

HOBO SPIDER NATURAL HISTORY

The hobo spider, *Tegenaria agrestis*, is a member of the family of spiders known as the Agelenidae or funnel web weavers. Approximately 500 species of funnel web weavers occur worldwide; about 300 of these are found in North America, and about 100 species are native to Europe. Funnel web weavers are characterized by their ability to move rapidly, and by their layered, flat web (see photo below) which has a funnel-like lair at the rear in which the spider resides and waits for prey. The web is not sticky like that of many spiders, but rather is a trip web, which traps insect prey that is unable to navigate on the surface.



The genus *Tegenaria* contains those spiders which are commonly known as European house spiders, although not all are European, and some do not live in houses; about 90 species are recognized. Some species of European *Tegenaria* have extended their range far beyond the European continent: The domestic or lesser house spider, *Tegenaria domestica*, is now cosmopolitan, and is common in and around human habitations in many areas of the world. In the United States the giant house spider, *Tegenaria gigantea*, is now found in the Pacific Northwest, and *Tegenaria pagana* is now established in some southern and western states.

Tegenaria agrestis, the hobo spider, was first described in 1802 by naturalist C.A. Walkenaer, in the Paris based journal *Faune Parisienne*, (vol. 2, pp. 187), under the name *Aranea agrestis*, which translates spider of the field. This reference to the field was accurate for the species in its indigenous range (western Europe), where the spider lives in fields, woods and rock quarries. While in Europe the hobo spider is occasionally found in greenhouses, it is largely divorced from the human population on that continent.

The hobo spider was first reported in the U.S. in 1936 by arachnologist Harriet Exline (as *Tegenaria magnacava*), who published her findings in the journal *Psyche*, vol. 43(1), pp. 21-26. In the United States, the introduced hobo spider did not seek the same type of habitat favored

by its European counterpart: Rather, it became established around human habitations, and is now commonly found around the foundations of houses, and beneath rocks, wood, and ornaments in yards. Recently, U.S. specimens of hobo spider have been found in rural areas, including some heavily farmed areas; this trend may continue, placing some U.S. populations of this spider in habitats similar to those that it occupies in Europe. It is unlikely that this trend will affect populations in urban areas. Urban populations of hobo spider do appear to be decreasing in some areas, such as Seattle, Washington, where the giant house spider, *Tegenaria gigantea*, has become abundant.

The life cycle of the hobo spider in the United States has not been conclusively established, as controlled laboratory studies on this topic have not been reported. Some arachnologists believe that west coast populations are annuals, completing the entire life cycle in one year. Inland populations were originally reported in the literature to undergo a two year life cycle; however, three distinct stages (small juveniles, medium sized immatures, and adults) can be found during the late summer and early fall in inland areas, suggesting that inland populations may actually have a life cycle of three years. The eggs of the hobo are deposited in one to four egg cases

(see photo) in late September and October. These egg cases are composed of several layers of silk, intermingled with layers of soil and debris. The egg cases are usually attached to the undersides of rocks, wood, or other items found in yards, gardens and vacant lots; each egg case may contain 100 or more eggs. Contrary to some references hobo spiders are not prone to construct egg cases inside living quarters (though they have been found in crawlspaces). The eggs hatch in early to mid-



June: The spiderlings emerge, feed, and largely remain beneath the surface during their first season, molting their exoskeleton periodically as they grow. The juvenile spiders then overwinter, and are sometimes found indoors during this period. Assuming the two year scenario, the spiders emerge as adults in late July to early August of the second year. The females build webs and remain stationary, but the males began nocturnal wanderings in search of mates. It is at this juncture that males enter houses (often in large numbers) from outside habitat and from garages and crawl spaces; thus, they come into contact with humans; most bites occur during this time period. The hobo spider season peaks during the first week or two of September in most areas. After mating the males began to die, and are absent by the first week of October. The females construct the egg cases, and most remain in the web until they die, usually expiring by mid-November: Some adult females do enter houses in late September, October, and November.

The behavioral aspects of the hobo spider have been a subject of controversy in the past, primarily due to the publicized myth of the "aggressive house spider". While the hobo will bite when pressed against skin or tormented, it is no more "aggressive" than other wandering spiders; it does not bite without clear provocation, and certainly does not track people down and attack them, as some people have come to believe. The quick movements of this spider, and the fact that they sometimes run toward individuals when disturbed have fueled such myths, but the idea that such spiders are "attacking" is a misinterpretation. In actuality, these spiders have very poor vision and cannot distinguish objects more than a foot or two away. When disturbed inside a house, particularly when a light has just been turned on, the spiders most often remain

stationary. When such spiders finally sense potential danger, they run, sometimes toward a person that they really can't see. Hobo spiders are not good climbers, and are usually found at ground or basement level. They sometimes climb up to a level of about four feet if the surface of the wall, etc. is sufficiently porous. Hobo spiders found in wash basins and bathtubs arrived there by falling down the slick porcelain surface; they did not come up through the drain.

