

**Chapter 1 : Beginner's Book List - The Fool Speaks: Occult Forums for Magick, Chaos, Goetia, and the Occult**

*Buy Liber Hirudo: The Book of the Leech by Oizus (Hardcover) online at Lulu. Visit the Lulu Marketplace for product details, ratings, and reviews.*

Environment Biology Of the species of leech listed, *Hirudo medicinalis* is one of the most extensively studied. This annelid from the subclass Hirudinea has 2 suckers, one housing the mouth and its 3 jaws. It lives mainly in the stagnant waters of marshes and ponds. When it comes to reproduction, the animal is a hermaphrodite. Inseminated leeches lay their eggs during the spring and summer months, outside the water, with cocoons containing as many as thirty young. Leeches mainly feed on the blood of mammals and can survive for long periods without eating. When it bites its prey, the leech then feeds on the blood and at the same time injects numerous substances with a variety of properties. Aware of the power of the leech, over the course of time people have associated with it virtues that sometimes border on the highly fanciful. But it was in the 19th century that numerous monographs were dedicated to leeches: At the beginning of the 20th century, the French pharmacopoeia gave a detailed description of the pigmentary characteristics of the medical leech. In the Bible, it appears under the name aluka and in some Arabic accounts under the name aleca. In English, the primitive meaning of leech is doctor.

**Classification** Of the species of leech that exist, *Hirudo medicinalis* is one of the most extensively studied annelids and the most widely used species in the therapeutic setting. Its scientific name reflects its importance in medicine. European medicinal leeches come in a large number of varieties. Depending on their geographic origin, leeches have different pigmentations making it possible to differentiate between different varieties. The Hungarian leech comes from Hungarian and Yugoslavian marshlands. Its dorsal surface is brightly coloured with various shades: The median band of its dorsal surface is dark green, demarcated on each side by an evenly serrated, thin black line. Its ventral surface is green. French leeches originate from the Landes and Camargue regions. The Landes leech has a median emerald green band demarcated on each side by a thin, straight black line on its dorsal surface. Its ventral surface is light green and smooth to the touch, with two black stripes running along each edge. The Camargue leech has a yellowish-green longitudinal median band demarcated on each side by a black line on its dorsal surface. Its ventral surface is yellowish green and smooth to the touch with a straight black stripe. This epithelium is covered by a thin cuticle that is renewed every time the leech moults. This thin, transparent moult, revealing the segmented structure of leeches, can be readily observed in the storage jars of the animals. Under the integument, the dermis is composed of muscle fibres organised into an external circular layer and a continuous internal longitudinal layer, giving leeches a very high level of contractility. The coelom is very small and occupied by parenchymatous tissue: It consists of 2 longitudinal sinuses one dorsal, one ventral joined by thin transversal sinuses, where a red plasmatic fluid circulates. The locomotor system Each end of its body has a sucker: This sucker, which is perforated by the mouth, has a conformation enabling it to exert suction on supports. Its musculature is not very powerful since it consists of a single circular fibre and a few longitudinal muscles. It is essential for locomotion. The digestive system This is located in the dorsal position, apart from the mouth, which has a ventral position. It consists of 4 parts: The mouth, which opens at the base of the anterior sucker, has 3 half moon-shaped jaws, the free edge of which have numerous calcite teeth making the incision. The pharynx, equipped with powerful muscles, is used to suck and swallow blood. It evaginates into the wound to absorb the blood. Its wall contains numerous salivary glands. The stomach has 11 pairs of gastric caeca, with the longest of these in the posterior position. The middle intestine is the active digestive zone and the short posterior intestine or rectum ends with the anus. The respiratory system There is no differentiated respiratory system. Leeches breathe directly through the epidermis. The circulatory system In *Hirudo medicinalis*, the circulatory system is composed of 4 blood vessels, including a ventral vessel attached to the nervous system, a dorsal vessel and 2 contractile lateral vessels joined by a network of fine capillaries. This system is devoid of a heart. The blood of *Hirudo medicinalis* contains leukocytes. It is coloured red by a chromoprotein. The nervous system The nervous system of the medicinal leech is formed by 2 cerebroid ganglions joined by a peri-oesophageal collar to a sub-oesophageal nerve mass, innervating the oral sucker,

