

CHAPTER 3

The Miocene

3.1 MIOCENE MAMMALS

During the Miocene only one extinct Order, Creodonta, is represented in southern Africa, but the total number of Orders rose to 14, with only the Soricomorpha (shrews) and Pholidota (pangolins) not present. This epoch is notable for having the largest number of families, of which slightly more than a third are extinct (Table 1.1), and for the diversity of elephants (Proboscidea), of which there are nine genera and eight species in four families. The Rodentia continued to be the most diverse Order, with 36 genera and 41 species in 12 families. Next most diverse at the family level, with six families each, are the Chiroptera (bats), Carnivora (carnivores) and Artiodactyla (even-toed ungulates), the first two of which appeared for the first time.

ORDER: AFROSORICIDA
Suborder: Tenrecomorpha
FAMILY: TENRECIDAE

†*Promicrogale namibiensis* Pickford, 2018. *Comm. Geol. Surv. Namibia* 18: 88, 89.

Type locality: Elisabethfeld.

Comments: Pickford (2018d) places the Tenrecidae in Order Soricomorpha, but points out (personal communication, 2018) that there is considerable disagreement on the allocation of this family. For now, Wilson and Reeder (2005) are followed in placing Tenrecidae in Afrosoricida.



Subfamily: †Protenrecinae

†*Protenrec butleri* Mein and Pickford, 2003. *Mem. Geol. Soc. Namibia* 19: 145.

Type locality: Arrisdrift.

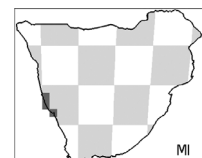
Additional references: Butler and Hopwood, (1957); Mein and Pickford (2008a).



Suborder: Chrysochloridea
FAMILY: CHRYSOCHLORIDAE
Subfamily: †Prochrysochlorinae

†*Prochrysochloris miocaenicus* Butler and Hopwood, 1957. *Foss. Mamm. Afr.* 13: 11.

Additional references: Butler (1984); Mein and Pickford (2008a).



ORDER: MACROSCELIDEA**FAMILY: MACROSCELIDIDAE****Subfamily: Macroscelidinae**

Elephantulus Thomas and Schwann, 1906. *Abstr. Proc. Zool. Soc. Lond.* 33: 10.

Additional references: Corbet and Hanks (1968); Evans (1942); Holroyd (2010a); Patterson (1965); Van der Horst (1944).



†*Miorhynchocyon gariensis* Senut, 2003. *Geol. Soc. Namibia Mem.* 19: 126.

Type locality: Arrisdrift.



†*Palaeothentoides* Stromer, 1931. *Sitzungsber. Bayer. Akad. Wiss. München. Math.-Nat. Abt.* 1931: 185.

Type locality: Kleinzee.

Additional references: Holroyd (2010a); Patterson (1965).

**Subfamily: †Myohyracinae**

†*Myohyrax oswaldi* Andrews, 1914. *Quart. J. Geol. Soc. Lond.* 70: 171.

Synonyms: *doederleini*; *osborni*.

Additional references: Holroyd (2010a); Leakey (1943a); Patterson (1965); Stromer (1923).



†*Myohyrax pickfordi* Senut, 2008. *Geol. Surv. Namibia Mem.* 20: 189.

Type locality: Langental.

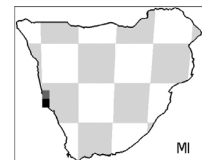


†*Protypotheroides beetzi* Stromer, 1921. *Sitz. Math.-Physik. Klasse Bayer. Akad. Wiss. München* 1921: 333.

Synonyms: *osborni*.

Type locality: Langental.

Additional references: Holroyd (2010a); Patterson (1965); Stromer (1923).



Comments: Stromer (1923: 258) refers to this taxon as *Protypotheroides beetzi* Stromer (1922, S. 333), but see note in Section 1.3 regarding journal volume numbers.

Subfamily: Rhynchocyoninae

†*Brevirhynchocyon gariensis* Senut, 2003. *Geol. Surv. Namibia Mem.* 19: 126.

Synonyms: *Brachyrhynchocyon*, *Miorhynchocyon*.

Type locality: Arrisdrift.

Additional references: Butler (1984); Senut and Georgalis (2014).

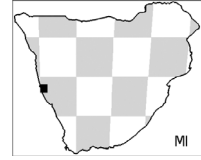


†*Brevirhynchocyon jacobi* Senut, 2008. *Geol. Surv. Namibia Mem.* 20: 192.

Synonyms: *Brachyrhynchocyon*.

Type locality: Elisabethfeld.

Additional references: Senut and Georgalis (2014).



†*Hypsorhynchocyon burrelli* Senut, 2008. *Geol. Surv. Namibia Mem.* 20: 194.

Type locality: Grillental 6.

**ORDER: TUBULIDENTATA**

FAMILY: ORYCTOPODIDAE

†*Amphiorcyteropus* Lehmann, 2009. *Zool. J. Linn. Soc.* 145: 665.

Synonyms: *Myorycyteropus minutus*; *Orycyteropus*.

Additional references: Holroyd (2010b); Pickford (1975, 1996b, 2003a).



Orycyteropus Cuvier, 1798. *Tabl. Elem. Hist. Nat. Anim.* 1798: 144.

Additional references: Holroyd (2010b); Kitching (1963); Lehmann (2007); Pickford (2008a).

**ORDER: HYRACOIDEA**

FAMILY: †PLIOHYRACIDAE

†*Parapliohyrax* Lavocat, 1961. *Notes Mém. Serv. Géol. Maroc* 155: 87.

Additional references: Pickford (1996a).



†*Parapliohyrax ngororaensis* Pickford and Fischer, 1987. *N. Jhb. Geol. Palaeontol. Abh.* 175: 212.

Additional references: Pickford (2003b); Rasmussen and Gutiérrez (2010).



†*Prohyrax hendeyi* Pickford, 1994. *Geol. Surv. Namibia Comm.* 9: 45.

Type locality: Arrisdrift.

Additional references: Pickford (2003b); Rasmussen and Gutiérrez (2010).



†*Prohyrax tertarius* Stromer, 1923. *Sitz. Math.-Physik. Klasse Bayer. Akad. Wiss. München* 1923(II): 256.

Type locality: Langental.

Additional references: Rasmussen and Gutiérrez (2010).



FAMILY: PROCAVIIDAE

†*Heterohyrax auricampensis* Rasmussen, Pickford, Mein, Senut and Conroy, 1996. *J. Mammal.* 77(3): 746.

Type locality: Berg Aukas 1.

Additional references: Rasmussen and Gutiérrez (2010).



FAMILY: †TITANOHYRACIDAE

†*Afrohyrax namibiensis* Pickford, 2008. *Mem. Geol. Surv. Namibia* 20: 314.

Type locality: Grillental 6.

Additional references: Pickford and Senut (2018).



ORDER: PROBOSCIDEA

FAMILY: †DEINOTHERIIDAE

Subfamily: †Deinotheriinae

†*Prodeinotherium hobleji* Andrews, 1911. *Proc. Zool. Soc. Lond.* 1911: 944.

Synonyms: *Deinotherium*; *Dinotherium*.

Additional references: Éhik (1930); Harris (1977); Sanders *et al.* (2010a).



