

A survey of the genus *Nasoona* Locket, 1982 with the description of six new species (Araneae, Linyphiidae)

Author: Tanasevitch, Andrei V.

Source: Revue suisse de Zoologie, 125(1) : 87-100

Published By: Muséum d'histoire naturelle, Genève

URL: <https://doi.org/10.5281/zenodo.1196025>

BioOne Complete (complete.BioOne.org) is a full-text database of 200 subscribed and open-access titles in the biological, ecological, and environmental sciences published by nonprofit societies, associations, museums, institutions, and presses.

Your use of this PDF, the BioOne Complete website, and all posted and associated content indicates your acceptance of BioOne's Terms of Use, available at www.bioone.org/terms-of-use.

Usage of BioOne Complete content is strictly limited to personal, educational, and non - commercial use. Commercial inquiries or rights and permissions requests should be directed to the individual publisher as copyright holder.

BioOne sees sustainable scholarly publishing as an inherently collaborative enterprise connecting authors, nonprofit publishers, academic institutions, research libraries, and research funders in the common goal of maximizing access to critical research.

A survey of the genus *Nasoona* Locket, 1982 with the description of six new species (Araneae, Linyphiidae)

Andrei V. Tanasevitch

A.N. Severtsov Institute of Ecology and Evolution, Russian Academy of Sciences, Leninsky prospekt, 33, Moscow 119071, Russia. E-mail: tanasevitch@gmail.com

Abstract: Taxonomic notes on the spider genus *Nasoona* Locket, 1982 are provided. Six species are described as new: *Nasoona indiana* sp. nov. (male) and *N. orissa* sp. nov. (male) from the Oriental part of India; *N. intuberosa* sp. nov. (male and female), *N. kinabalu* sp. nov. (male and female) and *N. sabah* sp. nov. (male and female) from Borneo, as well as *N. sulawesi* sp. nov. (male) from northern Sulawesi. The female of *N. comata* (Tanasevitch, 1998) from Nepal is described for the first time. *Nasoona nigromaculata* Gao, Fei & Xing, 1996 is transferred to *Oedothorax* Bertkau in Förster & Bertkau, 1883. New faunistic data on *N. comata* (Tanasevitch, 1998), *N. chrysanthusi* Locket, 1982, *N. crucifera* (Thorell, 1895) and *N. prominula* Locket, 1982 are given. The distribution of the genus can be characterized as disjunct Oriental-Neotropical.

Keywords: Erigoninae - India - East Malaysia - Indonesia - Southeast Asia.

INTRODUCTION

The spider genus *Nasoona* Locket, 1982 was erected by Locket (1982) for *N. prominula* Locket, 1982 (the type species) and *N. chrysanthusi* Locket, 1982, both described from the southern part of the Malay Peninsula, West Malaysia. Later the genus has been replenished with new species and species transferred here from other genera (Millidge, 1995; Gao *et al.*, 1996; Tanasevitch, 2014). Currently the genus comprises 12 species, distributed mainly in the Oriental Region (World Spider Catalog, 2017). Another six new species from India, East Malaysia and Indonesia are described below; one species is removed from the genus.

MATERIAL AND METHODS

This paper is based mainly on material kept at the Muséum d'histoire naturelle de Genève, Switzerland (MHNG), a few additional specimens were available from the Senckenberg Museum, Frankfurt am Main, Germany (SMF) and from the Zoological Museum of the Moscow State University, Moscow, Russia (ZMMU). If not mentioned otherwise, the material examined is deposited in the MHNG. Sample numbers are given in square brackets. Specimens preserved in 70% ethanol were studied

using a MBS-9 stereomicroscope. A Levenhuk C-800 digital camera was used for photos. The terminology of copulatory organs mainly follows that of Merrett (1963), Hormiga (2000) and Tanasevitch (1998, 2014, 2015). The chaetotaxy is given in a formula, e.g., 2.2.1.1, which refers to the number of dorsal spines on tibiae I-IV. The sequence of leg segment measurements is as follows: femur + patella + tibia + metatarsus + tarsus. All measurements are given in mm. All scale bars in the figures correspond to 0.1 mm.

Abbreviations

"A"	basal apophysis of the embolic division <i>sensu</i> Millidge (1995)
a.s.l.	above sea level
NHML	Natural History Museum, London, UK
C	convector <i>sensu</i> Tanasevitch (1998) = lamella <i>sensu</i> Merrett (1963)
D	duct
DAC	distal apophysis of convector <i>sensu</i> Tanasevitch (2015)
DSA	distal suprategular apophysis <i>sensu</i> Hormiga (2000)
E	embolus
MBC	main body of convector
N.P.	national park
PC	paraconvector <i>sensu</i> Tanasevitch (2014)

Pr	protegulum
Re	receptacle
SD	seminal duct
T	tegulum
TmI	position of trichobothrium on metatarsus I

TAXONOMY

Genus *Nasoona* Locket, 1982

Type species: *Nasoona prominula* Locket, 1982 by original designation.

Taxonomic remarks: The genus includes medium-sized erigonines with a variegated abdomen and, in most cases, with a postocular elevation on the male carapace bearing a group of curved, spines, stout spines or setae.

Three species lack this carapace elevation: *N. asocialis* (Wunderlich, 1974), *N. chrysanthusi* Locket, 1982 and a new species described below.

The chaetotaxy formula is 2.2.1.1. Two exceptions given in the literature, 1.1.1.1 in *N. coronata* (Simon, 1894) and 1.1.1.1 in the male of *N. locketi* Millidge, 1995, are mistakes based on incomplete spination caused by partial loss of spines. Each metatarsus is with a trichobothrium, except for *N. coronata*.

The male palp is characterized by the following features:

- 1) highly modified palpal tibia;
- 2) poorly expressed distal suprattegular apophysis;
- 3) reduction of median membrane and radix;
- 4) presence of convector (see Tanasevitch 1998, 2014);
- 5) presence of an additional sclerite in embolic division, named paraconvector (see Tanasevitch, 2014). At present the paraconvector is only known in *Nasoona*, but most probably this sclerite is more widely present among the Erigoninae. The embolus division of many taxa in this group is still poorly investigated.

The epigyne in *Nasoona* is typical for many erigonines and represented mostly by a shallow epigynal cavity which is sometimes divided by a septum and in a few species partially covered from above by an overhanging, visor-like outgrowth of the anterior epigynal wall. Receptacles are relatively small, subspherical or beanlike.

The position of the genus within the Erigoninae is unclear, but some somatic characters, i.e. chaeto- and trichobothriotaxy, modified male carapace, as well as genitalia conformation show similarity with *Gongylidioides* Oi, 1960 and in part *Oedothorax*.

Species included: Excluding one species which is removed from *Nasoona*, the genus currently comprises 17 species, 6 of them are described as new below.

Distribution: Extreme south of the Palaearctic Region: Nepal Himalayas and southern China; throughout the Oriental Region; Neotropical Region: Venezuela.

Range: Disjunct Oriental-Neotropical.

Nasoona indiana sp. nov.

Figs 1-3, 28-33

Holotype: Male; INDIA, West-Bengal, Darjeeling District, Ghoom, Tigerhill, southern slope, 2200-2300 m a.s.l., sifting in forest; 13.X.1978; leg. C. Besuchet & I. Löbl [#13].

