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The first account of a bite by the New Zealand native spider *Trite planiceps* (Araneae: Salticidae)

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Abstract

New Zealand has very few arthropods that pose a threat to human health. While most New Zealand spiders are considered harmless, the bite effects of most species are unknown. Here, we describe a case of a bite by a native spider, in which a young man was bitten after rolling over in his bed. The spider was collected and identified as *Trite planiceps* (Salticidae, black headed jumping spider), a native species commonly encountered around homes. The initial reaction was a relatively painful, sting-like, sensation, followed by the appearance of two red puncture marks and an urticarial wheal. Symptoms eventually disappeared after 72 hours, and he has had no further dermatological problems. *Trite planiceps* is considered to be a rather docile spider with regard to humans, but even a docile species may still bite defensively as a last resort. Notes on this species and on treatment of spider bites are provided.

New Zealand is fortunate in having very few arthropods that pose a threat to human health. Among the spiders (Araneae), the native katipo *Latrodectus katipo* (Theridiidae) is the only native species that is a considered dangerous to people, but it is not aggressive[1] and bites on humans are rare.

The introduced redback spider *Latrodectus hasseltii*, on the other hand, is larger and more aggressive, and in its native Australia hundreds of people are bitten each year.[2] However, in New Zealand populations of redbacks have been recorded only in Central Otago and New Plymouth.[3]

While Australian white-tail spiders (*Lampona cylindrata* and *L. murina*) are commonly thought to cause serious bites, this reputation is largely undeserved. Although their bites are painful, other clinical effects are generally minor.[4–6]

Despite the relative lack of venomous native spiders of concern in New Zealand, alleged spider bites were blamed for over 20,000 ACC claims during 2005–6.[7] While we remain sceptical that these were all genuine spider bites,[5] it is highly likely that at least some were. Therefore, even if only a very small percentage of these claims were correctly diagnosed, it means that numerous spider bites do occur in New Zealand.

Although there are accounts of spider bites inflicted by native species,[1,8–11] these are rare. There are over 1100 named species of spiders described from New Zealand, approximately 95% of which are unique to this country.[12] While many species are either too small to bite or are unlikely to be encountered by people, there are still species with undocumented bite effects that do not fit either category.

We describe a case of a bite by *Trite planiceps* (Salticidae, black headed jumping spider), a native species commonly encountered around homes.

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Case report

The case occurred in the suburb of Johnsonville (Wellington) in October 2009. On awaking at approximately 7:30 am after a night's sleep, a 23-year old man rolled over in his bed. He became instantly aware of a relatively painful, sting-like, sensation between his lower shoulder blades. He immediately sat up, pulling the t-shirt he was wearing over his head, at which point a spider fell from it onto the bed.

He killed the spider by hitting it with his t-shirt. Immediately afterwards, apart from the discomfort, he was noted to have two red puncture marks, approximately 1 mm apart, surrounded by an urticarial wheal, on his mid-back, which was assumed to be the result of the spider bite. Savlon antiseptic cream (cetrimide 0.5% w/w; chlorhexidine gluconate 0.1% w/w) was applied.

Four hours later, the two puncture marks were surrounded by an erythematous, swollen halo, which was tender to palpation. By the evening, the swelling and tenderness had largely settled, although the puncture marks persisted to the end of the second day. The erythema eventually faded after 72 hours. He has had no further dermatological problems.

The spider was collected and preserved in methylated spirits, being subsequently identified by PJS as *Trite planiceps* (Figure 1). This species is unique to New Zealand and placed in the family Salticidae, whose members are commonly known as 'jumping spiders'.

Figure 1. Male *Trite planiceps* (photo courtesy of Alan Macdougall)

Discussion

There are over 5200 species in the Salticidae family worldwide.[13] They are known as jumping spiders as they are capable of leaping many times their own body length. They use this ability when pouncing on prey, crossing gaps, or escaping from a perceived threat.[1]

Salticids do not construct snares to capture prey, and, unlike most spiders, they possess excellent eyesight.[1] The eyes of salticids, two of which are considerably enlarged (Figure 2), allow them to catch prey in daylight, hunting their prey in a similar fashion to cats catching mice (see Ray & Lyn Forster's seminal work on New Zealand spiders).[1]

Figure 2. Close up of *Trite planiceps*, showing the two large central eyes characteristic of the Salticidae, which provides the spider with a particular efficient sight for hunting prey (photo courtesy of Alan Macdougall)

