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The Barbary Lion, *Panthera leo leo* (Linnaeus, 1758); some systematic notes, and an interim list of the specimens preserved in European museums

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Eingang des Ms. 22. 10. 1969

I.

The infraspecific taxonomy of the species *Panthera leo* (Linnaeus, 1758) has frequently been discussed (e. g. ALLEN 1924, POCOCK 1930, WEIGEL, 1961, MAZAK 1968 and others). Two of the various subspecies recognized by individual authors are generally believed to be the most distinct among the African lion forms, viz. the Barbary Lion, *Panthera leo leo* (Linnaeus, 1758) and the Black-maned Lion of the Cape, *Panthera leo melanochaita* (Chr. H. Smith, 1842). Unfortunately the documentary materials concerning these two subspecies are not very numerous. Hence, there seems to be a need for lists of the preserved specimens of these famous lion forms. For the Black-maned Lion of the Cape the preliminary list was published some time ago (MAZAK 1964) and a more complete version of it is in preparation (MAZAK 1970). In the present paper the author would like to give a list of specimens of the Barbary Lion that are preserved in various European Museums as well as some notes concerning the systematics.

The Barbary Lion belongs among those forms of mammals that have joined the

list of extinct animals not so long ago. The original distributional area of this lion subspecies covered the northernmost parts of Africa from the westernmost Tripoli through Tunisia, Algeria, and Morocco, comprising thus the entire system of chains of the Great and Little Atlas.

JOHNSTON (1899, p. 564) says that about "... two hundred years ago the lion was found quite commonly in Tunisia. About the same time, so far as records go, the last lion was killed in the adjoining Pashalik of Tripoli, where the animal now seems to be entirely extinct." According to LAVAUDEN (1932, pp. 5–6) 1891 was the year when the last specimens of the Barbary Lion were killed in both Tunisia and Algeria. The respective localities are given as follows: Babouch, between Tabarka and Aïn Draham (Tunisia) and the vicinity of Souk-Ahras (Algeria). As to Algeria SEURAT (1930, p. 90) and SCHOMBER and KOCK (1960, p. 277) none the less mention a lioness that was killed in 1893 near Batna. Thus we can consider the Barbary Lion as having been exterminated in Tunisia in 1891 and in Algeria in 1893.

In Morocco the Lion survived well into the twentieth century. HEIM DE BALSAC (1936, p. 98) states that "Au Maroc, l'espèce a dû subsister jusqu'à la decade qui va de 1900 à 1910." CABRERA's data (1932, pp. 186–190), quoted also by HARPER (1945, pp. 290–291) and PANOUSE (1957, p. 130), show that the last specimens none the less survived in Morocco to about 1920–1925. SCHOMBER and KOCK (l. c.) say that "... in 1920 the last specimen was confirmed as having been seen in the neighbourhood of Azrou." PANOUSE (l. c.) then gives the following information that is apparently the last mention of the Barbary Lion in Morocco: "... le colonel Hubert m'a raconté... qu'aux environs de 1930, alors qu'il était capitaine à Aïn Leuh, le forestier d'Ouiouane lui avait téléphoné qu'un lion rôdait autour du poste; le lendemain on devait, en effect, observer aux environs les traces d'un félin qui ni les chasseurs ni les montagnards ne purent considérer comme une panthère étant données leurs grandes dimensions, mais le fauve ne fut jamais revu."

II.

The following specimens of the Barbary Lion, *Panthera leo leo* (Linnaeus, 1758), are known to the author of this article to be preserved in various European Museums.

1. Mounted skin of an adult male

Rijksmuseum van Natuurlijke Historie, Leiden, the Netherlands.

Museum No.: Catalogue Jentink (1892, p. 95), specimen "b".

Origin: "Barbarie".

Measurements of the mounted skin: height at shoulders, 970 mm; tail, 820 mm; hind foot, ca. 400 mm.

Remarks: The specimen is perfectly preserved. Ground coloration rather dark, greyish tawny, contrasting sharply with more bright, reddish sand yellow coloration of East African lions; hair very long, 30 to 35 mm. Mane long, yellowish around the face and darker, greyish brown or brown grey on shoulders, throat, and chest; under the belly there are two longitudinally parallel strips of longer, dark brown hairs that form the belly mane; large elbow tufts; tail tuft is long of dark brown colour. The transition of colours in the mane is not sharp.

