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STUDIES ON TROPICAL PHOLCIDAE I

PANJANGE, A NEW GENUS OF INDO-AUSTRALIAN LEAF- AND ROCK-DWELLING PHOLCID SPIDERS (ARANEAE)

by

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The study of tropical spiders was taken up in the last part of the nineteenth century by Thorell, Simon and others, but since then passed through a long dormant stage. Only during the last few decades there was some revival. In particular numerous spider species from leaf-litter, ground debris, etc. have been described after collecting by special methods such as sieving, Berlese funnels and pitfall trapping.

Spiders from another common habitat in South East Asian rainforests, the underside of leaves, seem to have been inadequately treated in older publications. Certain spiders, e.g. pholcids and clubionids, do not readily drop when disturbed, but stick firmly to their leaf substrate or escape sideways through twigs and branches. At present there is no adequate collecting method for this category of leaf-inhabiting spiders but to turn thousands of leaves one by one and pick them off by hand. The particular way of collecting must be the only reason why most species, which we thus collected during several visits to South East Asia, appear to be new to science. These new species were collected in various types of dense, humid forest in Borneo (Sabah and Kalimantan), Java, Sulawesi, Sri Lanka, Malay Peninsula and Luzon, and by F. R. Wanless in Sarawak, V. E. Davies and collaborators in North East Queensland, and J. R. Thomson in Kalimantan. Collecting efforts in the areas mentioned have been very rewarding and this leads to the expectation that in the areas mentioned and also in Sumatra, New Guinea and the Philippine Islands many species of Pholcidae still await discovery. Special attention should be given yet to spiders living in the canopy. There may be a considerable amount of endemism in this spider group and it is to be feared that many species will have become extinct by the wholesale destruction of Asian rainforests even before their discovery.

Most of the species described in this and subsequent papers live on the underside of large leaves of Liliaceae, Araceae and certain Dicotyledons. During

daytime they sit with outstretched legs under the leaves, some without a web, others with a very thin, finely mazed sheetweb adjacent to or underneath the leaf. Living in this habitat has entrained some changes in body form, such as a flattening of the carapace, shift of eye position to the sides of the head and loss of the anterior median eyes, and lengthening and thinning of abdomen and legs.

As in other pholcids and in many haplogyne spiders the sexes are mostly found in equal numbers. They are often seen in pairs on the same leaf: females have a male around most of the time and males seem to have a similar life span as females. Accordingly, the female genital apparatus lacks sophisticated devices to preserve sperm over long periods, such as the receptacula seminis found in other spider groups. The female genital organ simply consists of a bursa copulatrix with open valves or pockets for sperm preservation (Wiehle, 1967; Traciuc, 1971). The reproductive organs in Pholcidae are somewhat different from those of other families, but within the group they are relatively uniform.

One innovation, however, has occurred in South East Asia: in the leaf-adapted genera *Micromerys* Bradley and *Calapnita* Simon the typically massive, bulgy male palp has been transformed into a slender, elongate one with very long and thin appendages, three to four times longer than the carapace. This indeed has an enhancing effect on their mimicking a leaf nerve.

The species placed here in the genus *Panjange* nov. gen. share the above transformations with *Micromerys* and *Calapnita*, but their body form and the typical extensible epigyneal lip amongst other things clearly set them apart. A synopsis of distinguishing characters of the four Old World leaf-adapted genera recognized in this paper, the species of which have long, thin abdomina, are given in table 1. A redescription of *Leptopholcus* Simon was given by Brignoli (1980), those of *Micromerys* and *Calapnita* will be presented elsewhere (Deeleman-Reinhold, in press). In this latter paper another new species of *Panjange* from North East Queensland will be described. *Leptopholcus* is distributed in Asia and Africa, the other three genera have been found only in South East Asia and Australia.

A number of species can unequivocally be assigned to one of these four genera, which at present are sufficiently distinct. Probably only a small portion of the existing forms is represented in collections and future finds may somewhat confuse the generic delimitations. In my opinion the structure of the female genital organ and the appendages of the bulb are critical for generic distinction. A series of, mostly undescribed, species living in the same habitat show close affinities to the genus *Pholcus*.

