

New Phoroncidiinae and the Affinities of the New Zealand spider *Atkinsonia nana* Cambridge

By

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WITH 34 TEXT FIGURES

SUMMARY

The following Tasmanian spiders belonging to the sub-family Phoroncidiinae are described as new species: *Trigonobothrys setosus*, *Trigonobothrys aculeatus*, *Ulesanis cygnea* and *Ulesanis trituberculata*. The genus *Atkinsonia* Cambridge is re-established and its taxonomic position discussed. It is transferred to the Phoroncidiinae. A revised description of the New Zealand spider, *Atkinsonia nana* Cambridge, is given and a new species, *Atkinsonia petricola*, from Tasmania described.

Theridiid spiders belonging to the sub-family Phoroncidiinae are characterised by having the spinnerets and anal tubercle surrounded by a chitinous wall. In addition, the abdomen is protected by a dorsal scute or in some cases by a tough leathery integument reinforced with numerous small rounded sclerites. Most of the species are small, being less than 3 mm. in length. Ten genera embracing a total of about 57 species are recorded for the World. Of these species only two, *Ulesanis sextuberculata* Keyserling and *Ulesanis rotunda* (Keyserling), both from Queensland, are listed as occurring in Australia.

In the present paper the New Zealand genus *Atkinsonia* Cambridge which has been regarded as synonymous with *Dipoena* Thorell is re-established and placed in the Phoroncidiinae. In addition, five new species from Tasmania are described as belonging to the sub-family.

In view of the taxonomic importance of the arrangement of the respiratory organs in spiders, these organs have been examined in each of the species studied. In all cases the respiratory system was found to conform to the usual Theridiid pattern, consisting of a pair of book-lungs in the normal position and a tracheal system, which is limited to the abdomen and opens to the exterior by a single median spiracle near the spinnerets.

The species described in the following pages may be distinguished by the appended key.

KEY TO SPECIES.

- | | |
|--|--|
| 1. Front of abdomen with a deep median incision | 2 |
| Front of abdomen without a deep median incision | 3 |
| 2. Dorsal scute of abdomen without a posterior pair of conical lobes | <i>Trigonobothrys setosus</i> sp. nov. |
| Dorsal scute of abdomen with a posterior pair of conical lobes | <i>Trigonobothrys aculeatus</i> sp. nov. |
| 3. Dorsal surface of abdomen raised into conical humps | 4 |
| Dorsal surface of abdomen without conical humps | 5 |

4. Anterior margin of the abdomen forming an angle on each side *Ulesanis cygnea* sp. nov.
 Anterior margin of the abdomen not forming an angle on each side *Ulesanis trituberculata* sp. nov.
5. Dorsal surface of abdomen convex and clothed with long hairs *Atkinsonia nana* Cambridge
 Dorsal surface of abdomen flat and clothed with short hairs *Atkinsonia petricola* sp. nov.

Genus *Trigonobothrys* Simon 1888*Trigonobothrys setosus* sp. nov.

MALE							mm.
Total length							1.624
Length of carapace							0.754
Width of carapace							0.638
Length of abdomen							1.102
Width of abdomen							0.928
Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total	
1	0.4521	0.2329	0.3425	0.2877	0.2603	1.5755	
2	0.4521	0.2329	0.3151	0.2603	0.2603	1.5207	
3	0.4110	0.2329	0.3014	0.2466	0.2877	1.4796	
4	0.5206	0.3014	0.4110	0.3288	0.3151	1.8769	
Palp	0.2740	0.1096	0.0822	—	0.3425	0.8083	

Colour (in alcohol). Cephalothorax and appendages golden brown. Legs banded with dark-brown round the distal half of each femur, the base and middle of each tibia and the base of each metatarsus. The bands are more pronounced on the ventral than on the dorsal side. Abdomen golden brown above with three dark spots on each side and five in the middle. In some specimens the five middle spots merge into a central brown patch. The ventral surface and sides of the abdomen are golden brown.

Carapace. Slightly longer than wide, strongly convex, rounded at the sides. Head region narrow, high and projecting over the clypeus (fig. 1). Thoracic groove deep and longitudinal. Cervical groove well defined. Radial grooves strongly marked and short, not reaching half way to the margin. Coarse erect bristles are present on the cephalic part and a few hairs in the ocular area. On the clypeus, round the margin of the carapace, between the radial grooves and behind the thoracic groove are a few minute hairs mounted on small granules.

Eyes. Eight, arranged in two rows. Viewed from above the front row appears strongly recurved and the posterior row very slightly recurved, almost straight. Ratio of eyes AME : ALE : PME : PLE = 6 : 5 : 5 : 5. AME are mounted on a black tubercle and separated from each other by 5/6 of their diameter. They almost touch ALE. The lateral eyes are contiguous. PME separated from each other by once their diameter and from PLE by 3/5 of their diameter. The median ocular area is wider in front than behind in ratio 15 : 14. Its length is about equal to its posterior width. The height of the clypeus is about four and a half times the diameter of AME.

Chelicerae. Small, conical, clothed with a few stiff hairs in front. Inner side oblique, without teeth but with a row of five setae. Fang not strongly curved (fig. 2).

Maxillae. Somewhat triangular, strongly converging in front of labium. Provided with a scopula at the apex and serrula on front margin.

Labium. Wider than long. Rounded in front and at the base.

Sternum. Shield-shape and as wide as long. Excavated in front round base of labium. Truncate posteriorly between the fourth coxae, which are widely separated. Surface slightly convex and lightly clothed with hairs arising from small tubercles. Margin rebordered.

Legs. 4.1.2.3. The first three pairs almost equal in length. The first and second tarsi and metatarsi stouter than the third and fourth. The first tarsi have a dense clothing of hairs on the ventral side near the apex. Elsewhere the clothing of hairs is light. On the dorsal side of each patella and tibia there are 1 — 1 stout bristles. There are three trichobothria on each tibia and one on the distal half of each metatarsus. A drum is present on the basal quarter of each tarsus. The upper tarsal claws are similar and provided with a single tooth near the apex. The lower claw is small, strongly bent and has one minute tooth. The comb on the fourth tarsi is composed of 5 or 6 barbed setae.

Palpi. Tarsus large and spoon-shaped. Tibia cup-shaped, narrow at the base, provided with a circlet of hairs and one trichobothrium. Patella small. No apophyses on any of the segments. The form of the genital bulb is shown in fig. 3. The embolus arises near the base of the cymbium, curves upwards and runs round the upper margin of the alveolus to end in a point immediately below the apex.

Abdomen. Somewhat heart-shaped (fig. 4). The dorsal surface is almost completely covered by a hard chitinous shield, only the tip of the abdomen and spinnerets being left uncovered. The front margin has a deep cleft in the middle, thus forming a rounded lobe on each side. These lobes are provided with erect spine-like setae, each of which arises from a small tubercle. Posteriorly the spine-like setae are replaced by finer setae and hairs. The dorsal shield curves downwards round the lateral margins so as partly to cover the sides of the abdomen. In front the ventral surface is covered by an epigastric scute, which incorporates a pair of elongated oval pulmonary sclerites. On each side the posterior margin of the scute is produced backward forming a notch in which lies the pulmonary spiracle. The posterior half of the ventral surface is partly covered by a rectangular ventral scute. Between this and the epigastric scute are several smaller rounded sclerites (fig. 5). The spinnerettes and anal tubercle are surrounded by a chitinous ring. On the ventral surface of the ring and near its posterior margin is a median transverse slit, which opens into the tracheal spiracle. Six spinnerets are present, the anterior pair being the largest. A colulus is absent.

FEMALE

						mm.
Total length						2.030
Length of carapace						0.754
Width of carapace						0.667
Length of abdomen						1.450
Width of abdomen						1.160
Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
1	0.5617	0.2603	0.3836	0.3425	0.3425	1.8906
2	0.5069	0.2740	0.3014	0.3014	0.3288	1.7125
3	0.4932	0.2740	0.3425	0.3014	0.3562	1.7673
4	0.6302	0.3699	0.4795	0.3973	0.3973	2.2742
Palp ..	0.1913	0.0959	0.1370	—	0.2192	0.6439

Colour (in alcohol). Golden brown like that of the male, but the head region is somewhat darker and the dorsal scute of the abdomen has a longitudinal brown area extending from the anterior cleft to the posterior margin. This merges with the five dark brown spots in the middle of the scute.

Carapace. Resembles that of the male but lacks the strongly marked radial grooves.

Eyes. Equal in size. AME separated from each other by once their diameter and from ALE by 1/5 their diameter. Lateral eyes contiguous. PME separated from each other by once their diameter. Median ocular area almost square.