Length of mane hair: forehead and neck, 120 mm; throat, 200 mm; shoulders, 110 to 130 mm; chest, 190–220 mm; elbow tufts, 150 mm; belly, average length of hair is about 80–90 mm but there are hairs as long as 160 mm.

Figure: published for the first time in this article.

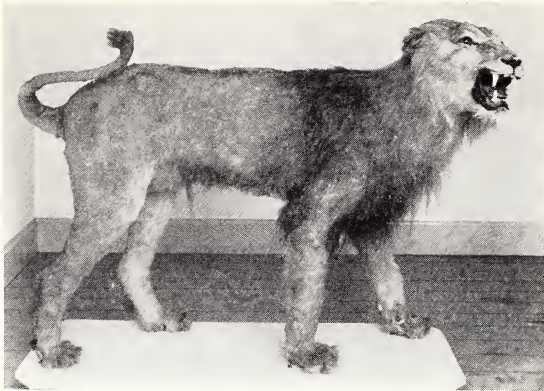


Fig. 1. Mounted skin of an adult male of the Barbary Lion. Rijksmuseum van Natuurlijke Historie, Leiden, Catalogue Jentink (1892), specimen "b" (By permission of the Rijksmuseum van Natuurlijke Historie, Leiden)

developed, long, yellowish around the face; greyish, greyish-brown, and deeply brown on shoulders, throat, and chest; no sharp transition of colours. Two tufts of long hairs run under the belly, forming thus the belly mane; large elbow tufts. Colour of the belly mane, and elbow tufts is greyish brown. Tail tuft is greyish brown. Tail tuft is long, blackish brown or almost black.

Length of mane hair: forehead and neck, 110 mm; throat, 140 mm; shoulders, 130 to 140 mm; chest, 140–160 mm; elbow tufts, 70–90 mm; belly, average length 75–80 mm, some hairs reach often as much as 100–120 mm.

Figure: published for the first time in this article.

3.1 Mounted skin of an adult male

Institut Royal des Sciences Naturelles, Bruxelles, Belgium.

Museum No.: 2405/902, "entré 11-XII-1862", (old catalogue no. 1114).

Origin: ". . . né au Maroc, mort au Jardin zool. de Bruxelles" (quoted from the old Museum catalogue).

Measurements: not taken.

Remarks: Perfectly preserved specimen. Ground coloration greyish tawny, hair very long. Mane heavily developed, long, yellowish around the face, graduating into the dark grey or grey brown on shoulders, throat, and chest. Very long elbow tufts of dark grey or grey brown colour; tail tuft of the same colour is not very long. The belly mane is formed by a tuft of long hairs present in the inguinal region on the both sides

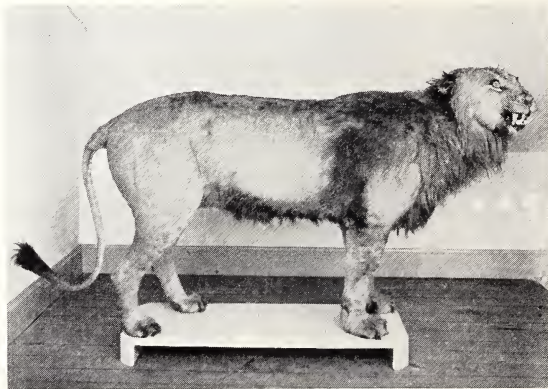


Fig. 2. Mounted skin of an adult male of the Barbary Lion. Rijksmuseum van Natuurlijke Historie, Leiden, Catalogue Jentink (1892), specimen "c" (By permission of the Rijksmuseum van Natuurlijke Historie, Leiden)

2. Mounted skin of an adult male

Rijksmuseum van Natuurlijke Historie, Leiden, the Netherlands.

Museum No.: Catalogue JENTINK (1892, p. 95), specimen "c".

Origin: "Des environs de Tunis . . . 1823" (JENTINK 1892, p. 95).