Thanks are due to R. L. Crawford of the Burke Museum, Seattle, for making available the material collected by J. R. Thomson in Indonesia and to Dr. P. J. van Helsdingen, Rijksmuseum van Natuurlijke Historie, Leiden, for critically reading an earlier version of the manuscript.

TABLE 1. Synopsis of distinguishing characters of Old World leaf-dwelling pholcid genera with long and thin abdomina

	Panjange (based on 5 spec.)	*Leptopholcus* (7 spec.)	*Micromerys* (3 spec.)	*Calapnita* (4 spec.)
Pattern on carapace and abdomen	present	absent	absent	absent
AME	absent	small or absent	small or absent	absent
Distance between eye groups	1.5-2d	3-4d	3-4d	3-4d
Eye groups in male	always raised	not or a little raised	sometimes raised	not raised
Chelicerae in male	basal apophysis, sometimes also distal apophysis	one small apophysis or none	basal apophysis only	basal and distal apophysis
Abdomen length	3-4 times carapace, truncated	6-7 times carapace, tapering	6-7 times carapace, tapering	6-7 times carapace, tapering
Male palpal tarsus	prolonged	not prolonged	not prolonged	not prolonged
Tarsal appendage	complex	with "elbow", like in *Pholcus*	with lateral branch	without lateral branch
Bulb	various shapes, not round	round	elongate	elongate
Bulbal apophyses	one long apophysis	2 short apophyses	reduced	one long apophysis
Embolus	long, thin	short, membraneous	long and flattened, sclerotized	long, tubular
Epigyneal lip	wrinkled, extensible, with apical tongue	with internal proximal valve, no tongue	with internal dorsal valves, no tongue	with prolongation and apical tongue

Panjange nov. gen.

Type-species: *Panjange lanthana* nov. spec.
Derivatio nominis: panjang is the Malay word for long, slender.

Diagnosis. — Pale coloured spiders, six eyes in two compact groups on the sides of the head, in the male on turrets; carapace flat or slightly domed; epigyneal lip folded like a concertina; male palpal femur, patella and tibia cylindrical, bulb elongate, bulb with one lanceolate apophysis.

Description. — Colour pale yellow with ochre or brownish pattern on carapace and abdomen, legs with darkened tips of femora, patellae and tibia-metatarsal joints. Most often found on the underside of leaves or on overhanging rocks. Carapace flat or slightly domed, impression between head and thorax hardly perceptible; fovea shallow. Six eyes in two triads, in the female 1.5-2

diameters removed, in the male on stalks or turrets; ALE slightly larger than PLE. Male chelicerae with a pair of basal horns and with or without an additional pair of median apophyses or teeth. Sternum slightly wider than long, triangular. Legs very thin and long, first pair more than 1.5 times longer than second pair. Abdomen at least three times longer than carapace, cylindrical, truncated or excavated behind. Male palp: femur and patella cylindrical, tibia not or only moderately enlarged. Tarsus proper prolonged into a lanceolate or tongue-like appendix, tarsal appendage rather complex, strongly sclerotized. Bulb elongated, with long, thin embolus and one lanceolate apophysis. Female palp with blunt tip and four terminal spine-like hairs, upper pair curved, lower pair straight. Epigyneal lip wrinkled, with V-shaped, extensible projection, which bears a little tongue at the tip.

