THE AMBLYCERA (PHTHIRAPTERA: INSECTA). pdf

1: Amblycera - Wikipedia

The taxonomic characters used for the seperation of the families comprising the Amblycera are described and the relationships of these families are discussed, with special referecnce to the lice of the marsupials.

Hemipteroid, closely related to Hemiptera and Psocoptera. The order is divided into four suborders Ischnocera, Amblycera, Rhynchophthirina, and Anoplura distinguishable from one another by the size of the head, the shape of the third antennal segment, and the presence or absence of maxillary palps. Common ectoparasites of birds and mammals. All Phthiraptera are wingless external parasites of birds and mammals. There is a continuing debate among entomologists regarding the ordinal grouping of these insects. The distinction is based primarily on the presence or absence of mandibles that are suitable for biting and chewing. As justification, they cite numerous similarities in structure and ecology. The biting lice probably evolved first on birds, feeding on feathers and dead skin cells. But sometime during the Cretaceous period less than million years ago biting lice expanded their host range to include certain groups of mammals. This lineage presumably gave rise to other sucking lice suborder Anoplura , all of which are blood-feeding ectoparasites of placental mammals. Unlike many other ectoparasites, the Phthiraptera cannot survive long if separated from the body of their host. Eggs called nits are glued directly to the hair or feathers and nymphs feed on the parental host. Since lice have no wings, dispersal to new host animals is limited to occasions when members of the host species come into direct contact with each other. This close interspecific association means most lice are limited to a very narrow host range â€” often only a single species. Appearance of Immatures and Adults: Head broad, with mandibulate mouthparts Antennae short; segmented Eyes reduced or absent Tarsi 1- or 2-segmented, most species have two small claws Sucking lice are responsible for the spread of disease in humans and domestic animals. Pediculosis is an infestation of lice anywhere on the human body. It is usually characterized by skin irritation, allergic reactions, and a general feeling of malaise. In addition, the human body louse is responsible for the spread of relapsing fever Borellia recurrentis , epidemic typhus Rickettsia prowazeki , and trench fever Rickettsia quintana. Lice associated with domestic animals have also been implicated in the transmission of disease e. Biting lice do not usually spread disease pathogens, but heavy infestations in poultry can cause severe skin irritation, weight loss, and reduced egg production. Philopteridae Bird Lice â€” a large family species containing several species that are pests of poultry. Trichodectidae Mammal Chewing Lice â€” ectoparasites of mammals, including pests of domestic cattle and sheep e. Menoponidae Poultry Lice â€” includes several important pests of poultry e. Haematopinidae Ungulate Lice â€” ectoparasites of cattle, deer, pigs, horses, and zebras e. Pediculidae Body Lice â€” includes the human body louse Pediculus humanus humanus and the human head louse P. Pthiridae Pubic Lice â€” includes Pthirus pubis, the human pubic or crab louse. Louse-borne disease is particularly common in wartime when soldiers are forced to live in crowded and unsanitary conditions. Trench fever was especially widespread during World War I, and was probably a major factor in the final collapse of the Russian army. Lice that feed exclusively on blood do not get a well-balanced diet. To compensate for the absence of certain vitamins and amino acids, these lice have intestinal symbionts mostly bacteria that provide additional nutrients. Nits are always glued to the hair of the host animal. The suborder Rhynchophthirina includes only one genus and two species. One species is a parasite of Asian and African elephants; the other species is a parasite of African wart-hogs. All members of the family Echinophthiriidae are ectoparasites of aquatic mammals mostly seals and sea lions General Entomology.

THE AMBLYCERA (PHTHIRAPTERA: INSECTA). pdf

2: Louse - Wikipedia

Louse (plural: lice) is the common name for members of the order Phthiraptera, which contains nearly 5, species of wingless insect. Lice are obligate parasites, living externally on warm-blooded hosts which include every species of bird and mammal, except for monotremes, pangolins, and bats.

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THE AMBLYCERA (PHTHIRAPTERA: INSECTA). pdf

3: The Amblycera (Phthiraptera: Insecta) | www.enganchecubano.com

The Amblycera are a large suborder of chewing lice, parasitic on both birds and www.enganchecubano.com Amblycera are considered the most primitive suborder of lice.