Physically, the adult hobo spider is a moderately large (12-18 mm body length) brown spider, with long, unmarked legs (legs included, a typical specimen would fit nicely on a silver dollar). The dorsal abdomen exhibits a "herringbone" or multiple chevron pattern, which may be quite obscure in darker individuals. The male (see photo) sports two pedipalps (antennae like protuberances) between the two front legs, which are swollen at the ends, looking somewhat like a pair of boxing gloves; these "boxing gloves" are actually the male genitalia, not "fangs" or "poison sacs". The female (see photo) generally has a larger abdomen than the male, and does not have swollen "boxing gloves" at the ends of the pedipalps. Several other spiders resemble hobo spiders; only an arachnologist, or other specifically trained person should attempt to make a positive identification of this species: In an instance where a spider has bitten a person, it is imperative to obtain positive identification only from a qualified professional arachnologist.



Male Hobo



Female Hobo

HOBO SPIDER POISONING (TEGENARISM)

Spider venom poisoning constitutes a disease state characterized by a set of signs (observable physical or objective evidence of disease) and symptoms (complaints that the bite victim relays to the physician, etc.), which lead to the diagnosis of spider envenomation. Traditionally,

disease states induced by spider bite have been assigned specific names, according to the genus of spider which causes the poisoning. For example, poisoning by the widow spiders (genus *Latrodectus*) is termed latrodectism, while poisoning by the recluse spiders (genus *Loxosceles*) is known as loxoscelism; thus, poisoning caused by the hobo spider, *Tegenaria agrestis*, may be properly termed tegenarism. While not all species in any given spider genus may induce significant poisoning, and while signs and symptoms may differ from species to species in a genus, this nomenclature has proven useful in categorizing different types of spider envenomation.

Hobo spider poisoning (tegenarism) does not invariably develop following a bite by a hobo spider. A large percentage (perhaps 50% or more) of defensive bites by the hobo are "dry", and no venom is injected when the spider bites. Hobo spiders, like many other venomous creatures, are more likely to incorporate venom in a food getting bite than in a defensive bite. Typically, defensive bites by the hobo spider are lightning fast, the spider opening its scissor-like fangs, closing them together into the tissue of the victim, and then withdrawing rapidly. Very often the bite itself is painless, although this varies depending upon the circumstance and location of the bite, and upon the psychological state of the victim. Most spider bites are single, not in rows or patches like those of some parasitic arthropods; multiple bites do occasionally occur, such as when the spider is trapped between skin and clothing, and cannot escape.

When envenomation does occur from the bite of a hobo spider, local and/or systemic manifestations may appear. The severity of these phenomena are dependent to a degree on the age and sex of the biting spider: In laboratory experiments the venom of the male hobo spider produces more severe effects than that of the female, and evidence exists suggesting that the venom of subadults may be more toxic than that of adults. The local effects, which appear following most hobo spider envenomations, represent a type of necrotic arachnidism, which is almost identical to the local effects produced by brown recluse spider, *Loxosceles reclusa*, poisoning. Typically, immediately following envenomation, a large (several cm.) area of redness (erythema) forms around the bite site: This usually disappears within a few hours, leaving a small reddish induration (hardened area), which is not dissimilar to the classical "mosquito bite". Within 24 to 48 hours blistering may occur at the bite site. Within an additional 24 hours these blisters may rupture, leaving an open ulceration. Within a few days of ulceration, if left uncovered, eschar or "scab" formation begins to develop over the lesion, and by three weeks post-bite this becomes pronounced, giving the lesion a "target and bulls-eye" appearance. Following this, the "scab" is sloughed and the lesion generally heals, leaving a scar, within 45 days of the original bite. In some instances, particularly when the bite is delivered in an area of fatty tissue, such local lesions may become deep and extensive, and may not heal for two to three years, as exemplified in the photo below.

Other long-term physical effects, such as intractable burning pain, damage to blood vessel valves, and cyst formation occasionally occur in conjunction with local lesion development. The lesion that results is sometimes oblong or multiple, resulting not from more than one spider bite, but rather from gravitational drift, which moves venom components downward, away from the bite site. The process which causes the local phenomenon of necrotic arachnidism involves circulatory disturbances which result in ischemia, or lack of adequate blood flow in the affected tissues. Following venom injection, rapid coagulation of blood occurs in the smaller blood vessels of these tissues. This produces a centralized area, which does not receive enough blood, and the area literally dies as a result of oxygen starvation.