and composed by coalescence of the ganglions of the first 5 metameres segments. The ventral nervous system, located within the ventral sinus, consists of 19 pairs of ganglions, with one per metamere. The excretory system Metamerised segmented and hypertrophic, the excretory system is composed of 17 pairs of nephridia opening at the integument by nephridiopores. Each nephridium represents an autonomous unit and includes a horseshoe-shaped gland composed of excretory tissue, extended by a short excretory duct leading to a bladder in the ventral position ending at the ventral pore. The reproductive system Leeches are hermaphrodites and therefore have both a male genital organ and a female genital organ. The male genital system is formed of 9 pairs of testicles positioned on either side of the ventral nervous system 12th and 20th metamere. At the level of the tenth segment, the sperm ducts, which transport spermatozoids, form the epididymis then become symmetrical again to form an ejaculatory duct within the long filiform penis. The base of the penis has a prostate containing spermatozoids. The male pore is located between the 24th and 25th ring. The female genital system 11th metamere consists of 2 globular ovaries, 2 oviducts, a uterus, the secretions of which form the shell of the eggs, and a vagina. The female pore is located between the 29th and the 30th ring. It lives in mostly stagnant marshes, ponds fresh water but can also be found in streams. In natural pools, it moves around its environment either by swimming, using undulating movements, or by moving along the substrate using suckers. On the ground, it moves by affixing the posterior sucker and then extending its body to attach the anterior sucker. It then detaches the posterior disc and contracts on its point of support to move the posterior part of the body towards the anterior sucker before re-applying the posterior sucker. In the natural environment, leeches are alerted to the presence of potential prey by water vibrations. They then swim towards the main source of the vibrations. Although they have 5 pairs of eyes, vision does not appear to be the major component in the detection of prey. The eyes, or ocelli, simply appear to give them light sensitivity; when placed in a lit aquarium, they instinctively seek out dark places. The other major stimulus for leeches is the temperature of the potential prey. A source of heat, such as a balloon filled with hot water, placed in the water of the pool attracts leeches to its surface. They probably detect warm-blooded vertebrates more easily therefore. Touch, through their integument and suckers, is also an important component in contact with potential prey. In contact with certain substances, leeches have the capacity to retract, reducing their length by up to two thirds. Hence the sensitivity of leeches to certain chemical substances has been identified. These substances include quinine, saccharin, chloral hydrate or odorous solvents. Some skin odours actually prevent them biting. Leeches also appear to be sensitive to sounds. Feeding Medicinal leeches are reputed to be a strictly haematophagous blood-sucking species. Their preferred food is mammal blood. But young individuals can initially feed on insect larvae and small molluscs. They may also feed on amphibian eggs, amphibians themselves and fish but the weight gain of the leech appears to be relatively minimal in this case. Wildlife living in natural pools do not only represent a potential source of food, since some insects actually represent a threat to leeches, either because they are capable of injuring them or because they feed on them. The leeches most at risk are probably the young ones. The predators are many: Once attached to their prey by their two suckers, the leech makes a three-cleft incision in the integument or skin using its 3 toothed jaws. The secretory content of the salivary cells is released when they bite. The mucus facilitates lubrication of the site and hydration of the blood and the hirudin injected promotes ingestion of the blood meal by preventing coagulation. The blood is sucked by means of rhythmic contractions of the posterior region of the pharynx. Once it is replete, around 20 to 40 minutes later, the leech detaches itself from its host. At this point it is swollen with blood and moves with difficulty. It can ingest between 3 and 10 times its own weight in blood, i. The blood then undergoes very slow changes, in particular by progressive lysis of the erythrocytes involving 2 successive mechanisms: The digestion progress is extremely slow and takes several months. Once sated, leeches do not bite. In the natural environment, access to prey is not always regular but the method of digestion of leeches makes them adapted to this lifestyle since they present an extraordinary resistance to fasting, being capable of fasting for 6 to 8 months at a time. Some leeches can even survive a fasting period of 18 months. At Ricarimpex, for obvious health and safety reasons, blood feeding is performed in the laboratory only under controlled conditions; mammal blood " although the preferred food of leeches " has been replaced by poultry blood. The use of this avoids the risk of disease transmission, which is much higher

between mammals. In any case, it is essential to use a controlled blood source veterinary controls on slaughtered animals and analysis of the blood. **Reproduction** Since they have both male and female reproductive systems, leeches are hermaphrodites.

