

Stung by a large *Polistes* wasp - a nasty experience in Samoa, Polynesia (Hymenoptera: Vespidae) followed by a noisome comorbid spider bite in Australia

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Abstract: The 'lived-experience' of a wasp sting in Samoa, arguably by the vespid, *Polistes olivaceus* (DeGeer) is described. It is a phenomenological anecdotal account based on a self-reported single, convenience observation, described in popular literary style for the leisure reading (largely because of identification limitations) of our common-interest community. The painful polistine sting symptomatology is compared and contrasted with a sequential comorbid spider bite (presumably that of a white-tailed spider, *Lampona cylindrata*) received soon after in Victoria, Australia. The polistine wasp's toxin exceeded the spider venom in perceived pain. However, the wasp sting paled in terms of longitudinal dermal insult significance when compared with the necrosis that resulted either from the spider's toxin, a possible fang-introduced infection, or an inappropriate immune response.

Introduction - stings and creeping things!

Like most field entomologists, I have had the odd, nasty experience with stinging and biting critters during my travels in the Asia-Pacific region. In temperate Australia I remember a wrist-brush with those colorful, slug-like cup-moth caterpillars (Limacodidae), grouped in triads on low hanging eucalypt leaves. They inflicted a nettle-like sting and rash. I have had repeated exposure to the irritating hairs of caterpillars of *Euproctis edwardsi* (Lymantriidae) accumulated under Eucalypt bark. The airborne hairs, exposed upon lifting bark, are a curse to seekers of larvae and pupae of *Ogyris* (Lycaenidae) in mistletoe-infested woodlands of southern Australia. When combined with contaminated clothing this makes for unpleasant, itchy caterpillar dermatitis - enough to spoil any field trip. Readers of Australian entomological publications may recall Dr Trevor Hawkeswood's (1991) eye-watering account of an unpleasant spider bite, received whilst hunting beetles in coastal New South Wales, Australia. It is common to receive miscellaneous ant bites whilst seeking myrmecophilous Lepidopteran caterpillars, but these are usually non-events. However, being savaged by numerous *Oecophylla* ants whilst hunting juveniles of *Brassolis* (Lycaenidae) in northern Queensland was of my own undoing (see Dunn 1994) - latex examination gloves, which enable handling dexterity, can be prophylactic. Most readers will have experienced the occasional bee sting, and in northern Australia probably many insect collectors eventually fall victim to those small, yet fearsome vespids (*Rhopalidia* spp.) that lurk in the paperbark swamps and mangroves. Other Queensland paper wasps (eg. *Polistes* spp.) perch and rotate like miniature jet fighters on their pedunculate, cellular nests, then unexpectedly charge out in a small cohort to attack the unsuspecting, net-waving entomologist!

In this contemporaneously written story, I tell of an unpleasant encounter with a medium sized *Polistes* wasp, whilst butterfly watching in O Le Pupu-Pu'e National Park in Upolu Island, Samoa.

Monday, 17 February 2003: southern coast of Upolu Island - butterfly watching

It was the wet season in the South Pacific, yet very few butterflies were active despite optimal, late morning, sunny conditions at the Togitogiga waterfall. This multipurpose attraction, about 3 km NNW of Saleilua in the Togigoga Scenic Reserve, is nestled amidst dense *Merremia* (Convolvulaceae) vine-infested rainforest, and is a popular swimming spot with the Samoans. My purpose, however, was focussed on insect life video-photography, predominantly butterflies. Males of the common Pacific Varied eggfly, *Hypolimnys bolina* and an occasional Argus, *Junonia villida* basked and patrolled open herb-areas along the river. Among denser vegetation many danaine adults of *Euploea algea schmeltzi* and *Tirumala hamata* hungrily foraged at flowers of *Morinda citrifolia* (Rubiaceae) (1145 hrs WST - Western Samoa Time). This is a common medicinal tree, with conspicuous fruits, that grows in dense secondary forest and agroforests - indeed, a favourite nectar source for many Pacific and Asian butterflies in my experience - and used to make therapeutic 'noni' juice by the Polynesians. Anticipating a greater diversity elsewhere, I hiked south-west several kilometres through the drier woodlands, to explore the coastal trail that meanders through littoral pandanus scrubs and vine-forests clothing the southern cliffs at Cape Niuafo'ou.

The early afternoon, tropical summer sunshine intensely heated the woodlands. The sandy 4WD track leading south to the lava coast was a monotonous and exhausting walk at this hour - reminiscent of Rudyard Kipling's familiar adage: 'Only mad dogs and Englishmen [or should that read entomologists?] go out in the midday sun' (Kipling, 1910, source untraced). Along the margins of secondary forest, many adults of *Tirumala hamata* fed continuously at the ubiquitous snakeweed flowers (*Stachytarpheta* sp.: Verbenaceae). And, a few localised *Vagrans egista* were active, breaking the general butterfly paucity. *Vagrans* adults were smaller throughout Upolu compared with those seen in Tonga, Rarotonga and other Pacific islands in summer. All were males - the distinctive tornal shape of the hindwing, seen clearly at close range as they flower-fed at head-height, clarified their identification.