Measurements of the mounted skin: height at shoulders, 1040 mm; tail, 1100 mm; hind foot, ca. 400 mm.

Remarks: Perfectly preserved specimen. Ground coloration greyish tawny, hair very long, being from 30 to 35 mm in length. Mane heavily developed

of belly; colour of these inguinal tufts varies from dark grey to dark greyish brown. Low on the sides of the thorax there are longitudinal crests of long hair; these side crests of much paler colour form a continuation of the two inguinal tufts.

Length of mane hair: forehead and neck, 110–120 mm; throat, 200 mm; shoulders, 150–160 mm; chest, 180–200 mm; elbow tufts, 100–110 mm; belly, inguinal tufts, 110–120 mm; crests of long hairs on sides of the thorax, 80–85 mm.

110–120 mm; crests of long hairs on sides

Figure: published for the first time in this article.

3.2 Skull of an adult male

Institut Royal des Sciences Naturelles, Bruxelles, Belgium.

Museum No.: 2405/902, “entré 11-XII-1862”. The skull belong to the specimen listed above sub 3. 1.

Origin: “. . . né au Maroc, mort au Jardin zool. de Bruxelles” (quoted from the old Museum catalogue).

Measurements: see Table 1.

Remarks: The skull is in excellent state and completely intact; mandible present; rather heavily built, relatively very wide across the zygomatic arches, very narrow postorbital bar.

Figure: published for the first time in this article.

Note: The entire skeleton of this specimen is preserved in the collections of the Inst. Royal des Sci. Nat. Bruxelles.

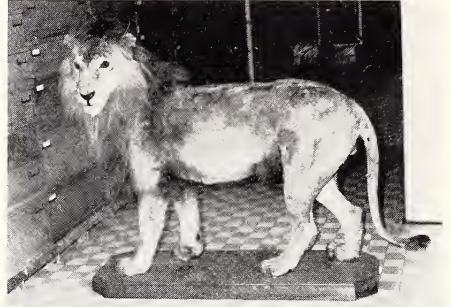


Fig. 3. Mounted skin of an adult male of the Barbary Lion. Institut Royal des Sciences Naturelles, Bruxelles, No. 2405/902 (By permission of the Institut Royal des Sciences Naturelles, Bruxelles)

4. Mounted skin of a young male

Muséum National d’Histoire Naturelle, Galerie de Zoologie, Paris, France.

Museum No.: not known.

Origin: “Mitjana (Algérie)” — obtained from Col. d’Argent, died at Paris Menagerie on March 19, 1855.

Measurements: not taken.

Remarks: Young male; according to the state of growth of the mane the specimen could have been aged about 1½ to 2 years.¹ Body hair relatively long; mane is short, though well developed.

The specimen is bleached by sun light, no relevant determination of colour could thus be made. The mane however seems to have originally been somewhat darker on the throat and shoulders. On the belly an initiation of the belly mane can be observed.

Figure: not published so far.

5. Mounted skin of a young male

Muséum National d’Histoire Naturelle, Galerie de Zoologie, Paris, France.

Museum No.: not known.

Origin: “Tunisie” — obtained from the Consul of Tunisia, died at Paris Menagerie on July 1, 1825.

¹ It has generally been believed that the mane starts to grow at age of about 3 years; this however is not true as some more recent observations show. Lion males begin to develop manes at about 14 months of age (cf. MAZAK 1968, p. 15).

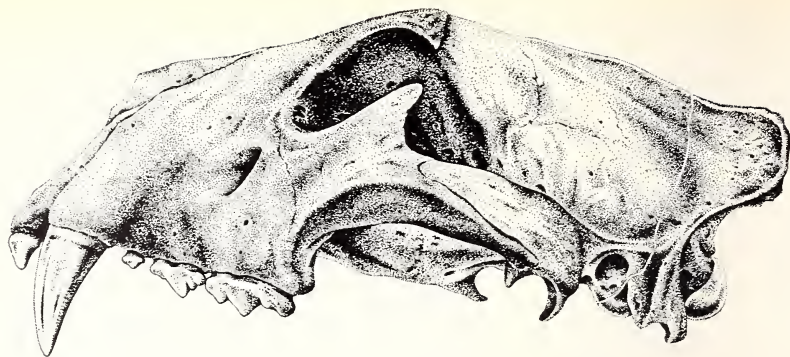


Fig. 4. Skull of an adult male of the Barbary Lion. Muséum National d'Histoire Naturelle, Cabinet d'Anatomie, Paris, No. 1897—286. The posterior part of the skull was cut off and is restored in this picture (Del. V. MAZAK)

Measurements: not taken.

