

Notes on the red ladybird beetle spider *Paraplectana thornntoni* (Blackwall, 1865) from South Africa (Araneae: Araneidae)

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Abstract: The genus *Paraplectana* Brito Capello, 1867 is known from Africa and Asia. *Paraplectana thornntoni* (Blackwall, 1865) is an African endemic species described by Blackwall (1865) from Mozambique and with their bright colours, they mimic beetle species belonging to the family Coccinellidae. A female *P. thornntoni* female was observed over a 10-day period on a farm in Barberton, Mpumalanga, South Africa. Observations on their behaviour, distribution and conservation are provided.

Keywords: behaviour, Cyrtarachninae, egg sac, spanning-web, velvet mites

INTRODUCTION

The genus *Paraplectana* is known from Africa and Asia. *Paraplectana thornntoni* (Blackwall, 1865) is an African endemic species described by Blackwall (1865) from Mozambique. They belong to the subfamily Cyrtarachninae. Members of this subfamily construct a “spanning thread-web”, a basic orb-web, but the web’s diameter, sticky spiral spacing and viscid thread diameter differ from that of typical orb-webs. The viscid threads are studded with large droplets. Each of the short threads between the radii is known as a spanning thread, and is unique in that it breaks when prey comes into contact with it. The prey flies into the web, gets stuck to a viscid thread, the thread breaks, and the spider pulls the prey up to the hub of the web to feed on (Stowe, 1986; Tanikawa *et al.*, 2014).

Paraplectana species are known as ladybird beetle spiders because they purportedly mimic beetles belonging to the family Coccinellidae and the tortoise beetles of the family Chrysomelidae (Heron, 2016). The beetles secrete a fluid from joints in their legs, which gives them a foul taste. This and their bright colours warn would-be attackers like birds to ignore them. For members of *Paraplectana*, with their vivid, aposematic colouration, it provides the necessary protection.

Two species have been recorded in South Africa and they can easily be recognised by their colour and abdominal patterns. The abdomen of *P. thornntoni* is shiny with a jet-black ground colour with raised, large and conspicuous bright orange-red, sometimes with markings dorsally (Figs 1a & 1b). This species is commonly known as the red ladybird beetle spider, while *P. walleri* (Blackwall, 1865) with its yellow body and black spots (Cooper & Dippenaar-Schoeman, 2020) is known as yellow ladybird beetle spiders.

Paraplectana thornntoni is an African endemic species described by Blackwall (1865) as *Eurysoma thornntoni* from a region through which the Shire River flows to its confluence with the Zambesi in Mozambique. *Peniza testudo*, a junior synonym of *P. thornntoni*, was described by Thorell (1868) from Caffraria, an old name for parts of the Eastern Cape. It was also recorded by O. Pickard-Cambridge (1879) from Caffraria. In South Africa, although the species is rarely collected, it was sampled from four provinces (Dippenaar-Schoeman *et al.*, 2022).

We present notes on the red ladybird beetle spider *P. thornntoni* from South Africa as observed by the first author (KdP) in the field. Images of a live specimen are provided with notes on web-building and egg-laying behaviour.



Fig. 1. *Paraplectana thornntoni* female: 1a. Dorsal view. 1b. Lateral view. (Photos: Kobie du Preez)



Fig. 2. *Paraplectana thornntoni* female with the ladybird beetles they mimic. (Photo: Susan Dippenaar)



Fig. 3a. *Paraplectana thorntoni* gravid female. 3b. A thinner female after egg laying. 3c. The egg sac. (Photos: Kobie du Preez)

METHODS

A female *P. thorntoni* was observed over a period of 12 days (13-25 April 2020) on Portion 8 of the farm Aylestone near Barberton in the Mpumalanga province by the first author (KdP). Photographs and videos were taken of the activities of the spiders (see BLOG <https://aylestone8.wordpress.com>). Unfortunately, the female disappeared before she could be sampled.

RESULTS

13 April 2020: A red ladybird beetle spider was discovered by the first author while walking through the bush on the farm Aylestone in Barberton, in the Lowveld of Mpumalanga, South Africa. This was early in the morning and photographs of the specimen were taken and it was identified as *P. thorntoni* of the family Araneidae (Figs 1a & 1b). The spider was not disturbed by any of the author's actions, and did not try to move away. It just sat on the leaf as if it was glued there. On the photographs (Fig. 1a), a small silk layer can be seen below the spider, which probably serves as a platform to cling to. From her swollen abdomen it could be deduced that she was most likely gravid.

14 April: The next morning, the spider was more or less in the same spot as the day before, in the open, not hiding and stuck to her post with her legs neatly tucked in as the day before. This was her daytime posture that I observed in the next week or so.

