

# LICE

## Glossary/Terminology

**Nits:** lice eggs

**Nymph:** immature form of life cycle following hatch from egg

**Pediculosis:** infestation of animals or humans by biting or sucking lice.

## Categories

Lice are members of the Phylum Arthropoda, Class Insecta, and Orders Anoplura (sucking Lice) and Mallophaga (chewing biting lice). Horses, donkeys, mules and other equids may be parasitized by an Anopluran or sucking louse, *Haematopinus asini*, and a mallophagan louse, *Werneckiella (Damalinia, Bovicola) equi*. These species of lice are capable of parasitizing the skin and/or subcutaneous tissues of horses.

## Lifecycle/Biology

As a sucking louse, *Haematopinus asini* feeds on tissue, fluids, and blood from horses, whereas *Bovicola (Werneckiella) equi* ingests skin and the occasional blood meal from horses.

Lice undergo a life cycle referred to as a simple metamorphosis, consisting of the egg (nit), larvae (nymph), and an adult stage. All stages of the louse lifecycle may be found among the body hair coat of the infested horse. Lice are typically host specific insects, and thus, horse lice are permanent ectoparasites of horses. The entire lifecycle of the horse lice species are spent on the horse (or other equids).

The eggs are oval, pale, and translucent. Adult females oviposit their eggs or nits on hairs, near the skin, using a 'glue-like' substance as a means of attachment. A female will deposit 1 egg/day and will usually live 30-35 days. Eggs hatch in 5 to 20 days, into small, pale nymphs, which are the same general body configurations – head, thorax, and abdomen. Sucking lice nymphs begin taking blood meals

immediately, reaching maturity in 2-4 wks. Lice breed in a horse's thick hair coat, and can be found throughout the year, but the total population numbers tend to diminish during the spring to summer months. Transmission of lice is by direct contact between horses, via infested brushes, blankets and other tack.

## Geographical

Both *Haematopinus asini* and *Bovicola (Werneckiella) equi* have a worldwide distribution. In temperate parts of the world, populations of horse lice are characteristically greatest during the winter or early spring with a decline in the summer.

## Identification

Adult lice are dorsal-ventrally flattened insects, a configuration that allows them to position themselves under the hair coat. As insects, the typical louse possesses a body with three distinct divisions: the head, the thorax, and the abdomen. Sucking and chewing/biting lice can be differentiated by a comparison between the widest part of the head (minus the antennae) with the widest part of the thorax. Sucking lice possess a head which is narrower than the widest part of the thorax, whereas chewing lice will have a head that is wider than the widest part of the their thorax.

The sucking louse, *Haematopinus asini* is approximately 3-5 mm long, grey to yellow-brown in color, with a thorax which is about half the width of it's the abdomen. The head of *H. asini* is narrowed anteriorly, and less than one-third of it's abdominal width. Since it is a sucking louse, this louse possesses distinct piercing mouth parts. *H asini* is often found on the head, mane and tail, and tend to move slowly. This specie may be observed with its mouthparts embedded in the skin.

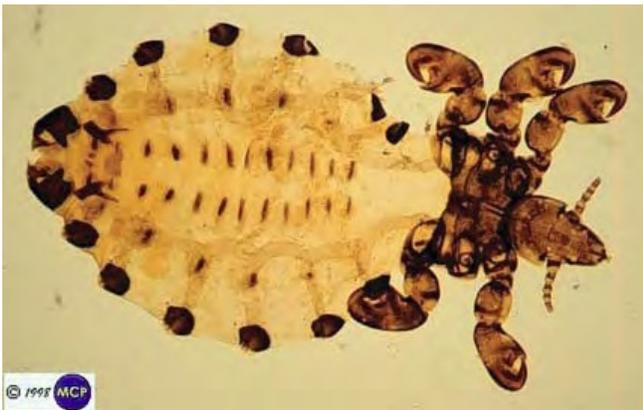
The chewing louse, *Werneckiella equi*, is

approximately 1-2mm long, flat with broad, rounded head. This louse has an arc, anterior to the antennae, a ventral chewing mandible, and thin legs. These chewing lice also are brown in color, and have yellow abdomens with contrasting dark bands. *W. equi* lice are usually found on the back and flanks, are more mobile and tend to move faster than *Hematopinus asini*. However, when heavy infestations occur, lice can be found everywhere on the body.

