Revision of the genus Spathiostenus Belokobylskij 1992
(Hymenoptera, Braconidae: Doryctinae)

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The species of the genus Spathiostenus Belokobylskij, 1992 are revised and illustrated. A re-description of the type species Eucryptes formosanus Watanabe, 1934 is given. Two new species are described: S. brevicauda sp. nov. from New Guinea and S. pasohus sp. nov. from Malaysia and Borneo. A new synonym (Eucryptes formosanus Watanabe, 1934 = Eucryptes tenus Nixon, 1943, syn. nov.) and a new combination [Polyctenus anaculus (Chen & Shi, 2004), comb. n.] are suggested. The transformation of the first tergite into the petiolo in Doryctinae and the status of the genus Spathiostenus are discussed.

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Introduction

Transformation of the first metasomal segment into a petiolo is one of the main evolutionary tendencies in the subfamily Doryctinae. This change is associated not only with the narrowing and elongation of the first metasomal tergite but primarily with the distinct elongation of the acrocerite – the sclerotised anterior part of the first sternite (Belokobylskij, 1992). The plesiomorphic state with the acrocerite short (0.25-0.3 times as long as the first tergite) is found in most doryctine genera. However, an elongated acrocerite (apomorphic state) is characterised by a different size ratio in comparison to the length of the tergite. In the first stage of this transformation, the elongation of the acrocerite is less marked and this sclerite is shorter than, or rarely almost equal to, half of the tergite length. Such an "incomplete" petiolo (semi-petiolo) is known not only in several, often Neotropical, genera (Masonius Marsh, 1993, Mononeuron Fischer, 1981, Fritziella Marsh, 1993, Micromatus Marsh, 1993, Playassatus Viecheck, 1911, Doryctopus Enderlein, 1912, Schlette-reriella Szepigett, 1904, etc.), but also in some species of genera with a basically normal short acrocerite (in Heterospilus Haliday, 1836, Acroplaxus Enderlein, 1912, Semirhyths Szepigett, 1902, Calihiormia Ashmead, 1900, etc.). Another large group of doryctine genera (including the largest genus, Spathius Nees, 1816) has a complete petiolo with the acrocerite much longer than half of the tergite. A recent study has revealed that the petiolate first tergite developed independently in different groups of doryctines (Zaldivar-Riveron et al., in press). A phylogenetic cladogram based on molecular data (nuclear 28S rDNA and COI mtDNA genes) of 50 doryctine genera shows that a complete petiolo has appeared in at least five clades, some of which are only distantly related - groups of genera near Spathius Nees, near Psenobolus Reinhard, 1885, and Neotropical genera close to Notiospathius Matthews & Marsh, 1973 (basically all of them were former members of the polymorphic tribe Spathini), as well as some taxa in the Rhaconotus Ruthe, 1854 (Lep-torhacotonotus Granger, 1949 and Antespathius Belokobylskij, 1995) and Ontora Cameron, 1900 (Spithionmorphia Tobias, 1976) groups of genera.

The genus Spathiostenus Belokobylskij, 1992 has been relatively recently described with the
type species *Eucorystes formosanus* Watanabe, 1934 from Taiwan (Belokobylskij, 1992). During a revision of the world genera of Doryctinae, it was found that this species has a clearly elongate acrosternite of the first segment, which was one of the main characters for the diagnosis of the former tribe *Spathini* s. l. (Belokobylskij, 1992). A second species of this genus, *S. glabriventris* Belokobylskij, Iqbal & Austin, 2004, has already been described from Australia (Belokobylskij et al., 2004). An examination of the holotypes of the species *Eucorystes formosanus* Watanabe and *E. tenuis* Nixon, 1943 showed their conspecificity (syn. nov.). Two additional new species are described in this paper from South-East Asia.

The genus *Spathiostenus* is most closely related to *Polystenus* Foerster, 1862, whose species are distributed in the southern part of the Palaearctic (only the type species *P. rugosus* Foerster, 1862) and in the Oriental region (*P. ruficeps* Ashmead, 1905), *P. renes* (Nixon, 1943) and *P. anaculus* (Chen & Shi, 2004), comb. n.). The main differences between this genus and *Polystenus* are as follows: in *Spathiostenus* the acrosternite of the first segment is distinctly elongate being a little shorter than, almost equal to, or sometimes longer than half of the tergite; the males have very long setae on the legs and metastoma, and the radial vein (*r*) arises from the middle of the pterostigma. Because the original description of this genus was incomplete and also because several new species of this genus have been discovered, providing additional information about generic characters, a complete redescription of the genus *Spathiostenus* is given in this paper with a redescription of the type species, descriptions of the new taxa, and a key to species.

Data on the biology of the *Spathiostenus* species are not yet available. The hosts of this genus might be similar to those of the related genus *Polystenus*, which has been recorded to parasitize larvae of beetles of the families *Buprestidae*, *Scolytidae* and (rarely) *Cerambycidae*.

**Material and methods**

The material examined is preserved in the collections listed below and includes the type specimens of the previously described species of this genus as well as additional material. The following acronyms are used:

<table>
<thead>
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<th>Acronym</th>
<th>Institution</th>
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<tbody>
<tr>
<td>ANIC</td>
<td>Australian National Insects Collection (Canberra, Australia)</td>
</tr>
<tr>
<td>BMNH</td>
<td>The Natural History Museum (London, U.K.)</td>
</tr>
<tr>
<td>DEI</td>
<td>Deutsche Entomologische Institut im ZALF (Müncheberg, Germany)</td>
</tr>
<tr>
<td>NIAES</td>
<td>National Institute of Agro-Environmental Sciences (Tsukuba, Japan)</td>
</tr>
<tr>
<td>ZISP</td>
<td>Zoological Institute, Russian Academy of Sciences (St. Petersburg, Russia)</td>
</tr>
<tr>
<td>ZMHU</td>
<td>Museum für Naturkunde Humboldt-Universität (Berlin, Germany)</td>
</tr>
</tbody>
</table>

The nomenclature for wing venation is as defined by Belokobylskij and Tobias (1998) and Wharton et al. (1997). In the text the following abbreviations for morphological structures are used: POL — postocular line; OOL — ocular-ocular line; Od — maximum diameter of lateral ocellus.

