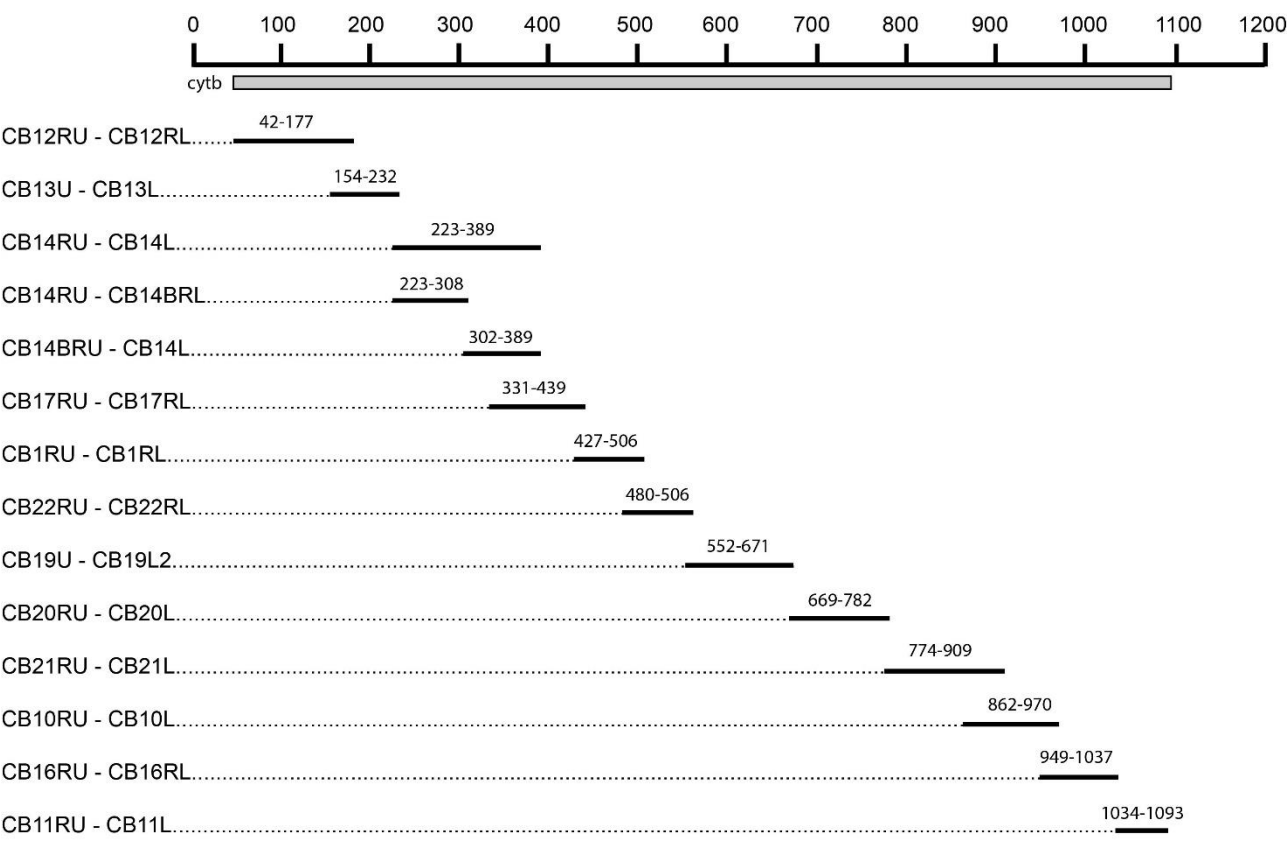


Supplementary Materials

Figure S1. Graphical representation of the portion of the cytochrome b analyzed in this study. The consensus sequence was obtained by means of overlapping fragments amplified through the selected couples of primers, modified from [38].