Systemic, or generalized effects are seen in about 45% of persons envenomated by hobo spiders. The most common reported symptom is severe headache, which usually does not respond to over the counter analgesics (aspirin, which can prolong bleeding time, should not be used for hobo spider bite induced headaches). In addition to this, victims may experience a dry

mouth, nausea, weakness and lethargy, dizziness, visual disturbances, hallucinations, joint pain and/or other undesirable effects. As with many types of complex poisoning, most victims of systemic tegeranism do not experience all of these phenomenon, but that is dependent upon the severity of the poisoning. About 15% of envenomated subjects are poisoned severely enough to require hospitalization: In rare cases aplastic anemia (bone marrow failure) can develop several weeks after the bite, which results in a fatal outcome. Another rare but dangerous condition that has been seen following hobo spider envenomation is the development of severe intractable vomiting accompanied by secretory diarrhea.

Some cardinal rules apply to persons that have been bitten by, or think that they have been bitten by a venomous spider. Above all, if you are bitten by any spider, and actually catch the spider in the act, always capture the spider for identification by a qualified arachnologist. Never discard a spider that has definitely bitten a human. In the case of the hobo spider, not only is positive species identification important, but so is a determination of the spiders sex and age; these factors can help predict the severity of potential poisoning, and assist the attending physician in charting a course of treatment. Preserve the spider (or whatever parts of it remain) and take it to the clinic with you. If you suspect that you have been bitten by a dangerously venomous spider, see a physician. Most suspected spider bites in the United States turn out to be other conditions. The vast majority of spiders are harmless and beneficial.

FOR PHYSICIANS AND OTHER HEALTH CARE PROFESSIONALS

The accurate diagnosis and treatment of tegeranism (hobo spider poisoning) presents a relatively new challenge to physicians and other health care workers in the northwestern United States and southwestern Canada. Necrotic arachnidism was virtually unknown in these regions until the late 1960s, but now has become commonplace. In 1994 a disproportionate number of spider bites (10.9% of the national total) were reported to poison control centers in Idaho, Oregon and Washington, states which comprise only 4% of the U.S. population. With the rapid spread of the hobo spider, and its increasing contact with humans in its North American range, this trend is expected to continue. It is important therefore, that clinicians become familiar with tegeranism, and adopt appropriate protocols for dealing with bites.

Spider bites are placed into three separate categories; possible, probable, and proven. Possible spider bite applies to those cases in which the physician feels could be a bite by a spider, but which lack sufficient clinical or circumstantial evidence to support a firm diagnosis. Probable spider bite applies to those cases in which the clinical and/or circumstantial evidence support the likelihood of spider bite, but the biting spider was not recovered and positively identified. Proven spider bite applies to those cases in which the clinical and circumstantial evidence support the diagnosis of spider bite, and the biting spider was captured and positively identified. Approximately 80% of suspected spider bites seen in U.S. clinics turn out to be the result of other causes in the final diagnosis. Conversely, a large number of spider bites are misdiagnosed when first evaluated.

Upon admission to the clinic or emergency room, the first diagnostic consideration (when presented with possible or probable spider bites) should be to rule out or confirm other possible causes. Delayed type hypersensitivity (DTH) and immediate type hypersensitivity (ITH) reactions to the bites of parasitic arthropods are the lesions most commonly mistaken for "spider bite". These two types of reactions may closely resemble the very early stages of necrotic spider bite lesions (the DTH reaction may occasionally exhibit very limited centralized necrosis), but neither will produce deep, persistent dermal necrosis. Suspect "spider bites" that appear in rows or patches are almost always bites by parasitic arthropods, which often bite and feed at one

site, then move a centimeter or two and bite again. Spider bites are usually single, unless the biting spider was caught between tissue and clothing and could not escape.

Mycoinfections, particularly tinea corporis, are another common differential diagnosis of spider bite in the northwestern United States. Bacterial infections of staphylococcal origin, particularly bacterial cellulitis and impetigo may exhibit both erythematous swelling and/or open cutaneous ulcers which resemble stages of necrotic arachnidism. Cat scratch disease has also been implicated in an occasional "spider bite" case. Clostridium perfringens has been the actual causative agent of some severe local reactions blamed on spider bite. In the northwestern United States, particularly in desert regions, tularemia may be confused with spider bite: Tularemia may produce both systemic manifestations and a local lesion which very closely resemble severe tegeranism. Tularemia should be suspected in any possible or probable "spider bite" case which exhibits pneumonia in conjunction with a local ulcerative lesion and systemic illness. Whenever possible, samples of lesion exudate should be obtained and cultured for bacterial growth: Spider bite lesions are generally sterile, and only occasionally develop secondary infection. Any "spider bite" that responds to antibiotic therapy is probably not a spider bite.