**Taxonomic part**

**Genus Spathiostenus Belokobylskij, 1992**

*Spathiostenus* Belokobylskij, 1992; Belokobylskij, Iqbal & Austin, 2004: 98.

**Type species.** *Eucorystes formosanus* Watanabe, 1934.

**Description.** Head more or less depressed, weakly transverse or subsquare (Figs 1-3, 13-15, 32-34). Ocelli arranged in triangle with base 1.1–1.25 times its sides. Frons very weakly concave, without median keel, with fine median furrow. Eyes glabrous. Occipital carina complete dorsally, below usually obliterated and not joining with hypostomial carina. Malar suture absent. Clypeus with distinct ventral flange. Hypocypal depression medium-sized (Figs 1, 13, 32). Postgenal bridge rather wide. Palpi long, maxillary palp 6-segmented, labial palp 4-segmented; third segment of labial palp not shortened. Scapus (Figs 4, 16, 35) rather wide, more or less long, without apical lobe and basal constriction, longer dorsally than ventrally. First flagellar segment subcylindrical, weakly curved, equal to or weakly longer than second segment. Apical segment pointed apically.

long, with several distinct carinae. Scuto-scutellar sulcus distinct. Scutellum weakly convex, without lateral carinae. Metanotum with small or very small median tooth. Mesopleural pit shallow and elongate. Sternauli rather deep, long and almost straight. Prepectal carina distinct and complete. Postpectal carina absent. Metapleural flange rather short, rounded apically. Propodeum long, without areas delineated by carinae; lateral tubercles and propodeal bridge absent; propodeal spines very small. Metapleural suture present but fine.

Wings (Figs 5, 6, 20-23, 38, 39). Pterostigma of fore wing relatively narrow and long. Radial vein (r) arising from or a little before middle of pterostigma. Radial (marginal) cell weakly shortened. Second radiomedial vein (r-m) absent. Recurrent vein (m-cu) shortly postfurcal or rarely shortly antefurcal. Discoidal (first discal) cell distinctly petiolate anteriorly. Nervulus (cu-a) postfurcal. Parallel vein (3Cu) not interstitial, usually arising from posterior 0.3 of distal margin of brachial (first subdiscal) cell. Brachial (first subdiscal) cell open postero-apically, brachial vein (2cu-a) absent. Transverse anal veins (2A and 2a) absent. Hind wing long and narrow basally, with 3 hamuli. First abscissa of costal vein (C+Sc+R) 0.7-0.9 times as long as second abscissa (Sc+R). Nervulus (cu-a) present. First abscissa of mediocubital vein (M+Cu) 0.3-0.5 times as long as second abscissa (M+Cu). Recurrent vein (m-cu) absent. Medial (basal) cell very narrow, always closed antero-distally, 0.3-0.35 times as long as wing. Radial (marginal) cell without additional transverse vein. Submedial (subbasal) cell very narrow. Hind wing of male without stigma-like enlargement.

Legs. Fore tibia with sparse thick spines arranged in a single row. Hind coxa (Figs 7, 19, 36) long, without basoventral corner and tooth. Hind femur (Figs 8, 17, 40) more or less slender and with a dorsal protuberance that is not high. Spurs of hind tibia short, inner spur about 0.2 times as long as basitarsus. Hind basitarsus 0.6-0.7 times as long as second-fifth segments combined.

Metasoma (Figs 11, 12, 25, 26, 41, 43) long and depressed. First tergite semi-petiolate or petiolate, rather narrow and long, with indistinct dorsorse, with more or less distinct, almost complete and subparallel dorsal carinae, with small spinocarinal tubercles in basal 0.3; their elongate acroternite 0.4-0.6 times as long as tergite. Second suture distinct, almost straight or weakly curved. Second-
Figs 1-12. Spathiostenus brevicauda sp. nov., female. (1) Head, facial view, (2) head, dorsal view, (3) head, lateral view, (4) four basal segments of antenna, (5) fore wing, (6) hind wing, (7) hind coxa, (8) hind femur, (9) mesosoma, lateral view, (10) hind tibia, (11) apical tergites of metasoma, (12) proximal tergites of metasoma

finely and partly transversely striate, widely glabrous medially. Hind tarsus long, 1.15 times longer than hind tibia. Hind basitarsus with rather high and distinct ventral keel. Acrosternite of the first tergite long, 0.5-0.6 times as long as tergite (Fig. 42). Setae of hind tibia of female longer, setae length 1.8-2.5 times maximum width of hind tibia (Fig. 37). First mediocubital abscissa of hind wing (M+CU) shorter, 0.35 times as long as second abscissa (IM) (Fig. 39). Body length 4.5-9.1 mm. – Malaysia, Brunei. S. pauxillus sp. nov.
**Spathiostenus brevicauda** Belokobylskij, sp. nov.

