

PHYLOGENY OF HORSE

| | | | | | |
|----|----|----|----|----|----|
| 31 | | | | 1 | 2 |
| 3 | 4 | 5 | 6 | 7 | 8 |
| 10 | 11 | 12 | 13 | 14 | 15 |
| 17 | 18 | 19 | 20 | 21 | 22 |
| 24 | 25 | 26 | 27 | 28 | 29 |
| M | T | W | T | F | S |

DECEMBER 2012

2012

NOVEMBER

THURSDAY

01

306-060 • Wk 44

The first known

1st ancestor of horse were fox like
2nd animals living on moist ground
3rd and browsing soft leafy
4th vegetation. With the change climatic
5th and physical condition and the
6th nature of, these were exposed to
7th various body changes and passed
8th soft evolutionary changes.
9th horses. The history of evolution
10th of horse present definite changes
11th in organs in a particular direction.
12th The directional changes
13th are known as evolutionary
14th trends.

2012
NOVEMBER
FRIDAY
02

| | | | | | | |
|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 29 | 30 | 31 | | | | |
| M | T | W | T | F | S | S |

OCTOBER 2012

02 The evolution of horse

Trends are exhibited in phylogeny of horse.

HORSE IN EOCENE

- In this period, the first known horse like animal
- which forms the starting point in the Equine evolution
- is Hyracotherium. It is also known as Eohippus & also commonly called 'dash horse'

Although they are like horse but are very much different from our modern modern horse

2012

NOVEMBER

SATURDAY

20:00 - 21:00

NOVEMBER 2012

It was small

03

browsing animal. Skull and neck

short. The back was arched and

flexible. The ulna & fibula

slant (زاویه) (کوتاه) and built

and free from tibia & radius.

The limb were digitigrade.

Hind limb are moderately

longer, Hind limb have ^{possing} four

3 digit and fore limb 4 digit.

The 1st and 5th digit of the

hind limb represented ^{by} ~~in~~ ^{by}

splint. All the toe touched

the ground and were supported

by pad. Hoof are present

2012
NOVEMBER
MONDAY

WK 45 • 310-056

05 both limb.

| | | | | | | |
|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 29 | 30 | 31 | | | | |
| M | T | W | T | F | S | S |

OCTOBER 2012

but springing mechanisms
absent. Preorbital portion
of the skull not elongated
Dentition was brachydont.
Total number of teeth 44.

Cerebral hemisphere small &
smooth. They are all

These animals are dated
off in early oligocene
in Europe and North America

Orohippus - Another species
Eocene period is Orohippus.

It is little higher than Eohippus
Fore limb & toes hand limb

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
 NOVEMBER 2012

2012
 NOVEMBER
 TUESDAY
 311-055 • Wk 45

Three toes 06

but tiny vestiges of the two toes in the hind limb were lost.

The third & 4th pre molars are broad forward molar but the animal was still a browser.

Epihippus - slightly larger

Orohippus It was also horse

like 4 hind toes. I don't

Last two pre molars are molar

like. This are extinct line

and Eocene period

HORSE IN OLLIGOCENE - Although

- there were several lines of
- descent of horses in Eocene but
- one leading to equine evolution
- is represented by Meshippus and
- Miohippus in Oligocene.
- Meshippus (Intermediate horse) -
- Meshippus appeared in Oligo-
- cene and was of the size of two
- sheep. It was 18-24 inches high
- neck was short and less flexible
- than the later forms. The
- trunk was long and slender
- & back was more arched.

legs were long 08

- slender & the number of toes in both limb four & four were reduced to three but 5th digit of fore limb represented by splint. All the three digit touched the ground but the middle one is larger and bore most of the weight of the body.
- In the hind exhibited lengthening tendency due to the elongation of metacarpals and metatarsals.
- The ulna & fibula were distinct & slender. Feet were still still provided with pad under the toes. The pre-axial

the tendency of elongation and

as a result diastema appeared

in the dentition was still

brachydont. The structure

of teeth & feet was suggestive

of their dwelling habit.