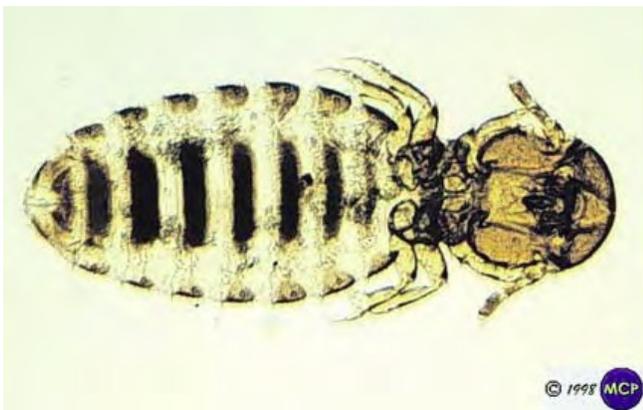
**Extension bulletin with photos of equine lice, page 9**

<http://www.uaex.edu/publications/pdf/MP484.pdf>

**Sucking louse, *Haematopinus* sp. (Marcelo de Campos Pereira, <http://www.icb.usp.br/~marcelcp/>)**



**Horse biting louse, *Bovicola equi* (Denny). (Marcelo de Campos Pereira, <http://www.icb.usp.br/~marcelcp/>)**



**Lice overview with photos.**

[http://www.merckvetmanual.com/mvm/integumentary\\_system/lice/lice\\_in\\_horses\\_and\\_donkeys.html](http://www.merckvetmanual.com/mvm/integumentary_system/lice/lice_in_horses_and_donkeys.html)



**Lice nits on a horse**

**Clinical Signs & Diagnosis**

Lice infestations are more common in sick, debilitated, possibly under conditioned, immunosuppressed animals. Pediculosis in horses is characterized by pruritus (scratching, rubbing, biting, etc), skin irritation, unthrifty appearance, a rough ‘unkept’ hair coat, and possibly a loss of body condition. In severe infestations, hair loss and skin scarification are often seen, and in the case of sucking lice, anemia may be present. Although both types of lice can be found anywhere on the horse, the chewing lice are more common on the head, mane, tail base, and shoulders; whereas the sucking lice are more commonly found in shorter haired regions of the horse (eg. head, neck, back, and inner thigh). Lice infestations and subsequent clinical signs are more common in late winter and early spring. Horses with thick hair coats appear to be more commonly infested. Some heavily infested horses may exhibit a nervous behavior which is associated with the constant irritation of feeding lice.

A diagnosis can be made based the presence of lice on the horse and possibly clinical signs. Use of a pen light and magnifying glass may be helpful, in a well lighted environment, the hair

around affected areas of the horse can be carefully parted, and the layers of the hair coat and skin carefully examined. Fast moving chewing lice are more easily observed, while sucking lice tend to move more slowly. Louse eggs can also be detected as small white eggs 'cemented' to the hair shafts. The mane, forelock, lower neck and base of tail are common sites of infestations and clinical signs.

#### **Associated Disease/Condition**

There is no documented transfer of infectious disease by lice in the horse.

#### **Specific Control and Treatment Measures**

Infested horses should be thoroughly washed with a shampoo that contains an approved insecticide (permethrins, coumaphos, dichlorvos, etc), insuring adequate skin contact to all affected areas. The use of a shampoo containing 1% selenium sulphide, just prior to the application of the insecticide containing shampoo, may help remove dead skin and scale, and allow for better insecticide contact. Selenium sulfide shampoos may also have a direct antiparasitic action. To maximize the effectiveness of lice control, the shampooing/cleaning should be repeated in two weeks in order to kill any nits that hatch after the first treatment. If shampooing is impractical, wettable powders or dusts containing insecticides (eg. carbaryl, coumaphos, fenthion, pyrethroids synergized with piperonyl butoxide, rotenone, etc) can be used. Regardless of the method used (washing or dusting) the horse should be completely

covered and the treatment should come in contact with the lice near or on the skin. The treatments may also be delivered by spraying, but care should be taken to insure sufficient skin contact. Gloves, and other protective gear should be worn in order to minimize human skin, eye, etc contact with the lice killing chemicals. The person treating the horse should also make every attempt to avoid the horse's eyes, mucosa of the mouth, nostrils, prepuce and vulva when applying insecticides or other chemicals. When using organophosphates such as coumaphos, you may be required to obtain a special application license—depending upon the formulation and the specific requirements of your state. These products should not be used on horses intended for slaughter.