(Figs 1-12)

**Type material.** Holotype: female, “New Guinea, Milne-Bay, Micholitz S., R. Krieger V” (ZMHU).

**Etymology.** From Latin “brevis” meaning “short” and “cauda” meaning “tail”.

**Description.** Female. Body length 5.8 mm; fore wing length 3.4 mm.

Head: distinctly depressed, its width 1.6 times median length, 1.6 times its height, 1.1 times width of mesoscutum. Head behind eyes distinctly and convex–roundly narrowed. Transverse diameter of eye 2.2 times longer than temple. Ocelli small, in triangle with base 1.2 times its sides. POL 1.2 times OD, 0.5 times OOL. Eye almost glabrous, with very shallow emargination of opposite antennal sockets, 1.15 times as high as broad. Malar space 0.25 times height of eye, 0.6 times basal width of mandible. Face convex, its width 0.9 times height of eye and 1.5 times height of face and clypeus combined. Hypoclypeal depression round, its width 0.9 times distance from edge of depression to eye, 0.35 times width of face. Occipital carina obliterated ventrally and not quite joining hypostomal carina. Antennae rather slender, weakly setiform, more than 31–segmented (apical segments missing). Scapus rather short and thick, 1.45 times longer than maximum width. First flagellar segment slender, weakly curved, subcylindrical, almost 5.0 times longer than apical width, 0.95 times as long as second segment. Subapical segments about 5.0 times longer than wide.

Mesosoma: strongly depressed, its length 4.7 times maximum height. Pronotum long, dorsally with weakly convex lobe in posterior 0.8 (lateral view), without pronotal keel, anterior margin of pronotum very weakly concave medially (dorsal view); side of pronotum with distinct, straight narrow oblique furrow in anterior half; Mesoscutum length 1.05 times its maximum width. Median lobe of mesoscutum distinctly protruding forwards, convex–rounded anteriorly. Notauli rather wide, crenulate–rugose, shallow posteriorly. Prescutellar depression shallow, narrow, with 5 carinae, finely rugulose between carinae, 0.3 times as long as scutellum. Scutellum flat, transverse, its basal width almost twice median length. Subalar depression shallow, rather wide, densely rugose–striate. Sternal weakly S-shaped, smooth, running along entire lower part of mesopleuron. Metanotal tooth very small. Propodeum very weakly roundly slanted (lateral view).

Wings: Fore wing about 4.5 times longer than its maximum width. Pterostigma 4.7 times longer than wide. Radial vein (r) arising a little before middle of pterostigma. Radial (marginal) cell weakly shortened, 4.0 times longer than maximum width. Metacarpus (RU) 0.9 times as long as pterostigma, 4.5 times longer than distance from apex of radial (marginal) cell to apex of wing. First radial abscessa (r) almost perpendicular to pterostigma, 0.9 times as long as its maximum width of pterostigma. Second radial abscessa (RS) weakly curved, 8.2 times longer than first radial abscessa (r), 4.0 times longer than first radiomedial vein (ZRS). First radiomedial vein (ZRS) twice longer than first radial abscessa (r), 1.4 times longer than recurrent vein (w-cu). Recurrent vein (w-cu) shortly antefurcal. First medial abscessa (RS+M) weakly S-shaped. Discoidal (first discal) cell 2.7 times longer than wide. Basal (IM) and recurrent (M-cu) veins distinctly divergent. Distance from nervulus (Cu-a) to basal vein (IM) 1.2 times nervulus (Cu-a) length; nervulus (Cu-a) straight and reclivious. Mediocubital vein (M+CU) distinctly S-shaped. Parallel vein (3CUb) very weakly curved subbasally. Hind wing 6.4 times longer than wide, strongly narrowed basally and distinctly widened subapically. First abscessa of costal vein (C+SC+R) 0.85 times as long as second abscessa (SC+R); second abscessa distinctly sclerotized. Radial vein (RS) strongly desclerotized, almost indistinct. Medial (basal) cell almost parallel–sided but weakly widened apically, its length 19.0 times maximum width. First abscessa of mediocubital vein (M+CU) 0.35 times as long as second abscessa (IM). Posterior margin of hind wing in basal half with long setae.

Legs: Fore tibia with 5 rather coarse spines. Hind coxa 2.3 times longer than maximum. Hind femur 4.1 times longer than wide. Hind tarsus almost as long as hind tibia. Basitarsus weakly thickened, with very fine ventral keel, 0.7 times as long as second–fifth segments combined. Second tarsal segment 0.5 times as long as basitarsus, 1.4 times longer than fifth segment (without pretarsus).

Metasoma: 1.5 times longer than head and mesosoma combined, 5.8 times longer than its maximum width. First tergite with distinct and wide
basolateral lobes, with very small dorsopore, weakly and almost linearly widened from base to subapex, then almost parallel-sided towards apex; its acro-
terneite 0.55 times as long as tergite. Maximum width of first tergite 1.6 times its minimum width
before lobes; length 2.2 times its apical width,
1.25 times length of propodeum. Median length of second
tergite 1.2 times basal width of second ter-
gite, 1.6 times length of third tergite. Combined
length of second and third tergites 1.7 times their
maximum width. Second suture distinct, deep,
complete, weakly rounded curved. Ovipositor
sheaths rather distinctly widened, pointed apically,
densely covered in thickened brown setae, 0.5
times as long as metastoma, 0.95 times as long as
mesosoma, 0.3 times as long as body, 0.5 times as
times as long as fore wing.

