Abstract

The most recent genetic studies have proven that skin colour of our European ancestors was originally very dark. Skin depigmentation has begun after "*out of Africa*" time as a result of low levels of the ultraviolet radiation in changed regions at the higher latitudes. Lightly pigmented skin allows sunlight to penetrate human skin more deeply and vitamin D, which is essential for optimal functions of human body, is synthesised by biochemical interaction of ultraviolet radiation and epidermis. A deficit of vitamin D and calcium may be associated with the rickets in children and osteomalacia in adults. Following the correlation of rising depigmentation at the higher latitudes we may notice an increasing number of people with specific metabolic ability known as lactase persistence.

Lactase persistence allows the digestion of milk sugar, lactose, in fresh milk in adulthood. It has likely evolved as a substitute in order to compensate for lower amounts of vitamin D in human body. The origin and spread of lactase persistence began around 7,000 years ago after the start of milk production. The oldest evidence of milk production was found in the Middle East. Lately, it has also been supported by the recent genetic analyses.

Depigmentation and lactase persistence both began as an adaptation due to changed environment by natural selection. These traits create an advantage for their carriers, which was the main reason for their fast spread in populations. The main theory of the origin of lactase persistence is known as the calcium assimilation hypothesis. It claims the ability of fresh milk (*i.e.* an important source of vitamin D and calcium) digestion decreases the deficit of vitamin D for the lightly pigmented people living at the higher latitudes. In addition, it could help prevent the rickets and severe skeletal disorders. The calcium assimilation hypothesis may explain the interaction between depigmentation and lactase persistence in Europe and is now generally accepted.

Key words: the calcium assimilation hypothesis, skin depigmentation, melanin, lactase persistence, lactase, vitamin D, Neolithic Revolution, positive selection, natural and sexual selection.