**Phanodesta celebessa** (Coleoptera: Trogossitidae): A New Species from Sulawesi, Indonesia

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**Abstract** A new species of the genus *Phanodesta* Reitter (Coleoptera, Trogossitidae) is described: *Phanodesta celebessa* from Sulawesi, Indonesia. This species is distributed in the westernmost area in the genus.

**Introduction**

The Gondwanan tribe Gymnochilini (Coleoptera: Trogossitidae) includes eight genera from the Juan Fernandez Islands of Chili, Asia, Europe to Africa (Kolibáč, 2006). One genus, *Phanodesta* Reitter, 1876, was recently revised by Leschen & Lackner (2013) and is represented by 21 species from New Zealand (9 spp.), New Caledonia (4 spp.), Juan Fernandez Islands (7 spp.), and Lord Howe Island (1 sp.). The distribution pattern of this genus shows clear disjunct distribution between the South American and Australasian Regions.

Unexpectedly, a new species described herein was discovered from south and central Sulawesi, Indonesia. This is the westernmost record of the genus.

**Material and Methods**

The method of general observation and dissection follows Yoshitomi & Lee (2014). Microstructures of dissected parts were studied in pure glycerin under an Olympus BH-2 compound microscope. After observation, the dissected parts were mounted on the same card with the specimen. Photographs (Figs. 1–2) were taken under a Leica MZ95 and combined with Helicon® Focus ver. 4.70.5 Pro (Helicon Soft® Limited). Some structures (Figs. 3–8) were observed with a digital microscope HiROX KH-1300 and images were captured with the 2D measurement software SHX-13M ver. 2.9.0. The terminology refers generally to Kolibáč (2005, 2006) and Leschen & Lackner (2013).

For phylogenetic analyses, the 47 characters and the data matrix derive from Leschen & Lackner (2013: supporting information file S2 and table S1), but OTUs are limited to 20 taxa (*Leperina* spp., *Phanodesta* spp. including new species, *Kolibacia*, and *Seidlitziella* (outgroup)). The character states of the new species are as follows (character number-state; ? is unknown state): 1-0, 2-1, 3-0, 4-0, 5-0, 6-0, 7-1, 8-1, 9-0, 10-0, 11-0, 12-0, 13-1, 14-0, 15-1, 16-0, 17-0, 18-2, 19-0, 20-0, 21-1, 22-0, 23-1, 24-0, 25-1, 26-1, 27-1, 28-2, 29-1, 30-2, 31-0, 32-?, 33-1, 34-1, 35-0, 36-0, 37-1, 38-0, 39-?, 40-1, 41-1, 42-1, 43-5, 44-1, 45-1, 46-1, 47-1. WinClada ver. 10.00.08 (Nixon, 2002) and NONA 2.0 (Goloboff, 1999) were used for the analyses.

Abbreviations used in this paper are as follows: EUMJ (Ehime University Museum, Matsuyama, Japan); EL (length Figs. 1–2. Habitus of *Phanodesta celebessa*. 1, Male, holotype; 2, female, paratype. Scale = 1.0 mm.

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of elytra at suture); EW (maximum width of elytra); PL (mesal length of pronotum); PW (maximum width of pronotum); TL (total length (PL+EL)).

Taxonomy

*Phanodesta celebessa* Yoshitomi, sp. nov.

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Description. Male (Fig. 1): Body oblong, convex dorsally, flat ventrally. Coloration of body black; mouth parts, antennae and legs brown. Dorsal vestiture composed of scales.

Head (Fig. 3) extending beyond anterior angles of pronotum; vertex flat, declined, sparsely covered with pale brown oblong scales; supra-ocular scales present. Labrum square, covered with short setae, with straight anterior margin. Submentum lacking transversal ctenidium, but bearing a pair of curved long setae in lateral portion. Eyes entire, relatively large, situated in lateral part of head; the distance between eyes about 1.7 times as long as the maximum diameter of an eye. Gena acute. Antennae (Fig. 4) 11-segmented,

Figs. 3–8. *Phanodesta celebessa*, male, holotype. 3, Head; 4, left antenna; 5, pronotum; 6, setae on pronotum; 7, elytra; 8, setae on elytron. Scales = 0.2 mm.
relatively short; antennal sockets invisible dorsally; antennal club relatively compact; antennomere 3 equal length to antennomere 2; shape of last antennomere semicircular.

