

The problem arose much sooner, was much easier than in the case of exposed plants, and apparently was solved much earlier. I believe that at the present time these advantages still show, ferns are able to extend themselves recklessly—there are probably few exposed plants which rival the ferns in ratio of surface to mass.

The New Zealand kidney-fern possesses an extraordinary extension of surface in proportion to its mass; a young and vigorous New Zealand cabbage-tree also shows very considerable surface: but if cut and exposed to a drying wind the fern shrivels in a few minutes, the cabbage-tree scarcely in a week. The fern in gaining large surface has become excessively open to damage by light, by wind, and by drought; the cabbage-tree in gaining a great extension of surface has retained its power of resisting all three.

It seems, therefore, reasonable enough to assume that even if the necessity for increased surface arose at the same time in ferns and exposed flowering-plants, the latter, faced by such difficulties, would take much greater time to develop it safely.

ART. XXXIII.—*Some New Zealand and Tasmanian Arachnidæ.*

By H. R. Hogg, M.A., F.Z.S.

Communicated by Dr. C. Chilton.

[Read before the Philosophical Institute of Canterbury, 3rd September, 1909.]

FOR the phalangids and spiders now described, with one exception, I have to thank Professor Benham, of Dunedin, and Dr. Chilton, of Christchurch.

Coming from Tasmania, Stewart Island, and New Zealand, they are representative of the southern fringe of the families to which they belong, and I welcome this opportunity of placing them on record.

The extension of the genus *Pantopsalis* to Tasmania and of *Macropsalis* to Stewart Island does away with the older supposition that the former was peculiar to the New Zealand region and the latter to the Australian.

Order ARANEÆ.

Fam. DICTYNIDÆ.

Genus AMAUROBIUS, Sund.

Amaurobius charybdis, nov. sp.

The cephalothorax is red-brown in front, orange-brown on the thoracic part, and darker orange on the cephalic part, with a narrow median stripe and side stripes quite dark brown.

The mandibles are black-brown, the fangs black at the base, red towards the point. The lip and maxillæ dark red-brown. The sternum dark yellow-brown, with long upstanding brown hair.

Coxæ and legs bright yellow-brown, with bands of light grey, three on the femur, tibia, and metatarsus, and one on the patella. Palpi yellow, with grey hairs.

The abdomen is dark grey, mottled with small bunches of white or yellow hairs. Two rather broad longitudinal yellow stripes divided by a

median grey stripe extend one-third the length from the front. In the centre behind these is a white pattern shaped like a St. Andrew's cross. On the under-side are four longitudinal pale-yellow stripes. The spinnerets are dark brown, the cribellum nearly white.

The *cephalothorax*, convex on the cephalic part, is furnished with some strong curved bristles over the anterior area; otherwise it is rather bare.

The sides of the thoracic part are well rounded.

The rear row of eyes is strongly pro-curved, the lower edge of the median being half their diameter above the upper edge of the laterals. The median eyes

are $1\frac{1}{2}$ times their diameter apart, and $2\frac{1}{2}$ times of the same distant from the laterals, which are oval, their long diameter perpendicular. They are on a common tubercle with the front laterals, which are of the same size and shape but lying horizontally, and from these they are parted at the corners by a third of their length. The front row is straight. The outer edge of its side eyes lies just within the inner edge of the rear laterals. They are their long diameter distant from the median,

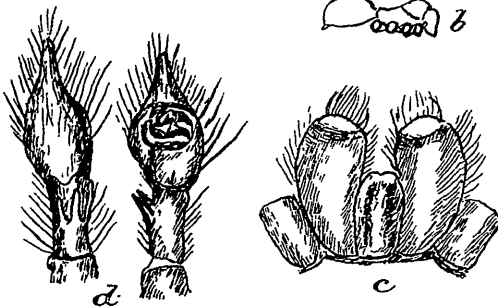
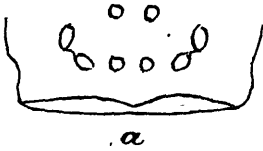


FIG. 1.—*AMAUROBIUS CHARYBDIS*.

a. Eyes. b. Profile, natural size. c. Lip and maxilla.
d. Male palp, front and back.

which are as large as the rear median, and stand their diameter apart from one another, and more than twice that distance from the rear median eyes. The clypeus is twice their diameter.