FAMILY: ELEPHANTIDAE

Subfamily: Elephantinae

Loxodonta Anonymous, 1827. *Zool. J.* 3: 140.

Synonyms: *Tetralophodon?*



†*Loxodonta cookei* Sanders, 2007. *Trans. R. Soc. S. Afr.* 62(1): 7.

Synonyms: *Lukeino Stage*.

Type locality: Langebaanweg.

Additional references: Pickford and Senut (1997); Sanders *et al.* (2010a); Todd (2010).



FAMILY: †GOMPHOTHERIIDAE

Subfamily: †Amebelodontinae

†*Afromastodon coppensi* Pickford, 2003. *Geol. Surv. Namibia Mem.* 19: 219.

Type locality: Arrisdrift.

Additional references: Sanders *et al.* (2010a).



†*Progomphotherium maraisi* Pickford, 2003c. *Geol. Surv. Namibia Mem.* 19: 211.

Type locality: Auchas.

Additional references: Osborn (1934); Sanders *et al.* (2010b).



Subfamily: †Anancinae

†*Anancus kenyensis* MacInnes, 1942. *Trans. Zool. Soc. Lond.* 25(2): 33–106.

Additional references: Cooke (1993b); Hautier *et al.* (2009); Pickford and Senut (1997); Sanders *et al.* (2010b); Tassy (1986).



Subfamily: †Choerolophodontinae

†*Afrochoerodon kisumuensis* MacInnes, 1942. *Trans. Zool. Soc. Lond.* 25(2): 51.

Additional references: Pickford (2001a, 2005a); Tassy (1986).



†*Gomphotherium pygmaeus* Depéret, 1897. *Bull. Soc. Géol. France, Series* 3, 25: 520.

Synonyms: *Choerolophodon*, *Mastodon*; *angustidens*.

Additional references: Beck (1906); Fraas (1907); Hamilton (1973); Pickford (2005a); Sanders *et al.* (2010a).



FAMILY: †MAMMUTHIDAE

†*Eozygodon morotoensis* Pickford and Tassy, 1980. *Neues Jahrb. Geol. Palaontol., Monatsch.* 4: 242.

Synonyms: *Zygodon aegyptensis* cf.

Additional references: Pickford (2007, 2008c).



ORDER: PRIMATES
Suborder: Haplorrhini
 FAMILY: CERCOPITHECIDAE
 Subfamily: Colobinae

†*Microcolobus* Benefit and Pickford, 1986. *Amer. Phys. Anthrop.* 69: 446.



FAMILY: HOMINIDAE
 Subfamily: Homininae

†*Otavipithecus namibiensis* Conroy, Pickford, Senut, Van Couvering and Mein 1992. *Nature* 356: 144.

Type locality: Berg Aukas I.

Additional references: Gommery (2000); Harrison (2010); Pickford *et al.* (1992 1997); Singleton (2000).



Subfamily: †Kenyapithecinae

†*Kenyapithecus* Leakey, 1961. *Ann. Mag. Nat. Hist.*, Series 13, 4: 690.

Additional references: McCrossin and Benefit (1997); Pickford and Senut (1997).

Comments: specimen listed as Hominoidea by Senut *et al.* (1997) and as a proconsulid (Nyanzapithecinae indet.) by Harrison (2010).



ORDER: RODENTIA
Suborder: Sciuromorpha
 FAMILY: SCIURIDAE
 Subfamily: Xerinae

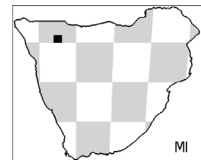
†*Heteroxerus karsticus* Mein, Pickford and Senut, 2000. *Comm. Geol. Surv. Namibia* 12: 381.

Synonyms: *Vulcanisciurus*.

Type locality: Harasib 3a.

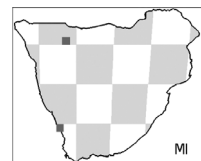
Additional references: Viriot *et al.* (2011).

Comments: the version of this publication available on the Geological Survey of Namibia website at www.mme.gov.na/files/publications/5dd_Mein%20et%20al_Late%20Miocene%20micromammals_Harasib.pdf appears to be wrongly paginated.



†*Vulcanisciurus* Lavocat, 1973. *Mem. Trav. Inst. Montpellier Ecole Prat. Hautes Etudes* 1: 1–284.

Comments: Lavocat (1973) not seen.



†*Vulcaniscirus africanus* Lavocat, 1973. *Mem. Trav. Inst. Montpellier Ecole Prat. Hautes Etudes* 1: 1–284.

Additional references: Viriot *et al.* (2011).

Comments: Lavocat (1973) not seen.



Suborder: Myomorpha

FAMILY: GLIRIDAE

Subfamily: Graphiurinae

†*Otaviglis daamsi* Mein, Pickford and Senut, 2000. *Comm. Geol. Surv. Namibia* 12: 383.

Type locality: Harasib 3a.

Comments: the version of this publication available on the Geological Survey of Namibia website at www.mme.gov.na/files/publications/5dd_Mein%20et%20al_Late%20Miocene%20micromammals_Harasib.pdf appears to be wrongly paginated.



FAMILY: SPALACIDAE

Subfamily: Rhizomyinae

†*Harasibomys* Mein, Pickford and Senut, 2000. *Comm. Geol. Surv. Namibia*, 12: 387.

Synonyms: *Brachyuromys* cf.

Type locality: Harasib 3a.

Comments: the version of this publication available on the Geological Survey of Namibia website at www.mme.gov.na/files/publications/5dd_Mein%20et%20al_Late%20Miocene%20micromammals_Harasib.pdf appears to be wrongly paginated.

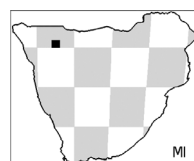


†*Harasibomys petteri* Mein, Pickford and Senut, 2000. *Comm. Geol. Surv. Namibia*, 12: 387.

Synonyms: *Brachyuromys* cf.

Type locality: Harasib 3a.

Comments: the version of this publication available on the Geological Survey of Namibia website at www.mme.gov.na/files/publications/5dd_Mein%20et%20al_Late%20Miocene%20micromammals_Harasib.pdf appears to be wrongly paginated.



†*Nakalimys lavocati* Flynn and Sabatier, 1984. *J. Paleontol.* 3: 161.



FAMILY: NESOMYIDAE

Subfamily: Afrocricetodontinae

†*Notocricetodon* Lavocat, 1973. *Mem. Trav. Inst. Montpellier Ecole Prat. Hautes Etudes* 1: 1–284.

Comments: Lavocat (1973) not seen.



†*Protarsomys* Lavocat, 1973. *Mem. Trav. Inst. Montpellier Ecole Prat. Hautes Etudes* 1: 1–284.

Comments: Lavocat (1973) not seen.



†*Protarsomys lavocati* Mein and Pickford, 2003. *Geol. Soc. Namibia Mem.* 19: 148.

Type locality: Arrisdrift.



†*Protarsomys macinnesi* Lavocat, 1973. *Mem. Trav. Inst. Montpellier Ecole Prat. Hautes Etudes* 1: 1–284.

Comments: Lavocat (1973) not seen.