Sculpture and pubescence: Vertex entirely
smooth; frons mostly smooth, distinctly trans-
versely striate at narrow anterior part; face dis-
tinctly and densely transversely striate, with fine
and dense ground sculpture between striae; temple
smooth. Sides of pronotum almost entirely dense-
lugose-reticulate, finely sculptured in upper part.
Mesocutume rather densely and finely or very
finely punctulate, partly almost smooth, coarsely
and rather densely rugose in wide medioposterior
half. Scutellum almost smooth, partly with very
fine punctuation. Mesopleuron smooth in lower
0.7. Metapleuron almost entirely and coarsely
rugose-reticulate. Propodeum with distinct and
almost straight median carina in basal 0.8, mostly
densely and distinctly punctate-reticulate, al-
most smooth on very narrow and long mediobasal
areas. Hind coxae mostly smooth with very fine
reticulation dorsally. Hind femur almost entirely
smooth. First tergite with distinct, widely separat-
ed, subparallel dorsal carinae, densely and coarsely
undulately striate with coarse ground transverse
rugosity, reticulate-areolate in basomedian half.
Second tergite entirely coarsely striate, with rather
dense and coarse rugosity between striae, reticu-
late-areolate in median triangle. Third-fifth ter-
gites dense and not coarsely, reticulate-areolate in
basal 0.7, very finely transversely striate to smooth
in medioposterior 0.2-0.3. Sixth tergite finely
transversely striate in basal half and reticulate-
coraceous to smooth in posterior half. Seventh
tergite smooth. Vertex with dense short and semi-
erecct setae, almost glabrous in medioanterior half.
Mesopleuron widely glabrous medially, with
dense, rather short and semi-erect setae in upper
0.3 and very long sparse and erect setae marginal-
ly around glabrous part. Hind tibia dorsally with
long, more or less sparse and almost erect setae;
length of these setae 1.7-2.0 times maximum
width of hind tibia.

Colour: Head brownish-yellow, faintly darker
dorsally. Metasoma dark reddish brown, meso-
plurum and mesosoma ventrally reddish brown to
light reddish brown. Metasoma dark reddish
brown to reddish brown, furrows, third-fifth ter-
gites in apical 0.3 and apical part of metasoma
brownish-yellow to yellow. Antenna brownish yel-
low basally, infuscate toward apex, dark reddish
brown apically. Palpi pale yellow. Legs yellow, all
tibiae basally and all fifth tarsal segments distinct-
ly infuscate. Fore wing almost hyaline. Pterostigma
light brown or brownish yellow.

Male. Unknown.

Diagnosis. – The new species distinctly differs
from the type species S. formosanus (Watanabe)
by having the ovipositor short, the vertex smooth,
large parts of mesoscutal lobes almost smooth,
the prescutellar depression short, the parallel vein
(3CUb) very weakly curved subbasally, the basal
(1M) and recurrent (m-cu) vein in the fore wing
distinctly divergent, and the colouration of ptero-
stigma brownish yellow.

Distribution. – New Guinea.

Spathiostenus formosanus (Watanabe, 1934)
(Figs 13-31)

Eucorystoides formosanus. Shenefelt & Marsh, 1976:
1554; Chen & Shi, 2004: 63.
Spathiostenus tenuis. Belokobylskij et al., 2004: 98.

Material examined. – China, Taiwan: 1 female (holo-
type), “Kankau (Koshun), Formosa, H. Sauter. IV 1912”.
“Eucorytes formosanus Watanabe , Type” (red ID).
India: 1 female (holotype), “Type” (round with red mar-
“S.E.'s. No 921”, “ex dry stiens”, “1072”, “Eucorytes
tenuis Nixon, Type, 1943” (handwriting by Nixon),
“B.M. Type Hyn, 3e 1385” (BMNH), Vietnam: 1
female, 1 male, “Vietnam, Mai Chau, Prov. Ha Son
Binh, forest, 21.11.1990, Belokobylskij” (ZISP).
Indonesia: 1 female, “Indonesia: Sulawesi Utara,
Dumoga-Bone N.P., July 1985” (BMNH), Japan: 1
from Celtis jessoensis (Ulmaceae)” (ZISP).
Figs 13-24. *Spathiostenus formosanus* (Watanabe, 1934), female. (13) Head, facial view; (14) head, dorsal view; (15) head, lateral view; (16) five basal segments of antenna; (17) hind femur; (18) hind tibia; (19) hind coxa; (20) fore wing of the holotype *E. tenuis*. (21) hind wing of the holotype *E. tenuis*. (22, 23) parts of fore wing of the holotype *E. formosanus*. (24) mesosoma, lateral view.

**Redescription.** – Female. Body length 5.5-8.4 mm; fore wing length 3.0-4.7 mm.

Head: depressed, its width 1.4-1.6 times median length, 1.4 times its height, 1.1-1.2 times width of mesoscutum. Head behind eyes more or less weakly convex anteriorly and distinctly roundly narrowed in posterior 0.6-0.7. Transverse diameter of eye 2.0-2.3 times longer than temple. Ocelli
rather small, in triangle with base 1.1-1.25 times its sides. POL 0.8-1.0 times Od, 0.4-0.6 times OOL. Eye glabrous, with shallow emargination of tapetum by very fine and short setae. Malar space 0.3-0.35 times height of eye, 0.6-0.75 times basal width of mandible. Face convex, its width 0.8-0.9 times height of eye and 1.15-1.3 times height of face, to which it is slightly convex. Hypoclypeal depression round, its width 0.6-0.8 times distance from edge of depression to eye, 0.3-0.4 times width of face. Occipital carina obliterating ventrally and not quite meeting hypostomal carina or sometimes fused by an additional ruga. Antennae rather slender, weakly subcylindrical, 40-setose, 1.1 times longer than body. Scapus rather long and thick, 1.5-1.7 times longer than its maximum width. First flagellar segment rather slender, weakly curved, subcylindrical, 5.5-6.0 times longer than apical width, 0.95-1.0 times as long as second segment. Penultimate segment 7.0 times longer than wide, 0.5 times as long as first segment as long as apical segment; the latter without apical spine.