The *mandibles* are long and powerful, kneed at the base, and furnished with long upstanding bristles. The fangs are long and well curved. There are three rather small teeth on the inner margin of the falx-sheath, and one large between two small on the outer.

The *maxilla* are upright, straight on the inner edge and moderately rounded on the outer. The *lip* is one-third longer than broad, narrowed anteriorly, truncate with a slight hollow in front.

The *sternum* is shield-shaped, twice the breadth of the lip, and is raised up from the margin; it is covered with long upstanding hairs; it narrows to a point at the rear, and slightly projects between the two rear coxæ, which are not quite contiguous. These are also separated from the coxæ of the third pair.

The *legs* are moderately fine, tapering to their anterior ends. The front pair are remarkably long, being nearly $4\frac{1}{2}$ times the length of the cephalothorax. There is no calamistrum on the male. The superior claws are strong and are well curved at the anterior end, with about nine teeth on the basal half.

The *palpi* are fine, and furnished with three apophyses on the back of the tibial joint.

The *abdomen* is oval, straight in front, rounded at the sides, and moderately high. It is covered with downlying thick bristly hair, interspersed with long upstanding bristles. The *cribellum* is divided, and stands up rather high above the level of the abdomen. The *spinnerets* are normal.

The measurements in millimetres are as follows:—

		Length.		Breadth.		
Cephalothorax	.. ..	..	6	4 (3 in front).		
Abdomen	.. ..	..	6	3½		
Mandibles	.. ..	..	3			
Legs,—		Coxæ.	Tr. and Fem.	Pat. and Tib.	Met. and Tars.	
1	2	6½	9	9	= 26½
2	2	6	7	7	= 22
3	2	5½	6	6	= 19½
4	2	6	6½	6½	= 21
Palpi	1	3	2	1½	= 7½

One male, from Stewart Island.

Fam. THOMISIDÆ.

Subfam. STEPHANOPSINÆ.

Group STEPHANOPSEÆ.

Genus STEPHANOPIS, Cambr.

Stephanopis, Rev. O. P. Cambridge, Ann. & Mag. Nat. Hist., 1869, p. 60;
L. Koch, Arach. Aust., 1874, p. 495; E. Simon, Hist. Nat. des Ar.,
vol. i, p. 1054.

Stephanopis benhami, nov. sp.

The *cephalothorax* is dull yellow with a darker triangular longitudinal median stripe reaching from the rear row of eyes to the top of the rear slope. The *palpi*, legs, lip and *maxillæ*, *sternum*, and both sides of the *abdomen* are about the same colour as the *cephalothorax*, the *mandibles* somewhat darker. On the upper side of the *abdomen* are three pairs of muscle spots.

The *cephalothorax* is triangular, widening from less than a millimetre in front to 2½ millimetres at the posterior end, the edge of which is straight. The skin is somewhat tuberculous, and thickly covered with downlying flat club-shaped bristles. The front part of the *cephalothorax*, on which lies the anterior row of eyes, is perpendicular to the remainder of the cephalic part, on the top of which is the rear row of eyes. The latter is slightly recurved, equal and equidistant, rather more than their diameter apart. The front row of eyes is strongly recurved, the laterals twice the diameter of the rear eyes; reaching up to the margin of the upper surface. The small median, one-third of the diameter of the latter, are their own diameter apart, and lie a little below the line joining the lower edge of the laterals. They are twice their diameter from the margin of the clypeus.

The *mandibles* are rather broad and straight. The lip is as broad as long, truncate in front, and reaches barely half-way up the *maxillæ*, which are straight at the anterior end, and nearly touch one another over the lip. The *sternum* is a broad oval, and the rear *coxæ* touch one another. The *palpi* are short and thick, thickly covered with bristly hair, and the *patellar joint* is as long as the *tibial*.