Subfamily: Cricetomyinae

Saccostomus Peters, 1846. *Bericht Verhandl. K. Preuss. Akad. Wiss. Berlin* 11: 258.



†*Saccostomus geraadsi* Mein, Pickford and Senut, 2004. *Comm. Geol. Soc. Namibia* 13: 43.

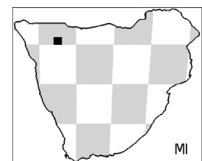
Synonyms: *major*; “K.”*majus* Geraads, 2001.



Subfamily: Dendromurinae

†*Dendromus denysae* Mein, Pickford and Senut, 2004. *Comm. Geol. Surv. Namibia* 13: 49.

Type locality: Harasib 3a.



Steatomys Peters, 1846. *Bericht Verhandl. K. Preuss. Akad. Wiss. Berlin* 11: 258.



†*Steatomys harasibensis* Mein, Pickford and Senut, 2004. *Comm. Geol. Surv. Namibia* 13: 45.
Type locality: Harasib 3a.



†*Steatomys jaegeri* Mein, Pickford and Senut, 2004. *Comm. Geol. Surv. Namibia* 13: 48.
Type locality: Harasib 3a.



Subfamily: †Otavimyinae

†*Otavimys senegasi* Mein, Pickford and Senut, 2004. *Comm. Geol. Surv. Namibia* 13: 51.
Type locality: Harasib 3a.

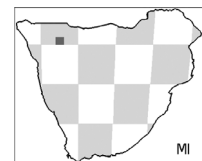


Subfamily: Petromyscinae

†*Harimyscus hoali* Mein, Pickford and Senut, 2000. *Comm. Geol. Surv. Namibia*, 12: 395.
Type locality: Harasib 3a.



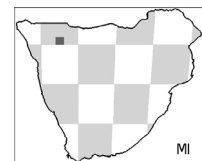
Petromyscus Thomas, 1926. *Ann. Mag. Nat. Hist.*, Series 9, 17: 179.
Additional references: Petter (1967).



FAMILY: MURIDAE

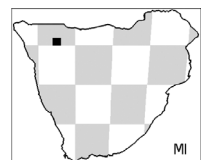
Subfamily: Cricetodontinae

†*Afaromys guillemoti* Geraads, 1998. *Palaeovertebrata* 27(3–4): 205.
Additional references: Mein *et al.* (2004).



Subfamily: Deomyinae

†*Preacomys griffini* Mein, Pickford and Senut, 2004. *Comm. Geol. Surv. Namibia* 13: 57.
Synonyms: *Karnimata*.
Type locality: Harasib 3a.



†*Preacomys karsticus* Mein, Pickford and Senut, 2004. *Comm. Geol. Surv. Namibia* 13: 57.

Type locality: Harasib 3a.



†*Preacomys kikiae* Geraads, 2001. *Palaeovertebrata* 30: 91.

Additional references: Mein *et al.* (2004).



Subfamily: Gerbillinae

†*Dakkamyoides* Lindsay, 1988. *Palaeovertebrata* 18(2): 123.



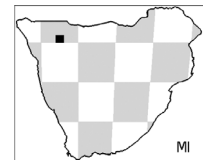
Subfamily: †Myocricetodontinae

†*Myocricetodon* Lavocat, 1952. *C. R. Acad. Sci. Paris* 235: 190.



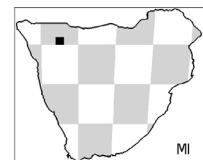
†*Mioharimys milleri* Mein, Pickford and Senut, 2000. *Comm. Geol. Surv. Namibia* 12: 391.

Type locality: Harasib 3a.



†*Mioharimys schneideri* Mein, Pickford and Senut, 2000. *Comm. Geol. Surv. Namibia* 12: 394.

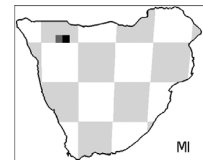
Type locality: Harasib 3a.



Subfamily: †Namibimyinae

†*Namibimys angustidens* Mein, Pickford and Senut, 2000. *Comm. Geol. Soc. Namibia* 12: 398.

Type locality: Berg Aukas I.



Suborder: Anomaluromorpha

FAMILY: †PARAPEDETIDAE

†*Parapedetes* Stromer, 1923. *Sitz. Math.-Physik. Abt. Bayer. Akad. Wiss. München* 1923 (II): 261.

Type locality: Elisabethfeld.



†*Parapedetes namaquensis* Stromer, 1923. *Sitz. Math.-Physik. Klasse Bayer. Akad. Wiss. München* 1923(II): 261.

Type locality: Elisabethfeld.

Additional references: Pickford and Mein (2011).



FAMILY: PEDETIDAE

†*Megapedetes gariepensis* Mein and Senut, 2003. *Geol. Soc. Namibia Mem.* 19: 162.

Type locality: Arrisdrift.

Additional references: Pickford and Mein (2011).



†*Oldrichpedetes brigittae* Pickford and Mein, 2011. *Estud. Geol.* 67(2): 465.

Type locality: Zebra Hill.



†*Oldrichpedetes pickfordi* Mein and Senut, 2003. *Geol. Soc. Namibia Mem.* 19: 166.

Synonyms: *Megapedetes*.

Type locality: Arrisdrift.

Additional references: Pickford and Mein (2011).



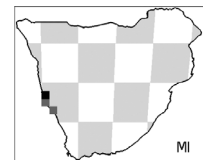
†*Propedetes* Mein and Pickford, 2008. *Geol. Surv. Namibia Mem.* 20: 242.

Type locality: Elisabethfeld.



†*Propedetes efeldensis* Mein and Pickford, 2008. *Geol. Surv. Namibia Mem.* 20: 242.

Type locality: Elisabethfeld.



†*Propedetes laetoliensis* Davies, 1987. In: Leakey and Harris. *The Pliocene Site of Laetoli, Northern Tanzania*: 172.

Synonyms: *Pedetes*.

Additional references: Pickford and Mein (2011).



Suborder: Hystricomorpha

FAMILY: †DIAMANTOMYIDAE

Subfamily: †Diamantomyinae

†*Diamantomys luederitzi* Stromer, 1921. *Sitz. Math.-Physik. Klasse Bayer. Akad. Wiss. München* 1921: 334.

Type locality: Sperrgebiet.

Comments: Stromer (1923: 265) refers to this taxon as *Diamantomys luederitzi* Stromer (1922, S. 334), but see note in Section 1.3 regarding journal volume numbers.



†*Pomonomys dubius* Stromer, 1921. *Sitz. Math.-Physik. Klasse Bayer. Akad. Wiss. München* 1921: 334.

Type locality: Grillental.

Comments: Stromer (1923: 265) refers to this taxon as *Pomonomys dubius* Stromer (1922, S. 334/5), but see note in Section 1.3 regarding journal volume numbers.



FAMILY: †BATHYERGOIDIDAE

†*Bathyergoides* Stromer, 1923. *Sitz. Math.-Physik. Klasse Bayer. Akad. Wiss. München* 1923(II): 263.

Type locality: Sperrgebiet.



†*Bathyergoides neotertiarius* Stromer, 1923. *Sitz. Math.-Physik. Klasse Bayer. Akad. Wiss. München* 1923(II): 263.

