

## Pacific Symphytognathid Spiders

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THE FAMILY SYMPHYTOGNATHIDAE was erected by Hickman (1931) for a minute spider, *Symphytognatha globosa*, from Tasmania. The most characteristic feature is the absence of lung-books, the anterior spiracles leading into tracheal tubes which supply the cephalothorax as well as the abdomen, while the posterior spiracles are absent. In *S. globosa* the female has no palps. Fage (1937) and Gertsch (1941) have transferred several other genera into this family, or described new ones. In some of these only four eyes are present instead of the usual six, and the female palps may be merely reduced in size instead of absent.

Some of the specimens described in the present paper were collected in 1946 in Upolu, Western Samoa, during a visit devoted to the collection of arachnids; a few hours of collecting in Suva, Fiji, on the return journey, yielded specimens of a closely related but quite distinct species. Because this is a peculiar and interesting family which has not previously been recorded from the Pacific islands, it seemed desirable to deal with both species together. The main Samoan collection is being dealt with as a whole.

In the following descriptions the leg index, given below the leg formula, is the length of the leg divided by the length of the carapace. The tibial index is the breadth of the proximal end of the patella expressed as a percentage of the combined lengths of the tibia and patella.

### *Patu* gen. nov.

Six eyes. Chelicerae fused for about half of

their length. Ventral end of the retromargin of the cheliceral groove with a large bifurcated process. Palp of female absent. Three claws, ventral one large. Abdomen pear-shaped with ventral spinnerets. Close to genus *Symphytognatha*, but different in web and cocoon and in a number of minor structural characters. Genotype: *Patu vitiensis*.

### *Patu vitiensis* n. sp.

Three ♀, 1 ♂, 1 immature ♂. From tree trunks, Suva, Fiji.

**FEMALE:** Length 1.20 mm. Carapace, sternum, and mouth parts brown, legs lighter. Abdomen mottled greyish-brown above, darkening towards the posterior end. Ventral surface behind the spinnerets very much lighter, almost cream-coloured.

**Carapace:** Length 0.37 mm., breadth 0.32 mm. Highest near the eyes, which are near the anterior margin.

**Eyes:** Six, all pale. Posterior row recurved. Lateral eyes touching. PME separated from one another by one quarter of their diameter and from the PLE by rather more than their diameter. Ratio of eyes PLE:ALE:PME = 71:68:60. Eye group breadth 0.23 mm.

**Chelicerae:** No boss or stridulating organ. Apparently fused for rather less than half of their length. Fang stout with relatively large serrations, and longer than the groove. The ventral retromargin of the groove with a stout process bifurcated into two blunt teeth.

**Maxillae:** Converging but not meeting above the lip.

**Lip:** Broader than long.

**Sternum:** Length 0.23 mm., breadth 0.22 mm. Convex.

**Palp:** No vestige visible even in cleared

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specimens, though a stout hair arises in the same spot.

$$\text{Legs: } \frac{1 \quad 4 \quad 2 \quad 3}{2.9 \quad 2.8 \quad 2.6 \quad 2.1}$$

seen in a cleared specimen as in the figure. Pair of striated structures on the pedicel as in *S. globosa*, where they were interpreted by Hickman (1931) as lyriform organs and by Petrunkevitch (1933) as stridulating organs.

	FEMUR	PATELLA AND TIBIA	METATARSUS	TARSUS	TOTAL
I.....	0.35	0.37	0.21	0.19	1.12
II.....	0.31	0.35	0.14	0.19	0.99
III.....	0.28	0.24	0.08	0.17	0.77
IV.....	0.35	0.35	0.14	0.21	1.05
Tibial Index I.....	13.1		Tibial Index IV.....13.6		

Three claws, the median one being long, sharp and downcurved, and larger than the paired ones. The median claw on legs I and II has one tooth; all the other claws are without pectinations. A few serrated bristles on the feet. No spines, but a large erect bristle towards the distal end of each patella, two smaller ones on tibia I, and one on tibia II. One trichobothrium on metatarsi I and II, three on tibiae I and II, two on III, and four on tibia IV.

