

人類 humans (hominids or hominins)

any organism or species more closely related to extant humans than to the extant chimpanzees (common chimpanzee and bonobo)

Fossil humans

Saheranthropus tchadensis Brunet *et al.*, 2002

6-7 Ma (faunal dating), Djuraj Desert, northern Chad

Orrorin tugenensis Senut *et al.*, 2001

5.8 Ma, Lukeino Formation, Tugen Hills, Kenya

Ardipithecus kadabba Haile-Selassie, 2001

5.2-5.8 Ma, Middle Awash, Ethiopia

given a species rank by Haile-Selassie *et al.*, 2004

Ardipithecus ramidas (White, Suwa and Asfaw, 1994)

4.4 Ma, Aramis, Middle Awash, Ethiopia

separated from *Australopithecus* by White, Suwa and Asfaw (1995)

Australopithecus anamensis Leakey *et al.*, 1995

3.9-4.2 Ma, Northern Kenya

Australopithecus afarensis Johanson, 1978

3.0-4.2? Ma, Ethiopia, Tanzania and possibly Kenya

Australopithecus bahrelghazali Brunet *et al.*, 1996

3.0-3.5 Ma (faunal dating), North Chad

Kenyanthropus platyops Leakey *et al.*, 2001

3.5 Ma, west of Lake Turkana, Kenya

Australopithecus africanus Dart, 1924

2.3-3.0 Ma, South Africa

Australopithecus garhi Asfaw *et al.*, 1999

2.5 Ma, Hata beds, Middle Awash, Ethiopia

evidence of carnivory (cut and percussion marks on bovid bones)

Paranthropus aethiopicus Arambourg and Coppens, 1968

2.3-2.7 Ma, southern Ethiopia and northern Kenya

Paranthropus robustus Broom, 1938

1-2 Ma, cave sites in South Africa

Paranthropus boisei (Leakey, 1959)

1.2-2.2 Ma, Ethiopia, Kenya and Tanzania

Homo habilis Leakey, Tobias and Napier, 1964

1.6-2.3 Ma, East Africa (and possibly southern Africa)

Homo rudolfensis (Alexeev, 1986)

1.8-2.4 Ma, Turkana basin, Northern Kenya (and possibly Malawi)

Homo ergaster Groves and Mazak, 1975

1.5-1.9 Ma, Africa (Lake Turkana region, Kenya)

African version of *H. erectus*

Homo erectus (Dubois, 1892)

27 Ka-1.9 Ma, Africa, Asia and Europe

Homo floresiensis Brown *et al.*, 2004

18Ka->38Ka, Liang Bua, Flores, east Indonesia

Homo heidelbergensis Schoetensack, 1908

0.13-0.7 Ma, Africa and Europe

Homo neanderthalensis King, 1864

30 Ka-0.3 Ma, Europe and western Asia

Homo sapiens Linnaeus, 1758

0-0.13 Ma, from Africa to all over the World

Homo sapiens idaltu White *et al.*, 2003

154-160 Ka, Herto, Middle Awash, Ethiopia

Human characteristics

Bipedalism obligate since *Homo erectus*, facultative before *H. erectus*

Proposed original selective advantages

tools (stone tools, 2.5 Ma)

carrying

infants by females

food for mates and offspring by males (increased reproductive efficiency)

weapon (anti-predation)

to see over tall grass (vigilance)

energetic efficiency

postural adaptation for foraging from tall bushes or small trees

feeding small, evenly distributed objects (gelada model)

limiting direct exposure to sun
bipedal displays of threat and gestures of appeasement
aquatic ape theory

Loss of honing mechanism (C-P3 complex)

Long life history (low mortality)

slow growth and development
infant altriciality (related with large brain)
prolongation of juvenile dependence (for learning knowledge and skills)
delayed maturity or reproduction
female first reproduction: 13-15 in chimpanzee, 17-20 in humans of foraging societies
female's post-menopausal period
"stopping early" hypothesis enhanced investment in existing offspring
grandmother hypothesis inclusive fitness

Loss of body hair

cooling of the body
accompanying bipedalism or larger brain
to reduce ectoparasite loads (in concert with sexual selection)
after fire, clothes and shelter
response to clothing

Provisioning of food and healthcare (low mortality)

KNM-ER 1808 1.6 Ma, *H. erectus*, hypervitaminosis A
Shanidar 1 and 3 70 Ka, *H. neanderthalensis*, lived for many years with disabling conditions

Meal and cooking (nonhuman primates: feeding independently at the site)

eating together at "home"
fire

Large brain (*Homo*)

Language (*Homo sapiens*?)

from grooming to gossip

gesture mirror neuron

vocalization alarm call