

**IDENTIFICATION OF MAMMALIAN SPECIES REPRESENTED BY FOSSIL
HAIRS IN *PARAHYAENA BRUNNEA* COPROLITES FROM MIDDLE
PLEISTOCENE DEPOSITS AT GLADYSVALE CAVE, SOUTH AFRICA**

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A thesis submitted to the Faculty of Science, University of the Witwatersrand, in fulfilment
of the requirements for the degree of Doctor of Philosophy

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DECLARATION

I declare that this thesis is my own, unaided work. It is being submitted for the Degree of Doctor of Philosophy in the University of Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other University.

(Signature of candidate)

_____ day of _____ 2012

ABSTRACT

This research focuses on scale pattern and cross sectional morphology of hair to identify fossil hairs from *Parahyaena brunnea* (brown hyaena) coprolites, from Gladysvale cave in the Sterkfontein Valley, South Africa. The coprolites are part of a brown hyaena latrine preserved in calcified cave sediment dated to the Middle Pleistocene (257- 195 ka). Forty-eight fossil hairs were extracted from a 75 x 30 x 15 cm block using fine tweezers and a binocular microscope. They were ultrasonic cleaned in analar ethanol and examined using scanning electron microscopy. Hair identification was based on consultation of standard guides to hair identification and comparison with my own collection of samples of previously undocumented guard hairs, from 15 taxa of indigenous southern African mammals. Samples were taken from the back of pelts curated at the Johannesburg Zoo and Ditsong National Museum of Natural History in Tshwane (formerly Transvaal Museum, Pretoria).

Based on the fossil hairs identified here, this research has established that brown hyaenas shared the Sterkfontein Valley with warthog, impala, zebra, kudu and black wildebeest. These animals are associated with savanna grasslands, much like the Highveld environment of today. Fossil human hair was also noted in the coprolites. These findings provide a new source of information, on the local Middle Pleistocene fossil mammal community, and insight into the environment in which archaic and modern humans in the interior of the African subcontinent lived. Amid a scarce fossil and archaeological record for this time period, these results make a significant contribution to the ongoing debate about the role of climate change in the evolution and success of modern humans. In accordance with modern brown hyaena feeding behaviour, the presence of medium to large-sized mammal hairs in the coprolites suggests the co-existence of large feline predators in the area, or a period of active hunting, based on the behaviour of modern brown hyaenas when rearing cubs.

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DEDICATION

This work is dedicated to my loving parents, Piniel and Roseline and to the precious mother of my children, Precious, who blessed me with wonderful kids. Special dedication also goes to my late brother, Rejoice.

LIST OF FIGURES

Figure 1.1: Map showing the location of Gladysvale cave	13
Figure 1.2: Clearly exposed, well preserved and stratified clastic sediments from the Western Face 1 (A) and the Peabody Chamber (B) in Gladysvale cave	13
Figure 1.3: (A) Geological section of Gladysvale deposits showing the position of the latrine within flowstone bounded unit 14. (B) Photograph of the area showing details of the section containing coprolites and the dated flowstone layers	15
Figure 1.4: Map indicating the position of the latrine in the cave system	15
Figure 1.5: An adult male brown hyaena	21
Figure 1.6: Female hyaena suckling its cubs	23
Figure 1.7: Brown hyaena paste mark showing the black and white paste (left), and a brown hyaena latrine on the right	24
Figure 1.8: Brown hyaena scavenging an egg from an ostrich nest	25
Figure 1.9: (a) Brown hyaena hunting a seal pup and (b) Brown hyaena lifting a hunted seal pup away from a seal colony	26
Figure 2.1: Basic structure of hair	30
Figure 2.2: Cuticular scale features used in identifying hair	33
Figure 2.3: Common hair cross sectional shapes	34
Figure 2.4: Block of calcified cave sediment containing part of the hyaena latrine, showing the largest coprolite analysed in this study (C8)	40
Figure 3.1: Impala hair cross section (left) and scale pattern (right)	49
Figure 3.2: Blue wildebeest hair cross section (left) and scale pattern (right)	49
Figure 3.3: Black wildebeest hair cross section (left) and scale pattern (right)	50
Figure 3.4: Buffalo hair cross section (left) and scale pattern (right)	50
Figure 3.5: Eland hair cross section (left) and scale pattern (right)	51
Figure 3.6: Steenbok hair cross section (left) and scale pattern (right)	51