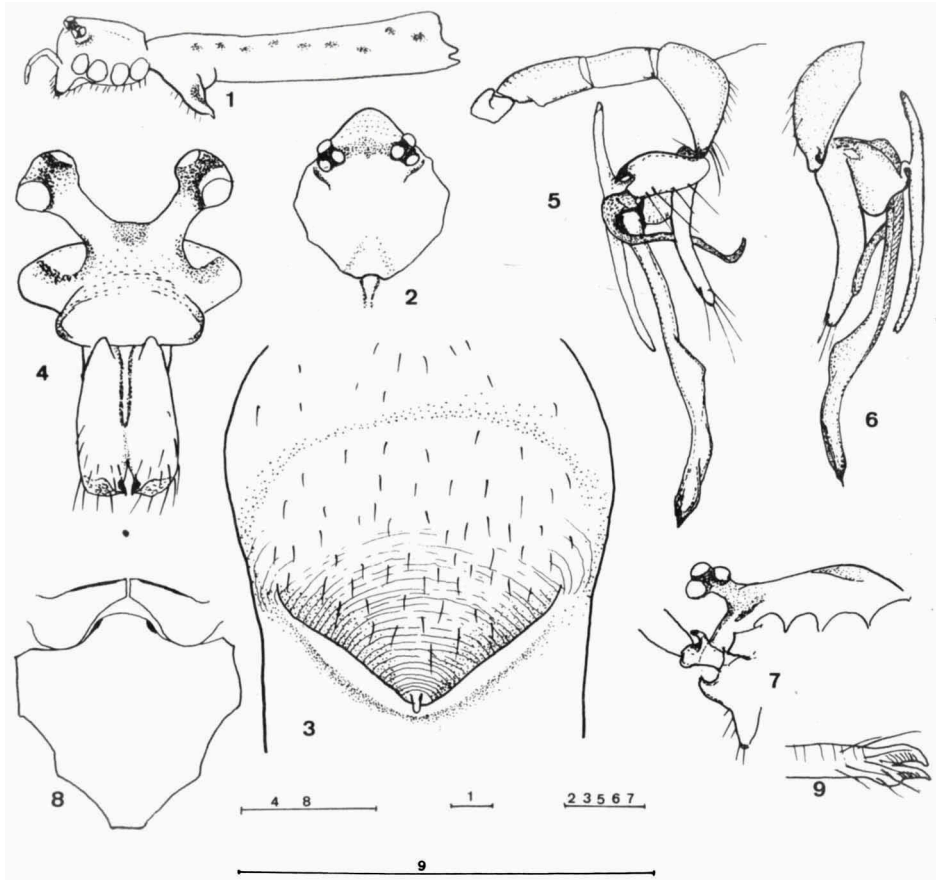
Panjange lanthana nov. spec.
(figs. 1-9)

Material examined. — Philippines: Luzon, Quezon National Park near Antimona, ca. 200 m altitude: ♀ holotype, 5 ♂ paratypes, under spotted leaves of Araceae, 2 ♀, paratypes under large haity leaves of shrub; leg. P. R. Deeleman, 12/13.x.1979. Holotype and 2 ♂ paratypes in RMNH Leiden, all others in Coll. Deeleman.

Description. — Cephalothorax pale yellow except for a dark transverse band connecting the eye groups and an ochre area on either side of the latter; abdomen white with a few isolated round or elliptical dark spots. Carapace (figs. 1, 2) in the ♀ holotype 1.20 mm long and 1.10 mm wide, in a ♂ paratype 1.15 mm long and 1.10 mm wide, dorsally flat, with grooves lateral to the eye groups and a shallow median groove and radiating striae. Distance between the eye groups about twice the diameter of the PME in the ♀; in the ♂, the eyes on diverging turrets (fig. 4). Clypeus steep in the ♀, a little slanting in the ♂. Basal horns in the ♂ chelicerae (fig. 4) triangular and stout, slightly arching inward; distal cheliceral apophysis lacking. Sternum (fig. 8) triangular, about one-fifth wider than long. Abdomen (fig. 1) cylindrical, three times as long as carapace, distally rectangular in profile, in the ♀ holotype 3.90 mm long, in the measured ♂ 4.13 mm. Legs: tarsal claws see fig. 9.

Leg measurements (in mm):

	Fe	Pa	Ti	M	T	Total
			♀ holotype			
I	8.50	0.40	—	—	—	—
II	5.72	0.40	5.28	9.12	1.42	20.94
III	3.75	0.40	3.12	4.80	0.72	12.79
IV	5.76	0.40	4.56	8.16	1.20	20.08
palp	2.60	1.37	0.82		2.25	7.04
			♂ paratype			
I	10.80	0.50	10.60	21.60	2.21	45.71
II	6.72	0.48	7.00	12.48	1.45	28.13
III	4.65	0.45	3.60	5.76	0.57	15.03
IV	7.00	0.50	7.30	9.60	1.20	25.60



Figs. 1-9. *Panjange lanthana* nov. spec. 1, ♀, lateral view; 2, ♀, carapace, dorsal view; 3, ♀, genital organ, ventral view; 4, ♂, head and chelicerae, anterior view; 5, 6, ♂, right palp, lateral and mesal view; 7, ♂, carapace, chelicer and trochanter, lateral view; 8, ♀, sternum, labium and maxillae, ventral view; 9, ♀, tip of tarsus III. Scales 0.5 mm.