The littoral vineforest, into which the lonely walking trail vanished, shimmered ahead like a mirage. Sweat-soaked I felt refreshing coolness upon entering its shadows. A solitary gliding male of *Euploea algea schmeltzi*, with his yellowish, abdominal hair pencils fully extended, patrolled a lek, a metre or so above the damp leaf-littered forest floor. As it followed its multi-repeated flight path through sections of very dark shade, it would seem to vanish briefly in the filtered light, aided by its sombre coloring. Some brilliant blue polyommata lycaenids (probably *Jamides bochus* group) patrolled and perched in localised patches in sunny glades at eye height, but I felt too exhausted to take any video photography. Instead, seating myself at the base of a tree to rest, I watched the crow continue his patrol, pausing very occasionally to settle with closed wings on deeply shaded hanging leaves before resuming again.

An unexpected encounter

At about 1400 hrs (WST), I wandered adjacent dense, cliff-top pandanus forest along the O Le Pupu lava coast. A solitary lycaenid, most probably *Famegana alsulus*, flew amongst herbs near my feet, and then whilst peering amongst the flickering shadows for indicative movement of other more photogenic butterflies, I felt something rip into the inner side of the triceps of my right arm. The intense, sharp and burning pain caused me to release my daypack and quickly examine my arm for a suspected open-wound injury. None was evident, so a sting seemed probable, but no insect or spider was near the pain site. Explanation quells fear, but nothing shook from my shirt. Annoyed, I scanned the ground hoping to see a scuttling culprit as I

redressed. Having travelled several months earlier in the rainforests of northern Cambodia where deadly, pale-green Hanuman snakes hunt immediately after summer rains, I was used to being ever alert for dangling horrors. Hence, momentarily forgetting my biogeography, I feared a tree-snake bite! Relieved, I saw I was a metre from any foliage, and then recalled their absence from Polynesia.

A single, fine trace-blood track running in a needle-like path and extending about 3 mm in length was at the pain site. It descended from the surface under the dermal layer at an acute angle, just at or below the biceps and above the triceps muscles. Pressure to this site caused a small blood spot (pin-head quantity) to ball on the skin at the puncture, indicating a tiny wound to subcutaneous tissue or deeper, with capillary contact. The single puncture ruled out a spider - relieving further anxiety. My next suspicion was a hymenopteran.

Within moments of the sting, my right biceps experienced muscle tremors and involuntary minor ripple-contractions lasting a few seconds - a reaction I watched with surprise and curiosity, as this was a new physiological experience. These twitches or fasciculations subsided to continuous burning pain of a very conscious severity (about 5/10 on a pain scale - 10 being unbearable) - unproductive pain, particularly of unclear cause promotes anxiety increasing its effect! The intense burning feeling suggested an alkaloid poison, or a nerve-damaging agent. The resultant muscle tremors support the latter, and suggest the action of a nerve depolariser. 'Fasciculation' is a medical term that refers to "localised, uncoordinated, uncontrollable twitching of a single muscle group innervated by a single motor nerve fibre or filament that may be palpated and seen under the skin" (Anderson, 2002: 659). According to this source, "Dietary deficiency, cerebral palsy, fever, neuralgia, polio, rheumatic heart disease, sodium deficiency, tic, or uremia", are among common causatives (p.659). Localised insect envenomation is not listed, but I recalled reading once in a popular source that Sydney funnel-web spider (*Atrax robustus*) bites can apparently stimulate muscle tremors at the wound site - a thought far from reassuring at that time! I reasoned that the supposed insect culprit, although not seen, must have got trapped under my armpit, after having crawled or flown in from beneath my daypack. I hoped it was nothing too poisonous, as I was in a remote location where transport was irregular. A serious anaphylactic hymenopteran reaction, although a rare potentiality, was far from desirable!

I carried an anti-inflammatory cream, Stingose® in my daypack, yet neglected to use it! No idea how I could forget an important self-help thing like that. Guess I was a little startled, or preoccupied by my diagnosis as I hastily flipped through my Lonely Planet guidebook for some hints. For the adventurous sole traveller I've found this handy series knows everything about anything one would want to know in a hurry - that is, when far from an Internet cafe. I was reassured to read in the South Pacific edition, that there are no dangerous animals in the forests of Samoa - bee and wasp stings are described as "painful rather than dangerous" (Hunt *et al.*, 2000: 88).