Viral infections with cutaneous manifestations may also be considered a differential diagnosis for suspected spider bite. Herpes zoster has been the actual causative agent in a number of suspected "spider bite" cases in the United States. Lyme disease should be considered as a possible differential diagnosis in areas where either the deer tick, Ixodes dammini, or the western black-footed tick, Ixodes pacificus, occur. Other possible differential diagnoses of "spider bite" include erythema (chronica migrans, multiforme and nodosum), scalded skin syndrome, and Stevens-Johnson syndrome. At least a dozen other disease states which produce cutaneous manifestations have been implicated in "spider bite" cases. Probable necrotic spider bite cases which occur outside of the known ranges of the brown recluse or the hobo spider are best diagnosed as probable necrotic arachnidism, rather than applying the name of a suspected biter.

In proven cases, where the patient actually brings the biting spider (or its remains) to the clinic, it is important to seek a positive identification of the specimen at once. While a tentative identification can be made at the clinic, positive identification, as well as age and sex determination by a qualified arachnologist is important; all of these factors can effect the severity and course of a hobo spider envenomation. In the northwestern United States, spiders can be positively identified by

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Spiders submitted for positive identification should always be accompanied with basic collection information, including the date, the exact location (street address, etc.), the name of the collector(s) and any other information about the spider that is available. Questions directed to Rod Crawford should concern spiders and/or spider identification, not questions regarding bites or envenomation.

Once the diagnosis of proven or probable hobo spider bite is established, a determination can be made as to the severity of the case, and treatment protocols can be implemented. Most patients will present exhibiting local effects only, and can be treated as outpatients. Tetanus prophylaxis is indicated, and the patient should be advised to clean the wound frequently, and (if on an extremity) to keep it immobilized and rested. Diphenhydramine (Benadryl) may be prescribed to help control itching. Prophylactic antibiotic therapy is not warranted, and antibiotics should be used as needed only to control secondary infection. Laboratory studies, including a CBC with platelets, Hb, Hct, BUN, creatinine and urinalysis are advisable in all cases of tegegarism. The patient should be scheduled with a followup visit, and should be told to watch the lesion closely for signs of darkening, etc. It is good practice to inform the patient of the typical healing time-table (see Hobo Spider Poisoning): It is also good to inform the patient (at each visit) that lesions of necrotic spider bite are often difficult to predict, and can sometimes get progressively worse.

Subjects that are bitten in areas which contain large amounts of adipose tissue, particularly if the victim is obese, are at high risk for the development of deep, slow healing lesions. In such cases excisional therapy is not indicated, and may exacerbate the condition of the lesion. While natural healing by slow granulation is preferred, split thickness skin grafts may be considered after the necrotizing process is completed (8 weeks); The initial graft attempt is usually not successful.

Patients exhibiting systemic effects of tegegarism should have the above mentioned laboratory screen performed immediately. If evidence of any significant abnormalities (except a moderate leukocytosis) are discovered, the patient should be given a regimen of a prednisolone based corticosteroid, and should be hospitalized. Typically, a tapered dose starting with the equivalent of 4 mg of Decadron is recommended. Some physicians experienced with tegegarism prefer to administer corticosteroids whether or not systemic effects are present; considering the insidious nature of some effects of hobo spider poisoning, this practice may have merit. Antianxiety medications such as hydroxyzine (Atarax) have proven beneficial to systemically poisoned hobo spider bite victims, and may provide some comfort to nervous or emotionally upset victims of any necrotic spider bite.

Tegegarism is a relatively new disease state and much is yet to be learned from it. An excellent clinical reference on necrotic arachnidism (published largely on the bite of the brown recluse spider, before the hobo entered the scene), is Wasserman, G.S. and Anderson, P.C. (1983-84): Loxoscelism and necrotic arachnidism. *J. Toxicol.-Clin. Toxicol.*, 21(4 &5), pp. 451-472. Physicians that have treated hobo spider bite cases are encouraged to publish case histories and observations on this topic.

