

European Araneism

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Araneism or araneidism, a term introduced by the Argentinians Sommer and Greco (22), means the envenomation introduced by the spider bite. This is the most accurate term for this condition, although in some countries, e.g. U.S.A., the term arachnidism is commonly used, not even to describe the disease caused by spider bites in general, but restricted to the effects of the bite of *Latrodectus* alone. On the other hand, "arachnidism" can mean the envenomation resulting from the bite of any member of the Arachnida.

In Europe by far the most venomous spider is *Latrodectus mactans tredecimguttatus* (Rossi), then to a much lesser extent *Chiracanthium punctorium* (Villers) and *Lycosa tarentula* (Linn.), but some other European spiders of minor toxicity have been described.

The black widow, *L. mactans tredecimguttatus*, lives in southern and south-eastern Europe, e.g. Portugal, Spain, France, Italy, Yugoslavia, Greece, Bulgaria, Roumania and southern parts of Russia, but also further north in Brittany and allegedly in Poland and Hungary (2, 11, 20, 24). Benoit (1) has described finding imported *L. mactans mactans* (Fabricius) and *L. geometricus* C. L. Koch, and even naturalization of the former, as far north as Belgium. *Latrodectus* species have never been found in Britain although E. Duffey (pers. com.) reported two instances of people at an American base in eastern England, who suffered bites in the upper thighs and buttocks and which produced *Latrodectus*-type symptoms. Although spiders were suspected the only specimens obtained from the patients' homes were immature *Tegenaria* sp. *L. m. tredecimguttatus* is also found in African and Asian parts of the Mediterranean (9, 14). Unlike latrodecism caused by some species and subspecies in America and other continents, in Europe it is of rural occurrence as has been confirmed by many authors (2, 9, 11). *L. m. tredecimguttatus* is found in buildings only in Israel according to Leffkowitz *et al.* (10). In Istria, Yugoslavia, the rural character of latro-

decism is very evident; out of 133 of my patients, 60 (45%) were bitten during harvesting and threshing, and the remainder during other work in the fields. As many as 22.6% of the patients were bitten on the same site, i.e. on the lower part of the left forearm. This is the site which rests upon the ears while harvesting or binding the sheaves. Other parts of the body which are often exposed to the bite are the chest and back while carrying sacks of wheat or hay. With mechanisation of agriculture, of course, the incidence of *Latrodectus* bites greatly decreases (11).

The bite itself is slight, followed by an almost insignificant local reaction, but within ten minutes or so the "early pain" appears in the regional lymphatic nodes, which become swollen. The pain increases in intensity and the patient then experiences "tightening" in the small of the back, belly and chest, with a feeling of oppression and fear of death. The insupportable pains are the main symptom of latrodecism. All secretions may be increased, profuse sweating being followed by watering of the eyes and nose, and increased salivation. The blood pressure may show a significant increase of convergent type. The patient may have difficulty in breathing and may also be unable to speak. Characteristic is the "facies latrodecismica" (Fig. 1), a sweat-covered, congested face with severe blepharoconjunctivitis and spasm of the jaw muscles which distorts the face into a painful grimace, which sometimes makes a spot diagnosis easy for anyone who has encountered the condition before (11). Especially important is the muscle rigidity which, in the belly, produces a hard, board-like abdominal wall which may be erroneously diagnosed as peritonitis due, perhaps, to a perforated appendix or ulcer. Consequently, an unnecessary operation may be performed; indeed, such cases have already been described (3). The function of the bladder or kidneys may be impaired, causing the urine output to fall or even cease, and loss of appetite, decrease of body weight and sleeplessness may also occur. Sometimes, after a few days, a generalized or localized polymorph rash may appear (Fig. 2). Laboratory investigations may reveal albumin in the urine, sometimes with red blood cells and granular casts in the sediment. The blood may show changes in the white cells (leukocytosis; neutrophilia with eosinolymphopenia) and the blood sugar and blood urea may both show a transient increase.

With regard to the treatment of latrodectism, over a hundred drugs have been tried, according to the literature (4, 11). Bogen (4) states that this fact is proof of their ineffectiveness. The treatment of choice, which should be used especially in young, old or diseased patients, is the combination of calcium and antitoxin. Calcium should be given immediately intravenously, whereupon the pains of latrodectism disappear, with the patient experiencing a feeling of warmth spreading all through the body. However, the pains soon return if the antivenin is not given intravenously, and later intramuscularly, immediately after the calcium – with all the prescribed precautions in case of hypersensitivity to the antitoxin. By the time that the effect of the calcium is wearing off, the antivenin is starting to work. The rapid relief from severe latrodectism is quite dramatic and takes only the short time necessary to prepare the syringes for injection (18). Healthy individuals between the ages of 16 and 60 years may be successfully treated with relaxants such as methocarbamol (Robaxin) (19).

