

ORANGUTAN TAXONOMY AND NOMENCLATURE

Craig Demitros

The taxonomy of the orangutan has been confusing and is still the subject of much debate. Questions at the specific and subspecific level are still being investigated (Courtenay et al. 1988). The following taxonomic information is taken primarily from Groves, 1971.

HIGHER LEVEL TAXONOMY:

Order: Primates

Suborder: Anthroidea

Superfamily: Hominoidea

Family: Pongidae (Includes extant genera *Pan*, *Gorilla* and *Pongo*).

HISTORICAL TAXONOMY AT THE GENUS AND GENUS SPECIES LEVEL:

Genus

Pongo Lacepede, 1799.

Ourangus Zimmerman, 1777 (Name invalidated).

Genus species (*Pongo pygmaeus* Hoppius, 1763).

Simia pygmaeus Hoppius, 1763. Type locality Sumatra.

Simia satyrus Linnaeus, 1766.

Ourangus outangus Zimmerman, 1777.

Pongo borneo Lacepede, 1799. Type locality Borneo.

Simia Agrais Schreber, 1779. Type locality Borneo.

Pongo Wurmii Tiedemann, 1808. Type locality Borneo.

Pongo Abelii Lesson, 1827. Type locality Sumatra.

Simia Morio Owen, 1836. Type locality Borneo.

Pithecius bicolor I. Geoffroy, 1841. Type locality Sumatra.

Simia Gargantica Pearson, 1841. Type locality Sumatra.

Pithecius brookei Blyth, 1853. Type locality Sarawak.

Pithecius owenii Blyth, 1853. Type locality Sarawak.

Pithecius curtus Blyth, 1855. Type locality Sarawak.

Satyrus Knekias Meyer, 1856. Type locality Borneo.

Pithecius Wallichii Gray, 1870. Type locality Borneo.

Pithecius sumatranus Selenka, 1896. Type locality Sumatra.

Pongo pygmaeus Rothschild, 1904. First use of this combination.

Pithecius wallacei Elliot, 1913. Type locality Borneo.

CURRENT TAXONOMY

The current and most accepted taxonomy of the Genus *Pongo* includes one species *Pongo pygmaeus* and two subspecies *P.p. pygmaeus* (the Bornean subspecies) and *P.p. abelii* (the Sumatran subspecies) (Bemmel 1968; Jones 1969; Groves 1971; Jacobshagen 1979; Seuarez et al. 1979 and Groves 1993).

Although hybrids have been produced in captivity, Andrews (1984), Groves (1986) and Janczewski, Goldman and O'Brien (1990) have suggested that the degree of difference between the two subspecies is considerable enough that the two forms be considered separate species. Based on further investigation of the physical appearance, behavior, morphology and biochemical and chromosomal characteristics of the subspecies, the authors concluded that the range of variation does not warrant separate species designation. They concur on the subspecific taxonomy of *Pongo pygmaeus pygmaeus* and *Pongo pygmaeus abelii*.

Recent molecular genetic research results show a distinctive difference between the Bornean and Sumatran populations different enough from one another to warrant separate species classification (See Orangutan Genetic Diversity Chapter, this volume).

Rohrer-Ertl (1988) suggests an alternative taxonomy for the orangutan: Genus *Pongo* von Wurmb, 1784 and species *satyrus* Linnaeus, 1758.

He divides the species *Pongo satyrus* into three subspecies: *Pongo satyrus satyrus*, the recent Sumatran subspecies and Sumatran and Javan fossil and subfossil forms, *Pongo satyrus borneensis*, the recent and subfossil Bornean subspecies and *Pongo satyrus weidenreichii*, fossil and subfossil forms from China, Laos and Vietnam.

PHYSICAL APPEARANCE AND DESCRIPTION OF THE TWO ORANGUTAN SUBSPECIES

The two subspecies of orangutan exhibit a broad range of variation in phenotypic characteristics (Rohrer-Ertl 1988). The physical differences are most apparent in adult males. Perkins and Maple (1990) state that the determination of subspecies based on physical appearance alone is imprecise. Subspecies identification has been refined by karyotyping and genetic analysis. The diverse physical characteristics used to differentiate the two subspecies are listed below.

