



HYSTRIX
the Italian Journal of Mammalogy

A LIST OF WILD MAMMALS
BREEDING AT THE ZOO OF ROME
FROM ITS FOUNDATION (1911) TO 1991

LISTA DEI MAMMIFERI SELVATICI
RIPRODOTTISI ALLO ZOO DI ROMA
DALLA SUA FONDAZIONE (1911) AL 1991

ANDREINA D'ALESSANDRO & SPARTACO GIPPOLITI

Volume 4, No 2, 1992

A LIST OF WILD MAMMALS BREEDING AT THE ZOO OF
ROME FROM ITS FOUNDATION (1911) TO 1991

LISTA DEI MAMMIFERI SELVATICI RIPRODOTTISI ALLO ZOO DI
ROMA DALLA SUA FONDAZIONE (1911) AL 1991

ANDREINA D'ALESSANDRO (*) & SPARTACO GIPPOLITI (**)

ABSTRACT

This work is dealing with a list of **174** species of wild mammals breeding at the Roman zoo in eighty years. The authors' aims are: to provide more insight on the history of the zoo; to single out species or taxonomic groups which would be more appropriate for the zoo's future breeding programmes; to make public a first data base for conservationists and researchers.

Key words: captive breeding, wild mammals, zoological garden.

RIASSUNTO

Il presente lavoro fornisce la lista delle **174** specie di mammiferi selvatici riprodottisi allo Zoo di Roma in ottanta anni. Si vuole così: valorizzare dal punto di vista storico lo Zoo di Roma: evidenziare specie e gruppi tassonomici, che essendosi ripetutamente riprodotti in passato, sarebbero da privilegiare in futuri progetti di conservazione; fornire notizie di base a conservazionisti e studiosi.

Parole chiave: riproduzione in cattività, mammiferi selvatici, giardino zoologico.

INTRODUCTION

The *Zoo* of Rome ("Giardino Zoologico di Roma"), the most important institution of its kind in Italy and for many years holding one of the largest mammalian collections in the world, celebrated its 80th birthday in 1991.

This work wishes to make known the results obtained by the Roman Zoo in the captive breeding of wild mammalian species during its history. The results, were, for the greater part, largely unknown in Italy as well as abroad.

The aims are to contribute to a better knowledge of the Roman Zoo's history, while at the same time, to provide conservationists and zoologists with a useful database.

(*) Giardino Zoologico e Museo di Zoologia, Viale del Giardino Zoologico 20, 00197 Roma.

(**) Associazione Teriologica Italiana, C.P. 7249 - 00100 Roma.

The data on which the work is based, have been gathered and taxonomically revised from the archival material owned by the Roman Zoo. Specific (and subspecific) identification in this work follows the same which was given in the zoo's archives. Only in a few cases and in recent years (since 1980s) could we correct the original taxonomic identification thank to photographic material or by our own observations. This should explain the following incongruences with the International Zoo Yearbook births section data: the reported birth of an hybrid *Cercopithecus pogonias nigripes* x *Cercopithecus aethiops* (1985) was caused by a nomenclature error, it must be referred to a pure bred *Cercopithecus aethiops*; the reported births of *Felis tigrina* ('81-'83, '84, '85), *Cervus douvaceli* ('83-'85) and *Cephalophus natalensis* ('77-'81, '83, '84) must be referred to *Felis bengalensis*, *Cervus nippon hortulorum* and *Cephalophus rufilatus* respectively. The families were arranged in the list according to Corbet & Hill (1986), while the nomenclature generally followed the more recent and reliable taxonomic revision of each group. In a few cases, pending agreement between specialist, the original nomenclature has been conserved also if it is not accepted nowadays (e.g. *Genetta dongolana tedescoi* De Beaux, 1924).

Regrettably, no materials of the first twelve years (1911-1923) were found, except for a few annual reports.

For some periods the records are very scanty (e.g. during Second World War), so we can suppose that our list is not absolutely exhaustive, as some births have probably not been recorded in the zoo's archives. It should also be noted that when only the generic name is given (e.g. *Redunca* sp.) more than one taxon could be involved.

The following domestic animals are not included in the list:

Dingo, Ferret, Domestic Ass, Tarpan, Camel, Lama, Domestic Reindeer, Yack, Domestic Buffalo, Zebu, Goat, Soay Sheep etc.). Instead, we have included hybrids between wild species and between domestic and wild forms. In the list, the years in which the species were bred follow after the scientific and English name of each species.

If the species has been breeding continuously for three years or more, only the first and the last years are given, divided by a dash (e.g. '31-'34). The question mark (?) after one year means an uncertain birth or unclear species identification. Asterisk (*) denotes an abortion.

Further details such as the number of animals born each year, the number of animals surviving the first thirty days, and the date of births are not given here. However, one of the authors (D'Alessandro) has gathered such information for a limited number of endangered species.

These data were published in the respective International Studbooks approved by the International Union of Directors of Zoological Gardens (e.g. Drill, Malayan Tapir, Banteng).