The brain of Meshippus

skibitted marked feature

of advance over the brain of

Hyrcotherium. The

cerebral hemisphere were

enlarged and convoluted

(complex) and brain had the

appearance of horse brain.

Mesochippus

2012

NOVEMBER

SATURDAY

10

Miochippus - In the late Oligocene

the form was slightly advanced

horse like form, named

Miochippus. It was much like

Mesochippus, but somewhat larger

in size. Although both limbs

were three toed but the toes

were broad and spreading.

This indicated that Miochippus

was also a forest dweller. The cannon

bone in both the limb was in

contact with the outer ankle

bone. The teeth were still low

crowns as it was still

a browser.

2012
NOVEMBER

MONDAY

Wk 46 • 317-049

12

| | | | | | | |
|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 29 | 30 | 31 | | | | |
| M | T | W | T | F | S | S |

OCTOBER 2012

Horse in Miocene - In this

9 am

period three forms represented

10 am

a gradual increase in body

11 am

size and modification of

12 noon

cheek teeth.

1 pm

The three toed horses which

2 pm

were on the direct line of

3 pm

descent of Equus are repre-

4 pm

sented by Parahippus and

5 pm

Meriychippus in Miocene period.

6 pm

and Ptochippus.

| | |
|----|----|
| 1 | 2 |
| 8 | 9 |
| 15 | 16 |
| 22 | 23 |
| 29 | 30 |
| 5 | 6 |
| 12 | 13 |
| 19 | 20 |
| 26 | 27 |
| 3 | 4 |
| 10 | 11 |
| 17 | 18 |
| 24 | 25 |
| 31 | |

DECEMBER 2012

2012
 NOVEMBER
 TUESDAY
 21.048.06.16

PARAHIPPUS — 13

It was on the direct line of equine evolution, which descended from mehippus in ^{early miocene} ~~early~~ period.

Its legs were three toes. The third digit of both limb become more predominant than into anchestors. Although all digit ~~are~~ touched the ground but middle one is effective in locomotion. The snout is considerably elongated.

Pre maxilla are maxilla like ^{the dental} formed battery. The dentition in parahippus was of hyposodont type

2012

NOVEMBER

WEDNESDAY

Wk 46 • 319-047

| | | | | | | |
|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 29 | 30 | 31 | | | | |
| M | T | W | T | F | S | S |

OCTOBER 2012

14 The fossil of

9 am

10 am

11 am

12 noon

1 pm

2 pm

3 pm

4 pm

5 pm

6 pm

various species of Parahippus presented the complete spectrum of various transitional stages from three toed browsers (Miohippus to "three toed grazers") which represents the next stage in Equine evolution.

MERYCHIPPUS - (Ruminant horse) -

This is lived in middle and upper Miocene and became extinct in Pliocene. It represented the first three toed grazer feeding

2017

NOVEMBER

THURSDAY

2017-11-09

on grass and 15

therefore, marks the transition
from primitive browsing
horse to the modern grazing
horse.

Although *Merychippus* still had
- three toes, the 2nd and 4th were
- reduced and no longer touched the
- ground. The limbs with well deve-
- loped cannon bones, the foot pad
- was absent. The teeth were high
- crowned (hypsodont) and fully
- cemented grinders, but the milk
- teeth were low crowned and
- uncemented. The cerebral base

2012
NOVEMBER
FRIDAY

| | | | | | |
|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 |
| 7 | 8 | 9 | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 | 17 | 18 |
| 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | | | | | |

WA 48 • 321 045 16 hemisphere were

OCTOBER 2012

large resembling that of
modern horse. The next
form which evolved
from *Merychippus* in later
miocene and became con-
temporary to it was
Protohippus. It was more or
less like of a *Merychippus*.
But its milk teeth, also high
crowned & cemented, were
adapted for grazing.