Type locality: Sperrgebiet.



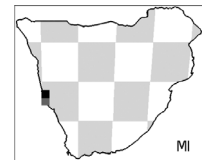
†*Geofossor corvinusae* Mein and Pickford, 2003. *Geol. Soc. Namibia Mem.* 19: 144.

Type locality: Arrisdrift.



†*Geofossor moralesi* Mein and Pickford, 2008. *Geol. Surv. Namibia Mem.* 20: 262.

Type locality: Elisabethfeld.



†*Microfossor biradiculatus* Mein and Pickford, 2008. *Geol. Surv. Namibia Mem.* 20: 262.

Type locality: Elisabethfeld.



FAMILY: BATHYERGIDAE

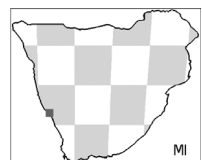
Subfamily: Bathyerginae

†*Proheliophobius* Lavocat, 1973. *Mem. Trav. Inst. Montpellier Ecole Prat. Hautes Etudes* 1: 1–284.

Synonyms: *Paracryptomys mackennae* (see comment below).

Comments: Lavocat (1973) not seen. Mein *et al.* (2000a: 386) state:

‘Denys and Jaeger (1992) provide measurements of a bathyergid (AD 1638) from Arrisdrift, Namibia which they identify as *Paracryptomys mackennae*, citing Hamilton and Van Couvering (1977) as the source of these measurements. There are two points that should be made,



firstly, the Arrisdrift species is far too small to belong to *Paracryptomys mackennae*, which is a giant bathyergid, possibly synonymous with *Bathyergoides neotertiarius* Stromer, and secondly, the site of Arrisdrift was unknown to Hamilton and Van Couvering as it was discovered in 1976 after they had submitted their manuscript for publication. In our opinion the Arrisdrift species is close to *Proheliophobius* but is slightly larger than the type species *P. leakeyi* Lavocat, 1973. The version of Mein *et al.* (2000a) available on the Geological Survey of Namibia website at www.mme.gov.na/files/publications/5dd_Mein%20et%20al_Late%20Miocene%20micromammals_Harasib.pdf appears to be wrongly paginated.

FAMILY: †MYOPHIOMYIDAE

Subfamily: †Myophiomyinae

†*Phiomoides humilis* Stromer, 1923. *Sitz. Math.-Physik. Klasse Bayer. Akad. Wiss. München* 1923(II): 264.

Type locality: Sperrgebiet.



FAMILY: THRYONOMYIDAE

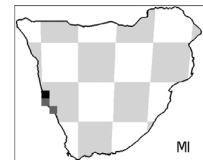
†*Apodecter* Hopwood, 1929. *Amer. Mus. Novit.* 344: 3.

Type locality: Lüderitz Bay (south of).



†*Apodecter stromeri* Hopwood, 1929. *Amer. Mus. Novit.* 344: 3.

Type locality: Lüderitz Bay (south of) (?Langental: Mein and Pickford, 2008c).



†*Neosciuromys africanus* Stromer, 1921. *Sitz. Math.-Physik. Klass. Bayer. Akad. Wiss. München* 1921 (II): 333.

Synonyms: *fractus*.

Type locality: Sperrgebiet.

Additional references: Stromer (1923).



†*Paraphiomys australis* Mein, Pickford and Senut, 2000. *Comm. Geol. Surv. Namibia* 12: 378.

Type locality: Harasib 3a.

Comments: the version of this publication available on the Geological Survey of Namibia website at www.mme.gov.na/files/publications/5dd_Mein%20et%20al_Late%20Miocene%20micromammals_Harasib.pdf appears to be wrongly paginated.



†*Paraphiomys orangeus* Mein and Pickford, 2003. *Geol. Soc. Namibia Mem.* 19: 143.

Type locality: Arrisdrift.



†*Paraphiomys roessneri* Mein, Pickford and Senut, 2000. *Comm. Geol. Surv. Namibia* 12: 375.

Synonyms: *Apodecter* cf.

Type locality: Harasib 3a.

Comments: the version of this publication available on the Geological Survey of Namibia website at www.mme.gov.na/files/publications/5dd_Mein%20et%20al_Late%20Miocene%20micromammals_Harasib.pdf appears to be wrongly paginated.



†*Paraulacodus johanesi* Jaeger, Michaux and Sabatier, 1980.

Palaeovertebrata 9 ext. *Mem. Jubil. R. Lavocat*: 367.



†*Phthinylla fracta* Hopwood, 1929. *Amer. Mus. Novit.* 344: 4.

Synonyms: *Neosciuromys*.

Type locality: Lüderitz Bay (south of) (?Langental: Mein and Pickford, 2008c).



FAMILY: TUFAMYIDAE

†*Efeldomys loliae* Mein and Pickford, 2008. *Geol. Surv. Namibia Mem.* 20: 259.

Type locality: Elisabethfeld.



ORDER: LAGOMORPHA

FAMILY: OCHOTONIDAE

†*Austrolagomys hendeyi* Mein and Pickford, 2003. *Geol. Soc. Namibia Mem.* 19: 172.

Synonyms: *Kenyalagomys*.

Type locality: Arrisdrift.



†*Austrolagomys inexpectatus* Stromer, 1923. *Sitz. Math.-Physik. Klasse Bayer. Akad. Wiss. München* 1923(II): 261.

Type locality: Sperrgebiet.

Synonyms: *Simpsoni*.

Additional references: Hopwood (1929); Mein and Pickford (2003d, 2008b).



ORDER: ERINACEOMORPHA

FAMILY: ERINACEIDAE

Subfamily: Erinaceinae

†*Amphexinus rusingensis* Butler, 1956. *Foss. Mamm. Africa* 11: 54.

Additional references: Butler (1984, 2010); Mein and Pickford (2008a).

†*Gymnurechinus leakeyi* Butler, 1956. *Foss. Mamm. Afr.* 11: 3.

Additional references: Mein and Pickford (2008a).



Subfamily: †Galericinae

†*Galerix* Pomel, 1848. *Arch. Sci. Phys. Nat. Genève* 9: 164.**ORDER: CHIROPTERA**
Suborder: Microchiroptera

FAMILY: RHINOLOPHIDAE

Rhinolophus Lacépède, 1799. *Tableau des Divisions, Sous-divisions, Ordres, et Genres des Mammifères*: 15.Additional references: Andersen 1905); Taylor *et al.* (2012).

Comments: Lacépède, 1799 not seen. Citation according to Wilson and Reeder (2005).

†*Rhinolophus contrarius* Mein and Pickford, 2003. *Geol. Surv. Namibia Mem.* 19: 115.

Type locality: Arrisdrift.



FAMILY: HIPPOSIDERIDAE

Asellia Gray, 1838. *Mag. Zool. Bot.* 2: 493.

Additional references: Thomas (1904a).

*Hipposideros gigas* Wagner, 1845. *Arch. Naturgesch.* 11(1): 148. Giant leaf-nosed bat.

FAMILY: MEGADERMATIDAE

Megaderma Geoffroy Saint-Hilaire, 1810. *Ann. Mus. Hist. Nat. Paris* 14: 197.



