AGRICULTURAL

MU Guide

PUBLISHED BY MU EXTENSION, UNIVERSITY OF MISSOURI-COLUMBIA muextension.missouri.edu/xplor/

Human Lice

Darryl P. Sanders
Department of Entomology

Lice are small, flat, wingless insects grayish or brownish in color. Each of their legs is equipped with a claw designed exclusively for clasping hair. Human lice historically have been associated with social upheavals, substandard and crowded living conditions, poverty, wars and lack of personal hygiene. However, we also know that human lice are not restricted to any particular socioeconomic level in our communities.

There are three recognized kinds of human lice (see Figure 1), whose common names indicate their preferred feeding site: head lice *(Pediculus humanus capitis);* body lice *(Pediculus humanus humanus);* and crab or pubic lice *(Phthirus pubis).* To survive, these lice require the temperature and humidity conditions of the human body. They will dry out and die if away from the host for more than a day.

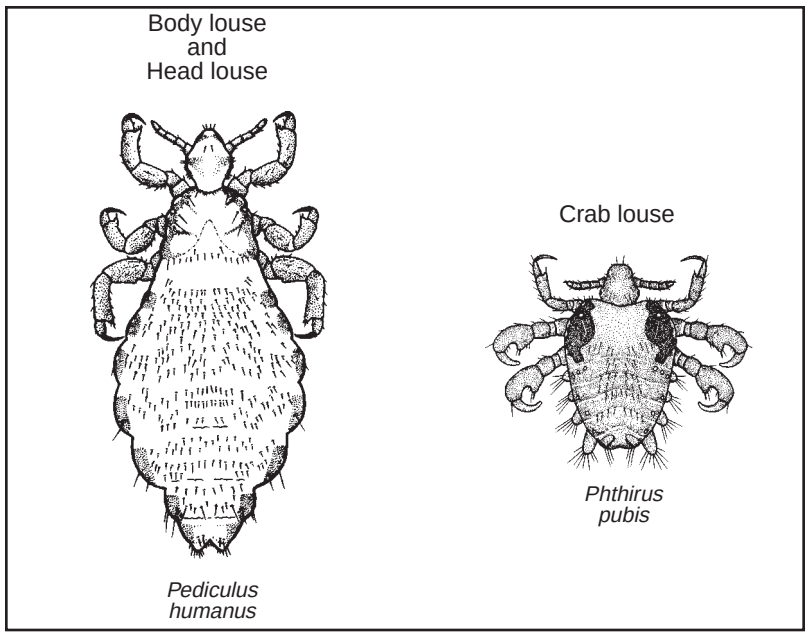

Figure 1. The three types of lice that infest human beings are from two species. Body lice and head lice, which look identical, are subspecies. Adult body lice and head lice are about 1/16 – 1/8 inch long. Crab lice are about 1/16 inch long.

Apart from the skin irritation caused by lice, their status as pests in the United States mostly relates to the social stigma of a louse infestation. Most people believe lice are associated with a lack of personal cleanliness and that crab lice are a sign of promiscuity. Such generalizations are dangerous and in the case of head lice are completely unfounded.

Life cycle

Head and body lice. Head lice prefer to live on the hair of the head although they have been known to wander to other parts of the body. The body louse prefers to remain on the clothing of the host and feed on the body. They have a three-stage life cycle: egg, nymph and adult (see Figure 2). The eggs of lice are called nits. They are light tan colored, oval cylinders. The eggs of head lice are glued to hairs of the head. The favorite areas seem to be near the ears and back of the head. Body lice glue their eggs to clothing, especially near seams and creases. Female head lice lay 6–7 eggs per day and may lay a total of 50–150 eggs during their lives. Female body lice may lay a total of 270–300 eggs in a lifetime. Under normal conditions the eggs will hatch in about a week. Below 74 degrees F, most eggs will not hatch. Newly hatched nymphs must feed within 24 hours or die. There are three immature nymphal stages separated by molts. Their appearance and habits are not greatly different from those of adults. Both nymphs and adults have piercing-sucking mouthparts, which pierce the skin for a blood meal. Adults may survive 3 to 5 days without a blood meal. Normally a young louse will mature to an adult in 3 to 5 weeks.

