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Inside this issue:

A new species of Tiger Spider, Genus *Poecilotheria*, from Northern Sri Lanka

Ranil P. Nanayakkara & Nilantha Vishvanath p6-15

Handling tarantulas & the BTS constitution

Martin Nicholas p16-17

Some notes and observations on the breeding of *Poecilotheria ornata* and *P. rufilata*

Ray Gabriel p18-27

The Theraphosa situation – a visual ID guide

Chris Graham p28-31

Report on a bad moult experience.

Kyle Smith p31-33

Does homosexuality occur in spiders?

Wes Flower p38-41

20 Days in Cambodia

Guy Tansley p42-47

A NEW SPECIES OF TIGER SPIDER, GENUS *POECILOTHERIA*, FROM NORTHERN SRI LANKA

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Introduction

The Family Theraphosidae Thorell, 1869 is represented by 939 species in 121 genera worldwide except Antarctica (Platnick, 2012). Most Theraphosidae are found in tropical areas but some representatives live in subtropical and temperate regions. They are mainly terrestrial in habit, living in burrows and other natural cavities or under rocks and fallen logs. Arboreal forms are found mainly in the tropical new world, Africa and Asia. *Poecilotheria* Simon, 1885 is restricted to mainland India and the island of Sri Lanka. So far, 15 species of *Poecilotheria* have been recorded; eight from India and seven from Sri Lanka (Platnick, 2012). However, it should be noted that *P. pococki* Charpentier, 1996 which is mentioned as a separate species is in fact a junior synonym of *P. smithi* Kirk, 1996. Most of these species are

still poorly known and have not been revised since their original description.

The spiders of the genus *Poecilotheria* are known for their large size, colourful markings, their lightening-fast speed and their potent venom (Nanayakkara & Vishvanath, 2011). Dorsally most of the spiders in the genus are marked cryptically with colours of brown, black and grey, with a few exceptions which are metallic blue, green, yellow and black in colour. The ventral aspect of these spiders are marked with intense yellow, white, lilac and black depending on the species, they have been easily differentiated into species by the ventral markings of leg I and IV, which is unique to each species. When compared to other theraphosid spiders, the genus *Poecilotheria* has some of the most colourful species of spiders in the world.

Poecilotheria are arboreal spiders that inhabit bark peels, naturally occurring tree hollows and, at times, found under rocks, decaying trees and in cracks in brick walls; however during the monsoonal period they display a tendency to enter human dwellings that border forested areas. This tendency appears to be more prevalent amongst the males.

During a survey on the spider fauna of Sri Lanka the authors discovered a previously unknown species of *Poecilotheria* in the Northern part of the country, which is described herein.

This new species of *Poecilotheria* was noticed in 2009, when a survey was carried out on the Theraphosidae spiders of Sri Lanka in the northern part of the country. The first specimen of this new species, which was brought to the attention of the authors, was a dead specimen of a male which had been killed by local villagers. Upon close inspection it was noticed that it did not conform to the descriptions of any of the species of *Poecilotheria* so far described from the island, differing in the possession of a ventral abdominal band, among other significant differences. The only other species of *Poecilotheria* which possesses such a band is *P. regalis*, found in mainland India. In order to establish if this really was a new species to Sri Lanka and to the world, the authors carried out intensive and extensive surveys in the northern part of Sri Lanka to establish the distribution and ecology of this new species, but what was lacking was a female or any other specimen of the same type. Days of extensive searching in every tree hole and bark peel were rewarded with a female and to our satisfaction several juveniles too. With help from Sub Inspector of Police, Puraja, we were able to secure or study more specimens of the same type in their natural habitat. Research in the Northern Province became possible due to the end of the 29 years long conflict that had affected the area.

Materials and Method

All specimens were collected from Mankulam, Northern Province of Sri Lanka using a 30cm diameter hand net. The specimens were preserved in 70% alcohol and deposited in the

National museum of Sri Lanka and the wildlife training centre museum at Giritale, Sri Lanka.

The specimens used in this study were drawn and dissected in the Zoology Department of the University of Colombo using an Olympus binocular microscope and all digital images were taken using a Canon 450 DSLR fitted with an 18-55mm standard lens with macro rings. The specimens were drawn to scale using digital vernier calipers, which was also the method by which measurements were obtained. All measurements are in mm.



