

Massocephalus stysi, a new species of Pentatomidae (Hemiptera: Heteroptera) from the Philippines

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Abstract. The pentatomid genus *Massocephalus* Dallas, 1851 and its only previously known species, *M. maculatus* Dallas, 1851 are redescribed. The tribal placement of *Massocephalus* is briefly discussed. One new species, *M. stysi* sp. nov. is described. A key to the species is provided.

Key words. Heteroptera, Pentatomidae, Cappaeini, *Massocephalus*, taxonomy, new species, Philippines

Introduction

A number of years ago, while visiting the U.S. National Museum of Natural History (Washington, D.C.) and the American Museum of Natural History (New York), I discovered several pentatomid specimens from the Philippines that I could not place to genus. After some study, I determined that they belonged to the monotypic genus *Massocephalus* Dallas, 1851 but there were two species present. One specimen matched the description of *M. maculatus* Dallas, 1851 completely, the other two specimens represent an undescribed species which I describe herein, and take the pleasure in naming after Prof. Pavel Štys in honor of his 75th birthday.

The philippine pentatomid fauna has not been treated comprehensively in over 150 years, the last thorough work being that of STÅL (1871). Unfortunately, *Massocephalus* was apparently unknown to Stål, and was not included in his monograph. Essentially, since its original description (DALLAS 1851), the genus *Massocephalus*, and its only included species, *M. maculatus*, have not been studied or redescribed. The only references available are from catalogs and a couple new faunal records cited.

Material and methods

When label data are cited in the text, each letter in parentheses represents a different label with (a) being closest to the specimen on the pin. All measurements are in millimeters; measurements in parentheses are of the holotype. Total length was measured from the apex

of the head to the apex of the abdomen. Total length and width measurements and measurements of the pronotum and scutellum were made with the anterior and posterior margins of the scutellum in the same plane of focus. Measurements of the head were made with the anterior and posterior margins of the head in the same plane of focus; length of the head was measured from the apex of the head to an imaginary line connecting the posterior margins of the ocelli.

The following acronyms of collections are used:

- AMNH American Museum of Natural History (New York);
BMNH Natural History Museum (London);
USNM U.S. National Museum of Natural History (Washington, D.C.).

Results

Massocephalus Dallas, 1851

Massocephalus Dallas, 1851: 195, 230-231.

Massocephalus: LETHERRY & SEVERIN (1893): 118 (catalog); KIRKALDY (1909): 51 (catalog); TANG (1935): 315 (catalog); RIDER (2006): 283 (catalog).

Type species: *Massocephalus maculatus* Dallas, 1851, by monotypy.

Redescription. Dorsal surface of head punctate, apex broadly rounded, lateral margins sinuous, antenniferous tubercles visible from above (Figs. 3, 8). First antennal segment reaching to or nearly to apex of head. Dorsal disk of pronotum sparsely but coarsely punctured, anterior pronotal margin not or only feebly reflexed, anterolateral margins weakly reflexed; pronotal cicatrices obscure, smooth. Scutellum subtriangular, sparsely and finely punctate. Coria finely punctate, R + M vein sinuous, embolar region distinctly wider near apex of R + M vein. Hemelytra covering or nearly covering connexiva. Posterolateral angles of connexiva rectilinear, perhaps slightly toothed, but not spinose.

Ventral surface of head coarsely punctate, antenniferous tubercles bifid in ventrolateral view. Bucculae long and narrow, becoming evanescent near base of head, each with small tooth at anterior end; first rostral segment not reaching base of head. Longitudinal median of thoracic sterna pilose, hairs very short, velvety; prosternum shallowly sulcate mesially, mesoternum nearly flat mesially with slight indication of carina anteriorly, metasternum broader and flatter mesially. Metathoracic scent gland ostiole each extended as long slender ruga, curving slightly forward, becoming acutely pointed apically, reaching to middle of metapleuron or slightly beyond; evaporative areas extensive, spilling onto posterior margin of mesopleura (Figs. 5, 9). Superior surface of each tibia distinctly sulcate; tarsi three-segmented. Abdomen weakly punctate, trichobothria typically located, but at oblique angle to each other, the more posterior trichobothria also located more laterad; spiracle position unusual, located just mesad of lateral abdominal margin, near the anterolateral corner of each abdominal segment (Figs. 6, 11).