The femora of the front two pairs of legs are much thicker and broader than the rest. They are carried thrown back from the coxæ, the other joints pointing forwards, and are covered with short spatulate bristles on the

upper side. On the under-side of the metatarsi of each are three pairs of stout spines, and on the under-side of the tibia four stout incurved pairs. These spines are much stouter on the front pair than on the second. There are also claw-tufts on the tarsi of the front two pairs. The rear two pairs are slighter and unarmed, with fine bristles under the tarsi.

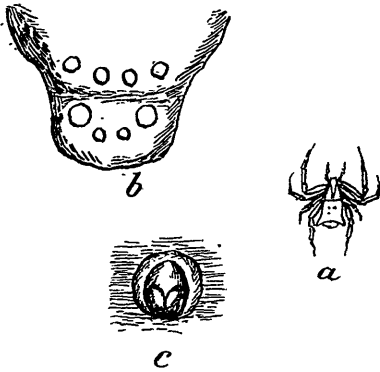


FIG. 2.—STEPHANOPSIS BENHAM.

a. Natural size. b. Eyes. c. Epigyne.

sinks perpendicularly to the spinnerets. The under-side of the abdomen is thickly covered with short spatulate bristles.

This species, in coloration, pattern of eyes, and shape of cephalothorax and abdomen, is very like L. Koch's *S. longipes*, from Rockhampton, Queensland. Besides being smaller, its front two pairs of legs are shorter in proportion, and the two rear pairs longer.

The measurements in millimetres are as follows:—

		Length.		Breadth.		
Cephalothorax	.. ..	3	2½	(1 in front).		
Abdomen	.. ..	3½	3			
Mandibles	.. ..	1				
Legs,—						
		Coxæ.	Tr. and Fem.	Pat. and Tib.	Met. and Tars.	
1	1	3½	3½	3	= 11
2	1	3	2½	2½	= 9
3	1	2	1½	1½	= 5½
4	1	3	2½	2	= 8½
Palpi	½	1	1	¾	= 3¼

One female, from Stewart Island.

I have named this species after the collector, Professor W. B. Benham.

M. Simon calls the genus *Stephanopsis*, possibly misled by the error in the Index of the Zoological Record, 1880-1900; but *Stephanopsis* is the name originally given to the genus by the Rev. O. P. Cambridge, and it must be so spelt: *Stephanops*, moreover, is the name of an older genus of *Rotifera*.

The area of distribution of the genus covers pretty well the whole of the subtropical regions south of the Line, with the exception of Africa, although it reaches as far as Madagascar. This specimen is from the farthest-south point hitherto recorded.

Order OPILIONES, Sundevall.

Suborder PALPATORES, Thorell.

Fam. PHALANGIOIDÆ, Thorell.

Genus MACROPSALIS, W. Sorensen.

Macropsalis, W. Sorensen, Die Arachniden Aust., ii Halfte, p. 54, 1886, Opiliones; R. I. Pocock, Proc. Zool. Soc. Lond., 1902, vol. ii, p. 398, New Harvest Spiders; Dr. J. C. C. Loman, Zoologischer Jahrbucher, Band xvi, 1902, p. 163 *et seq.*, Neue Ausereurop. Opilione.

Macropsalis chiltoni, nov. sp.

This specimen from Stewart Island is the first of the genus which has been recorded from New Zealand, the species hitherto described having come from the mainland of Australia, while the New Zealand forms were believed to have all fallen into the allied genus *Pantopsalis*, E. Sim.

Carapace dark red-brown, with two parallel longitudinal orange stripes reaching from the sides of the eye-tubercle to the rear slope. Legs and femoral joint of palpi brown with yellow bands, remainder of palpi pale yellow. Abdomen grey in front, with two parallel black-brown stripes reaching from the anterior end half-way down the abdomen, the remainder black-brown.

