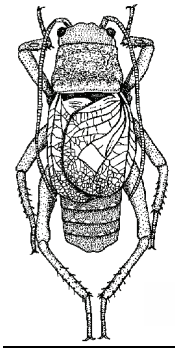

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TWO NEW SPECIES OF THE GENUS *ECHINOPLA* SMITH, 1857 (HYMENOPTERA: FORMICIDAE: FORMICINAE) FROM THAILAND

S. Tanansathaporn[1)], H. Zettel[2)], N. Pinkaew[1)], M. Kongmee[1*)], S. Waengsothorn[3)], W. Jaitrong[4)]

1) *Department of Entomology*, *Faculty of Agriculture at Kamphaeng Saen, Kasetsart University, Kamphaeng Saen Campus, Nakhon Pathom, 73140 Thailand*. [*]*Corresponding author. E-mail: fagrmtk@ku.ac.th*

2) *2nd Zoological Department, Natural History Museum, Burgring 7, 1010 Vienna, Austria.*

3) *Sakaerat Environmental Research Station, Wang Nam Khiao, Nakhon Ratchasima, 30370 Thailand.*

4) *Natural History Museum, National Science Museum, Technopolis, Khlong 5, Khlong Luang, Pathum Thani, 12120 Thailand.*

Summary. Thirty-three species and three subspecies of the genus *Echinopla* Smith, 1857 are known as arboreal ants and distributed from eastern India, China, various countries in Southeast Asia, New Guinea to Australia. Two new species are described from Thailand: *Echinopla charernsomi* Tanansathaporn et Jaitrong, **sp. n.** (Nakhon Ratchasima, Nakhon Nayok and Tak provinces) based on the worker caste and *Echinopla jeenthongi* Tanansathaporn et Jaitrong, **sp. n.** (Surat Thani, Nakhon Si Thammarat and Phangnga provinces) based on the worker caste and dealate gyne.

Key words: ants, Formicidae, taxonomy, new species, Southeast Asia.

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Резюме. Из Индии, Китая, стран Юго-Восточной Азии, Новой Гвинеи и Австралии известно 33 вида и 3 подвида древесных муравьев рода *Echinopla* Smith, 1857. Из Таиланда описываются два новых для науки вида: по касте рабочих из северных, центральных и западных провинций – *Echinopla charernsomi* Tanansathaporn et Jaitrong, **sp. n.**, а по рабочим и сбросившей крылья самке из южных провинций – *Echinopla jeenthongi* Tanansathaporn et Jaitrong, **sp. n.**

INTRODUCTION

Members of the genus *Echinopla* Smith, 1857 are arboreal ants (Bharti & Gul, 2012; Zettel & Laciny, 2015) which are most often encountered at the lower vegetation or on rotting wood. The genus is distributed in eastern India, China, various countries in Southeast Asia, New Guinea, and Australia (Bharti & Gul, 2012; Xu & Zhou, 2015; Zettel & Laciny, 2015, 2017). Currently, 33 species and three subspecies names are known (Antweb, 2018). So far, 25 species have been listed in Southeast Asia. Among them only three species, *Echinopla madli* Zettel et Laciny, 2015*, E. melanarctos* Smith, 1857 and *E. pallipes* Smith, 1857 were recorded from Thailand (Jaitrong & Nabhitabhata, 2005; Zettel & Laciny, 2015).

Recently, we have examined specimens deposited in the Ant Museum, Faculty of Forestry, Kasetsart University, Bangkok (Thailand), the Natural History Museum of the National Science Museum (Thailand) and in Faculty of Science, Prince of Songkla University (Thailand). We found two new species from northeastern (Nakhon Ratchasima province), central (Nakhon Nayok province), western (Tak province) and southern (Surat Thani, Nakhon Si Thammarat and Phangnga provinces) Thailand. In this paper we describe two new species based on the worker caste. The dealate gyne of *Echinopla jeenthongi* Tanansathaporn et Jaitrong, sp. n. is also described.