Comments. Without having studied the genus, RIDER (2006) tentatively catalogued *Massocephalus* in the Carpocorini; prior to that, no one had ever formally placed this genus in any known pentatomid tribe. DALLAS (1851) originally described *Massocephalus* between *Coenus* Dallas, 1851 (Carpocorini) and *Apines* Dallas, 1851 (Menidini). Members of the Carpocorini generally have shorter ostiolar rugae which are not apically acute, while members of the

Menidini usually have the basal region of the abdomen produced forward as a small spine or tubercle. *Massocephalus maculatus* has elongate, apically acute ostiolar rugae, and the base of the abdomen is not produced into a spine or tubercle. STÅL (1876), LETHIERRY & SEVERIN (1893), and KIRKALDY (1909) all listed *Massocephalus* between *Tolumnia* Stål, 1868 (Cappaeni) and *Palomena* Mulsant & Rey, 1868 (Nezarini). Members of the Nezarini are typically green in color, even after death. The two species of *Massocephalus* treated in this paper are not green in color, but they do have some characters which may align them with the Cappaeni. In general, members of the Cappaeni are brown in color and have elongate, apically acuminate ostiolar rugae. The color pattern exhibited by these two species of *Massocephalus* is very similar to several species of *Tolumnia*. Until a more thorough phylogenetic analysis can be done, it seems best to tentatively place *Massocephalus* in the Cappaeni.

Massocephalus is easily recognized by the lateral position of the spiracles coupled with the elongate, apically acute ostiolar rugae. The only known pentatomid genera which have the spiracles placed near the lateral abdominal margins are three Oriental or African genera in the tribe Aeschrocorini (*Aeschrocoris* Bergroth, 1887, *Geomorpha* Bergroth, 1893, and *Tyoma* Miller, 1952), a single South American genus in the tribe Carpocorini (*Caonabo* Rolston, 1974), and the very unusual South American genus *Stirotarsus* Bergroth, 1911, which was recently placed in its own subfamily (RIDER 2000). All of these genera either have the ostiolar ruga absent, or very short and ear-like.

Key to species of *Massocephalus*

- 1 A distinct, well-defined, oval, pale spot in each scutellar basal angle (Figs. 1, 4); lateral margins of hemelytra narrowly pale, lacking pale marginal spot near middle (Figs. 1, 4); femora and tibiae immaculate, lacking small brown spots; acetabula pale; ostiolar ruga pale, relatively long, reaching beyond middle of metapleural plate (Fig. 5). *M. maculatus* Dallas, 1851
- Basal scutellar pale markings consisting of an irregular band across entire basal margin (Figs. 2, 9); lateral margins of hemelytra not pale, but with a small, irregular, marginal, pale spot near middle (Figs. 2, 9); femora and tibiae with numerous small brown spots; acetabula dark brown; ostiolar ruga dark, relatively short, not quite reaching middle of metapleuron (Fig. 10). *M. stysi* sp. nov.

