Bats

I. What are bats?
- Anatomy & Taxonomy

II. Taxonomic & Biogeographic Diversity
- see reverse side

III. How do we catch bats to study?
- mist nets
- light tracking techniques

IV. Diversity in Feeding Behavior & Trophic Level Importance
1. Aerial Insectivores
2. Gleaning & Fly-catching Insectivores
3. Omnivores
4. Carnivores- the LARGEST NEW WORLD bats
5. Sanguinivores- VAMPIRES
6. Piscivores
7. Nectarivores- MAJOR rain forest pollinators
8. Frugivores- extremely important in seed dispersal!

V. Diversity in Reproductive Patterns
1. Polyestrous; seasonal VAMPIRES
2. Polyestrous; seasonal Most Other Tropical Bats
3. Monestrous; seasonal; Some Insectivorous Bats

VI. Diversity in Roost Site Selection
1. Caves- most rain forest areas have caves (Karst Topo)
2. Tree Limbs / Under Leaves
3. Tree Trunks
4. Tree Hollows
5. Fallen Logs
6. Rolled Heliconius and Banana Leaves
7. Buildings
8. Leaf Tents

VII. Diversity in Social Behavior
1. Solitary
2. Family Groups
3. Harems
4. Colonies
5. Leks

VIII. Diversity in Temperature Regulation
1. Constant Temperature; cannot lower (most tropical bats)
2. Usually Constant; can lower under stress (few tropical bats)

3. Ambient at Will; estivators / hibernators (some insect.)

IX. Evolution: possible polypheletic but evidence weak
1. Microchiroptera - most bats (from insectivores)
2. Megachiroptera - Old World Fruit Bats (from primares?)
3. Early Eocene fossil bat

Bats / Misc. Notes

CHIROPTERA:

*second largest mammalian order (approx. 950 species)

May also exceed all other groups of mammals in number of individuals

Microchiroptera: insect eaters & carnivores
Megachiroptera: frugivores (all tropical)

Trophic Levels:

*Insectivores	*Frugivores	*Nectarivores
*Carnivores	*Piscivores	*Sanguivores

"Bat Adaptations"

Ability To Fly: reduction of size & mass.
wing / "hand"; fingers support flight membrane & thumb holds bat to roost

Both flight and nocturnal habit lead to niche exploitation and speciation

Echolocation: 200 "clicks" per second
frequency: 40-90 kHz (humans 20 kHz)

Co-evolution in response to echolocation:
*noctuid moths - “fuzzbuster” / erratic flight
*arctiid moths – “scrambler” / 30-90 kHz

Nectarivores (like nocturnal moths) visit white flowers; some lap their own urine (HCI) to help digest protein coat of pollen