MATERIAL AND METHODS

The type series of the two new species were point-mounted dry specimens and deposited in the Natural History Museum of the National Science Museum, Thailand (THNHM) and in the Faculty of Science, Prince of Songkla University, Thailand (PSU). Specimens of other species deposited in the Ant Museum, Faculty of Forestry, Kasetsart University, Thailand (AMK), THNHM and PSU were also examined. The holotype of *E. mezgeri* Zettel et Laciny, 2015 and the lectotype of *E. lineata* Mayr, 1862 both in the Natural History Museum Vienna were also examined (by H. Zettel). *Echinopla charernsomi* Tanansathaporn et Jaitrong, sp. n. was compared with images of the type of *E. striata* Smith, 1857 available on Antweb (2018).

Most morphological observations were made with a ZEISS Discovery.V12 stereomicroscope. Multi-focused montage images were produced using NIS element 3.7 from a series of source images taken by a Nikon MNB42100 digital camera attached to a Nikon ECLIPSE E600 microscope. The holotype and paratypes were measured using a micrometer. All measurements are given in millimetres, rounded to the next one hundredth millimetre.

The acronyms used for the measurements and indices are as follows: **TL** – Total length. The added lengths of head (including mandibles), mesosoma, petiole, and gaster. **HL** – Head length. Length of head proper, excluding mandibles, measured along midline from anterior clypeal margin to posterior margin of head. **HW** – Head width. Maximum width of head, in full-face view measured behind eyes (excluding eyes). **SL** – Scape length. Maximum straight line length of antennal scape excluding the basal constriction and condylar bulb. **ED** – Eye diameter. Maximum diameter of eye. **PW** – Pronotal width. Maximum width of pronotum measured in dorsal view including spines. **MSL** – Mesosoma length. Diagonal length of mesosoma in profile, from the point at which pronotum meets cervical shield to posterior margin of metapleuron. **PL** – Petiole length. Length of petiole measured in profile from anterior process to posteriormost point of the tergite, where it surrounds gastral articulation. **PH** – Petiole height. Height of petiole measured in profile from apex of the ventral process vertically to a line intersecting dorsalmost point of node including spines. **DPW** – Dorsal petiole width. Maximum width of petiole in dorsal view including spines. **GW** – Maximum width of gaster measured from dorsal view. **CI** – Cephalic index. HW×100/HL. **EI** – Eye index. ED×100/HW. **SI** – Scape index. SL×100/HW. **LPI** – Lateral petiole index. PH×100/PL. **DPI** – Dorsal petiole index. PW×100/PL.

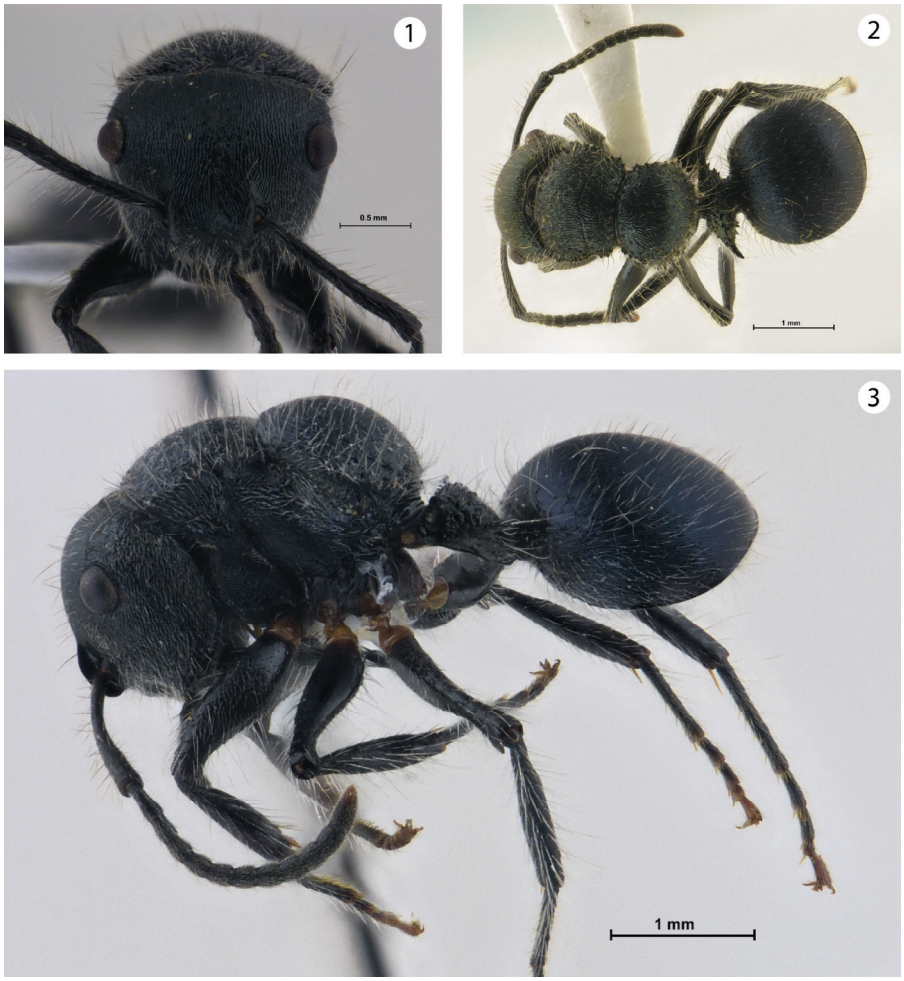
Acronyms of type depositories: **AMK** – Ant Museum, Faculty of Forestry, Kasetsart University, Thailand; **NHMW** – Natural History Museum Vienna, Austria; **PSU** – Faculty of Science, Prince of Songkla University, Thailand; **THNHM** – Natural History Museum of the National Science Museum, Thailand.

