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A revision of the genus *Storenomorpha* Simon

(Araneae, Zodariidae)

By **R. Jocqué & R. Bosmans**

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The genus *Storenomorpha* is redescribed and redelimited. The genus now contains five species: *S. comottoi* Simon, *S. joyaus* (Tikader) comb. nov. originally described in *Homalonychus*, and three new species: *S. arboccoae* (♂, ♀), *S. nupta* (♂, ♀) and *S. reinholdae* (♂). It is restricted to South East Asia as the species *S. angusta* Simon from Madagascar appears to belong to another, undescribed genus.

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Introduction

As most Zodariid genera, the genus *Storenomorpha* is a poorly known taxon. But unlike a fair number of these other genera, it is only known from a much restricted material and only a few more specimens are available at the moment. The present study intends to redelimit the genus, to get rid of the misidentifications that have prevailed so far and to gather the bits and pieces of information that have been collected to date.

Abbreviations

AE, AME, ALE: anterior, anterior median and anterior lateral eyes.
PE, PME, PLE: posterior, posterior median and posterior lateral eyes.
AW, PW, L: anterior width, posterior width and length of median ocular quadrangle.
Fe, Pa, Ti, Mt, Ta: femur, patella, tibia, metatarsus, tarsus.
STA: suprategular apophysis.
BMNH: British Museum of natural History.
KBIN: Koninklijk Belgisch Instituut voor Natuurwetenschappen.
MCSNG: Museo civico di Storia naturale di Genova.
MNHNP: Muséum national d'Histoire naturelle de Paris.
NHMV: Naturhistorisches Museum Vienna.
Measurements: in mm.

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Genus Storenomorpha Simon

Storenomorpha Simon, 1884: 352; 1893: 415.
Type species. *Storenomorpha comottoi* Simon, 1884: 353, by monotypy.

Diagnosis. Representatives of *Storenomorpha* are recognized by the distally widened tarsi with dense scopulae and three tarsal claws, the paired ones closely set in a shallow cavity.

Description

Big spiders (10–15 mm) with dark reddish integument and orange legs. Carapace (Figs 1, 2, 16) usually dark with paler median and lateral stripes; both stripes may be covered by white hairs; strongly granulated, except for the median paler area; at its widest between coxae II and III, strongly narrowed in front to sligthly less than half maximum width at level of PLE. Cervical grooves slightly marked. Fovea deep. Eyes in two rows, anterior ones strongly procurved as seen from above. All eyes light. AE circular; PE oval. AE close together, less than their diameter apart. PME about one diameter apart and at about 5 times that distance from PLE. L slightly larger than AW or PW. Clypeus concave, its height about four times the diameter of an ALE.

Chilum a wide triangle provided with some hairs. Chelicerae relatively long, tapering towards extremity, without teeth. Fangs short and thick at base. Endites (Fig. 3) slightly curved and converging, with terminal tuft of hairs, but without serrula. Labium diamond-shaped, longer than wide, without sclerites between it and coxae. Coxae almost contiguous. Leg formula 1432. Spinules are restricted to a terminal pair of ventral spines on the tibiae, and to paired ventral spines on Mt. Mt I and II with two rows of short spinules. Tarsi widened towards extremity; with dense scopulae, extending on distal part of Mt. Three tarsal claws, unpaired one very short; paired claws closely set and implanted in shallow concavity (Figs 4–5); teeth (about 5) on paired claws inplanted on lateral sides of claw, facing the other. Trichobothria: two converging rows in proximal half of tibia; metatarsi and tarsi with one row. Abdomen (Figs 6, 10, 13, 16, 22) clothed with short hairs; brown, with median and lateral longitudinal stripes formed by cylindriform hairs; dorsally with four muscle points; six spinnerets; anteriors and posteriors two-segmented with distal segment short, bearing spigots; medians very small hidden by other four; anteriors about twice as broad at base as posteriors and slightly longer. Colulus represented by a tuft of hairs. Tracheal spiracle narrow, with chitinous rim. Venter chitinized in front of epigastric fold, in males epigyne-like with two naked areas and posteriorly with a separate transversal sclerite.