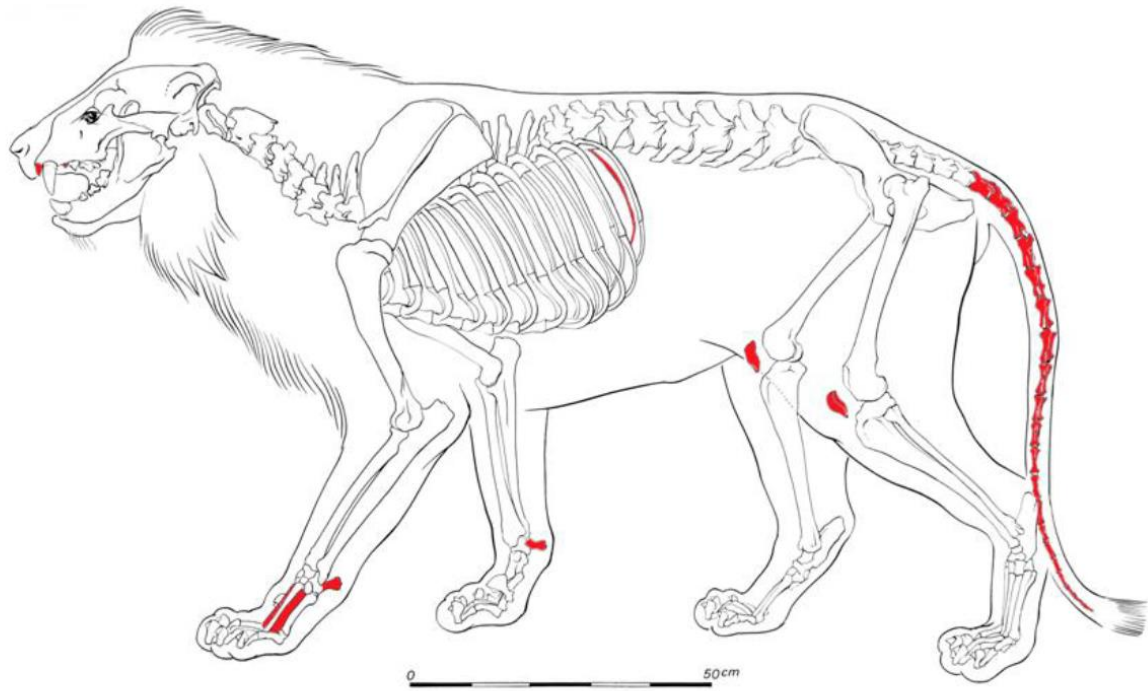


Figure S2. Schematic view of the missing skeletal elements of AN-1420 on the entire skeleton. Left side view of the complete skeleton of a lion. Missing elements from specimen AN-1420 are labelled in red (picture modified from [62]).

