

Australian Paralysis Tick (*Ixodes holocyclus*)

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The Australian paralysis tick (*Ixodes holocyclus*) is a very dangerous parasite that affects dogs in Australia; specifically on the east coast from North Queensland to Northern Victoria. The main area of distribution is a narrow area running, (roughly confined to a 20-kilometre band), along the coastal areas as indicated in Figure 1.

In northern parts of Australia, ticks can be found all year around. In the cooler southern areas, tick season is generally from spring through to late autumn (Figure 2).

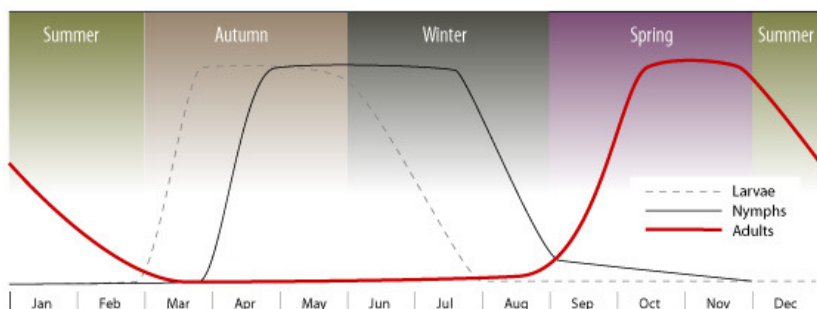


Fig: 2 – Seasonal distribution of 3 stages of *Ixodes holocyclus*

The Life Cycle of the Paralysis Tick

The natural hosts of *Ixodes holocyclus* include bandicoots, wallabies, kangaroos, and other marsupials – basically immune to the effects of the tick's toxin. Other species affected are human, cattle, sheep, horses, dogs, cats, poultry, and other animals. The *Ixodes* tick goes through the three stages of Larva (6 legs), Nymph (8 legs), and Adult (8 legs), attaching to and feeding on one host during each stage, then falling off and moulting before re-attaching to the same or more often a different host for the next stage.

If no host is available, the adult can survive up to 77 days without feeding. The Female Adult feeds and engorges for 6 (cool weather) to 21 days (warmer weather), before she drops to the ground to lay eggs, thus beginning the cycle again. It is important to note that the **adult female does not inject detectable amounts of toxin until the 3rd day of attachment to the host**, with peak amounts being injected on days 5 and 6. Conversely the Adult Male after crawling on to the host does not attach or suck blood, but spends its time wandering around on the host looking for a female with which it can mate. The adult male is yellowish-brown, flat, oval, and smaller than the female.

What do paralysis ticks look like?

1. The middle 2 pairs of legs are lighter in colour, unlike the Bush tick and Brown Dog tick which have the same colour legs.
2. Legs are “bunched up” at the front of the body.
3. They have a long mouth part which is called the “snout”.

Paralysis Tick Bush Tick Brown Dog Tick

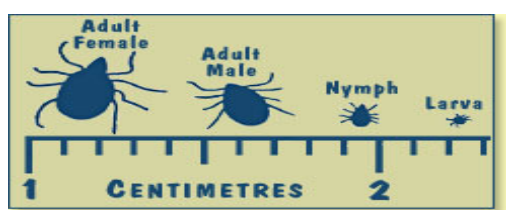
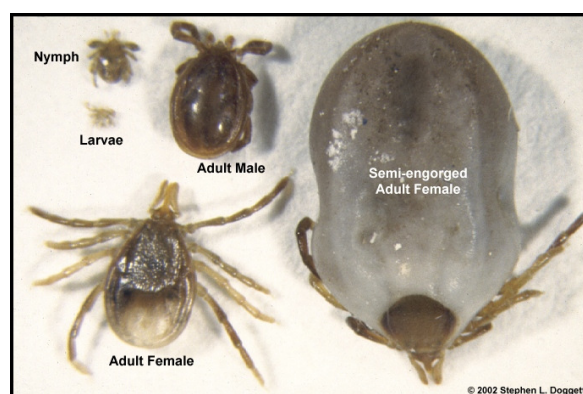
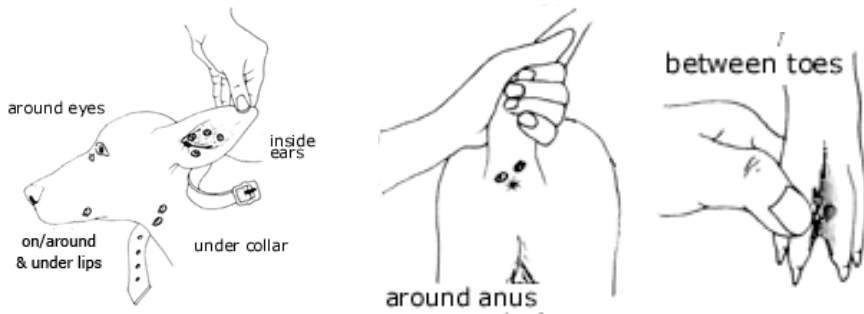