Remarks: Young male; according to the state of mane growth about 1½ year old. Body hair relatively long; mane very short.

The specimen is bleached by sun light; no estimation of original colour could be made.

The belly shows somewhat longer hairs that could be considered as the first appearance of the belly mane.

Figure: not published so far.

6. Mounted skin of a young male

Muséum National d'Histoire Naturelle, Galerie de Zoologie, Paris, France.

Museum No.: not known.

Origin: "Algérie" — obtained from Marechal de Mac-Mahon in 1865, died at Paris Menagerie on Nov. 12, 1866.

Measurements: not taken.

Remarks: Young male, aged about 14—15 months. Body hair rather long; incipient growth of the mane.

The specimen is bleached by sun light so that no estimation of the original coloration could be made.

Figure: not published so far.



Fig. 5. Skull of an adult male of the Barbary Lion. Institut Royal des Sciences Naturelles, Bruxelles, No. 2405/902 (Del. V. MAZAK)

7. Skin of a full-grown female

British Museum (Natural History), London, England.

Museum No.: B. M. (N. H.) 1.8.9.25.

Origin: "Tunis. Coll. Johnston".

Measurements: not taken.

Remarks: Flat skin, of much darker ground coloration than in average East African female specimen. The colour can be described as greyish tawny, mixed with numerous blackish hairs. The hair is unusually long, being about 30 to 32 mm.

Figure: not published so far.

Note: Mr. H. H. JOHNSTON travelled in Tunisia in 1880's.

8. Skull of an adult male

Muséum National d'Histoire Naturelle, Cabinet d'Anatomie, Paris, France.

Museum No.: 1897-286 (old catalogue No. 1931-582/S 1-1^{er} E-c 627 A).

Origin: "Atlas, Algérie".

Measurements: see Table 1.

Remarks: The skull is not intact, its posterior part having been cut off; mandible present. The skull is of rather robust structure, heavily built, not very wide across the zygomatic arches, with strongly constricted postorbital bar. According to other measurements the greatest skull length may be estimated as having been about 358–362 mm

Figure: published for the first time in this article.

9. Skull of an adult female

Muséum National d'Histoire Naturelle, Cabinet d'Anatomie, Paris, France.

Museum No.: 1862-54 (old catalogue No. S 1-1^{er} E-c 629 A).

Origin: "Algérie".

Measurements: see Table 1.

Remarks: The skull is in good state, the mandible is not preserved. Relatively heavily built skull, with very narrow postorbital bar.

Figure: published for the first time in this article.

10. Skull of an adult female

Naturhistoriska Riksmuseet, Stockholm, Sweden.

Museum No.: 287.

Origin: "Barbariet. H. M. Konungen 1831" (Barbary, His Majesty the King, 1831; apparently brought alive to Stockholm as a gift to the King of Sweden from one of the beys of North Africa – Dr. U. BERGSTRÖM, in litt., May 22, 1968).

Measurements: see Table 1.

Remarks: Partly destroyed skull, the posterior part having been cut off; mandible present. Very narrow postorbital constriction; according to the other measurements the greatest skull length might have been about 280 mm.

Figure: not published so far.

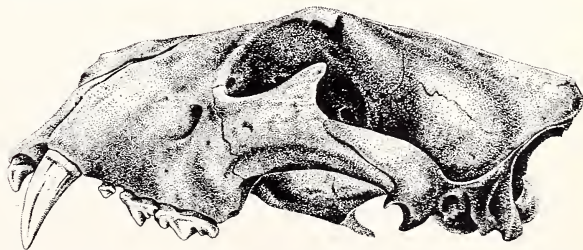


Fig. 6. Skull of an adult female of the Barbary Lion. Muséum National d'Histoire Naturelle, Cabinet d'Anatomie, Paris, No. 1862—54 (Del. V. MAZAK)

III.