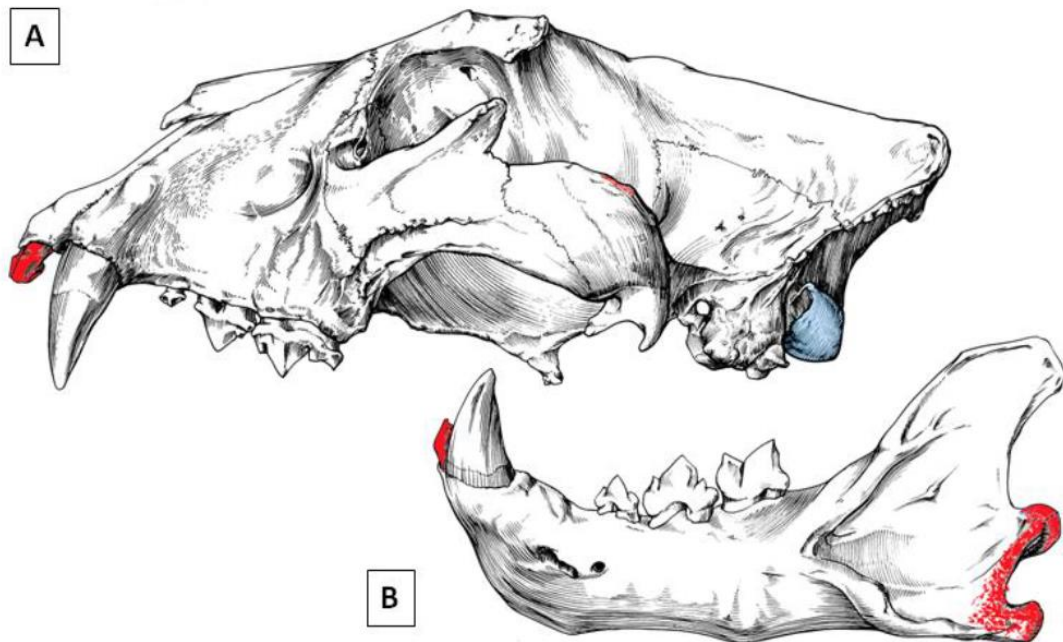


Figure S3. Missing elements from the cranium (left side view). **A:** Left side view of the skull of a lion. **B:** Left side view of the mandible. Missing elements from specimen AN-1420 are labelled in red (picture modified from [62]).