*Abdomen:* Length 0.88 mm., breadth 0.56 mm. Pear-shaped with a rounded posterior end. The six spinnerets are ventrally placed, the anterior being the largest. Anal tubercle widened transversely. No colulus. Epigyne in the form of a transverse furrow overhung from in front by a rounded lip. Internal structure

*MALE:* Length 0.76 mm. Carapace, sternum, and mouth parts brown, legs light brown. Abdomen light yellowish-brown, posterior end black. Anterior part of the sides slightly darker, there being a very faint suggestion of a dorsal band joining these areas. More well marked are two triangular dark areas anterior to the posterior black cap. Together they form a procurved crescentic dark marking, interrupted in the mid-dorsal line by the yellowish-brown ground colour of the abdomen.

*Carapace:* Length 0.30 mm., breadth 0.31 mm. Sloping up steeply to the conspicuous row of eyes. Anterior to the eyes is a sinuous ridge, concave above the chelicerae and curving forward in the middle line. This has the appearance of being the anterior edge of the

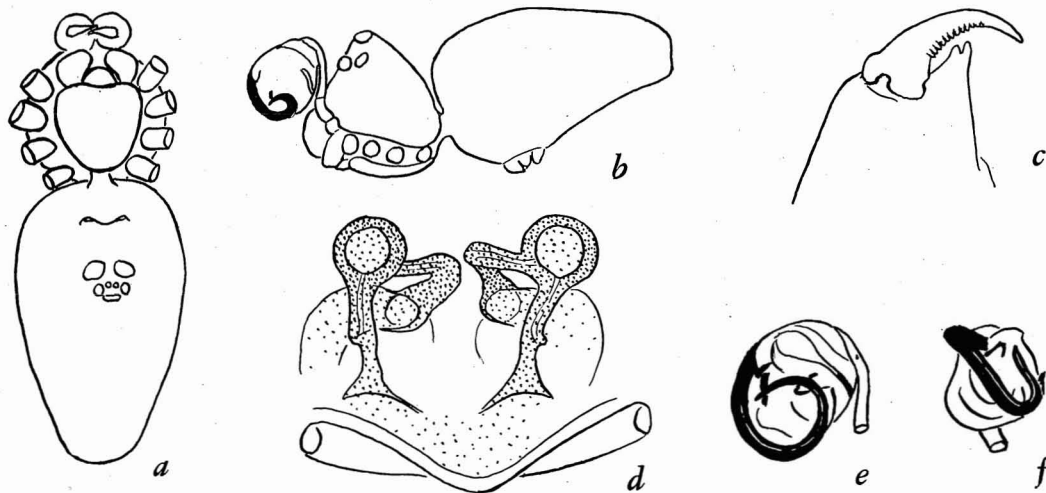


FIG. 1. *Patu viitensis*: a, female, ventral view; b, male, left side; c, female chelicera, dorso-retrolateral view; d, female apparatus as seen in a cleared skin; e, male palp, retrolateral view; f, male palp, ventral view.

carapace, but below it is a more or less vertical clypeus. The details are very difficult to make out, owing to the small size.

*Eyes:* Six, all pale. Posterior row slightly recurved. The PME are separated from one another by about half their diameter and from the PLE by almost their diameter. The lateral eyes are touching. Ratio of eyes, PLE:PME:ALE=75:70:51. Breadth of eye group 0.23 mm. The PME are separated from the anterior ridge by about half their diameter and from the anterior edge of the carapace by about two and a half times their diameter.

*Chelicerae:* Small.

*Maxillae and Lip:* As in female.

*Sternum:* length 0.24 mm., breadth 0.19 mm.

*Palp:* Large and rounded palpal organ, details as in figure.

$$\text{Legs: } \frac{1 \quad 2 \quad 4 \quad 3}{3.8 \quad 3.3 \quad 2.7 \quad 2.4}$$

*Patu samoensis* n. sp.