Chelicerae, maxillae, labium and sternum as described for the male.

Legs. 4.1.3.2. Trichobothria, setae, claws and tarsal drum as in the male.

Palpi. The tarsus ends in a wide claw, which is somewhat spatulate in shape and is armed in front with 7 teeth (fig. 6). The claw is not unlike that of *Hadrotarsus ornatus* Hickman. No drum is present. The hairs on the under side of the segment are barbed. The tibia has a single trichobothrium.

Abdomen. Resembles that of the male, but the dorsal scute is relatively smaller and covers only the anterior two-thirds of the dorsal surface. The epigastric scute on the ventral side is also smaller than in the male and does not incorporate the pulmonary sclerites on either side. There is also no ventral scute behind the epigastric furrow but several small sclerites are present (fig. 7). The epigynum occupies a large part of the epigastric scute. It has the form shown in fig. 8.

Locality. The type specimens were collected on the Domain, Hobart. The female was found 1st June, 1944, and the male in July, 1948. The spider also occurs at Trevallyn, Launceston. It is generally taken in grass tussocks or on the under side of stones.

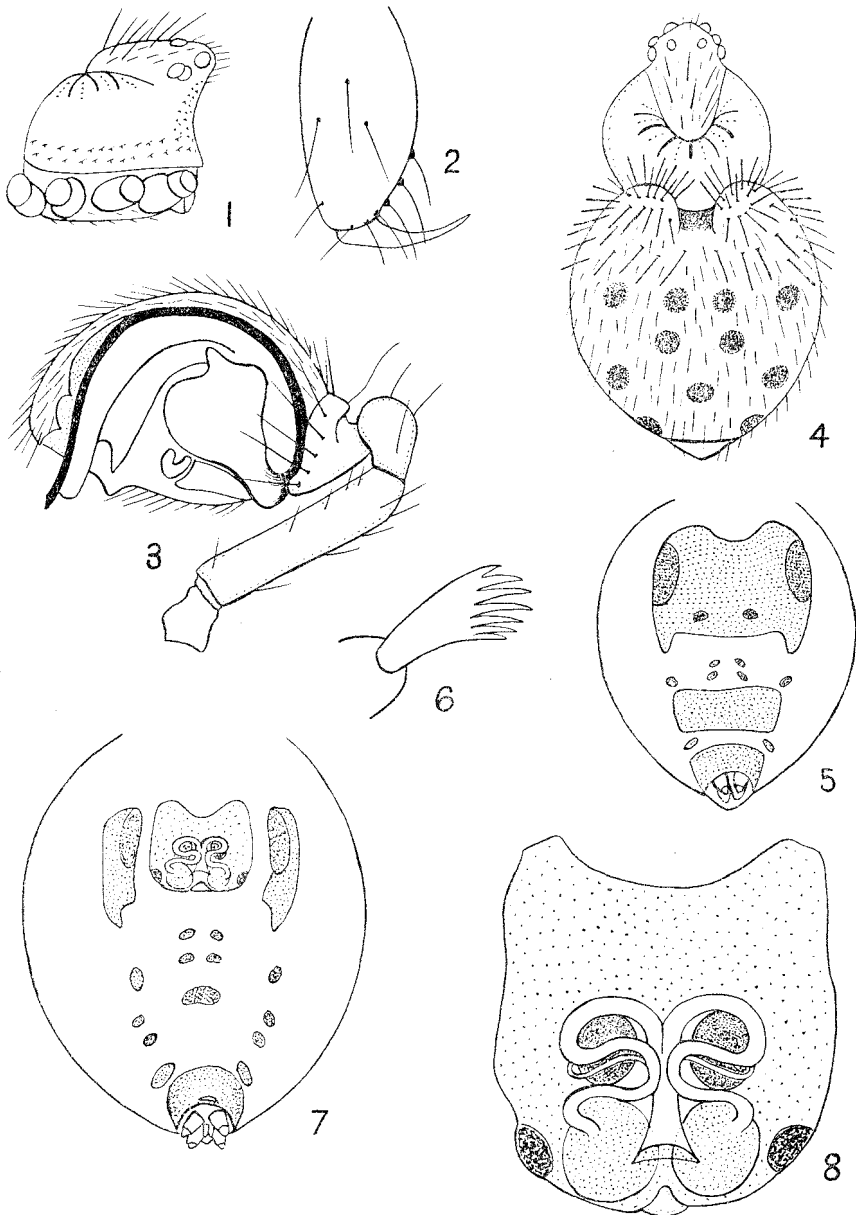
Trigonobothrys aculeatus sp. nov.

MALE							mm.
Total length							1.914
Length of carapace							0.696
Width of carapace							0.696
Length of abdomen							1.276
Width of abdomen							1.044
Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total	
1	0.5480	0.2740	0.4110	0.3973	0.2877	2.1180	
2	0.5069	0.2603	0.3973	0.3699	0.3151	1.8495	
3	0.4795	0.2466	0.3288	0.3425	0.3288	1.7262	
4	0.6165	0.3151	0.4795	0.4521	0.3425	2.2057	
Palp	0.3562	0.1370	0.0685	—	0.5069	1.0686	

Colour (in alcohol). Carapace, labium and sternum chocolate-brown. Legs yellowish banded with dark-brown. Chelicerae and maxillae yellowish-brown. Dorsal scute of abdomen dark chocolate-brown with a pair of narrow oblique golden-yellow stripes near the middle. In front of and behind these stripes are a few irregular yellowish spots. Sides of abdomen brown marked with cream. Ventral surface brown, the scutes being dark-brown. The spinnerets yellow.

Carapace. As wide as long. Rounded at the sides. Strongly convex and high. The head region forms a narrow rounded prominence, which projects over the clypeus (fig. 9). The dorsal surface somewhat granular and rugose but becoming smooth at the sides. Thoracic groove deep and longitudinal. Cervical and radial grooves deep and short. A few erect setae on the head region. Short hairs on the clypeus and dorsal surface of the carapace.

Eyes. Eight, arranged in two rows. Viewed from above the front row is strongly recurved and the posterior row almost straight. Ratio of eyes AME : ALE : PME : PLE = 7 : 5 : 5 : 5. AME are separated from each other by 4/7 of their diameter and from ALE by 1/7 of their diameter. The lateral eyes



Trigonobthrys setosus sp. nov. Fig. 1: Carapace of male. Fig. 2: Chelicera of male. Fig. 3: Male palp. Fig. 4: Carapace and abdomen of male. Fig. 5: Scutes on ventral surface of abdomen of male. Fig. 6: Claw of female palp. Fig. 7: Scutes on ventral surface of abdomen of female. Fig. 8: Epigastric scute and epigynum of female.

are contiguous. PME are separated from each other and from PLE by about once their diameter. The median ocular area is wider in front than behind in ratio 17 : 14. Its length is equal to its width in front. The height of the clypeus is nearly five times the diameter of AME.

Chelicerae. Small and conical, clothed with a few hairs. Devoid of teeth and scopula but with a row of five stiff hairs along the oblique inner margin. Fang not strongly curved.

Maxillae. Converging to form an arch-like curve in front of labium. A scopula at the apex and a long well developed serrula on the curved anterior margin.