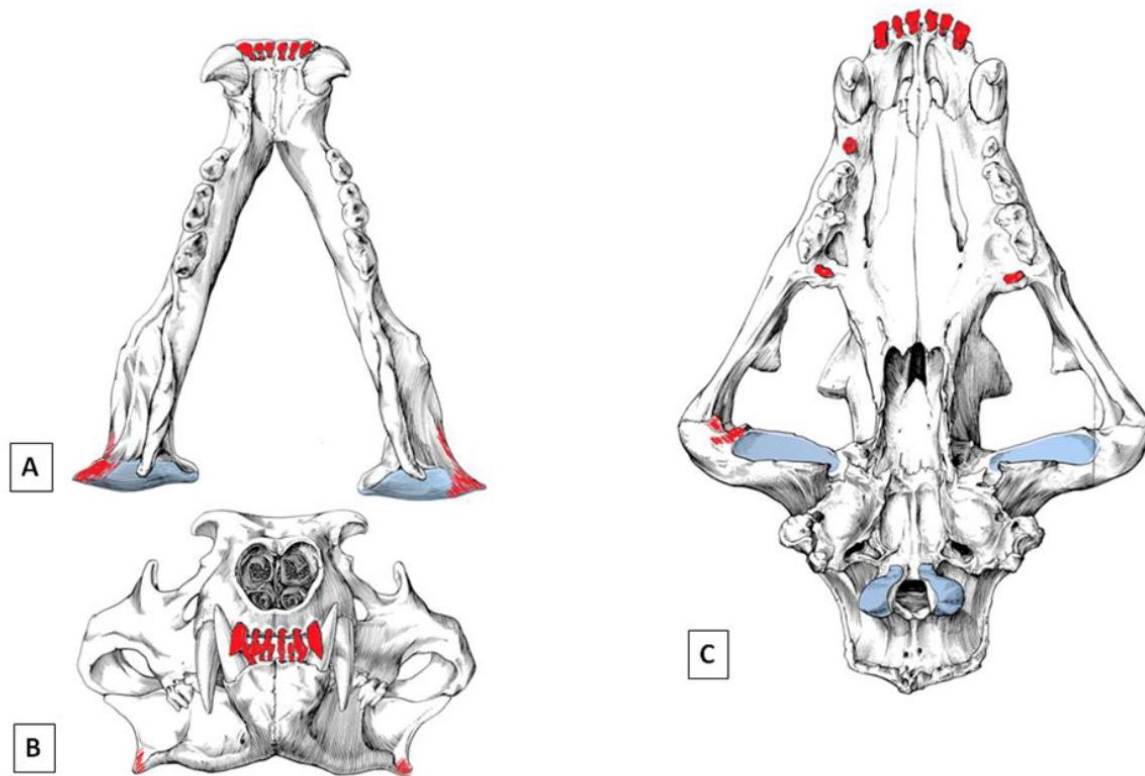


Figure S4. Missing skeletal elements of the cranium and the mandible (dorsal, frontal and ventral view). **A:** Dorsal view of the mandible. **B:** Frontal view of the cranium. **C:** Ventral view of the cranium. Missing elements from specimen AN-1420 are labelled in red (picture modified from [62]).

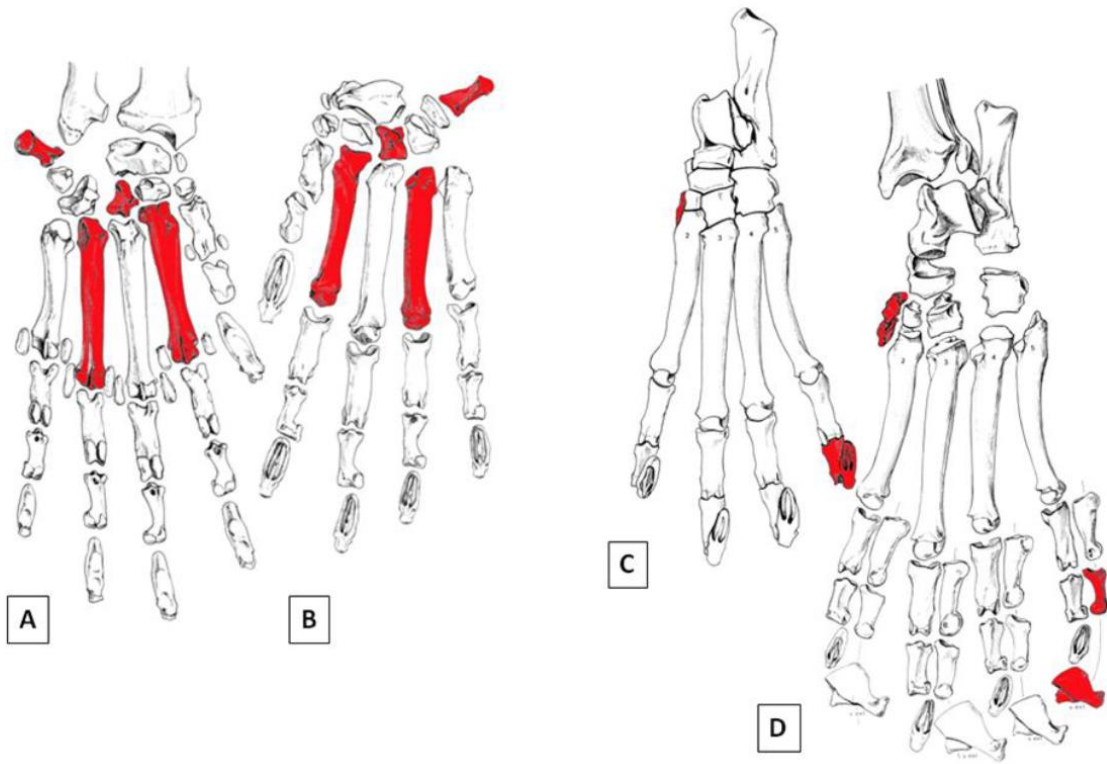


Figure S5. Missing elements of the distal region of the skeleton – autopodium. **A:** Right anterior autopodium, ventral view; **B:** Left autopodium, ventral view. **C:** Left posterior autopodium, dorsal view; **D:** Left posterior autopodium, ventral view. Missing elements from specimen AN-1420 are labelled in red (picture modified from [62]).