Chiracanthium punctorium lives in southern and mid-Europe, having been found in Yugoslavia, Italy, Switzerland, Germany and Russia, and allegedly also in the Netherlands and Belgium (7, 12, 23, 24). This spider lives both out of doors and inside buildings. Every winter the author has the opportunity to observe hibernating colonies of subadult specimens inside a cabin which is surrounded by vegetation and located near the sea-shore. Some of my patients have been bitten while working in the fields, while others have been bitten indoors, especially when putting on cast-off clothes or footwear into which the spiders had crept. The consequence of the bite is severe local pain, swelling and redness, with a small area of necrosis at the site of the bite. The regional lymph nodes may also become enlarged and tender. The overall state of the patient may be affected with a moderate temperature, chest discomfort and general malaise. Another European species of *Chiracanthium*, namely *C. mildei* L. Koch, has been described as a possible cause of necrotizing skin lesions in the United States (23). The treatment of chiracanthism is symptomatic, i.e. the local application of Burow's lotion (an astringent, aluminium acetate solution) and analgesics if necessary.

The more famous than venomous *Lycosa* (*Hogna*)

tarentula (= *Tarentula apuliae*) may cause necroses by its bite, but the effects depend upon various factors such as site of the bite, thickness of the skin, or sensitivity of the individual. Vellard's experiments with the venom of South American lycosids (24), which were later confirmed by Maretić with the venom of the European *Lycosa tarentula* (16) showed that in order to produce necrosis it is important that the venom arrives intradermally, from where it can be absorbed only very slowly, thus having time to manifest its cytotoxic effect. However, the bites of *Lycosa tarentula* are very rare; it is a spider which spends its life in burrows, only venturing out for hunting prey. It can only inflict bites on humans by chance during agricultural work or similar activity.

In the Middle Ages and later in Italy, and even up until the 18th century in Spain, groups of people were affected by a kind of choreomania, known as "tarantism". These people, the "Tarantati", believed, or pretended to believe, that they were bitten by the tarentula and that the only treatment for it was a long and exhausting dance, sometimes performed by masses of Tarantati with exhilarating music which has remained preserved today in the popular dance "Tarantella" (8, 24). One can still find remnants of tarantism in some remote parts of Puglia, Sardinia and Spain, where it remains, as in ancient times, the treatment for neurotics of all kinds. But although tarantism in its manifestations was mainly an expression of mass hysteria, it is probable that the model for it was the consequences of spider bite, but of *Latrodectus* rather than of *Tarentula*, as has been discussed in earlier papers (11, 16).

In 1962, another theridiid spider was found to be toxic to mammals, namely *Steatoda paykulliana* (Walck.) (17). This species is similar in appearance to *Latrodectus*, but it is smaller, and while its web has the typical irregular shape, the cocoons of cotton-like appearance are smaller and rose-coloured. It is found in a similar biotope to *Latrodectus*, i.e. in fields, in crevices along the boards of trenches, but also inside buildings. The author had the opportunity to observe subadult specimens hibernating inside the previously mentioned cabin.

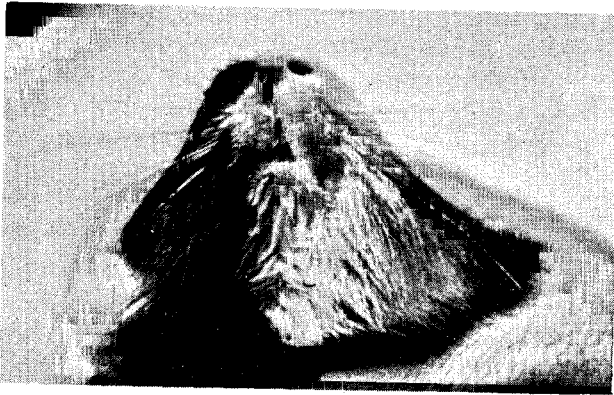
Human cases of steatodism have not been recorded, probably because the spider is a timid creature which has little opportunity to come into contact with man. However, experiments with guinea-



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2



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- Fig. 1. "Facies latrodectismica". One can see the painful expression on the face, and the blepharoconjunctivitis with heavy swollen eyelids.
- Fig. 2. Maculopapular rash on the side of the chest four days after the bite of *Latrodectus*.
- Fig. 3. The snout of a guinea-pig 43 minutes after the bite of a female *Steatoda paykulliana*. Note the local edema (right) and the profuse salivation.
- Fig. 4. Capillaropathy with skin haemorrhages two days after the bite of an undetermined spider.