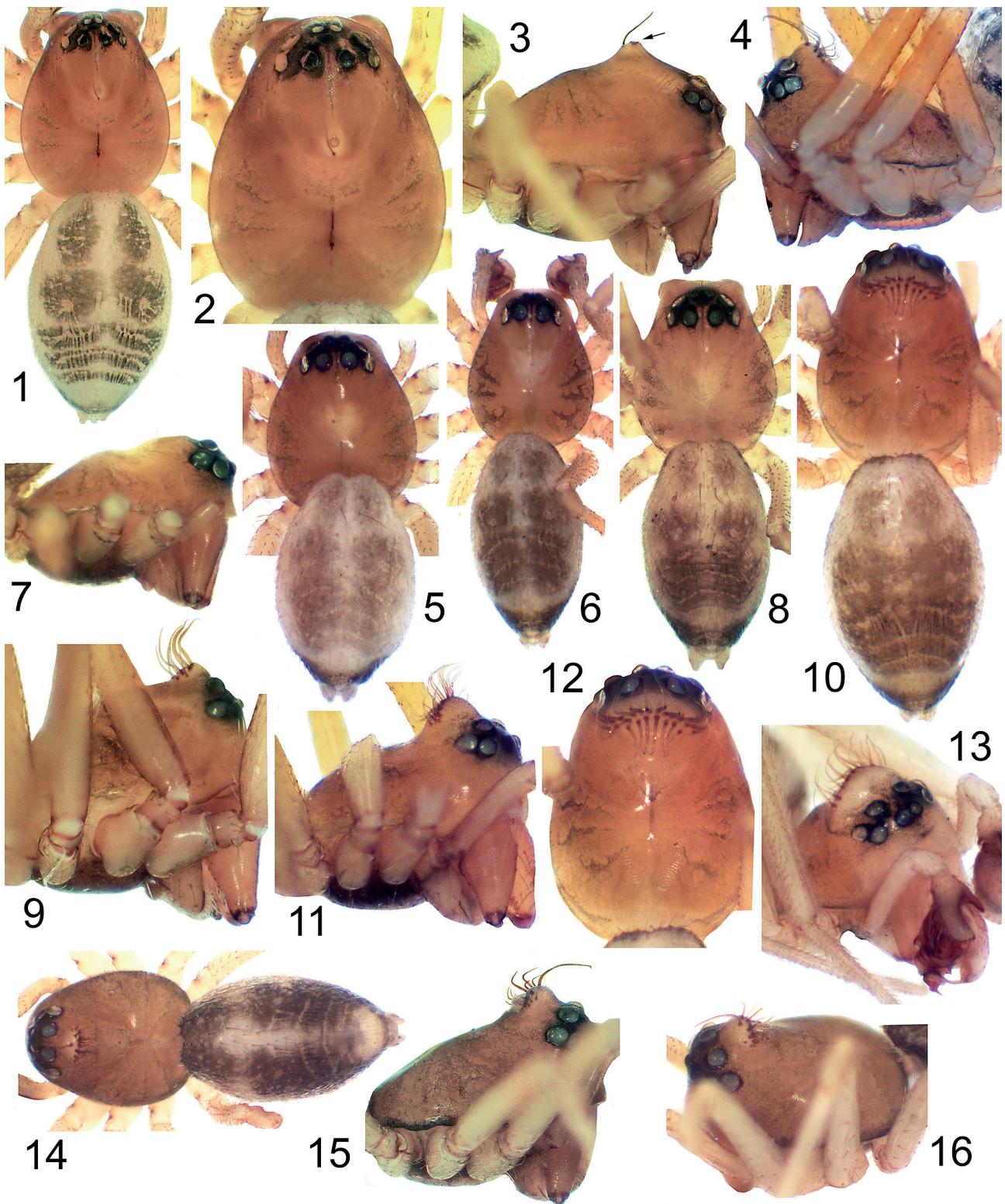
Diagnosis: According to the male palpal conformation, *N. indiana* sp. nov. seems to be most similar to *N. setifera* (Tanasevitch, 1998), known from a single locality in the mountains of Nepal (Tanasevitch, 1998). The new species differs by the bifid distal apophysis of the convector, by the slender distal process of the paraconvector which was erroneously named the suprattegular apophysis (Tanasevitch, 1998), as well as by the shape of the carapace. The carapace of *N. indiana* sp. nov. has a small, conical postocular elevation bearing a stout seta, while in *N. setifera* the carapace is armed with several stout, bent spines and a seta situated on a huge postocular elevation. The shape of the carapace and the structure of the embolic division of *N. indiana* sp. nov. is also similar to that of *N. conica* (Tanasevitch, 1998), known from high altitudes of the Nepalese Himalayas, but the new species differs clearly by the shape of its palpal tibia.

Etymology: The specific epithet, a Latinized adjective, is derived from the name of the country of origin, India.

Description: *Male (holotype):* Total length 2.01. Carapace 1.13 long, 0.90 wide, pale reddish brown, with grey radial stripes and a narrow margin. Behind posterior median eyes a conical elevation with a socket terminally, indicated with arrow in Fig. 3, probably for a large, stout seta which was lost in this specimen (Figs 1-3). Chelicerae 0.55 long, unmodified. Legs yellow. Leg I 4.38 long (1.25+0.30+1.13+10.05+0.65), IV 4.44 long (1.25+0.28+1.13+1.15+0.63). Chaetotaxy: spines mostly lost, but probably 2.2.1.1. Each metatarsus with a trichobothrium. TmI 0.71. Palp (Figs 28-33): Tibia slightly expanded distally, with several very short spinules terminally. Retrolateral side of tibia with a tooth-like tubercle, prolateral side with a small dark protuberance and two larger keel-shaped outgrowths. Proximal part of paracymbium narrow, distal part expanded and bearing several weak spines. Tegulum terminating in transparent protegulum. Distal suprattegular apophysis short, wide, T-shaped distally, bearing a black, sharp tooth in middle. Embolus long and thin, forming a loop, radix reduced. Main body of convector relatively narrow, twisted, its distal apophysis well-sclerotized, black, bifid. Paraconvector large, complicated, with a long, sabre-shaped distal process. Abdomen 1.40 long, 0.88 wide, dorsal pattern as in Fig. 1.

Female: Unknown.

Distribution: Only known from the type locality in the mountains of West-Bengal, India.



Figs 1-16. Photographs of *Nasoona indiana* sp. nov., male holotype (1-3); *N. orissa* sp. nov., male paratype (4); *N. intuberosa* sp. nov., male paratypes (5-7) and female paratype (8); *N. kinabalu* sp. nov., male holotype (9); *N. sabah* sp. nov., male paratype from Liwagu Trail (10-12) and male paratype from Silau-Silau Trail (13); *N. sulawesi* sp. nov., male holotype (14-16). (1, 5-6, 10, 14) Male body, dorsal view. (8) Female body, dorsal view. (2, 12) Male prosoma, dorsal view. (3-4, 7, 9, 11, 15) Male prosoma, lateral view. (13, 16) Male prosoma, anterolateral view. Not to scale.

***Nasoona orissa* sp. nov.**

Figs 4, 34-41

Holotype: ZMMU; male; INDIA, Odisha State (= Orissa before 2011), road from Banigocha to Daspalla, near Padiakutibari, 20.382°N 84.771°E; 17.-25.I.2014; leg. K. Tomkovich.

Paratypes: ZMMU; 3 males; MHNG; 2 males; collected together with the holotype.

Diagnosis: The new species is characterized by the peculiar shape of the male palpal tibia, by the distal apophysis of the convector which is divided into two lobes, as well as by a wide, strongly bent distal process of the paraconvactor. The massive distal apophysis of the convector, as well as the shape of the distal process of the paraconvactor of *N. orissa* sp. nov. resemble those of *N. crucifera*, which is widespread in the Oriental Region, but both species are clearly distinguished by the structure of the palpal tibia. The shape of the convector, as well as the strongly divided palpal tibia are similar to those of *N. sulawesi* sp. nov., but *N. orissa* sp. nov. can be easily distinguished by the shape of the distal process of the paraconvactor.

Etymology: The specific epithet is a name in apposition referring to the “terra typica”, the old name of the Odisha State in India.

Description:

Male (paratype): Total length 1.70. Carapace 0.75 long, 0.60 wide, pale brown, with a postocular elevation bearing bent, forward-directed, stout spines as shown in Fig. 4; eyes normal. Chelicerae 0.33 long, unmodified. Legs yellow. Leg I 2.61 long (0.70+0.18+0.68+0.63+0.42), IV 2.69 long (0.75+0.18+0.70+0.68+0.38). Chaetotaxy: 2.2.1.1, length of spines about 1.5-2.5 diameters of leg segment. Each metatarsus with a trichobothrium. TmI 0.52. Palp (Figs 34-41): Tibia divided into four lobes: prolateral one keel-shaped; dorso-prolateral one long, narrowing at middle; dorso-retrolateral one conical, with several very short spinules terminally; retrolateral outgrowth wide, forming a shallow cup. Proximal part of paracymbium narrow, L-shaped; distal part wide, ending in a hook. Distal suprategular apophysis short, flat, with a sharp, black tooth in middle. Embolus long and thin, forming a loop, radix reduced. Main body of convector relatively narrow, curved; its distal apophysis black, well sclerotized, divided into two uneven lobes with serrate walls. Paraconvactor massive, complicated, with serrate edges and distinctly protruded distal process. Abdomen 1.00 long, 0.60 wide, dorsally white, with three longitudinal pairs of large, grey spots.

Female: Unknown.

Distribution: Only known from the type locality in western India.

***Nasoona intuberosa* sp. nov.**

Figs 5-8, 17, 42-48

Holotype: Male; EAST MALAYSIA, Borneo, Sabah, Tambunan Distr., Crocker Range, 1550-1650 m a.s.l., near pass (road from Kota Kinabalu to Tambunan), *Lithocarpus* - *Castanopsis*, sifting decomposing wood, dead leaves and moss; 16.V.1987; leg. D. Burckhardt & I. Löbl [#27a].