FAMILY: EMBALLONURIDAE

†*Taphozous incognita* Butler and Hopwood, 1957. *Foss. Mamm. Africa* 13: 29.

Synonyms: *Saccolaimus*.

Additional references: Butler (1984).



FAMILY: MOLOSSIDAE

Subfamily: Molossinae

Tadarida Rafinesque, 1814. *Précis des découvertes et travaux somiologiques*: 55.



FAMILY: VESPERTILIONIDAE

Subfamily: Myotinae

Myotis Kaup, 1829. *Skizz. Entwickel.-Gesch. Nat. Syst. Europ. Thierwelt* 1: 106.

Additional references: Gray (1842).



ORDER: †CREODONTA

FAMILY: †HYAENODONTIDAE

Subfamily: †Hyaenodontinae

†*Metapterodon kaiseri* Stromer, 1923. *Sitz. Math.-Physik. Klasse Bayer. Akad. Wiss. München* 1923(II): 254.

Synonyms: *Isohyaenodon*.

Type locality: Elisabethfeld.

Additional references: Lewis and Morlo (2010); Morales *et al.* (2008a); Savage (1965).

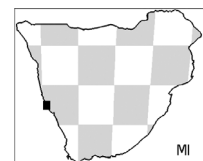


†*Metapterodon stromeri* Morales, Pickford and Soria, 1998. *C.R. Acad. Sci. Paris, Sci. Terre Plan.* 327: 634.

Synonyms: *Pterodon*.

Type locality: Langental.

Additional references: Lewis and Morlo (2010); Morales *et al.* (2008a).



Subfamily: †Hyainailourinae

†*Hyainailouros sulzeri* Biedermann, 1863. *Petrefakten aus der Umgegend von Winterthur. Zweites Heft.* 20.

Additional references: Helbing (1924); Morales *et al.* (1998b, 2003d); Morlo *et al.* (2007); Sach and Heizmann (2001).

Comments: Biedermann (1863) not seen.



FAMILY: †PRIONOGALIDAE

†*Namasector soriae* Morales, Pickford and Salesa, 2008. *Geol. Surv. Namibia Mem.* 20: 295.

Type locality: Elisabethfeld (Tortoise Site).

Comments: Werdelin and Cote (2010) are doubtful that this family should be placed in Creodonta and prefer to retain Prionogalidae as *Mammalia incertae sedis*.



ORDER: CARNIVORA

Suborder: Feliformia

FAMILY: †BARBOUROFELIDAE

†*Afrosmilus africanus* Andrews, 1914. *Quart. J. Geol. Soc. Lond.* 70: 179.

Synonyms: *Pseudaelurus*; *Metailurus*.

Additional references: Savage (1965); Werdelin and Peigné (2010).



Subfamily: †Barbourofelinae

†*Ginsburgsmilus napakensis* Morales, Salesa, Pickford and Soria, 2001. *Trans. R. Soc. Edinburgh* 92: 98.

Additional references: Morales and Pickford (2018).



FAMILY: FELIDAE

†*Diamantofelis ferox* Morales, Pickford, Soria and Fraile, 1998. *Eclogae Geol. Helv.* 91(1): 36.

Type locality: Arrisdrift.

Additional references: Morales *et al.* (2003d).



†*Namafelis minor* Morales, Pickford, Fraile, Salesa and Soria, 2003. *Mem. Geol. Surv. Namibia* 19: 184.

Type locality: Arrisdrift.



Subfamily: Felinae

†*Metailurus* Zdansky, 1924. *Palaeontol. Sinica*, Series C, 2(1): 123.

Comments: publication not seen but citation confirmed by L. Werdelin (personal communication, 12 December 2016).



Subfamily: Pantherinae

Panthera leo Linnaeus, 1758. *Systema Naturae Regnum Animale*, 10th edition, 1, Lion.

Additional references: Haas *et al.* (2005); Lacruz (2009).



FAMILY: †STENOPLESICTIDAE

†*Orangictis gariopensis* Morales, Pickford, Soria and Fraile, 2001.

Palaeontol. Afr. 37: 99.

Type locality: Arrisdrift.

Additional references: Werdelin and Peigné (2010).

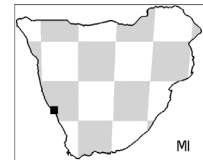


Subfamily: †Stenoplesictinae

†*Africanictis hyaenoides* Morales, Pickford, Fraile, Salesa and Soria, 2003.

Geol. Soc. Namibia Mem. 19: 183.

Type locality: Arrisdrift.



†*Africanictis meini* Morales, Pickford, Soria and Fraile, 1998. *Eclogae*

Geol. Helv. 91: 34.

Type locality: Arrisdrift.

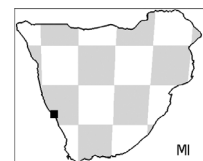


†*Africanictis schmidtktleri* Morales, Pickford, Soria and Fraile, 1998.

Eclogae Geol. Helv. 91: 35.

Type locality: Arrisdrift.

Additional references: Werdelin and Peigné (2010).



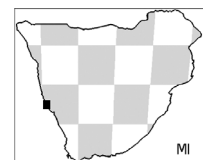
FAMILY: VIVERRIDAE

†*Leptoplesictis namibiensis* Morales, Pickford and Salesa, 2008. *Geol.*

Surv. Namibia Mem. 20: 304.

Type locality: Langental.

Comments: according to Werdelin and Peigné (2010), *Leptoplesictis* is generally considered to be a herpestid rather than a viverrid, although it was placed in the latter Family by Morales *et al.* (2008a).



†*Leptoplesictis senutae* Morales, Pickford and Salesa, 2008. *Geol. Surv. Namibia Mem.* 20: 303.

Type locality: Grillental.

Comments: see under *Leptoplesictis namibiensis*.



Suborder: Caniformia

FAMILY: †AMPHICYONIDAE

†*Agnotherium* Kaup, 1833. *Déscription d'Ossements Fossiles de Mammifères* 2: 28.

Additional references: Kurtén (1976); Werdelin and Peigné (2010).



Subfamily †Amphicyoninae

†*Amphicyon giganteus* Schinz, 1825. In: Cuvier, *Thierreich* IV: 342.

Synonyms: *Pseudocyon*; *steinheimensis*.

Additional references: Werdelin and Peigné (2010).



†*Hecubides euryodon* Savage, 1965. *Foss. Mamm. Africa* 19: 189.

Additional references: Morales *et al.* (2016).



†*Ysengrinia* Ginsburg, 1965. *Bull. Mus. Natl d'Hist. Nat., Series 2*, 37(4): 727.

Additional references: Werdelin and Peigné (2010).



†*Ysengrinia ginsburgi* Morales, Pickford, Soria, and Fraile, 1998. *Eclogae Geol. Helv.* 91(1): 30.

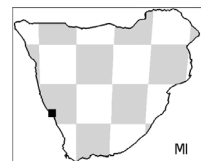
Type locality: Arrisdrift.



FAMILY: MUSTELIDAE

†*Namibictis senuti* Morales, Pickford, Soria, and Fraile, 1998. *Eclogae Geol. Helv.* 91(1): 32.

Type locality: Arrisdrift.