According to the above list 6 mounted skins, 1 flat skin, 4 skulls, and 1 postcranial skeleton of the extinct Barbary Lion, *Panthera leo leo* (Linnaeus, 1758) are preserved in various scientific institutions of Europe, constituting for the time being the only available material of the nominate subspecies of the Lion.

There have been numerous doubts and discrepancies as far as the external characteristics of the Black-maned Lion of the Cape are concerned. By contrast the majority of authors that have dealt with the Barbary Lion have generally described this lion race rather uniformly.

The study of all the material available has convinced the present author that the Barbary Lion should be regarded as a well distinguished subspecies that, having inhabited the whole mountainous system of the Great and Little Atlas, was geographically almost entirely separated from other lion populations by deserts on the south, south-east, and east.

It has generally been agreed that the Barbary Lion reached a very large size and was of darker colour than other lions, with a huge, very dark mane that extended to the middle of the back and covered the belly

There are, however, no reliable data at our disposal that could confirm that this lion form was conspicuously bigger than other subspecies. In this respect a quotation from PEASE (1899, p. 567) may be interesting: "The Algerian lions often had magnificent manes, but there is no evidence that they are of greater average size than other African lions. An average adult male will measure about 8 feet 3 inches from the tip of his nose to the tip of his tail . . . and stands about 3 feet 1½ inches at the shoulder." There is none the less no doubt that the Barbary Lion did not belong among the small lion subspecies and that its size was comparable to that of an average East African Lion, *Panthera leo somaliensis* (NOACK, 1891).²

Table 1
Measurements of skulls of the Barbary Lion, *Panthera leo leo* (Linnaeus, 1758)
(in mm)

	„Barbariet“ Naturhistoriska Riksmuseet, Stockholm No. 287	„Algérie“ Muséum National d'Histoire Naturelle, Cabinet d'Anatomie, Paris No. 1862—54	„Atlas, Algérie“ No. 1897—286	„Maroc“ Institut Royal des Sciences Naturelles, Bruxelles No. 2405/902
	♀	♀	♂	♂
Greatest length	—	308.5	—	338
Condylbasal length	—	278	—	309.6
Basal length I	—	262.5	—	293
Basal length II	—	256	—	285.7
Rostral breadth	79	83	97.5	92.7
Interorbital breadth	56	61.3	74	75.7
Postorbital breadth (constriction)	50	52.5	62.5	56
Bizygomatic breadth	189	204	231.7	245.7
Mastoid breadth	—	128	—	138.7
Mandible length	198.5	—	249.5	243.5
Pm ⁴ length	34.3	33.5	39	36.2
C - Pm ⁴ length	91.5	96	114	106.4

² The East African Lion is generally named *Panthera leo massaica* (Neumann, 1900) but it seems to the present author that the Massai Lion is consubspecific with the Somali Lion (cf. MAZAK 1968, p. 21). Hence, according to the priority rules the East African Lion should be called *somaliensis* (NOACK, 1891).

Table 2

Skulls measurements of Barbary Lions compared with East and South African,
and Indian Lions of similar size
(in mm)

		Sex	Greatest skull length	Postorbital constriction
Barbary Lion	Inst. Royal. Sci. Nat. Bruxelles No. 2405/902	♂	338	56
Lions from East and South Africa	British Mus. (N.H.), Nat. Hist. Mus. of Tervuren and Bruxelles	♂♂ n = 10	335—340	59.3—65.5
Indian Lions	British Mus. (N.H.),	♂♂ n = 2	338.2—340.4	54.8—57.0
Barbary Lion	Mus. Nat. d'Hist. Nat., Cab. d'Anat., Paris No. 1897—286	♂	(ca. 358—362)	62.5
Lions from East and South Africa	British Mus. (N.H.), Nat. Hist. Mus. of Tervuren and Bruxelles	♂♂ n = 13	355—365	63.5—69.6
Barbary Lion	Nat. Hist. Mus. Stockholm No. 287	♀	(ca. 280)	50.0
Lions from East and South Africa	British Mus. (N.H.), Nat. Hist. Mus. of Tervuren and Bruxelles	♀♀ n = 6	277—282	53.5—63
Indian Lions	British Mus. (N.H.),	♀	280	52.3
Barbary Lion	Mus. Nat. d'Hist. Nat., Cab. d'Anat., Paris No. 1862—54	♀	308.5	52.5
Lions from East and South Africa	British Mus. (N.H.) Nat. Hist. Mus. of Tervuren and Bruxelles	♀♀ n = 10	305—312	62.7—64.5
Indian Lions	British Mus. (N.H.)	♀	311.7	56