Bio-ecology of the louse, Upupicola upupae, infesting the common hoopoe, Upupa epops. Journal of Insect Science, 11 Sensilla on the mouthparts and antennae of the elephant louse, Haematomyzus elephantis Piaget Phthiraptera: Journal of Morphology, 3: External morphology of the antennae of Damalinia ovis Phthiraptera: Journal of Morphology, 2: A key to the genera of the Menoponidae Amblycera: A preliminary key to the genera of the Menoponidae Mallophage. Proceedings of the Zoological Society of London, The sensory physiology of blood sucking arthoropods. Experiment Parasitol, 6 1: The Macmillan Company, New York. The micromorphological specialization of the claw of the lousefly. Journal of the South African Veterinary Association, 73 2: Antennal lobe organization in the slender pigeon louse, Columbicola columbae Phthiraptera: Problems in preparing the antennal sensilla of insects for scanning studies. Wiadomosci Parazytologiczne, 33 1: Sensilla of haematophagous insects sensitive to vertebrate host-associated stimuli. International Journal of Tropical Insect Science, 8: Journal of the New York Entomological Society, Scanning electron microscopy of antennal structures of Polyplax serrata Burmeister Anoplura: Journal of the New York Entomological Society, 78 3: Scanning electron microscopy of Solenopotes capillatus Enderlein Anoplura: Scanning electron microscopy of Echinophthirius horridus Von olfers , Antarctophthirus callorhini Osbern , and Proechinophthirius fluctus Ferris with emphasis on the antennal structures Anoplura: The Journal of Parasitology, 57 3: Scanning electron microscopy of antennal structures of five Haematopinus Anoplura: New York Entomological Society, The morphology of Laemobothrion Laemobothrion maximum Phthiraptera: Studies on the mouth-parts of Mallophaga infesting north-Indian birds. Proceedings of Indian Academy of Sciences, 3: The structure of arthropod chaemoreceptors. Annual Review of Entomology, Sense organs on the antennal flagellum of a bird louse Mallophaga. Journal of New York Entomological Society, 84 3: Sense organs on the antennal flagellum of the human louse, Pediculus humanus Anoplura. Journal of Morphology, Avian louse phylogeny Phthiraptera: A cladystic study based on morphology. Thesis, University of Glasgow. Structure of the preantennal region of several species of Damalinia Phthiraptera: Journal of Medical Entomology, 38 6: Scanning electron microscopy of legs of two species of sucking lice Anoplura: Antennal sense organs of Phthiraptera Insecta. Scanning electron microscopy of several species of Anoplura. Sensory equipment of the antennal flagellum of several species of Damalinia Phthiraptera: Sense organs on the legs of Pediculus humanus humanus L. Anoplura, Pediculidae nymphs and imagines. Polskie Pismo Entomologiczne, 48 4: The sense organs on antennae of Pediculus humanus Anoplura: Pediculidae in post embryonic development stages. Acta Parasitologica Polonica, 29 The micromorphology of the blesbuck louse Damalinia Damalinia crenelata as observed under the scanning electron microscope. The micromorphology of the African buffalo louse Haematopinus bufali as observed under the scanning electron microscope. Comprehensive insect physiology, volume 6. Oxform Pergaman Press, pp. Morphologische untersuchungen uber die fuhlersinnesorgane von ischnozeren vogel-mallophagen. Antennal sensilla in Mallophaga in scanning electron microscope. Folia Histochemica et Cytobiologica, 24 4: Morphologic features, with particular regard to surface ultra-structure, of Docophoroides brevis Docopheridídae, Mallophage. Wiadomosci Parazytologiczne, 38 Antennal sensilla of head of poultry shaft louse, Menopon gallinae Phthiraptera, Insecta, Menoponidae, Amblycera. Journal of Applied and Natural Science, 4 2 ,

4: Phthiraptera (Chewing and Sucking Lice) | www.enganchecubano.com

- 11 mm long. Head large and developed laterally, often projecting posteriorly over prothorax. Tentorium complete with exception of dorsal arms.

For information about human infestation, see Pediculosis. For information on treatment, see Treatment of human head lice. Humans host three different kinds of lice: Lice infestations can be controlled with lice combs , and medicated shampoos or washes. They have narrow heads and oval, flattened bodies. They have no ocelli , and their compound eyes are reduced in size or absent. Their antennae are short with three to five segments, and their mouth parts, which are retractable into their head, are adapted for piercing and sucking. The mouthparts consist of a proboscis which is toothed, and a set of stylets arranged in a cylinder inside the proboscis, containing a salivary canal ventrally and a food canal dorsally. They are similar to sucking lice in form but the head is wider than the thorax and all species have compound eyes. There are no ocelli and the mouthparts are adapted for chewing. The antennae have three to five segments and are slender in the suborder Ischnocera , but club-shaped in the suborder Amblycera. The legs are short and robust, and terminated by one or two claws. Many lice are specific to a single species of host and have co-evolved with it. They are usually cryptically coloured to match the fur or feathers of the host. Most are found on only specific types of animals, and, in some cases, on only a particular part of the body; some animals are known to host up to fifteen different species, although one to three is typical for mammals, and two to six for birds. For example, in humans, different species of louse inhabit the scalp and pubic hair. Lice generally cannot survive for long if removed from their host. These may assist in digestion because if the insect is deprived of them, it will die. If their host dies, lice can opportunistically use phoresis to hitch a ride on a fly and attempt to find a new host. Female lice are usually more common than males, and some species are parthenogenetic , with young developing from unfertilized eggs. Lice inhabiting birds, however, may simply leave their eggs in parts of the body inaccessible to preening , such as the interior of feather shafts. Living louse eggs tend to be pale whitish, whereas dead louse eggs are yellower. The young moult three times before reaching the final adult form, usually within a month after hatching. This pattern is more pronounced in territorial than in colonialâ€”more socialâ€”bird species. Host-switching is a random event that would seem very rarely likely to be successful, but speciation has occurred over evolutionary time-scales so it must be successfully accomplished sometimes. The habit of dust bathing in domestic hens is probably an attempt by the birds to rid themselves of lice. Lice are present on every continent in all the habitats that their host animals and birds occupy. The species is sexually dimorphic , with the male smaller than the female. Phylogeny Lice have been the subject of significant DNA research in the s that led to discoveries on human evolution. The three species of sucking lice that parasitize human beings belong to two genera, Pediculus and Pthirus: Human head and body lice genus Pediculus share a common ancestor with chimpanzee lice, while pubic lice genus Pthirus share a common ancestor with gorilla lice. Using phylogenetic and cophylogenetic analysis, Reed et al. The age of divergence between Pediculus and its common ancestor is estimated to be million years ago, which matches the age predicted by chimpanzee-hominid divergence. Genetic evidence suggests that our human ancestors acquired pubic lice from gorillas approximately million years ago. While it is difficult to determine if a parasite-host switch occurred in evolutionary history, this explanation is the most parsimonious containing the fewest evolutionary changes. Because body lice require clothing to survive, the divergence of head and body lice from their common ancestor provides an estimate of the date of introduction of clothing in human evolutionary history. The dominating theory of anthropologists regarding human migration is the Out of Africa Hypothesis. Genetic diversity accumulates over time, and mutations occur at a relatively constant rate. Because there is more genetic diversity in African lice, the lice and their human hosts must have existed in Africa before anywhere else.

