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Fast recognition of *Loxosceles rufescens* in Italian spider bites to avoid misdiagnosis, alarmism and start a prompt treatment.

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In the daily clinical practice, many suspected spider bites can be caused by other conditions, decreasing diagnostic accuracy, such as: methicillin-resistant *Staphylococcus aureus* infections, cutaneous anthrax, dermatomycosis, erysipelas, furuncles, streptococcal ecthyma, herpes virus, impetigo, Lyme disease, pyoderma gangrenosum, sporotrichosis, autoimmune vasculitis, chemical burns, diabetic ulcers, lymphomatoid papulosis, venous stasis ulcers and other arthropod bites and stings.¹⁻³ As neither physicians nor patients are trained in spider identification, it is usually impossible to confirm the biting species in the case of a true spider bite.¹ The aim of this letter is to provide an initial, rapid and simple recognition of *L. rufescens* for physicians to exclude bites from spiders of this species or to confirm a *Loxosceles* bite, therefore taking relative medical measures and follow up.

This letter includes 3 patients (1F:2M), with a median age of 61 years (ranging between 35 and 64 years) observed over a 5-year period. (Table 1) In all cases, a spider bite verification process was performed.^{1,3} After visualization of the spider and relative consultation of an expert arachnologist, a final diagnosis of *L. rufescens* bite was performed in all cases. (Figs.1A-1B) In our patients, the lesions started as vesicle-bullas with surrounding erythema in the first 2 hours, while in the subsequent hours the lesions became reddish-bluish, leading to cutaneous necrosis. A central eschar was evident from the fourth day. (Fig.1C) No reactive lymph nodes were observed, additionally no anaphylactic reactions were experienced by the patients. (Fig.1D) One patient experienced fever and headache for 1 day, successfully treated with paracetamol. Laboratory investigations did not show alterations. In all cases, the lesions underwent an initial local wash with saline solution. Oral betamethasone and systemic

antibiotics (amoxicillin and clavulanic acid in 2 cases and doxycycline in 1 case) were administered together with topical collagenase ointment for the necrosis and chlortetracycline cream. In one patient, cetirizine was also administered. All patients showed a complete resolution of the cutaneous manifestations after a median of 9 weeks (ranging between 8 and 11 weeks), leading only to local residual scars.

Loxosceles (Araneae, Sicariidae) is a genus of spiders named "brown spiders" or "recluse spiders", distributed nearly worldwide in warmer areas and known to the public for the characteristic medically relevant effects of their bites. The species here considered, *L. rufescens*, is native to the Mediterranean basin and Near East, although it is present as an allochthonous in all continents.¹ It's a light brown to brown spider with a body length up to 8 mm and relatively long and thin legs (Fig.1A). This species is usually found under rocks or in cavities and dark ravines, both natural and anthropic: in homes it can find stable conditions throughout the year even in unsuitable geographical areas.¹

Even if extremely uncommon, cases of *L. rufescens* bites in Europe, can happen.⁴

In this regard, even for non-spider experts, with the aim of promoting a first and rapid recognition of the species, before sending the spider to an expert arachnologist and in addition to using more complex mnemonic devices,^{1,3} a morphological usable aspect for an initial and quick recognition are the eyes (six, arranged in a characteristic 3-pairs way, that we schematized in Fig.1B), in combination with a non "domed" cephalothorax: in Italy and throughout Europe, these combined characteristics are present only in *Loxosceles* spiders. Indeed, a prompt recognition of the species may help physicians in a correct initial therapeutic framework, especially in patients at risk of complications (such as the elderly, diabetic and immunosuppressed patients), otherwise avoiding alarmism in patients and family members in case of misdiagnosis.

For the diagnosis, in addition to the spider morphological determination, ELISA test on a swab from the area of the suspected bite has shown promising results in the other American species *L. reclusa*, although it is not yet commercially available.¹ A cutaneous biopsy can in no way specify the species of the spider, although it can be used to rule out other pathological conditions; large zones of necrosis, mixed inflammatory cell infiltrate, coagulative tissue necrosis surrounded by neutrophils and signs of vasculitis are the main histopathological

changes observed.⁴⁻⁶ Regarding the treatment, currently there is no guideline for any spider bite, therefore not even for *Loxosceles*, while only symptomatic therapy is recommended (pain treatment, systemic and topical antibiotics, systemic steroids, antihistamines and rest). Tetanus immunization status should always be evaluated and immunization provided as needed.

