**PECKHAMIA 213.1**, 12 July 2020, 1—6 ISSN 2161—8526 (print)
**LSID** urn:lsid:zoobank.org:pub:A87F4AB1-7C21-430D-A91B-DBAAFAC50830 (registered 11 JUL 2020) ISSN 1944—8120 (online)

# Hunting and brooding behaviour in *Phaeacius* sp. indet. (Araneae: Salticidae: Spartaeini), a new record for the Andaman Islands

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**Abstract.** This paper documents the first record of *Phaeacius* (Simon 1900) from the Andaman Islands, as well as observations of their behaviour in nature over a period of two months. Observations included predation and feeding on both ants (*Technomyrmex albipes*) and a salticid ant mimic (*Myrmarachne plataleoides*), and the maintenance of long, vertical silk lines above an attended egg-sac covered with debris.

## Introduction

*Phaeacius* (Simon 1900) is a genus of jumping spiders in the subfamily Spartaeinae (Wanless 1984). Many spartaeines are known to be araneophagic (Li 2000) and differ from other salticids in their use of silk to build platforms and simple web structures that aid them in prey capture. Spiders in the genera *Portia* and *Spartaeus*, for example, build prey-capture webs while most other salticid spiders typically only build silken retreats to rest, moult and oviposit. Spiders in the genus *Phaeacius* are not known to build webs or silken retreats, but lay down small, thin sheets of silk above the substrate when moulting or ovipositing (Jackson 1990).

Unlike other genera of Salticidae that actively move about in search of prey, *Phaeacius* is an ambush predator that waits stealthily on the trunks of trees. Most salticids leap towards their prey by jumping several times their body length, earning their common name, *jumping spiders*. However, *Phaeacius* typically lunge at their prey by moving forward as little as half their body length and 2-3 mm upwards (Jackson 1990).

Most studies that describe the behaviour of *Phaeacius* (Jackson & Hallas 1986; Jackson 1990; Li 2000), are primarily based on laboratory observations, and very few papers detail behaviour of spiders in this genus in its place of natural occurrence (Abhijith & Hill 2019). Since these spiders are sedentary ambush predators, it was possible to observe the behaviour of one adult female *Phaeacius* sp. indet. from 12 APR to 7 MAY 2020, and the behaviour of one juvenile that appeared to represent the same species, from 4-12 JUN 2020. Observations were made for 3-5 minutes every day at intervals of 2-3 hours between 06:00 and 16:00. Since this spider is diurnal, night-time observations were limited to incidental encounters. To minimize the influence of the observer during encounters, a distance of ~60-90 cm from the spider was usually maintained. However macrophotographs to illustrate the behaviours detailed in this study were taken within 10 cm of each spider. For these close-up encounters, the observer moved extremely slowly towards the spider and always approached the spider from a point lower than its position on the trunk of a tree.

The last survey of the spider fauna of the Andamans was published by B. K. Tikader (1977). A total of 11 species of Salticidae across 7 genera were listed in this survey. However, there was no mention of *Phaeacius*. Consequently, this paper serves as the first record of *Phaeacius* from the Andaman Islands.

## Observations

*Location and habitat*. The Andaman archipelago consists of 572 islands. The flora of these islands consists primarily of tropical evergreen, semi-evergreen, moist deciduous, littoral and mangrove forests. Islands inhabited by people also have cultivated vegetation. The observations for this study were made in a private plantation on Havelock (Swarajdweep) Island. Vegetation on this property was a mix of planted trees such as coconut, mango and areca palm alongside naturally occurring littoral vegetation to include *Manilkara littoralis*, *Terminalia catappa*, *Gyrocarpus americanus* and *Guettarda speciosa*. The plantation was approximately 100 metres from the seashore.

The *Phaeacius* spiders detailed here were found on an areca palm (*Areca catechu*). The trunk of this tree was actively used by weaver ants (*Oecophylla smaragdina*) as a route for transporting food to their colonies. A smaller ant species, *Technomyrmex albipes*, and other arthropods to include beetles, bagworms and centipedes, were frequently observed on these tree trunks.

*Position and movement*. As ambush predators *Phaeacius* assumed a flattened position on the *Areca* trunk. Their colouration and patterns allowed them to visually blend in with their background (Figure 1). This is particularly effective against potential prey, to include other species of Salticidae that have exceptional eyesight that is comparable to our own (Li 2003). The two *Phaeacius* sp. indet. individuals that were observed were usually seen resting with legs I-II in a forward position, with legs I pointing directly forward. Legs III extended laterally while legs IV were pointed to the rear. This allowed the spiders to maintain a low profile. In this stationary position, both the adult and juvenile that were observed would rest flat on the trunk facing downwards, directly towards the ground. The adult female was usually seen on the *Areca* palm trunk at a height of 220-230 cm from the ground. The juvenile was later seen on this trunk at a height of 90-100 cm above the ground (Figure 1).