**Chapter 2 : Medicinal leeches 'are the wrong kind' - Telegraph**

*Re: Liber Hirudo: Book of the Leech? by cyberdemon» Thu Feb 19, am The most well known books that "work" are the Grimoires by Crowley, which Waite wrote a book to simplify contained instructions.*

Animals Without Backbone 3rd ed. The University of Chicago Press. Neurobiology of the Leech. Cold Spring Harbor Laboratory. University of Toronto Medical Journal 79 1: Forsch Komplementmed 15 5: Results and implications of a pilot study". Alternative therapies in health and medicine 8 5: Retrieved 21 February Bain March 14, Retrieved January 19, Inhibition of platelet aggregation and of leukocyte activity and examination of reputed anaesthetic effects". Comparative Biochemistry and Physiology Part C: Comparative Pharmacology 88 1: Retrieved December 15, Evidence and immune modulation". European Journal of Biochemistry 8: Leech Fauna of Taiwan-Biota Taiwanica. Leeches Victorian Poisons Information Centre. The Internet Journal of Gynecology and Obstetrics 2 2. Hong Kong Medical Journal 11 2: Discovery and isolation of this protein led to a method of producing it by recombinant technology. Recombinant hirudin is available to physicians as an intravenous anticoagulant preparation for injection, particularly useful for patients who are allergic to or cannot tolerate heparin. The use of leeches in modern medicine made a small-scale comeback in the s after years of decline, with the advent of microsurgeries, such as plastic and reconstructive surgeries. In operations such as these, problematic venous congestion can arise due to inefficient venous drainage. Sometimes, because of the technical difficulties in forming an anastomosis of a vein , no attempt is made to reattach a venous supply to a flap at all. This condition is known as venous insufficiency. If this congestion is not cleared up quickly, the blood will clot, arteries that bring the tissues their necessary nourishment will become plugged, and the tissues will die. To prevent this, leeches are applied to a congested flap, and a certain amount of excess blood is consumed before the leech falls away. The combined effect is to reduce the swelling in the tissues and to promote healing by allowing fresh, oxygenated blood to reach the area. The use of leeches in medicine dates as far back as 2, years ago, when they were used for bloodletting in ancient India. Leech therapy is explained in ancient Ayurvedic texts. Many ancient civilizations practiced bloodletting, including Indian and Greek civilizations. In ancient Greek history, bloodletting was practiced according to the humoral theory, which proposed that, when the four humors, blood, phlegm, black and yellow bile in the human body were in balance, good health was guaranteed. An imbalance in the proportions of these humors was believed to be the cause of ill health. Bloodletting using leeches was one method used by physicians to balance the humors and to rid the body of the plethora. Medicinal use of leeches Some people suffer severe allergic or anaphylactic reactions from leech bites and require urgent medical care. Symptoms include red blotches or an itchy rash over the body, swelling around the lips or eyes, feeling faint or dizzy, and difficulty breathing. Bleeding time will vary, with location, from a few hours to three days. This is a function of the hirudin and other compounds that reduce the surface tension of the blood. Anticlotting medications also affect the bleeding time. Applying pressure can reduce bleeding, although blood loss from a single bite is not dangerous. The wound normally itches as it heals, but should not be scratched, as this may complicate healing and introduce other infections. An antihistamine can reduce itching, and applying a cold pack can reduce pain or swelling. An externally attached leech will detach and fall off on its own when it is satiated on blood, which may be anywhere from 20 minutes to two hours or more. After feeding, the leech will detach and depart. These will cause the leech to quickly detach; however, it will also regurgitate its stomach contents into the wound. The vomit may carry disease, and thus increase the risk of infection. Removal and treatment Leeches normally carry parasites in their digestive tracts , which cannot survive in humans and do not pose a threat. However, bacteria, viruses, and parasites from previous blood sources can survive within a leech for months, but only a few cases of leeches transmitting pathogens to humans have been reported. They are used by the leeches in modulating their own immunocytes and not for anesthetizing bite areas on their hosts. To feed on their hosts, leeches use their anterior suckers to connect to hosts for feeding. A leech attaches itself when it bites, and it will stay attached until it becomes full, at which point it falls off to digest. Due to the hirudin secreted, bites may bleed more than a normal wound after the leech is removed. Exploratory behavior includes head movements and