Massocephalus maculatus Dallas, 1851

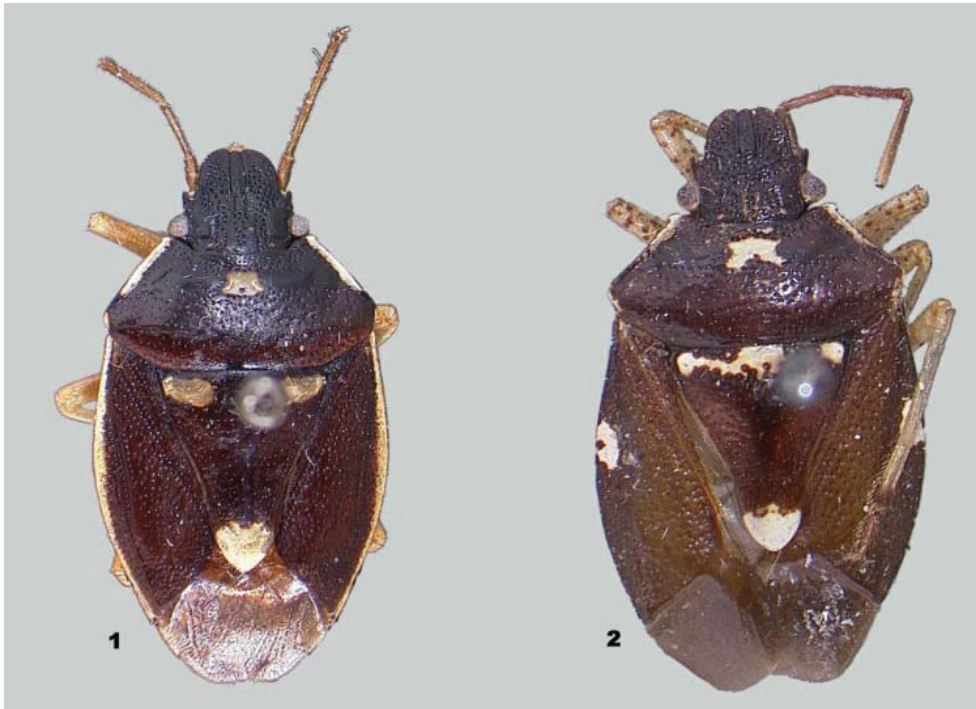
(Figs. 1, 3-7)

Massocephalus maculatus Dallas, 1851: 231, pl. 9: fig. 1.

Massocephalus maculatus: LETHIERRY & SEVERIN (1893): 118 (catalog); MATSUMURA (1905): 22 (record); KIRKALDY (1909): 51 (catalog); TANG (1935): 315 (catalog); TAKARA (1957): 34 (record); RIDER (2006): 283 (catalog).

Type material. Originally described from the Philippines. It is impossible to tell from the original description how many specimens DALLAS (1851) had when he described this species, but he had at least one, ♂ specimen from the Philippines; it should be considered a syntype. I have not examined the type material, but my colleague, Fred McDonald, examined a type specimen during a recent visit to the BMNH. He provided me with a short description which matches exactly the original description and the specimen that I have described below.

Material examined. PHILIPPINES: MINDANAO: Zamboanga, 1 ♀ (AMNH).



Figs. 1-2. Habitus. 1 – *Massocephalus maculatus* Dallas, 1851; 2 – *M. stysi* sp. nov.

Redescription. Dorsal surface of head fuscous to dark brown, slightly paler near apices of juga, coarsely punctate except large impunctate areas near compound eyes. Apex of head broadly rounded, lateral margins of juga sinuous, subparallel for middle third, apices projecting slightly beyond apex of tylus, but not contiguous anteriorly; antenniferous tubercles easily visible from above (Fig. 3). Ocelli relatively small, each located 3-4 times its own diameter from adjacent eye. Antennae pale brown, antennal segment I relatively short, not quite reaching apex of head, segment II slightly shorter than segment III.

Pronotum dark brown, posterior disk slightly paler than anterior disk, with a large quadrate pale spot between cicatrices, anterior three-fourths of anterolateral margins narrowly pale, and humeral angles narrowly pale (Figs. 1, 4). Pronotal punctation sparse, fine, becoming somewhat coarser and deeper near humeral angles, cicatrices obscure, impunctate, area anterior to cicatrices uniformly punctate, anterior pronotal margin not reflexed or delineated by submarginal sulcus or row of punctures. Anterior pronotal teeth relatively small, oriented laterally. Anterolateral pronotal margins straight, slightly reflexed. Scutellum subtriangular, with relatively large, well-defined, transverse, oval white spots, one in each basal angle, apex of scutellum also with large white spot (Figs. 1, 4). Hemelytra dark brown with lateral margins narrowly pale (Figs. 1, 4); punctures fairly uniform, except shallower and more sparse just

mesad of R + M vein, and small, dense area near apex of each corium. Hemelytral membrane fumose, veins obscure, subparallel. Connexivum nearly concealed by hemelytra, pale except posterolateral and anterolateral margins black.