Male palp. Patella with ventrolateral boss. Tibia with lateral or dorsolateral apophysis; cymbium with typical cylindriform hairs apically. Bulbus with long embolus, implanted mesally at proximal end of tegulum, partly or almost completely hidden by long semi-circular conductor. Tegular apophysis well-developed, strongly sclerotized.

Female palp with dentate claw; segments cylindriform, tarsus cone-shaped. Epigyne strongly chitinized. With a central plate in posterior half and two entrace openings in anterior part. In both the females studied, the epigyne was entirely covered by a thick plate of sticky material, apparently a plug attached by the male following copulation.

Misplaced species

Storenomorpha angusta Simon, 1889: 231 from Madagascar belongs in another yet undescribed genus of the Zodariidae (MNHNP, examined).

Distribution. NE-India (Sikkim), Burma, Thailand.

Natural History. The only data concerning the natural history of *Storenomorpha* were gathered by C. and R. Deeleman (pers. comm.). They found that the animals live in grassland and hide during the day in rolled up leaves of standing herbs. No silk lining of any sort was observed.

Key to the species

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1. Abdomen with three uninterrupted pale bands extending from front to at least three quarters of abdominal length, the median one arrow-like . . . . . *arboccoae*
– Abdomen with lateral bands broken or shorter than median one, the latter not arrow-like 2
2. Abdomen with broad pale median band and broken lateral bands (Figs 10, 13) 3
– Abdomen with narrow or broken pale median band and uninterrupted lateral bands (Figs 16, 22) 4
3. Big species (carapace > 7 mm long) with uniform reddish brown clypeus . . . . . *joyaus*
– Smaller species (carapace < 5 mm long) with inferior margin of clypeus with dense white pubescence . . . . . *reinholdae*
4. Median band on abdomen short and interrupted (Fig. 16); tegular apophysis short and blunt; tibial apophysis as long at tibia (Figs 17–18) . . . . . *nupta*
– Median band long, uninterrupted (Fig. 22); tegular apophysis long and sinuous, converging with conductor; tibial apophysis much shorter than tibia (Figs 20–21) . . . . . *comottoi*

Storenomorpha arboccoae, spec. nov.
(Figs 1–9)

Storenomorpha comottoi Thorell 1897: 192 (Misidentification).

Type material. Male holotype: Birma, Carin Cheba, Biapo, L. Fea leg., 1885–1889 (MCSNG). Female: Birma, Mulmein, 15.X.1938, Andreini leg. (NHNV 412).

Description

Male holotype. Measurements. Total length: 10.38; carapace: 5.23 long, 3.74 wide; sternum: 2.32 long, 1.50 wide; chelicerae: 1.38 long; clypeus: 0.64 high.

Colour. Carapace dark reddish brown, with median reddish brown stripe with white pubescence from the eye region to the back. Abdomen (Fig. 6) dorsally brown, somewhat mottled with dark brown, and with an arrow-like stripe formed by cylindriform whitish hairs; ventrally brown, laterally with a broad, curved pale stripe, converging in front of spinnerets.

Eyes. AW = 1.06 PW, PW = 1.02 L; AM = 1, AL = PL = 1.05, PM = 0.95; a = b = 1/2, c = 2/3, d = 8/3.

Legs. Mt I–II with 5 pairs of ventral cylindriform spines; Mt III–IV with 6 terminal ventral and lateral spines, disposed in a semi-circle.