Pronotum (Fig. 5) regularly punctate, strongly depressed ventrally in lateral portions, widest at middle; anterior angles projecting antero-ventrally, widely rounded; pronotal impressions absent; lateral carina weakly crenulate; posterior angles angulate; caudal margin medially lobate; pale brown scales (Fig. 6) on lateral portions, anterior angles and a part of mesal part oval or semicircular; black scales on mesal portion elongate; PW/PL 1.93. Scutellum transverse, covered with oblong pale brown scales. Elytra (Fig. 7) oblong, subparallel-sided from base to apical 1/4; nine discal carinae of the elytra present, beaded; sublateral keel (7th carinae) present; punctures on intercarinal space obscure by scales; window punctures absent; intercarinal scales (Fig. 8) circular, strongly overlapping and adressed, white (a part of posterior portion), pale brown (widely distributed on humeral, lateral and posterior portions), and black (widely on mesal portion), composed subirregular pattern; lateral carina simple; EL/EW 1.49; EL/PL 3.34; EW/PW 1.17; TL/EW 1.93. Epipleuron invisible from lateral view. Hind wings fully developed. Procoxae visible in lateral view. Scales of the hypomeron present. Prosternum rugosely punctate, lacking median asetose area, gently arcuate in posterior margin of prosternal process. Meso- and metaventrite strongly punctate. Trochanter of fore legs with a long setae. Proximal edge slightly crenulate; protibial macro absent; protibial spurs longer than tarsomere 2; anteriormost spur greatly enlarged and larger than the second.

Tergite VIII (Fig. 9) well sclerotized, semicircular, bearing short and long setae. Sternite VIII (Fig. 10) moderately sclerotized, bearing short setae in lateral and posterior portions, but some setae on lateral portion long, closely covered with minute spines in basal portion. Segments IX–X (Fig. 11) slightly sclerotized, with V-shaped spicular fork in segment IX, covered with minute setae in segment X. Tegmen (Figs. 12, 13) long, well sclerotized; phallobasic apodeme long, evenly tapering basally; tegmental struts long, gently curved inferiorly, about 0.3 times as long as total length of tegmen, parameral piece short, about 0.1 times as long.

Figs. 9–15. Male genitalia of *Phanodesta celebessa*, holotype. 9, Tergite VIII; 10, sternite VIII; 11, segments IX–X; 12, tegmen in dorsal view; 13, tegmen in ventral view; 14, phallus in dorsal view; 15, phallus in lateral view. Scale a for Figs. 9–11; scale b for Figs. 12–15.
as total length of tegmen, gently curved interiorly, obtuse at apices, bearing short setae in apical and intero-dorsal portions. Phallus (Figs. 14, 15) relatively short, about 0.8 times as long as tegmen, gently curved ventrally in apical portion, finely punctate in apical portion, obtuse at apex.

Female (Fig. 2): Sexual dimorphism distinct in following characteristics: body larger; scales on head and pronotum sparse; submentum lacking extra setae; anterior angles of pronotum wide, weakly depressed ventrally; PW/PL 2.05; EL/EW 1.45; EL/PL 3.52; EW/PW 1.18; TL/EW 1.87.

Tergite VIII (Fig. 16) well sclerotized, trapezoidal, bearing long setae along caudal margin, closely covered with minute spines in basal portion. Sternite VIII (Fig. 17) well sclerotized, semicircular, concave in mesal portion of caudal margin, bearing irregular setae in caudal portion, with straight long spiculum. Ovipositor (Fig. 18) long; stylus oblong, bearing irregular setae; coxite finely punctate, bearing long setae in apical portion; baculus long, bifurcate at base; approximate ratio of stylus, coxite, and baculus as (n = 1) 1.0 : 5.0 : 7.0.

Measurements. Male (n = 1): TL 6.95 mm; PW 3.08 mm; PL 1.60 mm; EL 5.35 mm; EW 3.60 mm. Female (n = 1): TL 8.22 mm; PW 3.73 mm; PL 1.82 mm; EL 6.40 mm; EW 4.40 mm.

**Taxonomic remarks.** This is a distinctive species in having broad body shape (Figs. 1, 2), scales on elytra wide and semicircular (Fig. 8), and phallobasic apodeme long and subacute (Figs. 12, 13).

**Biological notes.** The holotype was collected by a light trap setting in a natural forest. The paratype was collected from a rotten wood surface with *Ganoderma australe*.

**Etymology.** The name refers to the distribution of this species in Sulawesi (= former name Celebes).

**Systematic position**

As a result of analysis, one most-parsimonious tree was obtained (Fig. 19; TL: 102, Ci: 62, Ri: 82). The genus *Phanodesta* is monophyletic, and the new species is the most basal taxon in the genus. The apomorphies of *Phanodesta celebessa* are as follows: anterior angles of pronotum rounded (14-0), caudal margin of pronotum medially lobate (23-1), nine elytral carinae (28-2), presence of sublateral keel (29-1), epipleuron invisible in lateral view (37-1).
The topology of the resulting tree is similar to that of Leschen & Lackner (2013) in terminal clades, but it is quite different between these trees in that the genus Phanodesta (excluding P. celebessa) is divided into two clades. Further studies including unknown taxa and molecular phylogeny are required.

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[Fig. 19. Most-parsimonious tree.]