Eight ♀ from minute sheet webs in the irregularities of tree trunks in forest, Apia, Upolu, Western Samoa.

*FEMALE:* Length 1.63 mm. Carapace, sternum, and mouth parts dark brown. Legs lighter with dark annulations. Abdomen mottled greyish.

*Carapace:* Length 0.55 mm., breadth 0.43 mm. High and rounded.

*Eyes:* Six, all pale. Large and conspicuous, posterior row straight. PME separated from one another by less than a quarter of their diameter and from the PLE by less than half their diameter. Lateral eyes touching. Ratio of eyes, PME:PLE:ALE=78:68:64. Eye groups breadth 0.30 mm. PME twice their diameter from the carapace edge.

*Chelicerae:* Apparently fused for about half their length and rather cylindrical in anterior view. The fang is longer than the groove and

	FEMUR	PATELLA AND TIBIA	METATARSUS	TARSUS	TOTAL
I.....	0.31	0.36	0.16	0.23	1.06
II.....	0.26	0.33	0.14	0.19	0.92
III.....	0.20	0.23	0.10	0.15	0.68
IV.....	0.27	0.30	0.11	0.16	0.84
Tibial Index I.....	11.3				
		Tibial Index IV.....	12.5		

One stout spine on the ventral surface of tibia II about one third of its length from the distal end.

*Abdomen:* Length 0.55 mm., breadth 0.33 mm. Pear-shaped with the narrower posterior end truncated. Spinnerets ventral and close to the petiolus.

*Web and Cocoons:* The webs were situated on tree trunks and consisted of fine horizontal sheets about 4 centimeters long. The silk was too fine for the arrangement of threads to be made out. No oblique thread was noticed as in the Samoan species, though a bunch of cocoons was hanging some way from the edge. Spiders were seen sitting in the centre instead of with the cocoons; possibly these may have been males while the females were with the cocoons.

has relatively large serrations. On the ventral retromargin of the groove is a stout process bifurcated into two sharp teeth. The chelicerae do not bulge forward in front of the edge of the carapace when seen in dorsal view.

*Maxillae:* Converging but not meeting above the lip.

*Lip:* Broader than long. Junction with sternum distinct.

*Sternum:* Length 0.30 mm., breadth 0.29 mm. Convex.

*Palp:* No trace of a palp is to be seen even in a cleared specimen, though three or four hairs arise from the same spot. No palp was visible in the cleared skin of a first instar taken from a cocoon.

$$\text{Legs: } \frac{1 \quad 2 \quad 4 \quad 3}{2.6 \quad 2.4 \quad 2.4 \quad 1.9}$$

	FEMUR	PATELLA AND TIBIA	METATARSUS	TARSUS	TOTAL
I.....	0.43	0.46	0.26	0.30	1.45
II.....	0.38	0.43	0.22	0.30	1.33
III.....	0.31	0.31	0.16	0.22	1.00
IV.....	0.42	0.42	0.24	0.25	1.33
Tibial Index I.....	15.8				
		Tibial Index IV.....	14.3		

Three claws, the third as large as the dorsal pair and sharply directed downwards. Claws slender and not pectinated, and pectinated bristles not present. No spines, but a large erect bristle at the distal end of each patella, two smaller ones on tibia I and one on tibia II. One trichobothrium on metatarsi I and II, three on tibiae I and II, two on tibia III, and four on tibia IV.

*Abdomen:* Length 1.16 mm., breadth 0.80 mm. Pear-shaped, projecting behind in a knob-ended process and provided with a pair of similar dorso-lateral processes. The six spinnerets are ventral, the anterior being the largest. No colulus. Anal tubercle large. The epigyne is visible only when the abdomen is removed. There is a transverse fold overhung by a backwardly directed lip whose edge is

dark and thickened. The appearance of a cleared specimen is shown in the figure.