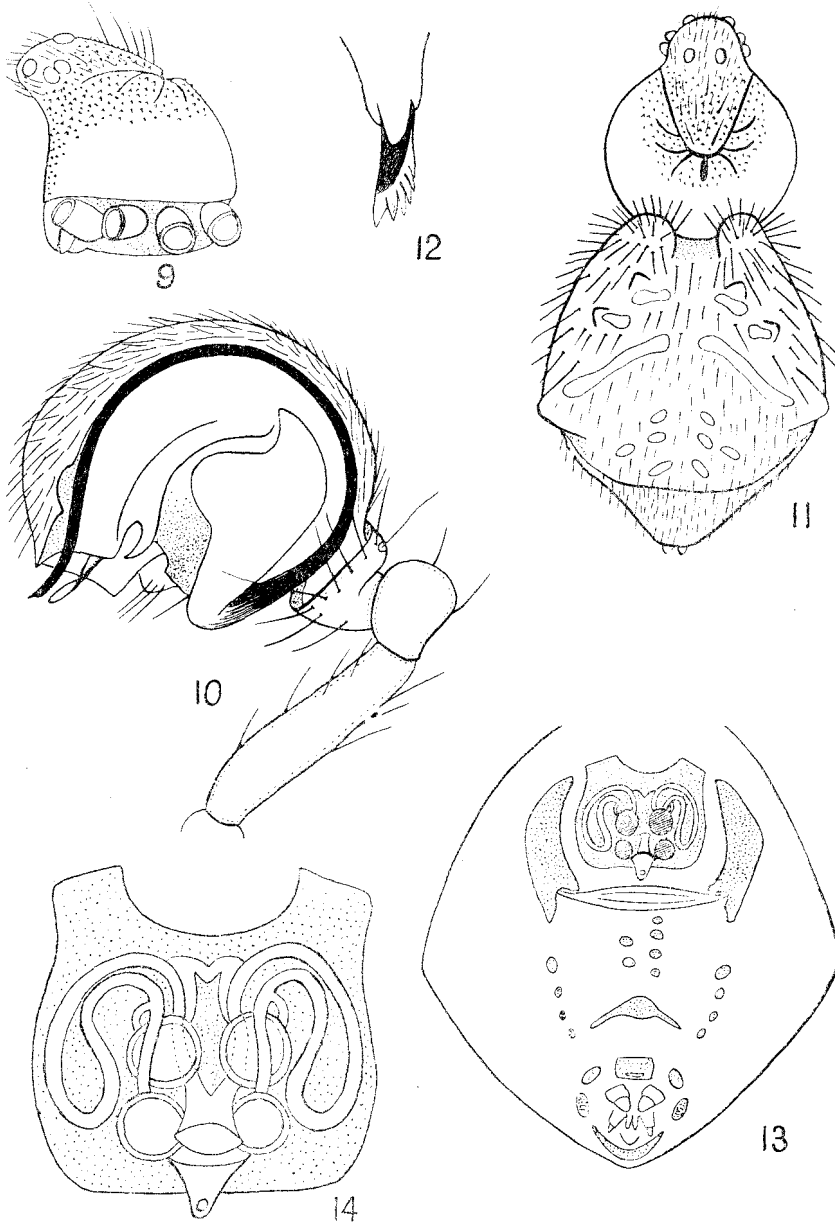
Labium. Rounded in front and at the base. Wider than long. Clothed with a few hairs.

Sternum. Shield-shaped, as wide as long and strongly convex. Truncate between the fourth coxae. Front margin excavated round base of labium. Lateral margins forming pointed projections between the bases of the coxae. Surface lightly clothed with hairs.

Legs. 4.1.2.3. Short and moderately stout. Lightly clothed with barbed hairs. On the under side of the first tarsi the hairs form a dense group near the apex. Metatarsi longer than tarsi. One basal and one apical bristle on each patella and 1 — 1 bristles on the dorsal side of each tibia. A single trichobothrium in the apical quarter of each metatarsus and four on each tibia. A small drum in the basal quarter of each tarsus. Three tarsal claws are present. The upper claws are similar and provided with a small tooth near the apex. The lower claw is strongly bent and also has one small tooth. The comb on the fourth tarsi is formed by a row of five barbed setae.

Palpi. Tarsal segment large and spoon-shaped (fig. 10). Tibia and patella short and without apophyses. A single trichobothrium is present on the tibia. Femur shorter than tarsus. The alveolus is large and occupies almost the whole of one side of the tarsus. The embolus arises from the genital bulb a short distance from the base and curves upward round the dorsal margin of the alveolus to end near the apex of the segment. The structure of the palp closely resembles that of the preceding species, *T. setosus*, but the tarsus is relatively larger and more rounded in outline and the origin of the embolus is not so close to the base of the segment.

Abdomen. Viewed from above the outline is somewhat rhomboidal, narrowed in front and pointed behind (fig. 11). The anterior three-quarters of the dorsal surface is covered by a hard scute, which is deeply incised on the front margin. Stiff spine-like setae are present on the front half of the dorsal surface and are especially prominent on each side of the median cleft. Two conical lobes, one on each side, arise near the postero-lateral angles of the dorsal scute. Between these lobes and the front of the abdomen are two pairs of small inconspicuous lobes. These are not readily seen from above but are clearly visible from the side. The lateral margins of the dorsal scute are bent downward so as partly to cover the sides of the abdomen. In front of the epigastric furrow the ventral surface is protected by a large epigastric scute, which incorporates the lung covers. The posterior lateral angles of the scute extend backwards forming a notch on each side to accommodate the pulmonary spiracle. Behind the epigastric scute is a narrow transverse sclerite bounding the posterior margin of the epigastric furrow. Immediately in front of the spinnerets is a small ventral sclerite, which extends upwards



Trigonobothrys aculeatus sp. nov. Fig. 9: Carapace of male. Fig 10: Male palp. Fig. 11: Carapace and abdomen of male. Fig. 12: Claw of female palp. Fig. 13: Scutes on ventral surface of abdomen of female. Fig. 14: Epigastric scute and epigynum of female.

on each side forming portion of the chitinous ring round the spinnerets. The ring is completed by a dorsal sclerite which extends downwards on each side to meet the ventral sclerite but does not fuse with it. Between the epigastric furrow and the spinnerets are four longitudinal rows of small rounded sclerites, two rows in the middle and one on each side. The tracheal spiracle is single and median. It is situated on the ventral sclerite immediately in front of the spinnerets. Six spinnerets are present but a colulus is absent.

FEMALE

							mm.
Total length							2.030
Length of carapace							0.754
Width of carapace							0.696
Length of abdomen							1.276
Width of abdomen							1.276
Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total	
1	0.5891	0.2740	0.4110	0.3836	0.2740	1.9317	
2	0.5480	0.2603	0.3562	0.3562	0.2877	1.8084	
3	0.5069	0.2603	0.3151	0.3425	0.2877	1.7125	
4	0.6850	0.3425	0.4795	0.4795	0.3014	2.2879	
Palp	0.2055	0.0685	0.1370	—	0.2466	0.6576	

Coloration and general appearance as in the male.

Carapace. Not so strongly convex as in the male. Nor are the cervical and radial grooves so deeply marked.

Eyes, chelicerae, maxillae, labium, sternum and legs as in the male.

Palpi. Small. Tarsus slightly longer than femur. Two bristles on dorsal side of patella. A single trichobothrium on basal half of tibia. Tarsal claw broad with five teeth on the prolateral (inner) margin (fig. 12). Tarsal drum absent.

Abdomen. The dorsal scute resembles that of the male in form and size. The epigastric scute, however, is smaller and does not incorporate the elongated lung covers situated on either side (fig. 13). The ventral scute is small and somewhat crescentic. The chitinous ring round the spinnerets is poorly developed and is composed of separate sclerites. Between the ventral scute and the epigastric furrow are four longitudinal rows of sclerites as in the male. Different specimens often show variations in the number of these sclerites and also in the extent to which the ventral scute and chitinous ring round the spinnerets are developed. The epigynum occupies almost the whole of the epigastric scute. In transparent preparations it has the form shown in fig. 14.

Locality. The type specimens, male and female, were collected on gorse at the Punch Bowl, Launceston, 23rd May, 1930. The species also occurs at East Risden. It is usually taken on low shrubs and grass tussocks but is sometimes found on the under side of stones.

Trigonobothrys aculeatus is readily distinguished from the preceding species, *T. setosus*, by the form of the abdomen. Both these species differ from *T. aheneus* Dyal (1935, p. 162), found in the Panjab, in having the front of the abdomen incised. They may also be distinguished from the West African species, *T. molle* Simon (1903, p. 75), in possessing a hard dorsal scute on the abdomen, and from *T. excisus* Simon (1888, p. 231), found in Madagascar, in the shape and nature of the dorsal scute.

Genus **Ulesanis** L. Koch, 1872**Ulesanis cygnea** sp. nov.

MALE

						mm.
	Total length	.....	.....	.....	.....	1.7980
	Length of carapace	.....	.....	.....	.....	0.5480
	Width of carapace	.....	.....	.....	.....	0.6576
	Length of abdomen	.....	.....	.....	.....	1.4385
	Width of abdomen	.....	.....	.....	.....	1.1234
Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
1	0.4795	0.2329	0.2740	0.2329	0.2466	1.4659
2	0.4110	0.2192	0.2329	0.2055	0.2603	1.3289
3	0.3699	0.2055	0.2192	0.1918	0.2466	1.2330
4	0.5206	0.2466	0.3288	0.2603	0.2877	1.6440
Palp	0.3699	0.2055	0.0822	—	0.4932	1.1508

Cotour (in alcohol). Carapace dark-brown, almost black, the median thoracic region, which is covered by the front of the abdomen, being paler. Legs and palpi yellowish, banded with dark-brown. Sternum, maxillae and labium dark-brown. Abdomen dark-brown with yellowish markings, especially at the antero-lateral angles and on the sides. A rectangular yellow area on ventral surface in front of spinnerets. The dark-brown and yellow pigmentation varies in different specimens. In some cases dark-brown, in others yellow predominates.