The general terminology of the worker ants follows Hölldobler & Wilson (1990) and Bolton (1994). For the important characteristics of the worker in the genus used in this paper, see Zettel & Laciny (2015).

TAXONOMY

Echinopla charernsomi **Tanansathaporn et Jaitrong, sp. n.**
Figs 1–3

TYPE MATERIAL. Holotype – worker (THNHM-I-01365), **NE Thailand**: Nakhon Ratchasima province, Wang Nam Khiao district, Sakaerat Environmental Research Station, 14.5097°N, 101.9319°E, 17.VIII 2009, leg. W. Jaitrong (THNHM). Paratypes: one worker (THNHM-I-01366), same data as holotype (THNHM); one worker (THNHM-I-01367), Central Thailand: Nakhon Nayok province, Muang Nakhon Nayok, Hin Tang subdistrict, 14.4372°N, 101.3758°E, dry evergreen forest, 25.III 2000, leg. W. Jaitrong (THNHM).



Figs 1–3. *Echinopla charernsomi*, holotype worker. 1 – head in full-face view; 2 – body from dorsal view; 3 – body in profile.

OTHER MATERIAL EXAMINED. One worker (THNHM-I-01218), W Thailand: Tak province, Umphang district, Thung Yai W.S., Ka-nga Sod Forest Ranger Station, 20.II 2015, leg. W. Jaitrong (THNHM).

MEASUREMENTS. **Holotype**: TL 5.32, HL 1.28, HW 1.60, SL 1.32, ED 0.28, PW 1.52, MSL 1.96, PL 0.52, PH 0.48, DPW 1.40, GW 1.72, CI 125, EI 18, SI 83, LPI 92, DPI 292. **Paratypes** (n = 2): TL 4.72–5.28, HL 1.12–1.16, HW 1.40–1.56, SL1.20–1.28, ED 0.28, PW 1.28–1.52, MSL 1.84–1.96, PL 0.56–0.64, PH 0.52–0.56, DPW 1.24–1.48, GW 1.52–1.80, CI 130–134, EI 18–19, SI 82–84, LPI 88–91, DPI 226–231.

DIAGNOSIS. Medium-sized, HW 1.40–1.56 mm, head in full-face view broader than long; eye relatively large, moderately convex; dorsum of mesosoma distinctly laterally marginate along its length, armed with numerous teeth; in dorsal view mesosoma with waist-like incision in front of propodeum; promesonotal suture present, narrow and shallow; metanotal groove distinct, deeply impressed; in posterior aspect, dorsal margin of petiole with numerous teeth; lateral margin of petiole with 3-4 large teeth; first gastral tergite globose, its posterior margin without denticles. Dorsa of head, mesosoma and first gastral tergite finely, longitudinally striate; lateral face of pronotum irregularly reticulate-punctate; mesopleuron punctate; lateral face of propodeum irregularly rugose. Dorsa of head, mesosoma, petiole, and first gastral tergite with dense black and long hairs mixed with dense pubescence. Body black; trochanters and tip of gaster reddish brown.