Solitary, medium sized (about 3 cm in length) orange-yellow, stout-bodied, hornet-like wasps were prolific in the woodland and occasionally seen flying beneath the pandanus forest canopy inspecting leaves and low vegetation. I had also seen them regularly flying along the vine-forest margins, but they kept to themselves, probably hunting caterpillars or larvae of other insects, so I didn't give them a second thought - apart from noting their local ubiquity - being the most conspicuous aerial insect. Then about three minutes after my sting, one suddenly charged at me! I bolted from the area - evidently some were aggressive! Perhaps it was even the same maleficent individual that had punctured my flesh? I no longer doubted which particular insect was the culprit!

The toxin remained localised and a small dispersing halo of inflammation soon appeared (diameter of about 15 mm) at the penetration site from bodily release of histamine. Burning

pain, characteristic of nerve injury continued for at least an hour. It gradually settled to about 4/10 - a 'grin and bear it' severity, tolerated in the typical Northern European 'stiff upper lip' response prized in western culture (Allis, 1992). I am somewhat stoical in physical terms particularly when distracted by entomological and recreational pursuits, but have no claim to Nepalese origin - a people group known for their tolerance of higher pain intensity than most (Clark & Clark, 1980). Thus, I was none too happy on facing a tiring afternoon return trek to the Main Coast Road with an aching arm and few entomological distractions.

Intermittent light showers were now passing above - it seemed my butterfly observations were over for the day - a common mid afternoon occurrence during the wet season. Moreover, at this time of day in the South Pacific tropics butterfly life often lulls anyway, even in optimal weather. As the sky to the north in the vicinity of Mt Fito (a volcanic landform rising 1158 m) blackened pending a very fierce electrical storm, I now hurriedly commenced on my four-kilometre hike out through, increasingly sloshy and muddy woodland. Visitors to the remote O Le Pupu-Pu'e National Park - a Polynesian name which means "from the coast to the mountain top" - are advised to bring their "own food and water" (Hunt *et al.*, 2000: 371), albeit on my visit the latter was now plentiful! Unexpectedly drenched a second time now in Upolu, and wary of worsening lightening forks striking the ranges, I was glad to arrive at a palm-thatched bus shelter on the park boundary near Sa'agafou - the only shelter available for miles! Indeed, it had become a miserable afternoon! Then half-naked, ringing-out my soaked jeans and shirt, I almost missed the infrequent village bus for my return trip to Apia. The bus shelter was off road some 10 m amidst secondary scrub and seemed otherwise invisible in the continuous sheet rain. According to a local taro-farmer, the breezy island-circuit school buses don't normally stop unless hailed, compelling me to stand near the middle of the road to ensure a lift.

Over the next few hours the pain gradually subsided, but two days later a rosy rash, like severe sunburn - involving an area roughly the size of my whole hand (about 10 x 20 square centimetres) covered my inner biceps and triceps. It had also spread down my arm from the sting site just below the armpit to my elbow. The former blood-lined puncture site appeared as a small inconspicuous, non-raised red spot. The rash, a delayed hypersensitivity, histamine reaction was now very hot to touch! Redness and heat are normal responses to inflammatory mediators that create peripheral vasodilation - therein promoting increased blood flow to this entomologically insulted area. The absence of prominent swelling or oedema, possibilities from inflammatory exudate, suggested absence of infection - at least my tetanus shots were up to date! When back in Fiji and hoping someone might recognise the rash and confirm a common wasp sting, I showed it to the Melanesian hotel workers, one of whom touched it saying, "sunburn!" She was shocked when I shook my head saying 'sting', exclaiming, "You must see doctor!" Under masculinity alignment, some social de-constructionists might argue for a male under-use of medical services for preventative health problems, rather than female excess (Doyal, 2000; Parslow *et al.*, 2004). Whether this be true or otherwise, since the injury produced no headache, fever or similar systemic concerns I was not too worried - it was obviously not serious, and remained fairly localised and uninfected.

My extensive rash from the Samoan wasp was perhaps an atypical allergic reaction, and probably an immunologic response from antibodies to vespid attacks a year previous, if all species possess similar antigens (ie. perhaps a re-exposure very minor anaphylaxis reaction?). I had been repeatedly stung by paper wasps (Vespidae) in northern Queensland in early January 2002. On that unfortunate occasion, as I intently watched for settling skippers in the brightly sunlit background, I had absent mindedly wandered too close to a partly silhouetted, 30 cm long wasp-laden, paper-covered nest hanging at head height from a tree branch in paperbark swamplands at Forrest Beach in the wet tropics. The large and bulky nest seemed similar to that described by Reik (1970: 936) for *Ropalidia*, which "blends well with their surroundings", unlike the conspicuous, tessellated comb-nests of *Polistes variabilis*, and *P. humilis* which I have commonly

seen in residential areas in coastal Queensland. The paper wasps' stings were momentarily sharp, like burning needles, and a few expletives were accidentally let fly on account of the shock impact as I received multiple facial stings! These Queensland vespids' stings lasted only for about 5-10 minutes before settling to a dull heat sensation and no obvious rash developed. Although stung simultaneously by many wasps, the impact was nowhere near as lingeringly painful as the Samoan wasp.