THE AMBLYCERA (PHTHIRAPTERA: INSECTA). pdf

5: Louse | insect | www.enganchecubano.com

Louse, (order Phthiraptera), any of a group of small wingless parasitic insects divisible into two main groups: the Amblycera and Ischnocera, or chewing or biting lice, which are parasites of birds and mammals, and the Anoplura, or sucking lice, parasites of mammals only.

Hemimetabolous having a simple metamorphosis, i. It is commonly assumed that the order is derived from a primitive Pscopteran-like ancestor which became parasitic first on birds. Chewing lice with their large head and mandibles comprise the largest group with some species. These are separable into three distinct superfamilies - the Amblycera, Ischnocera and Rhyncophthirina. Amblycerans are found on a diverse range of mammals and birds, and have retained some of the more primitive characteristics of the order, with a lesser degree of specialization for particular habitats. This is reflected in their classification, and they divided into around sixty homogenous genera, whilst the Ischnocera are contained by over a hundred and fifty genera, of which around three quarters are confined to birds. Amblycera chew away at younger feathers and soft areas of the skin, causing localized bleeding from which some can drink. They usually roam freely about the surface of their host and seldom attach firmly to fur or feathers, unlike the avian Ischnocera which are more site specific, and will attach securely to the feathers or fur to escape the preening activity of their host. Ischnocera confine themselves to feeding on the downy part of feathers and softer fur. The Rhyncophthirina comprises a single genus which parasitise elephants and wart-hogs. They are a small louse carrying mandibles at the end of a long proboscis-like snout. This allows them to drill through their hosts thick skin. Anoplura are a much smaller group comprised of some species. These are restricted to mammals, and like the Rhyncophthirina, feed using maxillae positioned at the end of a snout-like protrusion to pierce the skin. Feeding solely on blood they remain at the feeding site causing localized skin irritations to their host. Because of this they are the vectors to a number of blood borne diseases. This group includes the human louse Pediculus humanus, consequently they are probably the most well studied louse group. Discussion of Phylogenetic Relationships The phylogenetic relationships and classification of the four main groups of lice have been matters of contention for some time. A cladistic analysis of the morphological data conducted by Lyal detailed objections to the traditional classification of lice into "Mallophaga" and Anoplura. His study supported the monophyly of the Phthiraptera, with Anoplura and Rhyncophthirina forming a monophletic group, sister group to the Ischnocera ; the Amblycera are the sister group of this assemblage. This working hypothesis seems to have received general support amongst most leading lice systematists. Nevertheless, the familial relationships amongst most major groups of lice are poorly understood, and resolution of these relationships awaits an analysis of all available morphological data, as well as the gathering of molecular information. These relationships will not be easy to uncover as many groups have had a long and complex independent history, frequently involving instances of parallel and convergent evolution. Other Names for Phthiraptera Vernacular Names: Parasitic lice References Clay, T. Some problems in the evolution of a group of ectoparasites. An introduction to a classification of the avian Ischnocera Mallophaga: Transactions of the Royal Entomological Society of London ,2: Cospeciation of pocket gophers Geomys and their chewing lice Geomydoecus. Journal of Mammalogy 74 3: The sucking lice Insecta, Anoplura of the world: A taxonomic checklist with records of mammalian hosts and geographic distributions. Bulletin of the British Museum of Natural History Molecular phylogenies and host-parasite cospeciation: Philosophical Transactions of the Royal Society of London. A checklist of the genera and species of mallophaga. London, British Museum of Natural History. Data book for the study of chewing lice Phthiraptera: Records of the Zoological Survey of India: Miscellaneous Publication, Occasional Paper A cladistic analysis and classification of trichodectid mammal lice Phthiraptera: Bulletin of the British Museum Natural History 51 3: Phylogeny of Geomydoecus and Thomomydoecus pocket gopher lice Phthiraptera: Trichodectidae infered from cladistic analysis of adult and first instar morphology. Reconstructing the history of host-parasite assemblages. A list of the chewing lice Insecta: Mallophaga from birds in New Zealand. A study of bird ectoparasites. Colins New Naturalist Series. Speciation patterns of ectoparasites and "straggling" lice. International Journal for Parasitiology 23 7: Information on the Internet.