In New Zealand there are around 55 described species of salticids,[12] which range in size from 2 to 10 mm[1]. *Trite planiceps* is one of the most widely distributed species.[1] It is common around homes,[14] but its original habitats appear to be associated with New Zealand flax bushes (*Phormium tenax*) and other plants with similar morphology, as well as cabbage trees (*Cordyline* spp.).[1,15]

Trite planiceps is considered to be a rather docile spider with regard to humans. Andrew Crowe states that "if you are someone who finds yourself afraid of spiders, this one might help get you used to the idea that most are really quite harmless".[14]

These creatures are frequently handled by members of the public (Figure 3), without any reports of associated bites. However, it is important to point out that even a docile species may still bite defensively as a last resort.

Figure 3. A male *Trite planiceps* climbing over a finger. These spiders are docile and do not normally pose a threat to humans (photo courtesy of Alan Macdougall)

In this particular case, the bed linen had been replaced and the bed made late in the previous night, so the spider probably ventured into the sheets (and consequently into the patient's t-shirt) during the night. When the patient rolled onto the spider, it administered a defensive bite. Bites occurring while individuals are asleep or dressing are two of the most common circumstances reported by Isbister.[16]

It should be noted that although nearly all spiders produce venom, only a small percentage of species pose a danger to humans. Most spiders either do not have mouthparts capable of penetrating human skin or the venom is insufficiently toxic (in the quantities delivered) to cause any clinical symptoms.

To our knowledge there are no previously published reports of *Trite planiceps* causing bites, although there is one report of a bite by an unidentified *Trite* sp. in New Zealand.[11]

Jumping spiders are said to cause approximately 5% of spider bites in Australia.[16–18] These creatures are described as capable of inflicting pain with only minor effects, such as relatively brief localised pain,[19,20] which may be accompanied by a local reaction with an erythematous papule or a small urticarial wheal, as was the case in our patient. However, the bites of some overseas species of salticids may lead to more significant localised symptoms, which can last for several days,[21,22] and some people may experience symptoms that, although minor, may last for several months.[23] Furthermore, sensitivity to the venom of a particular species may vary considerably

from person to person, which can be exemplified by several cases of systemic effects associated with bites from salticids that have been observed in Australia.[18]

The treatment for spider bites is directly dependent on the species involved. Most spider bites are harmless, and require no first aid. If discomfort is experienced, the wound should be encouraged to bleed to wash out any foreign material. Topical antiseptics (1% hydrogen peroxide or 10% povidone-iodine) should be applied for the low possibility of secondary infection. An ice pack may help reduce pain and inflammation. A moderate potency topical corticosteroid cream can be applied twice a day if it becomes itchy, and paracetamol can be prescribed for discomfort, if required.

In the event of a *Latrodectus* bite, antivenom is available in New Zealand. Bites associated with other spiders in New Zealand are unlikely to lead to systemic effects. However, if more severe symptoms develop beyond the immediate area of the bite, such as widespread rash, shortness of breath or tachycardia, appropriate medical attention should be sought immediately. Should anaphylaxis occur, management is intramuscular adrenaline followed by antihistamines (oral or i.v.) and systemic corticosteroids.

It is important to highlight that although this case was clearly caused by a spider bite, most self-reported spider bites are not.[6] Folliculitis, *Staphylococcus aureus* infection and insect bites are much more likely explanations.[6] As a result, the following basic diagnostic criteria for spider bites are recommended:[6]

- A spider must be observed in the act of biting (not just observed in the vicinity).
- Bites are usually immediately symptomatic (venomous reactions can, however, initially be painless).
- Puncture wounds are usually visible in the first 24 hours.
- Reaction in most cases should settle within 72 hours.
- The spider should be collected and sent for proper taxonomic identification.

The latter in particular is important, to adequately substantiate claims of spider bites in New Zealand, and the only way this can be confirmed is if the biting organism is collected and accurately identified.[5]

Staff at any of the main centre museums (Otago, Auckland, Canterbury, Te Papa) can identify specimens. Note that it is extremely difficult to ascertain the identity of a spider on the basis of bite symptoms alone. Attempting to do so can lead to inaccurate diagnoses. Further, misdiagnoses regularly occur when a spider is not observed in the act of biting or immediately after, as appears to be the case with the Australian white-tail spiders.[5]

To help us obtain a more comprehensive picture of spider bite effects in New Zealand, we request that those spiders confirmed as having bitten a person are sent to Te Papa for proper identification (c/o Phil Sirvid). Spider specimens should ideally be preserved in a solution of 70% ethanol and 30% distilled water. Specimens should be labelled with the collector's name, date, locality (city, suburb) and place of collection (indoors, backyard, etc). However, since most households are unlikely to have ethanol on hand, specimens may be preserved in methylated spirits or kept in a freezer.