Crab louse. Crab lice are found primarily in the hair of the pubic area. They may also be found in the hair of the armpits and chest, in the beard or mustache and even rarely on the eyebrows and eyelashes. Their life cycle resembles that of the head and body louse except that their development from egg to adult normally requires from 4 to 6 weeks. Females deposit only 30–50 eggs in their lifetime. Eggs hatch after about 6 to 8 days into nymphs that molt three times before becoming adults. Adult crab lice live about 30 days while on the host.

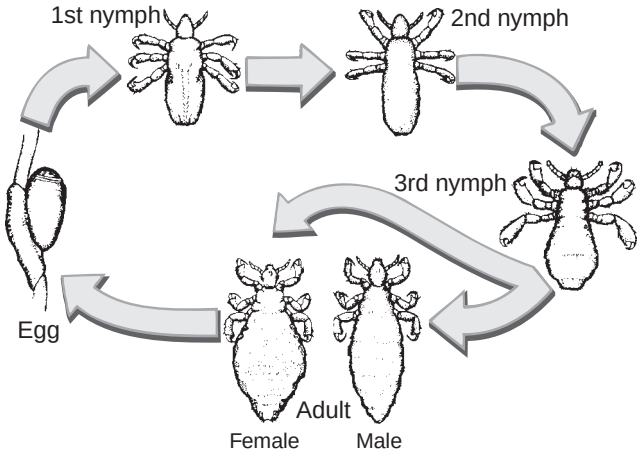

Figure 2. Lice pass through a three-stage life cycle, including three stages as immature nymphs.

Lice and human disease

Head lice have little real medical impact. Their feeding activity irritates the scalp, causing intense itching. They are not known to transmit any disease organisms, but a secondary infection may result if the skin is broken by repeated scratching. The most notable impact of head lice is the personal embarrassment associated with being identified publicly as having lice.

Crab lice are not known to transmit disease organisms, but one survey performed by the U.S. Department of Health found that one-third of the individuals with crab lice also had a sexually transmitted disease. Crab louse bites produce discrete, round slate-gray to bluish colored swellings on the skin. Proteins in the louse's saliva may cause an allergic reaction and intense itching. As with head lice, secondary bacterial infections may result from constant scratching and breaking of the skin.

Body lice, on the other hand, can transmit certain disease organisms. Louse-borne disease is generally confined to underdeveloped countries or is due to upheavals of war or large-scale disasters, where poor sanitation and overcrowding contribute to the problem. Lice then become widely dispersed among any large groups of people unable to wash and change their clothing. Louse-borne typhus, caused by the rickettsia *Rickettsia prowazeki,* and relapsing fever, caused by the spirochete *Borrelia recurrentis,* are the two major diseases known to be transmitted by human body lice. In highly developed countries, body lice are now very rare because regular laundering of garments makes it impossible for them to survive.

Diagnosis

Diagnosis is made by observing lice or nits on the hair and scalp. Head lice attach each nit to the hair shaft at the scalp with a waterproof cementlike substance. The presence of nits does not always mean that a person has a current infestation. The nits may be left from a past infestation that has been adequately treated. To determine whether a person is currently infested with head lice, there must be a louse present or there must be nits on the hair shaft within about ¼ inch of the scalp. The position of nits on the hair shaft can distinguish between current and past infestation, because female lice attach their eggs to the hair shaft at the scalp. In one week the louse egg will hatch. Human hair will have grown about ¼ inch by this time. Therefore nits farther than this from the scalp either have already hatched or will never hatch. They may remain attached to the hair shaft for months but play no role in the transmission of head lice. Removing these dead or empty nits with a fine-tooth comb could prevent needless treatment and a false diagnosis of infestation.

Itching is the most common symptom, but persons with very light infestations may experience no symptoms at all. Therefore, one cannot rely on itching as the only way to detect head lice. A thorough examination of the hair and scalp is necessary.

Control

Body lice. Treatment for body lice is virtually identical to the procedures for head lice. First, the infested person must be treated with pediculicides (delousing lotions or shampoos). As in the case of head lice, body lice move rapidly from person to person upon brief contact or when clothing is shared. Family members or others with whom the person comes in contact should be checked and treated, if necessary.

Washing clothes in hot water, 125 degrees F or higher, will kill body lice and their nits. Alternatively, clothing may be frozen in a deep freeze at 0 degrees F for 48 hours. Clothes that cannot be laundered should be dry-cleaned. Body lice can usually be controlled by frequent changes and washings of clothes.