TAXONOMIC LIST

MACROPODIDAE

- Petrogale* sp. Rock wallaby ('61,'62)
Mucropus agilis (Gould, 1842) Sand wallaby ('50,'51)
Mucropus dorsalis (Gray, 1837) Rock-striped wallaby ('36,'38)
Macropus eugenii (Desmarest, 1817) Tammar wallaby ('75)
Macropus giganteus (Zimmermann, 1777) Eastern grey kangaroo ('14,'36?, '40?, '42?, '69)
Macropus panna (Waterhouse, 184) Parma wallaby ('82-'85)
Mucropus robustus cervinus Thomas, 1900 Deer wallaroo ('14,'26-'28,'43,'52-'54,'56)
Mucropus robustus erubescens Sclater, 1870 Common wallaroo ('81)
Mucropus rufogriseus (Desmarest, 1817) Red-necked wallaby ('26,'27,'66,'68-'70,'74,'75,'78,'88)
Macropus rufus (Desmarest, 1882) Red kangaroo ('27,'29,'30?, '33,'37,'41,'58,'60-'66)
Mucropus rufus x *Mucropus giganteus* Red kangaroo x Eastern grey kangaroo ('36)

DASYPODIDAE

- Euphractus sexcinctus* (L., 1758) Six-banded armadillo ('30)
Armadillo, gen. sp. ('42,'43)

PTEROPODIDAE

- Pteropus* sp. Flying fox ('60)

LEMURIDAE

- Lemur catta* L., 1758 Ring-tailed lemur ('35-'38,'52,'62-'66)
Eulemur fulvus E. Geoffroy, 1812 Brown lemur ('24,'27,'30,'31,'37-'42,'49-'52)
Eulemur macaco macaco L., 1776 Black lemur ('11,'14)
Varecia variegata variegata (Kerr, 1792) Ruffed lemur ('38)

LORISIDAE

- Galago moholi* A. Smith, 1836 South African lesser bushbaby ('61-'63)

CALLITHRICIDAE

- Callithrix jacchus* (L., 1758) Common marmoset ('91*)
Leontopithecus rosalia (L., 1766) Golden lion tamarin ('37)

CEBIDAE

- Cebus apella*⁽¹⁾ (L., 1758) Black-capped capuchin ('37,'39-'43,'45,'49,'53,'61,'63,'64?, '73,'75,'77-'84,'85-'91)
Cebus capucinus (L., 1758) White-throated capuchin ('37,'46?, '47)

CERCOPITHECIDAE

- Mucucu arctoides* (Geoffroy, 1831) Bear macaque ('14,'35,'36,'52?, '53,'75-'77,'79,'81)
- Macaca fascicularis* (Raffles, 1821) Crab-eating macaque ('14,'27,'37-'39,'75-'79,'82-'84,'86,'87,'89,'91)
- Mucucu fascicularis* x *Mucucu mulatta* Crab-eating macaque x Rhesus macaque ('80)
- Macaca fuscata fuscata* (Blyth, 1875) Japanese macaque ('77-'91)
- Mucucu mulatta* (Zimmermann, 1780) Rhesus macaque ('24-'26,'29,'33,'40,'41,'44-'47,'49?, '50-'52,'57,'60,'61,'64,'65,'69,'78)
- Macaca mulatta* x *Macaca fascicularis* Rhesus macaque x Crab-eating macaque ('37)
- Macaca nemestrina* (L., 1766) Pigtail macaque ('78-'80,'84)
- Mucucu nemestrina nemestrina* (L., 1766) Sundaic pigtail macaque ('80,'81)
- Macaca nemestrina leonina* (Blyth, 1863) Indochinese pigtailed macaque ('83,'84)
- Mucucu nemestrina* x *Pupio hamadryas* Pigtail macaque x Hamadryas baboon ('40)
- Macaca ochreata* ⁽²⁾ Olgiby, 1840 Sulawesi booted macaque ('14,'71)
- Macaca silenus* (L., 1758) Liontail macaque ('34,'35)
- Mucucu sinica* (L., 1771) Toque macaque ('28)
- Mucucu sinica* x *Macaca fascicularis* Toque macaque x Crab-eating macaque ('24)
- Macaca nigra* (Desmarest, 1822) Celebes ape ('35,'38)
- Cercocebus atys atys* (Audebert, 1797) Sooty mangabey ('65)
- Cercocebus atys lunulatus* (Temminck, 1853) White-crowned mangabey ('35,'91)
- Cercocebus torquatus* (Kerr, 1792) White-collared mangabey ('42)
- Cercocebus torquatus* x *Cercocebus atys atys* White-collared mangabey x Sooty mangabey ('37,'38)
- Cercocebus torquatus* x *Pupio leucophaeus* White-collared mangabey x Drill ('54,'55)
- Cercocebus torquatus* x *Mandrillus sphinx* White-collared mangabey x Mandrill ('52)
- Cercocebus* sp. Mangabey ('25*)
- Pupio cynocephalus* (L., 1766) Yellow baboon ('29-'31, '33-'37,'43)
- Pupio cynocephalus* x *Pupio hamadryas* Yellow baboon x Hamadryas baboon ('37,'79,'80,'83-'88)
- Pupio hamadryas* (L., 1758) Hamadryas ('14,'24-'30,'33,'35,'38,'40-'45,'58,'60,'61,'63-'66,'68-'71,'73-'85,'87,'88)
- Mandrillus leucophaeus* (Cuvier, 1807) Drill ('57,'58)
- Mandrillus sphinx* (L., 1758) Mandrill ('24,'25, '35,'39,'45,'48-'50,'60-'73,'76,'78-'82,'85-'87)
- Mandrillus sphinx* x *Pupio hamadryas* Mandrill x Hamadryas baboon ('36,'37)
- Theropithecus gelada* (Ruppell, 1831) Gelada ('42)
- Cercopithecus aethiops* ⁽³⁾ (L., 1758) Green monkey ('14,'29,'30,'35-'40,'42-'49,'52,'54,'56-'58,'60-'62,'64,'66-'69,'72,'73,'76-'79,'85)
- Cercopithecus albogularis* (Sikes, 1831) Sykes' monkey ('52,'54*)
- Cercopithecus albogularis* x *Cercopithecus hamlyni hamlyni* Pocock, 1907 Sykes' monkey x Owl-faced monkey ('84*,'85)
- Cercopithecus mona* (Schreber, 1775) Mona monkey ('42)
- Cercopithecus ascanius schmidti* (Matschie, 1892) Schmidt's guenon ('64)
- Erythrocebus patas pyrrhonotus* (Hemprich & Ehrenberg, 1829) Patas monkey ('39-'42)