The material of Barbary Lion skulls, however scarce it is, seems to confirm too that this lion subspecies reached about the same size as the East African one. According to the author's experience the greatest skull length of an average East African male lion varies between about 335 and 370 mm, and between about 285 and 310 mm in an average East African female. As can be seen from Table 1, measurements of skulls of the Barbary Lion fall well within these limits.

The structure of a Barbary Lion skull has never been described before. The preserved material shows that a Barbary Lion skull, either of a male or of a female, differs from skulls of other African lions by its somewhat more robust shape, and especially by its much narrower postorbital constriction, being thus strongly depressed behind the processus zygomatici ossis frontalis.

This skull characteristic may be very clearly demonstrated by a comparison of measurements of the Barbary lion skulls with those of lions from various parts of East

and Southern Africa of corresponding size. The result of this comparison is shown in Table 2.

When studying lion skulls in various institutions the author has found that the same skull characteristic, the very narrow postorbital bar, occurs in Asiatic lions as well. This finding thus seems to show that there might have existed a closer relation between the lion populations of northernmost Africa and those of Asia. It may be that the South European Lion, that became extinct at the beginning of the Christian era, could have represented the connecting link between the North African and Asiatic lions.

The preserved skins of the Barbary Lion, though just 4 of them (3 males, 1 female) could have been used for the taxonomic study, show the ground coloration as being somewhat darker and more greyish than in more southerly lion populations, except the Black-maned Lion of the Cape. In the both sexes the hair seems to be much longer (30 to 35 mm) than in the most East and South African lions. The mane of males is large and relatively very long, reaching behind the shoulders on the back and under the belly two parallel stripes of long hair form the belly mane that gradually becomes shorter and thinner in front of the chest. The colour of the mane is yellowish around the face and darker on the neck, throat, shoulders, and chest. The mane, however, is paler than generally believed before. It is certainly dark but it is decidedly not black as sometimes stated. Its colour can be described as tawny grey, mixed with numerous bright brown or blackish brown hairs; the general impression being thus dark mouse-grey or grey-brown rather than black or blackish. The same dark colour is also shown by the elbow tufts, and by the belly mane. The tail tuft is somewhat darker in colour. The yellowish colouring of the mane around the face grades into the darker colour on the neck, shoulders, throat, and chest, never, however, displaying the sharp colour contrasts that give the impression of a yellowish "collar" around the face, as is the case with the Black-maned Lion of the Cape (cf. MAZAK 1970).

CABRERA (1932, p. 181) stated that females are lighter in colour. This statement, however, cannot be confirmed by the present observations concerning one female skin, deposited in the British Museum (Natural History) (No. B.M. 1.8.9.25). This skin shows about the same greyish tawny shade of ground coloration as the male skins of the Leiden and Brussels Museums do.

All the above mentioned data seem to indicate that the Barbary Lion was one of the most distinctive geographic races of the species. One other aspect of the problem can be mentioned here: There seems to be little doubt that the Barbary Lion was separated from other lion subspecies not only by morphological characteristics but by some features of its biology as well. As far as known to the present author all the accounts concerning this lion race show that the Barbary Lion inhabited mainly wooded mountainous areas (cf. CABRERA 1932, pp. 186–190; WERNER 1939, pp. 224–225, and others) and that its mode of life was that of a solitary living animal, except in the mating season. None of the old authors mentions having seen prides of Barbary lions, the only exception being females with their young. Contrary to this, in other parts of Africa lions are known to live in more or less numerous prides. The explanation of this might be seen in different trophic factors concerning the density of game that form the diet of the lion. Conditions of the "predator-prey" relation were certainly different in the mountainous areas of northernmost Africa and in those parts of African Continent that lie south of Sahara.