The routine use of a macrocyclic lactone deworming products (ivermectin, moxidectin) may also aid in the control of sucking lice. A possible treatment protocol may include the use of deworming product, particularly if the horses are concurrently parasitized with susceptible nematodes. It is preferable that all product labels be carefully read, the instructions followed and only approved lice control products be used. Where possible, the extra label use of any insecticide, or other pharmaceutical should be avoided.

All fomites (eg., tack, brushes, saddles, etc) should be treated with an effective insecticide. Blankets used on infested horses should also be washed in hot water, carefully rinsed, then dried at the hottest possible clothes dryer setting.

## Insecticide active ingredients labeled for topical application to control lice (biting and chewing)

| Active ingredients and concentrations                      | Application options             | Precautions  |
|--|---------------------------------|--|
| Coumaphos 6.15%  | Spray                           | Cholinesterase inhibitor Dilute before using (Follow all label precautions when using these product) |
| Cypermethrin 0.15% + Pyrethrins 0.20%                      | Spray or wipe                   |  |
| Permethrin 0.5%  | Spray                           |  |
| Permethrin 0.10% to 0.50% + Pyrethrins 0.05% to 0.20%      | Spray, spot spray or wipe       | Do not use on foals under 3 months old   |
| Permethrin 0.20% + 0.13% Prallethrin                       | Spray                           |  |
| Permethrin 0.25%   | Dust                            |  |
| Permethrin 0.90% + Tetramethrin 0.25% + Cypermethrin 0.10% | Spray or wipe                   | Do not use on foals under 3 months old   |
| Permethrin 1.0% + 0.50% Pyrethrins                         | Spray or wipe                   | Do not use on foals under 3 months old   |
| Permethrin 5% + 5% diflubenzuron IGR                       | Spray, wipe or Pour-on          | Do not use pour-on application on foals  |
| Permethrin 7.4% to 10%                                     | Pour-on                         | Do not use on foals under 3 months old<br>Do not ride within 24 hours of use                         |
| Permethrin 10% to 40%                                      | Spray or wipe Dilute before use |  |
| Pyrethrins 0.10%   | Spray or wipe-on                |  |

Check the product label for treatments intervals, application rates, and precautions prior to application.

Brush animals before treatment to remove dirt and dust which can reduce insecticide effectiveness. Clean and treat grooming equipment with insecticide after use.

Be familiar with pest feeding sites and thoroughly treat areas where the pests feed. The sucking louse is numerous in the mane, base of the tail, on the fetlocks, and upper and inner thighs. The chewing louse is commonly found on the forehead, neck, and dorso-lateral trunk. However, both can occur over larger areas in cases of heavy infestation.

Insecticides kill adults and nymphs (immature stages) but not the eggs (nits). A second treatment applied 14 to 21 days after the first is necessary to control the infestation.

Carefully examine newly acquired animals for lice. Those found to be infested or coming from a premise with a history of infestation should be isolated and treated before introduction to the herd.

Some animals may be sensitive to ingredients any product, especially if the concentration of active ingredients is high. Reactions may include skin sensitivity, itchiness, rash and hair discoloration or hair loss at the application site. Bathe the horse with a mild, non-insecticidal shampoo and rinse with large amounts of water if you see signs of sensitivity. Instruct clients to notify you if signs of sensitivity to treatment are observed.