PONGIDAE

- Pongo pygmaeus* (L., 1760) Orang-utan ('40,'64*,'70,'72,'83,'85,'87,'89)
Pongo pygmaeus abeli Lesson, 1827 Sumatran orang-utan ('30,'31)
Pun troglodydes Blumenbach, 1799 Chimpanzee ('32)
Gorilla gorilla gorilla (Savage & Wyman, 1847) Lowland-western gorilla ('80)

CANIDAE

- Canis aureus* L., 1758 Golden jackal ('28,'29,'36,'37,'39,'40,'42?-'46?,'49,'53,'54)
Canis latrans Say, 1823 Coyote ('36,'37)
Canis lupus L., 1758 Wolf ('27,'29,'39,'44,'82-'85,'87)
Canis lupus L., 1758 x *Canis lupus pallipes* Sikes, 1831 Wolf x Indian wolf ('81)
Canis lupus italicus Altobello, 1921 Italian wolf ('36,'46,'66)
Canis lupus tundrorum Miller, 1912 x *Canis lupus occidentalis* Richardson, 1829 Alaskan wolf x Mackenzie Valley wolf ('79-'81,'84,'85)
Canis familiaris dingo Blumenbach, 1780 x *Canis lupus* Dingo x Wolf ('48,'49,'50,'51,'52,'53)
Canis mesomelas Schreber, 1778 Black-backed jackal ('60,'61)
Atopex lagopus (L., 1758) Artic fox ('73)
Vulpes vulpes L., 1758 Red fox ('48,'50,'51,'54,'77)
Vulpes zerda (Zimmermann, 1780) Fennec fox ('82)
Lycyon pictus (Temminck, 1820) African hunting dog ('83-'86,'88-'90)
Otocyon megalotis (Desmarest, 1821) Bat-eared fox ('83)
Chrysocyon brachyurus (Illiger, 1815) Maned wolf ('91)

URSIDAE

- Selenarctos thibetanus* G. Cuvier, 1823 Asiatic black bear ('85,'87)
Ursus americanus Pallas, 1780 American black bear ('36,'37,'39,'78-'90)
Ursus arctos L., 1758 Brown bear ('24-'26,'28,'29,'30,'32,'36-'39,'52-'62,'64,'80-'90)
Ursus arctos synacus Hemprich & Ehrenberg, 1828 Syrian brown bear ('63)
Thalarctos maritimus Phipps, 1774 Polar bear ('35-'37,'40,'55,'56,'58,'61,'64)
Melursus ursinus (Shaw, 1791) Sloth bear ('54,'59)

PROCYONIDAE

- Bassariscus astutus* (Lichtenstein, 1830) Ring-tailed cacomistle ('59)
Procyon lotor (L., 1758) Common racoon ('41,'49,'50,'52-'61,'86,'87,'89,'90)
Nasua nasua (L., 1766) Coati ('64,'65,'68,'75,'83,'84*,'86)
Nasua narica (L., 1766) White-nosed coati ('35? '36)
Potos flavus (Schreber, 1774) Kinkajou ('75)

MUSTELIDAE

- Meles meles* (L., 1758) Eurasian badger ('57,'63)
Mephitis mephitis (Schreber, 1776) Striped skunk ('83,'84)

VIVERRIDAE

- Genetta genetta* (L., 1758) Small spotted genet ('50,'57,'59,'61)
Genetta dongolana tedescoi ⁽⁴⁾ De Beaux. 1924 Somalian genet ('29,'36)
Viverra civetta (Schreber, 1776) African civet ('83)
Paguma larvata (H. Smith, 1827) Masked palm civet ('73)

HYAENIDAE

- Hyaena hyaena* (L., 1758) Striped hyaena ('31)