Male palp (figs. 5, 6). — Trochanter laterally with clawlike apophysis. Femur 2.5 times as long as patella, the latter cylindrical. Tibia only slightly wider than femur, distally tapering. Tarsus proper lengthened, gradually tapering, unsclerotized and white; tarsal appendage consisting of a short basal branch, which distally bears a pointed apophysis and a rounded one; on the latter are hinged two long slender sclerites, the smaller one curving basally into a perpendicular position, then twisting, the longer one very long indeed ($1^1/_4$ times as long as carapace) and one margin toothed over most of its length, distally twisting along its longitudinal axis and terminating into a pointed apex. Bulb a little longer than wide, distally debouching on a transverse sclerotized rod, the

shorter branch of which seems to serve as embolus, while the opposite branch can be considered the bulbal apophysis.

Female genital organ (fig. 3). — Epigyneal lip V-shaped, at the tip a small tongue, the whole lip weakly sclerotized and extensible to two to three times its length. No internal chitinized valves apparent.

Derivatio nominis: derived from the greek "lanthano" = to be unnoticed, because the spider is cryptic.

Panjange nigrifrons nov. spec.
(figs. 10-16)

Material examined. — Indonesia: East Kalimantan, Sepaku, 40 km N of Balikpapan, degraded primary lowland forest: ♀ holotype, 1 ♂ paratype, on the underside of large, hairy leaves, 1-2 m above the ground at the edge of the forest; leg. P. R. Deeleman, 16.vii.1979, in RMNH. 2 ♀ paratypes, id., 4.viii.1980, in Coll. Deeleman. East Kalimantan, Makunjung, on Sungai Barito, 15 km N of Muratewe, 0°54'S, 114°55'E, 1 ♂, paratype, 1 ♀ paratype; leg. J. R. Thomson, 21.iv.1976, in Burke Museum, Seattle.

Description. — Cephalothorax yellow to white except the clypeus dark brown; chelicerae brown with light sides; abdomen white but for a few round, pale grey spots. Carapace in the ♀ holotype 1.20 mm long and 1.15 mm wide; in the ♂ paratype 1.30 mm long and 1.18 mm wide. Carapace (figs. 12, 16) dorsally flat, a pair of lateral grooves on either side of the eye groups, no median groove. Distance between the eye groups 1.5 times the diameter of PME in the ♀; in the ♂, eyes on diverging stalks (figs. 11, 15). Clypeus nearly vertical in the ♀, slightly slanting in the ♂. Male chelicerae baso-laterally with a blunt conical apophysis and near the distal-mesal margin a small, semicircular apophysis which is divided into a wide-based blunt tooth, orientated longitudinally and a smaller one perpendicular to it. Abdomen (fig. 16) cylindrical, in profile distally somewhat excised, 3.5 times as long as carapace.

Leg measurements (in mm):