Ventral surface of head nearly black except posterior third of bucculae narrowly pale margined, punctures relatively strong, becoming more sparse anteriorly; each buccula with a small tooth anteriorly. Propleura dark brown, infused with red along posterior margin, gradually becoming pale mesially (approximately half of prothoracic acetabula are pale), each lateral margin with pale band along anterior half, and apex of humeral angles pale. Meso- and metapleura dark brown with acetabula, mesial portion of evaporative area, and ostiolar rugae pale; ostiolar rugae relatively elongate, each clearly reaching beyond middle of metapleuron (Fig. 5). Legs pale yellowish, lacking brown spots; tarsi, especially basal segment, and apices of tibiae reddish. Venter dark brown with narrow, longitudinally rectangular pale spots along lateral margins, one in middle of each segment (Fig. 6); nearly impunctate, the few punctures present are sparse and very shallow.

Basal plates of female, when taken together, with large, U-shaped medial emargination, mesial margins relatively short, contiguous for most of length, lateral half of basal plates lobately extending posteriorly well onto 9th paratergites (Fig. 7). Remaining genital plates typical of most pentatomoids. Male not known to me.

Measurements (mm). Total length 11.30; total width across humeri 6.01, across abdomen 6.42; medial length of pronotum 2.43. Medial length of scutellum 4.49, basal width 3.72, width at distal end of frena 1.43. Head length 2.44, width 3.05, width between ocelli 1.22, width between eyes 2.17, distance from ocellus to adjacent eye 0.52, diameter of ocellus 0.15. Length of antennal segments I-III 0.75, 1.27, and 1.66, respectively (segments IV and V missing). Length of rostral segments I-IV 1.03, 1.47, 1.75, and 1.31 respectively.

Differential diagnosis. This species is easily recognized by the longer ostiolar rugae, and the pale markings. The well-defined oblong spots in each basal angle of the scutellum, and the narrow pale band along the lateral margin of each corium are diagnostic.

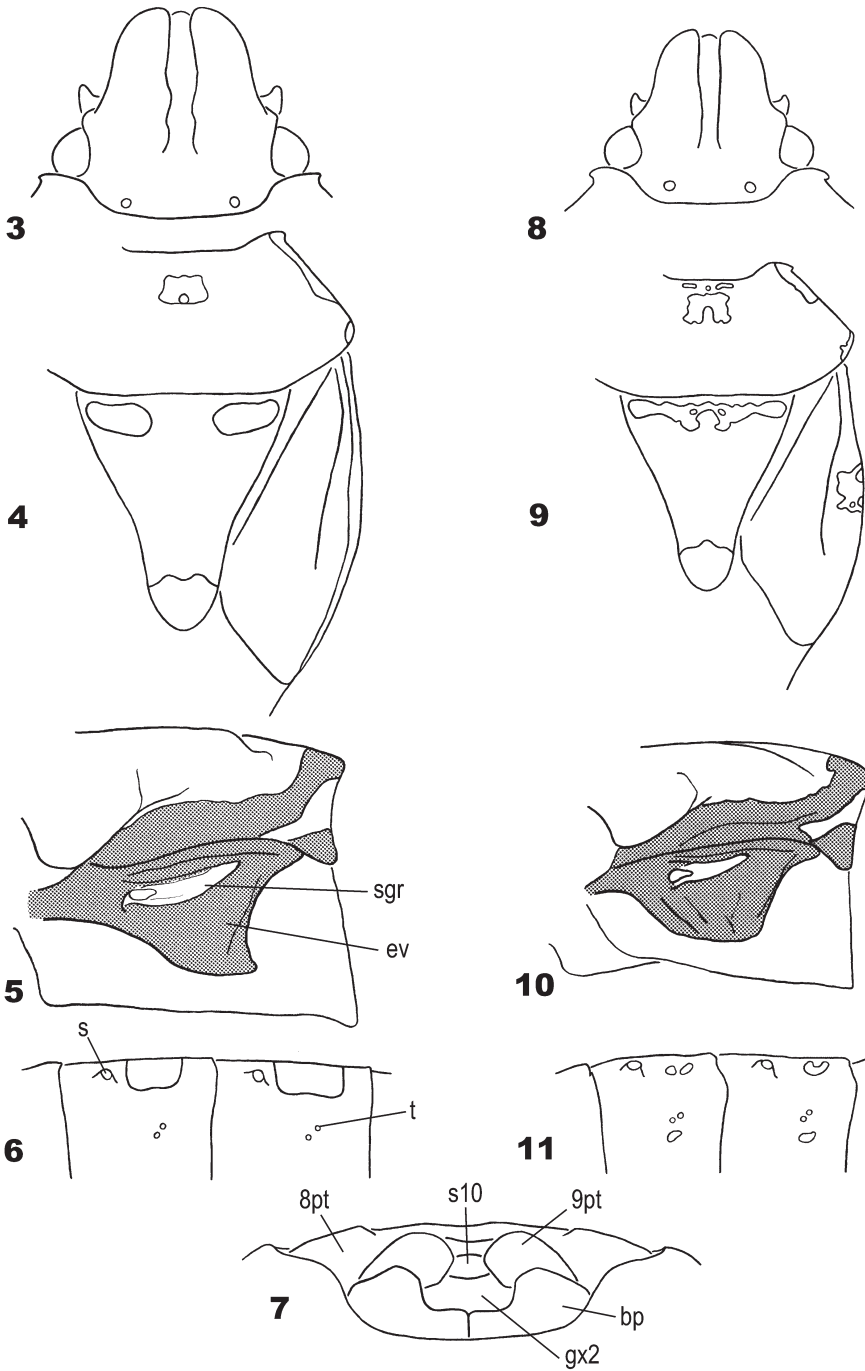
Distribution. Originally described from the Philippines without exact locality (DALLAS 1851). I have examined one ♀ specimen from Mindanao Island. It has also been reported from Okinawa in the Ryukyu Islands (MATSUMURA 1905).