FELIDAE

- Felis bengalensis* Kerr. 1792 Leopard cat ('81,'83-'85)
Felis caracal (Schreber, 1776) Caracal ('35-'37,'77-'81)
Felis concolor (L., 1771) Puma ('29-'32,'35,'36,'39-'42,'46,'59,'61,'62,'64-'67,'68-'71,'73-'76,'82-'85)
Felis pardalis (L., 1758) Ocelot ('67)
Felis serval Schreber. 1776 Serval ('85,'87,'88)
Felis viverrina Bennett, 1833 Fishing cat ('52-'57)
Lynx lynx (L., 1758) Eurasian lynx ('78?,'88,'91)
Lynx lynx wrangeli Ognev, 1928 Siberian lynx ('83,'85,'87,'88-'91)
Lynx rufus (Schreber, 1776) Bobcat ('73,'75-'77)
Panthera leo ⁽⁵⁾ (L., 1758) Lion ('14,'24,'27-'33,'35-'43,'45-'69,'73-'86,'88-'91)
Panthera leo persica (Meyer, 1826) x *Panthera leo* Asiatic lion x African lion ('37,'38)
Panthera onca Fitzinger, 1869 Jaguar ('34,'36,'37,'40,'62,'65,'87)
Panthera onca var. *melanica* Black jaguar ('83-'86)
Panthera pardus ⁽⁶⁾ (L., 1758) Leopard ('26,'28,'30-'38,'40,'42,'43,'51,'52,'54,'55,'58,'59,'61-'71,'73-'79,'80-'87)
Panthera pardus japonensis (Gray, 1862) Chinese leopard ('37,'80,'82,'84)
Panthera pardus nanopardus (Thomas, 1904) Somalian leopard ('31,'34,'36,'37,'39)
Panthera pardus saxicolor Pocock, 1927 Persian leopard ('90,'91)
Pantherapardus tulliana ⁽⁷⁾ (Valenciennes, 1856) Anatolian leopard ('36-'38,'40,'41,'43)
Panthera pardus var. *melanica* (L., 1758) Black leopard ('34,'37,'39,'56-'59,'61,'69,'73-'75,'83-'86,'88,'89,'91)
Panthera tigris tigris (L., 1758) Bengal tiger ('25,'27,'29,'31,'33,'38-'42,'57,'58,'62,'74,'76-'85)
Panthera tigris altaica (Temminck, 1845) Amur tiger ('39,'40,'79-'84,'86,'88,'89,'91)

OTARIDAE

Zalophus californianus (Lesson, 1828) Californian sealion ('39,'49,'60,'62,'65)

Otaria byronia Peters, 1866 South American sealion ('82-'87)

PHOCIDAE

Monachus monachus ⁽⁸⁾ (Hermann, 1779) Mediterranean monk seal ('31*)

ELEPHANTIDAE

Elephas maximus L., 1758 Indian elephant ('48,'50,'53*,'55)

EQUIDAE

Equus africanus africanus (Fitzinger, 1858) x *Equus asinus* L., 1758 Nubian wild ass x Domestic ass ('39,'41,'47)

Equus africanus taeniopus ⁽⁹⁾ Heuglin, 1861 Eritrean wild ass ('35,'36,'39,'40,'42,'45*,'46,'47*,'49-'54,'56)

Equus grevyi Oustalet, 1882 Grew's zebra ('18,'25,'26,'51,'53,'54,'56,'59,'60,'80,'81*,'84,'88,'89)

Equus burchelli bohemi Matschie, 1892 Grant's zebra ('35,'36)

Equus burchelli chapmani (Gray, 1824) Chapman's zebra ('35,'36,'60,'62,'82-'86,'89)

Equus przewalskii Poliakov, 1881 x *Equus caballus* L., 1758 Prezwalski's wild horse x Domestic horse ('44,'50,'51,'52,'53,'54,'56)

Equus kiang Moorcroft, 1841 x *Equus asinus* **Kiang** x Domestic ass ('43,'45)

Equus onager kulan (Groves & Mazak, 1967) Kulan ('83-86,88-'91)

TAPIRIDAE

Tapirus indicus Desmarest, 1819 Malayan tapir ('34,'36,'38,'40,'41,'43,'68,'71,'72*,'74,'76*)

Tapirus terrestris (L., 1766) Brazilian tapir ('54,'56,'59,'61,'62,'64,'84**85,'87,'90)

RHINOCERONTIDAE

Diceros bicornis (L., 1758) Black rhinoceros ('80)

PROCAVIDAE

Procavia syriaca ruficeps (Hemprich & Ehrenberg, 1832) Rock hyrax ('59,'60,'61,'63)

SUIDAE

Sus scrofa (L., 1758) Wild boar ('37-'40,'43-'48 '55-'59,'62,'70-'88)

Sus scrofa meridionalis Major, 1883 Sardinian wild boar ('24-'31,'33,'34,'36,'38,'40-'43)

Phacochoerus aethiopicus (Pallas, 1767) Wart hog ('43,'44)

TAYASSUIDAE

Tayassu pecari (Link, 1795) White-lipped peccary ('50)

Tayassu tajacu (L., 1758) Collared peccary ('2.5)

HIPPOPOTAMIDAE

Hippopotamus amphibius (L., 1758) Hippopotamus ('86-'90)

Choeropsis liberiensis (Morton, 1844) Pigmy hippopotamus ('86-'88,'91)

CAMELIDAE

Lama guanicoe (Muller, 1776) Guanaco ('36-'40,'42,'46,'48,'51-'66,'69,'70,'72-'74,'76-'91)

Camelus bactrianus bactrianus x *Camelus dromedarius* Bactrian camel x Dromedary ('38)

Camelus dromedarius L., 1758 Dromedary ('24-'29,'31,'33,'35-'38,'40,'41,'43,'44,'58,'68,'69,'71,'74,'76,'77)

TRAGULIDAE

Tragulus javanicus (Osbeck, 1765) Lesser Malay chevrotain ('39,'40)

Tragulus meminna (Erxleben, 1777) Indian spotted chevrotain ('38,'39)

CERVIDAE

Muntiacus muntjak (Zimmermann, 1780) Indian muntjac ('38,'40-'43,'64-'90)

Axis axis (Erxleben, 1777) Axis deer ('14,'25,'29-'34,'37-'41,'49-'66,'68,'70-'91)

Dama dama (L., 1758) Fallow deer ('14,'23-'30,'32-'39,'50-'57,'59,'60,'67,'74-'91)