Mesosoma: length 3.1-3.5 times its height. Pronotum long, dorsally with convex lobe in median 0.8 (lateral view), without distinct pronotal keel, anterior margin of pronotum weakly concave medially (dorsal view); side of pronotum with rather deep, straight and narrow submedian oblique furrow. Mesoscutum length 1.0-1.1 times its maximum width. Median lobe of mesoscutum more or less distinctly protruding forwards. Notauli rather wide, crenulate-rugulose. Prescutellar depression shallow, rather wide, with 5 carinae, finely hirsute between carinae, 0.4-0.5 times as long as scutellum. Scutellum flat, transverse, its basal width 1.1-1.4 times median length. Subalar depression shallow, rather wide, densely rugose-striate. Sternauli almost straight, smooth, running along elongate lower part of mesepisternum. Metanotal tooth short or very short and obtuse. Propodeum very weakly rounded slanted (lateral view).

Wings: Fore wing 4.5-4.8 times longer than its maximum width. Pterostigma 4.3-4.8 times longer than wide. Radial vein (r) arising a little before or from middle of pterostigma. Radial (marginal) cell weakly shortened, 4.0-5.0 times longer than maximum width. Metacarpus (R) 1.1-1.3 times longer than pterostigma, 4.5-6.0 times longer then distance from apex of radial (marginal) cell to apex of wing. First radial abscissa (r) almost perpendicular or weakly oblique to pterostigma, 0.7-1.0 times as long as maximum width of pterostigma. Second radial abscissa (RS) weakly curved, 7.0-10.0 times longer than first radial abscissa (r), 3.8-4.5 times longer than first radiomedial vein (2RS). First radiomedial vein (2RS) 2.0-2.5 times longer than first radial abscissa (r), 1.3-1.6 times longer than recurrent vein (m-cu). Recurrent vein (m-cu) very shortly antefurcal or postfurcal. First medial abscissa (RS+M) distinctly S-shaped. Discoidal (first discal) cell 3.0-3.5 times longer than wide. Basal (IM) and recurrent (m-cu) veins subparallel. Distance from nervulus (cu-a) to basal vein (IM) 0.8-1.0 times nervulus (cu-a) length; nervulus (cu-a) weakly curved and perpendicular to mediocubital vein (M+CU). Mediocubital vein (M+CU) rather distinctly S-shaped. Parallel vein (3CUb) distinctly curved subbasally. Hind wing 5.0-6.3 times longer than wide. First abscissa of costal vein (C+SC+R) 0.7-0.9 times as long as second abscissa (SC+R); second abscissa (SC+R) distinctly sclerotised; radial (marginal) cell weakly widened in anterior half, then distinctly narrowed towards apex. Medial (basal) cell almost parallel-sided but weakly widened apically, its length 15.0-20.0 times maximum width. First abscissa of mediocubital vein (M+CU) 0.4-0.5 times as long as second abscissa (IM).

Legs: Fore tibia with 4 coarse spines. Hind coxa about twice as long as maximum width. Hind femur 4.0-4.4 times longer than wide. Hind tarsus almost as long as hind tibia. Basitarsus not thickened, without or with very fine ventral keel, 0.6-0.7 times as long as second-fifth segments combined. Second tarsal segment 0.5-0.6 times as long as basitarsus, 1.5-2.0 times longer than fifth segment (without pretarsus).

Metasoma: 1.6-1.7 times longer than head and mesosoma combined, 6.0-6.7 times longer than its maximum width. First tergite without basolateral lobes, with additional small subbasal lateral tubercles, rather weakly and almost linearly widened from base to apex, then weakly narrowed towards apex; its acrosternite 0.4-0.45 times as long as tergite. Maximum width of first tergite 1.6-1.8 times its minimum width; length 2.1-2.5 times its apical width, 1.3-1.6 times length of propodeum. Median length of second tergite 1.2-1.4 times basal width of second tergite, 1.2-1.4 times length of third tergite. Combined length of second and third tergites 1.7-2.2 times their maximum width. Second suture distinct, deep, complete, twice
weakly roundly curved. Ovipositor sheaths rather distinctly widened, pointed apically, densely covered with thickened brown setae, 1.0–1.3 times longer than metasoma, 2.0–2.6 times longer than mesosoma, 0.6–0.8 times as long as body, 1.1–1.4 times longer than fore wing.

Sculpture and pubescence: Vertex distinctly, densely, semi-circularly and sometimes weakly undulate striate, with fine or very fine ground rugulosity medially and smooth between striae posteriorly; frons entirely densely distinctly and at least partly irregularly transversely striate. Face distinctly densely and more or less regularly transversely or curvedly striate, with fine or very fine and dense ground sculpture between striae; temple smooth. Sides of pronotum densely rugose-reticulate almost entirely, at least partly with subgranulate or punctulate sculpture between rugae. Mesoscutum densely and finely or distinctly granulate with dense punctuation, sometimes mostly with dense fine and numerous interrupted additional striae, rarely partly with indistinct additional fine striation, coarsely and rather densely rugose in medioposterior 0.7. Scutellum often striate-rugulose marginally, finely and sparsely punctulate, punctulate-rugulose or almost smooth medially or anteriorly. Mesopleuron very finely coriaceous or almost smooth in lower 0.5–0.7. Metapleuron entirely and coarsely rugose-reticulate. Propodeum with fine and almost straight or undulate median carina in basal 0.5–0.8, mostly densely rugose-reticulate, with additional striation posteriorly, finely and densely punctulate or sometimes almost smooth on rather narrow mediobasal areas. Hind coxae finely or distinctly striate with dense and fine or very fine rugulosity or reticulation dor-
sally (sometimes in dorsobasal half only), almost smooth ventrally and partly laterally. Hind femur finely or very finely striate or reticulate-striate dorsally and on upper lateral half, smooth or almost smooth on other parts. First tergite with rather distinct, widely separated, subparallel dorsal carinae, which are weakly convergent subapically, densely and coarsely undulate striate with distinct ground transverse rugosity almost entirely. Second tergite entirely coarsely striate with rather dense and coarse rugosity between striae. Third-fifth tergites with dense, less coarse, undulate and subparallel or sometimes weakly divergent posteriorly longitudinal striae and with dense ground rugulosity between striae in basal 0.7-0.9; their striation fine and dense in subapical parts, narrow apical margins of these tergites almost smooth. Sixth tergite very densely and finely granulate- or reticulate-coriaceous almost entirely, reticulation becoming finer posteriorly, rarely tergite almost smooth posteriorly. Seventh tergite very finely coriaceous or smooth. Vertex with dense short and semi-erect setae, usually glabrous in rather narrow median or medioanterior parts. Mesopleuron rather narrowly or widely glabrous medially, with dense, rather short and semi-erect setae above and long sparse erect setae below. Hind tibia dorsally with long, more or less sparse, semi-erect or almost erect setae; length of these setae 1.1-1.7 times maximum width of hind tibia.

