

Short Communication

The Western Conifer Seed Bug (Hemiptera: Coreidae) Has the Potential to Bite Humans

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Abstract

Among true bugs (Insecta: Hemiptera), only hematophagous species (families Reduviidae, Cimicidae) have high veterinary and medical significance. In addition, several predatory and plant-feeding bug species, which also have piercing–sucking mouthparts, are known to occasionally bite humans. The majority of such examples are known from the New World. Here, we report the first case concerning the human-biting potential of the western conifer seed bug, *Leptoglossus occidentalis* Heidemann (Hemiptera: Coreidae). This is a phytophagous bug species, which has become widespread in North America, and has also been introduced into Europe where it shows a rapidly expanding geographical range.

Key words: phytophagous bug, piercing–sucking mouthpart, skin lesion

True bugs (Insecta: Hemiptera) have as many as 90,000 species, but only two families (containing hematophagous species) are known to have high veterinary and medical significance (Krinsky 2009). Among reduviid bugs (Hemiptera: Reduviidae), representatives of several genera (*Triatoma*, *Panstrongylus*, *Rhodnius*) may transmit the causative agent of Chagas disease (*Trypanosoma cruzi*) in the New World. However, in Europe, only cimicid bugs (Hemiptera: Cimicidae) are regarded as parasites of humans and domestic or wild animals, the latter including bats and swallows. Adding to the above two bug families, several non-hematophagous (i.e., predatory or plant-feeding) bugs have been reported to occasionally bite humans: the majority of them from the New World, but three groups (Hemiptera: Cicadellidae, Miridae, Anthocoridae) also from Europe (Krinsky 2009). The latter family includes the flower (or miniature pirate) bugs (e.g., *Orius majusculus*), which were reported to cause human injury in England, the former Czechoslovakia (Krinsky 2009), and Germany (Kampen and Werner 2011).

Coreid bugs (Hemiptera: Coreidae) have a worldwide distribution and significance as agricultural and forest pests, owing to their phytophagous habit. Among them, one species, the western conifer seed bug (*Leptoglossus occidentalis* Heidemann), have recently deserved high attention from the scientific world, because of its abruptly expanding geographical distribution. Although this bug species was formerly indigenous to only North and Central America, recently it has been accidentally introduced in Europe (and spread rapidly through the continent: Fent and Kment 2011) and Asia (Japan: Ishikawa and Kikuhara 2009). This species uses its long piercing–sucking mouthparts (Fig. 1b) to imbibe preorally digested fluids from the seeds and young shoots of coniferous trees. Living close to or in urban

ecosystems, it may pose a threat to gardens and crops, but it may also massively invade human dwellings with the attempt of overwintering (Bates 2005). In this scenario, the western conifer seed bug has been regarded as a harmless insect, i.e., without landing on humans and unable to damage (pierce) human skin. In contrast to this, a persistent skin lesion caused by the bite of this species is reported here.

Materials and Methods

On 25 July 2016 (during evening hours), a western conifer seed bug landed on the front of the upper arm of a woman sitting on a balcony (location: Budapest, Hungary; coordinates: 47.51° N, 19.137° E). The bug bit the skin, and was consequently caught and preserved in 70% ethanol (Fig. 1a). Pictures of the bug were made with a VHX-5000 (Keyence Co., Osaka, Japan) digital microscope. The person received neither systemic nor topical treatment.

Results

The bite of the bug was immediately felt, without disturbing it. Although the bite was very painful and induced intense irritation (rather than pruritus), the person was unaware of the taxonomy of the insect and did not attribute significance to the event. However, by the next morning, a large coin-size erythematous area (i.e., ~2.5 cm in diameter) developed around the bite site. On the surroundings of the lesion, papillomatous protrusions appeared that showed a desquamative surface. The lesion remained similar for