Fig: 1 – distribution of *Ixodes holocyclus*



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They can attach anywhere even in the ears on the lips or around the anus. However, the ticks usually attach on the front half of the dog. The paralysis tick climbs up along grass, trees and bushes jumps onto the host and it is for this reason, we mostly find it on upper body parts such as lips, chin, around eyes, ear, back of head, neck, front legs and less commonly around the anus and between the toes.



The saliva of the tick has local pain killer in it so the host doesn't notice as the "teethed" mouth part digs in deep and attaches, sucking the blood from the host.

If you find a tick, don't stop searching as isn't uncommon to have 2-3 ticks. To make it trickier ticks can also fall off the animal before being found, however it always leaves a severe localized skin reaction with hardened, red, raised skin (see photo).



While the tick sucks the blood it injects a neurotoxin called Holocyclotoxin, which damages or destroys the cells of the central nervous system. The tick is fairly small when it attaches to its host, growing in size as it consumes more blood. Illness doesn't occur quickly, unlike the bites of snakes & spiders, it can take hours or even days before symptoms of poisoning become apparent.

What to do if a tick is found

It is recommended you wear a pair of latex gloves while removing a tick.

1. Immediately pull it off with forceps or a special tick remover device by grabbing and twisting in a clockwise direction. Please note that when removing a tick it is important not to disturb the body of the tick and to try and grab the tick by its head, at the point of insertion in the skin.
2. Do not to use irritant substances such as turpentine, kerosene, or petrol. These will kill the tick but won't make it any easier to remove and will also cause the tick to inject more toxin before dying. Chemicals can also cause a very nasty sore and unnecessary pain at the site of the tick bite.
3. If by any chance the head of the tick stays in the skin scratch it out with your fingernail. The head will not inject any more poison once the body has been removed, but it may cause a foreign body reaction similar to a splinter.
4. Once removed, save the tick by placing it in a jar of methylated spirit or alcohol so you can take it to your veterinarian for identification.



The best advice is that if you can remove the tick easily and cleanly yourself then do it, if not then a quick visit to your vet for assistance is worthwhile. If either of these options are not feasible then applying any of the tick controller products, such as Advantix, Frontline or topical products that kill the tick and allow removal once it is dead. Please note that it may take some time for the tick to die and thus increase the venom exposure, therefore unless impossible to access veterinary assistance the best course of action would be to take the dog to a vet. The **critical factor** in having a successful outcome is **TIME** – the less time exposure to the tick and the venom the quicker the treatment response and minimizing the risk of death.

The residual effect

Even when you find a tick and remove it, your pet isn't out of the woods. There's a very good chance the tick could have left a residue of poison under the skin which will then be slowly absorbed. It is important to keep an eye on him or her for the next two to four days, keeping it cool and calm while avoiding excitement and exercise.

The signs of tick poisoning

Once clinical signs become apparent it is important to note that any increased body temperature due to either hot weather or exercise will exacerbate symptoms. Therefore keeping your dog calm and in a cooler environment will assist in managing the symptoms until you can access veterinary care.

