

Classification of Bats

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In the 10th edition of *Systema Naturae*, published in 1758 and the starting point of the binomial system of nomenclature currently employed in zoology, Linnaeus recognized seven species of bats, which he placed in a single genus (*Vespertilio*) and grouped with the primates and dermopterans. All of Linnaeus's seven species are recognized today, but as they now are classified each represents a distinctive genus, and the genera are arranged taxonomically in five different families of two suborders. In contrast to Linnaeus's scheme, the present classification of bats (long ago placed in a distinct order, Chiroptera) lists 847 Recent species, belonging to 169 Recent genera, 15 families (at least three other families are known only as fossils), and two suborders (see Table 1).

Much work remains in elucidating the relationships of bats, even at the higher taxonomic levels. In the plethora of publications that have appeared in recent years on the distribution and systematics of bat genera and species, the trend has been to reduce the number of recognized taxa at these levels, even though some new species, and occasionally a new genus, are named annually. Several of the subsequent papers in this symposium touch on problems relating to classification.

SYNOPSIS OF RECENT FAMILIES OF CHIROPTERA

The following synopsis of the 16 Recent families of bats is designed to give the reader an overview of the distribution, both fossil and Recent, and of the diversity among the major taxonomic units of the order. Classification within each family is given through the included genera; the number of currently recognized species in each Recent genus is indicated parenthetically after the generic name. Names of taxa known only as fossils are preceded by an asterisk.

SUBORDER MEGACHIROPTERA

Family PTEROPODIDAE (fruit-eating bats, "flying foxes")

Distribution.—Fossil: Middle Oligocene and Miocene of Europe, Pleistocene of Madagascar and East Indies. Recent: Tropics and subtropics of Old World from Africa to southeast Asia, Australia, Samoa, and the Carolines.

Diversity.—Three subfamilies (one known only from fossil record), 38 Recent genera, and approximately 150 Recent species.

ABOUT BATS

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- *Subfamily Archaeopteropinae
 **Archaeopteropus*
- Subfamily Pteropodinae
 Tribe Pteropini
 Subtribe Rousettina
 Eidolon (1)
 Rousettus (6)
 Myonycteris (2)
 Boneia (1)
 Subtribe Pteropodina
 Pteropus (65)
 Acerodon (5)
 Neopteryx (1)
 Pteralopex (1)
 Styloctenium (1)
 Subtribe Dobsoniina
 Dobsonia (7)
- Tribe Harpyionycterini
 Harpyionycteris (1)
- Tribe Epomophorini
 Plerotes (1)
 Hypsognathus (1)
 Epomops (3)
 Epomophorus (8)
 Micropteropus (3)
 Nanonycteris (1)
 Scotoonycteris (2)
- Casinycteris* (1)
- Tribe Cynopterini
 Subtribe Cynopterina
 Cynopterus (4)
 Megaerops (2)
 Ptenochirus (1)
 Dyacopterus (1)
 Chironax (1)
 Thoopterus (1)
 Sphaerias (1)
 Balionycteris (1)
 Aethalops (1)
 Penthetor (1)
 Haplonycteris (1)
- Subtribe Nyctimenina
 Nyctimene (9)
 Paranyctimene (1)
- Subfamily Macroglossinae
 Tribe Macroglossini
 Eonycteris (3)
 Megaloglossus (1)
 Macroglossus (3)
 Syconycteris (3)
- Tribe Notopterini
 Melonycteris (3)
 Notopterus (1)

SUBORDER MICROCHIROPTERA

Superfamily EMBALLONUROIDEA

Family RHINOPOMATIDAE (mouse-tailed bats)

Distribution.—No fossils known. Recent: Northern Africa east through southern Asia to Sumatra.

Diversity.—One Recent genus with two species.

Rhinopoma (2)

Family EMBALLONURIDAE (sac-winged or sheath-tailed bats, ghost bats)

Distribution.—Fossil: Eocene or Oligocene and Pliocene of Europe, Miocene of Africa. Recent: Northern Mexico to southern Brazil in New World, Near East south to southern parts of Africa and Australia, and on Pacific islands east to Samoa, in Old World.

Diversity.—Two subfamilies, 12 Recent genera, and 44 Recent species.

