

CONCEPT MAP

HUMAN EVOLUTION

The process of evolution involves a series of natural changes that cause species to arise, adapt to the environment and become extinct. Humans too have originated through the process of biological evolution. The study of human evolution is called Paleoanthropology. Most of the scientists currently recognise 15-20 different species of early humans, of which major landmark species are discussed below.



Homo sapiens sapiens

Period : 25,000 years ago (Holocene)

Location : First appeared around Caspian and Mediterranean sea, from where it migrated and changed into present day Caucasoid, Mongloid and Negroid races.

Brain size : Approx 1450 cc

Adaptations : Reduction in cranial capacity and cultural evolution rather than that of anatomy.

Characteristics : Slightly raised skull cap, thinning of skull bones, forehead rising sharply. Four curves in vertebral column. Prominent chin, thin skeleton and non-existent brow ridges. Reduction in tooth and facial bone size.

Living modern man



Homo sapiens fossilis

(Cro-Magnon man)

Period : 50,000-10,000 years ago (Holocene)

Location : Cro-Magnon rocks in France.

Brain size : 1650 cc

Adaptations : Walk and run faster, omnivorous, direct ancestor of living modern man.

Characteristics : Well built body and about 1.8m tall. Face orthognathous with an elevated nose, broad and arched forehead and moderate brow ridges. Strong jaws with teeth close together and a well developed chin. Lived in families in caves. Made excellent tools as spears, bows and arrows as well as ornaments from stones, bones and elephant tusks. Had art and culture, obvious from carvings and paintings in caves. Became extinct about 10,000-11,000 yrs ago.

Direct ancestor of living modern man



Homo sapiens neanderthalensis

(Neanderthal man)

Period : 400,000-300,000 years ago. (Late Pleistocene)

Location : Neander valley in Germany.

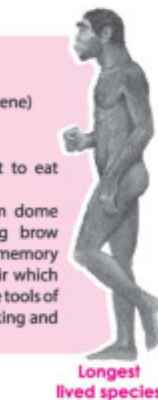
Brain size : 1,300-1,600cc

Adaptations : Walked upright with bipedal movement, cannibals.

Characteristics : Slightly prognathous face, low brows, receding jaws and high domed heads. Diet include significant amount of meat supplemented with vegetation. Skilled hunters with simple tools as heavy spears or knives to kill prey. First to use skin hides as clothing so as to protect from harsh environment. Legendary cave dwellers, illuminated and heated them with fire. First hominids to bury dead and may had religion.



Able or skillful man



Homo habilis

Period : 1.5-2 million years ago (Pleistocene)

Location : Pleistocene rocks to olduvai Gorge in East Africa.

Brain size : 700 cc, with an expansion of frontal lobe.

Adaptations : Bipedal locomotion, omnivorous

Characteristics : 1.2- 1.5 metres tall, had a nose and elevated forehead. Thumbs broader, teeth like modern man. Tool maker (as found with heaps of tools made from chipped stones). Community life, lived in caves. Nurtured young ones. Successful due to change in climate.



Homo erectus

(Erect man)

Period : 1.8-1.7 million years ago (Middle Pleistocene)

Location : Africa, Europe, Asia

Brain size : 800-1300 cc.

Adaptations : Erect posture, omnivorous and first to eat animal meat and take care of old.

Characteristics : 1.5-1.8 metres tall. Skull flatter and cranium dome shaped to accommodate large brain. Protruding jaws, projecting brow ridges. Small canines and large molar teeth. Increase in intellect, memory and speech usage. Ability to run on two legs and less body hair which allowed sweating. Males were larger than females. Made elaborate tools of stones and bones, hunted for meat. Use of fire probably for cooking and protection. Group living forming hunts-gatherer society.



Longest lived species

Sub-species of Homo erectus

Pithecanthropus erectus

(Java ape man)

Period : Pleistocene

Location : Pleistocene rocks in central Java, an island of Indonesia.

Brain size : 800-1000 cc

Adaptations : First prehistoric man with long legs and erect body, but slightly bent when moving, omnivorous and cannibal.

Characteristics : 1.65-1.75m tall and weighing about 70 kg. Skull cap thick and heavy but flattened in front. Forehead low and receding but brow ridges high (as in apes). Inconspicuous chin and broader nose, lower jaw large and heavy. Canines of lower jaw larger and lips thick and protruding. Use of fire for hunting, defence and cooking.



Homo erectus pekinensis

(Peking man)

Period : 1.8 million -300,000 years ago (Pleistocene)

Location : Rocks of limestone caves of Choukoutien, near Peking (China).

Brain size : 850-1100 cc (large cranial capacity)

Adaptations : Omnivorous and cannibal

Characteristics : Similar in structure to Java man, except that Peking man was slightly shorter (1.55-1.60m tall), lighter and weaker. Used to live in caves in small tribes. Tools used were more sophisticated.



Homo erectus heidelbergensis

(Heidelberg man)

Period : 500,000 years ago (Middle Pleistocene)

Location : Near Heidelberg, Germany.

Brain size : 1100-1400 cc

Adaptations : Intermediate between erectus and Neanderthal man, first to venture into cold climate.

Characteristics : Human like teeth and ape like massive jaw. Receding forehead and lack of chin. Use of tools and fire. First species to build substantial shelters and showed planning symbolic behaviour. Gave rise to both Neanderthals and modern humans.



Australopithecus africanus

Period : 5 million years ago (Pliocene)

Location : Pliocene rocks near Tuang in Africa

Brain size : 500 cc.

Adaptations : Bipedal locomotion, omnivorous but mostly vegetarian feeding on fruits, vegetables, nuts, seeds and eggs. Erect posture but climbed trees too.

Characteristics : Fully human shaped jaw and human like pelvis. Brow ridges projecting over eyes. Absence of chin. Lumbar curve in vertebral column.



Australopithecus afarensis

Period : 3.9-2.9 million years ago (Pliocene)

Location : Ethiopia, Tanzania

Brain size : 375-500cc (male and female size different)

Adaptations : Bipedal locomotion, walked upright and survived during dramatic climate fluctuations.

Characteristics : Looked and acted like ape. From waist down resemble humans (having pelvis and tibia/femur). Lived both on ground and on trees. Presence of lunate sulcus makes their occipital lobe smaller, suggesting greater reasoning skills and more control of motor functions.



Ramapithecus

Period : 14-15 million years ago (from late Miocene to Pliocene)

Location : Pliocene rocks of Shivalik Hills of India.

Brain size : Unknown

Adaptations : Walk erect on its hind feet on ground and lived on tree tops.

Characteristics : Small canines and large molars like humans. Ate hard nuts and seeds.



Dryopithecus

Period : 20-25 million years ago (Miocene)

Location : Miocene rocks of Africa and Europe

Brain size : Large (size not known)

Adaptations : Arboreal and ate soft fruits and leaves, semi-erect posture.

Characteristics : Arms and legs of same length, feet with heels, without brow ridges, knuckle walker.



First ape man



Common ancestor of man and apes