Carapace. Short, slightly wider than long, narrowed in front, rounded at the sides and excavated on the posterior margin above the pedicle. The cephalic region is extended upwards into a long curved neck-like projection, which bends forward and overhangs the front margin. The length of this projection is not included in the measurement of the length of the carapace given above. The surface of the carapace is smooth, shining and hairless, except on the neck-like cephalic part, where a few hairs are present (fig. 15).

Eyes. Eight. Ratio of eyes AME : ALE : PME : PLE = 10 : 7 : 8 : 7. The AME are situated almost at the end of the cephalic projection and are separated from each other by $6/5$ of their diameter. The lateral eyes are contiguous, ALE forming a straight transverse line with PME, from which they are separated by $1/2$ the diameter of AME. The PME are separated from each other by $3/8$ of their diameter and from AME by $3/2$ times the diameter of AME. The median ocular area is wider in front than behind in ratio 11 : 8 and its length is greater than its anterior width in ratio 15 : 11.

Chelicerae. Small and conical. The furrow is short and transverse with a single blunt tooth on the promargin. Scopula absent. Fang stout and curved. In front the base of the paturon is extended upward under the clypeus as a long pointed process (fig. 16).

Maxillae. Converging in front of labium. Provided with a scopula at the apex and a serrula on the front margin. Clothed with a few hairs.

Labium. Triangular. Almost twice as wide as it is long. Furnished with a few hairs.

Sternum. Heart-shaped, longer than wide in ratio 10 : 9, flat, rebordered, with pointed marginal processes extending between the bases of the coxae. Posterior end truncate, the fourth coxae being widely separated. A few scattered hairs on the surface, which is slightly pitted and rugose. Below the lateral margins of the carapace the epimera are fused together to form a continuous band on each side.

Legs. 4.1.2.3. Short and stout. Lightly clothed with hairs. Spines and scopulae absent. Three trichobothria on basal half of first and second tibia and four on the third and fourth tibia; one on the basal half of each metatarsus. Tarsi longer than metatarsi. Each tarsus has a drum situated in the basal quarter. Hairs on the tarsi are barbed. A tarsal comb formed of about six barbed hairs is present on the fourth tarsi. Three tarsal claws and setae forming accessory claws are present. The upper claws are similar and provided with three small teeth, which decrease in size towards the base. The lower claw is bent at a right angle and has one large and one small tooth.

Palpi. Tarsus large, narrow and longer than femur. The apex forms a hard black point devoid of hairs. The outer margin of the cymbium in the apical third gives rise to a hook-like process clothed with a few hairs and ending in a short curved spine. The embolus (fig. 17) arises on the outer side of the genital bulb. It curves upward, backward and downward passing under the base of the tarsus to the inner side, where it curves upward, forward and downward to end near the apex. On the inner side it is covered and protected by a transparent chitinous plate. The tibia is very short. It is provided with a circlet of hairs and a single trichobothrium.

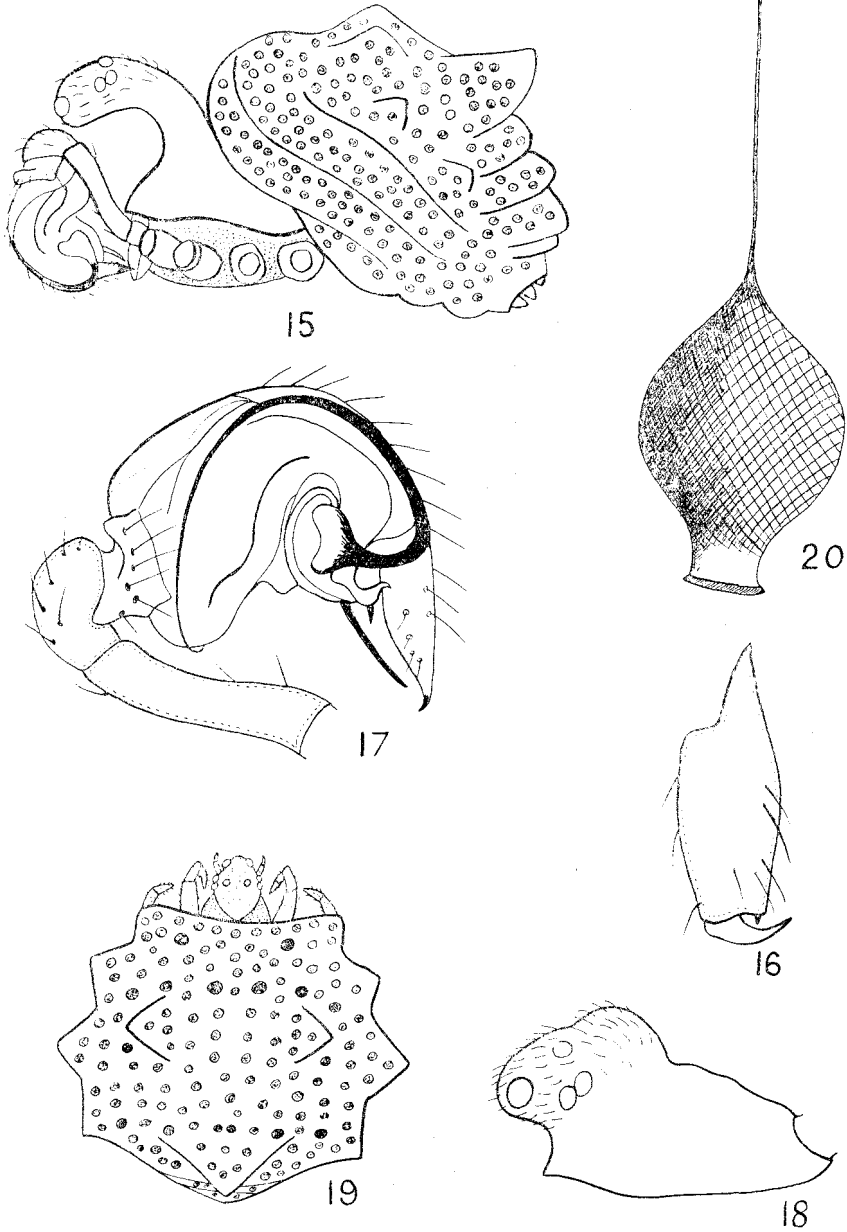
Abdomen. The front of the abdomen overhangs the carapace as far forward as the base of the neck-like cephalic region. The integument is tough and leathery, being studded with numerous small oval setigerous sclerites. Across the middle of the dorsal surface is a recurved row of four conical humps, the median pair being larger than the outer pair. Behind these is a transverse row of three similar humps, the middle one being the largest on the abdomen. Immediately in front of the row of humps across the middle of the abdomen is a transverse row of six oval sclerites, which do not carry hairs. A second row of five similar sclerites is situated immediately in front of the posterior row of humps. The middle sclerite in this latter row being composed of two fused together. At the sides of the abdomen and above the spinnerets the integument forms a series of folds, which are reinforced with elongate chitinous sclerites. Posteriorly these form two transverse bars below the large conical hump. On the ventral surface there is an epigastric scute, which extends forward on each side of the pedicle but does not surround it. The pulmonary spiracles are situated, one on each side, in a notch on the posterior margin of the scute. The spinnerets, colulus and anal tubercle are surrounded by a wide chitinous ring. The tracheal spiracle is in the form of a median transverse slit on the ventral surface of the ring. The anterior spinnerets are larger than the others. The colulus is small and tipped with three setae.

FEMALE

	mm.
Total length	2.320
Length of carapace	0.808
Width of carapace	0.808
Length of abdomen	2.088
Width of abdomen	2.494

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
1	0.5480	0.2877	0.2877	0.2603	0.2466	1.6303
2	0.4795	0.2740	0.2603	0.2329	0.2603	1.5070
3	0.4110	0.2740	0.2877	0.2466	0.2740	1.4933
4	0.6987	0.3151	0.4658	0.3562	0.3151	2.1509
Palp	0.2055	0.0959	0.1233	—	0.2055	0.6302

Colour (in alcohol). As in the male but some specimens are almost entirely black.



Ulesanis cygnea sp. nov. Fig. 15: Lateral view of male. Fig. 16: Chelicera of male. Fig. 17: Male palp. Fig. 18: Carapace of female. Fig. 19: Dorsal view of female. Fig. 20: Egg-sac.

Carapace. Rounded at the sides, narrow in front, convex and as wide as long. The cephalic region is elevated and slopes forward (fig. 18). Anteriorly it projects over the clypeus, but does not form a long neck-like structure as in the male.

