

# Lice

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The **body louse** (*Pediculus humanus humanus*, sometimes called *Pediculus humanus corporis*) is a louse which infests humans. The condition of being infested with head lice, body lice, or pubic lice is known as pediculosis.



## Origins

Genetic analysis suggests that the human body louse may have originated about 107,000 years ago from the head louse after the invention of clothing, with the ancestor of all human lice emerging about 770,000 years ago

## Entomology and pathology

*Pediculus humanus humanus* (the body louse) is indistinguishable in appearance from *Pediculus humanus capitis* (the head louse) and under laboratory conditions they will interbreed. In their natural state, however, the two subspecies do not interbreed and occupy different habitats. In particular, body lice have evolved to attach their eggs to clothes, whereas head lice attach their eggs to the base of hairs.

Body lice are a nuisance in themselves and cause intense itching. They are however, also vectors (transmitters) of other diseases such as epidemic typhus and louse-borne relapsing fever.



The **head louse** (*Pediculus humanus capitis*) is an obligate ectoparasite of humans. Head lice are wingless insects spending their entire life on human scalp and feeding exclusively on human blood. Humans are the only known host of this specific parasite, but many other species of lice are known which infest most orders of mammals and also birds

Human head lice are closely related to human body lice (*Pediculus humanus humanus*) which also infest humans. Genetic analysis suggests that the human body louse may have originated about 107,000 years ago from the head louse after the invention of clothing, with the ancestor of all human lice emerging about 770,000 years ago. A more distantly-related species of louse, the pubic or crab louse (*Phthirus pubis*), also infests humans. Lice infestation of any part of the body is known as pediculosis.

The head louse (and lice in general) differs from other hematophagic ectoparasites such as the flea in that lice spend their entire life cycle on a host. Head lice cannot fly, and their short stumpy legs render them incapable of jumping, or even walking efficiently on flat surfaces.



The pubic or **crab louse** (*Phthirus pubis*) is a parasitic insect which spends its entire life on human hair and feeds exclusively on blood. Humans are the only known host of this parasite. Humans can also be infested with body lice (*Pediculus humanus humanus*) and with head lice (*Pediculus humanus capitis*).

The dorso-ventrally flattened body of the louse is divided into head, thorax and abdomen. A pair of eyes and a pair of antennae are clearly visible on the head. The mouthparts are adapted to piercing the skin and sucking blood. The second and third pair of legs, with their terminal claws are adapted to holding the hair-shaft, while the first pair of leg holds the skin during feeding. Abdominal protuberances on the side of the body are characteristic of this species. Males are slightly smaller than females. The eggs are oval-shaped and ca. 0.8 mm in length. Immediately after oviposition they are shiny, round, and transparent. Pubic lice are 1-2- mm in size, varying according to the stage of their development. They are usually whitish-grayish in color though they become reddish-brown for some time after a blood-meal.

Pubic lice are insect parasites, spending their entire life on the host's hair and skin and feeding exclusively on blood, 4-5 times daily. The life-cycle from egg to adult is 22-27 days. The egg hatches producing the first nymphal stage, which after three molting develops to nymph 2, nymph 3 and subsequently to either a male or female louse. The incubation period of the egg is 7-8 days, while the rest of the cycle is taken up with the development of nymphal stages. The average adult female lives for 17 and the male for 22 days.

Pubic lice usually infect a new host only by close contact between individuals, usually through sexual contact. Parent to child infestations are more likely to occur through routes of shared towels, clothing, beds or closets. Adults are more frequently infested than children.

### **Treatment**

Delousing can be practically achieved by boiling all clothes and bed clothes. In fact, a temperature of 130° F or 55° C for 5 minutes will kill most of the adults and prevent eggs from hatching.<sup>[5]</sup> Where this is not practical or possible, powder dusting with 10% DDT, 1% malathion or 1% permethrin is also effective. If insecticide is not available, louse-infested clothes and bedding should be burnt on an open fire. Medication is usually not necessary, as the problem normally goes away with daily bathing and wearing of clean clothes.



Oral ivermectin at a dose of 12mg on days 0, 7 and 14 has been used in a small trial of 33 people in Marseilles, but did not result in complete eradication, although there was a significant fall in the number of parasites and proportion of people infected. At the moment, ivermectin cannot be routinely recommended for the treatment of body lice.