. Vol. 2: The Zoology and Geology. London: vii+516 pp..
BLYTH E., 1845 - In: I. HUTTON, Rough notes on the zoology of Candahar and the neighbouring districts. With notes by E. Blyth. *J. Asiat. Soc. Bengal*, **14**: 340-354.
BLYTH E., 1863 - Synoptical list of the species *Felis* inhabiting the Indian region and the adjacent parts of Middle Asia. Proc. Zool. Soc. London 1863: 181-186.
BOROVALI Ö., 1986 - Turkey. In: The SCI Record Book of Throphy Animals. Safari Club International, Tucson (Arizona): 528-530.
CORBET G.B., 1978 - The mammals of the Palaearctic Region: a taxonomic review. British Museum (Natural History) and Cornell University Press, London and Ithaca: 314 pp.
DANDFORD C.G., 1879 - On the mammals of Asia Minor. Part I. Proc. Zool. Soc. London: 270-282.
DANDFORD C.G., ALSTON E.R, 1880 - On the mammals of Asia Minor. Part II. Proc. Zool. Soc. London: 50-64.
ELLERMAN J.R., MORRISON-SCOTT T.C.S., 1951 - Checklist of Palaearctic and Indian mammals 1758 to 1946. British Museum (Natural History), London: 810 pp.
FELLOWS C., 1841 - An Account of Discoveries in Lycia, being a Journal kept during a second Excursion in Asia Minor (1840). London: 542 pp.
GASPERETTI J., HARRISON D.L., BÜTTIKER W., 1985 - The Carnivora of Arabia. Fauna Saudi Arabia, 7: 397-461.
HARRISON D.L., 1968 - The mammals of Arabia, Carnivora-Artiodactyla-Hyracoidea. Vol. II. Ernest Benn Ltd, London: 380 pp.
HARRISON D.L., BATES P.J.J., 1991 - The mammals of Arabia. Harrison Zoological Museum, Sevenoaks (England): 354 pp.
HEPTER V.G., SLUDSKII A.A., 1980 - Die Säugetiere der Sowjetunion, III: Raubtiere. Jena: 607 pp.

HUFNAGL E., 1972 - Libyan mammals. The Oleander Press, Cambridge: 1-85 pp.
HUS S., 1974 - Av hayvanlari ve avcilik. Orman Fakültesi, Istambul Universitesi, Istambul: 406 pp.
IOANNIDIS Y., GIANNATOS G., 1991 - Preliminary survey on the distribution and status of jackal (*Canis aureus* L., 1758) in southern Greece. Biol. Gallo-Hell., **18** (1): 67-74.
IOANNIDIS Y., DIMAKI M., DIMITROPOULOS A., 1994 - The herpetofauna of Samos (Eastern Aegean, Greece). Ann. Musei Goulandris, **9**: 445-456.
KASPAREK M., 1986 - On a historical occurrence of the lion, *Panthera leo*, in Turkey. Zool. Middle East, **1**: 9-10.
KASPAREK A., KASPAREK M., 1990 - Reiseführer Natur Türkei. BLV Verlagsgesellschaft mbH, München: 246 pp.
KINNEAR N.B., 1920 - The past and present distribution of the lion in south eastern Asia. J. Bombay Nat. Hist. Soc., 27 (1): 33-39.
KOCK D., 1990 - Historical record of a tiger, *Panthera tigris* (Linnaeus, 1758), in Iraq. *Zoology in the Middle East*, 4: 11-15.
KOWALSKI K., RZEBIK-KOWALSKA B., 1991 - Mammals of Algeria. Polish Academy of Sciences/Ossolineum, Wroclaw, Warszawa, Kraków: 370 pp.
KUMERLOEVE H., 1956 - Zur Verbreitung des Leoparden (*Panthera pardus* L.) in Anatolien. Zool. Garten N.F., **22**: 154-162.
KUMERLOEVE H., 1967 - Zur Verbreitung kleinasiatischer Raub-und Huftiere sowie einer Grossnager. Säugetierk. Mitt., **15** (4): 337-409.
KUMERLOEVE H., 1971 - Zum Stand des Vorkommens von *Panthera pardus tulliana* Valenciennes, 1856 in Kleinasiaen. Zool. Garten N.F., Leipzig, **40**: 4-22.
KUMERLOEVE H., 1974 - Zum Vorkommen des Tigers auf türkischem Boden. Säugetierk. Mitt., **22** (4): 348-350.