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Figures and tables legend

Figure 1A. Close up of a *Loxosceles rufescens* individual from southern Italy.

Figure 1B. *Loxosceles* sp., eye arrangement in dorsal and frontal views, which allows physicians a quick and fast recognition of the species. It's important to highlight that another family of

spiders (*Scytodidae*) also have a 3-pairs eye arrangement, but their “domed” cephalothorax makes distinction easy.

Figure 1C. Cutaneous lesion after a verified *Loxosceles rufescens* bite, on the fourth day. Central necrotic lesion with an eschar. Note the typical bluish and erythematous border. The necrosis in *Loxosceles* is mainly due to the toxin sphingomyelinase.

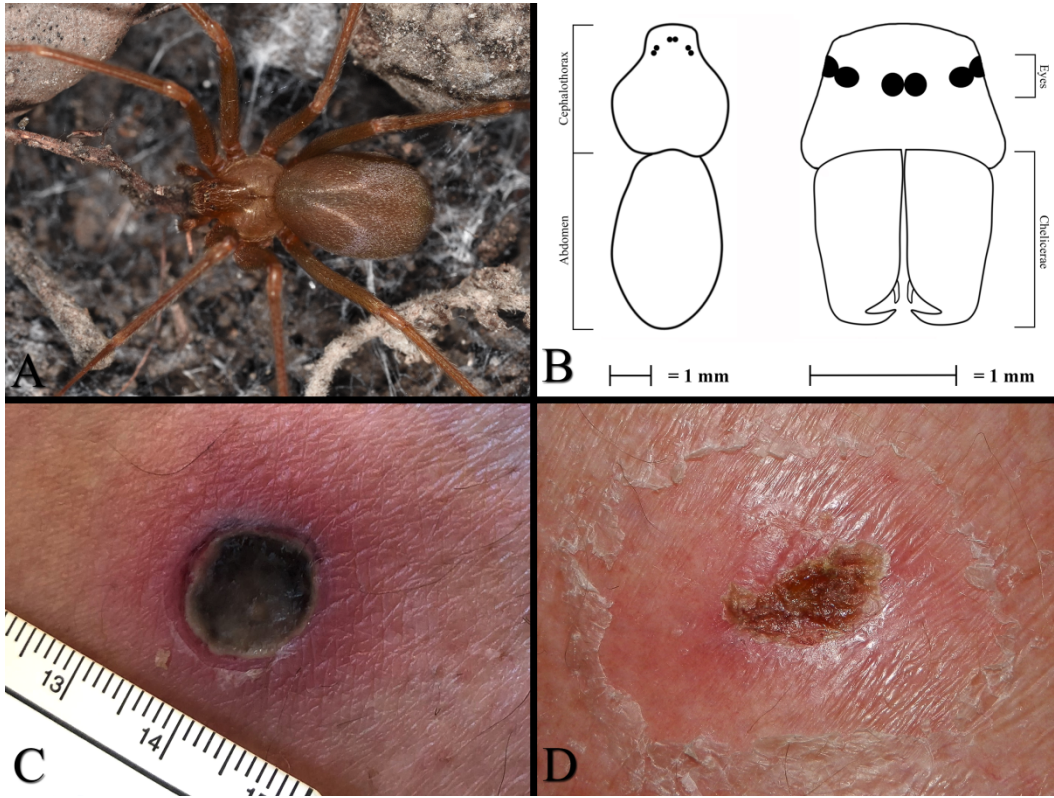
Figure 1D. Cutaneous lesion after a verified *Loxosceles rufescens* bite, on the 8th week. Central scaly-crust, surrounded by a peripheral annular fine desquamation, with an erythema.

Table 1. Clinical features of patients bitten by *Loxosceles rufescens*.

Table 1 Clinical features of patients bitten by *Loxosceles rufescens*.

n	Gender	Age	Body area	Diameter	Treatment
1	F	61	Lower limb	3.4 cm	Betamethasone+ amoxicillin and clavulanic acid + paracetamol+topical collagenase ointment and chlortetracycline cream
2	M	35	Lower limb	3 cm	Betamethasone+doxycycline+cetirizine+ topical collagenase ointment and chlortetracycline cream
3	M	64	Upper limb	1.5 cm	Betamethasone+ amoxicillin and clavulanic acid + topical collagenase ointment and chlortetracycline cream

n means number; M means male; F means female.



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