Massocephalus stysi sp. nov.

(Figs. 2, 8-11)

Type material. HOLOTYPE: ♂, PHILIPPINES: LUZON: BENGUET PROVINCE: labeled a) 'Baguio Mts. Prov. PI - Feb. '26'; b) 'F Rivera Coll'; c) 'HOLOTYPE *Massocephalus stysi* Rider' (USNM). PARATYPE: 1 specimen lacking abdomen, PHILIPPINES: LUZON: BENGUET PROVINCE: labeled a) 'Baguio Luzon PI'; b) 'W Robinson donor'; c) 'PARATYPE *Massocephalus stysi* Rider' (USNM).

Description. Dorsal surface of head brown to reddish brown, somewhat paler laterally and apically, with a few obscure pale areas on vertex; coarsely punctate except for large impunctate areas just mesad of each compound eye. Apex of head broadly rounded, lateral margins of juga sinuous, subparallel for middle third, apices projecting slightly beyond apex of tylus, but not contiguous anteriorly; antenniferous tubercles easily visible from above (Fig. 8). Ocelli relatively small, each located 3-4 times its own diameter from adjacent eye. Antennae



pale brown, segment I with small obscure darker brown spots, segments II and III slightly reddish, segment I reaching to or slightly beyond apices of juga, length of segment II shorter than segment III.

Pronotum dark brown, posterior disk slightly paler than anterior disk, with large, irregular, quadrate pale spot between cicatrices (dark coloration intruding into posterior margin of spot), anterior one-half to two-thirds of anterolateral margins narrowly pale, a weak, irregular, transverse pale line just behind vertex of head, and humeral angles narrowly pale (Figs. 2, 9). Pronotal punctation sparse, fine, becoming somewhat coarser and deeper near humeral angles, cicatrices obscure, impunctate, area anterior to cicatrices uniformly punctate, anterior pronotal margin not reflexed or delineated by submarginal sulcus or row of punctures. Anterior pronotal teeth distinct, slightly recurved posteriorly. Anterolateral pronotal margins nearly straight, distinctly reflexed. Scutellum subtriangular, with an irregular, transverse, white band across base, the white areas are invaded with several dark punctures, apex of scutellum also with relatively large white spot (Figs. 2, 9). Hemelytra brown to dark brown, lateral margins not pale, but with distinct, irregular, lateral white spot near middle (Figs. 2, 9), punctures fairly uniform, except becoming more shallow and sparse near R + M vein, and small, dense area near apex of each corium. Hemelytral membrane fumose, veins obscure, subparallel. Connexivum nearly concealed by hemelytra, mostly dark with pale markings.