Taxonomy

Poecilotheria rajaei sp. n. (fig 1-25)

Material examined. – Holotype: mature female collected from Mankulam, Northern Sri Lanka, 9° 7' 25.93" N, 80° 26' 51.51" E, 12 September 2009, Collected by M.R. Purajah and Ranil P. Nanayakkara, deposited in National museum of Colombo, Sri Lanka.

Paratypes: males – (all collected from type locality) collected by M. R. Purajah and Ranil P. Nanayakkara, 15 October 2009.

Others – mature female, collected from old doctor’s quarters of Mankulam Hospital. Northern Sri Lanka. Additional material examined: moults of juvenile and mature specimens.

Etymology: The spider is named after Sub Inspector of Police, SI Michael Rajakumar Purajah, in recognition of his support and tireless hours in the field, while the work was being conducted on this new species of *Poecilotheria*

Diagnosis

Poecilotheria rajaei n. sp. falls in to the group of *Poecilotheria* which has daffodil yellow colouration on the prolateral face of leg I and II

(femur, patellae and, to some extent, the tibia). In India this group is made up of *P. striata* Pocock, 1895, *P. regalis* Pocock, 1899 and *P. hanumavilasumica* Smith 2004 and in Sri Lanka by the single species *P. fasciata* (Latreille, 1804) (Smith, 2006). Though the new species has similar leg patterns to *P. fasciata*, which is the type species for the whole genus *Poecilotheria*, it can readily be differentiated from all other species of *Poecilotheria* recorded from Sri Lanka by the ventral abdominal band (pinkish grey in colour) which passes right across the abdomen from side to side, is situated behind the epigastric fold and encompasses the booklung covers. Though *Poecilotheria rajaei* somewhat resembles *P. regalis* (which is found in India), by the possession of an abdominal band, it can be easily differentiated by the distinctive half -moon shaped markings on the proximal end of the femur of legs III and IV. The two can also be set apart from the ventral surface of the tibia in leg I; in *P. rajaei* the broad black diagonal band which starts distally, comes down diagonally half way and then thins out and continues down the margin of the tibia to join with the patella, whereas in *P. regalis* it covers only half of the tibia. The distal black band of the patellae is not continuous but has a clear separation in the middle, whereas in *P. regalis* the black band displays no clear separation but only a slight notch.

fig 2: *P. rajaei*, female



fig 3: *P. regalis*



Illustrations of legs I and IV from *P. rajaei* sp. n. (**fig. 2**) and *P. regalis* (**fig. 3**) are provided for comparative purposes.

Female holotype (**fig. 1**): Total length, including chelicerae but excluding spinnerets, 62.29. Carapace – caput profile low, length 26.18, width 23.39. Ocular tubercle (**fig. 18**) length 3.32, width 4.89; somewhat wide. Foveal groove, deep and transverse. Chelicerae (**fig. 12**) length 13.78. Abdomen length 22.33, width 14.96. sternum (**fig. 22**) with one pair of posterior submarginal sigilla. Labium with small granules, c. 100. Maxilla with small granules c. 100+. Paired labiosternal depression present on labiosternal suture. Maxilla of pedipalp (**figs. 13 & 19**) 2/3 rows of

a line of approximately 70 tapering stridulating lyra/setae on the prolateral face of the maxilla. Two black tubercles (**fig. 20a**) are present on the anterior edge of the lyra (**fig. 20b**), one large and the other much smaller. These lyra/setae act against 3 rows x18/22 moderately long straight strikers on the retromargin of the cheliceral furrow.