15 April: Even after a 42 mm rain shower the night before, she was still in the same position on the bush. She remained on the same bush for a few more days.

19 April: In the morning and afternoon, she was gone.

20 April: In the morning an egg sac was found in the grass, approximately 30 cm from the ground (Fig. 3c). However, the female was still missing. The egg sac was secured to the grass with silk and looked quite sturdy. The whole structure was 40 mm in length and 12 mm in width. Only in the late afternoon was the female eventually found in her new hiding spot in a thorn tree close to the egg sac. She was visibly flatter than before (Fig. 3b).



Fig. 4. *Paraplectana thorntoni*: 4a. Female moving around building the web. 4b. Web after egg laying. 4c. Web a few days later. 4d. Egg sac with red velvet mite. (Photos: Kobie du Preez)

That night, her web was only two strands of silk without diagonal reinforcements (Fig. 4b). A loose strand with a large drop of the sticky fluid was swaying loose. Her energy was clearly used on building her egg sac. While constructing the web, it was very interesting to see her pulling threads with sticky droplets from her spinnerets (Fig. 4a). A video of the process was taken and it can be viewed at <https://youtu.be/1PRfnU6sRLA>.

21 April: The spider was breaking down the web early in the morning. She was reeling in the silk strands and gathered them in a bundle close to her cephalothorax. A video of the process can be viewed at <https://youtu.be/NciP7aRy3og>.

22 April: The spider was not found in the morning or during the day. The egg sac remained unchanged. That night she was found about one metre to the back. Two main strands of silk were used and she was busy eating. At least her hard work was paying off in a nice meal.

23 April: Day 10 since she was discovered, her condition improved again and her egg sac was still intact. That night, her web was a bit more intricate than the previous night, so she definitely had more energy. The silk strands were now diagonal again. A moth (still alive) was dangling from a loose strand.

24 April: In the photo taken that morning, one can visibly see the difference in her condition; her abdomen was inflated again.

27 April: Unfortunately, at this stage, the female had disappeared. On the egg sac a larger red arachnid was visible (Fig. 4d) and it was now becoming clear that they definitely were not spiderlings but red velvet mites that invaded the egg sac (Fig. 5a).

5 May: The egg sac was opened and 22 mites of different sizes were found. Some were too large to fit through the tiny holes and they must have cannibalised the other mites to survive.

CONCLUSION

Little is still known about the behaviour of many spiders in South Africa, especially species of rare genera such as *Paraplectana*. We now know they sit on top of leaves during the day. They build their webs at night, which is a spanning thread-web. They feed on moths and they are found in low vegetation and possibly mimic the ladybird beetle that is also an inhabitant of low vegetation. Their egg sac is attached to the vegetation and could thus be parasitised by red velvet mites.

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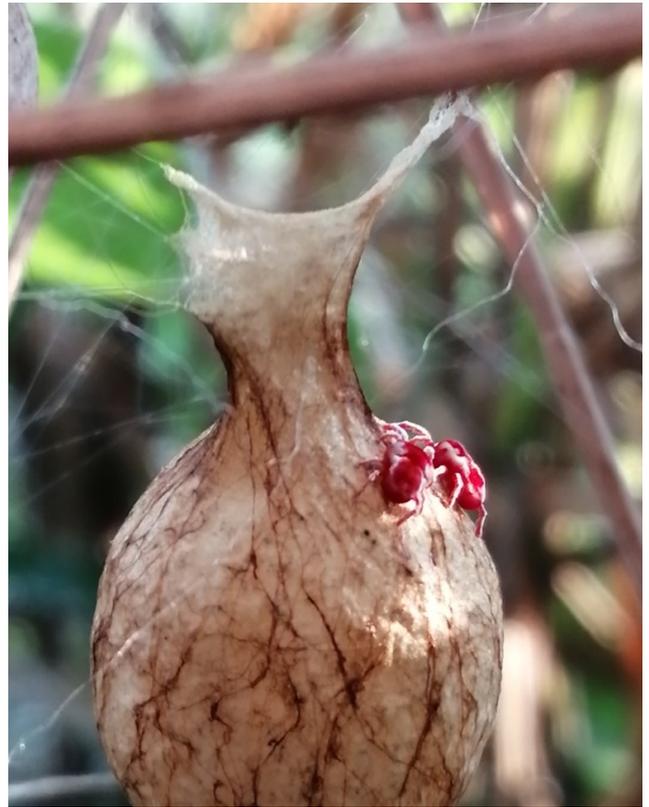


Fig. 5. *Paraplectana thornstoni* egg sac infested with red velvet mites (Photo: Kobie du Preez)