Eyes. Eight. Ratio of eyes AME : ALE : PME : PLE = 7 : 5 : 6 : 6. The AME separated from each other and from ALE by 5/7 of their diameter. Lateral eyes contiguous. PME separated from each other and from PLE by 5/6 of their diameter. Median ocular area rectangular, longer than wide in ratio 18 : 17. Clypeus high and curved forward. Cephalic region lightly clothed with hair. Thoracic region smooth, shining and devoid of hair.

Chelicerae, maxillae, labium, sternum and legs as in male.

Palpi. Small. Tarsal segment without a drum. Clothed with barbed hairs. Claw absent. A single trichobothrium is present on the tibia.

Abdomen. Wider than long. When viewed from above it appears polygonal in outline (fig. 19). The front margin is almost straight. The anterior part of the abdomen overhangs the cephalothorax reaching as far forward as the head region. The integument is tough and leathery being strengthened with numerous rounded sclerites. Projecting on each side are four angular lobes or humps. Near the middle of the dorsal surface is a pair of large conical humps and behind these near the posterior margin is a single large median hump. The sides of the abdomen exhibit a series of folds as in the male. The ventral surface has a small epigastric scute, on each side of which is a narrow pulmonary plate. In surface view the epigynum has the form of a small median conical lobe on the posterior margin of the epigastric scute. Spinnerets, colulus and anal tubercle are surrounded by a chitinous ring.

Locality. The type specimens, male and female, were found together with other adult and immature forms on the under side of stones at Fern Tree, Mt. Wellington, Tasmania, on 25th August, 1947.

Habits and Egg-sac. The spider spins a small irregular web on the under side of stones. The egg-sac, which is pear-shaped, is made of golden brown silk (fig. 20). It is suspended from the under surface of a stone by a long thread composed of several strands. The wall of the egg-sac is tough and parchment like, but at the bottom there is a short tubular opening provided with a flange and closed with a diaphragm of soft silk, through which the young spiderlings make their escape. The sac measures 3.19 mm. long and 2.32 mm. in greatest diameter. The thread by which it is suspended varies in length from 6 mm. to 11 mm. One sac was found to contain 22 eggs. Each egg measures about 0.580 mm. in diameter. Two or three egg-sacs are sometimes found suspended close together.

Ulesanis trituberculata sp. nov.

MALE		mm.				
Total length		1.2056				
Length of carapace		0.4658				
Width of carapace		0.4795				
Length of abdomen		1.0960				
Width of abdomen		0.8768				
Height of abdomen		1.0960				
Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
1	0.3836	0.1918	0.2055	0.1918	0.2055	1.1782
2	0.3562	0.1918	0.1918	0.1781	0.2055	1.1234
3	0.2740	0.1644	0.1781	0.1507	0.2192	0.9864
4	0.4247	0.2192	0.2740	0.2055	0.2466	1.3700
Palp	0.3014	0.1507	0.0685	—	0.2740	0.7946

Colour (in alcohol). Cephalothorax and appendages golden brown. Abdomen yellowish with brown markings.

Carapace. Slightly wider than long. Narrowed in front and rounded at the sides. Head region high and produced into a neck-like projection, which is curved forward over the anterior margin (fig. 21). Clypeus high. Surface of carapace smooth, except the head region which is clothed with short hairs mounted on small granules. The epimera fused into a continuous band on each side below the margin of the carapace.

Eyes. Eight, carried on the neck-like projection, and arranged in two rows. Viewed from above the front row appears strongly recurved and the posterior row almost straight. Ratio of eyes AME : ALE : PME : PLE = 6 : 4 : 5 : 5. The AME are separated from each other by $\frac{5}{6}$ of their diameter and from ALE by $\frac{1}{2}$ of their diameter. The lateral eyes are contiguous. PME are separated from each other by once their diameter and from PLE by $\frac{3}{5}$ of their diameter. The median ocular area is rectangular and longer than wide in ratio 17 : 15.

Chelicerae. Small, conical, parallel. Furrow transverse a single tooth on promargin near basal end of furrow. Fang short curved and stout. Scopula absent. In front the basal end of the paturon is produced upward under the clypeus as a long sharp process (fig. 22).

Maxillae. Triangular, converging in front of labium. A scopula at apex and a serrula on the front margin.

Labium. Triangular, wider than long in ratio 7 : 6 and clothed with about seven hairs.

Sternum. Heart-shaped, as wide as long, truncate posteriorly between the fourth coxae, which are widely separated. Surface clothed with a few hairs and not pitted.

Legs. 4.1.2.3. Short and stout, lightly clothed with hairs but devoid of spines. Tarsi longer than metatarsi. Three trichobothria on the basal half the first and second tibia and four on the third and fourth tibia, one on the basal half of each metatarsus. A drum is present on the basal quarter of each tarsus. Three tarsal claws and setae modified as accessory claws are present. The upper claws are similar and provided with three teeth. The lower claw is strongly bent and has two teeth. The comb on the fourth tarsi is formed by a row of five barbed setae.

Palpi. Tarsus shorter than femur, and produced into a hard point, devoid of hairs, at the apex. The retromargin of the cymbium forms a hook-like projection near the apex (fig. 23). Distally the genital bulb gives rise to a stout curved apophysis, the tip of which is near the apex of the tarsus and is provided with a dense group of small teeth on one side. The embolus is difficult to see and its course has not been followed. Tibia very short and cup-like. It has no apophyses but carries a single trichobothrium and a circlet of hairs.

Abdomen. As high as it is long. In front it overhangs the carapace as far forward as the head region. Arising from the middle of the dorsal surface are two conical humps situated side by side, with a third slightly larger hump in a median position close behind them. The integument is tough and leathery. It has numerous small oval sclerites, which give to it a pitted appearance. Immediately in front of the middle pair of humps is a transverse row of six larger sclerites, and between the paired humps and the posterior median hump is a similar row of five sclerites. At the sides of the abdomen are three longitudinal folds, which are continuous above the spinnerets. In the grooves between the folds are narrow

chitinous bars. On the ventral side is a well developed epigastric scute, which is fused with the pulmonary plates on either side and also with a small crescentic plate above the petiolus. The pulmonary spiracles open in a notch on each side of the posterior margin of the epigastric scute. Behind the posterior lateral angles of the scute are two rounded sclerites, one on each side. The spinnerets, colulus and anal tubercle are surrounded by a thick annular chitinous tube, on the ventral surface of which is a short median transverse slit, which forms the opening of the tracheal spiracle. The colulus is small and furnished with three small hairs. There are six spinnerets, the anterior pair being the largest.

FEMALE							mm.
Total length						1.740	
Length of carapace						0.696	
Width of carapace						0.580	
Length of abdomen						1.508	
Width of abdomen						1.276	
Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total	
1	0.4110	0.2192	0.2055	0.1781	0.2329	1.2467	
2	0.3699	0.2055	0.1918	0.1781	0.2466	1.1919	
3	0.3151	0.1918	0.2055	0.1918	0.2466	1.1508	
4	0.5343	0.2466	0.3425	0.2605	0.2877	1.6714	
Palp	0.1507	0.0959	0.0822	—	0.1644	0.4932	

Colour (in alcohol). As in the male.

Carapace. Resembles that of the male except that the cephalic region is not elevated to the same extent (fig. 24).

Eyes. Eight, arranged in two rows. Viewed from above the front row appears strongly recurved and the posterior row almost straight. Ratio of eyes AME : ALE : PME : PLE = 7 : 5 : 5 : 6. The AME are separated from each other and from ALE by 5/7 of their diameter. Lateral eyes contiguous. PME separated from each other by 6/5 of their diameter and from PLE by once their diameter. Median ocular area wider behind than in front in ratio 17 : 16. Its length is greater than its posterior width in ratio 20 : 17.