THE AMBLYCERA (PHTHIRAPTERA: INSECTA). pdf

6: Phthiraptera/NCState-AgNIC

The order Phthiraptera comprises four suborders, three of which (the Amblycera, Ischnocera, and Rhynchophthirina) are known as chewing or biting lice and the fourth (the Anoplura) as sucking lice. All species of Anoplura and Rhynchophthirina are restricted to mammals, whereas species of Ischnocera and Amblycera are known from both mammals and.

Head broad, with mandibulate mouthparts Antennae short; segmented Tarsi 1- or 2-segmented, most species have two small claws Head conical, with suctorial mouthparts Antennae short, 3- to 5-segmented Eyes reduced or absent Tarsi usually 1-segmented with a single large claw Economic Importance Sucking lice are responsible for the spread of disease in humans and domestic animals. Pediculosis is an infestation of lice anywhere on the human body. It is usually characterized by skin irritation, allergic reactions, and a general feeling of malaise. In addition, the human body louse is responsible for the spread of relapsing fever Borellia recurrentis , epidemic typhus Rickettsia prowazeki , and trench fever Rickettsia quintana. Lice associated with domestic animals have also been implicated in the transmission of disease e. Biting lice do not usually spread disease pathogens, but heavy infestations in poultry can cause severe skin irritation, weight loss, and reduced egg production. Major Families Philopteridae Bird Lice -- a large family species containing several species that are pests of poultry. Trichodectidae Mammal Chewing Lice -- ectoparasites of mammals, including pests of domestic cattle and sheep e. Menoponidae Poultry Lice -- includes several important pests of poultry e. Haematopinidae Ungulate Lice -- ectoparasites of cattle, deer, pigs, horses, and zebras e. Pediculidae Body Lice -- includes the human body louse Pediculus humanus humanus and the human head louse P. Pthiridae Pubic Lice -- includes Pthirus pubis, the human pubic or crab louse. Bug Bytes Louse-borne disease is particularly common in wartime when soldiers are forced to live in crowded and unsanitary conditions. Trench fever was especially widespread during World War I, and was probably a major factor in the final collapse of the Russian army. Lice that feed exclusively on blood do not get a well-balanced diet. To compensate for the absence of certain vitamins and amino acids, these lice have intestinal symbionts mostly bacteria that provide additional nutrients. A "nit" is the egg stage of a louse. Nits are always glued to the hair of the host animal. The suborder Rhynchophthirina includes only one genus and two species. One species is a parasite of Asian and African elephants; the other species is a parasite of African wart-hogs. All members of the family Echinophthiriidae are ectoparasites of aquatic mammals mostly seals and sea lions.

THE AMBLYCERA (PHTHIRAPTERA: INSECTA). pdf

7: ENT | General Entomology | Resource Library | Compendium [phthiraptera]

All Phthiraptera are wingless external parasites of birds and mammals. There is a continuing debate among entomologists regarding the ordinal grouping of these insects. "Splitters" divide them into biting lice (order Mallophaga) and sucking lice (order Anoplura).