Movement of the resting adult female *Phaeacius* was only observed when a group of weaver ants ventured too close to her position. In these situations, the spider ran in rapid bursts for short distances and then returned to a sedentary position when there was no longer a perceivable threat.

*Web Structures, nest and oviposition*. The adult female *Phaeacius* was spotted on a newly created silken structure that was covered with debris, on 29 APR 2020 (Figure 2:3), during peak summer when there was a marked increase in daytime temperature to a high of 32C. This structure was approximately 3.0 ± 0.1 cm at its widest point and 3.0 ± 0.1 cm long at its longest point, located on the trunk of the *Areca* tree at a height of 222.0 ± 0.5 cm from the ground, near the place where this female had usually been seen previously. The female *Phaeacius* stayed within reach of this structure, often with at least two legs in contact with it (Figure 2:3-4). Seven days after this structure was first detected, the upper silk layer was found to be torn off and discarded. The presence of eggs or egg remnants indicated that this was an egg-sac (Figure 2:4). In captivity, female *Phaeacius* are known to feed on their own eggs (Jackson 1990), and that may have been the fate of this brood.

The female *Phaeacius* had also placed 10–12 lines of silk that ran vertically along the length of the tree trunk just a few millimetres over the egg-sac, in contact with her as she rested (Figure 2:1). The length of each line of silk was nearly identical, with an average length of 46 cm. While the purpose of these lines of

silk is not known for certain, they might serve as a defensive structure against aerial predators that might attack either the spider or the nest. Or they might serve to alert the female to the presence of either prey or a dangerous intruder. When a single strand of silk was accidentally damaged by a part of my camera during one encounter, the spider seemed visibly alarmed for a brief period and repaired the damaged line of silk shortly thereafter (Figure 2:2). Four weeks after the nesting female was observed, a juvenile *Phaeacius* that was roughly half the size of the adult female was spotted on the same tree. This juvenile built its own silken retreat within days.