DESCRIPTION. Worker. Head in full-face view trapezoidal, narrowed anteriorly and broader than long, lateral margin weakly convex, posterior margin moderately convex, posterolateral corner roundly convex. Eye relatively large, moderately convex, located close to posterior corner of head. Frontal lobe obliquely elevated, in full-face view covering antennal fossa only in part. Mandible short, subrectangular, and its masticatory margin armed with five teeth. Clypeus broad, anterior margin almost straight. Frontal carina short, not surpassing level of anterior margin of eye. Antennae 12-segmented; scape moderately long and slender, one third of scape length extending beyond posterior margin of head; funicular segments, each longer than broad; antennal segment II slightly narrower and longer than each of III–XI; terminal segment (XII) almost as long as X and XI combined.

Mesosoma stout, dorsum of mesosoma distinctly marginate at sides along entire length, length roughly 1.3 times pronotum width; propodeum slightly larger than promesonotum. In profile dorsal outline of promesonotum weakly convex, while propodeum strongly convex; both promesonotum and propodeum meeting at deep and broad incision, the metanotal groove; promesonotal suture present, narrow and shallow; mesopleuron flat, not clearly demarcated from metapleuron. In dorsal view mesosoma with waist-like incision in front of propodeum; pronotum trapezoidal or subrectangular, anterior margin convex, posterior margin concave, lateral margin straight; pronotum narrower than head; mesonotum clearly shorter and narrower than pronotum; propodeum more or less subglobose, as broad as pronotum, and longer than mesonotum; anterior and lateral margins of mesosoma armed with numerous teeth. Legs relatively long; femora flat, seen from posterior aspect broad at base then gradually narrowed to apex.

Petiole in profile longer than high, and narrowed dorsally. In dorsal view petiole transverse, about as broad as propodeum, each side with strong posteriorly bent spine; anterior face much narrower than posterior face. In posterior aspect dorsal margin with 12-13 denticles; lateral margin with 3-4 large teeth.

First gastral tergite in dorsal view globose, covering remaining tergites, slightly broader than long, posterior margin roundly convex without denticles.

Dorsum and lateral face of head finely, longitudinally striate; antennal scape superficially reticulate with smooth and shiny interspaces; mandible roughly and irregularly rugose. Dorsa of pronotum, mesonotum and propodeum longitudinally striate; lateral face of pronotum irregularly reticulate-punctate; mesopleuron punctate;

lateral face of propodeum irregularly rugose; legs reticulate with smooth and shiny interspaces. First gastral tergite densely, finely, longitudinally striate.

Dorsa of head, mesosoma, petiole, and first gastral tergite with dense erect long hairs mixed with dense pubescence. Scape and legs with sub erect long hairs mixed with sparse pubescence.

Entire body black; apex of mandible, antennal segments X-XII, trochanters, and tip of gaster reddish brown; eye grayish brown.

REMARKS. New species belongs to the *Echinopla striata* group (*sensu* Xu & Zhou, 2015; Zettel & Laciny, 2017) and is similar to *E. striata* and *E. lineata* by having a longitudinal striation on the dorsal body surface. However, *E. charernsomi* sp. n. can be distinguished from *E. striata* by much smaller size (HW 1.40–1.60 mm in *E. charernsomi* sp. n., HW 1.72–1.85 mm in *E. striata*), a irregularly reticulate-punctate lateral face of propodeum (smooth and shiny in *E. striata*), and yellowish brown trochanters (black to dark brown in *E. striata*). *Echinopla charernsomi* sp. n. is separated from *E. lineata* by the smaller body size (HW 1.40–1.60 mm in *E. charernsomi* sp. n.; HW 1.58–1.75 mm in *E. lineata*) and a punctate and reticulate-punctate sculpturing on the lateral face of the mesosoma (in *E. lineata*, entirely striate).