Wasps can be attracted to 'sweaty people' (or probably their perfumed deodorants) I've heard it said amongst Queensland folklore. 'Sweaty' I sure was, on that wet-season afternoon in Polynesia - although probably only about 30°C, it was oppressively humid under the forest canopy, and more so on the brink of a storm. Armpits are sites of deodorants and where the wasp may have been heading, prior to presumed compression against my arm. The charging orange wasp, from which I fled, and my wound received only minutes before remain circumstantially linked.

Dr James Carpenter, a wasp specialist at the American Museum of Natural History, kindly commented that "there are only three Vespidae recorded from Samoa." The two eumenines are *Anterhynchium rufipes* (Fabricius) and *Parodynerus bicinctus* (Fabricius), and "neither of these is predominantly orange, but the *Polistes* is." Moreover, the "eumenines are unlikely to sting anyway, but polistines are another matter...[so]...it seems more likely from your description that it was a *Polistes*, namely *olivaceus* (DeGeer), which is widespread in the Pacific, including Samoa." He further clarified, "the wasp that stung you in Queensland was certainly *Ropalidia romandi* (Le Guillou), which is the aggressive species with which Queenslanders are all too familiar. There are only two species of Australian paper wasps that cover their nests with an envelope, and *romandi* is the common one - the other (*R. nigrior*) is found only in the Iron Range, but *romandi* is abundant across northern Queensland into NT. It is a small, yellow species, and the smaller size may explain why the symptoms were not as severe as with the *Polistes*. But note that sting severity is also a function of the amount of venom injected - you may have had some bad luck in Samoa!" (Carpenter, pers. comm., 2004). Those interested in Polynesian wasp biogeography might consult specialist literature by Carpenter (1996), Giordani Soika (1957) and Perkins & Cheesman (1928).

A comorbid spider bite

The very painful sting from *Polistes olivaceus* was minor in symptomatic duration compared to a likely white-tailed spider bite, received a few weeks later in the foothills east of Melbourne. Awoken by crawling movements on my neck, but not a fang insult, a black scuttling spider vanished across my pillow before I could confirm any characters - rather unfortunately in terms of identification rigour for this claim on sequential, arthropod-induced comorbidity. Nonetheless, it was likely to be a white-tailed spider (*Lampona cylindrata*) as there was a 'big mother' in my bed a day or so before - which I had promptly killed. At first I thought I had dreamt this new one, as there was no stinging sensation suggesting a bite, and so I quickly returned to sleep.

This roaming arachnid predator, convicted on the balance of probabilities, can be common at times indoors in late summer and early autumn in this part of open-forested Victoria where I live. However on rare occasions, other potentially serious biting culprits sometimes lurk indoors. These have included a large black spider with prominent finger-like posterior spinnerets (perhaps a trapdoor or funnel web), small blackish wolf spiders (Lycosidae), and common black house spiders (*Badumna* sp.). All have usually been splattered before I had an opportunity to examine or collect them intact!

My spider bite was seemingly painless, but within the first two hours I re-awoke with a full body sweat and bad headache. A red circular flattened swelling of 10 mm diameter appeared on my neck within a day or so. There was trace evidence of a twin puncture, with width separation of

about 2 or 3 mm suggesting a mygalomorph spider bite. Yet several times over the last decade I have had similar looking bites and all of mild pain sensitivity; these slowly disappeared after a week or so, and none was associated with sweating and headache. Several days later this more serious bite erupted into masses of very itchy, tiny orange bubble-blisters that horridly ulcerated, and then full skin-thickness eroded into three small deep-crater necroses.

After a week or more these ulcerated craters blackened into disgusting, dark-thread-linked eschars scattered over a three-centimetre diameter, ovoid-shaped region of my neck situated just behind my right ear lobe. The slowly enlarging ulcerations remained resistant to a broad-spectrum, penicillin-based antibiotic prescribed soon after for a supposed wound-infective bacterium obtained overseas. With the eventual shedding of the eschars, I thought the worst was over. Then a centimetre away, new emergent satellite, pinhead-sized, blistering clusters erupted, and evolved similarly! Collectively the multi-ulcerated noisome sore took three months to heal and left pale shiny scarring at the site - a depressing case of necrotic arachnidism. My sister remarked as she examined an Internet site on the topic soon after the first ulceration appeared, "better see a doctor quickly I think - there wont be much left of you if they have to amputate at the neck!" I certainly heeded that advice!

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