Nematode Worms and Tarantulas

by Guy Tansley

Introduction. This article is intended as a 'what to look for' guide to tarantulas suffering from nematode (family Panagrolaimidae, probably a Panagrolaimus sp.) worms. At the time of writing there is no effective cure for this problem and although several treatments were made available to the author, none proved successful. It is not the intention of this article to go into great detail of tested treatments and/or dosages but to simply make the keeper aware of the symptoms and procedures that should be undertaken to prevent further infestation and spread of this particularly devastating ailment.

Over the 15 years that I have been collecting tarantulas, I have had many successes and many losses. Most of these losses I can explain (or at least take an educated guess at); bad moults, premature moults, mould, injury, old age, dehydration etc., but it wasn't until last year (2002) that I discovered something new about tarantula ailments.

A few of these deaths I put down to a 'bacterial infection' as the spiders all displayed the same symptoms; legs curled slightly under, shrunken abdomen, restlessness and an unusual white sticky mass around the mouth. I tried to help the afflicted spiders as much as I could by providing extra heat/humidity and ensuring they had access to an open water dish at all times but all attempts failed and they eventually died.

Most recently I acquired a large wild caught adult female C. huahini and two female A. purpurea that displayed these symptoms within a week of purchase and, putting this down to yet another 'bacterial infection' (more common in wild caught spiders), they were duly disposed of.

Several uneventful months passed but then another spider, this time a long-term captive female B. emilia, came down with the same symptoms. Now at the time there was a brief discussion on tarantula ailments on the internet arachnid mailing lists and this included problems with nematode worms. I'd heard of nematodes over the years but never (or so I thought at the time) been affected by them. A few photos were posted of afflicted spiders, which prompted me to inspect my latest 'bacterial infection' case further.

On inspection I found the spiders' sternum to be very wet, spreading down the vent and to the sides of the abdomen to some extent. The spider became more restless as time went on, spending more time around its water dish and spinning more silk than usual. The palps were constantly held curled under the chelicerae and very rarely placed flat on the floor (in the normal stance). Even when the spider walked or when the cage was disturbed, the palps always remained elevated. There was a strange sweet odour coming from the cage also. Turning the spider over, there was a viscous white mass around the mouth and samples of this were gently removed using a small pin and dropped into a vial containing alcohol. The vial was shook and thousands of tiny worms could easily be seen. Clearing the mouth as much as possible, I flushed the mouth area with water and placed the spider in a quarantined container (a clean, well ventilated container lined with dry tissue and a small water dish).

At this point I contacted Romain Pizzi (a veterinarian with a keen interest in arthropods) to ask his advice on the problem. He was eager to receive swabs from the spiders' mouth and sent the first of two treatments for me to try (Baytril). He also recommended isolating the spider from the rest of my collection and using separate tools (forceps etc) to prevent cross-contamination.

Several days later, a second spider was discovered with the same symptoms as the B. emilia, this time an adult female P. chordatus (see Plate 1). Following the same procedure as before, the spiders' mouth was cleaned and was re-housed and isolated from the rest of my collection. A
second, different treatment (Panacur) was tested on this spider and I crossed my fingers that there would be some good news.

Over the next few days, both spiders were still restless and still spinning copious amounts of silk. Their mouths were cleaned daily to remove any remaining worms and the treatments administered but after approximately two weeks, the *B. emilia* eventually died followed by the *P. chordatus* (from initial symptoms to death was approximately 10-12 days). Both spiders were dropped into alcohol and sent to Romain for a post mortem and he discovered "...nematodes infecting the mouth. Even those with none visible externally, had large numbers present in the deep folds between the chelicerae and the mouth." After several weeks, Romain reviewed the histopathology slides and concluded that "...nematodes are not just affecting the mouth, I have also seen them in section in much deeper tissues in the cephalothorax, and some also have very severely affected book lungs that are very damaged. Some also show signs of an accompanying bacterial infection."

Meanwhile I had another spider with the same problem (another adult female *B. emilia*) but by this time I knew the suggested treatments were unsuccessful so decided to simply flush the spiders mouth with water daily. Posting my findings on the arachnid mailing lists, several people suggested treatments (including garlic and diluted disinfectant) and possible causes but as the weeks passed by, more and more of my collection was falling foul to these worms. One case was particularly disturbing. A recently mature male *B. vagans* was seen with extremely large worms trailing from its mouth (see plate 2) and from that point, all infected spiders were either frozen or dropped into alcohol immediately in an attempt to stop the spread.

There was much discussion over possible causes of infestation and these included crickets, phorid flies and substrate. Perhaps the worms were coming from infested crickets and the worms were moving host and entering the spider via the book lungs or the anus (the mouth, the most obvious point of entry, contains a very fine filtering system preventing even microscopic worms from entering and this would also explain the damaged book lungs). Phorid flies. These flies were present in my spider room at the time of infestation and could easily be vectors of the worms and their eggs, spreading them as they moved freely between containers. Attempts were made to eradicate these pests with some success and all feeding of suspected crickets was suspended until further information could be gathered. My cricket supplier assured me that their crickets had been checked and they found no signs of nematodes and my own tests (agar plates) showed inconclusive evidence also. Nematode worms are present in all commonly used substrates (there is a lot of research done into so-called beneficial nematode worms for agricultural purposes) but these species are causing tarantula keepers major problems.

By this time I had no choice but to take drastic action and decided to thoroughly clean out all of my spiders' containers and re-house them on vermiculite in the hope of preventing further contamination. A mammoth task to say the least, it took three days before all cages were disinfected, thoroughly rinsed, dried and filled with clean substrate. There were one or two isolated cases afterwards but I anticipated this as these were already affected at the time of the clean out. This was June 2002 and since then I have gladly been nematode worm free (in total I lost around ten adult spiders and several juveniles).

**Conclusion.** Although devastating when present, nematode worms are relatively rare in collections and by taking the right precautions and procedures, we can at least limit the amount of damage they do. In summary, typical symptoms to watch out for are; restlessness, spinning unusual amounts of silk, spending long periods around the water dish, any unusual sweet smell coming from the container, a very wet sternum caused by the spider drooling (not to be confused with normal cleaning behaviour) and, most importantly, a white sticky mass around the mouth and holding the palps permanently under the chelicerae. For some reason the chelicerae become paralysed, making it impossible for the spider to clean itself and making feeding impossible. A quick test is to gently shake the spiders’ container. Under normal circumstances, the spider will steady itself with all the legs and this includes placing the palps on the floor also. Infected spiders won't do this. You can also try feeding, as affected spiders cannot attack prey. If your spider accepts prey, chances are worms aren't present. Inspect new spiders carefully especially wild caught ones; paying particular attention to the underside (I noticed an affected *A. avicularia* for
sale at this years BTS show) and to be safe, any new additions should be quarantined for at least three months away from the rest of your collection (ideally in a different room). Use separate tools for these in quarantine and, if found to be infected, it is recommended that the spider be disposed of as quickly as possible. Romain and others are eager to receive samples of nematode affected spiders so ideally specimens should be placed into formalin (alcohol is considered too damaging to the worms) and passed on for further research.

The key lies in finding a treatment that kills the worms but leaves the spider unharmed. I'm confident that there will eventually be a successful treatment available but until then awareness and caution are the best method of prevention against these 'no legged-freaks'.

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*B. vagans* male showing heavy nematode worm infestation.