Cervus douvacei Cuvier, 1823 Swamp deer ('36)

Cervus elaphus L., 1758 Red deer ('14,'25,'26,'29,'36-'38,'42,'45,'49,'56,'61-'78,'80-'86,'88,'91)

Cervus elaphus corsicanus Erxleben, 1777 Sardinian red deer ('27-'29,'32,'33,'35-'42)

Cervus curiadensis Erxleben, 1777 Wapiti ('36,'61,'62,'64,'68,'81,'82,'85)

Cervus nippon Temminck, 1838 Sika deer ('14,'51,'53,'54,'56)

Cervus nippon hortulorum Taczanowski, 1878 Dybowski's sika deer ('83-'87,'89-'91)

Cervus nippon pseudoaxis (Gray, 1861) Indochina sika ('42,'43?,'44?)

Cervus porcinus (Zimmermann, 1780) Hog deer ('60-'82,'84-'87)

Cervus unicolor Kerr, 1792 Sambar (36-'43,'47)

Cervus unicolor x *Cervus elaphus* Sambar x Red deer ('25)

Cervus timorensis mtoluccensis (Quoy & Gaimard, 1830) Moluccan rusa deer ('24,'25,'28,'30,'31,'33,'34,'38,'42)

Elaphurus davidianus Milne-Edwards, 1866 Pere David's deer or Milu ('58,'63,'66,'84,'85,'87,'88)

Alces alces (L., 1758) Moose ('34-'37)

Odocoileus bezoarticus (L., 1776) Pampas deer ('38)

Odocoileus virginianus (Zimmermann, 1780) White-tailed deer ('61,'63)

Mazama sp. Brochet ('35-'40)

Capreolus capreolus L., 1758 Roe deer ('37,'51,'58)

GIRAFFIDAE

Giraffa camelopardalis (L., 1758) Giraffe ('36,'38,'39,'42,'53,'56,'58,'60,'61,'63,'65-'68,'73-'75,'79,'80,'82)

BOVIDAE

Tragelaphus imberbis (Blyth, 1869) Lesser kudu ('36-'39,'56-'63,'65-'68)

Pugeluphus imberbis x *Tragelaphus spekei* Lesser kudu x Sitatunga ('67)

Tragelaphus oryx (Pallas, 1766) Common Eland ('32-'39,'41,'58-'60,'62,'63,'65-'86,'88,'91)

Tragelaphus oryx livingstoni Lydekker, Sharpe & Jackson, 1899 Livingstone's eland ('30,'33)

Tragelaphus scriptus (Pallas, 1766) Bushbuck ('60-'63)

Tragelaphus scriptus meneliki ⁽¹⁰⁾ (Neumann, 1902) Menelik's bushbuck ('33-'35)

Tragelaphus spekei Sclater, 1864 Sitatunga ('37,'38,'40-'43,'46,'48,'49,'62,'63,'68,'75,'77-'89)

Tragelaphus spekei x *Tragelaphus scriptus* Sitatunga x Bushbuck ('37)

Tragelaphus strepsiceros (Pallas, 1766) Greater Kudu ('33-'35,'38,'63,'67)

Boselaphus tragocamelus (Pallas, 1776) Nilgai ('25-'28,'36,'38-'40,'50,'51,'53,'55,'57,'58,'60,'74-'77,'80-'84,'86,'88,'90,'91)

Tetraceros quadricornis (De Blainville, 1866) Four-horned antelope ('39,'41,'43)

Bos gaurus H. Smith, 1827 Gaur ('43,'46,'47)

Bos javanicus D'Alton, 1823 Banteng ('66-'91)

Syncerus caffer caffer (Sparrman, 1779) x *Syncerus caffer brachyceros* (Gray, 1837) Cape buffalo x Sudan buffalo ('34)

Bison bison (L., 1758) American bison ('28,'30,'32,'33,'35,'36,'46-'48,'53,'54,'58,'60,'61,'65-'68)

Bison bison x **Bison bonasus** American bison x Wisent ('34,'41,'42,'48)

Bison bonasus L., 1758 Wisent ('53,'54,'56,'57,'60,'62-'68,'70-'75)

Cephalophus nufilatus Gray, 1846 Red flanked duiker ('63-'67,'69,'77-'81,'83,'84)

Sylvicapra grimmia (L., 1758) Common duiker ('29,'36,'59)

Kobus ellipsiprymnus (*ellipsiprymnus* group) Olgiby, 1833 Common waterbuck ('29,'31,'33,'36,'37,'43,'45,'57,'61-'70,'72-'76,'82)

Kobus ellipsiprymius (*defassa* group) (**Ruppell**, 1835) Defassa waterbuck ('36,'39,'57,'61,'63-'68,'70)

Kobus kob (Erxleben, 1777) Kob ('39,'40,'42)

Kobus kob x **Kobus kob thomasi** Kob x Uganda kob ('66)

Kobus kob thomasi Sclater, 1864 Uganda kob ('60,'61,'63,'65,'66,'68,'71,'72,'75,'76)

Kobus leche (Gray, 1850) Lechwe ('35,'38-'40,'43)

Kobus megaceros Fitzinger, 1855 Nile Lechwe ('59,'60,'62,'63,'65,'66,'68-'91)

Redunca sp. Reedbuck ('45-'47,'59)

Hippotragus niger (Harris, 1838) Sable antelope ('68,'71)