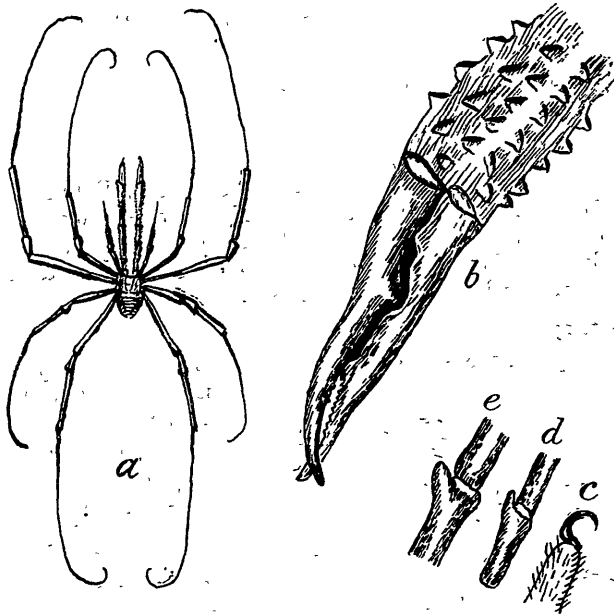


FIG. 3.—MACROPSALIS CHILTONI.

a. Natural size. b. Mandibular finger, enlarged. c. Palpal claw. d. End of tibial joint of palp, from inside. e. Same, from outside.

Of the mandibles the basal segment is yellow-brown, darkening anteriorly on the upper side. The second segment is dark red-brown above and yellow underneath.

With the exception of a few small spines on the eye-tubercle and in front of same, the whole carapace is quite smooth.

The mandibles are thickly covered with spicules and tubercles. They are thin, but widening out slightly at the anterior end of each joint. The fingers are long and thin. The fixed joint has two large teeth, and a row of smaller reaching nearly to the anterior end. On the movable joint is one large tooth near the middle and a few serrations reaching to the anterior end. The patellar joint of the palp is shorter than the tibial, and has a lateral process at the anterior end.

The legs have no spicules on the trochanter, but short strong spicules on the femoral joint, and a few weaker spicules on the patella.

I am unable to distinguish the sex without damaging the single specimen.

The measurements in millimetres are as follows :—

				Length.	Breadth.
Cephalothorax	..	..	..	.. 2½	2½
Abdomen	..	..	..	.. 2	2½
				1st Joint.	2nd Joint.
Mandibles	..	..	..	.. 7	8
Legs,—		Coxæ.	Tr. and Fem.	Pat. and Tib.	Met. and Tars.
1	..	.. 2	6	7	18 = 33
2	..	.. 2	12	12	24 = 50
3	..	.. 2	6	7	18 = 33
4	..	.. 2	9	10	24 = 45
Palpi	..	.. —	3	3	3½ = 9½

One specimen, from Stewart Island. Named after Professor C. Chilton, of Canterbury College.

Genus PANTOPSALIS, E. Simon.

Pantopsalis, E. Simon, Comptes Rendus de la Soc. Ent. de Belgique, Mai, 1879, p. 16; W. Sorensen, Arach. Austr., Zweiter Theil, 1886, p. 56; Dr. J. C. C. Loman, Zool. Jahrb., Band XXI, 1902; R. I. Pocock, Proc. Zool. Soc., Dec. 2, 1902, p. 392, and Ann. & Mag. Nat. Hist., ser. 7, vol. xi, May, 1903, p. 436.

Pantopsalis trippi, Pocock.

I have compared this single specimen with Mr. Pocock's type specimen (in the British Museum Nat. Hist. Dept.) from Timaru, and it is certainly the same; the only difference being that in this there are short fine bristles on the eye-tubercle and in front of same, in his they are more definite spicules.

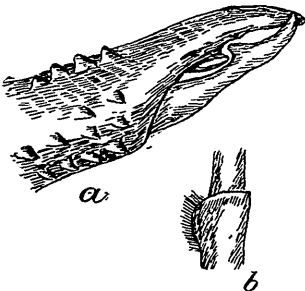


FIG. 4.—PANTOPSALIS TRIPPI.
a. Mandibular finger. b. End of tibial joint of palp.

The coxa, femur, patella, and tibia of the palp are orange, the long metatarsal joint being nearly white. The patella and tibia of same are of equal length. The anterior end of the patella has a sort of pad, covered with short bristles, instead of the process in the genus *Macropsalis* above detailed from the same locality,

and the fingers are shorter, with one large tooth about the middle.