According to various authors (SHORTRIDGE 1934, STEVENSON-HAMILTON 1947, GUGGISBERG 1961, SPINAGE 1962, PRATER 1965, and others) lions breed during the whole year, the mating period being thus not fixed to any certain season of year. PEASE (1899, p. 568) states, however, that the lions "... in Algeria generally couple in January ...". There is, unfortunately, no possibility of verifying this statement as the lion is extinct in North Africa by now. Hence we cannot say with certainty whether the

the Barbary Lion did or did not really differ from other lion populations in this feature of its biology also.

IV.

The basic taxonomic data on the Barbary Lion can be summarized as follows:

Panthera leo leo (Linnaeus, 1758) Barbary Lion

- 1758: *Felis leo* Linnaeus, Syst. Nat. ed. 10, 1, 41. Africa.
 1826: *Felis leo barbaricus* J. N. von Meyer, Diss. Inaug. Anat.-Med. de genere Felium, p. 6, Berberei.
 1829: *Felis leo barbarus* J. B. Fischer, Syn. Mammal., p. 197, Berberei.
 1834: *Leo africanus* Jardine, Naturalist's Library, Mamm. 2 (Felinae), p. 118, Africa, *nomen nudum*.
 1858: *Felis leo nigra* Loche, Cat. Mamm. Oiseaux observés en Algérie, p. 7, La province de Constantine, Algérie.
 1868: *Leo barbarus* Fitzinger, Sitzber. Akad. Wiss. Wien. Mathem.-naturw. Cl., 58, I. Teil, p. 432, Nord-Afrika, Berberei.

Type specimen: not known.

Type locality: Africa; restricted by J. A. Allen, 1924 to „Constantine, Algeria.“

Description: a large subspecies of darker, greyish tawny colour, males with large, dark greyish-brown or mouse-grey manes that reach behind the shoulders, belly mane developed. The skull is characterized by a relatively very narrow postorbital constriction.

Distribution: The northernmost, mountainous parts of Africa, from western Tripoli, through Tunisia, Algeria, and Morocco. Entirely extinct.

Note: As generally agreed no type specimen of Linnaeus's *Felis leo* is known. It does not, however, seem that there is sufficient reason to justify the selection of a neotype of the species (which would, of course, at the same time be the type of the nominate subspecies) since a neotype should only be selected as a last resort to solve a nomenclatorial problem. This is the viewpoint also of Dr. L. B. HOLTUIS, Vice-President of the International Commission on Zoological Nomenclature (in litt., Oct. 21, 1968). I think none the less that the *Leiden Museum specimen "b" of Jentink's Catalogue* (1892, p. 95), listed here sub (1) *should serve as a "standard specimen"* that should be seen by every zoologist dealing with systematics of the species *Panthera leo*. Jentink's specimen "b" is known to have come from "Barbarie" which thus is in accordance with the restricted type locality given by ALLEN (1924, p. 222) as "the Barbary coast region of Africa, or, more explicitly, Constantine, Algeria."

It should be stated that the list of preserved specimens of *Panthera leo leo* (Linnaeus, 1758) is obviously not complete as yet. There are certainly more specimens in various scientific as well as in private collections that are waiting to be discovered and described. Madame M.-C. *Saint Girons* (Paris) has, for example, written to me that in the Lyon Natural History Museum there is a skull that might be that of a Barbary Lion (Museum No. F 55). I have not however been able to obtain detailed data on this skull.

V.

Note: Skull measurements were taken as follows: Greatest length, prosthion — opisthocranion; Condylbasal length, prosthion — condyilion; Basal length I, prosthion — basion; Basal length II, orale — basion; Rostral breadth, the greatest breadth of the rostrum above the canines; Interorbital breadth, the smallest distance between orbits;

Postorbital breadth (constriction), the smallest breadth of the postorbital bar; Bizygomatic breadth, zygion — zygion; Mastoid breadth, the greatest breadth of the skull above mastoidal processus (taken on the temporal crest); Mandible length, infradentale — condylion mediale; Pm⁴ length, the greatest length of crown of the upper carnassial; C-Pm⁴ length, the distance between the most oral edge of alveolus of the upper canine and the most aboral edge of alveolus of the upper carnassial.