pigs and white mice showed that *Steatoda* possesses a neurotoxic venom which produces signs like the effects of *Latrodectus* venom, but of lower intensity. As in *Latrodectus*, only the females are toxic. Guinea-pigs bitten by *Steatoda* showed toxic signs within 5-10 minutes, consisting first of rubbing the snout, even if bitten in other parts of the body, indicating that the toxin has a general effect. Soon the animal began to distort its neck, and then a motoric restlessness with clonic cramps appeared, followed by curving of the whole body to one side, extension of the hind legs and later pareses. Excessive salivation appeared and the animal swallowed the saliva (Fig. 3). These signs lasted 4-5 hours and then gradually disappeared. Guinea-pigs which received about 15 bites simultaneously showed strong motoric restlessness, clonic cramps, exhaustion, ataxia, parietic signs, adynamy, prostration and finally died. In experimental animals loss of weight was also noted, together with leukocytosis with neutrophilia and eosinophilia and a transient increase in blood sugar.

There must be other European spiders which can harm man. *Steatoda paykulliana* is an example which shows that spiders with a relatively potent venom can still be discovered in Europe and not only overseas, as was the case with the East African *Pterinochilus* (13). On the other hand, owing to the phenomenon of hypersensitivity any spider bite can be potentially dangerous, and the danger of anaphylactic shock is present if a person is rendered hypersensitive by repeated bites. It is also vital to remember that the antitoxins used to combat spider, and other, bites can themselves cause anaphylactic shock. Although all of these data may not be reliable, pathological reactions have been attributed to *Araneus diadematus* Cl., *Argiope lobata* (Pallas), *Segestria florentina* (Rossi), *Agelena labyrinthica* (Cl.), *Nemesia caementaria* (Latr.), *Argyroneta aquatica* (Cl.), and *Coelotes obesus* Simon (5, 6, 9, 15).

Finally in my practice I have had the opportunity to observe spider bites where the culprit could not be determined, although all the usual causes of arachnidism could almost certainly be excluded. In two cases after such bites a capillary disorder causing scattered, small areas of skin haemorrhage could be observed (Fig. 4). In another case a deep skin necrosis developed (15). In all these cases, of course, the differential diagnosis of bites and stings of other venomous

animals comes into consideration. In the above-mentioned case of necrotic arachnidism one must also take into consideration the fact that living in the Mediterranean area there is *Loxosceles rufescens* (Dufour), whose bite may be found to produce the same signs as that of some other species of *Loxosceles* (21).

In conclusion, it can be said that in some parts of Europe, especially in the south, araneism can have its practical implications. There are also examples of imported venomous spiders, and hence araneism, in northern parts of the continent. In spite of this most physicians are unfamiliar with these conditions, even in countries where araneism is not rare. It is therefore necessary to draw the attention of the medical profession to these conditions, and thereby remedy this deficiency.

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A linyphiid spider biting workers on a Sewage-treatment plant

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Native British spiders have seldom been held responsible for bites on people although it is known that a large species such as *Araneus diadematus* Clerck can pierce the soft skin of a man's arm and it is recorded that a *Dysdera* sp. caused a painful bite to the ankle of a building worker on one occasion. *Herpyllus blackwalli* (Thorell) has also been suspected of causing a bite on a woman's face which eventually left a small permanent scar. However no-one has ever suggested that the smaller species of Linyphiidae were capable of causing the slightest annoyance to man.

In July 1974 reports were received that workmen engaged on maintenance work at the Minworth Sewage Treatment Plant, Birmingham, were being bitten by small spiders emerging from the filter-beds which dropped down their necks or crawled up their sleeves. The bites caused irritation and swelling and in

several cases men left their work to receive first-aid treatment. It was found that the ointment "Iglodine" alleviated the symptoms. On 7 August one of the painters working on a filter-bed temporarily taken out of use, demonstrated the offending spider and its bite to the Safety Officer and Senior Biologist of the Upper Tame Water Reclamation Division. He placed the spider on his forearm and by gently pushing it with a finger caused it to bite, producing marked inflammation and swelling. The spider was later identified as a male *Leptorhoptrum robustum* (Westring). This species, which is widespread in Britain in marshy areas, occurs in very large numbers amongst the stones of sewage filter-beds and in the Birmingham area is the most common spider in this habitat. A total of 120 spiders were collected from amongst the webs on the surface of two of the filter beds on 7 and 28 August 1974 at Minworth, and included the following:

<i>Leptorhoptrum robustum</i> (Westr.)	14♂ 5♀
<i>Erigone longipalpis</i> (Sund.)	5♂
<i>Diplocephalus cristatus</i> (Bl.)	1♂
Immature indet. Linyphiids	95 (mostly more than half-grown)

The particular circumstances of this occurrence are worth noting. The population of *L. robustum* in a normally working filter bed may be very high. In a