body waving. In *Hirudo medicinalis*, these supplementary factors are produced by an obligatory symbiotic relationship with two bacterial species, *Aeromonas veronii* and a still-uncharacterized *Rikenella* species. Nonbloodsucking leeches, such as *Erpobdella punctata*, are host to three bacterial symbionts, *Pseudomonas*, *Aeromonas*, and *Klebsiella* spp. The bacteria are passed from parent to offspring in the cocoon as it is formed. Bacteria in the gut were long thought to carry on digestion for the leech, instead of endogenous enzymes that are very low or absent in the intestine. As discovered relatively recently, all leech species studied do produce endogenous intestinal exopeptidases [3] which can unlink free terminal-end amino acids, one monomer at a time from a gradually unwinding and degrading protein polymer. However, unzipping of the protein can start from either the amino tail or carboxyl head terminal-end of the protein molecule. The leech exopeptidases arylamidases, starting from the tail or amino end and possibly aided by proteases from endosymbiotic bacteria in the intestine, slowly but progressively remove many hundreds of individual terminal amino acids for resynthesis into proteins that constitute the leech. Since leeches lack endopeptidases, the mechanism of protein digestion cannot follow the same sequence as it would in all other animals in which exopeptidases act sequentially on peptides produced by the action of endopeptidases. This evolutionary choice of exopeptic digestion in Hirudinea distinguishes these carnivorous clitellates from Oligochaeta. The bodies of predatory leeches are similar, though instead of jaws many have a protrusible proboscis, which for most of the time they keep retracted into the mouth. Such leeches often are ambush predators that lie in wait till they can strike prey with the proboscises in a spear-like fashion. In most blood-sucking leeches the digestive system starts with the jaws, three blades set at an angle to each other. In feeding they slice their way through the skin of the host, leaving a Y-shaped incision. Behind the blades is the mouth, located ventrally at the anterior end of the body. It leads successively into the pharynx, then the esophagus, the crop, the gizzard, and the intestine, which ends at the posterior sucker. The crop is a distension of the alimentary canal that functions as an expandable storage compartment. In the crop, some blood-sucking species of leech can store up to five times the body mass of blood. The leech produces an anticoagulant that prevents the stored blood from clotting, plus other agents that inhibit microbial decay of the blood. These measures are so effective that a mature medicinal leech does not need to feed more than twice a year. Possibly as an adaptation, its digestive process is extremely slow.

**Leech cross-section Mouthparts and sucker Digestion** The ectoderm and mesoderm of the body trunk are exclusively derived from the teloblast cells in a region called the posterior progress zone. During stage 1, the first cleavage occurs, which gives rise to an AB and a CD blastomere, and is in the interphase of this cell division when a yolk-free cytoplasm called teloplasm is formed. As a consequence, it creates a large D cell on the left and a smaller C cell to the right. This unequal division process is dependent on actinomycin [15] and by the end of stage 3 the AB cell divides. On stage 4 of development, the micromeres and teloblast stem cells are formed and subsequently, the D quadrant divides to form the DM and the DNOPQ teloblast precursor cells. By the end stage 6, the zygote contains a set of 25 micromeres, 3 macromeres A, B and C and 10 teloblasts derived from the D quadrant. They use a spermatophore, which is a structure containing the sperm. The leech then shoots the spermatophore into the clitellur region of the opposing leech, where its sperm will make its way to the female reproductive parts. Leeches are ovaries and testes, respectively. Leeches reproduce by reciprocal fertilization, and sperm transfer occurs during copulation. Similar to the earthworms, leeches also use a clitellum to hold their eggs and secrete the cocoon. Reproduction and development [12][11]

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Chapter 3 : Leech - Wikipedia