Colour: Head light reddish brown, in ventral half brownish yellow or yellow with brownish tint, sometimes narrowly brown behind eyes. Mesosoma reddish brown or dark reddish brown, rarely light reddish brown partly or almost black with pale ventral part, propodeum always dark to almost black; mesoscutum usually paler, prescutellar depression and metanotum almost black; sometimes mesosoma almost black but reddish brown ventrally. Metasoma reddish brown with dark spots, sometimes brownish yellow or light reddish brown with first tergite entirely or almost entirely (except for pale reddish brown spot mediodorsally), second tergite mostly and third-sixth tergites in rather wide or narrow basolateral areas reddish brown to dark reddish brown; sometimes metasoma black basally, dark reddish brown to reddish brown at most part, third-sixth tergites in medio-apical 0.3-0.5 and seventh tergite at most part brownish yellow. Antenna reddish brown or dark reddish brown, sometimes mostly almost black and yellowish brown in basal 0.2-0.3, scape and pedicel at least partly infuscate. Palpi yellow or pale yellow. Legs yellow, often hind femur medio-posteriorly or in posterior half brownish, all tarsi faintly infuscate, fifth segments brown. Fore wing very faintly infuscate. Pterostigma brown, faintly paler apically.

Male. Body length 7.2-8.0 mm; fore wing length 3.8-4.1 mm. Head width 1.35-1.4 times its median length. Transverse diameter of eye 1.7-1.8 times longer than temple. Antennae slender, setiform, 38-segmented, almost as long as body. First flagellar segment 7.0-7.3 times longer than apical width. Penultimate segment 6.0 times longer than width, 0.45 times as long as first segment. Mesosoma length 3.4-3.5 times its height. Metacarpus (R1) about as long as pterostigma, 4.4-4.7 times distance from apex of radial (marginal) cell to apex of wing. First radiomedial vein (2RS) 1.7-2.1 times longer than first radial abscissa (r). Recurrent vein (m-cu) antefurcal. Hind wing 5.8-6.5 times longer than wide; Medial (basal) cell more or less distinctly widened apically. Fore tibia with 5-6 spines. Hind coxa 2.2-2.5 times longer than maximum width. Hind femur 4.5-4.7 times longer than wide. Metasoma slender and long, 1.7-2.0 times longer than head and mesosoma combined, 9.0-10.5 times longer than its maximum width. Length of first tergite 2.3-2.7 times its apical width, 1.5-1.7 times length of propodeum. Median length of second tergite 1.5-1.8 times basal width of second tergite. Combined length of second and third tergites 2.6-3.0 times their maximum width. Vertex widely striate. Propodeum without smooth mediobasal areas. Hind coxae mostly smooth dorsally. Hind femur finely and densely rugose-reticulate in dorsal half. First-fifth metastomal tergites sometimes mostly coarsely rugose-reticulate with undulate striation. Hind legs covered in very long setae, length of setae on dorsal margin of hind tibia 4.0-6.0 times maximum width of hind tibia. Metasoma laterally with sparse and very long semi-erect setae. Mesosoma and metasoma mostly black. Antenna sometimes yellow to brownish yellow in basal 0.4. Otherwise similar to female.

Remark. – The synonymy of S. formosanus (Watanabe) and P. remus (Nixon) was discovered as a result of an examination of the holotypes of both taxa.

Distribution. – Japan (Hokkaido) (first record), China (Taiwan), Vietnam (first record), India.
Figs 32–43. *Spathiostenus pasolhus* sp. nov. (32) Head, facial view, (33) head, dorsal view, (34) head, lateral view, (35) basal and apical segments of antenna, (36) hind coxa, (37) hind tibia, (38) fore wing, (39) hind wing, (40) hind femur, (41) apical tergites of metastoma, (42) first tergite, lateral view, (43) proximal tergites of metastoma.

*Spathiostenus glabrivertex* Belokobylskij, Iqbal & Austin, 2004

*Spathiostenus glabrivertex* Belokobylskij, Iqbal & Austin, 2004: 98.

Examined material. – Australia: 1 female (holotype), “10.4S 142.30E, Qld, 9 km S Cape York, 20 June 1993, I.D. Naumann & P. Zborowski” (ANIC); 1 female (paratype), “13.43S 143.19E, Qld, 15 km WNW Bald..."
Hill, Melliwraith Rd, 420 m, 27.vi-12.vii.1989, I.D. Naumann” (ANIC).