Number of families 24 Evolution and systematics It generally is accepted that lice Phthiraptera are derived from the insect order Psocoptera the so-called book lice or bark lice , and speculative estimates place their origin between the Late Carboniferous and the end of the Cretaceous, 66â€” million years ago. With the exception of a louse egg found in Baltic amber and a louselike insect from the Lower Cretaceous of Transbaikalia in Russia, there are no fossils that might provide direct information on the evolution of lice. The host distribution of lice is, however, analogous in some ways to a fossil record. The order Phthiraptera comprises four suborders, three of which the Amblycera, Ischnocera, and Rhynchophthirina are known as chewing or biting lice and the fourth the Anoplura as sucking lice. All species of Anoplura and Rhynchophthirina are restricted to mammals, whereas species of Ischnocera and Amblycera are known from both mammals and birds. These have a common ancestor with the Ischnocera and together form a sister taxon to the most basal louse suborderâ€”the Amblycera. By , 4, valid species of chewing lice had been recorded from 3, different hosts 3, bird and mammal species. The sucking lice are a much smaller group and, as of the year , valid species were described from different species of mammals. These figures are a small fraction of the true species diversity among lice, and many new species await formal description or discovery. Their size ranges from just 0. Within many host groups there is a strong correlation between the size of the host and the size of their lice. The body is dorsoventrally flattened, with a horizontally positioned head. These are adaptations for lying flat against a hair shaft or between feather barbules, and they reduce the chance of the louse becoming dislodged during grooming or preening by the host. Coloration varies from pale white through shades of yellow and brown to black. Lice have mandibles that have been variously modified in each of the suborders. Asymmetric opposing mandibles are present in Amblycera and Ischnocera. In Amblycera, the mandibles articulate horizontally from the head, whereas in Ischnocera, the mandibles articulate vertically. These mandibles are involved in feeding and play a vital secondary role in anchoring the louse to the host. Within the Rhynchophthirina, the mandibles are much reduced, occurring at the end of a long rostrum and articulating outward rather than opposing each other. In most Anoplura, the mandibles have been completely lost. However, some species have tiny mandibular vestiges present internally within the anterior section of the head. These vestiges are just one of the many characters that highlight the common ancestry of chewing and sucking lice. Distribution As permanent, obligate host-specific ectoparasites, lice have distributions that essentially mirror those of their hosts, with very few exceptions. As such, they are found worldwide and are present on every continent and in virtually every habitat occupied by birds and mammals. All orders and most families of birds have records of host-specific lice; of the few groups that do not, it is likely either that their lice are extinct or that the hosts have been searched insufficiently. Similarly, all major groups of mammals have lice, with the exception of species belonging to the orders Chiroptera bats , Cetacea whales and dolphins , Microbiotheria Chilean colocolos , Monotremata echidna and platypus , Notoryctemorphia marsupial moles , Pholidota pangolins , and Sirenia dugongs and manatees. Within the range of a host species, louse distribution often is patchy, and not every individual harbors all the lice previously recorded from the host. A true geographic distribution within the range of a host also has been noted for some species of lice. The size of a louse population varies enormously on different individuals, sometimes seasonally. Sick animals and, in particular, birds with damaged bills or feet may have abnormally large numbers, owing to their inability to groom or preen effectively. Habitat All lice complete their entire life cycle from egg to adult on the body of the host. The constant temperature and relative humidity that this environment affords lice may account for their success on mammals and birds. This seemingly uniform environment is, in fact, a series of interconnected microhabitats, and different species of lice are morphologically and behaviorally adapted to exploiting these niches on their host. This allows several species of lice to coexist on the same host species.

These microhabitats are most evident on birds and are partitioned by the different feather types present on the wings, back, head, and rump. The differential ability of birds and mammals to preen or groom various parts of their bodies also exerts a major selection pressure on louse morphological characteristics and influences the microhabitat occupied by most lice. Extreme examples are the species of Piagetiella Amblycera , which live inside the throat pouches of pelicans and cormorants, feeding on blood and serum within the pouch, but return to the head feathers to lay their eggs. Some species of Actornithophilus Amblycera have adapted to living inside the quills of wing feathers, thus completely escaping the effects of preening by their shorebird hosts. Most species of lice are highly host specific, restricted to a single host species or a handful of closely related hosts. In several cases, host specificity extends to the host subspecies, and for this reason it often is possible to judge the identity of the host from the assemblage of lice present on its body. There are some notable exceptions to this trend, and a few louse species are recorded from hosts spanning several bird or mammal orders. There are also many anomalies in host-louse associations that can be explained only by accepting that there has been some interchange of lice between major host groups. For example, Trichophilopterus babakotophilus from Madagascan lemurs is a species of ischnoceran louse that belongs to a group otherwise restricted to birds. Similarly, Heterodoxus spiniger Amblycera on the domestic dog and other carnivores is a secondary infestation derived from an Australian marsupial. Thus, the axiom of strict host specificity that once was thought to be the rule of host-louse associations is a generalization, for which there are exceptions. Behavior Observations on the behavior of lice are limited to generalizations obtained from a few louse species. Amblyceran lice typically are more mobile than the other louse suborders, and some species are known to make short forays away from the host. For the majority of species, however, remaining attached to the host is critical for survival, and lice have a variety of behavioral and morphological adaptations to ensure that they never become parted from their host, except during dispersal. Wing lice of birds escape preening by inserting between feather barbs of the wing feathers, and there is a strong correlation between the size of the interbarb space and the size of the lice for different host and louse species. Similarly, "fluff lice" that occupy the fine feathers close to the abdomen, escape the preening activity of their hosts by burrowing down into the downy basal regions of these feathers. Lice grip feather barbs or hair shafts with the aid of their tightly locking mandibles. Successful transmission is perhaps the greatest challenge faced by any parasite, and lice are no exception. Direct physical contact between host individuals remains the principal route of dispersal for lice within a host species. Shared nest holes and nest material, predator-prey interactions, and mixed species use of dust baths all provide opportunities for dispersal to a new host species. Arguably the most unusual means of dispersal between hosts involves hitchhiking on the abdomen of hippoboscid flies, a phenomenon known as "phoresy. Feeding ecology and diet Specializations in the diet of lice underpin their major taxonomic divisions. This flexible bundle can be driven in different directions until a suitable blood vessel is located. Once the tip of the bundle enters a vessel, feeding can commence. The other three louse suborders possess a pair of distinct mandibles. Rhynchophthirina elephant lice and their relatives have mandibles located at the end of a long rostrum. They each have been rotated degrees so that they articulate outward, rather than oppose each other. Thus, Rhynchophthirina cannot "bite" or "chew" in the traditional sense of the word, but instead they use the sharply serrated mandibles to rasp at the skin, allowing a pool of blood to form that is sucked up through an opening at the end of the rostrum. These are true pool feeders telmophages , unlike the vessel-feeding Anoplura solenophages. All species of avian Ischnocera are believed to feed exclusively on feather barbules, the remains of which usually can be seen in crops of specimens that have fed recently. These are sheared from feathers by toothed mandibles. Mammalian Ischnocera family Trichodectidae feed on skin debris and hair although this is disputed by some researchers , and at least one species is known to take blood meals. Amblycera have more generalist feeding habits, and in addition to feathers or hair, are known to feed on flakes of dead skin, blood, and skin secretions. Most chewing lice that do not partly blood-feed have an efficient water-vapor uptake system that extracts water from the atmosphere. For this reason, these species are particularly sensitive to the ambient humidity. Reproductive biology Lice are difficult to study under natural conditions, and for this reason most information on the bionomics of lice i. Separate male and female sexes are known for most louse species, but a few species reproduce parthogenetically. Lice eggs are attached to feather