Figure S6. The copies of the carpals created for specimen AN-1420. Left: right and left carpals of the specimen of *Panthera leo* N°547 of the Museum of Fauna of the Department of Veterinary Sciences (University of Messina) . Right: copies of carpals reconstructed by 3D printing. Photo credit: Daniele Di Lorenzo, kind concession of the Museum of Zoology "P. Doderlein", Sistema Museale d'Ateneo, Università degli Studi di Palermo.



Figure S7. The mounted left forelimb of specimen AN-1420. On the left palmar vision and on the right dorsomedial view of the left forelimb of *Panthera leo* AN-1420; in gray there are the copies of carpals, metacarpals and claws reconstructed by 3D printing. Photo credit: Daniele Di Lorenzo, kind concession of the Museum of Zoology "P. Doderlein", Sistema Museale d'Ateneo, Università degli Studi di Palermo.



Figure S8. A particular of the restored skull of *Panthera leo* AN-1420. On the left: dorso-lateral view of the skull. On the right: detail of the upper incisors. In grey the elements reconstructed by 3D printing. Photo credit: Daniele Di Lorenzo, kind concession of the Museum of Zoology "P. Doderlein", Sistema Museale d'Ateneo, Università degli Studi di Palermo.

Table S1. List of the primers used in this study [38]. Ta = Temperature of annealing (°C)

Primer forward	Sequence 5'-3'	Primer reverse	Sequence 5'-3'	Fragment length (bp)	Ta
CB12RU	CACACCCCTTGTAATATT	CB12RL	TGACTGATGAGAAAGCGTTAT	180	50
CB13U	AAATTCTACCGGCTCTTTCTA	CB13L	TTGGCGTAGGTACCGGATAA	124	52
CB14RU	CACATTTGCCGCGATGTAAAY	CB14L	TGGCCCCACGGTAAGACATAT	209	50
CB14RU	CACATTTGCCGCGATGTAAAY	CB14BRL	TTTCTGAGAAAGTATAGGAGCCATAG	132	56
CB14BRU	CCTATACATGCATGTAGGACGAG	CB14L	TGGCCCCACGGTAAGACATAT	131	56
C 17RU	TACTATGGCTCCTATACYTTCTCA	CB17RL	TGGGATTGCTGATAGGAGATTG	156	50
CB1RU	CCAAATATCCTTTGAGGTGC	CB1RL	TCAGGGTGGCTTTGTCTAC	118	56
CB8U	TTTTGAGGTGCAACTGTAATC	CB8RL	GAAGCCTCCTCAGATYCAC	87	46
CB22RU	CATACATCGGRGCCGACCT	CB22RL	GATTCTTTGCCTTCCACTTCAT	124	52
CB19U	GATTCTTTGCCTTCCACTTCAT	CB19L2	AAGGCCTAGGATATCTTTGATTGTA	167	50
CB20RU	CAGATAAAATTCATTCCATCCATA	CB20L	TGGGGAGGGGTGCTTAGA	157	50
CB21RU	ATCCCGAYAACTATACCCC	CB21L	GAGGGCAGGGATAATTGCTAAG	167	46
CB10RU	CTCCGATCTATTCCCAAYAACT	CB10L	CCGCTACTAGGAATCAGAATA	151	46
CB16RU	CCAAACAGCGAGGAWTAATG	CB16RL	TTGGCCRATGGTGATGAAG	128	46
CB11RU	GTGGCCATCCTGTAGAAC	CB11L	ATGCCTGAGATGGGTATTA	97	56

Table S2. Database of the 55 sequences used for phylogenetic analyses.