## Available insecticide products containing active ingredients for topical application to control lice

| Brand name  | AI 1               | AI 2               | Synergist                                     |
|---|--------------------|--------------------|---|
| Bite Free Biting Fly Repellent                    | Cypermethrin 0.15% | Pyrethrins 0.20%   | Piperonyl butoxide 1.60%                      |
| Endure Roll-on for Horses                         | Cypermethrin 0.15% | Pyrethrins 0.20%   | Piperonyl butoxide 1.60%                      |
| Endure Sweat-Resistant Fly Spray                  | Cypermethrin 0.15% | Pyrethrins 0.20%   | Piperonyl butoxide 1.6%                       |
| Tri-Tec 14  | Cypermethrin 0.15% | Pyrethrins 0.20%   | Piperonyl butoxide 1.6%                       |
| Absorbine Ultrashield Sport                       | Cypermethrin 1.0%  |                    |   |
| Ambush Insecticide and Repellent                  | Permethrin 0.10%   | Pyrethrins 0.05%   | Piperonyl butoxide 0.5%                       |
| Bronco Equine Fly Spray Plus Citronella Scent     | Permethrin 0.10%   | Pyrethrins 0.05%   | Piperonyl butoxide 0.5%                       |
| Flysect Super-7 Repellent Spray                   | Permethrin 0.20%   | Pyrethrins 0.20%   | Piperonyl butoxide 0.50%                      |
| Absorbine Dura Guard Insecticide & Repellent      | Permethrin 0.20%   | Pyrethrins 0.10%   |   |
| Mosquito Halt Repellent Spray For Horses          | Permethrin 0.20%   | Prallethrin 0.13%  | Piperonyl butoxide 0.50%                      |
| Absorbine Ultrashield EX Insecticide & Repellent  | Permethrin 0.5%    | Pyrethrins 0.10%   | Piperonyl butoxide 1.0%                       |
| Bio-Groom Repel-35 Insect Spray                   | Permethrin 0.5%    |                    |   |
| Cut-Heal Zonk it!35                               | Permethrin 0.5%    |                    |   |
| Gordon's Horse & Pony Spray                       | Permethrin 0.50%   | Pyrethrins 0.5%    | Piperonyl butoxide 0.5%                       |
| Absorbine Ultrashield Red                         | Permethrin 0.9%    | Tetramethrin 0.25% | Pyrethrins 0.025% PBO 1.0% Cypermethrin 0.10% |
| Equicare Flysect Super-C Repellent Concentrate    | Permethrin 1.0%    | Pyrethrins 0.50%   | Piperonyl butoxide 1.85%                      |
| Brute Pour-On Insecticide                         | Permethrin 10%     |                    |   |
| Permethrin II                                     | Permethrin 10%     |                    |   |
| Atroban 11%EC                                     | Permethrin 11%     |                    |   |
| Gardstar 40% EC Livestock And Premise Insecticide | Permethrin 40%     |                    |   |

**Available insecticide products containing active ingredients for topical application to control lice (continued)**

| <b>Brand name</b>                          | <b>AI 1</b>      | <b>AI 2</b>             | <b>Synergist</b> |
|--|------------------|-------------------------|------------------|
| Equi-Spot Spot-On Fly Control For Horses   | Permethrin 45%   |                         |                  |
| FlyRid Plus Spot-On Fly Control For Horses | Permethrin 45%   |                         |                  |
| Celebration Spot-On                        | Permethrin 45%   |                         |                  |
| Freedom Spot-On 45                         | Permethrin 45%   |                         |                  |
| Prozap War Paint Insecticidal Paste        | Permethrin 7%    |                         |                  |
| Permethrin CDS                             | Permethrin 7.4%  | Piperonyl butoxide 7.4% |                  |
| Bronco Gold Equine Fly Spray               | Pyrethrins 0.10% | Piperonyl butoxide 1.0% |                  |
| Equicare Flysect Citronella Spray          | Pyrethrins 0.10% | Piperonyl butoxide 1.0% |                  |
| Equisect Fly Repellent                     | Pyrethrins 0.10% | Piperonyl butoxide 1.0% |                  |
| Pyranha Wipe n Spray for Horses            | Pyrethrins 0.10% | Piperonyl butoxide 1.0% |                  |
| Prozap Aqueous Fly Spray                   | Pyrethrins 0.10% | Piperonyl butoxide 1.0% |                  |
| Wipe Fly Protectant                        | Pyrethrins 0.20% | Piperonyl butoxide 0.5% |                  |
| Equine Spray n Wipe                        | Pyrethrins 0.25% | Piperonyl butoxide 2.5% |                  |

Extension bulletin with list of equine lice control products, pg 3.