DISTRIBUTION. Thailand (Nakhon Ratchasima, Nakhon Nayok and Tak provinces).

ETYMOLOGY. The species epithet is dedicated to Dr. Kosol Charernsom of Kasetsart University, who is the most excellent specialist in biodiversity sciences in Thailand and helped and inspired many young taxonomists.

***Echinopla jeenthongi* Tanansathaporn et Jaitrong, sp. n.**
Figs 4–9

TYPE MATERIAL. Holotype – worker (THNHM-I-01368), **S Thailand**: Nakhon Si Thammarat province, Sichon district, Khao Noi subdistrict, near Yod Nam Waterfall, 8.9091°N, 99.7319°E, 1.XI 2008, leg. T. Jeenthong (THNHM). Paratypes: one worker (NW310705-1), S Thailand, Surat Thani province, Ban Nasarn district, Julaporn, 8.8613°N, 99.4847°E, evergreen forest, 400–550 m, lower vegetation, 31.VII 2005, leg. N. Noon-anant (PSU); one worker (NW150405-2), S Thailand, Nakhon Si Thammarat province, Noppitam district, Noppitum [Noppitam] sub-district, Krung Ching, 8.6572°N, 99.6363°E, 100–300 m, lower vegetation, 15.IV 2005, leg. N. Noon-anant (PSU); one dealate gyne (NW091105-3), S Thailand, Phangnga province, Muang Phangnga, Song Prang sub-district, 8.6111°N, 98.5505°E, 200–300 m, lower vegetation, 09.XI 2005, leg. N. Noon-anant (PSU).

MEASUREMENTS. **Holotype**: TL 3.80, HL 1.12, HW 1.04, SL 1.12, ED 0.24, PW 0.92, MSL 1.62, PL 0.53, PH 0.50, DPW 0.96, GW 1.25, CI 93, EI 23, SI 108, LPI 94, DPI 181. **Paratypes** (n = 2): TL 4.40–4.50, HL 0.89–1.15, HW 0.96–1.00, SL 1.06–1.15, ED 0.23–0.25, PW 0.85–0.86, MSL 1.72–2.35, PL 0.65–0.66, PH 0.53–0.60, DPW 0.73–0.80, GW 1.30–1.58, CI 87–108, EI 24–25, SI 110–115, LPI 80–92, DPI 111–123.

Figs 4–6. *Echinopla jeenthongi*, holotype worker. 4 – head in full-face view; 5 – body from dorsal view; 6 – body in profile.

DIAGNOSIS. Medium-sized, HW 0.96–1.04 mm, head in full-face view elliptical, clearly longer than broad; eye relatively large, weakly convex; mesosoma very elongated and subcylindrical; pronotum with tooth-like angles; in dorsal view mesosoma with waist-like incision in front of propodeum; promesonotal suture almost absent; metanotal groove distinct with shallow depression; petiole in profile subtriangular, in dorsal view transverse and armed with two spines; first gastral tergite in dorsal view elliptical, much longer than broad, its posterior margin with numerous small denticles. Dorsa and lateral face of head, mesosoma, petiole and first gastral tergite with dense macropunctures. Dorsum and lateral face of head, mesosoma petiole, and first gastral tergite without long standing hairs; clypeus,

mandible and first gastral sternite with sparse long hairs. Entire body black; antenna dark brown, leg reddish brown.

DESCRIPTION. **Worker** (Figs 4–6). Head in full-face view clearly longer than broad, elliptical, with weakly convex lateral margin and convex posterior margin. Eye relatively large, moderately protruding, located at mid-length of head. Frontal lobe horizontal, in full-face view covering antennal fossa only in part. Mandible short, subrectangular, anterior margin slightly convex, and its masticatory margin armed with five teeth. Clypeus broad, anterior margin almost straight, while posterior margin strongly convex. Frontal carina short, not surpassing level of anterior margin of eye. Antennal scape moderately long, steadily widened from base to apex, slightly extending beyond posterior margin of head; antennal segment II clearly narrower and longer than each of III–VI; terminal segment (XII) almost as long as X and XI combined.