Measurements

	Fe	Pa	Ti	Mt	Ta
I	1.84	0.92	1.50	1.08	0.71
II	1.64	0.89	1.28	0.97	0.66
III	1.44	0.78	0.90	0.74	0.59
IV	1.74	0.82	1.26	1.16	0.62
palp	0.38	0.18	0.18	–	0.44

Palp (Figs 5–8): Tibial apophysis with basodorsal transverse boss, an anterodorsally directed branch with terminal concavity, and a blunt dorsomedian process. Cymbium with basolateral boss, and with 7 terminal cylindriform hairs. STA a strong, anterodorsally directed, slightly curved tooth. Bulbus with large oval depression at the junction with the conductor; conductor large, basal 4/5 with nearly parallel margin, in its terminal part with a transverse ridge and pointed. Embolus linear, basal part for a relatively long period visible.

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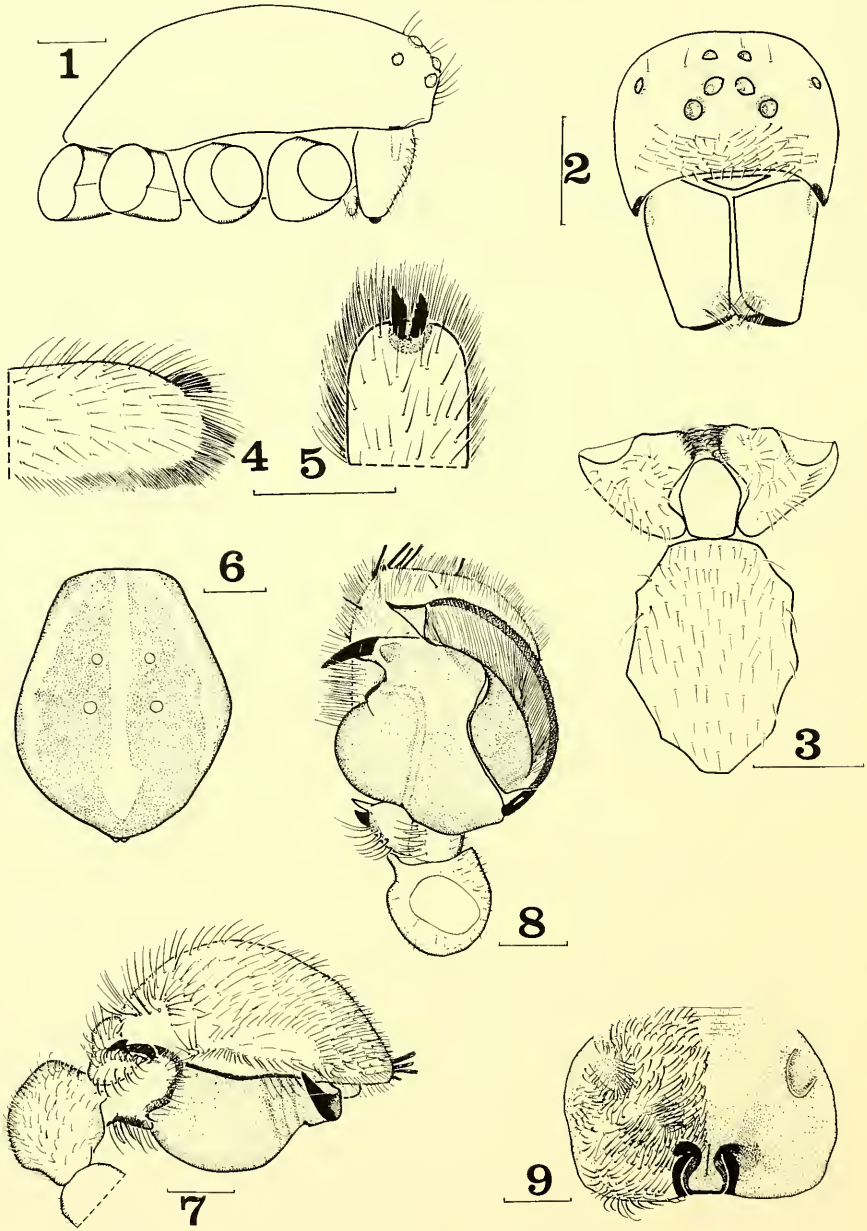
Female. Measurements. Total length: 12.16; carapace: 5.00 long, 3.50 wide; sternum: 1.83 long, 1.50 wide; chelicerae: 1.46 long; clypeus: 0.54 high.