Acknowledgements

The author wishes to express his most sincere thanks to all who enabled him to study the respective materials and aided him in different ways. Their names are as follows: Madame H. GENEST (Muséum Nat. d'Hist. Naturelle, Paris), Madame M.-C. SAINT GIRONS (C.N.R.S., Paris), Dr. U. BERGSTRÖM (Naturhistoriska Riksmuseet, Stockholm), Dr. P. J. H. VAN BREE (Zoölogisch Museum, Amsterdam), Dr. K. CURRY-LINDAHL (Stockholm), Professor J. DORST (Muséum Nat. d'Hist. Naturelle, Paris), Dr. C. P. GROVES (Cambridge University, England), Mr. J. E. HILL (British Museum of Natural History, London), Dr. A. M. HUSSON (Rijksmuseum van Natuurlijke Historie, Leiden), and Dr. X. MISONNE (Inst. Royal des Sci. Nat., Brussel). The author's special thanks are due to his friend Dr. COLIN P. GROVES (Cambridge) for reading a preliminary draft of this paper.

Summary

The available data on the extinct Barbary Lion, *Panthera leo leo* (Linnaeus, 1758) are summarized in the present paper. Some external and cranial characteristics and taxonomic criteria are discussed. The author also gives a preliminary list of the specimens of this Lion subspecies preserved in various museums of Europe.

Zusammenfassung

Die vorhandenen Daten über den ausgestorbenen Berberlöwen, *Panthera leo leo* (Linnaeus, 1758) sind in dieser Arbeit zusammengestellt. Einige äußere Merkmale, Schädelmerkmale und taxonomische Kriterien werden diskutiert. Weiterhin ist eine vorläufige Liste über das Material dieser Löwenunterart in den europäischen Museen zusammengestellt.

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Ökologische Beobachtungen der Fledermäuse der Adriatischen Inseln¹

VON BEATRICA DULIĆ

Eingang des Ms. 9. 4. 1969

Einleitung

Obwohl die Ökologie der Fledermäuse einiger mediterranen Inseln sowie von Corsica (KAHMANN und BROTZLER, 1955, KAHMANN und GOERNER, 1956), Sardinien (FRICK und FELTEN, 1952), Sizilien (KLEMMER, 1957), Kreta (POHLE, 1953; KAHMANN, 1959), den Pityusen (KÖNIG, 1958; VERICAD und BALCELLIS, 1965) ziemlich gut bekannt ist, gibt es von den Fledermäusen der adriatischen Inseln fast keine ökologischen Angaben.

In neuerer Zeit wird häufig die Fangmethode von Fledermäusen im Fluge entweder mittels aufgestellter Nylonfäden in bestimmter Entfernung von den Trinkstellen oder in verschiedenen Biotopen mittels japanischen Netzen ausgeübt. Doch gering sind die Angaben über das Artenverhältnis bei solchem Fang sowie auch über die Fledermausarten, die man an Trinkstellen finden kann. So ist das Ziel dieser vorliegenden Arbeit, außer ökologischen Angaben über einzelne Fledermausarten aus dem Gebiet der adriatischen Inseln auch eine Übersicht über die qualitative Zusammensetzung von Fledermäusen zu geben, welche an den Tränken in diesem Raum in japanischen Netzen gefangen wurden. Die hier dargestellten Beobachtungen erstrecken sich auf die Monate Juli und August.

¹ Nach dem Vortrag, der auf der 42. Hauptversammlung der Deutschen Gesellschaft für Säugetierkunde e. V. in Bern 1968 gehalten wurde.

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Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Mammalian Biology \(früher Zeitschrift für Säugetierkunde\)](#)

Jahr/Year: 1969

Band/Volume: [35](#)

Autor(en)/Author(s): Mazak Vratislav

Artikel/Article: [The Barbary Lion, Panthera leo leo \(Linnaeus, 1758\); some systematic notes, and an interim list of the specimens preserved in European museums 34-45](#)