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Orchitis Where do leeches come from and how do they work? Leeches are primarily found in freshwater lakes, ponds or rivers. Historically, leech collectors would wade in leech-infested waters collecting these as they allowed the leeches to attach themselves to their legs. The problem with these leeches is they carry in their gut the bacteria *Aeromonas hydrophila*, which can be passed to the patient during therapy and cause pneumonia, septicaemia or gastroenteritis. Nowadays, leeches for medical use are bred in laboratories under sterile conditions in order to reduce secondary infections in patients. There are 2 species of therapeutic leeches, *Hirudo medicinalis* European medical leech and *Hirudo michaelseni*. Leeches work by attaching themselves to the patient by means of their 2 suckers located at either ends of their bodies. As the leeches suck the blood they release certain chemicals via their saliva that deliver the main therapeutic benefits of hirudotherapy. Anticoagulant enzymes – leeches secrete an anticoagulant called hirudin that stops the blood from clotting. This action can last up to 6 hours after the leech is detached from the patient, and effectively drains away blood that could otherwise accumulate and cause tissue death. Local anaesthetic – this numbs the area so much so that the patient feels hardly any pain, other than the initial bite. Often, people bitten by leeches in nature are unaware of it until afterwards when they notice a Y-shaped incision and a trickle of blood that is hard to stop. Vasodilator and prostaglandin – helps reduce swelling. The feeding process of a leech usually lasts about minutes where ml of blood is ingested and their body size may increase times their original size. Once the leech is full it will release itself and drop off. However, if leeches need to be removed by hand, their grip should first be loosened with heat, alcohol, or acid before pulling them off. Forcibly pulling them off may leave their jaws behind in the wound. Complications of hirudotherapy Possible complications of hirudotherapy include: Infection caused by bacteria and other microorganisms that the leech may carry and pass on – it is recommended that all patients who have leech therapy should receive broad-spectrum antibiotics to prevent leech-related infections, especially with *Aeromonas hydrophila*. Excess blood loss – it is necessary to monitor the amount of blood removed, since a drop in red blood cell counts can occur in rare cases of prolonged bleeding. Loss of leeches in body orifices and spaces. Allergic reactions such as pruritus itching, wheal formation and blisters. Foreign body reaction against leech jaw that can remain in tissue when leech forcibly removed. Necrosis with chronic progressive ulcer due to leech bite toxin or antigens in leech saliva. Contribute to Dermnet Did you find this page useful? We want to continue to deliver accurate dermatological information to health professionals and their patients – for free. Funding goes towards creating articles for DermNet, supporting researchers, and improving dermatological knowledge around the world. Donate now with credit card or Paypal References Book:

*Keep your jar with leeches in a cold, partly dark place, away from direct sunlight. During winter, they can be kept outdoors, partly-covering the jars with a towel, to protect from full sun-exposure. We do not advise you to feed your leeches during winter. Leech species can keep for 1 year without feeding.*

The saliva of leeches is a highly efficient and highly complex trait acquired over the course of the evolution of the species. When the leech bites its victim, the effect is a combination of at least 30 individual chemicals. However, only eight constituents of leech saliva have so far been characterized in terms of chemical structure and mechanism [ 2] see p. In some cases, the functional value of the compound e. Hirudin enables the blood to flow for some time without it clotting. This is the fundamental fact that makes the process possible at all. The main function of this protein is to induce secondary bleeding, which can last up to 12 hours. At first glance, you might wonder why the leech would need to produce a substance that makes the wound bleed for a relatively long time. Consequently, the leech has no direct benefits to gain from the prolonged blood flow. Nature normally does not allow itself the luxury of producing a protein for no apparent reason. The answer to this puzzle may be that the secondary bleeding is designed to attract other leeches, which would function as a means of preserving the population. However, water movement alone is a well-known signal that serves this purpose, so it still would not be necessary to produce a protein with the same function. The most likely answer is that the induction of prolonged bleeding is designed to help the host cleanse the wound and thus serves as a simple yet effective means of disinfection. It reduces the risk of infectious diseases and sepsis, which the prey could contract through infection, for example with the leech-borne bacterium *Aeromonas* see p. Leech saliva has other generally beneficial effects. Therefore, encounters between the leech and its victims within the ecological niche are not entirely coincidental because the victim is not unhappy about returning. This behavior establishes the basis for joint evolution characterized by species cooperation. After prehistoric times, Hirudinea entered the written history of medicine and has since passed through it in waves of popularity. The information in ancient writings does not always allow one to clearly identify which of roughly existing leech species was used. According to Arndt [ 1], 15 species are used for medicinal leech therapy. The natural leech supply was never seriously endangered before the 19th century, during which, however, entire leech populations were then devastated. In those days, leeches were returned to nearby ponds after use. There was no fear of transferring diseases through microorganisms since people did not know that microbes existed. However, other practices led to a drastic reduction in the domestic leech supply. One such practice was the unrestrained removal of leeches from their natural habitats in order to ship them by the ton, for example from Hamburg to France, America, Australia, and England. This seemed like a very promising business opportunity, but their idea came too late. In the age of Koch, Pasteur, and Virchow, leeching disappeared from the medical repertoire toward the end of the 19th century. The once endangered leech populations had a relatively long time to recover during the 20th century, but regained the justifiable attention of physicians in the second third of the century. Now that the mechanism of action of leeching was relatively well known, leeches were applied very selectively and usually in small numbers. This hiatus in the 20th century did not suffice for regeneration of European leech populations, because the required wetlands had meanwhile been lost through drainage or had otherwise become unfit for leech survival. A large portion of natural leech biotopes e. Furthermore, environmental toxins have made it even more difficult for these sensitive organisms to survive in Europe. The number of natural leech habitats existing in Europe today is very small indeed. Most leeches now used in Central Europe for medicinal purposes are imported mainly from Turkey and are seldom grown domestically. Because the active constituents in leech saliva are effective ingredients in ointments and other topical products, the Turkish leech populations are very tightly monitored because leeches are very much in demand, alive or dead. Several tons of leeches, both fresh and frozen, are imported to Europe each year. Conservationists had hoped that recombinant hirudin manufactured from genetically modified bacteria and yeasts would soon be able to reduce the pressure on leech populations, but this hope has yet to be fulfilled. Because of the variety of constituents and complex mechanisms of action of leech saliva, live leeches are more