The measurements in millimetres are as follows:—

		Length.		Breadth.		
Cephalothorax	..	..	3	..	3	
Abdomen	..	..	—	..	—	(missing).
			1st Joint.		2nd Joint.	
Mandibles	..	..	10	..	11	= 21
			Tr. and Fem.		Pat. and Tib.	Met. and Tars.
Legs,—	Coxæ.	..	7½	..	6½	16 = 32
1	..	..	2	..	—	—
2	..	..	2	..	—	—
3	..	..	2	..	6½	18 = 32½
4	..	..	2	..	10	24 = 44
Palpi	..	..	—	..	3	3 = 8

One specimen, from Stewart Island.

In addition to the six species of *Pantopsalis*, all from New Zealand, detailed by Mr. Pocock (*loc. cit.*), there is in the British Museum collection a dried specimen from Tasmania, and broken parts of two more of the same, apparently undescribed. This extends the range of the genus farther than had been hitherto recorded. The Tasmanian species is lighter in colour, but not very different from the above. For the sake of comparison I append the description.

Pantopsalis tasmanica, nov. sp.

Carapace and legs rather dark yellow-brown.

The femoral, patellar, and tibial joints of the palpi yellow blotched with grey, the distal joint pale yellow.

The carapace and low eye-tubercle are quite smooth, without spines or granulation.

The mandibles are long and thin, the spinous tubercles thereon small but thickly spread over the whole surface of both joints. The first joint is slightly thickened at each end. The second, which is longer and stouter, gradually thickens slightly from the base to the anterior end. The point of the movable finger crosses that of the fixed one. The fingers are short, with one large tooth in the middle of each.

The palpi are fine and smooth, and shorter than the first joint of the mandibles. The patella and tibia are of equal length, and the anterior end of the former is just slightly thickened.

The measurements in millimetres are,—

		Length.		Breadth.		
Cephalothorax	2	..	2	
Abdomen	—	..	—	
			1st Joint.		2nd Joint.	
Mandibles	7	..	8	= 15

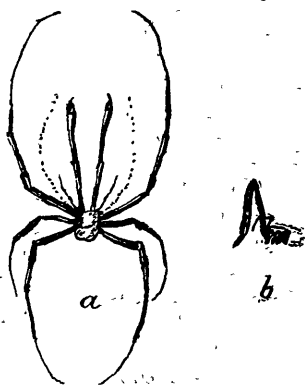


FIG. 5.—PANTOPSALIS TASMANICA.
a. Natural size. b. Profile.

of equal length, and the anterior end of the former is just slightly thickened.

Legs,—			Tr. and Fem.	Pat. and Tib.	Met. and Tars.		
1	..	..	.. —	—	—
2	..	..	.. 7½	8	17	=	32½
3	..	..	.. 4½	4	8	=	16½
4	..	..	.. 6	6	14	=	26
Palpi	..	..	.. 1½	1½	2	=	5

One dried specimen in the British Museum (the abdomen and front pairs of legs missing), and parts of two others (smaller), one with much shorter but similar-shaped mandibles. This might be a sexual or age difference, but it is impossible to distinguish the sex of any of them.

Tricenyx testaceus, nov. sp.

Carapace orange. Eye-tubercle yellow, with two black patches between the eyes. Mandibles pale yellow. Abdomen orange, transversely striped with black on the posterior segments. Legs very pale yellow.

The carapace, including the ocular tubercle, which is quite terminal, is very finely granulated, almost smooth, and with no tubercles or spines. The eyes are yellow, and situated nearly at the apex of their tubercle. On the upper side of the abdomen there is a transverse row of fine spines on each segment. On the under-side the segments are finely granulated and without tubercles.

The mandibles have the first joint smooth, the second with a median row of spinous bristles down the front and spines round the anterior margin; the fingers just cross one another at the points.

Palpi: The coxa has two large spinous tubercles on the under-side. The trochanter has one similar. The femur has on the under-side two large spinous tubercles at the base and one small about the middle, on the upper side a median row of small tubercles and red mottlings on the yellow ground. The patella is smooth. The tibia has two long spinous tubercles on the inner side and one short one in front. The tarsus has two inner and three outer spines.