Figure 3.7: Springbok hair cross section (left) and scale pattern (right)	52
Figure 3.8: Kudu hair cross section (left) and scale pattern (right)	52
Figure 3.9: Warthog hair cross section (left) and scale pattern (right)	53
Figure 3.10: Scrub-hare hair cross section (left) and scale pattern (right)	53
Figure 3.11 (a): Red rock hare hair cross section (left) and scale pattern (right)	54
Figure 3.11 (b): Red rock hare hair cross section containing more than ten perforations	54
Figure 3.12: Burchell's zebra hair cross section (left) and scale pattern (right)	55
Figure 3.13: Black rhino hair cross section (left) and scale pattern (right)	55
Figure 3.14 (a): Rock dassie hair cross section (left) and scale pattern (right)	56
Figure 3.14 (b): Rock dassie hair scale pattern at two other positions along the length of the hair	56
Figure 3.15: Aardvark hair cross section shape (left) and scale pattern (right)	57
Figure 3.16: Distorted cross section of an unidentified fossil hair (left) and severely degraded cuticular scales (right)	59
Figure 3.17: Fossil hair specimen 1 cross section (left) and scale pattern (right)	60
Figure 3.18: Fossil hair specimen 2 cross section (left) and scale pattern (right)	60
Figure 3.19: Fossil hair specimen 3 scale pattern	61
Figure 3.20: Fossil hair specimen 4 scale pattern	61
Figure 3.21: Fossil hair specimen 5 scale pattern	62
Figure 3.22: Fossil hair specimen 6 scale pattern	62
Figure 3.23: Fossil hair specimen 7 scale pattern	63
Figure 3.24: Fossil hair specimen 8 cross section (left) and scale pattern (right)	63
Figure 3.25: Fossil hair specimen 9 cross section (left) and scale pattern (right)	64
Figure 3.26: Fossil hair specimen 10 cross section (left) and scale pattern (right)	64
Figure 3.27: Fossil hair specimen 11 scale pattern	65
Figure 3.28: Fossil hair specimen 12 scale pattern	65
Figure 3.29: Fossil hair specimen 13 scale pattern	66
Figure 3.30: Fossil hair specimen number 14 scale pattern	66

Figure 3.31: Fossil hair specimen 15 scale pattern	67
Figure 3.32: Fossil hair specimen 16 scale pattern	67
Figure 3.33: Fossil hair specimen 17 cross section (left) and scale pattern (right)	68

LIST OF TABLES

Table 2.1: Coprolites from Gladysvale cave analysed in this study	40
Table 2.2: Coprolites from which fossil hairs were collected	42
Table 2.3: Modern comparative mammals from which guard hair samples were collected	44
Table 2.4: Descriptions of scale patterns used in the text	46
Table 3.1: Morphological characteristics of 15 modern hairs analysed by scanning electron microscopy	58
Table 3.2: Possible fossil hair identifications	75

CONTENTS	Page
DECLARATION	ii
ABSTRACT	iii
ACKNOWLEDGEMENTS	iv
DEDICATION	v
LIST OF FIGURES	vi
LIST OF TABLES	ix

CHAPTER ONE: INTRODUCTION

1.1	Background	1
1.2	Hair development	3
1.3	Preservation of hair	4
1.4	Previous mammal hair research	6
1.5	Objectives	11
1.6	Hypotheses	11
1.7	Study site	12
1.8	Coprolites	16
1.8.1	<i>Parahyaena brunnea</i> scats	19
1.9	<i>Parahyaena brunnea</i>	20
1.9.1	Physical description of extant <i>Parahyaena brunnea</i>	20
1.9.2	Reproduction of extant <i>Parahyaena brunnea</i>	22
1.9.3	<i>Parahyaena brunnea</i> territory	23
1.9.4	Modern <i>Parahyaena brunnea</i> diet	24
1.10	Summary	27

CHAPTER TWO: MATERIALS AND METHODS

2.1	Background to hair morphology and identification	29
2.2	Cuticular scale features	31
2.3	Cross-sectional shapes	33
2.4	Techniques for studying hair morphology	35
2.5	Analytical protocol used in this study	37
2.5.1	Scanning electron microscopy	37
2.5.2	Operation principle of the scanning electron microscope	38
2.5.3	Fossil hair analysis	39
2.6	Modern hair analysis	43
2.6.1	Modern comparative collection	43
2.6.2	Cleaning of modern hair samples	44
2.7	Hair identification features and definitions	46

CHAPTER THREE: RESULTS

3.1	Introduction	48
3.1.1	Scanning electron micrographs of modern comparative hair samples	49
3.1.2	Summary of modern hair morphological characteristics	57
3.1.3	Scanning electron micrographs and descriptions of fossil hairs	59
3.2	Possible fossil hair identifications	68
3.3	Summary of results	74

CHAPTER FOUR: DISCUSSION

4.1	Hair identification difficulties	78
4.2	Hair comparison and identification	79
4.3	Implications for Middle Pleistocene hyaena ecology and palaeoenvironment	84

CHAPTER FIVE: CONCLUSION

Conclusion	91
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REFERENCES	93
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APPENDICES

Appendix A	Modern steenbok hair scale pattern at different scales	153
Appendix B	Unidentified fossil hair scale pattern at different scales	153
Appendix C	Unidentified fossil hair cross section and scale pattern	154
Appendix D	Modern Burchell's zebra hair cross section at different magnifications	154
Appendix E	Unidentified fossil hair scale pattern at different magnifications	155