effective than pure hirudin in a number of cases. The number of live leeches used in Germany alone is probably around 1 million each year. Assuming each leech weighs around 3 g, this equates to roughly 1. This may spark a new round of pressure on the species. Although the approval of leech therapy may be good news for humans, it is not so great for the leech—at least not yet. Ironically, the evolutionary feat of adapting to its prey ultimately resulted in more harm than good for the leech. Leeches are now being parasitized by humans. As mentioned above, the usefulness of the leech for humans is based on a survival strategy developed by the leech over the course of evolution. Considering that leeches have repeatedly been on the brink of extinction, it would be smart to develop new and efficient strategies to ensure their continued well-being for a change. For these reasons, *Hirudo medicinalis* was included in Appendix II of the Washington Endangered Species Act, which was designed to impose harvesting quotas and control leech trade. Under this agreement, it is mandatory for anyone buying or selling leeches to submit a CITES report form. In countries around the world, including Germany, wild animals and wild plants are being removed from their natural environments for trade and manufacturing purposes. Many animals around the world are currently endangered because they are being used as foodstuffs, traditional remedies, or live commodities. On the initiative of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety and the Federal Agency for Nature Conservation BfN, criteria specifying ways in which the use of wild fauna and flora can be conducted in harmony with Nature have now been proposed.

Chapter 5 : Leeches | DermNet New Zealand

*This hydro gel is specially formulated and designed for leech transportation and storage purposes. When you receive 50 grams of gel, this will turn into to a couple bucketfuls of plump and gelatinous hydrogel crystals, after the dry gel crystals have been dissolved fully in plain tap water.*

Morphology[ edit ] The general morphology of medicinal leeches follows that of most other leeches. The dorsal side also has a thin red stripe. These organisms have two suckers, one at each end, called the anterior and posterior suckers. The posterior is used mainly for leverage, whereas the anterior sucker, consisting of the jaw and teeth , is where the feeding takes place. Medicinal leeches have three jaws tripartite that look like little saws, and on them are about sharp teeth used to incise the host. The incision leaves a mark that is an inverted Y inside of a circle. After piercing the skin, they suck out blood whilst injecting anticoagulants hirudin and anaesthetics. Large adults can consume up to ten times their body weight in a single meal, with 5â€”15 ml being the average volume taken. Range and ecology[ edit ] Typical habitat with a large population of *Hirudo medicinalis*, in Germany Their range extends over almost the whole of Europe and into Asia as far as Kazakhstan and Uzbekistan. The preferred habitat for this species is muddy freshwater pools and ditches with plentiful weed growth in temperate climates. Over-exploitation by leech collectors in the 19th century has left only scattered populations, and reduction in natural habitat though drainage has also contributed to their decline. As a result, this species is now considered near threatened by the IUCN , and European medicinal leeches are legally protected through nearly all of their natural range. They are particularly sparsely distributed in France and Belgium , and in the UK there may be as few as 20 remaining isolated populations all widely scattered. The largest at Lydd is estimated to contain several thousand individuals; 12 of these areas have been designated Sites of Special Scientific Interest. There are small, transplanted populations in several countries outside their natural range, including the USA. Beneficial secretions[ edit ] Medicinal leeches have been found to secrete saliva containing about 60 different proteins. Several of these secreted proteins serve as anticoagulants such as hirudin , platelet aggregation inhibitors most notably apyrase , collagenase , and calin , vasodilators , and proteinase inhibitors. It describes 12 types of leeches 6 poisonous and 6 non-poisonous. Diseases where leech therapy was indicated include skin diseases, sciatica , and musculoskeletal pains. Earthenware jar for holding medicinal leeches In medieval and early modern medicine, the medicinal leech *Hirudo medicinalis* and its congeners *H.* The four humors of ancient medical philosophy were blood, phlegm , black bile , and yellow bile. Similarly, any person whose behavior was strident and sanguine was thought to be suffering from an excess of blood. Leeches were often gathered by leech collectors and were eventually farmed in large numbers. A recorded use of leeches in medicine was also found during B. The price of leeches varied between one penny and threepence halfpenny each. In leeches accounted for 4. The hospital maintained an aquarium for leeches until the s. Hirudin and related substances are synthesised using recombinant techniques. Devices called "mechanical leeches" that dispense heparin and perform the same function as medicinal leeches have been developed, but they are not yet commercially available.