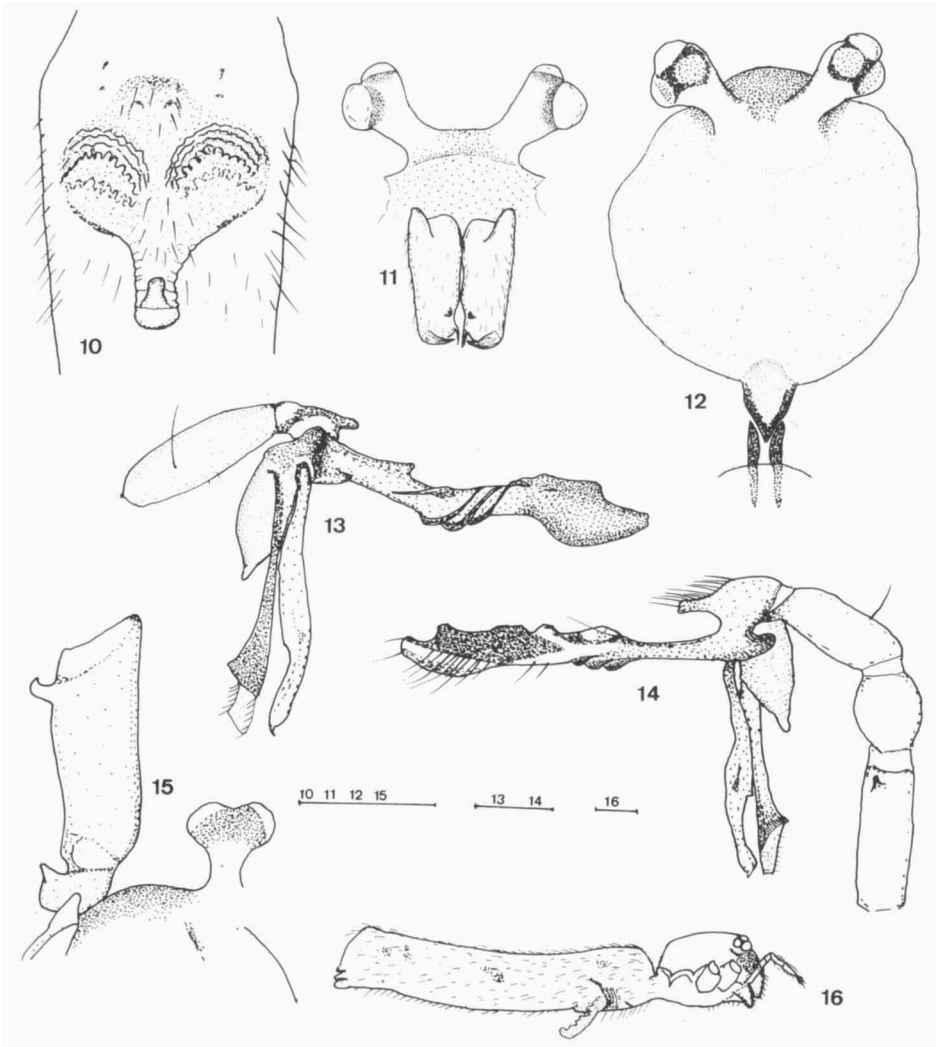
♀ holotype

	Fe	Pa	Ti	M	T	Total
I	8.35	0.50	8.16	16.50	2.73	36.24
II	5.76	0.48	5.28	9.30	1.72	22.54
III	4.08	0.43	3.36	6.10	0.86	14.83
IV	6.50	0.50	6.00	8.90	1.34	23.24
palp	2.74	1.37	1.70		2.26	8.07

♂ paratype

I	10.56	0.50	10.40	18.72	2.63	42.81
II	7.00	0.48	6.50	11.10	1.63	26.71
III	4.90	0.40	3.90	6.45	0.81	16.46
IV	6.72	0.50	4.90	8.60	1.40	22.12

Male palp (figs. 13, 14). — Trochanter with small pointed apophysis. Femur (fig. 15) cylindrical, slightly widening distally, on two-thirds of its length a small hook-shaped apophysis; patella cylindrical; tibia not enlarged. Tarsus proper on-



Figs. 10-16. *Panjange nigrifrons* nov. spec. 10, ♀, genital organ, ventral view; 11, ♂, head and chelicerae, anterior view; 12, ♂, carapace, dorsal view; 13, 14, ♀, left palp, mesal and lateral view; 15, ♂, trochanter and femur of palp, cheliceral basis and right eye, lateral view; 16, ♀, lateral view. Scales 0.5 mm.

ly a little lengthened, with narrow, obtuse tip. Tarsal appendage long and nearly straight, in the middle encircled by three parallel sharp ridges, distally widening into a pointed blade; a zone between these portions unsclerotized, flexible. Bulb distally pointed, from its base arising a long thin embolus and a lanceolate apophysis, bearing a claw distally.

