

The Horse of Vatera

The open terrains around Vatera two million years ago were inhabited by a wild horse (*Equus cf. stenonis*). This horse was not as large as the domestic horse, and had slender limb bones and a long muzzle with a hollow profile. Most likely, it had stiff upright manes as seen in wild horses and zebras today, striped legs and some striping on the back. It stood some 155 cm at the withers, comparable to a Thoroughbred of today.

Horses are odd-toed animals (Perissodactyls), and close relatives of the tapirs and rhinoceroses. The domestic horse (*Equus caballus*) is a member of the horse family, and so are the donkey (*Equus asinus*), the zebra's (*Equus burchelli*, *E. grevyi*, *E. zebra*) and the wild asses or onagers (*Equus hemionus*) of Asia. The Perissodactyls originated in the late Paleocene, some ten million years after the dinosaurs got extinct. The tapirs and rhinoceroses remained browsers in the tropical forests, but the horses gradually adapted to a grazing life on the steppes. For this, two major specializations had to take place. Firstly, the horses developed a much faster locomotion than their ancestors to outrun their predators. In the open, you're much easier spotted by predators, and in addition, you cannot hide so well as in the forest. A faster locomotion in equids is characterized by a reduction of toes – from fully three-toed (*Eohippus*) to truly single-toed (all *Equus*) –, elongation of the limb, and unguligrade locomotion – walking on tip-toes. Horses gradually became specialized runners. Secondly, in order to eat the coarse grasses of the steppes instead of the softer leaves of the forest, the horses developed a more grinding dentition than their ancestors. This can be seen in the very high crowns of the molars (hypsodont) in the modern horses, which are very different from the low-crowned molars (brachyodont), adapted to a more omnivorous diet, of their ancestors. Grass contains lots of silica, and this abrades teeth, so high crowns are an advantage. In addition, extra crests and ridges on the teeth make them better for grinding the abrasive grass. Lastly, to withstand abrasion even more, a cement layer was developed on the teeth.

The evolutionary story of the horse family is not as straightforward as often presented. It certainly does not follow a gradual straight line from *Eohippus* right up to modern *Equus*. There are many other branches, apart from that leading to *Equus*. Once, there was a whole bunch of equids. Especially during the Middle Miocene, about ten million years ago, the diversity within the horse family reached a top. Equids grazed the plains and browsed the forest in huge numbers in both the Old and the New World. Strange as it may be, only one genus made it up to the present day: *Equus*.