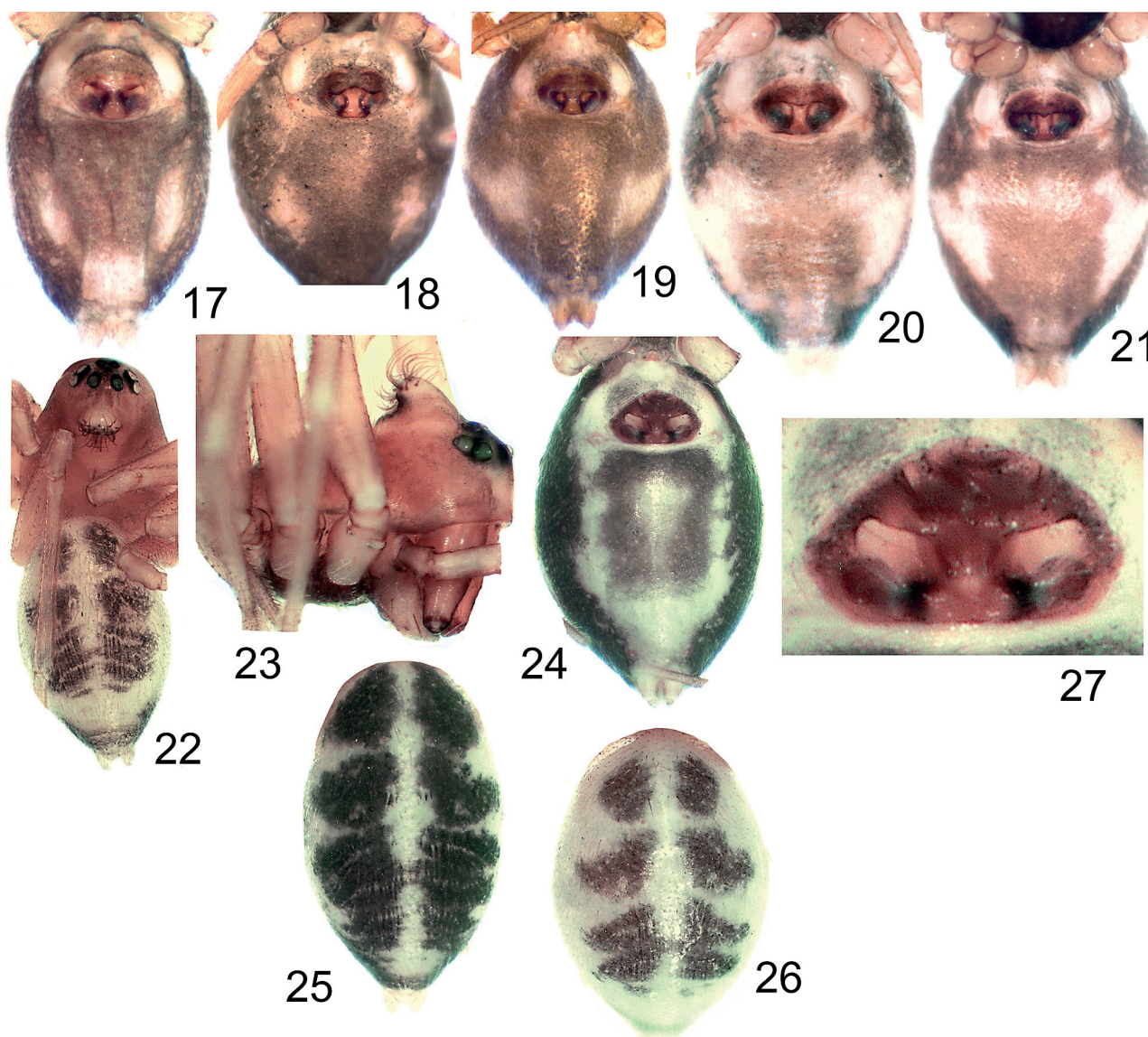
Paratypes: 2 males, 3 females; collected together with the holotype.

Diagnosis: The new species is characterized by the unmodified carapace of males, which is untypical for the genus and previously known only from *N. asocialis* and *N. chrysanthusi*, as well as by the presence of two elongated pockets in the epigyne, similar to that of the Nepalese *N. comata*. Judging from the male palpal conformation, *N. intuberosa* sp. nov. is similar to two other new species described in here from the Mt Kinabalu, i.e., *N. kinabalu* sp. nov. and *N. sabah* sp. nov. From these two species *N. intuberosa* sp. nov. differs by the absence of a hump on the male carapace, by the shape of the palpal tibia, by details of the embolic division, as well as by the presence of two pockets divided by a relatively wide septum in the epigyne.

Etymology: The specific epithet is a Latin adjective referring to the absence of a hump on the male carapace, which is a characteristic feature for the genus *Nasoona*.

Description:

Male (paratype): Total length 1.65. Carapace 0.75 long, 0.65 wide, unmodified, pale brown, with grey radial stripes as shown in Figs 5-7; eyes normal. Chelicerae 0.35 long, unmodified. Legs yellow, pale brown. Leg I 3.21 long (0.83+0.23+0.82+0.78+0.55), IV 3.18 long (0.87+0.23+0.75+0.80+0.53). Chaetotaxy: spines mostly lost, but probably 2.2.1.1. Each metatarsus with a trichobothrium. TmI 0.61. Palp (Figs 42-46): Tibia relatively short, its retrolateral branch wide, with several very short spinules terminally, and with a black, pointed tubercle on its inner side. Prolateral branch well-sclerotized, stylet-shaped. Proximal part of paracymbium narrow, L-shaped; distal part wide, ending in a hook. Distal suprategular apophysis very short, flat, with a black, sharp tooth in middle, and with a transparent, narrow process terminally. Embolus long and thin, forming a loop, radix reduced. Main body of convector curved, its distal apophysis dark, narrow, serrate. Paraconvactor large, with a long, claw-shaped distal process. Abdomen 0.95 long, 0.63 wide, dorsal pattern as shown in Figs 5-6. *Female (paratype):* Total length 1.80. Carapace 0.80 long, 0.68 wide, unmodified, pale brown, with grey, radial stripes, as shown in Fig. 8. Chelicerae 0.35 long, unmodified. Legs pale brown. Leg I 3.21 long (0.88+0.25+0.78+0.75+0.55), IV 3.16 long (0.88+0.25+0.78+0.80+0.45). Legs yellow, pale brown.



Figs 17-27. Photographs of *Nasoona intuberosa* sp. nov., female paratype (17); *N. kinabalu* sp. nov., female paratype from Mt Kinabalu, 3150-3200 m (18) and female paratype from Mt Kinabalu, 2590 m (19); *N. sabah* sp. nov., female paratype from Silau-Silau Trail (20) and female paratype from Liwagu Trail (21); *N. comata* (Tanasevitch, 1998), specimens from Hellok, Nepal (22-27).

(17-21, 24) Female abdomen, ventral view. (22) Male body, dorsal view. (23) Male prosoma, lateral view. (25-26) Female abdomen, dorsal view. (27) Epigyne, ventral view. Not to scale.

Chaetotaxy: 2.2.1.1, length of spines about 1.5-2.5 diameters of leg segment. Each metatarsus with a trichobothrium. TmI 0.62. Abdomen 1.03 long, 0.65 wide, as shown in Fig. 8. Epigyne (Figs 17, 47-48) with two shallow elongated pockets; seminal ducts wide, S-shaped; receptacles subspherical.

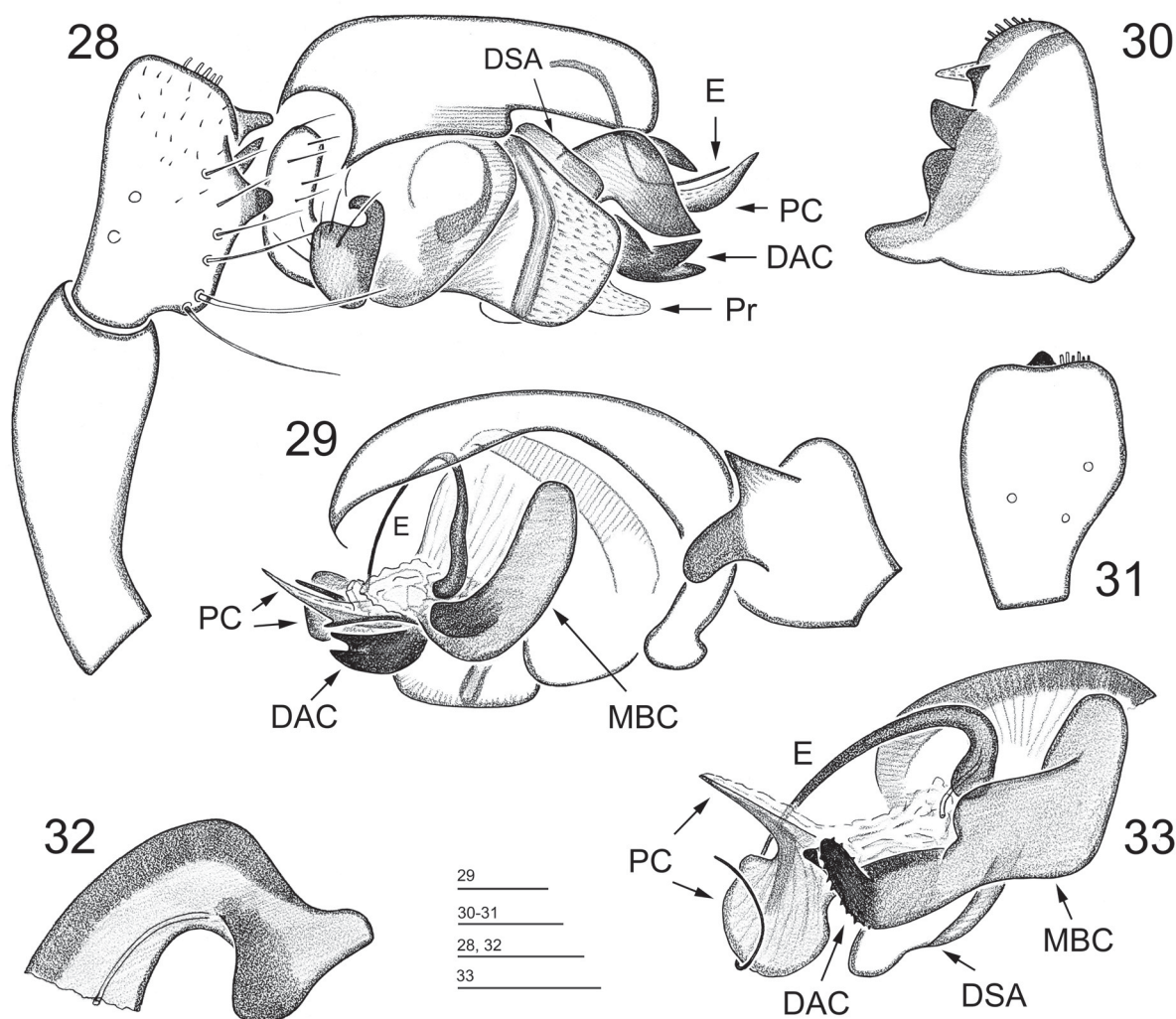
Distribution: Only known from the type locality in the Crocker Range on Borneo, East Malaysia.