BITE PREVENTION AND CONTROL

Preventing bites by hobo spiders in high risk situations calls for simple, common sense measures. When working in enclosed infested areas, particularly in such places as the crawl spaces beneath mobile homes, wear protective clothing, including long sleeves tucked into gloves, long pants tucked into boots, and coveralls or a jacket with a hood. Rubber bands over pant legs and sleeves will minimize the possibility of a spider running up an arm or leg in a confined situation. Wear gloves when working outdoors in potential habitats such as rock gardens, and when moving wood. Keep bare hands out of places that you cannot see, and do not use bare hands to turn over possible hiding places: Many bites by snakes and spiders occur when the victim uses bare fingers to turn over wood or other objects that conceal the hidden organism.

Indoors, shake clothing out that has been stored or laid down in spider inhabited dwellings. Exercise caution when moving boxes or other objects that have been stored in basements, cellars or greenhouses within the range of the hobo spider. A significant number of hobo spider bites occur in bed, when the sleeping person inadvertently rolls over or places a limb on the arachnid. In many instances this could be prevented by eliminating the spiders' means of getting in or onto the bed. Hobo spiders usually get onto beds by climbing bedspreads or other linen which touches, or is very close to the floor; they are not proficient at scaling slick surfaces, such as polished wood or metal bedposts. Keeping the sides and the front of bedspreads at least eight inches above the floor, and keeping beds at least eight inches from walls with porous surfaces, will minimize the possibility of acquiring an unwelcome eight-legged bed partner.

Measures aimed at controlling hobo spider populations should start by eliminating suitable habitat around infested areas. In the late summer and early fall these spiders (particularly females) and their webs can be found beneath rocks, wood, lawn ornaments and debris; hobo spiders inhabit the undersides of objects such as this, and require a small amount of space between the soil and the bottom of the object chosen as a web site. When placing decorative objects in gardens or lawns, firmly anchoring the base of these items into the soil (leaving no space between the soil and the objects' base) will prevent spiders from nesting there. The undersides of decorative railroad ties are a favorite micro-habitat of hobo spiders; anchor the base of ties firmly into the ground, and use caulking or other sealant to close off cracks between stacked ties.

The hobo is a spider which often enters living quarters when searching for mates, etc. Keeping hobo spiders out of houses in heavily infested areas is a challenge. In such areas one should inspect the foundation of dwellings and seal off potential entry-ways such as deep cracks in concrete, spaces beneath doors, loose fitting panels in window wells, etc. Screening off dryer vents from the outside is also recommended. Dealing with hobo spiders inside of dwellings should include routine household cleaning, making certain to thoroughly vacuum in corners and closets, behind furniture, and underneath beds.

Spider Traps - Eagle Rock Research is not recommending specific brands of Glue Traps at this time. Previous experience has shown that traps baited with attractant are most effective. This attractant appears as a blue dash in the sticky center of the trap surface and may not work well if the traps are old or have been stored in hot conditions.

Chemical control of hobo spiders, indoors or out, should be considered only in situations where large infestations are present and other measures have failed. Due to the mobile nature of this species, it is virtually impossible to completely eradicate hobo spider populations. While pesticide use to control the hobo may sound very easy and appealing, very rarely does it yield long term results, regardless of the technique or the chemical agent(s) used. Pesticide use during the active season for adults (late July through October) is the least effective: The application of pesticides outside (along foundations and beneath low shrubbery) in late June (when the spiders are not abundant on the surface) will kill both recently hatched juveniles and soon to emerge adults. The single most effective deterrent against the hobo spider is the presence of competing spider species; if such competing species are eliminated by indiscriminate spraying, the reinfestation of the hobo spider is virtually guaranteed.

When using pesticides on your own, always read and follow labeled directions, and make sure that the product is rated for the specific type of area (indoors or out) that you intend to spray, etc.: apply such materials only in low areas where hobo spiders are likely to be found. For indoor applications chlorpyrifos (Dursban), propoxur (Baygon), bendiocarb, and diazinon have been suggested by various authors for potential use against hobo spiders. The use of aerosol bombs or foggers can help reduce populations in crawl spaces or other enclosed areas, but it is usually necessary to fog both such spaces and any adjoining units. In several instances where aerosol bombs have been applied in basements or crawl spaces alone, the hobo has simply moved upstairs, directly into the living quarters. For outdoor applications chlorpyrifos, diazinon, or malathion can be applied around foundations, window wells, outbuildings, etc. Once again, the application of pesticides much above ground level is not recommended in attempting to control hobo spiders. In circumstances where severe infestations pose a real or perceived threat, it is best to retain the services of a licensed professional pest control operator to handle the problem.