barbs; to hairs; or, in the case of the human body louse, to projecting clothing fibers with a drop of glandular cement. This surrounds the substrate and the base of the egg. Typically whitish in color, the eggs require four to 10 days of incubation before hatching, depending upon species and ambient temperature. When the nymph is ready to hatch, air is drawn in though the mouth and accumulates behind the nymph. When sufficient pressure is reached, the caplike operculum on the noncemented end of the egg is forced open, and the first-stage nymph crawls out. Three nymphal stages follow, each lasting three to 12 days. In some cases the first-stage nymphs, while lacking functional genitalia, may be miniature versions of the adult; in others, the nymphs successively become more adultlike through each instar developmental stage. Adult lice live for about one month, and a female human body louse may produce 50â€” eggs during her lifetime. Conservation status It is seldom appreciated that the extinction of a mammal or bird species also results in the extinction of all associated host-specific parasites. The extreme host specificity of lice, along with other ectoparasite groups, such as feather mites and fleas, leaves them particularly vulnerable to co-extinction. At least eight species of lice were known to be extinct by , and this is almost certainly a gross underestimate of true loss of louse species diversity within the past century. Perhaps as the result of ignorance or the negative human perception of parasites, just one louse species Haematopinus oliveriâ€”an anopluran whose host species is the pygmy hog, Sus salvanius is listed on the IUCN Red List of threatened species as of , yet this same list defines bird and mammal species as Extinct in the Wild or Critically Endangered. If we assume that these species have an average rate of host-specific louse infestation, there are at least 50 species of lice that face a significant and immediate threat of extinction within the next 10 years. Significance to humans The human body louse Pediculus humanus "humanus"; quote marks are used to indicate that this is not considered a valid taxonomic species is the principal vector for Rickettsia prowazekii, which causes louse-borne typhus; Bartonella quintana, which causes trench fever; and Borrelia recurrentis, which causes epidemic or louse-borne relapsing fever. Epidemic and endemic infections can occur in conditions that foster the prevalence of lice, such as among homeless populations, in refugee camps, and during times of war or natural disasters. Humans can be infested with the human head louse Pediculus humanus "capitis" , which is confined to the scalp and is common among schoolchildren worldwide, or the pubic louse Pthirus pubis , which normally is transmitted through sexual contact. Lice are important pests of domesticated mammals and poultry, and while modern insecticides have proved highly effective at controlling louse infestations, concerns over the safety of these chemicals, insecticide resistance, and the difficulty of treating large numbers of animals on a regular basis mean that lice will continue to be a major problem for livestock farmers. Similar losses are likely in other countries where sheep, cattle, or poultry are farmed intensively.

THE AMBLYCERA (PHTHIRAPTERA: INSECTA). pdf

8: Phthiraptera - Wikispecies

A detailed redescription of Gyropus parvus (Insecta: Phthiraptera: Amblycera: Gyropidae) is given based on specimens collected from the type host, Ctenomys colburni Allen , and the type locality, Estancia HuanuluÃ¡n, Provincia de Rio Negro, Argentina. We expand and provide new chaetotaxy.