Subfamily Emballonurinae	<i>Cormura</i> (1)
* <i>Vespertiliavus</i>	<i>Balantiopteryx</i> (3)
<i>Emballonura</i> (10)	<i>Taphozous</i> (14)
<i>Coleura</i> (2)	Subfamily Diclidurinae
<i>Rhynchonycteris</i> (1)	<i>Cyttarops</i> (1)
<i>Saccopteryx</i> (4)	<i>Depanycteris</i> (1)
<i>Centronycteris</i> (1)	<i>Diclidurus</i> (3)
<i>Peropteryx</i> (3)	

Family NOCTILIONIDAE (bull-dog bats)

Distribution.—Fossil: Only sub-Recent material known. Recent: Tropical America from Sinaloa, Mexico, and the Antilles south to northern Argentina.

Diversity.—One Recent genus with two species.

Noctilio (2)

Superfamily RHINOLOPHOIDEA

Family NYCTERIDAE (hispid bats)

Distribution.—No fossils known. Recent: Africa except Sahara Region, Madagascar, and Arabian coast; Malayan Peninsula, Sumatra, Java, Borneo, and adjacent islands.

Diversity.—One Recent genus with 13 species.

Nycteris (13)

Family MEGADERMATIDAE (false vampire bats, yellow-winged bats)

Distribution.—Fossil: Late Eocene or early Oligocene to Miocene of Europe, Miocene of Africa, Pleistocene of Asia. Recent: Central Africa, India, southeast Asia, Philippines, and East Indies to Australia.

Diversity.—Four Recent genera and five Recent species.

* <i>Necromantis</i>	<i>Macroderma</i> (1)
* <i>Miomegaderma</i>	<i>Cardioderma</i> (1)
<i>Megaderma</i> (2)	<i>Lavia</i> (1)

Family RHINOLOPHIDAE (horseshoe bats)

Distribution.—Fossil: Late Eocene to Pleistocene of Europe, Pleistocene of Asia. Recent: Old World from British Isles and Africa east to Japan, Philippines, New Hebrides, and northern and eastern Australia.

Diversity.—Two subfamilies (Rhinolophinae and Hipposiderinae, the latter regarded as a distinct family by some authors), 11 Recent genera and approximately 128 Recent species.

Subfamily Rhinolophinae	<i>Anthops</i> (1)
* <i>Paleonycteris</i>	<i>Asellia</i> (2)

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| <i>Rhinolophus</i> (68) | <i>Aselliscus</i> (2) |
| <i>Rhinomegalophus</i> (1) | <i>Cloeotis</i> (1) |
| Subfamily Hipposiderinae | <i>Rhinonycteris</i> (1) |
| *Tribe Palaeophyllophorini | <i>Triaenops</i> (4) |
| * <i>Palaeophyllophora</i> | Tribe Coelopsini |
| * <i>Paraphyllophora</i> | <i>Coelops</i> (3) |
| Tribe Hipposiderini | <i>Paracoelops</i> (1) |
| <i>Hipposideros</i> (44) | |

Superfamily PHYLLOSTOMATOIDEA

Family PHYLLOSTOMATIDAE (leaf-nosed bats, vampire bats)

Distribution.—Fossil: Known certainly from Miocene of Colombia (**Notonycteris*) and Pleistocene of North, Central, and South America. Recent: New World (principally tropical areas) from southwestern United States and Antilles south to northern Argentina and central Chile.

Diversity.—Seven subfamilies, 50 Recent genera, and approximately 131 Recent species. The Desmodontinae (vampire bats), long regarded as a distinct family, probably is deserving of only subfamilial recognition in the Phyllostomatidae and is so arranged here; conversely, the subfamily Chilonycterinae may well warrant recognition as a full family.