Colour, general appearance, eye position, leg spinulation and proportions as in the male.



Figs 1–9. *Storenomorpha arboccoae*, spec. nov. 1. Male carapace, lateral view. 2. Do., frontal view. 3. Sternum, labium and endites. 4. Tarsus I, lateral view. 5. Do., dorsal view. 6. Abdomen, dorsal view. 7. Male palp, lateral view. 8. Do., ventral view. 9. Epigynum. (scale lines 1 mm: 1–3, 6; 0.5 mm: 4–5, 7–9).

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Epigyne (Fig. 9). A strongly sclerotized quadrangle, covered with thick, dense hairs; central plate small; entrance openings covered by dense converging hairs.

Diagnosis. This species is easily recognized by the arrow-like abdominal median stripe and the details of male palp and epigyne.

Etymology. The name is a patronym in honour of Dr. G. Arbocco, who kindly permitted us to study the *Storenomorpha* present in the collection of the MCSNG.

Storenomorpha joyaus (Tikader) comb. nov.

(Figs 10–12)

Homalonychus joyaus Tikader, 1970: 6 (Description ♀).
Genus (?) *joyaus* Roth 1984: 3; Brignoli 1976: 211.

Material. North India, Sikkim, Gantok, 5000 feet, 7. IV. 1924, R. W. G. Hingston leg. (BMNH 1934.2.28.78.83).

Description of the male

Measurements. Total length: 15.53; carapace: 7.72 long, 5.98 wide; sternum: 3.20 long, 2.36 wide; chelicerae: 2.32 long; clypeus: 1.00 high.

Colour. Carapace dark reddish brown, with wide, median reddish brown stripe with white pubescence, continuing on the clypeus but without pubescence there; lateral reddish brown stripe less wide, also with white pubescence. Abdomen (Fig. 10) dorsally dark brown, with median lanceolate stripe, posteriorly distinctly widened and square-like; dorsolateral stripe split into three bars; ventrally dark brown, with large pale ventrolateral stripe.

Legs. Tibiae I–IV with a pair of terminal ventral spinules; Mt I–II with 5 pairs of ventral spinules; Mt III with one medioventral pair of spinules and 8 terminal spinules; Mt IV with 8 terminal spinules.
Measurements:

	Fe	Pa	Ti	Mt	Ta
I	6.23	2.82	5.48	8.38	4.22
II	5.89	2.82	4.98	7.39	4.07
III	5.47	2.49	3.57	4.90	3.40
IV	5.81	2.49	4.90	3.57	1.73
palp	6.39	3.07	2.49	–	8.53

Palp (Figs 17–18). Cymbium rather flattened dorsally, basolaterally depressed near tibial apophysis; terminally with 6 spinules. Cymbium laterally with large, rounded lobe, a large, erect, dorsolaterally directed, pointed apophysis, and a rounded dorsomedian lobe. Bulbus with triangular depression at junction of conductor. Tegular apophysis a large, conical, laterally directed tooth. Conductor very large, lunulate, terminally sharply pointed. Embolus long and linear, only visible for a very short part.

Diagnosis. The species is recognized by its size, the broad median and broken lateral abdominal band, and the uniform reddish clypeus.

Remark

Only the female of this species was known. Tikader (1970) described it from West Sikkim, bank of Great Rangit river, in the genus *Homalonychus*, formerly regarded as belonging to the Zoderiidae. However, the species clearly belongs in *Storenomorpha*. The holotype could not be obtained on loan but as all *Storenomorpha* species so far known can be identified on the basis of their abdominal pattern and since Tikader's drawings are detailed enough, we do not hesitate to match that female with a similar, equally big male from the collections of the BMNH, also collected in Sikkim.