Keeping them frozen would also preserve DNA for molecular identification,[24] in case morphological identification is not possible.

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(For assistance with identification of spiders associated with bites, contact Phil Sirvid, email: PhilS@tepapa.govt.nz).

References:

1. Forster R, Forster L. Spiders of New Zealand and their Worldwide Kin. Dunedin: University of Otago Press, 1999.
2. Sutherland SK. Spider bites in Australia - there are still some mysteries. Med J Aust 1983;2:597.
3. Vink C, Derraik JGB, Sirvid P, Phillips CB. The invasive Australian redback spider, Latrodectus hasseltii Thorell 1870, (Araneae: Theridiidae): current and potential distributions, and likely impacts. Unpublished manuscript.
4. Isbister GK, Gray MR. White-tail spider bite: a prospective study of 130 definite bites by Lampona species. Med J Aust 2003;179:199-202.
5. Derraik JGB, Sirvid P, Vink C, Hall G. White-tail tales. NZ Med J 2008;121(1269):U2937.
6. Rademaker M, Derraik JGB. White-tail spider bites. ACC Review 2009. http://www.acc.co.nz/for-providers/clinical-best-practice/acc-review/index.htm
7. Boyes N. 20,000 spider bites sting ACC for $1.7m. Sunday Star Times 2006;10 December 2006.
8. Chamberlain G. Arachnoidism as applied to New Zealand spiders. A preliminary note. Rec Auckland Inst Museum 1947;3:157–159.
9. Watt JC. The toxic effects of the bite of a clubionid spider. NZ Entomol 1971;5:87-90.
10. Hornabrook R. Studies in preventive hygiene from the Otago Medical School: the katipo spider. NZ Med J 1951;50(276):131–138.
11. O'Donnell M. A review of records of spider bites on humans in New Zealand including some previously unpublished records. The Weta 1983;6:72-74.
12. Sirvid P, Zhang Z-Q, Harvey M, et al. Phylum Arthropoda - Subphylum Chelicerata - horseshoe crabs, sea spiders, and arachnids. In: Gordon D, editor. The New Zealand Inventory of Biodiversity. A Species 2000 Symposium Review 2003. Christchurch: Canterbury University Press, in press.
13. Platnick NI. The world spider catalog, version 10.0: American Museum of Natural History, 2009. http://research.amnh.org/iz/spiders/catalog/
14. Crowe A. Which New Zealand Spider?: Penguin Books, 2007.
15. Zabka M, Pollard S. A checklist of the Salticidae (Arachnida: Araneae) of New Zealand. Rec Canterbury Museum 2002;16:73-82.

16. Isbister GK. Prospective cohort study of definite spider bites in Australian children. J Paediatr Child Health 2004;40:360-64.
17. Isbister GK, White J. Clinical consequences of spider bites: recent advances in our understanding. Toxicon 2004;43:477-92.
18. Isbister GK, Gray MR. A prospective study of 750 definite spider bites, with expert spider identification. QJM 2002;95:723-31.
19. Vetter RS, Isbister GK. Medical aspects of spider bites. Ann Rev Entomol 2008;53:409-29.
20. Nimorakiotakis B, Winkel KD. The funnel web and common spider bites. Australian Fam Physician 2004;33:244-52.
21. Russell FE. Bite by the spider *Phidippus formosus*: case history. Toxicon 1970;8:193-94.
22. Wong RC, Hughes SE, Voorhees JJ. Spider Bites. Arch Dermatol 1987;123:98-104.
23. Hawkeswood TJ. A record of a bite to a human arm from a species of *Opisthoncus* (Arachnida: Salticidae) in Australia. Mauritiana 1996;16:37-39.
24. Vink CJ, Thomas SM, Paquin P, Hayashi CY, Hedin M. The effects of preservatives and temperatures on arachnid DNA. Inverteb Syst 2005;19:99-104.