- Oryx dammah* (Cretschmar, 1826) Scimitar oryx ('36,'37,'39,'40,'43,'64,'65)
- Oryx gazella gazella* (L., 1758) Gemsbok ('29,'31,'33,'37,'39,'61,'63-'67,'83-'87,'91)
- Oryx gazella beisa* (Ruppell, 1835) Beisa oryx ('29,'31,'33,'37,'39,'61,'63-'67)
- Connochaetes gnou* (Zimmermann, 1780) White-tailed gnu ('33,'35,'60,'62,'67)
- Connochaetes taurinus taurinus* (Burchell, 1823) Brindled gnu ('32,'39,'63-'66,'70,'73,'84-'86)
- Connochaetes taurinus albojubatus* Thomas, 1892 White bearded gnu ('40,'53,'54,'55-'58,'60,'65,'76,'83,'85)
- Connochaetes taurinus albojubatus* x *Connochaetes t. taurinus* White bearded gnu x Brindled gnu ('81,'82)
- Alcelaphus buselaphus cokii* Gunther, 1844 Kongoni ('63,'65,'66,'68)
- Damaliscus dorcas philippii* Harper, 1939 Blesbok ('32,'38,'59,'61-'63,'65,'66)
- Aepyceros melampus* (Lichtenstein, 1812) Impala ('41,'42,'63-'67,'69,'73,'74)
- Antilope cervicapra* (L., 1758) Blackbuck ('14,'25-'28,'30-'38,'40,'41,'43-'46,'50-'63,'80-'91)
- Antidorcas marsupialis* (Zimmermann, 1780) Spingbok ('61)
- Gazella gazella arabica* ⁽¹¹⁾ (Lichtenstein, 1827) Arabian gazelle ('50,'51)
- Gazella dorcus* (L., 1758) Dorcas gazelle ('26,'35-'37,'40-'42,'60-'63,'65,'73,'74?)
- Gazella dorcus isabella* Gray, 1846 Isabelline gazelle or Eritrean gazelle ('56,'57)
- Gazella rufifrons tilonura* (Heuglin, 1863) Heuglin's gazelle ('30,'55,'56,'59-'61,'63)
- Gazella soemmerringi* (Cretschmar, 1826) Sommering's gazelle ('33,'61-'66)
- Gazella subgutturosa* (Guldenstaedt, 1780) Goitred gazelle ('38,'39,'61,'62)
- Rupicapra rupicapra rupicapra* (L., 1758) Alpine chamois ('33,'36,'37,'52,'91)
- Hemitragus jemlahicus* H. Smith, 1826 Himalayan tahr ('33-'37,'39-'43,'45-'48,'63,'67,'69,'71,'82-'84,'86,'88-'91)
- Capra falconeri* (Wagner, 1858) Markhor ('86?,'87)
- Capra ibex iber* L., 1758 Alpine ibex ('35-'38,'40,'63,'85-'87)
- Capra ibex ibex* x *Capra hircus* Alpine ibex x Domestic goat ('33,'37,'38,'40)
- Capra ibex iber* x *Hemitragus jemlahicus* Alpine ibex x Himalayan tahr ('39)
- Capra ibex sibirica* Pallas, 1776 Siberian ibex ('52,'54)
- Ammotragus lervia* (Pallas, 1777) Barbary sheep or Aoudad ('61,'77-'80,'82-'86)
- Ammotragus lervia fassini* Lepri, 1930 Lybian barbary sheep ('31-'34,'36,'38-'49)
- Ovis canadensis* Shaw, 1804 American Bighorn ('38)
- Ovis orientalis musimon* (Pallas, 1811) Sardinian mouflon ('14,'25,'28-'30,'32-'46,'50,'51,'62-'71,'73-'91)
- Ovis vignei* Blyth, 1841 Urial ('42)

CASTORIDAE

- Castor canadensis* Kuhl, 1820 American beaver ('58-'60,'77)

HYSTRICIDAE

- Hystrix cristata* L., 1758 Crested porcupine ('24-'28,'50,'53,'54,'56-'58,'73-'75,'77,'79,'80,'83)

CAVIDAE

Dolichotis patagonum (Zimmermann, 1780) Patagonian mara ('26-'29,'31,'36,'65,'74,'75,'83,'84)

DASYPROCTIDAE

Agouti paca (L., 1758) Spotted paca ('25,'26,'64)

Dasyprocta aguti (L., 1766) Golden agouti or Brazilian agouti ('34,'36,'40,'41)

Dasyprocta sp. Agouti ('43,'45-'49,'64,'66,'69,'70)

CHINCHILLIDAE

Chinchilla laniger (Molina, 1782) Long-tailed chinchilla ('64,'65,'77)

MYOCASTORIDAE

Myocastor coypus (Molina, 1782) Coypu ('34,'50,'58,'62,'63,'65,'66,'75-'78,'86-'87)