HORSE IN PLEISTOCENE

1 2
3 4 5 6 7 8 9
10 11 12 13 14 15 16
17 18 19 20 21 22 23
24 25 26 27 28 29 30
31
DECEMBER 2012

2012

NOVEMBER

SATURDAY

2012-12-15

The conditions 17

become more arid and land

bridges were formed resulting

in the changes and migration of

the fauna. The common

grazers of Pliocene are

Heuyarion, Neohyrion and

Nannippus. All the three were

toed grazers having high

rowned cheek teeth and of the

size of the pony. All of them

become extinct in late Pliocene

or early Pleistocene. The

Merychippus which later on

pleistocene, give rise to Equus

2012
NOVEMBER

ACQUINT

19 was Plehippus

commonly known as Pleocene
horse.

Hepparion - The fossil
remains of Hepparion are
found in Pleocene strata.

These were the last in the
three toed ancestors of horse
and were of the size of
pony about 40" in height.

The teeth were straight but
with cusps adapted for

grinding. In early Pleocene
its offspring gave rise to style

hepparion, but the latter has been
extinct in upper pleistocene.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

2012
NOVEMBER
TUESDAY
2012.11.20

20

② Pliohippus

It is the first one-toed horse which fossil remains are found from upper miocene and pliocene. It is on the line leading to equus. It was of the size of modern pony about 40" in height. The most striking change was the reduction of the side teeth 2nd and 4th. The crowns of the upper molar were similar to those of modern horse, but the pattern of ridges was not elaborate.

This exhibited trends for the increase in size, preorbital teeth

10 11 12 13 14 15 16
17 18 19 20 21 22 23
24 25 26 27 28 29 30
DECEMBER 2011

2012
NOVEMBER
THURSDAY
22 09 . 14 17

Further increase 22

In size & some changes in the anatomical details. During Pleistocene Equus achieved worldwide distribution.

It is about 60" in height. They have lost the first and 5th digits entirely. The second and 4th digits are represented by splint. So that the entire weight of the body is balanced by the third toe alone. It bears well developed ~~hoof~~ hoof.

The crown of the molar ~~more~~ much elongated & possess

2012
NOVEMBER
FRIDAY

| | | | | | | |
|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 29 | 30 | 31 | | | | |

23 complicated

enamel, ridges, adapted to
feed on dry and hard
grass. The brain is enlarg-
ed & the cerebral hemis-
pheres have grooved surface.
Thus the evolution of horse
has resulted in the develop-
ment of an intelligent, long-
legged, swift running
animal, which is suited to
live and feed on open
grassland.

2013
NOVEMBER
SATURDAY
NOV 24 10 35

Although North **24**

horses were the stage of Equus
evolution but horses became
extinct in the continent on the
class of Pleistocene due to
colder unknown reasons. The
species of horse, found there are
secondary introduced by man.

At present time, some
wild type of horse are present
only in Asia. The varieties

found in North America are

not the wild horses but the

descendants of domesticated

horses brought over from Europe.

2012
NOVEMBER
MONDAY

WA 46 • 331 033

26 of

| | | | | | | |
|----|----|----|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 29 | 30 | 31 | | | | |
| M | T | W | T | F | S | S |

October 2012

Of them only Pleohipus
give rise to Equus and
Others become extinct. Even
from Pleohipus, the form
radiated were not only
Equus but also Hippidion
& Onchopithecus which
underwent independent
adaptive radiation.
This suggest that the
process of evolution is
chiefly based on adaptive

| | | | | | |
|----|----|----|----|----|----|
| 4 | 5 | 6 | 7 | 8 | 9 |
| 11 | 12 | 13 | 14 | 15 | 16 |
| 18 | 19 | 20 | 21 | 22 | 23 |
| 25 | 26 | 27 | 28 | 29 | 30 |
| 1 | 2 | 3 | 4 | 5 | 6 |

DECEMBER 2012

2012

NOVEMBER

TUESDAY

332-034 • Wk 48

modification

27

and changes occurring in
 all directions but the evolu-
 tionary shift continues as
 long as it brings an improved
 adaptation.

gh
 rain

3
 11