In specimens cleared in potash the spiracles could be seen leading into an atrium from which numerous tracheal tubes supplied both the cephalothorax and abdomen. There was a transverse connecting tube between the atria. Sections showed five pairs of tracheal tubes, three large and two small, passing through the pedicel into the cephalothorax.

*Web and Cocoon:* The webs were spun in the irregularities of a fallen tree trunk. They consisted of a very fine horizontal sheet with very regular meshes. The sheet was an irregular polygon some 6 centimeters long, and an oblique thread extended upwards from the sheet between 1 and 2 centimeters from one end. The threads of the sheet radiated from

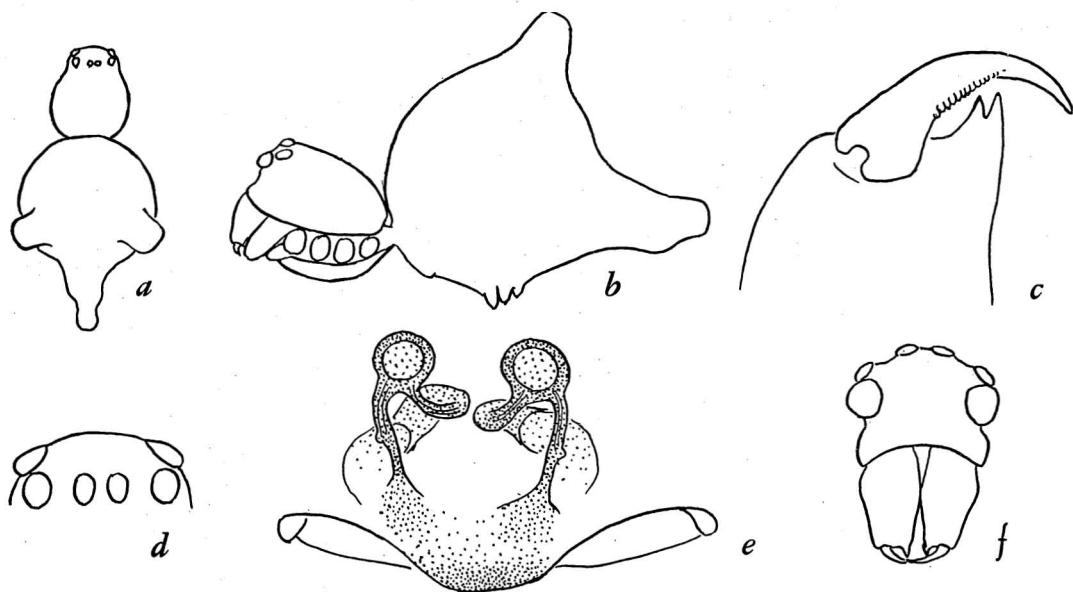


FIG. 2. *Patu samoensis*: a, female, dorsal view; b, female, left side; c, female chelicera, dorso-retrolateral view; d, female, eyes, dorsal view; e, female apparatus as seen in a cleared skin; f, female, anterior view of carapace and chelicerae.

the point of attachment of the oblique thread, but it was a sheet and not an orb web. The spider rested at this point together with a cluster of cocoons. The cocoons each contained only a single egg about 0.34 mm. in diameter. The cocoon consisted of a sphere some 0.66 mm. in diameter, woven loosely of fine threads so as to be transparent, the whole surface being covered with spirals of thick thread with the loops projecting from the surface. The whole structure was thus 0.83 mm. in diameter. All the silk was white. This is quite unlike the web and cocoon described by Hickman for *S. globosa*. A first instar removed from a cocoon had a globular abdomen with no trace of the projections.

#### SUMMARY

A new genus of spiders belonging to the family Symphytognathidae is described, with a species from Fiji and another from Samoa. Members of this family have been described

from Tasmania, New Caledonia, East Indies, and Central and South America, but apparently not from the Pacific islands. The new genus seems to be close to *Symphytognatha* from Tasmania.

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