NOTES

- (1) Since 1985 on research loan to the "Istituto di Psicologia Comparata del C.N.R." of Rome.
- (2) Based on morphological features the specific identification of the specimen born in 1971 is uncertain between *maura* and *ochreata*.
- (3) *C. aethiops* here includes *tantalus*, *sabaeus* and *pygerythrus*.
- (4) Given the lack of consensus about the taxonomy of the genus *Genetta* we prefer to maintain the original denomination of this taxon used in the zoo records.
- (5) Should be noted that till the **Second** World War almost only the Somalian lions were represented in the collection.
- (6) Probably all births in the pre-war periods should be referible to *Panthera pardus nanopardus*.
- (7) Subspecific identification uncertain. The vernacular name used in the archives "Pantera di Corea" could mean they were in fact *Panthera pardus orientalis*.
- (8) The death of a recently wild-caught female was caused by overgrowth of two foetus.
- (9) *taeniopus* is of dubious taxonomic value. The Rome Zoo stock seems to be of domestic origin.
- (10) Subspecific identification uncertain. A mounted specimen of zoo origin in the "Museo Civico di Zoologia di Roma" seems to belong to *T. s. decula*.
- (11) Groves (1983) considers *arabica* a full species endemic of the Farasan Island (Red Sea). It is likely that the Rome Zoo stock must be referred to the mainland widespread form *Gazella g. cora*

DISCUSSION

The recording of accurate information about each specimen must be considered of fundamental importance for every zoological garden directed according strict scientific criteria.

The "Menagerie" of the "Jardin des Plantes" (Paris) maintains records of his collection from 1808; the Berlin Zoological Gardens from 1845 (Jones, 1986); the Zoological Society of London's records go back to 1828, the year of its foundation,

and there the births' records provided the data for a classic work by Zuckerman (1953) about "The breeding season of mammals in captivity".

The maintenance of data for such long periods clearly represents an historic and scientific patrimony of great value.

Furthermore, the genetic and demographic management of self-sustaining captive population on an international basis is nowadays only possible thanks to the existence of accurate records for each specimen. The development of various computer systems dealing with the management of captive populations for conservation purpose is discussed in detail by Flessness & Mace (1988).

Going back to the Roman Zoo history, poor records and lack of scientific publications have in many cases prevented the full scientific use of the mammalian collection. The African wild asses held in Rome in the period 1925-50, for example, could not be included in a recent taxonomic revision of the species (Schlawe, 1980) for the inadequate materials preserved. However it must be noted that zoo specimens conserved in the "Museo Civico di Zoologia di Roma" have never been properly examined and studied.

Our work has sought to light some very interesting breeding results of the Roman Zoo, which not only have never been published, but are sometimes overlooked by the Roman Zoo staff itself. This is the case of the first orangutang birth in the Roman Zoo (1930); the fifth known birth of the species in captivity in the world.

Other notable births which appear to be world firsts, according to the data of Jones (1986), are those of *Macaca ochreata* (1914), *Erythrocebus patas* (1939) and *Cercopithecus ascanius* (1964).

In general, the strong link between the Roman Zoo and the ex-Italian colonies before Second World War should be stressed. This led in those years to the formation of breeding groups of many populations still little known from a taxonomic point of view and nowadays threatened in the wild (e.g. Somalian leopard, Somalian lion, African wild ass, Lybian barbary sheep etc.). Incidentally, the beginning of the war surprised an expedition in Ethiopia lead by Dr. Taibel, which should have brought a group of antelopes, including the legendary Mountain Nyala *Tragelaphus buxtoni* to Rome (Taibel, 1949).

Ungulates have been the prominent feature of the Roman Zoo mammalian collection. But the rigors of the Second World War and then in 1949 the outbreak of rinderpest, signed the end of important stocks: further information about the history of the Rome Zoological Garden can be found in Florio & Mangili (1984).

The list shows the breeding records of 174 pure breed species which belong to 37 families and 11 orders and those of all hybrids. Bovidae, with 42 species, is the most represented family (fig. 1); four families (Cercopithecidae, Felidae, Cervidae and Bovidae) contributed to more than half, 92 out of 174, of the total breeding species. Some orders are few or not at all represented (Chiroptera, Rodentia, Marsupialia other than Macropodidae). This probably reflects the absence of a "Small Mammal House" or "Night House" in the Roman zoo where small nocturnal mammals could be exhibited in a more appropriate way, as is usually done by other urban zoos abroad.