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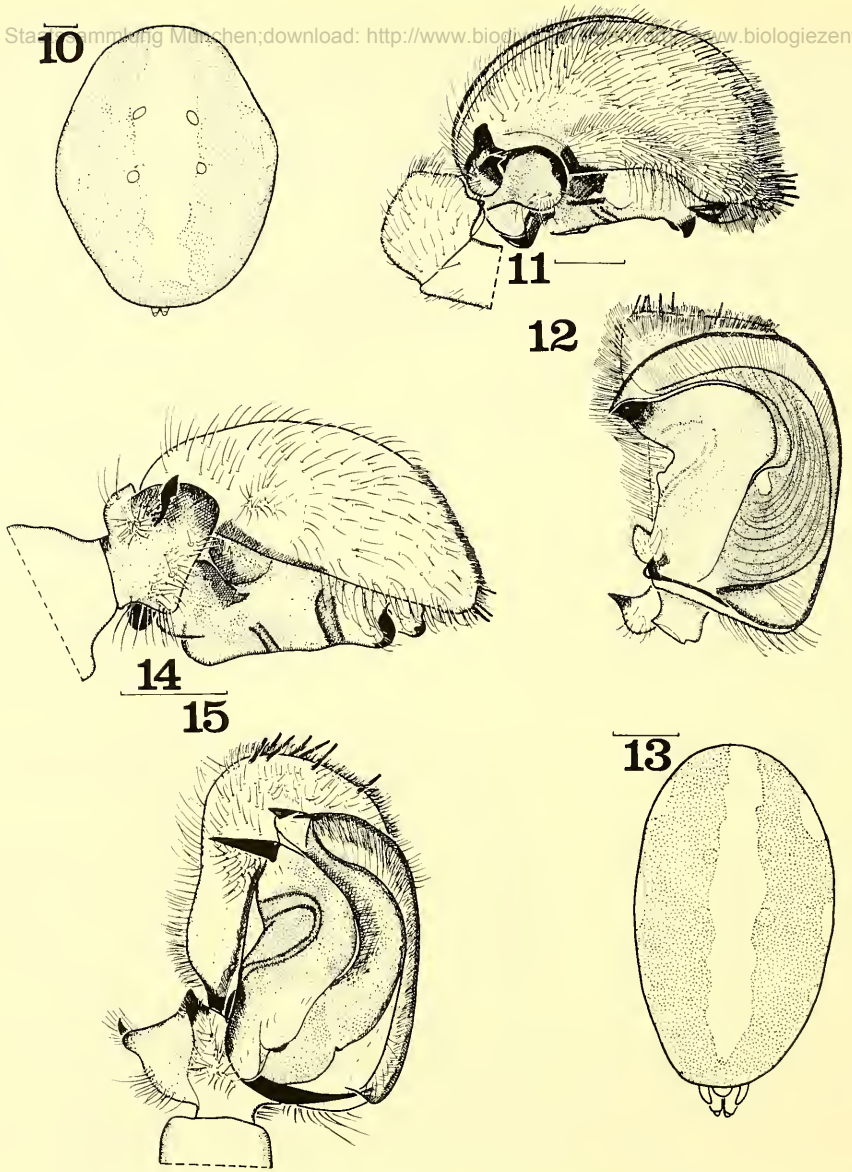

Figs 10–12. *Storenomorpha joyaus* (Tikader). 10. Male abdomen, dorsal view. 14. Male palp, lateral view. 15. Do., ventral view. (scale lines 1 mm: 10–13; 0.5 mm: 14–15).

Figs 13–15. *Storenomorpha reinholdae*, spec. nov. 13. Male abdomen, dorsal view. 14. Male palp, lateral view. 15. Do., ventral view. (scale lines 1 mm: 10–13; 0.5 mm: 14–15).

Storenomorpha reinholdae, spec. nov.