Table 1

Physical Characteristics of the Two Orangutan Subspecies

Pongo pygmaeus pygmaeus

(Bornean subspecies)

Pongo pygmaeus abelii

(Sumatran subspecies)

hair color

darker, almost maroon (A)

vary from red rust to dark maroon or blackish brown (D,E)

young have bright orange hair which darkens to chocolate or maroon with age (C)

never have white hairs (D)

more uniform dark pelage (C)

less variation in color (E)

hair color

lighter, more cinnamon colored (A)

light rusty red or reddish cinnamon (B,E)

young are paler orange becoming cinnamon with age (C)

may have white or yellow hair on face, in beard or groin (C, D)

pelage a mixture of light and dark hairs (C)

more variation in color (E)

hair length

less hair about the head density and neck (A)

young thinly haired (A)

shorter hair overall (C)

hair length

more hair about the head and neck (A)

young have denser hair (A)

longer hair, infants have long hair on top of head; adult males have long hair on arms, sides of back and beard (C)

hair texture

hair stiff, shiny and brittle (C)

stiffer and shinier (D)

hair texture

hair is finer and fleecier (C,D)

dry in texture (D)

hair pattern

no information

hair pattern

short hair comes on head forward over top of head (D)

Pongo pygmaeus pygmaeus
(Bornean subspecies)

facial hair

beard is less noticeable (A, E)
less hair about the face (C)
in young face is usually bare (A)
beard is darker, from orange to dark red (C)
facial hair has rough tousled appearance (C)
facial hair generally short, scruffy and less noticeable (D)

shape of face

broader faced with prominent muzzle but have a great deal of variation (C)
upper and lower jaws are pronounced (prognathous) (A,D)
figure eight-shaped face (D)

facial color

area about the eyes has a bluish cast (A,F)

eye color

darker eye color (A)

Pongo pygmaeus abelii
(Sumatran subspecies)

facial hair

beard is always present and well developed (A,B,E)
beard is lush, often gives a mustached appearance (A,E)
females also have long beards (A)
both sexes generally hairier about the face (C)
young are hairier about the face (A)
males may have long pointed or double pointed yellow or orange beards (C)
facial hair neater in appearance (C)
both sexes have longer facial hair (D)
long yellow beard grows out of upper jaw giving a mustached appearance (A,D,E)

shape of face

more elongated and flat with a definite O-shape (B)
jaw is less pronounced (A)
long oval face with marked cheek hollows (C,D)

facial color

face grey (F)

eye color

usually clearer and (variable) paler (A,D)

Pongo pygmaeus pygmaeus

(Bornean subspecies)

look or appearance

in adult males "unfriendly glower" (D)

eye/nose angle (i.e. angle between center of eyes and center of nasal septum) (E)

in adult males angle is 48-66 degrees, mean 57 degrees (C)

cheek pad/flange (the one character in which a very clear difference appears to exist between the two subspecies) (E)

in males development starts in 8th year, fully developed by 15th year (A,E,F)

naked or covered with short, bristly hairs, is quite shiny (A)

skin is dark brown or black, naked or has sparse red hair (C)

curve outward from the face (A,E)

swing forward like "blinkers", appear rounded and lumpy (C)

heavier and less rigid, develop laterally from both top and sides of face, giving a square appearance (C)

junction of the pads above the brow results in a deep wrinkled pad (C)

throat/gular pouch

large and pendulous in adult males (A,D,E)

larger and generally naked (C)

Pongo pygmaeus abelii

(Sumatran subspecies)

look or appearance

in adult males "haughty quizzical" look (D)

eye/nose angle (i.e. angle between center of eyes and center of nasal septum) (E)

in adult males angle is 37-51 degrees, mean 45 degrees (C)

cheek pad/flange (the one character in which a very clear difference appears to exist between the two subspecies) (E)

in males development, starts in 10th year, fully developed by 20th year (A,D,E,F)

hair on pad is light in color, very noticeable and silky (A)

have tufts of short white or yellow hair (plumous) (C)

rest flat against the face (A,E)

extend laterally, parallel to the face, gives the face a diamond shaped appearance (C)

**Pad/flange development in a subordinate male may be inhibited by the presence of a more dominant male (Kingsley 1982; Nacey-Maggioncalda and Czekala this volume).*

throat/gular pouch

less noticeable in adult males (A,D,E)

smaller and usually hairy (C,F)

Pongo pygmaeus pygmaeus

(Bornean subspecies)

body size/ build

tendency to become obese in captivity (A,E)

robust, often obese (C)

Body Weight

Information on body weights is scarce (E).

Presence of nail

nail may be missing from hallux (A)

foot placement/locomotion

hooked foot cannot be placed flat on ground (C,D)

walk with foot curled on outside edge (C,D)

spend less time bipedal (C,D)

A; Jones 1969
B; Bemmell 1968
C; MacKinnon 1975
D; Mallinson 1978
E; Courtenay et al. 1988
F; Groves 1971

Pongo pygmaeus abelii

(Sumatran subspecies)

body size/ build

larger in body length, appears more muscular, rarely becomes overweight (A,E)

thinner, lankier, tend to be more muscular or linear in build (C,F)

Body Weight

Information on body weights is scarce (E).