If left to run its course, a case of tick poisoning goes through three stages.

Early signs:

- A change in voice; the bark becomes softer and/or changes pitch.
- Weakness in the back legs; walking along then sitting down suddenly is a common early sign.
- Loss of appetite
- Vomiting, especially if it happens several times in a day and you see froth.

Later signs:

- Wobbliness in the back legs.
- Excessive salivation and vomiting is not uncommon.
- Panting, progressing to loud breathing, even grunting noises.
- Many dogs will exhibit a moist cough and breathing problems before other signs.



Worsening signs:

- As signs of poisoning progress, the animals become unable to stand as forelimbs become affected.
- Difficulty in swallowing which can progress to depression of the gag (pharyngeal) reflex and attempts to clear the throat may produce a characteristic harsh, groaning respiratory sound.
- Regurgitation of oesophageal contents and saliva pooling can lead to aspiration of the fluids into the lungs and pneumonia.
- Breathing becomes exaggerated and difficult.
- As breathing becomes more difficult and laboured, the gums become cold and blue-tinged.
- Coma and death follows quite quickly.

What to do if your dog is showing clinical signs?

1. Try to keep yourself & your dog as calm as possible.
2. Remove any food & water as poisoning can prevent the dog from swallowing properly, to minimise the risk of choking.
3. Take it to the veterinarian as soon as possible. It is important to not delay taking your dog to a vet, as the longer it takes to diagnose and initiate treatment worse the symptoms will become, which will significantly impact on prognosis and may lead to death.

What treatment will be performed on a dog that has been poisoned by a tick?



Treatment depends on the severity of the symptoms, and is different from case to case. The greater the severity, the more care the animal will need & mortality rate increases, which is why it's so important to seek veterinary care as soon as you suspect tick poisoning.

Initially the dog will be stabilised according to the presenting symptoms and their severity. This may consist of antiserum, sedation, supportive fluids and oxygen. The dog will be hospitalised and this averages to be 2-4 days according to the severity of the symptoms.

Post treatment it is important to keep your dog:

1. **QUIET** and **COOL** for 2 weeks after tick poisoning because of the possibility of delayed cardio-toxic effects.
2. Feed **small frequent meals** and ensure that your dog is **drinking enough fluids**. Need to ensure access to fresh cool water noting how much water they are actually drinking.



3. **Check** that your pet is **urinating freely**. This means **observing** a stream of urine not just "that he's cocking his leg"! This is not generally a common-side effect of tick poisoning but the inhibition of a dog's ability to urinate can occur and if missed become an emergency very quickly.

It is important to realise that your pet is **still** susceptible to poisoning from any future ticks. The antiserum given at the time of treatment does not have any lasting protective effects and so preventative measures should be undertaken.

How do you prevent tick poisoning?

Critical to preventative strategies is to CHECK your pet thoroughly every day for ticks.



1. Keep away from bushland areas in the peak tick season which runs from August to April
2. Clip long haired dogs
3. Searching pets – Start from the tip of the nose & work your way right down to the tail. Ensure you check carefully between the toes, inside the ears. Daily searching is critical during tick season as no known product on the market is 100% effective against this deadly parasite.
4. Products – There are a number of products on the market for dogs, such as Frontline Plus Top Spot (fortnightly), Frontline Spray (fortnightly), Fidos Fre-Itch Rinse Concentrate, tick collars, Advantix (fortnightly) and Permaxin spray (2-3 times per week).



It is important to remember that **NO** prevention is 100% effective alone and gives 100% guarantee, so combining a few methods will help towards minimizing risk and protecting your dog.

Therefore in summary the best course of action is to never take a wait and see approach as time is critical for the best outcome if your dog is presenting with any of the clinical signs. Also if you are not able to or confident enough to remove the ticks when you find them then seeking veterinary assistance will save a lot time and potential grief.

Finally developing a strategy with regards to prevention and early intervention when a tick is found on your dog will minimize risk and maximize the health of your dog. For more detailed information in relation to incidence of Paralysis Tick in your area it best to enquire further with your local Veterinary Hospital.