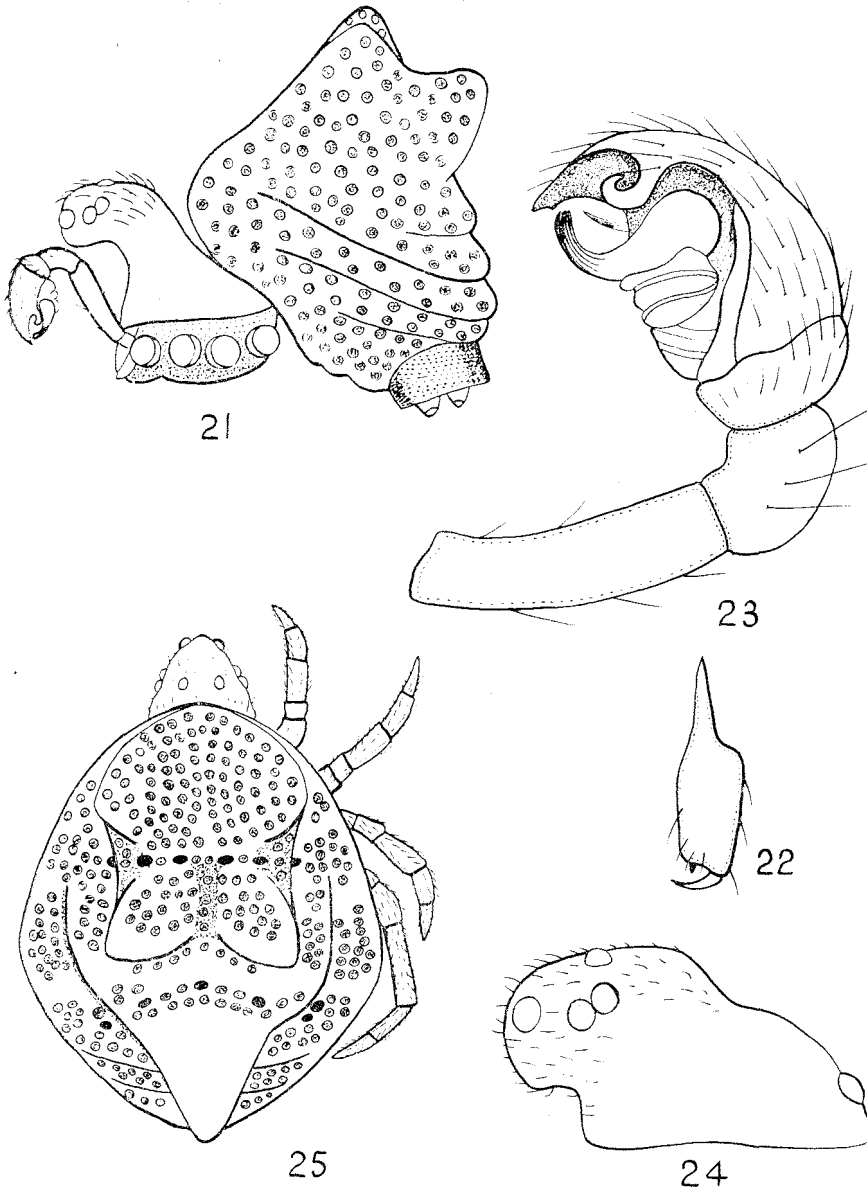
Chelicerae, maxillae, labium, sternum and legs as in the male.

Palpi. Small, lightly clothed with hairs, those on the tarsus being barbed. A single trichobothrium on the tibia and a drum on the apical half of the tarsus. No tarsal claw is present.

Abdomen. When viewed from above somewhat rhomboidal in outline. Not as high as in the male. The dorsal surface is raised into three large conical humps, which are situated in a similar position to those of the male. In addition to these there are two smaller lobes, one on each side, nearer the front of the abdomen (fig. 25). The integument is studded with small rounded sclerites. The epigastric scute is not fused with the pulmonary plates nor with the crescent-shaped sclerite above the petiolus. Spinnerets as in the male. The epigynum occupies the middle of the epigastric scute. It is a somewhat rectangular plate having a median depression, which leads into a crescent-shaped aperture anteriorly.

Locality. The type specimens, male and female were collected in gorse at the Punch Bowl, Launceston, Tasmania, 23rd May, 1930. Other specimens have been taken in low shrubs at Lenah Valley, and in grass tussocks at East Risdon.

Ulesanis trituberculata and *U. cygnea* differ from each other in the form of the abdomen. The presence of a large posterior median hump distinguishes both species from the two Queensland forms, *U. sextuberculata* Keys. and *U. rotunda* (Keys.), and from the three New Zealand species *U. excussa* (Urquhart), *U. lacunosa* (Urquhart) and *U. quadrata* (Cambridge). The Fijian spider, *U. personata* L. Koch differs from the two Tasmanian species in having a strongly pitted carapace.



Ulesanis trituberculata sp. nov. Fig. 21: Lateral view of male. Fig. 22: Chelicera of male. Fig. 23: Male palp. Fig. 24: Carapace of female. Fig. 25: Dorsal view of female.

Genus *Atkinsonia* Cambridge 1879

The genus *Atkinsonia* was founded on the characters of a small New Zealand spider, which Cambridge described under the name of *Atkinsonia nana*. The definition of the genus and the description of the species are adequate for the identification of the spider but not in sufficient detail to indicate the true affinities of the species. Simon (1894, p. 546) regarded the spider as belonging to his group Theridieae, whilst Dalmas (1917, p. 358) and Bryant (1933, p. 10) have abandoned the genus *Atkinsonia* and have placed the spider in the genus *Dipoena* Thorell, which belongs to Simon's group Dipoenaeae.

Through the courtesy of Mr. C. L. Wilton I have received from Mangarei, New Zealand, two adult males and one adult female of *Atkinsonia nana*. An examination of these specimens shows quite clearly that the spider is much more closely related to genera in the sub-family Phoroncidiinae than it is to the genus *Dipoena*. Several features mentioned by Cambridge (1879, p. 691) suggested that this might be the case. For example, he describes the cuticle of the abdomen as being 'somewhat coriaceous, thickly covered with pock-like markings' and states that 'the spinners are enclosed within a kind of sheath-like circular border'. These features are not possessed by members of the genus *Dipoena* but are characteristic of genera belonging to the Phoroncidiinae.

It seems necessary, therefore, to re-establish the genus *Atkinsonia*, to amplify the definition which Cambridge has given and to redescribe the species, *Atkinsonia nana*, in greater detail.

Definition of the Genus. Cephalothorax short and convex. Front of head region projecting over the clypeus, which is high. Eight eyes in two rows. Front row strongly recurved, posterior row almost straight. Lateral eyes contiguous. Median ocular area nearly square. Legs short and slender, 4.1.2.3. Tarsi longer than metatarsi. Chelicerae small and short, their length being less than the height of the clypeus. Tarsus of male palp produced into a narrow conical point at apex. Palp of female ending in a broad spatulate toothed claw. Front of abdomen projecting over base of carapace. Cuticle of abdomen coriaceous. Epigastric scute well developed. Spinnerets and anal tubercle surrounded by a chitinous ring.

Atkinsonia nana Cambridge						
						mm.
Total length						1.5660
Length of carapace						0.5800
Width of carapace						0.5754
Length of abdomen						1.1600
Width of abdomen						0.9316
Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
1	0.4110	0.2055	0.2740	0.2192	0.2740	1.3837
2	0.3973	0.2055	0.2466	0.2192	0.3014	1.3700
3	0.3699	0.2055	0.2603	0.2192	0.3151	1.3700
4	0.4110	0.2191	0.3425	0.2466	0.3425	1.5618
Palp	0.1507	0.0822	0.0822	—	0.2603	0.5754

Colour (in alcohol). Carapace, palpi, chelicerae, legs, maxillae and sternum reddish brown, the legs having dark infuscation underneath. Head region with a median brown area. Dorsal surface of abdomen yellowish with a longitudinal brown area in the middle and on each side. Ventral surface yellowish brown with reddish brown epigastric scute and sclerites.

Carapace. Slightly longer than wide. Narrowed in front, rounded at the sides. Head region high and projecting over the clypeus in front. The height of the clypeus is greater than the length of the chelicerae. Surface lightly clothed with hairs. Four long setae in a transverse row on posterior part of head region.

Eyes. Eight, arranged in two rows, which occupy the full width of the carapace in front. Viewed from above the anterior row is recurved and the posterior row is straight. Ratio of eyes AME : ALE : PME : PLE = 4 : 4 : 6 : 4. The AME are separated from each other by about once their diameter and from ALE by 1/4 of their diameter. PME are separated from each other and from PLE by 1/2 their diameter. The lateral eyes are contiguous, the median ocular area is slightly wider behind than in front in ratio 13 : 12, and is longer than its posterior width in ratio 14 : 13. The eyes are surrounded by black rims.

Chelicerae. Small and conical. Teeth and scopula absent. Fang long, slender and curved (fig. 26). In a position of rest the right and left fangs lie transversely, one behind the other.

Maxillae. Triangular, converging in front of labium, provided with a scopula at the apex and a serrula on front margin.