***Nasoona kinabalu* sp. nov.**

Figs 9, 18-19, 49-55

Holotype: Male; EAST MALAYSIA, Borneo, Sabah, Kinabalu N.P., Mt Kinabalu, below Layang-Layang, 2600 m a.s.l., interception trap; 2.-8.V.1987; leg. A. Smetana [#B20].

Paratypes: 1 male; Mt Kinabalu, below Layang-Layang, 2595 m a.s.l.; 2.V.1987; leg. A. Smetana [#B19]. – 1 male, 3 females; Mt Kinabalu, 2590 m a.s.l., humid ravine below Layang Layang, cloud forest, sifting



Figs 28-33. *Nasoona indiana* sp. nov., holotype. (28-29) Right palp, retrolateral and prolateral view, respectively. (30-31) Palpal tibia, prolateral and dorsal view, respectively. (32) Distal suprategular apophysis. (33) Distal suprategular apophysis and embolic division.

leaf litter in humid ravine; 1.V.1987; leg. D. Burckhardt & I. Löbl [#10a]. – 1 male, 1 female; Mt Kinabalu, 3150-3200 m a.s.l., humid Myrtaceae and Ericaceae forest, sifting moss and fern near Paka cave, near river; 3.V.1987; leg. D. Burckhardt & I. Löbl [#12b].

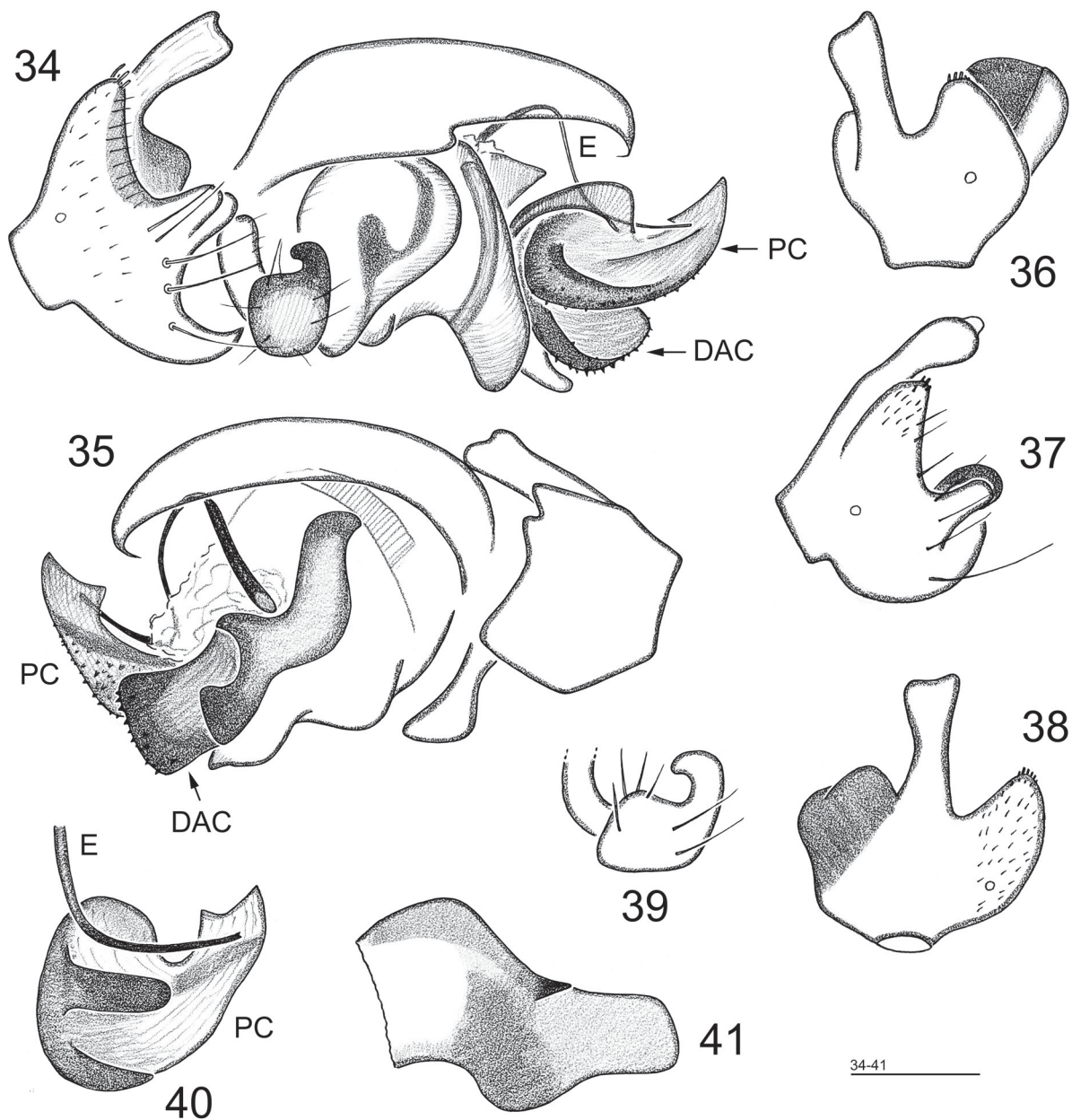
Diagnosis: The species appears to be most similar to *N. sabah* sp. nov., and differs by the shorter retrolateral outgrowth of the male palpal tibia, by the shape of the paraconvactor, as well as by the presence of a bipartite visor-like structure above the epigynal cavity.

Etymology: The specific epithet is a name in apposition referring to the “terra typica”, Mt Kinabalu on Borneo.

Description:

Male (paratype from Mt Kinabalu, 2590 m a.s.l.): Total length 1.90. Carapace 0.95 long, 0.75 wide, pale brown, with grey radial stripes and a narrow

margin. Postocular elevation bearing bent, forward-directed stout spines as shown in Fig. 9; eyes normal. Chelicerae 0.95 long, unmodified. Legs pale brown. Leg I 3.63 long ($1.00+0.25+0.95+0.83+0.60$), IV 3.66 long ($1.03+0.25+0.93+0.85+0.60$). Chaetotaxy: 2.2.1.1, length of spines about 1.5-2.5 diameters of leg segment. Each metatarsus with a trichobothrium. TmI 0.70. Palp (Figs 49-53): Tibia relatively short, its retrolateral branch wide, with several very short spinules terminally and with a black, rounded tubercle on its inner side. Prolateral branch well-sclerotized, dagger-shaped. Paracymbium widened distally, ending in a hook. Distal suprategular apophysis short, flat, with a shallow distally and with a black, sharp tooth in middle. Embolus long and thin, forming a loop, radix reduced. Main body of convactor narrow, curved; its distal apophysis black, well sclerotized, serrate, rounded apically. Paraconvactor massive, complicated, serrate; distal process distinctly



Figs 34-41. *Nasoona orissa* sp. nov., male paratype. (34-35) Right palp, retrolateral and prolateral view, respectively. (36-38) Palpal tibia, retrodorsal, retrolateral and dorsal view, respectively. (39) Paracymbium. (40) Distal suprategular apophysis. (41) Distal part of embolus and paraconvector.

protruded. Abdomen 1.00 long, 0.60 wide, dorsally white, with three longitudinal pairs of large, grey spots.