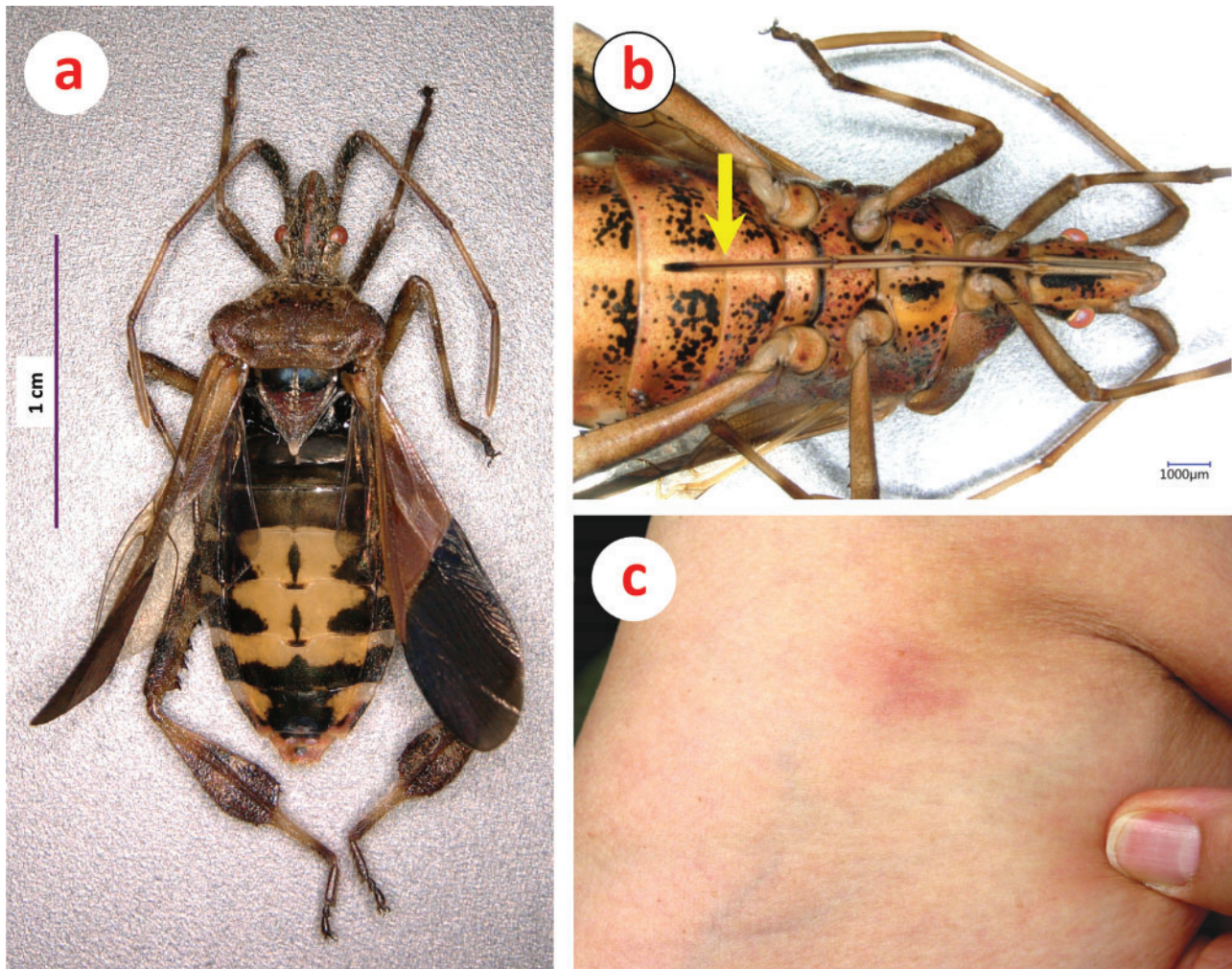


Fig. 1. (a) *Leptoglossus occidentalis* that has bitten the human patient. (b) The 1-cm-long piercing-sucking mouthparts of this bug curved under its abdomen, indicated with a yellow arrow. (c) The patient's upper arm showing erythema and bitten wound 3 wk after the biting.

48 h, then started to subside. In the second phase, the erythema (with irregular outline) persisted for 4 wk (Fig. 1c).

Discussion

To the best of our knowledge, this is the first report of the western conifer seed bug, an emerging species with growing importance in North America and Europe, to naturally bite a human being. In its genus, only a South American species, *Leptoglossus chilensis*, was reported to have a human-biting potential (Faúndez and Carvajal 2011). It is important to note that in the present case, the bite did not result from disturbing the bug, and preceded its removal. The most likely explanation for this bite is an attempt of feeding (probing) from the human skin. Unlike the generally painless bites by hematophagous species, predaceous and phytophagous bug bites often cause severe pain or a burning sensation, presumably resulting from enzymes and other substances in the saliva that normally digest insect or plant materials (Krinsky 2009). Most of these bites cause only transient discomfort, localized erythema, and edema associated with allergic and toxic reactions to foreign proteins (Krinsky 2009). In contrast, the skin lesion in the present case persisted for several weeks.

In conclusion, the western conifer seed bug is able to pierce (probe) human skin with its mouthparts, and this bite may cause the

development of a long-lasting skin reaction. Adding to this consequence, the mouthparts of certain *Leptoglossus* spp. and related bugs were reported to carry fungal yeasts (Dammer and Ravelo 1990), bacteria (including *Pseudomonas* spp.), and protozoa (Mitchell 2004). Such contaminants may aggravate or prolong healing, and may even result in secondary infection.

The present case should be regarded as adventitious, and only temporary nuisance can be expected from conifer seed bugs. On the other hand, the public majority may not have the skills to distinguish insect taxa, and (especially when not seeking medical care) will remain unaware of the cause of skin bite. For instance, during their flight, western conifer seed bugs may be mistaken with wasps, because of the yellow-black pattern on their abdomen (Fig. 1a), the buzzing noise they make, and the hanging position of legs. Therefore, also taking into account the vast geographical range of *L. occidentalis*, it is assumed that there may have been numerous unreported cases similar to the present one, and coreid bugs have to be taken into account when the etiology of an insect bite is diagnosed.

Ethics Statement

Written consent of publishing the picture of the lesion was obtained from the patient.

Acknowledgments

We thank the patient, E. O. who allowed taking pictures of the lesion.

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