

Contents

Preface xi

Acknowledgments xv

1 Introduction 1

What Is a Small Mammal? 1

Advantages and Disadvantages of Being a Small Mammal 2

The Protagonists 4

Monotremes and Marsupials 4

Afrosoricida, Erinaceomorpha, Soricomorpha, Macroscelidea,
Scandentia, and Dermoptera 6

Chiroptera 7

Primates 8

Carnivora 10

Rodentia 11

Lagomorpha 15

Hyracoidea 16

PART ONE Modes of Feeding 19

2 Insectivory 21

General Characteristics 21

Dilambdodont Dentition 21

Terrestrial Insectivores 24

Venomous Saliva 25

Long, Protrusile Tongue 28

Arboreal Insectivores 32

Elongated Digits 32

	Semiaquatic and Fossorial Insectivores	34
	<i>Sensory Mucous Glands</i>	34
	<i>Eimer's Organs</i>	36
	<i>Underwater Sniffing</i>	40
	Subterranean Insectivores	42
	<i>Seismic Sensitivity</i>	46
	Aerial Insectivores	48
	<i>Wings</i>	50
	<i>Echolocation</i>	52
3	Herbivory	60
	General Characteristics	61
	<i>Ever-Growing Incisors</i>	61
	<i>Coprophagy</i>	63
	Granivores	65
	<i>Food Hoarding</i>	67
	<i>Cheek Pouches</i>	71
	Frugivores	76
	<i>Piercing Teeth</i>	77
	<i>Prehensile Tail and Protrusile Tongue</i>	80
	Nectarivores	82
	<i>Brush-Tipped Tongue</i>	82
	Gummivores	89
	Folivores	95
	<i>Foregut versus Hindgut Fermentation</i>	95
	<i>Gliding Membranes and Pectinate Teeth</i>	98
	CASE STUDY	
	<i>Rock Badgers: Gutsy Cliff-Dwellers</i>	101
4	Carnivory	105
	General Characteristics	105
	<i>Carnassial Teeth</i>	105
	Flesh-Eating Carnivores	106
	<i>Felids</i>	106
	<i>Mustelids</i>	110
	<i>Canids</i>	114
	Piscivores	117
	<i>Claws, Cheek Pouches, and a Sixth Finger</i>	117

	Sanguinivores	122
	<i>Knifelike Teeth and Heat-Sensitive Nasal Pits</i>	122
5	Omnivory	126
	Omnivorous Carnivores	127
	<i>Procyonids</i>	127
	<i>Herpestids</i>	127
	<i>Viverrids</i>	128
	<i>Euplerids</i>	129
	Mycophagy	129
	CASE STUDIES	
	<i>The Hero Shrew: Mysterious Insectivore</i>	131
	<i>Dietary Nonconformists</i>	134
	<i>Gleaning, Hawking, Hovering, and Perch-Hunting</i>	142
	PART TWO Environmental Adaptations	147
6	Endothermy	149
7	Heterothermy	156
	Torpor	156
	Hibernation	160
8	Coping with Cold	172
	Insulatory Changes	172
	Countercurrent Heat Exchange: The Miraculous Net	174
	Reduced Level of Activity	175
	Reduction of Body Mass (Dehnel's Phenomenon)	179
	Fat Tails	180
	Social Thermoregulation	183
	Increased Heat Production	189
9	Coping with Heat and Aridity	192
	Conserving Water	193
	Dietary Water Intake	195
	Evaporative Cooling	197
	<i>Sweating, Panting, and Saliva Spreading</i>	198
	<i>Respiratory Heat Exchange</i>	200
	Pelage Insulation	203
	Behavioral Avoidance of Heat	204

10	Ecogeographic Rules	208
	Modified Size of Appendages (Allen's Rule)	208
	Seasonal Color Dimorphism (Gloger's Rule)	210
	Body Mass and Latitude (Bergmann's Rule)	214
	CASE STUDIES	
	Communal Nesting	216
	Hedgehogs: Spiny Hibernators	218
	PART THREE Reproduction	221
11	Reproductive Variations	223
	Delayed Fertilization	223
	Delayed Implantation	225
	Delayed Development	228
	Embryonic Diapause	228
12	Mating Systems and Reproductive Strategies	231
	High Fecundity	231
	Monogamy, Housekeeping, and Mate Guarding	234
	Absentee Maternal Care	237
	Lek Behavior	240
	Eusociality	242
	Semelparity: Breeding and Sudden Death	246
13	Population Cycles: Lemmings and Snowshoe Hares	249
	Appendix: Useful Web Sites	255
	Glossary	257
	References	267
	Index	297