Female (paratype from Mt Kinabalu, 2590 m a.s.l.): Total length 2.52. Carapace 1.00 long, 0.85 wide, pale greyish brown, with grey radial stripes and a narrow margin; unmodified. Chelicerae 0.45 long, unmodified. Legs pale brown. Leg I 3.90 long (1.05+0.30+1.03+0.90+0.62), IV 4.11 long (1.15+0.30+1.03+1.05+0.58). Chaetotaxy: 2.2.1.1, length of spines about 1.5-2.5 diameters of leg segment. Each metatarsus with a trichobothrium. TmI 0.71. Epigyne (Figs 18-19, 54-55): Anterior wall with a bipartite visor-like outgrowth overhanging epigynal

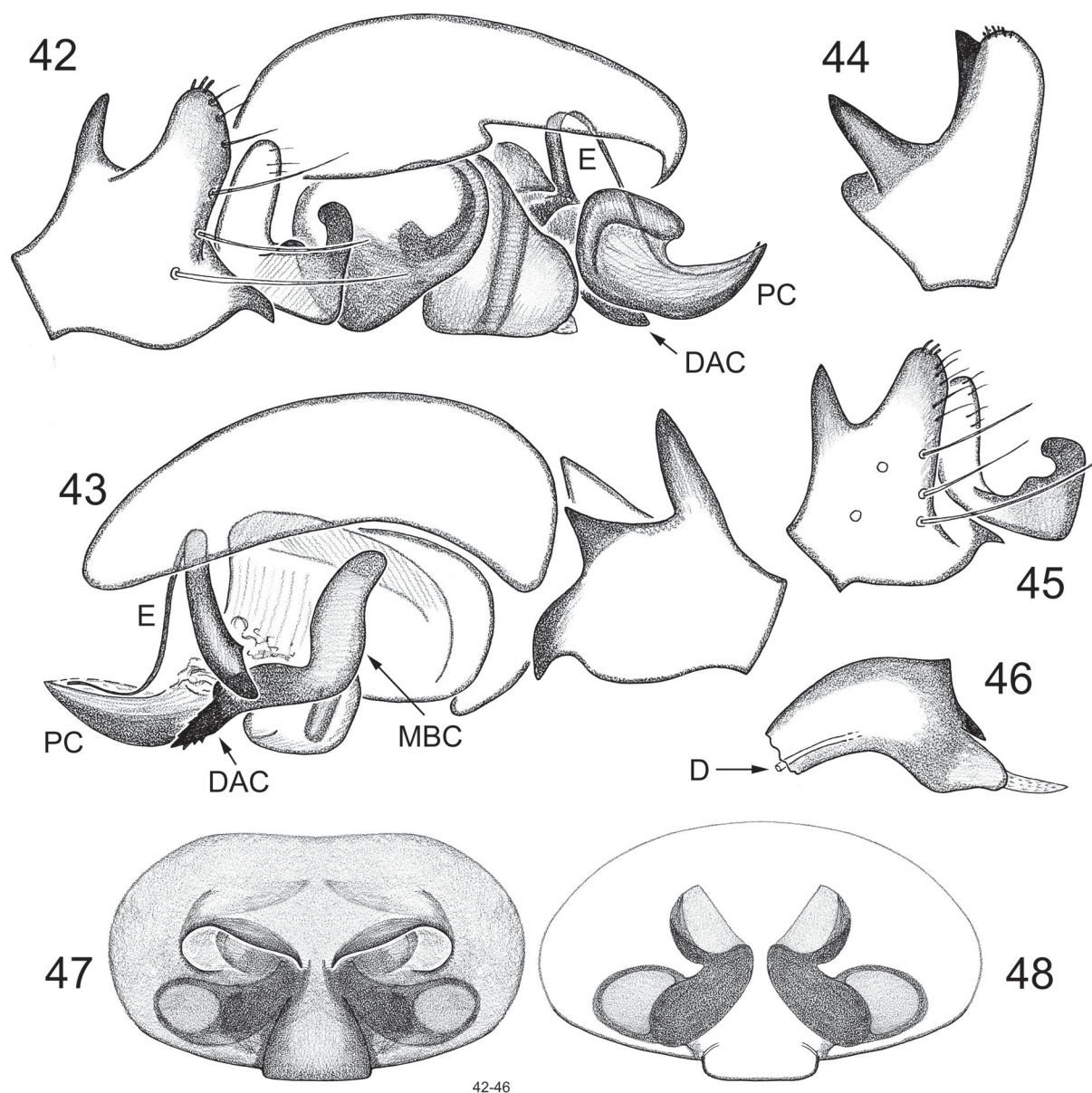
cavity. Seminal ducts wide, shaped like a question mark, receptacles beanlike. Abdomen 1.50 long, 1.15 wide, dorsally with two rows of almost merged grey spots.

Distribution: Only known from highlands of Mt Kinabalu on Borneo, East Malaysia.

***Nasoona sabah* sp. nov.**

Figs 10-13, 20-21, 56-63

Holotype: Male; EAST MALAYSIA, Borneo, Sabah, Kinabalu N.P., Mt Kinabalu, 1550-1650 m a.s.l., Silau-



Figs 42-48. *Nasoona intuberosa* sp. nov., male and female paratypes. (42-43) Right palp, retrolateral and prolateral view, respectively. (44) Palpal tibia, dorsal view. (45) Palpal tibia and paracymbium, retrodorsal and very slightly proximal view. (46) Distal suprategular apophysis. (47) Epigyne, ventral view. (48) Cleared epigyne, dorsal view.

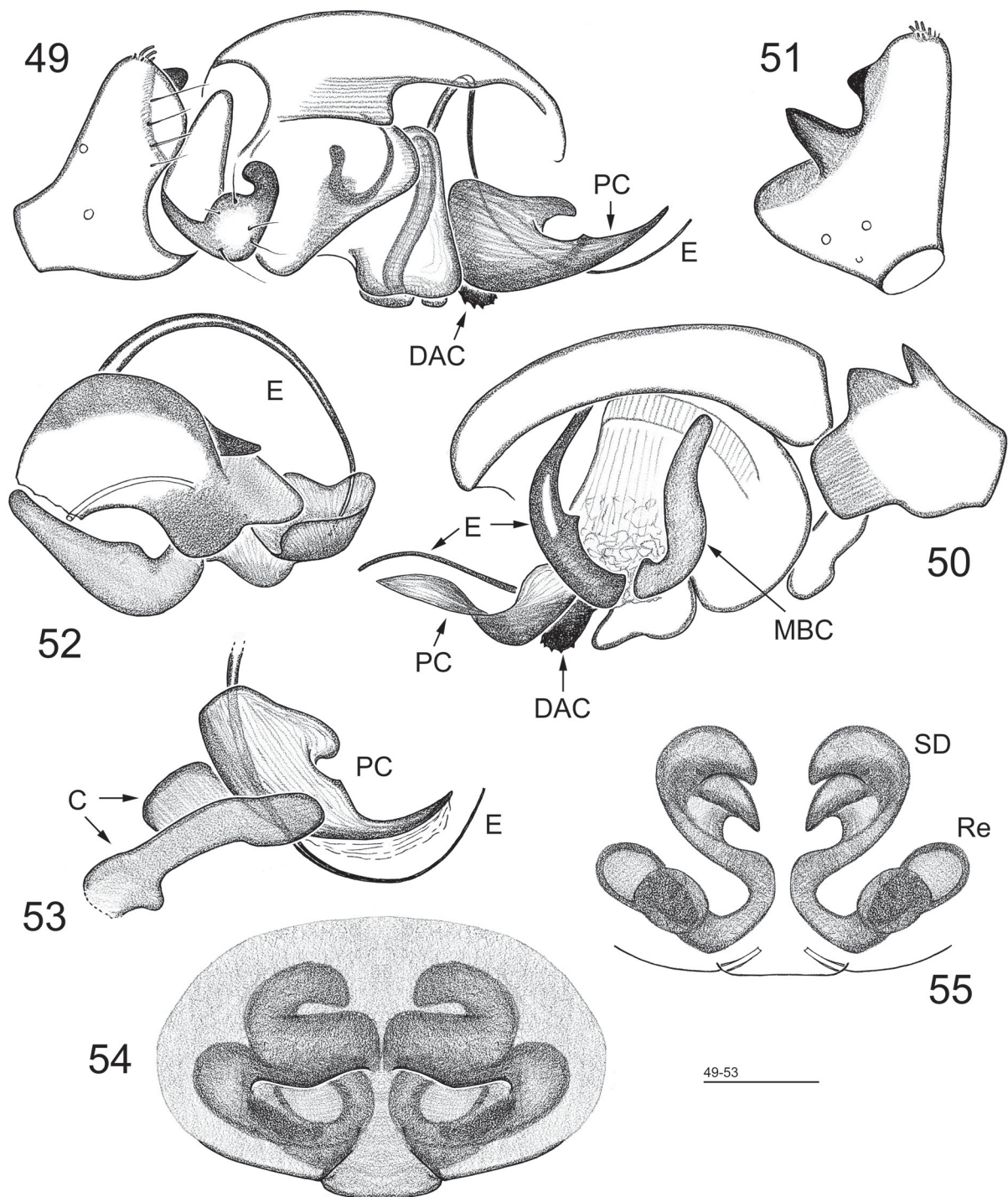
Silau Trail, *Lithocarpus-Castanopsis* forest, sifting decomposing wood and dead leaves in humid ravine; 24.IV.1987; leg. D. Burckhardt & I. Löbl [#2a].

Paratypes: 2 males, 5 females; collected together with the holotype. – 1 male, 2 female; Mt Kinabalu, 1540 m a.s.l., Liwagu Trail, sifting leaf litter in small ravine and at base of old trees; 29.IV.1987; leg. D. Burckhardt & I. Löbl [#8a]. – 1 female; Mt Kinabalu, 1750 m a.s.l., Liwagu Trail, sifting bark, decomposing wood and leaf litter next to a log and at base of tree stumps; 27.IV.1987; leg. D. Burckhardt & I. Löbl [#5a]. – 6 females; Mt Kinabalu, 1500 m a.s.l., Liwagu Trail,

section 2, *Lithocarpus & Podocarpus* forest, Silau-Silau Trail, *Lithocarpus-Podocarpus* forest, sifting moss and dead leaves along Silau-Silau Trail; 21.V.1987; leg. D. Burckhardt & I. Löbl [#34b].