Female genital organ (figs. 10, 16). — Epigyneal lip divided up into a larger basal part, which is composed of two semicircular wrinkled areas marked with reddish lines, laterally continuing as the abdominal epidermis, and a strongly extensible median projection, provided on its extremity with a replicate tongue. Internal valves occupying only a small part of the width of the bursa; the bursal opening narrow.

Panjange cavicola nov. spec.
(figs. 17-21)

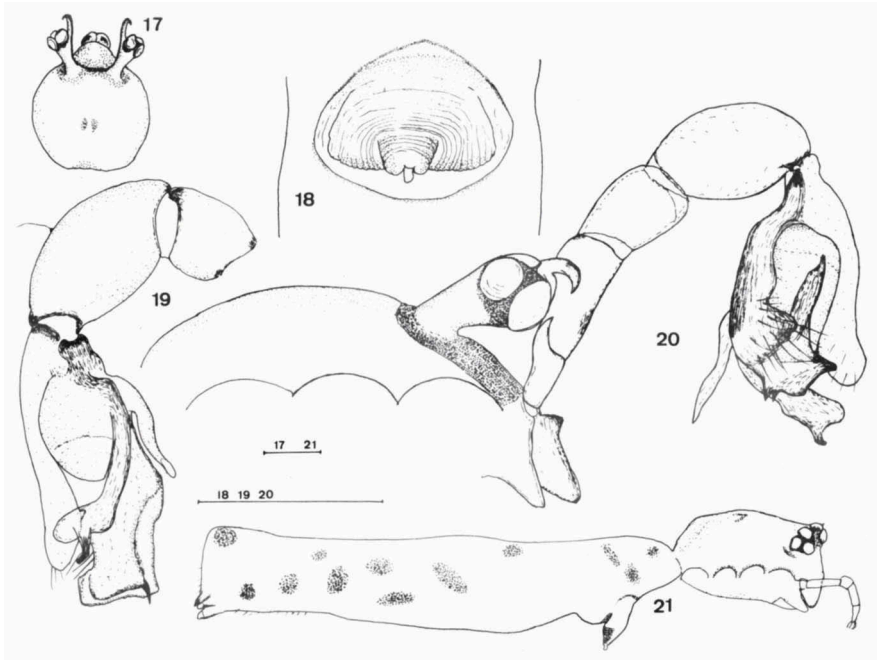
Material examined. — Indonesia: Sulawesi, between Udjung Pandang and Camba, about 23 km from the latter, in forest on karst: ♀ holotype, 1 ♀ and 1 ♂ paratype on overhanging rock and on ceiling of cave entrance; holotype leg. P. R. & C. L. Deeleman, 13.viii.1980; paratypes, id., 9.viii.1980. Holotype and ♂ paratype in RMNH, ♀ paratype in Coll. Deeleman.

Description. — Cephalothorax pale yellow, an ochre band connecting the eye groups and extending on either side of the eyes, between the eyes on the band a W-shaped black mark, in the middle of the carapace a reversed V in ochre; clypeus and chelicerae with ochre streaks; abdomen white, interspersed with round and oval spots. Carapace in both ♀ 1.20 mm long and 1.10 mm wide, in the ♂ 1.15 mm long and 1.10 mm wide. No groove or striae, in profile sloping down abruptly behind (fig. 21). Distance between the eye groups in the ♀ scarcely two diameters of PME, in the ♂ eye groups on top of long, forward directed stalks, which are mesally prolonged into curved spikes (figs. 17, 20); in the ♀ anterior margin of PME with small excrescence in the middle. Clypeus nearly vertical in the ♀, slanting in the ♂. Chelicerae in the ♂ basally with a low lateral cone, the apex of which points mesally; distal apophysis lacking. Abdomen in profile rectangular (fig. 21), 3.5 times as long as carapace in the holotype, 3 times in the paratypes.

Leg measurements (in mm):

	Fe	Pa	Ti	M	T	Total
			♀ holotype			
I	9.80	0.50	10.08	20.65	2.16	43.19
II	6.50	0.50	6.00	10.32	1.14	24.46
III	4.60	0.45	3.36	6.76	0.63	15.80
IV	6.72	0.50	4.90	9.34	1.20	22.66
palp	2.10	1.24	1.37		1.72	6.43
			♂ paratype			
I	missing					
II	9.90	0.50	8.45	13.44	1.20	33.49
III	5.50	0.45	4.80	7.44	0.67	18.86
IV	7.80	0.50	7.20	11.52	1.20	28.22

Male palp (figs. 19, 20). — Trochanter longer than wide, apical margin with lateral apophysis. Femur and patella cylindrical, tibia slightly enlarged. Tarsus proper with spoon-shaped prolongation carrying a small, dentiform apophysis.