See Article History Alternative Titles: Phthiraptera, lice Louse, order Phthiraptera , any of a group of small wingless parasitic insects divisible into two main groups: One of the sucking lice, the human louse , thrives in conditions of filth and overcrowding and is the carrier of typhus and louse-borne relapsing fever. Outbreaks of louse-borne diseases were frequent by-products of famine, war, and other disasters before the advent of insecticides see infectious disease. Partly due to the widespread use of insecticidal shampoos for control, the head louse has developed resistance to many insecticides and is exhibiting a resurgence in many areas of the world. Heavy infestations of lice may cause intense skin irritation, and scratching for relief may lead to secondary infections. In domestic animals, rubbing and damage to hides and wool may also occur, and meat and egg production may be reduced. In badly infested birds, the feathers may be severely damaged. One of the dog lice is the intermediate host of the dog tapeworm, and a rat louse is a transmitter of murine typhus among rats. General features The flattened bodies of lice range from 0. Probably all species of birds have chewing lice, and most mammals have either chewing or sucking lice Anoplura or both. There are about 2, known species of Amblycera and Ischnocera, with many others still undescribed, and about species of Anoplura. No lice have been taken from the platypus duckbill or from anteaters and armadillos, and none are known from bats or whales. The density of louse populations varies enormously on different individuals and also varies seasonally. Sick animals and birds with damaged bills, probably because of the absence of grooming and preening, may have abnormally large numbers: The numbers found on healthy hosts are usually considerably smaller. Apart from grooming and preening by the host, lice and their eggs may be controlled by predatory mites, dust baths, intense sunlight, and continuous wetting. Natural history Life cycle With the exception of the human body louse, lice spend their entire life cycle, from egg to adult, on the host. The females are usually larger than the males and often outnumber them on any one host. In some species males are rarely found, and reproduction is by unfertilized eggs parthenogenetic. The eggs are laid singly or in clumps, usually cemented to a feather or hair. The human body louse lays its eggs on clothing next to the skin. The eggs may be simple ovoid structures glistening white among the feathers or hairs or may be heavily sculptured or ornamented with projections that assist in the attachment of the egg or serve in gas exchange. When the nymph within the egg is ready to hatch, it sucks in air through its mouth. The air passes through the alimentary canal and accumulates behind the nymph until sufficient pressure is built up to force off the egg cap operculum. In many species the nymph also has a sharp platelike structure, the hatching organ, in the head region, which is also used to open the operculum. The emergent nymph is similar to the adult but is smaller and uncoloured, has fewer hairs, and differs in certain other morphological details. Metamorphosis in the lice is simple, the nymphs molting three times, each of the three stages between molts instars becoming larger and more like the adult. The duration of the different stages of development varies from species to species and within each species according to temperature. In the human louse the egg stage may last from six to 14 days and the stages from hatching to adult, eight to 16 days. The life cycle may be closely correlated with the particular habits of the host; e. Ecology Sucking lice feed exclusively on blood and have mouthparts well adapted for this purpose. The delicate stylets are used to pierce the skin, and a salivary secretion is injected to prevent coagulation while the blood is sucked into the mouth. The stylets are retracted into the head when the louse is not feeding. The chewing lice of birds feed on feathers, or on feathers, blood, and tissue fluids, or on fluids only. The fluids are obtained either by gnawing the skin or, as in the poultry body louse, from the central pulp of a developing feather. The feather-eating Mallophaga are able to digest the keratin of feathers. It is probable that the chewing lice of mammals do not feed on wool or hairs but on skin debris, secretions, and perhaps sometimes blood and tissue fluids. Many birds and mammals are infested by more than one species of lice. Many species of birds have at least four or five louse species. Among the avian chewing lice, some species occupy different body