Ventral surface of head brown to dark brown with posterior half or more of bucculae narrowly pale margined, punctures relatively strong, becoming more sparse anteriorly; each buccula with a small tooth anteriorly. Propleura dark brown becoming paler mesially (prothoracic acetabula are completely dark), each lateral margin with narrow, weak, irregular pale band along anterior third, and apex of humeral angles pale. Meso- and metapleural plates dark brown, including acetabula and all stink gland structures; ostiolar rugae relatively short, each reaching at most to middle of metapleuron (Fig. 10). Legs pale yellowish-white, with numerous brown spots on femora and basal half of tibiae; tarsi, especially segment I, and apices of tibiae brown to reddish brown. Venter dark brown with irregular pale areas along lateral margins (Fig. 11), especially basally and apically; nearly impunctate, punctures sparse and shallow.

Pygophore (note: the pygophore of the only male specimen available for study is withdrawn into abdomen, and is difficult to see), in ventral view with shallow medial emargination, a lobate projection on each side; parameres in caudal view are sinuous, apices oriented dorsally. Proctiger relatively large, smooth, transversely arcuate, superior ridge anterior to proctiger U-shaped. All structures with numerous long hairs. Female unknown.

Measurements (mm). Total length 9.10-9.35 (9.10); total width across humeri 5.15-5.22 (5.22), across abdomen 5.63 (5.63); medial length of pronotum 2.04-2.07 (2.04). Medial

Figs. 3-11. 3-7 – *Mossocephalus maculatus* Dallas, 1851. 3 – head, dorsal view; 4 – dorsal habitus showing color pattern; 5 – meso- and metapleura showing scent gland structure and evaporative areas; 6 – abdominal segments IV-V, lateral view; 7 – female genital plates, caudoventral view. 8-11 – *M. stysi* sp. nov. 8 – head, dorsal view; 9 – dorsal habitus showing color pattern; 10 – meso- and metapleura showing scent gland structure and evaporative areas; 11 – abdominal segments IV-V, lateral view. Symbols: bp – basal plate; ev – evaporative areas; gx2 – second gonocoxa; s – spiracle; sgr – scent gland ruga; s10 – sternite 10; t – trichobothria; 8pt – eighth paratergite; 9pt – ninth paratergite.

length of scutellum 3.60-3.62 (3.60), basal width 3.03-3.05 (3.03), width at distal end of frena 1.25-1.27 (1.25). Head length 1.97-2.00 (1.97), width 2.57-2.60 (2.57), width between ocelli 0.89-0.97 (0.89), width between eyes 1.71 (1.71), distance from ocellus to adjacent eye 0.41-0.42 (0.41), diameter of ocellus 0.13-0.14 (0.13). Length of antennal segments I-V 0.73-0.78 (0.73), 0.95-0.96 (0.96), 1.45-1.57 (1.45), 1.66-1.67 (1.66), and 1.71 (1.71) respectively. Length of rostral segments I-IV 0.75-0.81 (0.75), 1.28-1.36 (1.28), 1.26, and 1.18 respectively.

Differential diagnosis. This species is easily recognized by shorter ostiolar rugae, and differences in color pattern. The irregular pale band across the base of the scutellum and the irregular pale spot along the lateral margin of each corium are diagnostic.

Etymology. It is with great pleasure that I dedicate this species to Pavel Štys in commemoration of his 75th birthday. Prof. Štys has contributed much to our knowledge of true bugs.

Distribution. At present, only known from the type locality on Luzon Island, Philippines.

Acknowledgements

I would like to thank Thomas Henry (USNM), and Toby Schuh (AMNH), for the loan of specimens. I would also like to thank Fred McDonald (University of Queensland, Australia), for examining a type specimen of *M. maculatus* while visiting the BMNH, and for sending notes, thus confirming its identity.

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