Other material examined: Male holotype of *Pronasoona sylvatica* Millidge, 1995; Kinabalu N.P., Poring Hot Springs.

Diagnosis: The new species is characterized by the shape of the postocular elevation on the male carapace which looks like a transverse ridge similar to that in *Pronasoona sylvatica*, but *P. sylvatica*, has only one row of spines on the elevation, *N. sabah* sp. nov. has



Figs 49-55. *Nasoona kinabalu* sp. nov., male and female paratypes from Mt Kinabalu, 2590 m. (49-50) Right palp, retrolateral and prolateral view, respectively. (51) Palpal tibia, dorsal view. (52) Distal suprategular apophysis and embolic division. (53) Convector, paraconvector and distal part of embolus. (54) Epigyne, ventral view. (55) Cleared epigyne, dorsal view.

two rows of bent, stout spines. According to the male palp structure the new species appears most similar to *N. kinabalu* sp. nov. (see above). The epigyne of *N. sabah* sp. nov. resembles that of *N. chrysanthusi*, but differs by the shape of the translucent seminal ducts.

Etymology: The specific epithet is a name in apposition

referring to the “terra typica”, the Sabah State of East Malaysia on Borneo Island.

Description:

Male (paratype from Silau-Silau Trail): Total length 2.02. Carapace 0.93 long, 0.70 wide, pale brown, with grey radial stripes and a narrow margin. A transverse

postocular ridge slightly bent forward and bearing two rows of curved, stout spines. Spines of anterior row directed forward, those of posterior row directed backwards, as shown in Figs 10-13; eyes normal. Chelicerae 0.35 long, unmodified. Legs pale brown. Leg I 3.26 long (0.88+0.20+0.85+0.80+0.53), IV 3.23 long (0.90+0.22+0.83+0.80+0.48). Chaetotaxy: 2.2.1.1, length of spines about 1.5-2.5 diameters of leg segment. Each metatarsus with a trichobothrium. TmI 0.60. Palp (Figs 56-61): Retrolateral branch of palpal tibia relatively long and wide, with several very short spinules terminally and with a black rounded tubercle on its inner side. Prolateral branch strongly sclerotized, dagger-shaped. Paracymbium L-shaped, ending with a hook. Distal suprategular apophysis short, flat, narrow, with a black, sharp tooth in middle. Embolus long and thin, forming a loop, radix reduced. Main body of convector curved, its distal apophysis dark, narrow, serrate. Paraconvactor large, complicated, with a long, claw-shaped distal process. Abdomen 1.28 long, 0.70 wide, dorsal pattern as shown in Fig. 10.

Female (paratype from Silau-Silau Trail): Total length 2.15. Carapace 0.95 long, 0.70 wide, unmodified. Chelicerae 0.43 long, unmodified. Legs pale brown. Leg I 3.41 long (0.95+0.25+0.88+0.83+0.50), IV 3.46 long (1.00+0.25+0.90+0.83+0.48). Chaetotaxy: 2.2.1.1, length of spines about 1.5-3 diameters of leg segment. Each metatarsus with a trichobothrium. TmI 0.60. Abdomen 1.38 long, 0.85 wide, dorsally white and with indistinct grey pattern. Epigyne (Figs 20-21, 62-63): anterior wall forming an angle slightly overhanging wide, shallow epigynal cavity. Seminal ducts very wide, receptacles subspherical.

Distribution: Only known from Mt Kinabalu on Borneo, East Malaysia.

***Nasoona sulawesi* sp. nov.**

Figs 14-16, 64-69

Holotype: Male; INDONESIA, northern Sulawesi, Kotamobagu, Matali Baru, road to Torosik, Mt Tongara, 600-900 m a.s.l.; 5.XII.1999; leg. A. Riedel.

Other material examined: Male holotype and 2 females paratypes of *Nasoona silvestris* Millidge, 1995 from Sumba Island, Indonesia.

Diagnosis: The new species appears most similar to the Neotropical *N. coronata*, known from San Esteban N.P., Venezuela. This similarity is seen the palpal structure, namely in the shape of the large, strongly sclerotized convector and paraconvactor. *Nasoona sulawesi* sp. nov. is also somewhat similar to *N. crucifera*, which is widespread in the Oriental Region (World Spider Catalog, 2017) and to *N. silvestris*, described from Sumba, Indonesia (Millidge, 1995). *Nasoona sulawesi* sp. nov. is distinguished from the above-mentioned

species by the shape of the strongly modified palpal tibia and by details of the palpal sclerites.

Etymology: The specific epithet is a name in apposition referring to the “terra typica”, Sulawesi Island.

Description:

Male (holotype): Total length 1.83. Carapace 0.85 long, 0.70 wide, greyish brown, with a postocular elevation bearing bent, stout spines as shown in Figs 14-16; occipital region of elevation with a small hollow bearing very short hairs as shown in Fig. 15; eyes normal. Chelicerae 0.30 long, unmodified. Legs yellow. Leg I 3.06 long (0.85+0.23+0.83+0.75+0.50), IV 3.14 long (0.85+0.23+0.80+0.78+0.48). Chaetotaxy: 2.2.1.1, length of spines about 1.5-2.5 diameters of leg segment. Each metatarsus with a trichobothrium. TmI 0.53. Palp (Figs 64-69): Tibia divided into four parts of different shapes. Dorsal branch of palpal tibia with several very short spinules terminally. Proximal part of paracymbium narrow, L-shaped; distal part wide, bearing several weak spines, ending with a hook. Distal suprategular apophysis short, flat, rounded distally, with a sharp black tooth in middle. Embolus long and thin, forming a loop; radix reduced. Main body of convector massive, black, distally divided by a narrow cleft into two parts, these serrate distally. Paraconvactor large, complicated, with a long, claw-shaped distal process. Abdomen 1.01 long, 0.65 wide, dorsally dark grey, with a white, median stripe as shown in Fig. 14.

Female. Unknown.

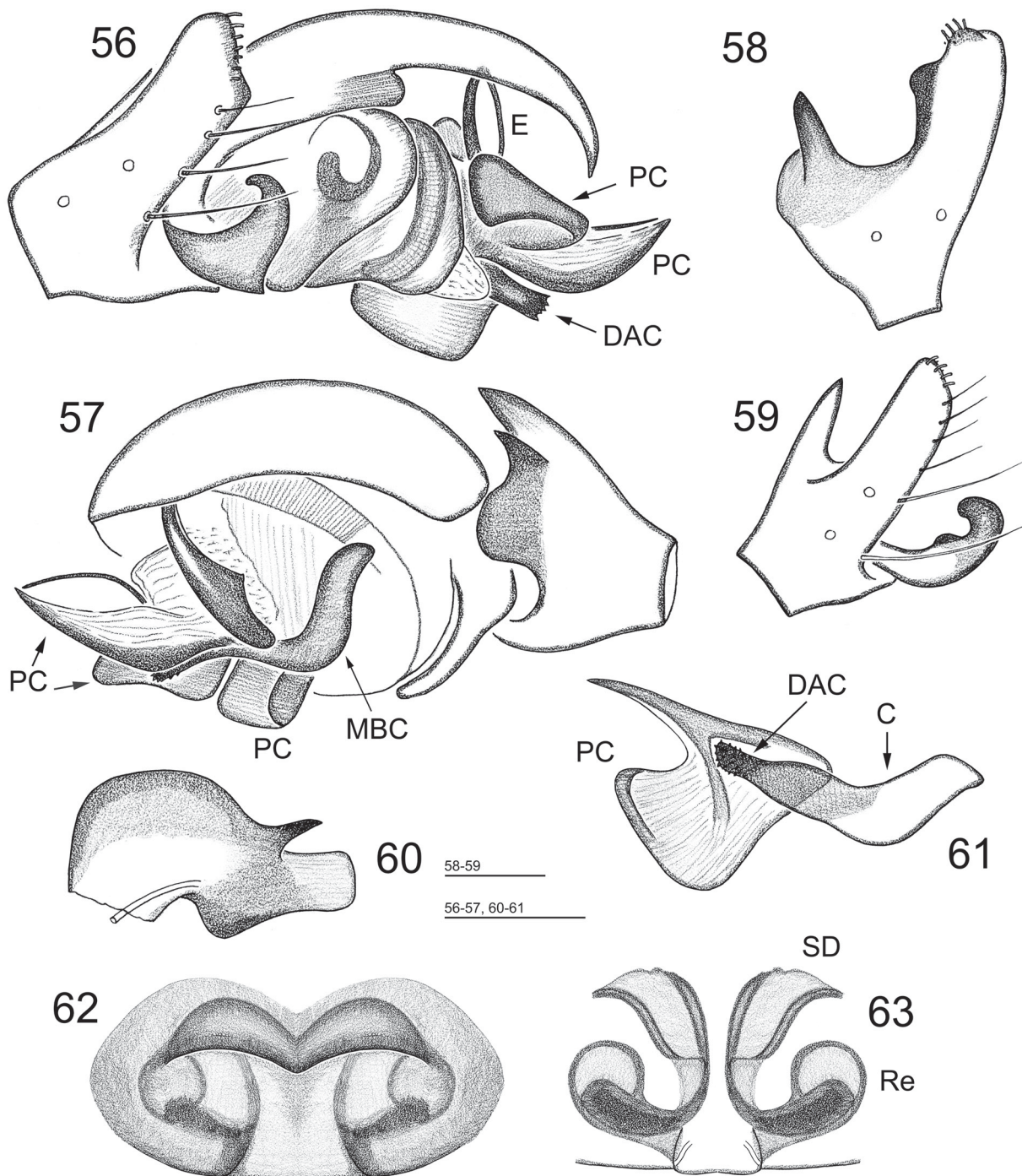
Distribution: Only known from the type locality in northern Sulawesi, Indonesia.