**Distribution.** – Australia (Queensland).

**Spathiostenus pasohus Belokobylskij, sp. nov.**

(Figs 32-43)


**Etymology.** – From the name of Natural Reserve in Malaysia.

**Description.** – Female. Body length 7.3-9.1 mm; fore wing length 4.2-4.9 mm.

Head depressed, its width 1.5 times median length, 1.3-1.4 times its height, 1.1-1.15 times width of mesoscutum. Head behind eyes distinctly convex-rounded narrowed (dorsal view). Transverse diameter of eye 2.1-2.3 times longer than temple. Ocelli rather small, in triangle with base 1.1 times its sides. POL 0.8-0.9 times Od, 0.3-0.4 times OOL. Eye glabrous, with shallow emargination opposite antennal sockets, 1.15 times as high as broad. Malar space 0.3-0.4 times height of eye, 0.6-0.7 times basal width of mandible. Face convex, its width 0.85-0.9 times height of eye and 1.1-1.2 times height of face and clypeus combined. Hypoclypeal depression round, its width 0.7-0.8 times distance from edge of depression to eye, 0.4 times width of face. Occipital carina obliterated ventrally and not quite meeting hypostomal carina. Antennae slender, weakly setiform, 47-51-segmented, 1.1-1.2 times longer than body. Scapus rather short and thick, 1.5-1.6 times longer than its maximum width. First flagellar segment slender, weakly curved, subcylindrical, 5.3-5.7 times longer than apical width, 0.9-0.95 times as long as second segment. Penultimate segment 5.5-6.0 times longer than wide, 0.55 times as long as first segment, 0.9-1.0 times as long as apical segment; the latter without apical spine.

Mesosoma: length 3.3-3.4 times its height. Pronotum long, dorsally with convex lobe in median 0.8 (lateral view), without distinct pronotal keel, anterior margin of pronotum weakly concave medially (dorsal view); side of pronotum with rather deep, straight, narrow submedian oblique furrow. Mesoscutum length 1.1 times its maximum width. Median lobe of mesoscutum rather distinctly protruding forwards. Notauli wide, rugose-reticulate. Precoxal depression shallow, wide, with 5 carinae, finely rugulose-striate between carinae, 0.4-0.45 times as long as scutellum. Scutellum flat, transverse, its basal width 1.3-1.4 times median length. Subalar depression shallow, rather wide, densely and coarsely irregularly striae. Sternauli almost straight, smooth, running along entire lower part of mesopleuron. Metanotal tooth very short and obtuse. Propodeum very weakly rounded slanted (lateral view).

Wings: Fore wing 4.8-5.0 times longer than its maximum width. Pterostigma 4.6-4.8 times longer than wide. Radial vein (r) arising almost from middle of pterostigma. Radical (marginal) cell weakly shortened, 4.5-5.3 times longer than maximum width. Metacarpus (R1) 1.2 times longer than pterostigma. 7.0-7.7 times longer than distance from apex of radial (marginal) cell to apex of wing. First radial abscissa (r) weakly oblique to pterostigma, 0.7 times as long as maximum width of pterostigma. Second radial abscissa (RS) weakly curved in basal half and straight in apical half, 12.0-12.5 times longer than first radial abscissa (r), 4.4-4.7 times longer than first radiomedial vein (2RS). First radiomedial vein (2RS) 2.6-2.8 times longer than first radial abscissa (r), 1.5-1.6 times longer than recurrent vein (m-cu). Recurrent vein (m-cu) shortly postfurcal. First medial abscissa (RS+M) weakly S-shaped. Discoidal (first discal) cell 3.0-3.4 times longer than wide. Basal (IM) and recurrent (m-cu) vein almost parallel. Distance from nervulus (cu-a) to basal vein (IM) 0.5-1.0 times nervulus (cu-a) length; nervulus (cu-a) perpendicular to mediocubital vein (M+CU). Mediocubital vein (M+CU) rather distinctly S-shaped. Parallel vein (3CUb) distinctly curved subbasally. Hind wing 6.3-6.7 times longer than wide. First abscissa of costal vein (C+SC+R) 0.9 times as long as second abscissa (SC+R); second abscissa distinctly sclerotised. Radial vein (RS) strongly desclerotised; radial (marginal) cell weakly widened in anterior half, then distinctly narrowed towards apex. Medial (basal) cell almost parallel-sided but weakly widened apically, its length 19.0-21.0 times maximum width. First abscissa of mediocubital vein (M+CU) 0.35 times as long as second abscissa (IM).

Legs: Fore tibia with 4 coarse spines. Hind coxa about twice longer than maximum width. Hind
femur 4.0-4.3 times longer than wide. Hind tarsus 1.15 times longer than hind tibia. Basitarsus not thickened, with rather distinct ventral keel, 0.65-0.7 times as long as second-fifth segments combined. Second tarsal segment 0.55-0.6 times as long as basitarsus, 1.8 times longer than fifth segment (without pretarsus).

Metasoma: 1.7-2.0 times longer than head and mesosoma combined, 7.0-8.0 times longer than its maximum width. First tergite without basolateral lobes, with additional small subpointed basolateral tubercles, almost parallel-sided in basal half, weakly and almost linearly widened from middle to subapex, then very weakly narrowed towards apex; its acrosternite about 0.5 times as long as tergite. Maximum width of first tergite 1.6-1.7 times its minimum width; length 2.3-2.5 times its apical width, 1.4-1.55 times length of propodeum. Median length of second tergite 1.4-1.6 times basal width of second tergite, 1.4-1.5 times length of third tergite. Combined length of second and third tergites 2.1-2.3 times their maximum width. Second suture distinct, deep, complete, weakly or very weakly twice curved. Ovipositor sheaths rather distinctly widened subapically, shortly pointed apically, densely covered in weakly thickened black setae, almost as long as metasoma. 2.3-2.4 times longer than mesosoma, 0.65-0.7 times as long as body. 1.2-1.3 times longer than fore wing.