Leg and palp segment lengths in Table 1. Spines absent on all prolateral and retro lateral faces of the leg segments. 3-4 inferior spines on the metatarsi of legs III-IV. Tarsal Scopulae: palp and legs I-II integral or part divided: legs II-IV integral or part divided – not by setae. Scopulae of tarsus and metatarsus of legs I-II well developed compared to legs III-IV.

fig 4: *P. rajaei*, male



fig. 5 *P. rajaei*, female



fig. 6 *P. rajaei*, male



Table 2: Leg and palp lengths of *P. rajaei* sp. n. – female holotype

	FEMUR	PATELLA	TIBIA	METATARSUS	TARSUS	TOTAL
PALP	14.14	7.52	9.62	NIL	9.48	40.76
LEG I	21.64	8.61	17.55	15.62	7.55	70.97
LEG II	20.07	6.95	17.42	14.58	8.22	67.24
LEG III	16.72	5.82	12.49	11.30	7.99	54.32
LEG IV	19.93	6.67	15.43	15.60	7.76	65.39

Metatarsal scopulae: legs I-II, 95% integral; leg III, 75% integral and leg IV, 50%, divided by a line of stiffened setae. Spermathecae: a simple fused conical seminal receptacle typical of the genus.

Colour – Dorsal Surface (**fig. 7**) as the norm for



7

the genus the dorsal surface is cryptically marked with grey, black and white over its body and legs. As with *P. fasciata*, *P. striata*, *P. regalis* and *P. hanumavilasumica* the prolateral face of the femora of legs I-II have a dash of daffodil yellow. The carapace has a dark median line, which encompasses the ocular tubercle and the foveal groove. Within this dark band there is a central white core with two distinctive radiating white lines on the edge of the caput area. The edge of the thick black median line can range from foliate curves to a ‘starburst’ pattern. The remainder of the carapace is grey. Abdomen: as per the norm for the genus, the abdomen has a foliated median line and 5/6 pairs of chevrons. Legs: The dorsal surfaces on all four legs are virtually the same and appear to be similar to *P. fasciata*. The femora of legs I-II are lighter proximally and grow darker for three quarters the length – legs III-IV are slightly darker. The patellae of all legs are light grey proximally to about halfway and then black with a thin grey band distally and two longitudinal striating lines. Patellae of palp grey with two longitudinal striating lines. The tibiae have thin grey bands proximally and distally with black midsection. The tibia is also divided by two longitudinal striating lines and two parallel lines of small greyish spots. The metatarsi with thin grey proximal band, the remainder has black band which extends little over halfway and grey band distally, the black band has grey slashes.

Table 1: Leg and palp lengths of *P. rajaei* sp. n. – male paratype

	FEMUR	PATELLA	TIBIA	METATARSUS	TARSUS	TOTAL
PALP	12.33	6.35	10.80	NIL	4.33	33.81
LEG I	18.76	8.21	15.88	15.88	8.89	67.62
LEG II	17.04	7.48	15.31	13.93	8.08	61.84
LEG III	14.35	6.37	11.55	12.38	7.61	52.26
LEG IV	17.30	6.23	15.18	16.07	8.23	63.01

Ventral surface (**fig. 8**) legs I-II are similar. The dominant colour on the segments (femur, patellae and tibia) is daffodil yellow, with dividing black and coffee brown lines of varying degrees of width. The femur is yellow with a small patch of black at its basal end and a diagonal black band (with a bluish tinge)

around three quarters distally and a thin distal yellow band. The patellae is mostly yellow with a black basal patch and an irregular subdivided coffee-brown band distally. The tibia is yellow proximally with a coffee-brown angling band and a thin yellow band distally. Legs III-IV are similar with blue/grey ground colour and black bands of varying degree. The femur is blue/grey with a half-moon patch of black at its basal end and a diagonal black band around three-quarters distally with a thin blue/grey band at the distal end. The patellae predominantly blue/grey in colour with inconspicuous black markings. The tibia is blue/grey proximally with a black band which starts halfway up the tibia and with a thin blue/grey distal band. The basal half of metatarsus blue/grey. The underside of the cephalothorax is blackish brown. The lower surface of the abdomen and the epigastric area in front of the generative fold blackish brown, but behind the epigastric folds there is a broad transverse pinkish band passing right across the abdomen from side to side and embracing the posterior breathing-organs.