***Nasoona comata* (Tanasevitch, 1998)**

Figs 22-27

Remarks: This Nepalese species was hitherto known from males only (Tanasevitch, 1998). When re-examining material collected during Jochen Martens' expeditions to Nepal and kept at the SMF, the unknown females were found. The male of *N. comata* was described in detail earlier (see Tanasevitch, 1988), therefore I here only give photos of the male body (Fig. 22) and prosoma (Fig. 23). The first description of the female of *N. comata* is given below.

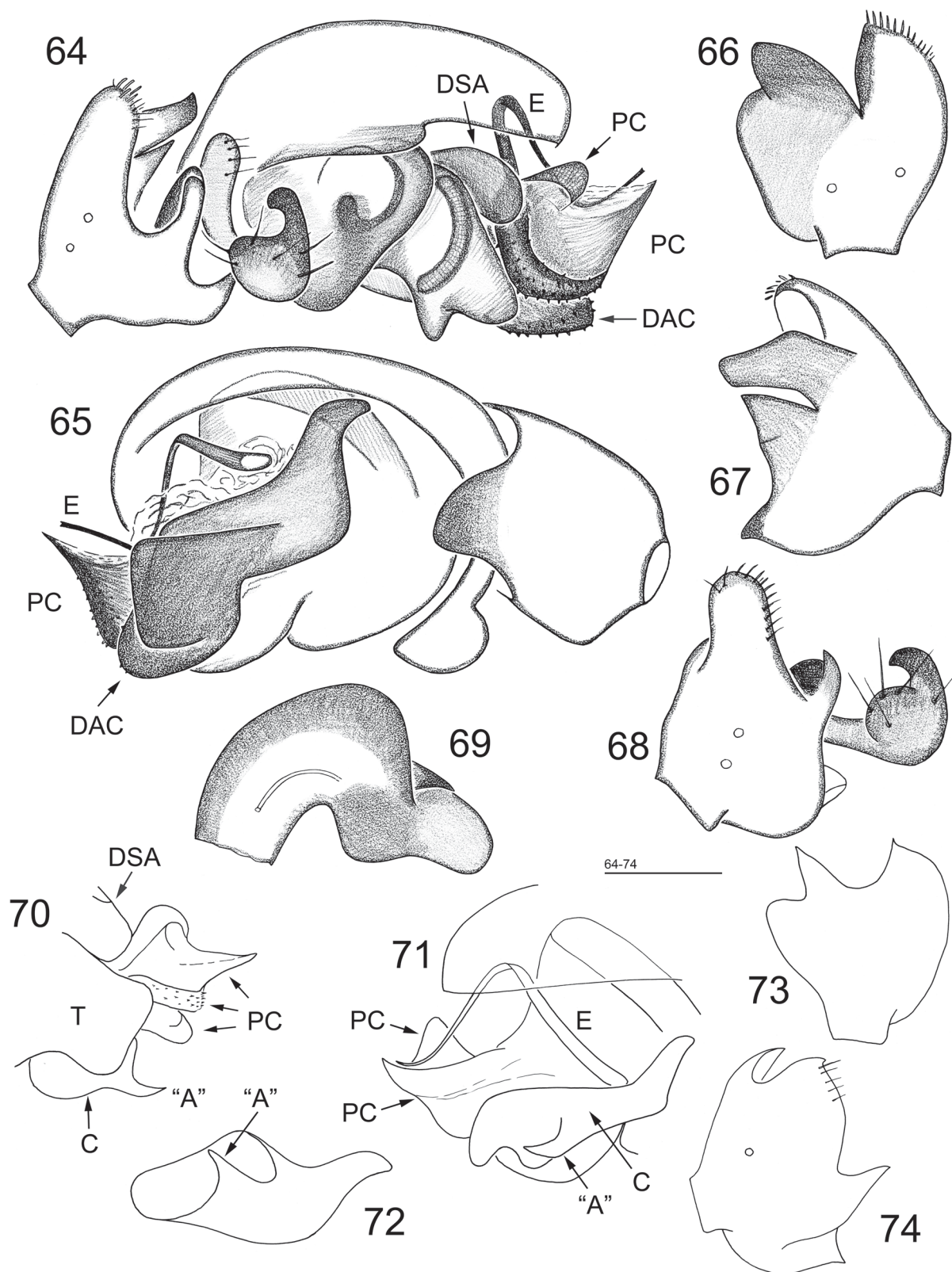
Material examined: All specimens in SMF: 1 male, 6 females; NEPAL, Taplejung Distr., Hellok in Tamur Valley, 2000 m a.s.l., forest remnant, bushes; 17.V.1988; leg. J. Martens & W. Schawaller [#371]. – 5 females; Ilam Distr., Mai Pokhari, 2100-2200 m a.s.l., forest; 25.-27.III.1980; leg. J. Martens & A. Ausobsky [#116]. – 1 female; same locality, 2100 m a.s.l., forest; 31.III.-1.IV.1980; leg. J. Martens & A. Ausobsky [#117]. – 4 females; Taplejung Distr., Grat Lasse Dhara and Aim Lasseham, 3000-3300 m a.s.l.; 6.-7.IX.1983; leg. J. Martens & B. Daams [#275]. – 1 female; SE



Figs 56-63. *Nasoona sabah* sp. nov., male and female paratypes from Mt Kinabalu, 1540 m. (56-57) Right palp, retrolateral and prolateral view, respectively. (58) Palpal tibia, dorsal view. (59) Palpal tibia and paracymbium, retrodorsal and slightly proximal view. (60) Distal suprategular apophysis. (61) Paraconvexor and convexor. (62) Epigyne, ventral view. (63) Cleared epigyne, dorsal view.

Yamputhin, 1650-2000 m a.s.l., forest mainly *Alnus*; 26. & 30.IV.1988; leg. J. Martens & W. Schawaller [#350]. – 3 females; Yamputhin cultural land, 1650-1800 m a.s.l., open forest; 26.IV-1.V.1988; leg. J. Martens & W. Schawaller [#351]. – 5 females; Omje Kharka NW Yamputhin, natural mixed broadleaved forest,

2300-2500 m a.s.l.; 1.-6.V.1988; leg. J. Martens & W. Schawaller [#356]. – 2 females; pasture Lassetham NW of Yamputhin, 3300-3500 m a.s.l., mature *Abies-Rhododendron* forest; 6.-9.V.1988; leg. J. Martens & W. Schawaller [#59]. – 1 female; upper Simbua Khola, ascent to pasture Lassetham, 3000-3150 m a.s.l.,



Figs 64-74. *Nasoona sulawesi* sp. nov., male holotype (64-69) and *N. locketi* Millidge, 1995, male paratype from NHML (70-74). (64-65) Right palp, retrolateral and prolateral view, respectively. (66-67) Palpal tibia, dorsal and prolateral view, respectively. (68) Palpal tibia and paracymbium, retrodorsal and slightly proximal view. (69) Distal suprategular apophysis. (70-71) Distal part of palp, retrolateral and prolateral view, respectively. (72) Convector. (73-74) Palpal tibia, dorsal and prolateral view, respectively.

mature mixed *Tsuga-Rhododendron* broadleaved forest; 15.V.1988; leg. J. Martens & W. Schawaller [#364]. – 1 male, 6 females; Hellok in Tamur Valley, 2000 m a.s.l., forest remnant, bushes; 17.V.1988; leg. J. Martens & W. Schawaller [#371]. – 3 females; Panchthar Distr., Paniporua, 2300 m a.s.l., mixed broadleaved forest; 16.-20.IV.1988; leg. J. Martens & W. Schawaller [#328]. – 1 female; between Paniporua and Hinwa Khola Valley, 1850-2300 m a.s.l., cultivated land, tree-rich; 20.IV.1988; leg. J. Martens & W. Schawaller [#329].

Description:

Female (specimen from Hellok): Total length 2.30. Carapace 1.15 long, 0.80 wide, unmodified, reddish brown, with a narrow, grey margin. Chelicerae 0.45 long. Legs pale brown. Leg I 4.33 long (1.25+0.30+1.13+1.00+0.65), IV 4.30 long (1.20+0.30+1.10+1.10+0.60). Chaetotaxy 2.2.1.1. Each metatarsus with a trichobothrium. Tm I 0.68. Abdomen 1.25 long, 0.85 wide, dorsal pattern as shown in Figs 25-26. Epigyne (Figs 24, 27) with elongated pockets divided with relatively wide septum. Seminal ducts wide, receptacles oval.