The coxæ of the first pair of legs have two large spinous tubercles on the under-side, and there are smaller spinous tubercles on those of pairs 2 and 3.

The maxillary process at the base of the second leg is double, the inner segment being twice as high as the other. The tarsal segments are 4, 10, 5, 5.

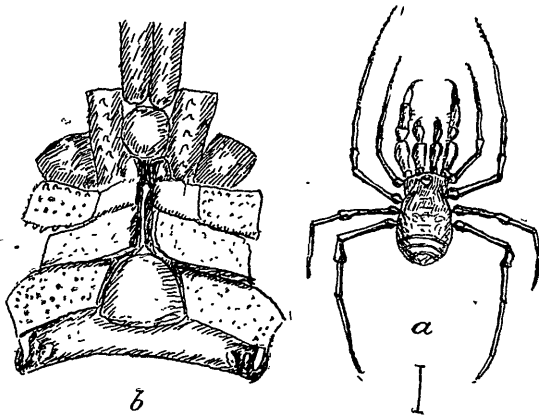


FIG. 6.—*TRICENYX TESTACEUS*

a. Enlarged; $\times 2$. b. Sternal and coxal area of under-side of thorax.

The measurements are as follows, in millimetres:—

	Length.		Breadth.		
	6		4		
	1st Joint.		2nd Joint.		
Mandibles	2	1½	=		3½
	Tr. and Fem.	Pat. and Tib.	Met. and Tars.		
Legs,—					
1	3	3	=		9
2	4	4	=		14
3	3	3	=		9½
4	4	4	=		13
Palpi	2½	2½	=		6½

This species is near to *T. sublævis*, Pocock. But, apart from the colour, which might possibly be a matter of age, it differs in the length of the end part of the single maxillary process, which is in this twice as high as in the other. The palp also is shorter, and the bespining of same different.

One female (?) labelled "New Zealand" only.

Tricononyx stewartius, nov. sp.

Dorsal surface of carapace dark yellow-brown, lighter yellow-brown along the posterior edges of the segments; under-side lighter yellow-brown. Legs dark brown mottled with yellow; palpi, coxa, and trochanter yellow; femur black-brown with round yellow spots, bright yellow at anterior end; patella yellow; tibia black-brown at basal half, anterior portion bright yellow; distal segment bright yellow. Mandibles black-brown, fingers yellow.

The carapace is finely granulated, without spines or tubercles except as mentioned below. The anterior area of the upper surface is two-thirds as deep as the remainder. The eye-tubercle is quite on the anterior edge, finely granulated, but without tubercles or spines. It is conical and low, and the eyes are situated almost at the apex.

There is a row of tubercles in front of the posterior border of the scute, and a few short bristles on the median line.

Palpi.—On the coxal joint there is 1 short spinous tubercle at the anterior end.

On the trochanter, 1 above and 1 each side.

On the femur, 3 large and 1 small above, 3 small on the inner side and 3 below.

On the patella, none.

On the tibia, 2 each side and 1 underneath at rear end.

On the tarsus, 3 on the outer side and 2 on the inner, with slightly curved yellow claws at the end.

On the palpal coxæ, and coxæ of 1st, 2nd, and 3rd pairs of legs, are rather large granulations. That of 4 is nearly smooth. The maxillary processes on the coxæ of the second pair of legs are single and roughly triangular.

The measurements in millimetres are as follows:—

	Length.	Breadth.
Carapace	3½	3 (2 in front).
Abdomen	1½	3



FIG. 7.
TRICONONYX STEWARTIUS.
a. Enlarged; ×2.
b. Profile.

Legs,—	Tr. and Fem.	Pat. and Tib.	Met. and Tars.	=	
1	1½	1½	2¼	=	5¼
2	2	2	4	=	8
3	1½	1½	2	=	5
4	2½	2½	3½	=	8½
Palpi	1¼	½, ¾	1	=	3½

The tarsal divisions of legs are 4, 11, 5, 5,

This species is rather close to *T. coriacea*, Poc., from Auckland; but the legs are shorter in proportion and the bespining of the palpi is rather different, there are no tubercles on the abdominal segments, and the tarsal divisions of the legs are greater in number.