8

Male paratype (**fig. 9**): total length, including chelicerae but excluding spinnerets 45.04. Carapace - caput low profile, length 17.96, width 16.15. Chelicerae (**fig. 14**) length 9.44. Abdomen length 17.64, width 10. Ocular tubercle (**fig. 21**) length 2.57, width 3.89. Clypeus moderately wide. Foveal groove narrow and transverse, less than the width of



9

the ocular tubercle. The layout of the sigilla on the sternum and the granules on the maxillae and labium are similar to the female. Maxilla of pedipalp (**fig. 15**) 2/3 rows of a line of approximately 36 tapering stridulating lyra/

setae on the prolateral face of the maxilla. One black tubercle is present on the anterior edge of the lyra. These lyra/setae act against 3 rows of moderately long straight strikers on the retromargin of the cheliceral furrow. Palpal bulb (**figs. 16, 23-25**) a large pyriform bulb with stout embolus that has a lipped apical keel that divides into two curved keels that spiral over the dorsal face and end abruptly. Leg and Palp segment lengths in table 2. The number of spines on the leg segment is similar to the female as are the length of scopulae on the ventral apices of metatarsi I and IV.

Colour – dorsal surface (**figs. 10**). Dorsally the male is representative of males of the genus, being a brownish grey, with light brown



10



11



12



14



13



15

highlights and subdued markings on both the body and legs. The markings on the legs of the male are inconspicuous, however the longitudinal striating line on the patellae is seen clearly. The abdomen has a dark median line divided by distinctive diamond and oval shaped junctions and chevrons.

Ventral surface (**fig. 11**) – the markings on the ventral surface of legs I-II are similar to the female, but somewhat elongated. Legs III-IV

are similar to the female's, with a hazy effect. The underside of the cephalothorax is blackish-brown. The lower surface of the abdomen and the epigastric area in front of the generative fold blackish brown, but behind the epigastric folds there is a broad transverse band of grey with a tinge of pink, passing right across the abdomen from side to side and embracing the book lungs. The rest of the abdomen light brown. The setae around the palpal bulb reddish.

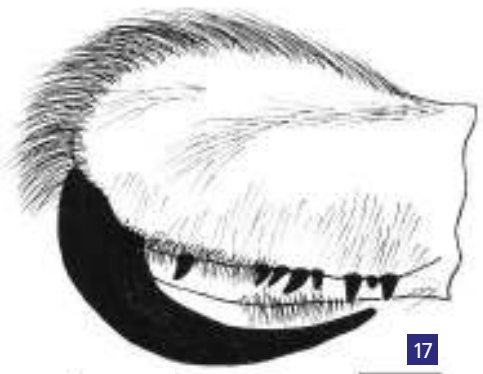
16

1mm



17

1mm



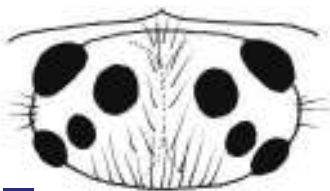
22

1 cm



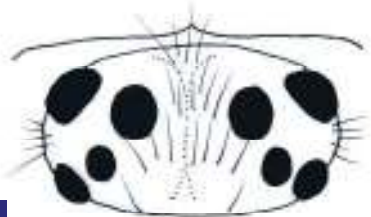
18

1mm



21

1mm



20b

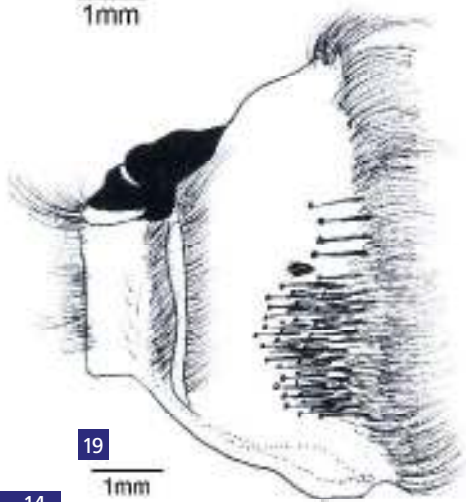
20a

0.1mm



19

1mm





23

prolateral view



24

dorsal view



25

retrolateral view



Remark

Poecilotheria rajaei sp. n. belongs to the group of *Poecilotheria* that have 1 to 3 tubercles above the stridulating organ on the maxilla of the pedipalp. This structure of the organ is similar to that of *P. pederseni* which is found in Sri Lanka and *P. hanumavilasumica* which is found in mainland India; it only resembles *P. regalis* by the possession of the ventral abdominal band, but is easily set apart by the markings on the legs, the stridulating organ and by other morphometrics.

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