ORDER: PERISSODACTYLA**FAMILY: EQUIDAE**

†*Eurygnathohippus cornelianus* Van Hoepen, 1930. *Paleontol. Nav. Nas. Mus. Bloemfontein* 2(2): 23.

Synonyms: *Hipparion*; *Stylohipparion*; *hipkini*; *libycum*; *sitifense* in part?; *steytleri*.

Type locality: Cornelia.

Additional references: Bernor *et al.* (2010); Churcher (1970, 2000); Churcher and Watson (1993); Franz-Odenaal *et al.* (2003); Pomel (1897); Van Hoepen (1932a).

Comments: the material from Hondeklip Bay was doubtfully ascribed by Pickford and Senut (1997) to *Hipparion sitifense*, which Bernor *et al.* (2010) consider a *nomen dubium*. See also the comment under *Hipparion* below.

**FAMILY: RHINOCEROTIDAE****Subfamily: Rhinocerotinae**

†*Brachypotherium* Roger, 1902. *Ber. Naturwiss. Ver. Schwaben und Neuburg* 36: 12.



†*Brachypotherium heinzeli* Hooijer, 1963. *Ann. Mus. Roy. Afr. Cent., Tervuren Sci. Géol.* 46: 45.

Synonyms: *lewisi*?

Additional references: Geraads (2010a); Guérin (2008); Heissig (1971); Hooijer (1973).



†*Chilotheridium pattersoni* Hooijer, 1971. *Bull. Mus. Comp. Zool.* 144: 342.

Additional references: Geraads (2010a); Guérin (2003, 2008); Hooijer (1973).



†*Diceros australis* Guérin, 2000. *Palaeontol. Afr.* 36: 122.

Synonyms: *Dicerorhinus*.

Type locality: Arrisdrift.

Additional references: Geraads (2010a); Guérin (2003).



†*Diceros praecox* Hooijer and Patterson, 1972. *Bull. Mus. Comp. Zool.* 144: 19.

Synonyms: *Ceratotherium*.

Additional references: Geraads (2005, 2010a); Guérin (1987); Hooijer (1972 1973); Pickford and Senut (1997).



†*Turkanatherium acutirostrum* Deraniyagala, 1951. *Spol. Zeyl.* 26(2): 134.

Synonyms: *Aceratatherium*.

Additional references: Geraads (2010a); Guérin (2008); Hooijer (1973).



ORDER: ARTIODACTYLA

†*Namibiomeryx senuti* Morales, Soria and Pickford, 1995. *C. R. Acad. Sci. Paris, Série Ila*, 321: 1211.

Type locality: Elisabethfeld.

Additional references: Cote (2010).



†*Namibiomeryx spaggiarii* Morales, Soria and Pickford, 2008. *Mem. Geol. Surv.* 20: 442.

Type locality: Langental.



†*Orangemeryx hendeyi* Morales, Soria and Pickford, 1999. *Geodiversitas*, Series 21, 2: 241.

Synonyms: *Climacoceras*.

Type locality: Arrisdrift.

Additional references: Azanza *et al.* (2003); Cote (2010); Hamilton (1978); MacInnes (1936); Morales *et al.* (2003d).



Subfamily: †Sperrgebietomerycinae

†*Sperrgebietomeryx wardi* Morales, Soria and Pickford, 1999.

Geodiversitas, Series 21, 2: 232.

Type locality: Elisabethfeld.

Additional references: Cote (2010).



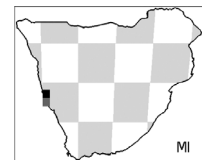
FAMILY: †CLIMACOCERATIDAE

Subfamily: †Propalaeorycinae

†*Propalaeoryx austroafricanus* Stromer, 1923. *Sitz. Math.-Physik. Klasse Bayer. Akad. Wiss. München* 1923(II): 256.

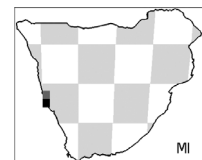
Type locality: Elisabethfeld.

Additional references: Cote (2010).



†*Propalaeoryx stromeri* Morales, Soria and Pickford, 2008. *Geol. Surv. Namibia Mem.* 20: 410.

Type locality: Langental.



FAMILY: SUIDAE

Subfamily: †Kubanochoerinae

†*Kenyasus namaquensis* Pickford and Senut, 1997. *Palaeontol. Afr.* 34: 208.

Type locality: Ryskop.

Additional references: Bishop (2010); Pickford (1986).



†*Kenyasus rusingensis* Pickford, 1986. *Tert. Res. Spec. Pap.* 7: 24.

Additional references: Bishop (2010); Pickford and Senut (1997).



†*Nguruwe namibensis* Pickford, 1986. *Tert. Res. Spec. Pap.* 7: 25.

Synonyms: *Hyotherium*; *Kenyasus*; *kijivium*.

Type locality: Langental.

Additional references: Bishop (2010); Pickford (1997, 2003e, 2008e).



Subfamily: †Namachoerinae

†*Namachoerus moruoroti* Wilkinson, 1976. *Foss. Vert. Afr.* 4: 173–282.

Synonyms: *Lopholistriodon*.

Additional references: Pickford (1987, 1995, 2003f).



Subfamily: †Tetraconodontinae

†*Nyanzachoerus kanamensis* Leakey, 1958. *Foss. Mamm. Afr.* 14: 10.

Additional references: Bishop (2010); Harris and White (1979).



FAMILY: †ANTHRACOTHERIIDAE

†*Brachyodus aequatorialis* MacInnes, 1951. *Foss. Mamm. Afr.* 4: 3.

Synonyms: *Masritherium*.

Additional references: Holroyd *et al.* (2010); Madden *et al.* (1983); Pickford (1991a, 1996b, 2015f).



†*Brachyodus depereti* Fourtau, 1918. *Contribution à l'étude des vertébrés miocènes de l'Égypte*: 64.

Synonyms: *Masritherium*.

Additional references: Holroyd *et al.* (2010); Miller *et al.* (2014); Pickford (2003d, 2008d).

Comments: Fourtau (1918) not seen. M. Pickford (personal communication 1 December 2016) believes that the earliest evidence for the transfer of this species to *Brachyodus* is that given by Dineur (1982).



FAMILY: †SANITHERIIDAE

†*Diamantohyus africanus* Stromer, 1921. *Sitz. Math.-Physik. Klass. Bayer. Akad. Wiss. München* 1921 (II): 332.

Type locality: Sperrgebiet?

Additional references: Bishop (2010); Pickford (1984, 1997, 2004, 2008f).

Comments: this taxon has been ascribed to Stromer (1926) by Bishop (2010) and others.



FAMILY: TRAGULIDAE

†*Dorcatherium moruorotensis* Pickford, 2001. *Geobios* 34(4): 437.

Additional references: Geraads (2010b); Quiralte *et al.* (2008).



†*Dorcatherium parvum* Whitworth, 1958. *Foss. Mamm. Afr.* 15: 11.

Additional references: Geraads (2010b); Quiralte *et al.* (2008).



†*Dorcatherium pigotti* Whitworth, 1958. *Foss. Mamm. Afr.* 15: 9.

Additional references: Geraads (2010b); Morales *et al.* (2003d); Pickford *et al.* (1996); Quiralte *et al.* (2008).