Crab lice. Crab lice are spread primarily through sexual contact. It is possible, but extremely rare, that they could be acquired through contact with infested toilet seats, clothing or bedding. As with other louse problems, successful treatment is based on a combination of sanitation and pediculicides. Persons who share a bed with the infested person should be examined and treated if necessary.

Undergarments and bed linens should be washed in hot water for at least 20 minutes, then dried on a high temperature setting. It is strongly recommended that infested persons first seek advice from their personal physician. Because a crab louse can survive off of its human host for only about 24 hours, insecticide treatments in the home, workplace, school or other areas are neither necessary nor recommended.

Head lice. Dense, long, and curly hair is ideal for

head lice. Once an infestation is started, the shorter the hair the easier the control.

Several pediculicides, in the form of shampoos, creme rinses and lotions, are available at most drugstores. Some are sold over-the-counter and others require a prescription. They are listed in Table 1. There have been reports of lack of effectiveness of pediculicides, possibly due to a built-up resistance of the lice to the active ingredients. Follow the directions on the container and if control is not obtained, try a product with a different active ingredient. Since lice are very susceptible to heat, shampooing with water as hot as can be comfortably tolerated is advisable.

Table 1. Pediculicides for head louse control.

Chemical name	Brand name*	Availability
lindane 1%	Kwell	prescription
permethrin 5%	Elimite	prescription
permethrin 1%	Nix	over-the-counter
pyrethrins 0.33% plus piperonyl butoxide 4%	A.200, Clear, Licetrol, R&C, RID, etc.	over-the-counter

* Other brand names may be available in some areas, and all products listed here may not be available everywhere.

Various "home remedies" such as tea tree oil, thyme oil and even deodorized kerosene have been reported as being "head lice cures." Since research on the effectiveness and safety of these products does not exist or is questionable, one should never use them without obtaining the advice of a physician.

Several sprays are available, over-the-counter, which may be used to help prevent reinfestation and transmission of lice to other household members. These products should be used only on garments, bedding, furniture and other inanimate objects that cannot be laundered, dry-cleaned or frozen.

Even when pediculicides are effective in killing nymphal and adult lice, some eggs may survive. Retreatment in 7 to 10 days is necessary to kill any newly hatched lice. Failure to do a second treatment in 7 to 10 days may lead to the continuation of the lice infestation.

Fumigation or spraying of schools and homes is not recommended because of the short life span of lice away from the human host. Also, eggs present on detached hairs will not hatch at room temperatures of 70 degrees F or less. Lice do not hide in crevices and floor cracks like cockroaches and other household pests. Cleaning carpets, upholstered furniture, and so forth should be limited to simple vacuuming.

Mechanical removal of louse eggs helps reduce the number of lice that might hatch on the scalp. Even if you use a shampoo, the egg shells may remain attached to the hairs, giving the impression of an active infestation. Since children who are declared "nit-free" can return to class sooner, removing nits has a positive effect on their morale and lessens disruption to their school activities. Special fine-toothed combs (metal ones are best) for nit removal are provided with some pediculicides or may be purchased separately. The nits are so firmly glued to the hair that one will often pull the hair out by its roots or break it off before the nit will break loose, particularly if the nit has just recently been deposited. Nits are more easily removed after shampooing the hair, when it is still damp. Adding a little vinegar to the rinse water may help removal. Certain commercially available products, such as "Clear Lice Egg Remover," may also help with nit removal.

To avoid becoming infested with head lice, all family members should be inspected and undergo treatment if necessary and be taught not to share other people's combs, brushes, scarves, etc. At school the need for delousing depends largely on the age of the students and the layout of the classroom. As in the home, vacuuming carpeting and sleeping mats can help. Mats with vinyl or other nonfabric coverings can be cleaned with hot, soapy water. Clothing or personal items that students have left in a closet, storage area or desk should be removed and deloused.

A school screening program can help keep head lice from becoming epidemic. Solving head lice problems is not difficult if everyone cooperates. Parents should notify the school principal or nurse immediately if their child is identified as having head lice. Don't be embarrassed by the problem or hesitate about calling the school.

Note: Much of the material for this publication was put together by Josette Stanhope, an MU student in entomology.

University Extension
UNIVERSITY OF MISSOURI
COLUMBIA