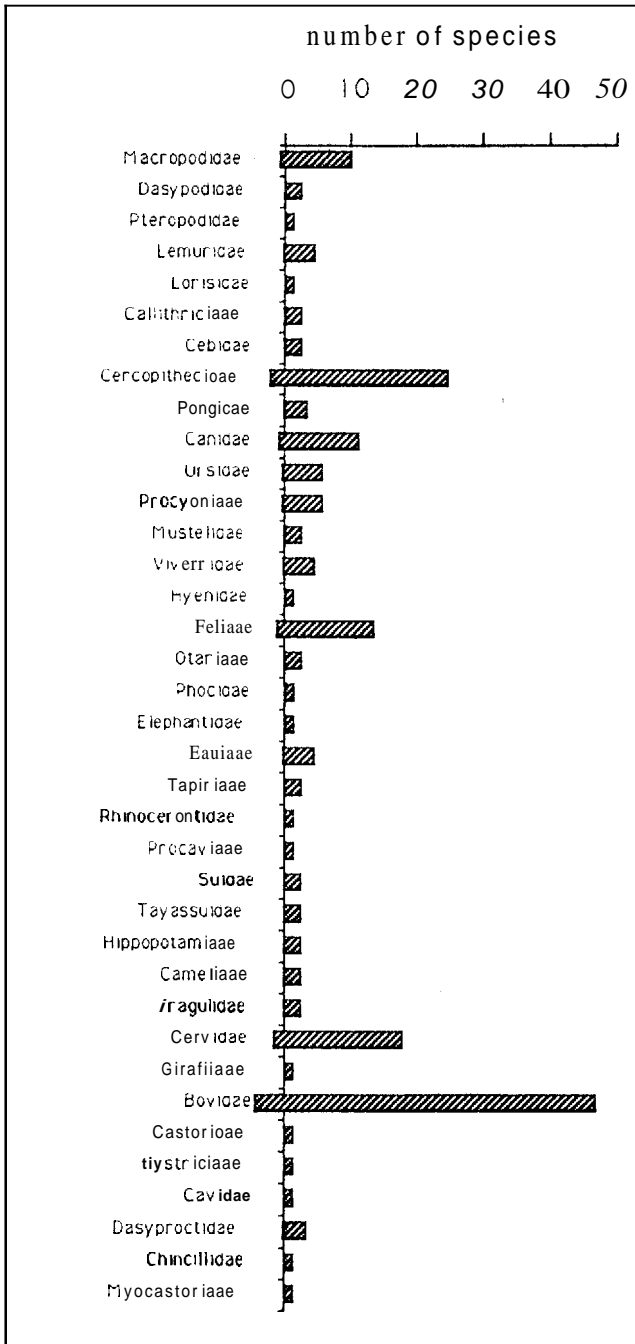


Fig. 1 - The contribution (species number) of each family to the list.

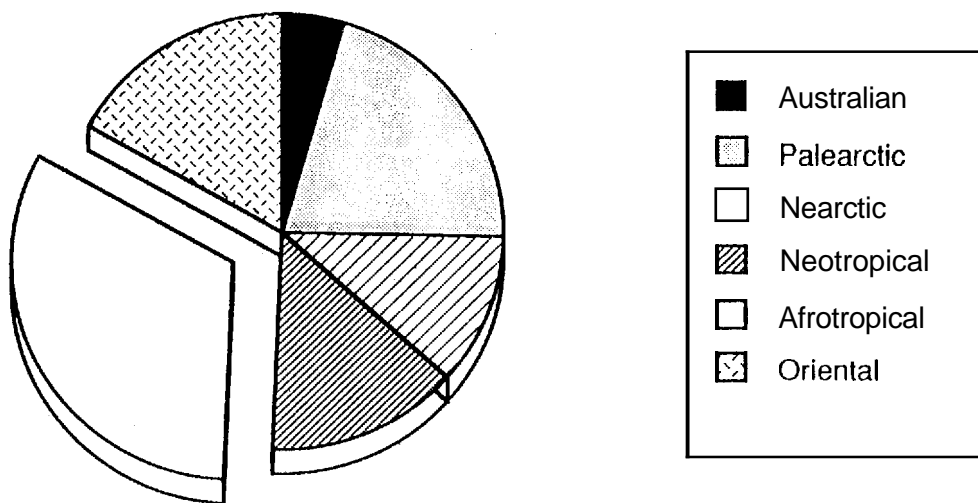


Fig. 2 - Zoogeographical analysis of the species included in the list (hybrids not included).

The result of our analysis indicate that the most represented Zoogeographical Region is the Afrotropical one with 32,4%, followed by the Palearctic one with 20.9% (fig.2). These results are a bit different with the zoogeographical analysis of the present mammals collection (Cignini & D'Alessandro, 1992) where the Palearctic Region is the most represented (27,4%), followed by the African Region (Afrotropical +North Africa) with the 25%.

The past historical preponderance of African elements in the mammalian collection of the Roman Zoo, due to both political **and** geographical factors , in our opinion, must be carefully considered in future master plans aimed **at** improving the scientific and educative value of the Rome Zoological Garden.

ACKNOWLEDGEMENTS

We are grateful to Drs. Giuseppe M. Carpaneto, Bruno Cignini and Vincenzo Vomero for their helpful comments on the manuscript. We are also indebted to Ms. B. Quinn for improving the English text.

REFERENCES

- CIGNINI B. & D'ALESSANDRO A. 1992. Lo Zoo di Roma e le sue collezioni al 1989. *Museol. sci.*, VIII: 97-119.
- CORBET G.B. & HILL J.E. 1986. A world list of mammalian species. British Museum (Natural History) London, 254 pp.
- FLESSHNESS N.R. & MACE G.H. 1988. Population databases and zoological conservation. *Int. Zoo Yb.*, 27: 42-49.
- FLORIO P.L. & MANGILI G. 1984. Lo Zoo di Roma oggi. I suoi primati. Programmi e prospettive per il domani. *In*: AA.VV." La nostra Arca di Noè. Storia e prospettive dello Zoo di Roma". Marsilio Editori, Venezia: 51-56.
- GROVES C.P. 1983. Notes on gazelles IV. The Arabian gazelles collected by Hemprich and Ehrenberg. *Z. Saugetierk.*, 48: 371-381.
- JONES M.L. 1986. Successes and Failures of Captive Breeding. *In*: Benirschke K. (ed.) "Primates the Road to Self-Sustaining Populations" Springer Verlag, New York: 251-260.
- SCHLAWE L. 1980. Kritisches zur Nomenklatur und Taxonomischen Beurteilung von *Equus africanus* (Fitzinger, 1858). *Equus*, (1)2: 101-127.
- TAIBEL A.M. 1948. Osservazioni biologiche sopra tre giovani esemplari di Nyala di monte *Tragelaphus buxtoni*. Lid. allevati per la prima volta in cattività'. *Boll. Zool.*, (4-5-6) XV: 123-144.
- ZUCKERMAN S. 1953. The breeding season of mammals in captivity. *Proc. Zool. Soc. Lond.*, 122 827-950.