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| Subfamily Chilonycterinae | <i>Rhinophylla</i> (3) |
| <i>Pteronotus</i> (6) | Subfamily Stenoderminae |
| <i>Mormoops</i> (2) | Tribe Sturnirini |
| Subfamily Phyllostomatinae | <i>Sturnira</i> (10) |
| <i>Micronycteris</i> (10) | Tribe Brachyphyllini |
| <i>Macrotus</i> (1) | <i>Brachyphylla</i> (2) |
| <i>Lonchorhina</i> (1) | Tribe Stenodermini |
| <i>Macrophyllum</i> (1) | <i>Uroderma</i> (2) |
| <i>Tonatia</i> (5) | <i>Vampyrops</i> (5) |
| <i>Mimon</i> (2) | <i>Vampyrodes</i> (1) |
| <i>Phyllostomus</i> (4) | <i>Vampyressa</i> (5) |
| <i>Phylloderma</i> (1) | <i>Chiroderma</i> (4) |
| <i>Trachops</i> (1) | <i>Ectophylla</i> (2) |
| * <i>Notonycteris</i> | <i>Enchisthenes</i> (1) |
| <i>Chrotopterus</i> (1) | <i>Artibeus</i> (8) |
| <i>Vampyrum</i> (1) | <i>Ardops</i> (1) |
| Subfamily Glossophaginae | <i>Phyllops</i> (2) |
| <i>Glossophaga</i> (4) | <i>Ariteus</i> (1) |
| <i>Lionycteris</i> (1) | <i>Stenoderma</i> (1) |
| <i>Lonchophylla</i> (4) | <i>Pygoderma</i> (1) |
| <i>Platalina</i> (1) | <i>Ametrida</i> (1) |
| <i>Monophyllus</i> (2) | <i>Sphaeronycteris</i> (1) |
| <i>Anoura</i> (5) | <i>Centurio</i> (1) |

<i>Scleronycteris</i> (1)	Subfamily Phyllonycterinae
<i>Hylonycteris</i> (1)	<i>Erophylla</i> (2)
<i>Choeroniscus</i> (5)	<i>Phyllonycteris</i> (3)
<i>Choeronycteris</i> (2)	Subfamily Desmodontinae
<i>Leptonycteris</i> (3)	<i>Diphylla</i> (1)
<i>Lichonycteris</i> (2)	<i>Diaemus</i> (1)
Subfamily Carollinae	<i>Desmodus</i> (1)
<i>Carollia</i> (4)	

Superfamily VESPERTILIONOIDEA

Family NATALIDAE (funnel-eared bats)

Distribution.—Fossil: Pleistocene of the Bahamas, Cuba, and Jamaica. Recent: Neotropics from northern Mexico and the Antilles south to Brazil.

Diversity.—One Recent genus with four species.

Natalus (4)

Family FURIPTERIDAE (smoky bats)

Distribution.—No fossils known. Recent: Trinidad and northern South America to southern Brazil and northern Chile.

Diversity.—Two Recent genera, each monotypic.

Furipterus (1)

Amorphochilus (1)

Family THYROPTERIDAE (disc-winged bats)

Distribution.—No fossils known. Recent: Neotropics from southern Mexico south to Brazil and Peru.

Diversity.—One Recent genus with two species.

Thyroptera (2)

Family MYZOPODIDAE (sucker-footed bat)

Distribution.—No fossils known. Recent: Madagascar.

Diversity.—One monotypic Recent genus.

Myzopoda (1)

Family VESPERTILIONIDAE (common bats)

Distribution.—Fossil: Late Eocene to Pleistocene of Europe, Middle Oligocene to Pleistocene of North America, Pliocene and Pleistocene of Asia, Pleistocene of North Africa, Antilles, South America. Recent: Broadest distribution of any living family of bats; north to the Arctic Circle in Palearctic and Nearctic regions, south to southern parts of Africa, Australia, and South America, and on many islands including Hawaii, Iceland, and New Zealand.

Diversity.—Six subfamilies, 34 Recent genera, and approximately 283 Recent species.

