Human lice: Spectators and actors of the history of humanity through the ages

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It is poetically acknowledged that the flap of butterfly's wings in China can set off a cascade of atmospheric events that lastly cause a tornado in the United States. If this is true, it is also true that the movements of the louse, an insect much smaller than a butterfly, has accompanied the history of mankind from its dawn, playing a crucial role in some historical facts and radically influencing their course. However, lice preceded by far the appearance of *Homo sapiens* on the earth, as demonstrated by fossils with an estimated age of 100 million years.

Two families of lice belonging to the suborder Anoplura are found in humans and represent a paradigmatic example of cospeciation, a form of coevolution in which speciation of one species dictates speciation of another species, typical of host–parasite relationship. The family Pediculidae includes the genus *Pediculus*, shared with chimpanzee, and the family Pthiridae includes the genus *Pthirus*, shared with gorillas.[1]

Pediculus encompasses two species, *Pediculus humanus var. capitis* and *Pediculus humanus var. corporis*. The latter diverged from the head louse around 100,000 years ago, at the time of the origin of clothing.[2] Although head lice have a bad social reputation and is commonly thought that it afflict unclean subjects, they carry negligible risk of disease transmission:[3,4] *Pediculus humanus* became dangerous during times of war and deprivation, such as in the Nazi camps when lice infestation caused the spread of *Rickettsia prowazeki*, which lives in the louse's gut and is excreted in its feces. *Rickettsia prowazeki* is the causative agent of epidemic typhus that killed thousands of prisoners, including Anne Frank, a Jewish girl author of the "Diary of a young girl."

The genus *Pthirus* includes only one species, namely *Pthirus pubis* or popularly crab louse due to its almost round body. Pubic lice typically affect pubic hair but sometimes are found on coarse hair elsewhere on the body, that is, eyelashes, eyebrows, mustache, beard, and quite uncommonly on the scalp.[5]

Lice are cited in the Bible (in Jewish, *kinnim*) and have been interpreted by some authors as the third plague of Egypt. The Ebers papyrus reported about natural remedies based on fat of hippopotamus to kill lice by asphyxiation. Lice have been found also in mummies of Egyptian pharaohs, thus demonstrating that these insects have no predilections for specific social classes.[6] Fine-toothed combs discovered in Egyptian tombs are very similar to the ones used nowadays to remove the nits. Greek historian Herodotus relates that Egyptian priests used to shave completely their bodies each two days to prevent lice infestations while rendering their services. For the same reasons, they are usually represented as completely bald and without eyebrows.

The discovery of eggs and adult pubic lice in a 2000-year-old Chilean mummy helped to eliminate once and for all the belief that the lice had been imported into the New World by European colonizers.[7]

Evidence for the presence of body lice was also recently discovered in the excavation of a fortress in Masada, Israel, which was originally the storeroom for King Herod the Great, the ruler of Judea who ordered the Massacre of the Innocents at the time of the birth of Jesus.[8]

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Ancient Romans called pediculosis as *morbus pedicularis*, but the disease was interpreted, according to the Hippocratic theory, as an imbalance of body moods, from which the lice derived. The Greek naturalist Pliny the Elder proposed some of the first therapies for lice: destroying nits using dog's fat or eating cooked serpents. Furthermore, Pliny and Greek Dioscorides recommended the use of herbal preparations made from *Delphinium staphisagria* seeds for destroying body lice. This plant which belongs to the family Ranunculaceae is also known as lice-bane or stavesacre and was used for this purpose until XIX century.

After the fall of the Roman Empire, scientific culture passed to the Arabian world: Thabit Ibn Qurra suggested the use of honey and borax to kill head lice. Hair care is recommended in Hilyat al-Muttaqin, a book of Islamic instructions and traditions: it is deserving to shave the hair of the head and take care of it, than to wash and comb them; depilating pubic hair is a sign of faith in God, besides being a tradition of the Prophet of Islam; depilating unwanted hair from other parts of the body is a source of purity and other physical and psychological benefits, while not doing so causes physical problems. These instructions have certainly contributed to the prevention of lice infestations. Nowadays, shaving body is a new fashion in Western countries, which have reduced the incidence of *Pthirus pubis* infestation simultaneously increasing the risk of other infections, such as molluscum contagiosum and genital warts.[9,10]

During Middle Ages and Renaissance, in European monasteries, regular hair caring, including shaving, was extremely important; on the contrary a part from Church men, hair were not cleaned and daily delousing was a habit. Several paintings showed the hunting of louse as a part of body care: for example, in "The toilette" by Bartolomé Esteban Murillo, an old woman is searching for lice on her boy's head. Later, in XVIII century, the fashion of large wigs could have been dictated by the need to shave the hair to eradicate the infestations: even the "Sun King" seemed to have been infested by head lice.

In the same centuries, peasantry and higher classes, were affected by Polish plait (*Plica polonica* in latin), an uncommon condition nowadays in which the hairs becomes irreversibly entangled, forming a sticky and moist mass. This was due to neglected hair care, use of bad quality of water, shampoo, and lice infestation.[11] Polish plait used to be particularly common in Poland, hence its name, and in Germany it was called Vistula plait, derived from the name of the river Vistula. It was considered as an amulet to keep illness away from the body and for this reason it was encouraged.

Jean-Louis-Marc Alibert, pioneer of French dermatology, at the beginning of XIX century, considered pediculosis both as a contagious disease as well as a non-contagious eruption, such as senile prurigo, because it afflicted mainly elderly rather than young people. Eventually, in 1858, Alfred Hardy, President of the first World Congress of Dermatology, regarded pediculosis as contagious infestation.

After this journey through history that gave us the opportunity to observe the consequences caused by a parasitic infestation, only one thing remains certain: human–lice symbiotic relationship is evidenced by the fact that the natural history of untreated pediculosis will be interrupted by very few events, one of which is the death of the individual. This fact suggests that the louse, spectator and actor in the history of mankind through past ages, is destined to accompany us in the future for many years to come.

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