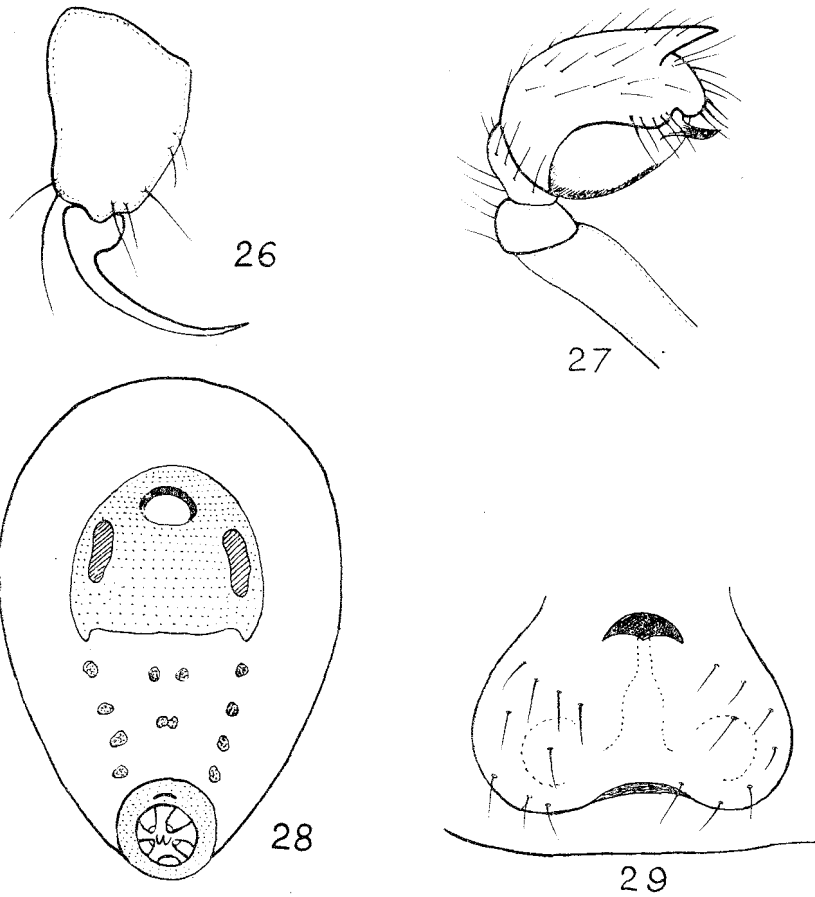
Labium. Triangular, wider than long, rounded at the base, clothed with about ten hairs.

Sternum. Shield-shape, wider than long in ratio 27 : 25. Truncate posteriorly between the fourth coxae, which are widely separated. Front margin excavated round the base of labium. Surface convex, lightly clothed with long hairs.

Legs. 4.1.2.3. Lightly clothed with hairs. Spines absent. One basal and one apical bristle on dorsal side of each patella and 1 — 1 bristles on dorsal side of each tibia. Two trichobothria on first and second tibia, three on the third and four on the fourth; one on each metatarsus. A drum is present near the base of each tarsus. Three tarsal claws. Upper claws of the first, second and fourth legs have five prolateral teeth and a single retrolateral tooth, those of the third leg have five prolateral teeth and one retrolateral tooth on the pro-claw and one prolateral tooth and five retrolateral teeth on the retro-claw. The lower claw is very small and strongly bent. Tarsi are longer than metatarsi.

Palpi. The tarsus ends in a short conical projection which terminates in a hard point. The alveolus is oval in outline. Its apical margin is thickly chitinized and indented by a notch. On each side of the notch the margin forms a small lobe which carries a few coarse setae, those on the outer lobe being stouter than those on the inner lobe. The genital bulb is ovoid and bears a short thorn-like apophysis situated near the notch in the apical margin of the alveolus. The embolus is short and ends in a black point near the apophysis (fig. 27). The tibia is short and has the form of a shallow cup. It is provided with a single trichobothrium and is devoid of apophyses. Femur shorter than tarsus.

Abdomen. Oval, somewhat pointed posteriorly. Anterior part overhangs the carapace. Integument tough and coriaceous. It has a pitted appearance due to the presence of numerous small rounded sclerites carrying long hairs. Near the middle of the dorsal surface are two conspicuous muscle spots. At the sides the abdomen forms two longitudinal folds. The groove between the folds contains a row of sclerites. The ventral surface is covered anteriorly by an epigastric scute, which extends forward and surrounds the base of the petiolus. On each side the scute incorporates the elongated pulmonary plate. Behind the posterior lateral angles of the epigastric scute and extending backwards towards the spinnerets is a longitudinal row of four small sclerites on each side. In a median position between the epigastric scute and spinnerets are two pairs of small sclerites (fig. 28). The spinnerets and anal tubercle are surrounded by a chitinous ring, on the ventral side of which is the median tracheal spiracle. No colulus is present.



Atkinsonia nana Cambridge. Fig. 26: Chelicera of male. Fig. 27: Male palp. Fig. 28: Scutes on ventral surface of abdomen of male. Fig. 29: Epigynum of female in surface view.

FEMALE

		mm.					
Total length							1.6240
Length of carapace							0.5800
Width of carapace							0.5500
Length of abdomen							1.2760
Width of abdomen							0.9860
Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total	
1	0.4521	0.1918	0.2740	0.2329	0.2877	1.4385	
2	0.4247	0.2055	0.2740	0.2329	0.3288	1.4659	
3	0.4110	0.2192	0.2740	0.2329	0.3836	1.5207	
4	0.5069	0.2603	0.3699	0.2740	0.4110	1.8221	
Palp	0.1370	0.0822	0.0959	—	0.1781	0.4932	

The female closely resembles the male and only the following structures need be described.

Palpi. Tarsal segment longer than femur. Patella and tibia very short. Tarsus clothed with barbed hairs. Tarsal claw wide, spatulate and concave underneath. It has seven teeth on its front margin and presents the appearance of a small rake. It resembles the claw of *Hadrotarsus ornatus*.

Epigynum. Occupies a large portion of the epigastric scute. In surface view it has the form shown in fig. 29.

Locality. Mangarei, New Zealand. Mr. C. L. Wilton collected the female on 28th July, 1944, and the males on 24th September, 1944.

Atkinsonia petricola sp. nov.

MALE							mm.
Total length							1.740
Length of carapace							0.754
Width of carapace							0.638
Length of abdomen							1.218
Width of abdomen							1.160
Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total	
1	0.5206	0.2055	0.3288	0.2740	0.3014	1.6303	
2	0.4932	0.2055	0.3151	0.2466	0.2877	1.5481	
3	0.4247	0.2055	0.2877	0.2192	0.3288	1.4659	
4	0.5343	0.2329	0.3973	0.2877	0.3836	1.8358	
Palp	0.2329	0.0959	0.1096	—	0.4795	0.9179	

Colour (in alcohol). Carapace reddish brown with dark margin. Legs reddish brown above becoming darker underneath. Palpi chelicerae, maxillae, labium and sternum reddish brown. Dorsal surface of abdomen yellow marked with a pattern of irregular transverse black bars and round reddish spots (fig. 30). Sides yellow with black markings. Ventral surface reddish brown.

Carapace. Strongly convex, rounded at the sides and narrowed in front. Cephalic part high and projecting forward over the clypeus (fig. 31). Thoracic groove V-shaped. Radial grooves indistinct. Dorsal surface of head region clothed with light coloured hairs, which point forward. Clypeus and thoracic region devoid of hairs.

Eyes. Eight, arranged in two rows, which occupy the full width of the head region. Viewed from above the front row is strongly recurved and the posterior row almost straight. Ratio of eyes AME : ALE : PME : PLE = 5 : 7 : 7 : 7. The AME dark, the other eyes pearly white. AME separated from each other by once their diameter and from ALE by $\frac{3}{5}$ of their diameter. Lateral eyes contiguous and projecting slightly at the sides. PME oval and separated from each other by $\frac{2}{7}$ of their long diameter and from PLE by once their long diameter. Median ocular area wider in front than behind in ratio 14 : 13 and longer than its anterior width in ratio 17 : 14.

Chelicerae. Small and conical. Teeth and scopula absent. Fang long slender and curved, its length being greater than that of the paturon. In a position of rest the left and right fangs cross each other (fig. 32).

Maxillae. Triangular, converging in front of labium, furnished with a well developed serrula on the front margin and a scopula near the inner apical angle.

Labium. Triangular, rounded at the base and truncate at the apex. Wider than long in ratio 12 : 10. Clothed with a few hairs.

Sternum. Shield-shape, as wide as long, convex, truncate between the fourth coxae, which are widely separated. Margin rebordered and forming pointed projections between the bases of the coxae. Surface slightly pitted and clothed with fine hairs.