Figs. 17-21. *Panjange cavicola* nov. spec. 17, ♂, carapace, dorsal view; 18, ♀, genital organ, ventral view; 19, ♂, right palp, mesal view; 20, ♂, carapace, right chelicer and palp, lateral view; 21, ♀, lateral view. Scales 0.5 mm.

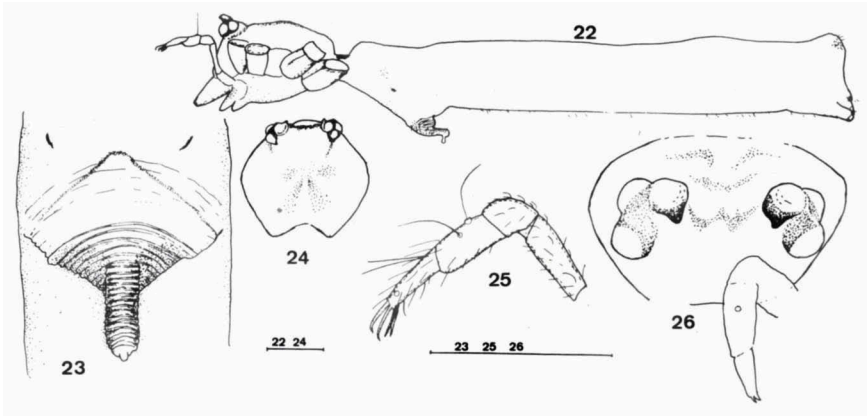
Tarsal appendage distal to the "elbow" flattened and widened, with one offshoot, apically a small, median tooth. Bulb with simple, unsclerotized embolus, the curved apophysis almost twice its length.

Female genital organ (fig. 18). — Epigyneal lip strongly wrinkled over its whole width; projection small and short, bursal opening large. Internal chitinous valves extending over the whole width of the organ.

Panjange alba nov. spec.
(figs. 22-26)

Material examined. — Indonesia: Sulawesi, 40 km W of Kendari, near Sampara, edge of woodland: ♀ holotype, 3 ♀ paratypes on underside of leaves of shrub; leg. P. R. Deeleman, 12.vii.1980. Holotype in RMNH, paratypes in Coll. Deeleman.

Description. — Cephalothorax, chelicerae, legs creamy white, carapace with ochre pattern (fig. 24): a narrow band connecting eye groups brownish, interrupted by a dark W-mark in the middle; abdomen white, unspotted or with 2-3 pairs of very pale round blots. Carapace in the holotype 1.13 mm long and 1.05 mm wide, flat and smooth except for grooves lateral to the eye groups (fig. 22). Distance between the eye groups 2 diameters of the PME, their mesal margin



Figs. 22-26. *Panjange alba* nov. spec. 22, ♀, lateral view; 23, ♀, genital organ, ventral view; 24, ♀, carapace, dorsal view; 25, ♀, palp, lateral view; 26, ♂, carapace, clypeus and left palp, anterior view. Scales 0.5 mm.

with little cusps (fig. 26). Clypeus nearly vertical. Abdomen distally rectangular in profile, 3.5 times the length of the carapace.

Leg measurements of the ♀ holotype (in mm):

	Fe	Pa	Ti	M	T	Total
I	9.12	0.48	8.80	17.30	2.40	38.10
II	6.00	0.46	5.30	10.08	1.20	23.04
III	4.30	0.43	3.26	5.28	0.72	13.27
IV	6.45	0.48	4.80	8.60	1.30	21.63
palp	2.10	1.37	1.40		1.70	6.57

Female genital organ (fig. 23). — Posterior part of epigyneal lip chitinized and strongly wrinkled; opening of the bursa very wide; internal chitinized valves extended across the whole width, V-shaped.

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