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| Subfamily Vespertilioninae | <i>Baeodon</i> (1) |
| Tribe Myotini | <i>Scotomanes</i> (1) |
| * <i>Stehlinia</i> | <i>Scotophilus</i> (7) |
| * <i>Oligomyotis</i> | <i>Otonycteris</i> (1) |
| * <i>Suaptenos</i> | Tribe Lasiurini |
| * <i>Miomyotis</i> | <i>Lasiurus</i> (6) |
| <i>Myotis</i> (68) | Tribe Plecotini |
| <i>Lasionycteris</i> (1) | <i>Barbastella</i> (2) |
| Tribe Vespertilionini | <i>Plecotus</i> (5) |
| * <i>Samonycteris</i> | <i>Euderma</i> (1) |
| * <i>Simonycteris</i> | Subfamily Miniopterinae |
| <i>Eudiscopus</i> (1) | <i>Miniopterus</i> (6) |
| <i>Pipistrellus</i> (53) | Subfamily Murinae |
| <i>Nyctalus</i> (9) | <i>Murina</i> (11) |
| <i>Glischropus</i> (2) | <i>Harpiocephalus</i> (1) |
| <i>Eptesicus</i> (26) | Subfamily Kerivoulinae |
| <i>Vespertilio</i> (3) | <i>Kerivoula</i> (22) |
| <i>Laephotis</i> (1) | Subfamily Nyctophilinae |
| <i>Histiotus</i> (3) | Tribe Antrozoini |
| <i>Philetor</i> (1) | * <i>Anzanycteris</i> |
| <i>Tylonycteris</i> (2) | <i>Antrozous</i> (3) |
| <i>Mimetillus</i> (1) | Tribe Nyctophilini |
| <i>Hesperoptenus</i> (4) | <i>Lamingtona</i> (1) |
| <i>Chalinolobus</i> (13) | <i>Nyctophilus</i> (7) |
| Tribe Nycticeini | <i>Pharotis</i> (1) |
| <i>Nycticeius</i> (12) | Subfamily Tomopeatinae |
| <i>Rhogeesa</i> (3) | <i>Tomopeas</i> (1) |

Family MYSTACINIDAE (short-tailed bat)

Distribution.—No fossils known. Recent: New Zealand.

Diversity.—One monotypic Recent genus.

Mystacina (1)

Family MOLOSSIDAE (free-tailed bats)

Distribution.—Fossil: Late Oligocene to Pleistocene of Europe, Pleistocene of North and South America. Recent: Old World from southern parts of Europe and Asia south to Africa (except Sahara), East Indies, Australia, and the Fiji Islands; New World from southwestern Canada through Middle America and the Antilles to South America (Argentina and Chile).

Diversity.—Eleven Recent genera and approximately 82 Recent species.

<i>Tadarida</i> (45)	<i>Molossops</i> (6)
<i>Otomops</i> (5)	<i>Eumops</i> (10)
<i>Neoplaticymops</i> (1)	<i>Promops</i> (3)
<i>Sauromys</i> (1)	<i>Molossus</i> (5)
<i>Platymops</i> (1)	<i>Cheiromeles</i> (2)
<i>Myopterus</i> (3)	

FOSSIL CHIROPTERA OF UNCERTAIN STATUS

*Family Icaronycteridae	* <i>Paleochiropteryx</i>
* <i>Icaronycteris</i>	* <i>Cecilionycteris (incertae sedis)</i>
*Family Archaeonycteridae	Chiroptera <i>incertae sedis</i>
* <i>Archaeonycteris</i>	* <i>Paleunycteris</i>
*Family Paleochiropterygidae	* <i>Paradoxonycteris</i>

TABLE 1.—DIVERSITY OF RECENT BATS

Classification	Subfamilies	Recent Genera	Recent Species
Suborder MEGACHIROPTERA			
Family Pteropodidae	3*	38	ca. 150
Suborder MICROCHIROPTERA			
Superfamily Emballonuroidea			
Family Rhinopomatidae		1	2
Family Emballonuridae	2	12	44
Family Noctilionidae		1	2
Superfamily Rhinolophoidea			
Family Nycteridae		1	13
Family Megadermatidae		4	5
Family Rhinolophidae	2	11	ca. 128
Superfamily Phyllostomatoidea			
Family Phyllostomatidae	7	50	ca. 131
Superfamily Vespertilionoidea			
Family Natalidae		1	4
Family Furipteridae		2	2
Family Thyropteridae		1	2
Family Myzopodidae		1	1
Family Vespertilionidae	6	34	ca. 280
Family Mystacinidae		1	1
Family Molossidae		11	ca. 82

*One subfamily known only as fossil.

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