†*Dorcatherium songhorensis* Whitworth, 1958. *Foss. Mamm. Afr.* 15: 14.

Additional references: Quiralte *et al.* (2008).



FAMILY: BOVIDAE

†*Namacerus gariopensis* Morales, Soria, Pickford and Nieto, 2003. *Geol. Surv. Namibia Mem.* 19: 372.

Type locality: Arrisdrift.

Additional references: Gentry (2010).



Subfamily: Alcelaphinae

†*Damalacra acalla* Gentry, 1980. *Ann. S. Afr. Mus.* 79(8): 272.

Type locality: Langebaanweg.

Additional references: Brink and Stynder (2009).



Subfamily: Antilopinae

†*Homoiodorcas* Thomas, 1981. *Proc. Kon. Nederl. Akad. Weten. Ser. B. Phys. Sci.* 84(3): 364.



Subfamily: Bovinae

†*Ugandax demissum* Gentry, 1980. *Ann. S. Afr. Mus.* 79(8): 233.

Synonyms: *Simatherium*.

Type locality: Langebaanweg.

Additional references: Gentry (2006, 2010); Geraads (1992); Pickford and Senut (1997).



3.2 MIOCENE SITES

The 25 Miocene sites are restricted to west of 20°E and north of about 30°S (Figure 3.1). Particularly rich sites are Harasib 3a in the north, and Arrisdrift, Langental and Grillental in the south. Exploration of the southern African Miocene began fairly early, notably with the work of Stromer (1921), but Corvinus (1978) and Hendey (1978c) started what might be described as the modern era. However, the discovery of *Otavipithecus namibiensis* at Berg Aukas (Conroy *et al.* 1996) provided the impetus for the subsequent work undertaken by Martin Pickford and colleagues (see references), which greatly expanded coverage of the Miocene in the region.

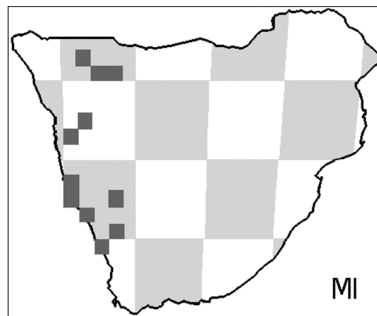


Figure 3.1 Location of Miocene sites.

Arrisdrift (2828:1642). Taxa: *Africanictis hyaenoides*; *Africanictis meini*; *Africanictis schmidtkittleri*; *Fromastodon coppensi*; *Afrosmilus africanus*; *Amphechinus rusingensis*; *Amphicyon giganteus*; *Amphiorcyteropus*; *Apodecter stromeri* cf.; *Austrolagomys hendeyi*; *Bathyrgoides*; *Brevirhynchocyon jacobi*; *Chilotheridium pattersoni* cf.; *Choerolophodon pygmaeus*; *Diamantofelis ferox*; *Diamantomys luederitzi*; *Diceros australis*; *Dorcatherium pigotti*; *Eozygodon morotoensis*; *Geofossor corvinusae*; *Homoiodorcas* cf.; *Hyainailouros sulzeri*; *Megapedetes gariensis*; *Metailurus*; *Miorhynchocyon gariensis*; *Myohyrax oswaldi*; *Namacerus gariensis*; *Namachoerus moruoroti*; *Namafelis minor*; *Namibictis senuti*; *Nguruwe namibensis*; *Oldrichpedetes pickfordi*; *Orangemeryx hendeyi*; *Orangictis*

gariensis; *Palaeothentoides?*; *Parapedetes*; *Paraphiomys orangeus*; *Prochrysochloris miocaenicus* cf.; *Prodeinotherium hobleyi*; *Proheliophobius*; *Prohyrax hendeyi*; *Protarsomys lavocati*; *Protenrec butleri*; *Rhinolophus contrarius*; *Vulcanisciurus*; *Ysengrinia ginsburgi*. References: Corvinus (1978); Guérin (2003); Harris (1977); Hendey (1978c, 1984); Mein and Pickford (2003b, 2003c); Morales *et al.* (2001a); Morales *et al.* (2003b–2003d); Pickford (2003a, 2003c, 2003e, 2005a); Pickford *et al.* (1996); Pickford and Senut (1999, 2003); Senut (2003); Senut and Georgalis (2014).

Auchas (2816BC?). Taxa: *Brachyodus depereti*; *Brachypotherium?*; *Diamantofelis*; *Diamantomys luederitzi*; *Eozygodon morotoensis*; *Megapedetes*; *Prodeinotherium hobleyi*; *Progomphotherium maraisi*; *Prohyrax hendeyi*. References: Guérin (2003); Morales *et al.* (2008a); Pickford (2003b, 2003c); Pickford and Senut (2003); Pickford *et al.* (1995).

Baken (2829:1647). Taxa: *Prohyrax hendeyi*. References: Pickford (2003b).

Berg Aukas (1931:1815). Taxa: *Apodecter*; *Asellia*; *Dakkamyoides*; *Elephantulus*; *Galerix*; *Harasibomys*; *Heterohyrax auricampensis*; *Hipposideros gigas* cf.; *Megaderma*; *Myocricetodon*; *Myotis*; *Namibimys angustidens*; *Notocricetodon*; *Otaviipithecus namibiensis*; *Parapliohyrax*; *Protarsomys*; *Rhinolophus*; *Saccostomus* cf.; *Steatomys* cf.; *Tadarida*; *Taphozous incognita*; *Vulcanisciurus*. References: Conroy *et al.* (1996); Grine *et al.* (1995); Mein *et al.* (2000b); Pickford and Senut (2010); Senut *et al.* (1992).

Bogenfels (2728:1523). Taxa: *Propalaeoryx austroafricanus*. References: Cooke (1955).

Bohrloch des Betriebes 4 (2205:1617). Taxa: *Myohyrax oswaldi*; *Neosciuromys africanus*; *Phiomyoides humilis*. References: Mein and Pickford (2008c); Senut (2003).

Bosluis Pan (2953:1858). Taxa: *Afrochoerodon kisumuensis* aff.; *Choerolophodon pygmaeus*; *Myohyrax oswaldi*. References: Pickford (2005a); Senut *et al.* (1996).

E-Bay [Elisabethbucht?](2615CC). Taxa: *Apodecter stromeri*; *Phiomyoides humilis*; *Protarsomys macinnesi*. References: Mein and Pickford (2008c).

Elisabethfeld (2658:1515). Taxa: *Afrohyrax namibiensis*; *Apodecter stromeri*; *Austrolagomys inexpectatus*; *Bathyergoides neotertiarius*; *Brevirhynchocyon jacobi*; *Diamantohyus africanus*; *Diamantomys luederitzi*; *Efeldomys loliae*; *Eozygodon morotoensis*; *Geofossor moralesi*; *Hecubides euryodon*; *Mesochoerus lategani*; *Metapterodon kaiseri*; *Microfossor biradiculatus*; *Myohyrax oswaldi*; *Namasector soriae*; *Namibiomyx senuti*; *Neosciuromys africanus*; *Nguruwe namibensis*; *Parapedetes namaquensis*; *Phiomyoides humilis*; *Phthinynlla fracta*; *Prochrysochloris miocaenicus* cf.; *Prohyrax tertiarius*; *Promicrogale namibiensis*; *Propalaeoryx austroafricanus*; *Propedetes efeldensis*; *Protarsomys macinnesi*; *Protenrec butleri*; *Protypotheroides beetzi*; *Sperrgebietomyx wardi*; *Vulcanisciurus africanus*; *Ysengrinia*. References: Mein and Pickford (2008a, 2008c); Morales *et al.* (2008a, 2008b, 2016); Pickford (2008b, 2008c, 2008e); Pickford and Senut (2008, 2018); Senut (2008); Senut and Georgalis (2014).