One male, from Stewart Island.

APPENDIX.

The following descriptions are reprinted here for the benefit of students in the Dominion who may not be able to consult the original works.

White, Proc. Zool. Soc. Lond., vol. xvii, 1849, p. 6.

PHALANGIUM LISTERI.

Chelicera enormously long; first joint not quite so long as the second, and, like it, rough with outstanding short spines; the end very slightly thickened, with two claws, one fixed, with a small tooth inside near the base, followed by a deepish notch, the movable claw with a largish tooth about the middle which fits into the notch of fixed claw.

Hab.—New Zealand.

M. Eugene Simon, Soc. Ent. de Belgique, Comptes Rendus, 2 May 1879, p. 16.

Genus PANTOPSALIS, nov. gen.

(Παν = totus, ψαλις = forfex.)

Teguments sub-coriacés. Corps tres-court, presque arrondi. Abdomen plus court que le cephalothorax; celui-ci très élevé, presque conique.

Mamelon oculaire élevé, plus large que long, inerme, largement separé du bord antérieur. Chelicères d'une longueur excessive, plus de quatre fois plus longues que le corps, leurs deux articles presque égaux, doigts robustes et courts. Pre-epistome très grande trapezoïde, epistome plus petit, en triangle avec le sommet un peu saillant et conique, mais non en forme de lame.

Lobes maxillaires de la seconde paire, cylindriques, attex, grêles, non attendus, et obtus, dirigés obliquement en avant mais ne se rencontrant pas. Avance sternale de l'abdomen un peu élargie en avant et tronquée. Piece anale petite, semi-circulaire, à peine aussi large que les bords refléchis du 8 segment. Patte machoire beaucoup plus court que les chelicères, patelle et tibia beaucoup plus longs que larges, presque d'égale longueur, sans brosse interne, griffe tarsale très petite. Pattes très-longues et fines, tibia de la seconde paire et metatarses des 4 paires pourvus de fausses articulations.

Ce genre est le plus singulier de la famille des *Phalangidae*, par des énormes chelicères ayant plus de quatre fois la longueur du corps, il rappelle même

avec exaggeration, le genre *Ischyropsalis*, ses principaux caractères le rapprochent du genre *Gagrella*, Stol.

Type, *Pantopsalis listeri*, White. Proc. Zool. Soc., part xvii, 1849, sub. *Phalangium*.

Long., 5 mm. ; chel. long., 25 mm. Nouvelle-Zélande (Île du Milieu).

Le Muséum du Paris possède trois exemplaires rapportés par M. Filhol.

Corps très noir finement chagriné, portant sur le bord anterior un groupe de petits denticules irrégulières.

Chelicères noires, doigts courts très robustes pourvus chacun d'une forte dent médiane.

Pattes noire cylindriques, femur garnis de petits denticules irrégulières. Patte Machoire blanc testacés avec le fémur brun-rouge.

M. Simon (Zoologischen Jahrbuchern, vol. xxi, pt. 4, 1905) gives the following list of spiders as having been recorded from the Chatham Islands :—

Tegenaria domestica, Clerck (probably introduced).

Theridion tepidariorum, C. Koch (probably introduced).

Tetragnatha gulosa, L. Koch

Araneus verrucosus, Walckenaer

Clubiona peculiaris, L. Koch

C. cambridgei, L. Koch

Desis marinus, Hector

Cambridgea antipodiana, White

Lycosa hilaris, L. Koch

Amaurobius chathamensis, E. Simon

Ariadne barbiger, E. Simon

Clubiona chathamensis, E. Simon

Mynoglenes (nov. gen.) *insolens*, E. Simon

Dolomedes schauinslandi, E. Simon

Lycosa ralph, E. Simon

L. turbida, E. Simon

L. retiruga, E. Simon

L. algida, E. Simon

} New Zealand also.

} From Wharekauri Island, Chatham Islands, and peculiar to the locality.

To these I added (Proc. Zool. Soc. Lond., 1908, p. 340 *et seq.*), from Pitt Island,—

Dolomedes huttoni, nov. sp.

D. trippi, nov. sp.