

Mammalogy Laboratory 8 – Perissodactyla & Cetartiodactyla

General Notes: The phylogenetic evidence that cetaceans evolved from within the artiodactyls and are a sister group to hippopotamids has become very compelling; I was skeptical at first (back in the mid-90's).

Order Perissodactyla (odd-toed ungulates)

General Notes: This order contains three families, **Equidae (horses)**, Tapiridae (tapirs), and Rhinocerotidae (rhinos). We only have the equids represented.

Diagnosis: Hoofed, with middle digit (III) larger than others; usually three digits on pes, but only the middle digit may be functional; skull elongate through enlargement of facial bones; cheek teeth broad and lophodont to selenolophodont.

Family Equidae (horses)

Diagnosis: Lateral digits reduced, third functional and terminating in a hoof; nasal bones long and narrow, projecting freely; orbits small and enclosed by post-orbital bar; tympanic bulla poorly developed; incisors broad, canines small and variable; cheek teeth hypsodont.

Habits: Grazers occurring in open planes; gregarious; both nocturnal and diurnal; may live 20 - 25 years; gestation period of ca. 11 months.

Range: Africa, Arabia, western and central Asia; widely introduced by humans.

Material in Lab: *Equus caballus* (horse)*

*Not an Idaho species

Order Cetartiodactyla (even-toed ungulates and whales)

General Notes: This order contains 10 terrestrial families and 10 marine families; most of terrestrial families are probably already familiar to you. In older classifications, these are divided into three suborders: the Suborder Suiformes, which included Suidae (Pigs), Tayassuidae (Peccaries), and Hippopotamidae (Hippopotami); the Suborder Tylopoda, which included Camelidae (Camels, Llamas, etc.); and the Suborder Ruminantia, which included Tragulidae (Chevrotains), Giraffidae (Giraffes), Moschidae (Musk deer, formerly included with cervids), Cervidae (Deer, etc.), Antilocapridae (Pronghorn), Bovidae (Bovids). The last five families were sometimes grouped into the infraorder Pecora (hence you'll sometimes hear the term "pecoran ruminants").

Diagnosis for terrestrial families: Teeth bunodont to selenodont, brachydont to hypsodont; horns or antlers may be present; parietals usually reduced, frontals usually enlarged; third trochanter of femur absent; main axis of manus and pes between third and fourth digits; second and fifth digits

usually reduced, often lost; two or four toes on each foot; astragalus with double pulley-like surface.

Range of terrestrial families: Native to all land areas except Australian region (and Antarctica), where they have been introduced.

Family Suidae (pigs)

Diagnosis: Molars bunodont; canines usually with sharp lateral edges, upper canines large and tend to turn upward and outward, forming tusks; post-orbital bar absent; sagittal crest often well developed; may have sesamoid bone in nose-pad; metapodials not fused.

Habits: Usually gregarious; nocturnal or diurnal; grub for food; omnivorous; breed throughout year.

Range: Native to Eurasia and Africa, introduced widely.

Representative Genera: *Sus*, *Potamochoerus*, *Phacochoerus*, *Babyrousa*.

Material in Lab: *Sus scrofa* (hog)*

*Not an Idaho species

Family Tayassuidae (peccaries)

Diagnosis: Upper canine tusks relatively small, directed downward with sharp cutting edge; molars bunodont; four toes on front feet, three on hind; no post-orbital bar, sagittal crest present; mastoid process not visible from lateral view.

Habits: Gregarious; omnivorous; usually bear twins.

Range: Southwestern U.S. south to central Argentina

Genera: *Tayassu*, *Catagonus*, *Dicotyles*

Material in Lab: *Dicotyles tajacu* (collared peccary or javelina)*
Catagonus wagneri (Chacoan peccary)

*Not an Idaho species

Family Cervidae (deer)

Diagnosis: Vacuity between lacrimal and nasal bones; post-orbital bar present; sagittal crest absent; mandibular condyle long; molars selenodont and brachydont; lateral toes present but

small (sometimes called dew-claws); metapodials fused; deciduous antlers usually present and usually restricted to males, if antlers absent, males have enlarged canines.