Mesosoma very elongated and subcylindrical, promesonotum clearly larger than propodeum in dorsal view. In profile dorsal outline of mesosoma weakly convex; promesonotal suture absent, but laterally indicated by short row of puncture; metanotal groove weakly impressed; propodeal outline strongly convex dorsally; propodeal declivity weakly convex. In dorsal view mesosoma with waist-like incision in front of propodeum; promesonotum clearly longer than broad; pronotum with pair of tooth-like protrusions; maximum pronotal width slightly narrower than head excluding eyes. In dorsal view, propodeum suboval, narrowed anteriorly, clearly longer than broad, with lateral and posterior margins convexs; proprodeal spiracle protruding laterally. Legs relatively long and slender.

Petiole in profile subtriangular, as long as high, ventral outline feebly concave. In dorsal view petiole transverse, about as broad as propodeal width, its anterior face as broad as posterior face. In posterior aspect dorsal margin with two spines; lateral margin without denticles or teeth.

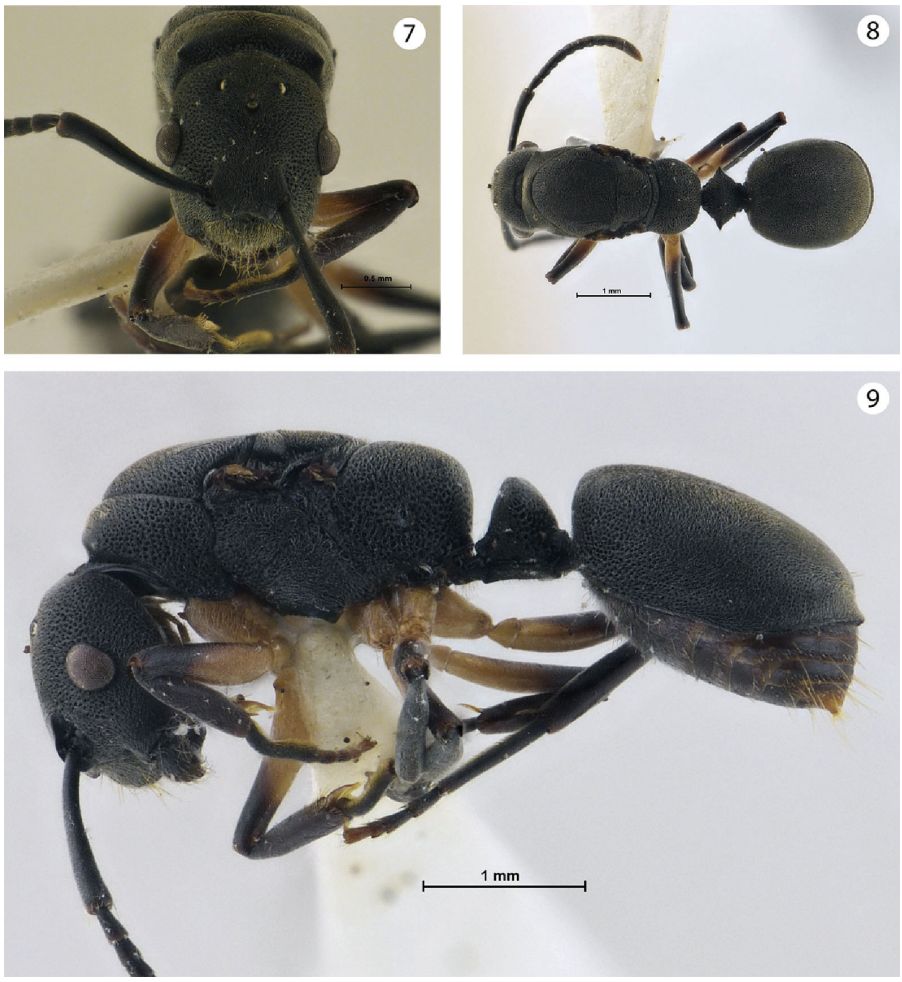
First gastral tergite in dorsal view elliptical, much longer than broad, broader posteriorly, covering remaining tergites, posterior margin convex with numerous small denticles.