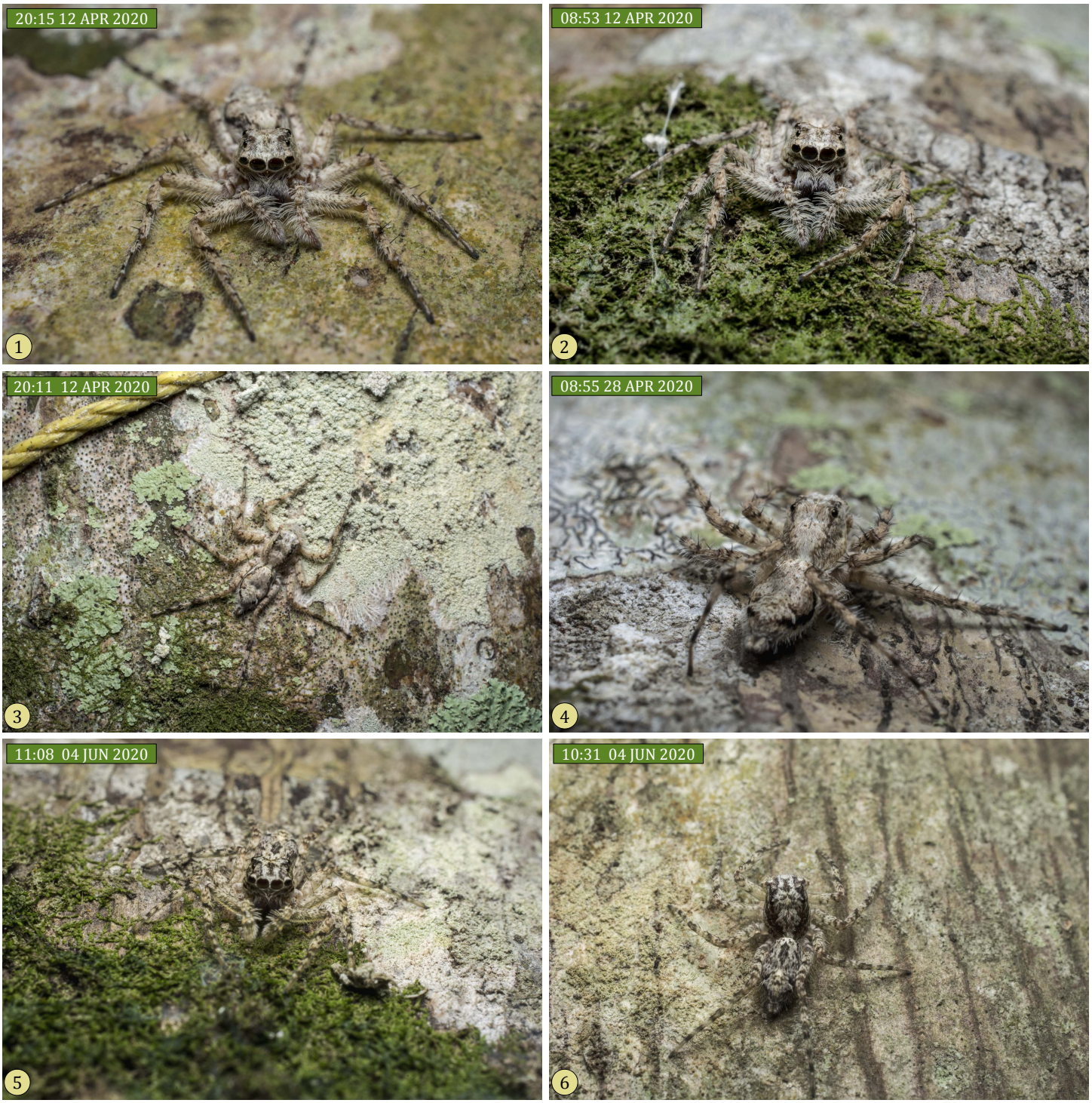


**Figure 1.** *Phaeacius* sp. on the trunk of an *Areca catechu* palm in Havelock Island. **1-4,** Views of the adult female that was observed. **5-6,** Views of the juvenile that was later observed on the same tree.

