

Neogene Paleontology of the Manonga Valley, Tanzania

A Window into the Evolutionary History of East Africa

Edited by

Terry Harrison

*New York University
New York, New York*

Plenum Press • New York and London

Contents

Chapter 1 • Introduction: Paleontological and Geological Research in the Manonga Valley, Tanzania

Terry Harrison and Michael L. Mbago

1. Introduction	2
2. The Modern Geographic Context	4
3. History of Research	7
4. Geological Context	9
5. Paleontological Localities in the Manonga Valley	17
6. Significance of Paleontological Research in the Manonga Valley	28
References	29

Chapter 2 • Detailed Stratigraphy of the Neogene Sediments at Tinde and Other Localities in the Central Manonga Basin

Jacques Verniers

1. Introduction	33
2. History of Previous Geological Research	34
3. Geological Structure of the Manonga Basin	36
4. Stratigraphy	48
5. Lithostratigraphy	50
6. Paleoenvironment	57
7. Schematic Geological Map	61
8. Conclusions	61
References	64

Chapter 3 • Mineralogy of the Wembere–Manonga Formation,
Manonga Valley, Tanzania, and the Possible
Provenance of the Sediments

Medard Mutakyahwa

1. Introduction	67
2. Ngofila Profile	68
3. Beredi South Profiles	70
4. Mineralogy	71
5. Conclusions	77
References	78

Chapter 4 • Paleocology and Taphonomy of Fossil Localities in
the Manonga Valley, Tanzania

Terry Harrison

1. Introduction	79
2. Geological Context	81
3. Taphonomy and Paleocology at Tinde (Tinde Member)	81
4. Taphonomy and Paleocology at Kiloleli (Kiloleli Member)	94
5. Taphonomy and Paleocology at Shoshamagai and Inolelo (Ibole Member)	99
6. Conclusions	103
References	104

Chapter 5 • Fossil Ruminants (Mammalia) from the Manonga
Valley, Tanzania

Alan W. Gentry

1. Introduction	107
2. Fossil Giraffids	108
3. Fossil Bovids	112
4. Summary of Manonga Ruminants	128
5. Reduncine Phylogeny	130
6. Faunal Correlations	130
References	132

Chapter 6 • The Anatomy, Paleobiology, and Phylogenetic Relationships of the Hippopotamidae (Mammalia, Artiodactyla) from the Manonga Valley, Tanzania

Terry Harrison

1. Introduction.....	138
2. Materials	138
3. Temporal and Geographic Distribution of <i>Hexaprotodon harvardi</i>	140
4. Craniodental Material	141
5. Postcranial Material	158
6. Taxonomy and Phylogenetic Relationships	175
7. Summary and Conclusions.....	185
References	186

Chapter 7 • Fossil Suids from the Manonga Valley, Tanzania

Laura C. Bishop

1. Introduction.....	191
2. Descriptions.....	193
3. Discussion	202
4. Conclusions.....	215
References	215

Chapter 8 • Later Neogene Hipparions from the Manonga Valley, Tanzania

Raymond L. Bernor and Miranda Armour-Chelu

1. Introduction.....	219
2. Abbreviations and Definitions	221
3. Materials and Methods	222
4. Description of the Material	223
5. Discussion	249
6. Conclusions.....	254
References	255
Appendixes	258

Chapter 9 • Fossil Proboscidea from the Wembere–Manonga Formation, Manonga Valley, Tanzania

William J. Sanders

1. Introduction	265
2. Terminology and Measurements	268
3. Systematic Paleontology	269
4. Discussion	301
5. Summary	306
References	307

Chapter 10 • Systematics, Paleobiogeography, and Paleoenvironmental Significance of Rodents from the Ibole Member, Manonga Valley, Tanzania

Alisa J. Winkler

1. Introduction	311
2. Description of Specimens	312
3. Discussion and Conclusions	329
References	330

Chapter 11 • Fossil Fish from the Manonga Valley, Tanzania: Description, Paleoecology, and Biogeographic Relationships

Kathlyn M. Stewart

1. Introduction	334
2. History of Research	334
3. Description of Fossils	335
4. Composition of the Manonga Fish Fauna and Relationships with Other Fish Faunas	344
5. Evolutionary Relationships	346
6. Paleoecological Implications	347
7. Summary	347
References	348

Chapter 12 • Late Cenozoic Freshwater Mollusks of the Wembere–Manonga Formation, Manonga Valley, Tanzania

Dirk Van Damme and Achilles Gautier

1. Introduction	351
2. Taxonomy	353
3. Paleoecology and Zoogeography	358
4. Conclusions	359
References	359

Chapter 13 • Paleontology and Biochronology of Fossil Localities in the Manonga Valley, Tanzania

Terry Harrison and Eric Baker

1. Introduction	362
2. Fossil Mammals from the Wembere–Manonga Formation	362
3. Nonmammalian Fossils from the Wembere–Manonga Formation	373
4. Biochronological Implications of the Fauna from the Wembere–Manonga Formation	378
5. Fossil Mammals from the Mbuga Clay and Yellow Clay Horizons	382
6. Conclusions	386
References	387

Chapter 14 • Hominid Origins: A View from the Manonga Valley

Terry Harrison

1. Introduction	395
2. What Evidence Is Available for Hominids Older Than 4 Ma?	397
3. Why Are There No Hominids in the Manonga Valley?	398
4. How Will We Recognize a Hominid if We Find One?	401
5. Conclusions	402
References	403

Index	407
-----------------	-----