KUMERLOEVE H., 1976 - Leoparden, *Panthera pardus tulliana* (Valenciennes, 1856), in Zentralanatolien. Säugetierk. Mitt., **24** (1): 46-48.
JACKSON P., 1994 - Serious plight of the desert leopards. Cat News, **20**: 12.
LAY D.M., 1967 - A study of the mammals of Iran, resulting from the Street expedition of 1962-1963. Fieldiana (Zool.), **54**: 1-282.
LE BERRE M., 1990 - Faune du Sahara. 2. Mammiferes. Editions R. Chabaud-Lechevalier, Paris: 360 pp.
LEYHAUSEN P., 1990 - The subspecies question. Cat News, **15**: 17-18.
MARCHESSAUX D., 1978 - Note sur la présence ancienne du tigre, *Panthera tigris virgata* (Illiger, 1815), en Turquie. Mammalia, **41** (4), 1977: 541-542.
MAZAK V., 1979 - Der Tiger, *Panthera tigris*. Neue Brehm-Bücherei, **356**: 1-228, Wittenberg-Lutherstadt.
MENDELSSOHN H., 1989 - Felids in Israel. Cat News, **10**: 2-4.
MENDELSSOHN H., 1990 - Anatolian leopard *Panthera pardus tulliana*. Cat Specialist Group Meeting Report. Cat News, **12**: 4.
MISONNE X., 1957 - Mammiferes de la Turquie sud-orientale et du nord de la Syrie. Mammalia, **21**: 53-67.
MISONNE X., 1959 - Analyse zoogéographique des mammifères de l'Iran. Mém. Inst. Roy. Sci. Nat. Belgique, **59** (2): 1-157.
O'BRIEN S.J., WILDT D.E., BUSH M., 1986 - Rischio genetico per il ghepardo. *Le Scienze*, **215**: 44-55.
OGNEV S.I., 1935 - Mammals of eastern Europe and Northern Asia. Vol. 2. Carnivora, Fissipedia and Pinnipedia. Moscow.
ONDRIAS J.C., 1968 - Liste des Amphibiens et des Reptiles de Grèce. Biol. Gallo-Hell., **1**: 111-135.
OSBORN D.J., HELMY I., 1980 - The contemporary land mammals of Egypt (including Sinai). Feldiana Zool., **5**: 1-579.
POCOCK R.I., 1930 - The Panthers and Ounces of Asia. J. Bombay Nat. Hist. Soc., **34**: 63-82, 307-336.
POCOCK R.I., 1935 - Note on a Panther from Asia Minor, obtained by J.E. Whitall. J. Bombay Nat. Hist. Soc., **37**: 947-949.
RIFFEL M., 1990 - Der anatolischen Leopard ist nicht ausgestorben. Mitt. Zool. Gesell. Art. Popolat. V., **6** (1): 9-10.
SOWERBY A., 1938 - Large tiger reported in Turkey. China J., **28**: 178.
STUART C.T., 1984 - The Distribution and Status of *Felis caracal* Schreber, 1776. Säugetierk. Mitt., **31**: 197-203.
TORTONESE E., 1948 - Impressioni di un naturalista in Anatolia. *Riv. Sci. Nat. "Natura"*, **39**: 49-57.
TOURNEFORT J.P. DE, 1717 - Voyage d'un botaniste. II. La Turquie, la Géorgie, l'Arménie. François Maspero, Paris, 332 pp.
ULRICH B., 1994 - Neue Gefahren für die letzen Leoparden der Türkei. Mitt. Zool. Gesell. Art. Popolat. V., **10** (1): 14-15.
ULRICH B., RIFFEL M., 1993 - New evidence for the occurrence of the Anatolian leopard *Panthera pardus tulliana* (Valenciennes, 1956) in Western Turkey. *Zool. Middle East*, **8**: 5-14.
VALENCIENNES M.A., 1856 - Sur une nouvelle espèce de Panthère tuée par M. Tchihatcheff à Ninfi, village situé à huit lieues Est de Smyrne. Compt. Rend. Hebdom. Acad. Sci., **42**: 1035-1039.
WERNER F., 1935 - Reptilien der Ägäischen Inseln. Sitz. ber. Akad. Wiss. Wien, Math.-naturwiss. Kl., **144**: 81-117.
WERNER F., 1938 - Die Amphibien und Reptilien Griechenlands. *Zoologica*, **35**: 1-117.