regions for resting, feeding, and egg laying. A louse is unable to live for more than short periods of time away from its host, and adaptations serve to maintain its close contact. It is also probably sensitive to the smell of its host and the peculiarities of feathers and hairs that help the louse orient itself. A louse may leave its host temporarily to pass to another host of the same species or to a host of another species, such as from prey to predator. Chewing lice have often been found attached to louse flies Hippoboscidae , also parasitic on birds and mammals, and on other insects by which they may be transferred to a new host. However, they may not be able to establish themselves on the new host because of chemical or physical incompatibility with the host as food or habitat. Some mammalian lice, for example, can lay their eggs only on hairs of a suitable diameter. The infrequency of transfer from one host species to another leads to host specificity, or host restriction, in which a species of louse is found only on one species of host or a group of closely related host species. It is probable that some host-specific species have developed through isolation because there is simply no opportunity for the transfer of lice. Domestic and zoo animals sometimes have established populations of lice from different hosts, and pheasants and partridges often have flourishing populations of chicken lice. Heterodoxus spiniger, which is parasitic on domestic dogs in tropical regions, was most likely acquired relatively recently from an Australian marsupial. Form and function The louse body is flattened dorsoventrally with the long axis of the head horizontal, enabling it to lie close along the feathers or hairs for attachment or feeding. The shape of the head and body varies considerably, especially in the avian chewing lice, in adaptation to the different ecological niches on the body of the host. Birds with white plumage, such as swans, have a white body louse, while the dark-plumaged coot has an almost black body louse. The antennae are short, three- to five-segmented, sometimes modified in the male as clasping organs to hold the female during copulation. The mouthparts are biting in the Mallophaga and strongly modified for sucking in the Anoplura. The Anoplura have three stylets enclosed in a sheath within the head, and a small proboscis armed with recurved toothlike processes, probably for holding the skin during feeding. The elephant louse has chewing mouthparts, with the modified mandibles borne on the end of a long proboscis. The thorax may have three visible segments, may have either the mesothorax and metathorax fused, or may have all three fused into a single segment as in the Anoplura. The legs are well developed with the tarsus being one- to two-segmented. There are two claws in the avian inhabiting Mallophaga and a single claw in some of the mammal-infesting families. The Anoplura have a single claw opposed to a tibial process forming a hair-clasping organ. The abdomen has eight to 10 visible segments. There is one pair of thoracic breathing pores spiracles and a maximum of six abdominal pairs. The eversible male genitalia provide important characters for the classification of species. The female has no well-defined ovipositor, but various lobes present on the last two segments of some species may act as guides to the eggs during laying. The alimentary canal in the Mallophaga is composed of the esophagus, a well-developed crop and midgut, a smaller hindgut, four malpighian tubules, and a rectum with six papillae. The crop is either a simple swelling between esophagus and midgut or a diverticulum from the esophagus. In the Anoplura the esophagus passes straight into the large midgut with or without a swelling forming a crop. There is also a strong pump, associated with the esophagus, for sucking up the blood. Members of the superfamily Amblycera have well-developed, comblike structures at the base of the crop, which prevent undigested feather parts or other particles from passing into the midgut; in the family Philopteridae these combs are smaller and lie at the anterior part of the crop, whereas the Trichodectidae and Anoplura have no crop teeth. Apart from the eyes, which are sensitive to light, the other sensory structures are the tactile hairs and the sense organs in the mouth and on the antenna, some of which function as taste and smell organs. Evolution and paleontology It is generally accepted that the lice are derived from the book lice order Psocoptera. It is also accepted that the Anoplura are related to the Mallophaga, some authorities believing that they evolved from an ancestral stock before the division into the Amblycera and Ischnocera, others that they diverged from those Ischnocera already parasitic on mammals. The origins of the elephant louse are obscure. Apart from a louse egg found in Baltic amber, there are no fossils that might provide information on the evolution of the lice. However, their host distribution is in some ways analogous to a fossil history. Mallophagan genera frequently have a number of species that are restricted to one species of bird or to a group of closely related birds, suggesting that the stock ancestral to the bird order was parasitized by an

ancestral mallophagan stock that diverged and evolved along with the divergence and evolution of its bird hosts. This relationship between host and parasite may throw some light on the relationships of the hosts themselves. The flamingos , which are usually placed with the storks, are parasitized by three genera of Mallophaga found elsewhere only on ducks, geese, and swans and may therefore be more closely related to those birds than to storks. The louse most nearly related to the human body louse is that of the chimpanzee, and to the human pubic louse that of the gorilla. However, a number of factors have obscured the direct relationship between louse species and host species. The most important of these is secondary infestation, which is the establishment of a louse species on a new and unrelated host. This may have happened at any stage during the evolution of host or parasite so that subsequent divergence will have obscured all traces of the original change of host. Classification Distinguishing taxonomic features The important characters used in classifying lice at the subordinal level are mainly based on the mouthparts. Features separating the lower categories are the special modifications of mouthparts, crop, antennae, sutures, and internal thickening of the head capsule; the number and form of claws; the segmentation of thorax and abdomen; the form of body plates; the number of spiracles; the pattern of bristles or setae ; and features of the male genitalia and terminal segments of the abdomen. Annotated classification Lice can be included in one order, the Phthiraptera, being separated by the characters of the mouthparts into four suborders: Amblycera, Ischnocera, Rhynchophthirina , and Anoplura. The suborders Amblycera and Ischnocera contain the majority of Phthiraptera, consisting of approximately 2, described species. Order Phthiraptera Small dorso-ventrally flattened parasitic insects. Eyes reduced or absent, ocelli absent, antenna three- to five-segmented, mouthparts mandibulate or piercing. Obligate permanent ectoparasites of birds and mammals. Suborder Amblycera chewing or biting lice Mandibulate mouthparts. Parasites of birds and mammals. Antenna four- to five-segmented, third segment pedunculate; articulation of mandibles horizontal; two- to five-segmented maxillary palpus; crop simple. Family Menoponidae Widespread parasites of birds, contained in about 60 genera. Family Boopidae Confined to marsupials of Australasia, except for one species found on domestic dogs. Family Laemobothriidae Contains some of the largest Amblycera up to 11 millimetres in length. Parasites of birds of prey, rails, and some storks.

9: Louse - Simple English Wikipedia, the free encyclopedia

Introduction. Lice belong to the order Phthiraptera, and are the only truly parasitic group amongst the exopterygote insects. As permanent ectoparasites of most birds and mammals they exhibit a remarkable level of host specificity which is unparalleled in most other metazoan parasites.

THE AMBLYCERA (PHTHIRAPTERA: INSECTA). pdf

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