(Figs 13–15)

Type material. Holotype male: Thailand, Khao Yai National Park, + 1000 m, grassy vegetation at edge of secondary forest, in rolled leaf, C. & R. Deeleman (KBIN).

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Description of male

Measurements. Total length: 10.16; carapace: 4.74 long, 3.08 wide; sternum: 1.91 long, 1.39 wide; chelicerae: 0.63 long; clypeus: 0.61 long.

Colour. Carapace dark reddish brown with black hairs and broad median stripe with dense white pubescence; clypeus dark brownish grey, inferior part with dense cover of white hairs. First pair of legs reddish brown, other legs orange, Pa and Ti of all legs paler than other segments. Chelicerae dark reddish brown. Sternum reddish brown. Abdomen (Fig. 13) dark grey slightly mottled with paler grey; provided with sparse short dark hairs, which are also present on the broad pale central band and the three white blotches on each side, which represent the lateral bands. Muscle points pinkish. Venter dark grey with a double central row of paler points and two broad lateral bands converging in front of spinnerets. Genital area sclerotized.

Eyes. AW = AL = 1.08 PW; AM = 1, AL = PL = 1.02, PM = 1.2; a = 1/2, b = 3/4, c = 3/5, d = 9/4.

Legs. Ti I and II with a pair or one terminal ventral spinule; Ti III and IV with one or none. Mt I and II with five pairs of ventral spinules, two of which are situated near the distal tip.

Measurements.

	Fe	Pa	Ti	Mt	Ta	Total
I	3.42	1.71	2.87	2.33	1.46	11.80
II	2.88	1.67	2.29	1.88	1.38	10.09
III	2.71	1.33	1.67	1.50	1.08	8.30
IV	3.21	1.46	2.50	2.12	1.21	10.50
palp	1.54	0.71	0.46		1.38	

Palp (Figs 14–15). Tibia with one twisted, sharply pointed, dorsolateral process; dorsally concave and with dorsomesal swelling; cymbium with seven distal cylindriform hairs. Tegular apophysis straigth and sharp; conductor very much as in *S. comottoi.*

Etymology. The name is a patronym of Dr. C. Deeleman-Reinhold, one of the collectors of the type specimen.

Diagnosis. The species is recognized by the white inferior margin of the clypeus, the broad median white band of the abdomen flanked by an interrupted white line on each side; the male palp is similar to that of *S. arboccoae* but the course of the duct in the tegulum is clearly different.

Storenomorpha nupta, spec. nov.

(Figs 16–19)

Storenomorpha comottoi Hogg 1922: 285 (misidentification).

Type material. Male holotype, female paratype: Birma, S. Annam, Langbian Peaks, 6500 foot, IV. 1918, G. Kloss leg. (BMNH 1924.III.1.114.118).

Description. Male holotype

Measurements. Total length: 7.7; carapace: 3.8 long, 3.0 wide; sternum: 1.6 wide, 1.4 wide; chelicerae: 1.1 long; clypeus: 0.4 high.

Colour. Carapace dark reddish brown with wide, median reddish brown stripe, constricted behind the eyes; in the pale stripe, darker patches around the PM and a very narrow median dark stripe; lateral pale stripe moderately wide. Coxae and tarsi of legs yellowish orange; other segments reddish brown with yellowish orange median annulation. Abdomen (Fig. 16) dark grey suffused with brown; median pale stripe reduced to a narrow, pointed anterior part and a square posterior patch; lateral pale stripe only 1/5 of the length of the abdomen. Venter dark grey with two faint longitudinal pale lines in the middle and pale mottling at the sides.