<http://msuextension.org/publications/AgandNaturalResources/MT201002AG.pdf>

Extension bulletin with products for external parasite control in horses, lice is found on page 9.

<http://alabamahorsecouncil.org/wp/wp-content/uploads/2011/10/ANR-0464-Managing-Pests.pdf>

**Prevention and Environmental Control Options**

Infested horses should be kept separate from non infested horses. Tack and other grooming equipment should never be used on infested and non-infested horses. In the case of an extensive louse infestation within a stable or other horse facility, all horse handling or grooming equipment should be thoroughly cleaned, and Sevin dust or a pyrethroid spray or powder should be applied on the floors of infested areas. Good grooming practices are also an important part of early detection and control. Careful attention to adequate nutritional intake and body condition score, internal parasite control, overall health particularly in geriatric or other at risk horses (chronic illness, thin, poordoers) may aid in the prevention and or treatment.

## References

<http://edis.ifas.ufl.edu/ig139>

[http://www.omafra.gov.on.ca/english/livestock/horses/facts/info\\_lice.htm](http://www.omafra.gov.on.ca/english/livestock/horses/facts/info_lice.htm)

<http://pubs.cas.psu.edu/FreePubs/PDFs/XF0276.pdf>

<http://equineextension.colostate.edu/files/articles/HorseArthropodPests.pdf>

<http://pest.ca.uky.edu/EXT/Recs/ENT513-Horses.pdf>

<http://pest.ca.uky.edu/EXT/Recs/ENT513-Horses.pdf>

Al-Quraisy S, F Abdel-Ghaffar, KAS Al-Rasheid, J Mehlhorn, H Mehlhorn. Observations on effects of a neem seed extract (MiteStop) on biting lice (mallophages) and bloodsucking insects parasitizing horses. *Parasitol Res* 2012; 110:335-339.

Bacot A, L Linzell. The incubation period of the eggs of *Haematopinus asini*. 388-392.

Biggin TA, A Bristol, GC Coles. Parasite control in horses of members of pony clubs. *Equine Vet Educ* 1999; 11:318-321.

Da Silva AS, AA Tonin, LS Lopes. Outbreak of lice in horses: epidemiology, diagnosis, and treatment. *J Equine Vet Sci* 2013; 33:530-532.

Egri B, P Sarkozy, G Banhidy. Prevalence of botfly larvae and lice in studs of North Caucasus (Stawropol County, Russia). *Acta Vet Hung* 1995; 43:287-289.

Gulegen E, VY Cirak. Occurrence and treatment of *Bovicola* (*Damalinia*) *equi* (Linnaeus, 1758) infestation on a thoroughbred horse farm. (English abstract). *Turkiye Parazit Derg* 2005; 29:183-184.

Hall MC. The control of lice on horses, with especial reference to winter conditions. *Vet J* 1918; 74:201-215.

Larsen KS, M Eydal, N Mencke, H Sigurosson. Infestation of *Werneckiella equi* on Icelandic horses, characteristics of predilection sites and lice dermatitis. *Parasitol Res* 2005; 96:398-401.

Mencke N, KS Larsen, M Eydal, H Sigurosson. Natural infestation of the chewing lice (*Werneckiella equi*) on horses and treatment with imidacloprid and phoxim. *Parasitol Res* 2004; 94:367-370.

Mencke N, KS Larsen, M Eydal, H Sigurosson. Dermatological and parasitological evaluation of infestations with chewing lice (*Werneckiella equi*) on horses and treatment with imidacloprid. *Parasitol Res* 2005; 97:7-12.

Moreby C. The biting louse genus *Werneckiella* (Phthiraptera: Trichodectidae) ectoparasitic on the horse family Equidae (Mammalia: Perissodactyla). *J Natural His* 1978; 12:395-412.

Murray MD. Influence of temperature on the reproduction of *Damalinia equi* (Denny). *Aust J Zool* 1963; 11:183-189.

Paterson S, S Orrell. Treatment of biting lice (*Damalinia equi*) in 25 horses using 1% selenium sulphide. *Equine Vet Educ* 1995; 7:304-306.

Sorrell MS, RE Fish, KH Taylor. Pediculosis in two research ponies (*Equus caballus*). *J Am Assoc Lab Anim Sci* 2010; 49:487-490.