Legs. 4.1.2.3. Lightly clothed with fine hairs, those on the tarsi and metatarsi being barbed. Spines are absent. A basal and apical bristle on the dorsal side of each patella and 1 — 1 bristles on the dorsal side of each tibia. Four trichobothria

on the first three tibiae and five on the fourth. A single trichobothrium on each metatarsus near the middle. Tarsi longer than metatarsi. Three tarsal claws and setae modified as accessory claws are present. The upper claws are similar and have four teeth on the promargin and one on the retromargin. The lower claw is bent at a right angle and has one small tooth. The comb on the fourth tarsi is formed by a longitudinal row of six barbed setae. A small drum is present on the dorsal side of the tarsi near the base.

Palpi. The apex of the tarsus is narrow and conical. It ends in a hard black point (fig. 33). The alveolus is oval in shape. The middle of its apical margin is thickly chitinised and notched. On each side of the notch the margin is fringed with about six strong setae, which extend inwards across the bulb. Near the centre of the bulb is a short black thorn-like apophysis. The embolus is short and ends at one side of the apophysis. The tibia and patella are short and without apophyses. There is a single trichobothrium on the tibia.

Abdomen. Partly overlaps the carapace. The length is slightly more than the width. The integument is tough and leathery, having a punctate appearance due to the presence of numerous small rounded sclerites. The dorsal surface is almost flat, slightly procurved in front, rounded and somewhat undulating at the sides, clothed with short hairs and sloping posteriorly to a narrow point at the spinnerets. It is marked by a number of larger round reddish-brown sclerites arranged as shown in fig. 30. The sides of the abdomen have three longitudinal folds, which are continuous above the spinnerets. In the grooves between the folds are a number of sclerites (fig. 31). The base of the petiolus is surrounded by a chitinous ring, behind which is an epigastric scute, which incorporates on each side a large oval pulmonary plate. The anal tubercle and spinnerets are surrounded by a wide chitinous ring. On the ventral surface of the ring is the median tracheal spiracle. There are six spinnerets, the anterior pair being the largest. No colulus is present.

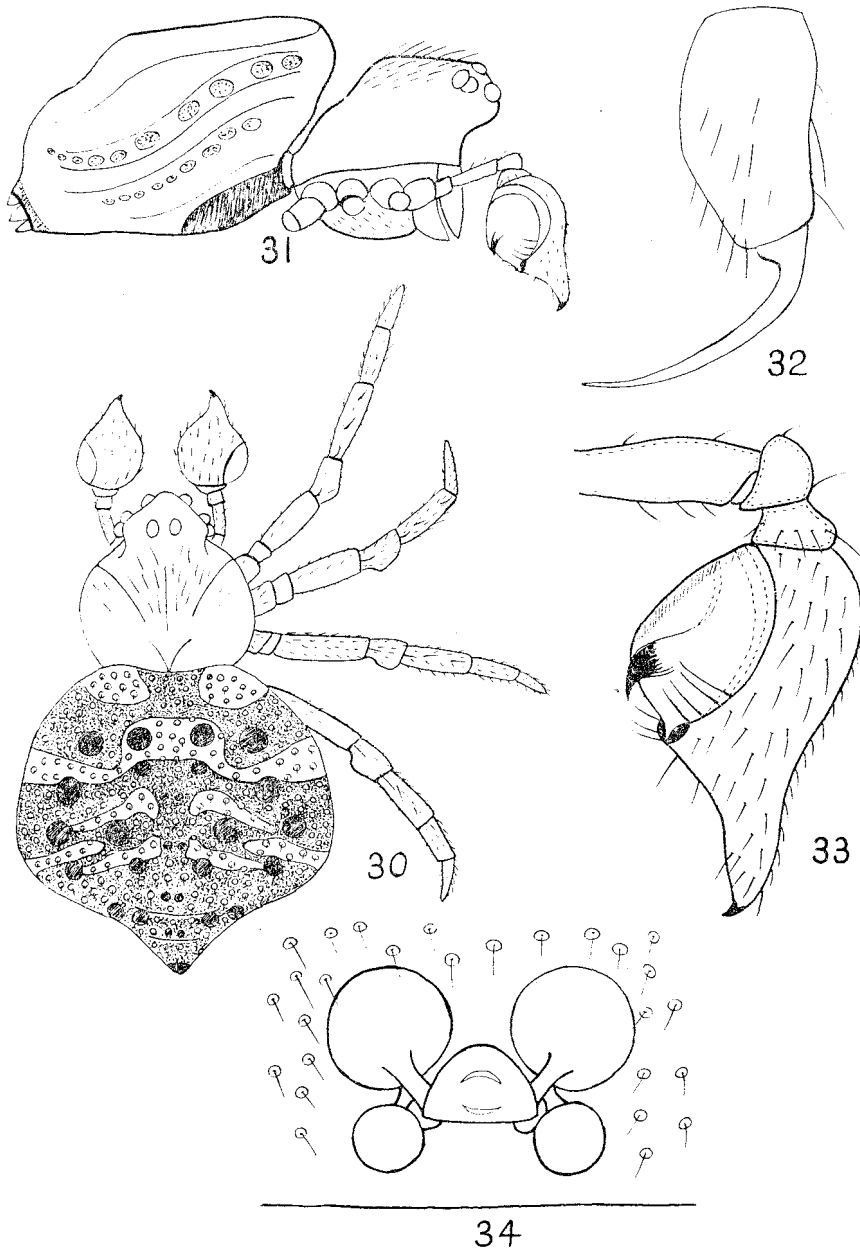
FEMALE

						mm.
Total length						1.740
Length of carapace						0.754
Width of carapace						0.580
Length of abdomen						1.334
Width of abdomen						1.334
Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
1	0.5069	0.2055	0.3014	0.2603	0.2877	1.5618
2	0.4658	0.2055	0.2877	0.2466	0.3151	1.5207
3	0.4247	0.2055	2.2877	0.2329	0.3425	1.4933
4	0.5480	0.2329	0.3973	0.2877	0.3836	1.8495
Palpi	0.1370	0.0822	0.0822	—	0.1644	0.4658

The female resembles the male in size, general appearance and colouration. However, the dark areas on the abdomen are usually smaller and may consist of a single irregular patch of black passing transversely across the middle of the dorsal surface.

Palpi. Tarsus longer than femur. Tibia and patella very short. A single trichobothrium on tibia. Tarsus lightly clothed with barbed hairs. Tarsal claw broad, rake-like and provided with nine teeth.

Epigynum. In surface view the epigynum appears as a small aperture with a rounded anterior lip. The aperture is situated on the epigastric scute in a median position slightly in front of the epigastric furrow. In transparent preparations two pairs of rounded spermathecae are visible, the anterior pair being larger than the posterior pair (fig. 34).



Atkinsonia petricola sp. nov. Fig. 30: Dorsal view of male. Fig. 31: Lateral view of male. Fig. 32: Chelicera of male. Fig. 33: Male palp. Fig. 34: Epigynum of female.

Locality. The type specimens, male and female, were collected together with a number of other adult and immature forms on the under surface of stones at Fern Tree, Mt. Wellington, Tasmania, 4th May, 1950.

My thanks are due to Mr. C. L. Wilton for specimens of New Zealand spiders and to Dr. Hamid Khan Bhatti of the Panjab University for literature not available in Australia.

REFERENCES

- ERYANT, E. B., 1933.—Notes on Types of Urquhart's Spiders. *Rec. Cant. Mus.*, 4, p. 10.
CAMBRIDGE, O. P., 1879.—On some New and Rare Spiders from New Zealand, with Characters of four New Genera. *Proc. Zool. Soc. Lond.*, 1879, p. 698.
DALMAS, R. de., 1917.—Araignées de Nouvelle Zélande. *Ann. Soc. ent. Fr.*, 86, p. 358.
DYAL, S., 1935.—Fauna of Lahore. 4: Spiders of Lahore. *Bull. Dep. Zool. Panjab Univ.*, 1, p. 162.
KEYSERLING, E., 1890.—Die Arachniden Australiens. II. Nürnberg. pp. 235-236.
KOCH, L., 1871.—Die Arachniden Australiens. I. Nürnberg. p. 243.
SIMON, E., 1889.—Etudes arachnologiques. Descriptions d'espèces et de genres nouveaux de Madagascar et de Mayotte. *Ann. Soc. ent. Fr.*, (6) 8. p. 231.
———, 1894.—Histoire Naturelle des Araignées. Paris. p. 559.
———, 1903.—Arachnides de la Guinée espagnole. *Mem. Soc. esp. hist. nat.*, 1(3), p. 75.
URQUHART, A. T., 1892.—Descriptions of New Species of Araneae. *Trans. N. Zeal. Inst.*, 25, pp. 169-171.