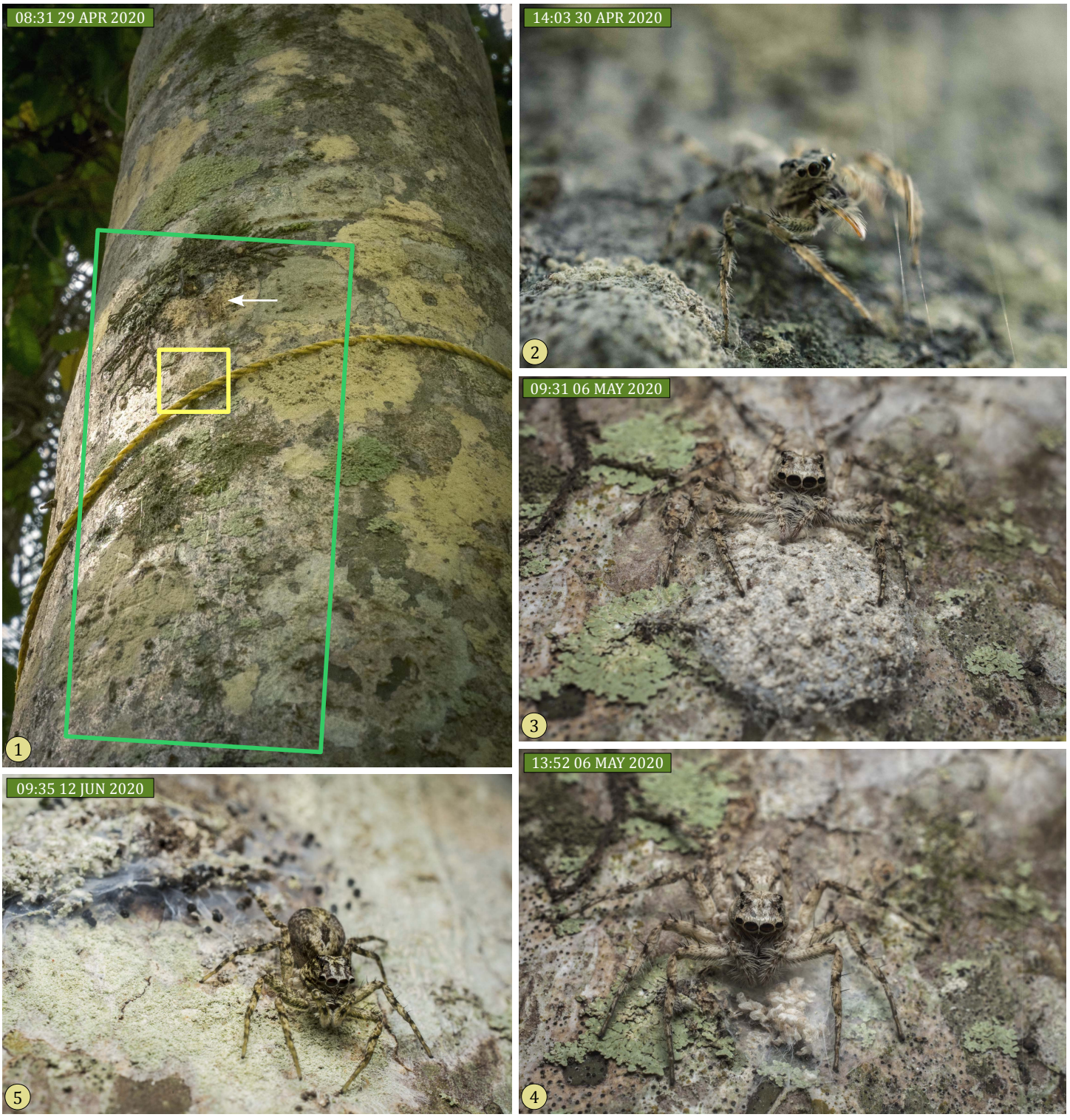


**Figure 2.** *Areca catechu* tree trunk and the two *Phaecius* that were observed on it. **1,** Lines of silk running vertically along the trunk (green inset) below the resting female *Phaeacius* (arrow), and the egg-sac location (yellow inset). **2,** Female *Phaeacius* repairing the vertical lines of silk running over it and its nest. **3,** Female sitting with front legs and pedipalps touching her egg-sac. **4,** Female tending to her egg-sac after the cover had been removed. **5,** More than one month later this juvenile *Phaeacius* was observed in the same area of this tree trunk, near a similar nest (upper left), but at a lower level.


**Figure 3.** Female *Phaeacius* feeding on a captured female *Myrmarachne plataleoides*.

*Hunting Behaviour*. Before construction of her egg-sac, the adult female *Phaeacius* was seen sitting and waiting at different places on the trunk of the *Areca* palm (Figure 1). This change in location was observed every few days. However, after the egg-sac was seen, this female was only seen resting next to that structure and was not observed to venture out for food. Many individuals of a relatively small species of ant (*Technomyrmex albipes*) were frequently seen moving close to this egg-sac. The female would regularly feed on any individual *T. albipes* that ventured close enough to her. The *Areca* palm trunk was also occupied by a large number of weaver ants.

Subsequently the tree was also frequented by a salticid mimic (*Myrmarachne plataleoides*) of the weaver ant (*Oecophylla smaragdina*). The female *Phaeacius* was seen feeding on a female *Myrmarachne plataleoides* (Figure 3). We were able to get within 10 cm of the female without any apparent change in her feeding behaviour. A short 30s video clip that can be viewed online (John 2020) was recorded within

10 cm of this spider as she was feeding on the *Myrmarachne*. The female *Phaeacius* fed through the duration of this video clip and continued to feed at the same location after we slowly backed away to a distance of more than 90 cm.

*Threat Perception*. Before building her egg-sac, the female *Phaeacius* appeared to be exploring locations. These were within a distance of 10 ± 1 cm from the pivotal position that eventually became the site of the egg-sac. During these exploratory movements, she would sometimes encounter weaver ant (*Oecophylla smaragdina*) workers. During these encounters, the ants would assume a territorial stance, with raised gaster and open mandibles. On sensing that it had been detected by the ants, the female *Phaeacius* would often retreat rapidly for just a few centimetres until it could not be seen by the ants.

This female, usually sitting ~220 cm above the ground, did not seem easily alarmed by the presence of humans or cameras in close proximity. She would simply continue in her resting position, occasionally turning towards moving objects on the trunk. These included passing weaver ants or other spiders, including *Cosmophasis* sp. The juvenile *Phaeacius* observed one month later rested at a lower level, 90-120 cm from the ground, and was easily alarmed by human presence at a distance as far as ~60 cm away. Upon detecting a human presence at this distance, the juvenile would run in rapid bursts horizontally around the trunk to the other side until it was out of the observer's sight. However, if the juvenile was approached from a height lower than its position on the trunk, it reacted less cautiously and remained sedentary.

*Comments*. While these observations provide a preliminary view of some of the behaviours of *Phaeacius*, there still remains much to be learned about this fascinating genus of sit-and-wait jumping spiders. Observing spiders in their natural habitat can unlock a wealth of natural history information and knowledge that can augment and inspire further studies, to include laboratory-based studies.

## Acknowledgements

I would like to thank Chetana for her guidance and support both emotional and literal as I climbed trees, Vena and Divya for being spider-shaped inspirations. I would also like to thank DIVEIndia for creating a safe space for critters of all sizes.

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