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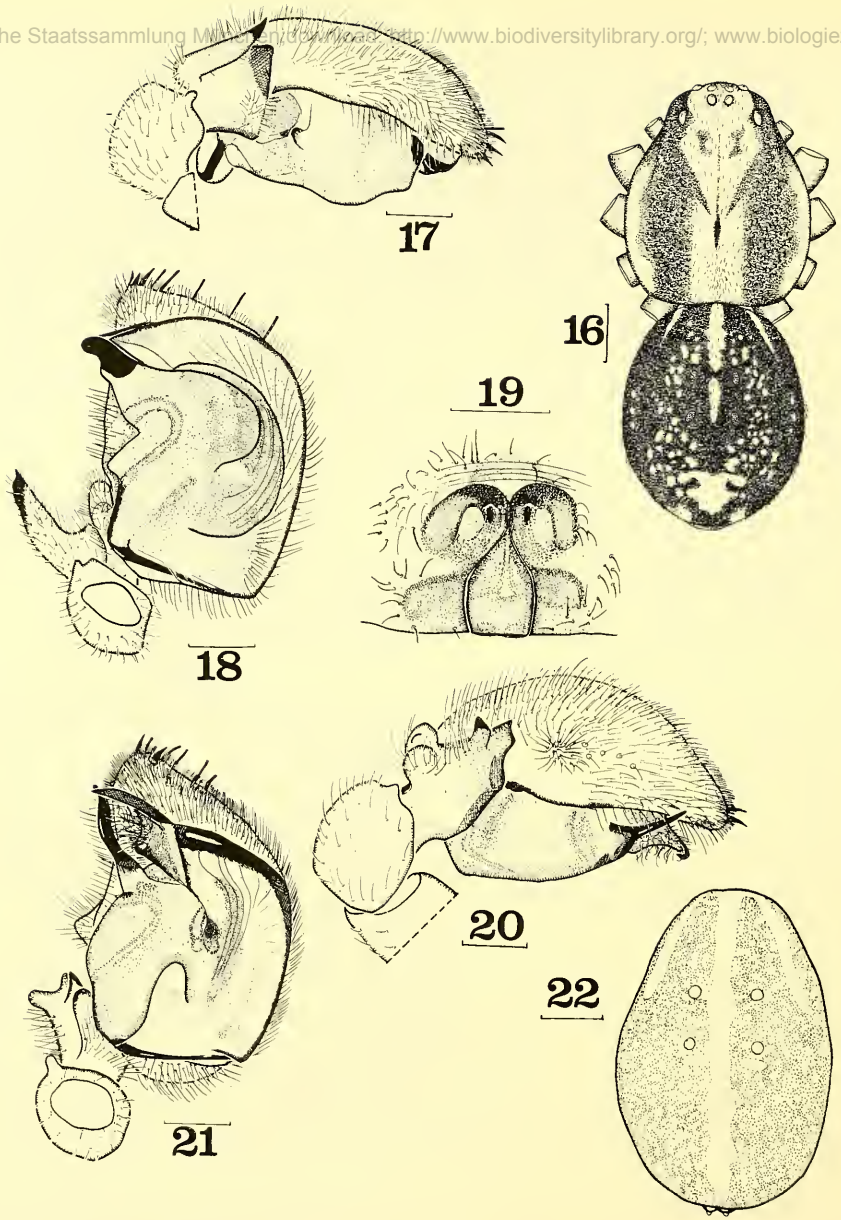

Figs 16–19. *Storenomorpha nupta*, spec. nov. 16. Habitus female, dorsal view. 17. Male palp, lateral view. 18. Do., ventral view. 19. Epigynum. Fig. 20–22. *Storenomorpha comottoi* Simon. 20. Male palp, lateral view. 21. Do., ventral view. 22. Male abdomen, dorsal view. (scale lines 1 mm: 16, 22; 0.5 mm: 17–21).

Carapace. Dark part of carapace distinctly granulated; pale part of carapace with scarse white pubescence, but possibly rubbed off.

Eyes. AW = PW = 1.03 L; AM = 1, PM = 1.07, AL = PL = 0.94; a = 1/2, b = c = 2/3, d = 2.6.

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Legs.