Etosha Pan (1816CA). Taxa: *Damalacra acalla*; *Loxodonta cookei* cf.; *Panthera leo* cf. References: Pickford *et al.* (2014).

Fiskus (2615CA). Taxa: *Afrohyrax namibiensis*; *Afrosmilus africanus*; *Bathyergoides neotertiarius*; *Diamantohyus africanus*; *Myohyrax oswaldi*; *Neosciuromys africanus*; *Nguruwe namibensis*; *Propalaeoryx stromeri*; *Protypotheroides beetzi*; *Turkanatherium acutirostrum*; *Ysengrinia*. References: Guérin (2008); Morales *et al.* (2008a, 2008b); Pickford (2008e); Pickford and Senut (2008, 2018); Senut (2008).

- Glastal** (2715). Taxa: *Diamantomys luederitzi*; *Neosciuromys africanus*. References: Mein and Pickford (2008c).
- GP Pan North** (2829:1632). Taxa: *Propedetes laetoliensis*. References: Pickford and Mein (2011).
- Grillental** (2715AB). Taxa: *Afrohyrax namibiensis*; *Afrosmilus africanus*; *Apodecter stromeri*; *Austrolagomys inexpectatus*; *Bathyergoides neotertiarius*; *Brachyodus aequatorialis*; *Brachyodus depereti*; *Brachypotherium heinzlini*; *Chilotheridium pattersoni*; *Diamantohyus africanus*; *Diamantomys luederitzi*; *Dorcatherium moruorotensis* cf.; *Dorcatherium songhorensis*; *Geofossor moralesi*; *Ginsburgsmilus napakensis*; *Gymnurechinus leakeyi*; *Hecubides euryodon*; *Hypsorhynchocyon burrelli*; *Leptoplesictis senutae*; *Metapterodon*; *Myohyrax oswaldi*; *Neosciuromys africanus*; *Nguruwe namibensis*; *Orycteropus*; *Phiomyoides humilis*; *Phthinylla fracta*; *Pomonmys dubius*; *Prohyrax tertarius*; *Propalaeoryx stromeri*; *Protarsomys macinnesi*; *Protenrec butleri*; *Protypotheroides beetzi*; *Vulcanisciurus africanus*; *Ysengrinia*. References: Guérin (2008); Mein and Pickford (2008a–2008c); Morales and Pickford (2018); Morales *et al.* (2008a, 2016); Pickford (2008a, 2008b, 2008d–2008f); Pickford and Senut (2008); Senut (2008).
- Groenrivier** (2718BD). Taxa: *Ugandax demissum*. References: Pickford and Senut (1997).
- Harasib 3a** (1934:1748). Taxa: *Afaromys guillemoti* cf.; *Apodecter* cf.; *Dendromus denysae*; *Harasibomys petteri*; *Harimyscus hoali*; *Heteroxerus karsticus*; *Microcolobus?*; *Mioharimys milleri*; *Mioharimys schneideri*; *Myocricetodon*; *Nakalimys lavocati*; *Namibimys angustidens*; *Otaviglis daamsi*; *Otavimys senegasi*; *Paraphiomys australis*; *Paraphiomys roessneri*; *Paraulacodus johanesi* cf.; *Petromyscus*; *Preacomys griffini*; *Preacomys karsticus*; *Preacomys kikiae*; *Propedetes*; *Rhinolophus*; *Saccostomus geraadsi*; *Steatomys harasibensis*; *Steatomys jaegeri*. References: Conroy *et al.* (1993); Pickford and Mein (2011); Pickford and Senut (2010); Pickford *et al.* (1994); Senut *et al.* (1992).
- Hondeklip Bay** (3017AD). Taxa: *Agnotherium*; *Anancus kenyensis*; *Diceros praecox*; *Eurygnathohippus cornelianus* cf.; *Loxodonta*; *Nyanzachoerus kanamensis*; *Ugandax demissum?*. References: Pether (1994); Pickford and Senut (1997).
- Karingarab** (2812:1621). Taxa: *Propedetes laetoliensis*. References: Pickford and Mein (2011).
- Langental** (2724:1524). Taxa: *Afrosmilus africanus*; *Amphechinus rusingensis*; *Apodecter stromeri*; *Austrolagomys inexpectatus*; *Bathyergoides neotertiarius*; *Brachyodus aequatorialis*; *Brachypotherium heinzlini*; *Diamantohyus africanus*; *Diamantomys luederitzi*; *Dorcatherium parvum* cf.; *Dorcatherium songhorensis*; *Geofossor moralesi*; *Gymnurechinus leakeyi*; *Hecubides euryodon*; *Leptoplesictis namibiensis*; *Megapedetes garipeensis*; *Metapterodon stromeri*; *Myohyrax oswaldi*; *Myohyrax pickfordi*; *Namibiomyx spaggiarii*; *Neosciuromys africanus*; *Nguruwe namibensis*; *Phiomyoides humilis*; *Phthinylla fracta*; *Pomonmys dubius*; *Prochrysochloris miocaenicus* cf.; *Prohyrax tertarius*; *Propalaeoryx stromeri*; *Propedetes efeldensis*; *Protarsomys macinnesi*; *Protenrec butleri*; *Protypotheroides beetzi*; *Vulcanisciurus africanus*; *Ysengrinia*. References: Guérin (2008); Mein and Pickford (2008a, 2008b); Morales *et al.* (2008a, 2016); Pickford (2003b, 2003d–2003f); Pickford and Senut (2008); Senut (2008).
- Lüderitz Bay (south of)** (2615). Taxa: *Apodecter stromeri*; *Austrolagomys inexpectatus*; *Phthinylla fracta*. References: Hopwood (1929); Mein and Pickford (2008c).
- Nova** (3017AD). Taxa: *Parapliohyrax ngororaensis*. References: Pickford (2003f).

- Roilepel** (2818:1635). Taxa: *Amphiorcyteropus*; *Propedetes efeldensis*; *Propedetes laetoliensis*. References: Lehmann (2009); Pickford (1996b); Pickford and Mein (2011).
- Ryskop** (3018:1718). Taxa: *Kenyapithecus* cf.; *Kenyasus namaquensis*; *Kenyasus rusingensis*; *Nguruwe namibensis*; *Prodeinotherium hobleiyi*; *Ugandax demissum*. References: Pickford (2003e); Pickford and Senut (1997); Senut *et al.* (1997).
- Swartlintjies 2** (3018:1718). Taxa: *Anancus kenyensis*; *Diceros praecox*. References: Pickford and Senut (1997).
- Zebra Hill** (2337:1538). Taxa: *Oldrichpedetes brigittae*. References: Pickford and Mein (2011).