**Chapter 6 : Liber Hirudo: The Book of the Leech von Oizus (Hardcover) â€™ Lulu DE**

*In this expanded and revised grimoire, one learns how to take command of a necropolis, form an army of spirits, invoke powers of undeath, and claim one's place as the Gravelord; the undisputed master of that death field. Var Von Brennos has also authored the widely popular vampiric grimoire, "Liber Hirudo: The Book of the Leech".*

Evolution[ edit ] The most ancient annelid group is the free-living polychaetes that evolved in the Cambrian period, being plentiful in the Burgess Shale about million years ago. Oligochaetes evolved from polychaetes and the leeches branched off from the oligochaetes. Both the oligochaetes and the leeches, having no hard parts, do not fossilise well. Anatomy and physiology[ edit ] Leech anatomy in cross-section: The number and position of eyes are essential for distinguishing the leech species. Leeches show a remarkable similarity to each other in morphology, very different from typical annelids which are basically cylindrical, with a fluid-filled space, the coelom body cavity. In leeches, the coelom is reduced to four slender longitudinal channels, and the interior of the body is filled with a solid dermis in between the various organs. Typically, the body is dorso-ventrally flattened and tapers at both ends. Longitudinal and circular muscles in the body wall are supplemented by diagonal muscles, giving the leech the ability to adopt a large range of body shapes and show great flexibility. Most leeches have a sucker at both the anterior front and posterior back ends, but some primitive leeches have a single sucker at the back. The following 21 mid-body segments each contain a nerve ganglion , and between them contain two reproductive organs, a single female gonopore and nine pairs of testes. There are also dorso-ventral muscles. The coelomic channels run the full length of the body, the two main ones being on either side. The coelom has taken over the function of the hemal system blood vessels in other annelids. Part of the lining epithelium consists of chloragogen cells which are used for the storage of nutrients and in excretion. There are ten to seventeen pairs of metanephridia excretory organs in the mid-region of the leech. From these, ducts typically lead to a urinary bladder , which empties to the outside at a nephridiopore. Leech embryogenesis Leeches are protandric hermaphrodites, with the male reproductive organs , the testes , maturing first and the ovaries later. In hirudinids, a pair will line up with the clitellar regions in contact, with the anterior end of one leech pointing towards the posterior end of the other; this results in the male gonopore of one leech being in contact with the female gonopore of the other. The penis passes a spermatophore into the female gonopore and sperm is transferred, and probably stored in, the vagina. The leeches intertwine and grasp each other with their suckers. A spermatophore is pushed by one through the integument of the other, usually into the clitellar region. The sperm is liberated and passes to the ovisacs, either through the coelomic channels or interstitially through specialist "target tissue" pathways. In most species, an albumin-filled cocoon is secreted by the clitellum and receives one or more eggs as it passes over the female gonopore. The cocoon is fixed to a submerged object, or in the case of terrestrial leeches, deposited under a stone or buried in damp soil. The cocoon of *Hemibdella soleae* is attached to a suitable fish host , [15] and that of a branchiobdellid, to the shell of a crayfish on which the young will become ectosymbionts. Here they produce their cocoons, after which the adults of most species die. When the eggs hatch, the juveniles seek out potential hosts when these approach the shore. Leeches either have a protusible pharynx, commonly called a proboscis, or a non-protusible pharynx which may or may not be armed with jaws. In feeding these slice their way through the skin of the host, leaving a Y-shaped incision. Behind the blades is the mouth, located ventrally at the anterior end of the body. It leads successively into the pharynx , a short oesophagus, a crop in some species , a stomach and a hindgut, which ends at an anus located just above the posterior sucker. The stomach may be a simple tube, but the crop, when present, is an enlarged part of the midgut with a number of pairs of ceca that stores ingested blood. The leech secretes an anticoagulant, hirudin , in its saliva which prevents the blood from clotting before ingestion. Such leeches are often ambush predators that lie in wait till they can strike prey with the proboscises in a spear-like fashion. The prey is usually sucked in and swallowed whole. Some Rhynchobdellida, however, suck the soft tissues from their prey, making them intermediate between predators and blood-suckers. In general, sanguivorous leeches are non host-specific, and do little harm to their host, dropping off after consuming a blood meal. Some marine species, however, remain