Scutellum and pupercence: Vertex almost smooth, sometimes partly finely or very finely (almost indistinctly) transversely striate medially; frons medially densely rather finely and more or less regularly transversely striate. Face distinctly densely and more or less regularly transversely striate, striae partly weakly directed downwards, with fine and dense ground sculpture between striae; temple smooth. Sides of pronotum entirely densely and closely rugose-reticulate. Mesoscutum mostly densely and rather finely granulate with fine and dense numerous interrupted additional striation, coarsely and rather densely rugose in medioposterior half. Scutellum smooth medially, more or less rugulate marginally. Mesopleuron very finely coriaceous or almost smooth in lower 0.4-0.5, coarsely rugose-striate upper and posteriorly. Metapleuron entirely and coarsely rugose-striate. Propodeum with fine and almost straight complete median carina, mostly densely and rather finely rugose-reticulate, narrowly almost smooth basolaterally. Hind coxae dorsally finely or very finely striate-rugulose with dense and fine granulation, densely and finely reticulate-coriaceous laterally, almost smooth ventrally. Hind femur finely reticulate-coriaceous dorsally, coriaceous laterally, otherwise almost smooth. First tergite with rather distinct, widely separated, subparallel dorsal carinae, which are weakly convergent apically, densely and coarsely more or less undulate posteriorly striate with distinct ground rugosity almost entirely. Second tergite entirely coarsely striate with rather dense and coarse rugosity between striae. Third-fifth tergites with dense, partly less course, undulate, subparallel, but weakly divergent posteriorly longitudinal striae and with dense ground rugulosity between striae in their basal 0.7-0.9. Sixth tergite very densely and finely granulate- or reticulate-coriaceous, partly with transverse striation, very finely coriaceous in posterior 0.2. Seventh tergite very finely coriaceous to smooth. Vertex widely glabrous, with dense short and semi-erect setae laterally. Mesopleuron rather widely glabrous medially, with dense, rather short and semi-erect setae in upper 0.3 and long sparse and erect setae marginally and below. Hind tibia dorsally with long, more or less sparse, almost erect setae; length of these setae 1.8-2.5 times maximum width of hind tibia.

Colour: Head light reddish brown dorsally, brownish yellow or yellow in lower half. Mesosoma entirely or mostly almost black, sometimes reddish brown ventrally and yellow along sternauli and lower margin of pronotum. Metasoma black, apical 0.3-0.5 of third-sixth tergites and seventh tergite almost entirely light reddish brown, apex of metasoma dark reddish brown. Antenna dark reddish brown to black, scape and pedicel brownish yellow, distinctly infuscate ventrally, sometimes basal 0.2 of flagellum yellowish brown. Palpi yellow. Legs yellow, hind legs partly more or less infuscate, fifth tarsal segments almost black, all tibiae basally pale yellow. Fore wing very faintly infuscate. Pterostigma almost entirely brown.

Male. Body length 4.5 mm; fore wing length 2.4 mm. Head width 1.2 times median length, 1.25 times its height. Head behind eyes subparallel in anterior 0.3, rounded narrowed in posterior 0.7 (dorsal view). Transverse diameter of eye 1.6 times longer than temple. Ocelli in triangle with base 1.3 times its sides. Face width 1.3 times height of face and clypeus combined. Hypoclypeal depression width almost equal to distance from edge of depression to eye, 0.5 times width of face. First flagellar segment 6.0 times longer than apical
width, 0.8 times as long as second segment. Meso-
soma length 3.9 times its height. Fore wing 5.6
times longer than its maximum width. Metacarpus
(R,T) 1.1 times longer than pterostigma, 4.5 times
longer than distance from apex of radial (margi-
cell) to apex of wing. Second radial absissa
(RS) 5.2 times longer than first radiomedial vein
(ZRS). First radiomedial vein (ZRS) 1.8 times
longer than first radial absissa (r), 1.3 times
longer than recurrent vein (m-cu). First absissa of
costal vein of hind wing (C+SC+R) 0.8 times as
long as second absissa (SC+R). Hind femur 4.8
times longer than wide. Metasoma about 10.0
times longer than its maximum width. Acrosterni-
ite of first tergite 0.6 times as long as tergite.
Length of first tergite 3.4 times its apical width,
1.7 times length of propodeum. Median length of
second tergite 1.7 times basal width of second ter-
gite, 1.2 times length of third tergite. Combined
length of second and third tergites almost 3.0
times their maximum width. Vertex and frons
entirely smooth. Mesoscutum distinctly granulate.
Propodeum with distinct median carina, without
smooth basolateral areas. Sculpture of metasoma
not strong. Third-fifth tergites with dense, rather
fine, linear, subparallel, but weakly divergent pos-
teriorly longitudinal striae. Vertex almost entirely
shagreen. Hind tibia dorsally with very long and
erect setae; length of these setae 7.0-8.0 times
maximum width of hind tibia. Head brownish yel-
low almost entirely. Mesosoma and metasoma
dark reddish brown to black, mesosoma ventrally
and metasoma in apical half reddish brown to
dark reddish brown. Antenna yellow or brownish
yellow in basal half, regularly infuscate towards
apex. Hind femur brown in posterior 0.7.
Pterostigma almost pale brown. Otherwise similar
to female.

**Diagnosis.** – This new species is very similar to S.
glabrivertex Belokobylskij, Iqbal & Austin
(Belokobylskij et al., 2004) and differs in having
the recurrent vein (m-cu) weakly postfurcal, the
mesoscutum entirely shortly setose, the acrosterni-
ite of the first tergite and the third tergite long, the
tetse of hind tarsus long, and the hind tibia with-
out subbasal dark ring. *S. pasohus* sp. nov. is dis-
tinguished from *S. formosanus* (Watanabe) in hav-
ing the vertex mostly smooth and widely glabrous
medially, the hind tarsus long, the hind basitarus
with rather high ventral keel, the acrosternite of
the first tergite long, the setae of the hind tarsus
long, and the first mediocubital absissa of the
hind wing (M+CU) short.

**Distribution.** – Malaysia, Brunei.

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