Habits: Gregarious, social; some are seasonally migratory; usually are good swimmers; herbivorous, generally browsers; use antlers in intraspecific combat during and prior to breeding season; usually one or two young per litter.

Range: Cosmopolitan, except for most of Africa and Australian region (introduced to New Zealand, where they have become pests).

Representative Genera: *Hydropotes*, *Muntiacus*, *Dama*, *Axis*, *Mazama*, *Pudu*, *Alces*, *Rangifer*, *Cervus*, *Odocoileus*, *Blastocercus*.

Material in Lab: *Odocoileus virginianus* (white-tailed deer)
 O. hemionus (mule deer)
 Alces alces (moose, called elk in Europe)
 Rangifer tarandus (caribou)
 **Cervus canadensis* (elk, or wapiti; some still consider wapiti as
 conspecific with European red deer, *C. elephas*).
 Mazama americana (brocket deer)**

*Several (not terribly strong) genetic studies have recommended that North American elk and eastern Asian red deer should be considered a separate species, *Cervus canadensis*, from European red deer. Even 20 years after these was first recommended, it is still based primarily on mtDNA; this recommendation has been adopted by many authors, but not by all (e.g., Golosova et al., 2023. *Biology Bulletin Reviews*, 13: 482).

**Not an Idaho species

Family Antilocapridae (pronghorn)

Diagnosis: Cheek teeth selenodont, hypsodont; dental formula 0/3, 0/1, 3/3, 3/3 = 32; horns in both sexes having bony cores and sheaths of fused hair; sheaths shed annually after the breeding season; no sagittal crest; post-orbital bar present; lacrimal bone separated from nasal by vacuity; no lateral toes present; metapodials fused; horns have a short branch arising above middle that is directed forward.

Habits: Gregarious in winter, but solitary or occurring in small bands at other times; erect hairs on white rump when disturbed; agile and rapid runners, cruise at 50 km/hr; most aerobically adapted mammals; keen vision; herbivorous, chiefly browsers.

Range: western North America

Genus: *Antilocapra* is the single extant genus, but there was substantial antilocaprid diversity in North America during the Quaternary.

Material in Lab: *Antilocapra americana* (pronghorn)

Note that this is NOT an antelope, in spite of the common (mis)usage of the word.

Family Bovidae (cattle, goats, sheep, antelope, etc.)

Diagnosis: Upper canines reduced or absent; molars usually hypsodont, selenodont; lacrimal bone almost meeting nasal, no lacrimal vacuity; no sagittal crest; postorbital bar present; lateral toes reduced to vestiges; metapodials fused; unbranched horns composed of bony core and keratinized sheath, non-deciduous (except in some cases of injury), always present in males, often present in females.

Habits: Primarily grassland grazers; polyestrous; young vary in number from one to five; usually gregarious.

Range: Cosmopolitan, except for Central and South America and Australasia; worldwide in domestication.

Representative Genera (approximately 45 genera separated into 8 subfamilies)

Bovinae: *Bos*, *Boselaphus*, *Syncerus*, *Tragelaphus*, *Bubalus*

Antilopinae: *Antelope*, *Gazella*, *Neotragus*

Alcephalinae: *Alcephalus*, *Connochaetes*

Caprinae: *Ammotragus*, *Capra*, *Hemitragus*, *Oreamnos*, *Ovibos*, *Ovis*

Cephalophinae: *Cephalophus*, *Sylvicapra*

Hippotraginae: *Hippotragus*, *Addax*, *Oryx*

Reducinae: *Kobus*, *Redunca*

Peleinae: *Pelea*

Material in Lab: *Bos (Bison) bison* (bison)
 Bos taurus (cattle)*
 Syncerus caffer (African buffalo)*
 Ovis aries (sheep)*
 O. canadensis (bighorn sheep)
 Oreamnos americanus (mountain goat)
 Capra hircus (goat)*

* Introduced or not an Idaho species