Dorsum and lateral face of head finely macropunctate, except frontal lobe punctate; mandible with dense puncture at base, smooth and shiny along masticatory margin and apex; antennal scape finely punctate. Mesosoma entirely macropunctate, except anterior-most portion punctate. Petiole and first gastral tergite macropunctate. Legs reticulate with smooth and shiny interspaces. Dorsum of head, mesosoma, petiole, and first gastral tergite without erect hairs; clypeus, mandible, and apex of scape with sparse erect hairs; gastral sternites with dense hairs.

Entire body black; mandible reddish brown; antenna dark brown, with tip of scape reddish brown and antennal segment XII yellowish brown; coxae, trochanter, and basal half of femora yellowish brown; apical half of femora, tibiae, and tarsi reddish brown.

Dealate gyne (Figs 7–9). Body size slightly larger than worker. Head in full-face view longer than broad, elliptical, with weakly convex side. Compound eye relatively

large, moderately protruding, positioned at mid-length of head. Ocelli present, distance between lateral ocelli longer than distance between anterior and lateral ocellus. Mandible short, subrectangular, outer margin slightly convex, its masticatory margin armed with five teeth. Clypeus broad, its anterior margin almost straight, while posterior margin strongly convex. Antennal scape moderately long, steadily widened from base to apex, slightly extending beyond posterior margin of head.



Figs 7–9. *Echinopla jeenthongi*, paratype gyne. 7 – head in full-face view; 8 – body from dorsal view; 9 – body in profile.

Mesosoma elongated. In dorsal view, pronotum short, separated from mesoscutum by a suture, its anterolateral corner armed with a short, truncate tooth; mesoscutum

large, slightly longer than broad, its anterior margin strongly convex, while posterior margin almost straight; mesoscutellum trapezoidal, slightly broader than long, anterior margin weakly convex, separated from mesoscutum and metanotum by shallow sutures; metanotum very short, separated propodeum by a deep suture; propodeum larger than mesoscutellum, anterior margin feebly concave and posterior margin convex; in profile mesopluron broad, anepisternum separated from katepisternum by a transverse mesoplural groove; metapleuron not demarcated from lateral face of propodeum.

Petiole in profile view subtriangular, as long as high. In dorsal view petiole transverse, slightly narrower than propodeum. In posterior aspect dorsal margin with 2 spines laterally.

First gastral tergite in dorsal view elliptical, much longer than broad, broader posteriorly, covering remaining gastral tergites, posterior margin convex with numerous small denticles.

Sculpture, setae and colour condition similar to those of worker caste. Posterior portion of first gastral tergite with four short erect hairs.

REMARKS. New species belongs to the *Echinopla mezgeri* group (*sensu* Zettel & Laciny, 2017). It is closely related to *Echinopla mezgeri* Zettel et Laciny, 2005, the only hitherto described species of this group. Both species lack long standing hairs on the body surface. However, *E. jeenthongi* sp. n. can be distinguished from *E. mezgeri* by the following characteristics: entire head, mesosoma, petiole and first gastral tergite finely macropunctate (finely punctate, except mesopleuron and lateral face of propodeum covered by a coarse punctuation in *E. mezgeri*); posterior margin of first gastral tergite with numerous small denticles (without serration in *E. mezgeri*); basal half of femora yellowish brown (dark brown in *E. mezgeri*); sparse short pubescent hairs on dorsum of mesosoma (very dense in *E. mezgeri*). A third species of the *Echinopla mezgeri* group from West Malaysia (Laciny *et al*., in press) differs from both species by a strongly reduced puncturation of mesosoma and gaster tergite 1, and from *E. jeenthongi* sp. n. also by a non-serrate hind margin of gaster tergite 1.

HABITAT. The holotype and paratypes were collected from lower vegetation in evergreen forests in southern Thailand. This species seen to be restricted to Sunderland.

DISTRIBUTION. Thailand (Surat Thani, Nakhon Si Thammarat and Phangnga provinces).

ETYMOLOGY. We dedicate this species to Mr. Tadsanai Jeenthong (National Science Museum, Thailand), who donated the holotype to THNHM.

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Echinopla, including the two new species in the present paper. This research was supported by the Graduate Program Scholarship from The Graduate School, Kasetsart University and partly by the National Science Museum.

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