Taxonomic remarks: According to genitalia conformation, *N. comata* appears most similar to the Bornean *N. intuberosa* sp. nov. The male of *N. comata* can be easily distinguished from that of *N. intuberosa* sp. nov. by the presence of a hump on the male carapace bearing a group of bent, stout spines (see Figs 22-23), as well as by the shape of the palpal tibia. Females differ by more widely separated pockets of the epigyne in *N. comata*.

Distribution: The species has hitherto been known from 1650-2300 m a.s.l. in the Ilam, Panchithar and Taplejung districts in Nepal. The new records expand the known distribution of this species in Nepal, and its altitudinal range to 3500 m a.s.l.

Nasoona locketi Millidge, 1995

Figs 70-74

Type material examined: NHML #bm.1995-7-25-12; female holotype of *Nasoona locketi*; Rakata, Krakatoa, Sept. 1984 (Latrobe Exped.). – NHML #bm.1995-7-25-11; male paratype of *Nasoona locketi*; Rakata, Krakatoa, Sept. 1984. (Latrobe Exped.).

Remarks: The species was originally described from both sexes from Krakatoa Island, Indonesia (Millidge, 1995). As mentioned above, the untypical chaetotaxy in the male (1.1.1.1 instead of 2.2.1.1) is the result of an incorrect count of the number of spines caused by partial loss. The figures of the male palp given by the author for *N. locketi* (see Millidge, 1995: figs 27-29) do not accurately reflect its structure, therefore I give new schematic drawings of the male paratype here (see Figs 70-74). The “basal apophysis of the embolic division” of Millidge (1995: 45), which is marked in figs 24

and 28 as “A” [the same in fig. 23 for *N. coronata*], is indeed an apophysis of the convector.

Nasoona chrysanthusi Locket, 1982

New material examined: 1 female; INDONESIA, Sumatra, West Sumatra Province, Rimbo Panti N.R., ca 30 km N of Lubuksikaping, 0°20'46"N 100°04'09"E, 300-400 m a.s.l., primary forest; 11. & 13.VI.2006; leg. P. Schwendinger [Sum-06/18]. – 1 female; Panti, 250 m a.s.l., sifting of vegetational debris in lowland swamp forest; 19.XI.1989; leg. D. Burckhardt, I. Löbl and D. Agosti [#23].

Distribution: The species was previously known from Malaysia and Singapore (World Spider Catalog, 2017) and is here also reported from Indonesia.

Nasoona crucifera (Thorell, 1895)

New material examined: SMF; 1 male, 1 female; TAIWAN, Pingtung County, Kenting, close to Howard Beach Resort, 21°56'17.63"N 120°48'31.85"E, 24 m a.s.l., secondary forest, at night, by hand; 24.VI.2013; leg. P. Jäger. – 1 female; Pingtung County, Hengchun Township, near Kenting Youth Activities Center, decaying wood and adjacent litter; 3.I.2012; leg. S. Vit [TAIW-11-12/5]. – 1 male; HONG KONG, Victoria Peak, environs of Hong Kong University, 150 m a.s.l.; 30.XI.1988; leg. C. Lienhard [Bru-88/53].

Distribution: The species was previously known from India, Myanmar, Thailand, Laos, Vietnam, Singapore, Malaysia, Indonesia, China (World Spider Catalog, 2017) and is here also reported from Taiwan and Hong Kong.

Nasoona prominula Locket, 1982

New material examined: SMF; 1 male, 1 female; TAIWAN, Pingtung County, Kenting, close to Howard Beach Resort, 21°56'17.63"N 120°48'31.85"E, 24 m a.s.l., secondary forest, at night, by hand; 24.VI.2013; leg. P. Jäger.

Remarks: The species was previously known from Thailand, Laos, Malaysia, Singapore (World Spider Catalog, 2017) and is here also reported from Taiwan.

Oedothorax nigromaculatus

(Gao, Fei & Xing, 1996) comb. nov.

Nasoona nigromaculata Gao, Fei & Xing, 1996: 29, figs 1-5.

Remarks Type material: The type material had been deposited at the Department of Cellular Biology,

Norman Bethune University of Medical Sciences (Changchun, China), but according to Shou-Wang Lin is now lost (pers. comm.).

Taxonomic remarks: This species was originally described from specimens collected in the Anhui and Zhejiang provinces of China and placed in the genus *Nasootia*. Despite the poorly drawn genitals, it is quite obvious that the species actually belongs to *Oedothorax*. The transfer proposed here is also supported by the same chaetotaxy (2.2.1.1), by the presence of a trichobothrium on metatarsus IV, as well as by the similar conformation of genitals.

CONCLUSION

Taking into account the new data, the genus *Nasootia* now comprises 16 nominal species mostly distributed in the Oriental Region. Two species, *N. indiana* sp. nov. and *N. orissa* sp. nov., are known from India. Three species, *N. asocialis*, *N. crucifera* and *N. prominula*, are widespread throughout the region, and the northern margin of their geographical ranges slightly extend into the Palearctic, i.e. into Nepal and southern China. *Nasootia chrysanthusi* is still known only from the Malay Peninsula and Sumatra. Four species, *N. comata*, *N. conica*, *N. setifera* and *N. wunderlichi*, occur in the highlands of Nepal, just near the border of the Palearctic and the Oriental regions. Six species are known only from Southeast Asian islands: *N. kinabalu* sp. nov., *N. intuberosa* sp. nov. and *N. sabah* sp. nov. from Borneo; *N. locketi* from Krakatoa, *N. silvestris* from Sumba, *N. sulawesi* sp. nov. from Sulawesi. One congener, *N. coronata* (type specimen in the National Museum of Natural History in Paris examined), is known from Venezuela in the Neotropics. This is rather unusual and could be based on a confusion of labels. Therefore a confirmation of this record by newly collected specimens from Venezuela is desirable. According to the current data, the geographical range of the genus can be characterized as disjunct Oriental-Neotropical.

ACKNOWLEDGEMENTS

I am deeply grateful to Peter Schwendinger (MNHG), Kirill Mikhailov (ZMMU), Peter Jäger and Julia Altmann (SMF) for the opportunity to work with museum collections, as well as to Janet Beccaloni (NHML) for providing type specimens. Thanks also go to Shou-Wang Lin (currently at the University of Greifswald, Germany), who kindly reviewed the manuscript.

REFERENCES

- Förster A., Bertkau P. 1883. Beiträge zur Kenntniss der Spinnenfauna der Rheinprovinz. *Verhandlungen des Naturhistorischen Vereins der Preussischen Rheinlande und Westfalens* 40: 205-278.
- Gao J.C., Fei R., Xing S.Y. 1996. A new species of the genus *Nasootia* from China (Araneae: Linyphiidae: Erigoninae). *Acta Zootaxonomica Sinica* 21: 29-31.
- Hormiga G. 2000. Higher level phylogenetics of erigonine spiders (Araneae, Linyphiidae, Erigoninae). *Smithsonian Contributions to Zoology* 609: 1-160.
- Locket G.H. 1982. Some linyphiid spiders from western Malaysia. *Bulletin of the British Arachnological Society* 5: 361-384.
- Merrett P. 1963. The palpus of male spiders of the family Linyphiidae. *Proceedings of the Zoological Society of London* 140: 347-467.
- Millidge A.F. 1995. Some linyphiid spiders from south-east Asia. *Bulletin of the British Arachnological Society* 10: 41-56.
- Oi R. 1960. Linyphiid spiders of Japan. *Journal of the Institute of Polytechnics Osaka City University* 11(D): 137-244.
- Simon E. 1894. Histoire naturelle des araignées, vol. 1. *Roret, Paris*, pp. 489-760.
- Tanasevitch A.V. 1998. *Gorbothorax* n. gen., a new linyphiid spider genus from the Nepal Himalayas (Arachnida, Araneae, Linyphiidae). *Bonner Zoologische Beiträge* 47: 421-428.
- Tanasevitch A.V. 2014. New species and records of linyphiid spiders from Laos (Araneae, Linyphiidae). *Zootaxa* 3841(1): 67-89.
- Tanasevitch A.V. 2015. Notes on the spider genus *Oedothorax* Bertkau, 1883 with description of eleven new species from India (Linyphiidae: Erigoninae). *Revue suisse de Zoologie* 122(2): 381-398.
- Thorell T. 1895. Descriptive catalogue of the spiders of Burma, based upon the collection made by Eugene W. Oates and preserved in the British Museum. *British Museum (Natural History), London*, 406 pp.
- World Spider Catalog 2017. World Spider Catalog, version 18.5. Natural History Museum Bern. Online at <http://wsc.nmbe.ch> (accessed in October, 2017).
- Wunderlich J. 1974. Linyphiidae aus Nepal, II. Die Gattung *Oedothorax* Bertkau 1883 (Arachnida: Araneae). *Senckenbergiana biologica* 55: 169-188.