Presence of nail

see information below from Rijksen (1978)

foot placement/locomotion

foot more plantigrade (C,D)

walk with feet splayed, but flat or nearly flat (C,D)

-in captivity spend more time bipedal, often walk with chest out (C,D)

Rijksen (1978) distinguishes two morphological types of Sumatran orangutan, *Pongo pygmaeus abelii*:

Table 2 Morphological Types of Sumatran Orangutan, <i>Pongo pygmaeus abelii</i> (Rijksen 1978)	
<p><i>Dark-haired, long-fingered type</i></p> <p>hair color brown to maroon</p> <p>skin and facial color - dark brown to blackish</p> <p>body build delicate build, slender extremities, long fingers and toes</p> <p>weight smaller and lighter in weight</p> <p>digits and nails well developed thumb and hallux; both have nails</p>	<p><i>Light-haired, short-fingered type</i></p> <p>hair color reddish cinnamon to rusty red</p> <p>skin and facial color - light to dark grayish brown</p> <p>body build more heavily built, stouter limbs, short, thick fingers and toes</p> <p>weight larger and heavier in weight</p> <p>digits and nails small/rudimentary nails, thumb and hallux; nail may be missing on thumb but always absent on hallux</p>

According to Rijksen, the light-haired, short-fingered type may show considerable variation in characteristics such as finger length. The dark-haired form shows great consistency in characteristics such as long, slender limbs and nails on both thumb and hallux.

CONCLUDING REMARK

As would be expected, subspecific hybrids produced in captivity show intermediate characteristics between the Bornean and Sumatran subspecies. Captive animals should be karyotyped (consult the species coordinator at lori410@mindspring.com for a listing of qualified laboratories) before being identified to the subspecific level.

REFERENCES

- Andrews, P. 1984. Review of L.E.M. de Boer, ed., The Orang-Utan. Its Biology and Conservation. *Primate Eye*, 23:34-37.
- Bemmel, A.C. van. 1968. Contribution to the knowledge of the geographical races of *Pongo pygmaeus* (Hoppius). *Bijdragen tot de Dierkunde*, 38:13-15.
- Courtenay, J., C. Groves and P. Andrews. 1988. Inter- or intra-island variation? An assessment of the differences between Bornean and Sumatran orangutans. In: J.H. Schwartz, ed. *Orangutan Biology*, pps.19-29. New York: Oxford University Press.
- Groves, C.P. 1971. *Pongo pygmaeus*. *Mammalian species*. 4:1-6.
- _____. 1986. Systematics of the Great Apes. In: D.R. Swindler, ed. *Comparative Primate Biology*, (1), pp.187-217. New York: Alan R. Liss.
- _____. 1993. Speciation in living hominoid primates. In: W.H. Kimbel and L.B. Martin, eds. *Species, Species Concepts, and Primate Evolution*, pp.109-121. New York: Plenum Press.
- Jacobshagen, B. 1979. Morphometric studies in the taxonomy of the orangutan. *Folia Primatologica*, 32:29-34.
- Jones, M.L. 1969. The geographical races of orangutan. In: *Proceedings of the 2nd International Congress of Primatology*, Volume 2, pp.217-233. Basel: Karger.
- Kingsley, S. 1982. Causes of non-breeding and the development of secondary sexual characteristics in the male orangutan: a hormonal study. In: L.E.M. deBoer, ed. *The Orang Utan: Its Biology and Conservation*, pp.215-229. The Hague: Junk.
- Janczewski, D.N., D. Goldman and S.J. O'Brien. 1990. Molecular genetic divergence of orangutan (*Pongo pygmaeus*) subspecies based on isozyme and two-dimensional gel electrophoresis. *Journal of Heredity*, 81:375-387.
- MacKinnon J.R. 1975. Distinguishing characteristics of the insular forms of orangutan. *International Zoo Yearbook*, 15:195-197.
- Mallinson, J.C. 1978. "Cocktail" orangutans and the need to preserve purebred stock. *Dodo*, 15:69-77.
- Perkins, L.A., and T.L. Maple. 1990. North American Orangutan Species Survival Plan: Current status and progress in the 1980's. *Zoo Biology*, 9:135-139.
- Rijksen, H.D. 1978. A field study of Sumatran orangutans *Pongo pygmaeus abelii*, Lesson 1827). The Netherlands: H.Veenman & Zonen.
- Rohrer-Ertl, O. 1988. Research history, nomenclature and taxonomy of the orangutan. In: J.H. Schwartz, ed. *Orangutan Biology*, pp.7-18. New York: Oxford University Press.
- Seuarez, H., H.J. Evans, D.E. Martin and J. Fletcher. 1979. An inversion in chromosome 2 that distinguishes between Bornean and Sumatran orangutan. *Cytogenetic Cell Genetics*, 23:137-140.