	Fe	Pa	Ti	Mt	Ta	Total
I	2.6	1.2	1.8	1.5	1.1	8.2
II	2.4	1.2	1.7	1.7	1.2	8.2
III	2.1	1.2	1.4	1.1	0.9	6.7
IV	2.3	1.2	2.0	1.9	0.9	8.3

Palp (Figs 17–18): Tibia with wide, truncate distolateral margin, an oblique lateral depression, and a large and erect dorsolateral apophysis, pointed in anterolateral direction. Cymbium with small concavity near the tibial apophysis, distal margin with 9 spinules. Tegular apophysis rather compact, bluntly pointed in anterolateral direction. Bulbus with oval depression at the junction with the conductor. Conductor very much as in *comottoi*. Only a short basal part of embolus visible.

Female paratype

Measurements. Total length: 10.1; carapace: 1.04 long, 0.78 wide; sternum: 0.41 long, 0.34 wide; chelicerae: 0.29 long; clypeus: 0.13 high. Colour and general appearance as in the male. Spinulation as in the male except for Mt III, which has no ventral spinule.

Epigyne (Fig. 19). A pear-shaped central plate with median groove in anterior half; narrow anterior part flanked on each side by a dark spot, in the center of which there is a small hole; posterior part of central plate also bordered by a dark area on each side, probably the spermathecae shining through.

Diagnosis. This species is distinguished by the relatively short and inconspicious abdominal stripes, the absence of a broad ventral lateral band and the details of palp and epigyne.

Etymology. *Nupta* means "married" and refers to the fact that this is the only *Storenomorpha* species for which ♂ and ♀ are known from the same sample.

Storenomorpha comottoi Simon
(Figs 20–22)

Storenomorpha comottoi Simon, 1884: 353 (description male); 1893: 414–415.
Type material. Male holotype: Birma, Minhla, G. B. Comotto leg. (MCSNG).

Description

Measurements. Total length: 9.05; carapace: 4.94 long, 3.49 wide; sternum: 2.08 long, 1.52 wide; chelicerae: 1.30 long; clypeus: 0.50 high.

Colour. Carapace dark reddish brown with median and lateral reddish brown stripes with white pubescence. Legs reddish brown. Abdomen (Fig. 22) dorsally brown, somewhat mottled with dark brown; white stripes of equal length, the median one terminally widened, the laterals broken into two parts; lateroventral pale stripe not reaching the spinnerets.

Eyes. 1.18 AW = PW, AW = 1.09 L; AM = 1, AL = $^{9}/_{10}$, PM = $^{2}/_{3}$, PL = $^{9}/_{10}$; a = $^{1}/_{2}$, b = $^{5}/_{8}$, c = $^{5}/_{7}$, d = $^{5}/_{2}$.

Legs. Tibiae I–II with a pair of small terminal spines; tibiae III–IV spineless; metatarsi spinulated as in *commottoi*. Measurements.

	Fe	Pa	Ti	Mt	Ta
I	1.62	0.80	1.44	1.10	0.71
II	1.60	0.80	1.22	0.96	0.62
III	1.32	0.66	0.87	0.76	0.55
IV	1.60	0.74	1.30	1.10	0.59
palp	0.33	0.08	0.09	–	0.39

Palp (Figs 20–21). Tibia with basal transverse boss; apophysis in dorsolateral position, longitudinally grooved, distolateral margin with small concavity, terminally with sharp superior and blunt inferior tooth; dorsomedian margin protruding as a rounded lobe. Cymbium with lateral boss; distally with 7 cylindriform spinules. Tegular apophysis a strong, dorsally directed black tooth. Bulbus longitudinally depressed at the junction with the conductor. Conductor large, basal 4/5 with nearly parallel margin, terminally with a transverse ridge and pointed. Embolus linear, basal part for relatively long visible.

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Diagnosis. This species is easily distinguished by the long median and short lateral uninterrupted abdominal lines; the male palp has a long sinuous tegular apophysis converging with the conductor.

Acknowledgements

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