Header	GenBank Acc. N.	cytb haplotypes (as in Bertola)	cytb haplotypes (as in Barnett)	References
Algeria_1	KJ545528.1	27		[38]
Barbary_1	KJ545524.1	24		[38]
Benin_1	KP001497.1	4		[42]
Benin_2	GU131165.1	4	C	[63]
Benin_3	GU131164.1	4	C	[63]
Botswana_1	GU131168.2	15	K	[63]
Botswana_2	GU131167.2	15	K	[63]
Botswana_3	GU131166.1	15	K	[63]
Cameroon (Benoue)_1	GU131169.1		B	[63]
Cameroon (Benoue)_2	GU131170.2	6	D	[63]
Cameroon (Waza)_1	GU131175.2	7	A	[63]
Cameroon (Waza)_2	GU131174.2	7	A	[63]
Cameroon (Waza)_3	GU131173.2	7	A	[63]
Cameroon (Waza)_4	GU131172.2	7	A	[63]
Cameroon (Waza)_5	GU131171.1	7	A	[63]
Cameroon_1	KP001493.1	8		[42]
Cameroon_2	KP001502.1	6		[42]
DRC_1	KJ652248.1	11	A	[64]
DRC_2	KP001494.1	9		[42]
DRC_3	KP001506.1	9		[42]
DRC_4	DQ018994.1	9	A	[38]
DRC_5	DQ018993.1	9	A	[38]
Ethiopia_3	AY781210.1	14	L	[38]
Ethiopia_4	AY781208.1	14	L	[38]
Ethiopia_5	AY781207.1	14	L	[38]
Guinea_1	DQ018996.2	4	C	[38]
India (Gir)_1	GU131178.2	29	E	[63]
India (Gir)_2	GU131177.1	29	E	[63]
India (Gir)_3	GU131176.1	29	E	[63]
India_1	KP001501.1	29		[42]
India_2	AY781206.1	29	E	[38]
Namibia (Zoo)_1	GU131180.1	23	P	[63]
Namibia (Zoo)_2	GU131179.1	23	P	[63]
Namibia_1	KJ652251.1	20	L	[64]
Namibia_2	KP001496.1	23		[42]
Namibia_3	KP001504.1	20		[42]
North Africa_1	KJ545527.1	27		[38]
North_1	KJ545531.1	27		[38]
North_2	KJ545532.1	27		[38]
Panthera pardus	KP001507.1			[42]
Senegal_1	KJ652247.1	1	A	[64]
Somalia (Zoo)_1	GU131182.1	13	J	[63]
Somalia (Zoo)_2	GU131181.1	13	J	[63]
Somalia_1	KP001499.1	13		[42]
Somalia_2	DQ018995.1	13	J	[38]
South Africa (Zoo)_1	GU131184.1	22	O	[63]
South Africa (Zoo)_2	GU131183.2	22	O	[63]
South Africa (Zoo)_3	GU131185.2	22	O	[63]
South Africa_1	KP001500.1	22		[42]
Tunisia_1	KJ545526.1	27		[38]
Zambia_1	KJ652250.1	16	K	[64]
Zambia_2	KP001503.1	16		[42]
Zambia_3	KP001505.1	16		[42]
Chad_1	AY781197.1	8	E	[38]
Chad_2	AY781198.1	8	E	[38]

Table S3. Sequences available in Genbank that match with the one obtained in this study.

GenBank Acc. N.	Countries	References
KP001506.1	DRC	[42]
KP001502.1	Cameroon	[42]
KP001494.1	DRC	[42]
KP202262.1	Unknown	[65]
KM374705.1	CAR	[42]
KJ652248.1	DRC	[64]
KR132589.1	Unknown	[66]
KF776494	Unknown	[67]
GU131174.2	Cameroon	[63]
GU131170.2	Cameroon	[63]
GU131171.1	Cameroon	[63]
DQ018993.1	DRC?	[68]
AY781202.1	Cameroon	[68]
AY781201.1	Angola ?	[68]
AY781200.1	Chad	[68]
AY781195.1	Morocco?	[68]
DQ022291.1	Senegal?	[68]
X82300.1	Unknown	Unknown
MW257216.1	Unknown	Hassanin, A.*

* Reference obtained from GenBank, but it is not associated with a scientific paper