attached until it is time to reproduce. If present in great numbers on a host, these can be debilitating, and in extreme cases, cause death. In *Hirudo medicinalis*, these supplementary factors are produced by an obligatory symbiotic relationship with two bacterial species, *Aeromonas veronii* and a still-uncharacterised *Rikenella* species. Nonbloodsucking leeches, such as *Erpobdella punctata*, are host to three bacterial symbionts, *Pseudomonas*, *Aeromonas*, and *Klebsiella* spp. The bacteria are passed from parent to offspring in the cocoon as it is formed. The main nerve centre consists of the cerebral ganglion above the gut and another ganglion beneath it, with connecting nerves forming a ring around the pharynx a little way behind the mouth. A nerve cord runs backwards from this in the ventral coelomic channel, with 21 pairs of ganglia in segments 6 to 33, other paired ganglia fuse to form the caudal ganglion. There are also sensory papillae arranged in a lateral row in one annulation of each segment. Each papilla contains many sensory cells. Some rhynchobdellids have the ability to change colour dramatically by moving pigment in chromatophore cells; this process is under the control of the nervous system but its function is unclear as the change in hue seems unrelated to the colour of the surroundings. Species that feed on warm-blooded hosts move towards warmer objects. Many leeches avoid light, though some blood feeders move towards light when they are ready to feed, presumably increasing the chances of finding a host. The exception to this is in the Piscicolidae, where branching or leaf-like lateral outgrowths from the body wall form gills. The posterior end is attached to the substrate, and the anterior end is projected forward peristaltically by the circular muscles until it touches down, as far as it can reach, and the anterior end is attached. Then the posterior end is released, pulled forward by the longitudinal muscles, and reattached; then the anterior end is released, and the cycle repeats. Symptoms of these reactions include red blotches or an itchy rash over the body, swelling around the lips or eyes, a feeling of faintness or dizziness, and difficulty in breathing. These cause the leech to detach quickly, but also to regurgitate its stomach contents into the wound, with a risk of infection. Nevertheless, only a few cases of leeches transmitting pathogens to humans have been reported. They are used by the leeches in modulating their own immunocytes and not for anesthetizing bite areas on their hosts. Hirudotherapy The leech appears in Proverbs Ayurvedic texts describe their use for bloodletting in ancient India. In ancient Greece, bloodletting was practised according to the theory of humours found in the Hippocratic Corpus of the fifth century BC, which maintained that health depended on a balance of the four humours, blood, phlegm, and black and yellow bile. Bloodletting using leeches enabled physicians to restore balance if blood was present in excess. By 1900, British hospitals had switched to imported leeches, some seven million being imported to hospitals in London that year. Retrieved 9 July Euhirudinea, their phylogeny and the evolution of life-history strategies".

#### Chapter 7 : European medicinal leech | annelid | www.nxgvision.com

*Hirudo medicinalis*, the European medicinal leech, is one of several species of leeches used as "medicinal leeches". Other species of *Hirudo* sometimes also used as medicinal leeches include *H. orientalis*, *H. troctina*, and *H. verbana*. The Mexican medical leech is *Hirudinaria manillensis*, and the North American medical leech is *Macrobdella decora*.

#### Chapter 8 : Leech collector - Wikipedia

The best-known, such as the medicinal leech, *Hirudo medicinalis*, are hematophagous, attaching themselves to a host with a sucker and feeding on blood, having first secreted the peptide hirudin to prevent the blood from clotting. A minority of leech species are predatory, mostly preying on small invertebrates.

#### Chapter 9 : Liber Hirudo: The Book of the Leech by Oizus | LibraryThing

Hello brethren Well Like I said before I've practiced with Michael W ford's Vampyre rituals, as well as a book called Liber Hirudo:Book of the leech, Very good book but not for the faint of heart very horrific rituals that involve some very draining rituals this shit is hardcore vampyrism even stuff on how to survive consciousness after death.