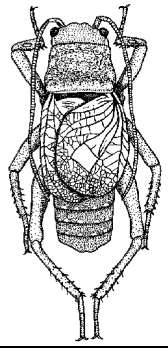

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TWO NEW SPECIES OF THE ANT GENUS *PLAGIOLEPIS* MAYR, 1861 (HYMENOPTERA: FORMICIDAE: FORMICINAE) FROM INDOCHINA

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Summary. Two new species, *Plagiolepis chomphuphuangi* **sp. n.** and *Plagiolepis silpaarchai* **sp. n.**, are described based on the worker caste from Laos and Thailand, respectively. The type series of former species was collected on the ground in a coffee plantation at highland (ca. 1000 m). *Plagiolepis silpaarchai* **sp. n.** inhabits lowland (ca. 250 m), and the type series was collected with a pitfall trap in a disturbed area near a mixed deciduous forest during the dry season. A key to the Southeast Asian species of the genus *Plagiolepis* Mayr, 1861 is provided.

Key words: ant, taxonomy, new species, key to species, Laos, Thailand.

Н. Фосритонг, К. Раттаначан, Л. Сатакун, В. Ятронг. Два новых вида муравьев рода *Plagiolepis* Mayr, 1861 (Hymenoptera: Formicidae: Fomicinae) из Индокитая // Дальневосточный энтомолог. 2024. N 492. С. 1-14.

Резюме. По рабочим особям из Лаоса и Таиланда, соответственно, описаны два новых вида муравьев: *Plagiolepis chomphuphuangi* **sp. n.** и *Plagiolepis silpaarchai* **sp. n.** Типовая серия первого вида собрана на почве кофейной плантации в высокогорьях (около 1000 м). *Plagiolepis silpaarchai* **sp. n.** найден на высоте около 250 м; его типовая серия собрана в засушливый период при помощи почвенных ловушек на нарушенном участке вблизи смешанного лиственного леса. Дана определительная таблица видов рода *Plagiolepis* Mayr, 1861 Юго-Восточной Азии.

INTRODUCTION

Plagiolepis Mayr, 1861 is one of the medium-sized ant genera of the subfamily Formicinae. The genus was described from Palaearctic region by Mayr (1861), with *Plagiolepis pygmaea* Latreille, 1798 as the type species. Members of the genus are distributed in the tropical and temperate regions of the Old World (Brown, 2000; Robertson, 2000). Nests are made under the bark of trees, in soil, under stone, in rotten wood or twigs, or in hard-packed earth (Bolton, 1973; Salata *et al*., 2018; Seifert, 2020). Currently, 65 valid extant species, 13 valid subspecies, and ten valid fossil species are listed (Bolton, 2023). Among them, thirty-two species have been known in Asia (Bolton, 2023; AntWeb, 2023; AntWiki, 2023). Among them six species: *P. adynata* (Bolton, 1995); *P. bicolor* (Forel, 1901), *P. demangei* (Santschi, 1920); *P. exigua* (Forel, 1894); *P. nitida* (Karavaiev, 1935); and *P. rogeri* (Forel, 1894) (Wang *et al*., 2022; AntWeb, 2023; AntWiki, 2023; Chapman & Capco, 1951) have been recorded from Southeast Asia. Jaitrong *et al*. (2016) and Khachonpisitsak *et al.* (2020) only reported the occurrence of the genus in Laos and Thailand without listing any named species.

Recently, we collected two undescribed species of *Plagiolepis* from Laos and Thailand; the specimens collected are large and have a dark brown body and dense setae on the head. After carefully examining these specimens under a stereoscope and comparing them with the type material of closely related species, it was concluded that the two species are new to science. In the present paper, we describe these two species based on the worker caste. A key to Southeast Asian species is provided.

MATERIAL AND METHODS

The holotypes and paratypes of the two new species are point-mounted dry specimens and deposited in the Natural History Museum of the National Science Museum, Thailand (**THNHM**). The type series was compared with the holotype and paratype images of the closely related species: *P. demangei* (CASENT0912417) and *P. rogeri* (CASENT0909857), which are available on AntWeb (2023) and AntWiki (2023).

Most morphological observations were made with a ZEISS Stemi305 stereoscope. Multi-focused montage images were produced using NISElements-D from a series of source images taken by a Nikon Digital Sight-Ri1 camera attached to a Nikon AZ100M stereoscope. The holotypes and paratypes of the new species were measured

using a micrometer. All measurements are given in millimeters and to the second decimal place.

The abbreviations used for the measurements and indices are as follows (see Sharaf *et al.,* 2011): **TL** – total length, the outstretched length of the ant from the mandibular apex to the gastral apex; **HW** – head width, the maximum width of the head behind the eyes in full face view; **HL** – head length, the maximum length of the head, excluding the mandibles; **SL** – scape length, excluding basal neck; **EL** – eye length, the maximum diameter of the eye; **ML** – mesosoma length, the length of the mesosoma in lateral view, from the point at which the pronotum meets the cervical shield to the posterior base of the propodeal lobes or teeth; **PRW** – pronotum width, the maximum width of pronotum in dorsal view; **PL** – petiole length, the maximum length measured in dorsal view, from the anterior margin to the posterior margin; **PW** – petiole width, maximum width measured in dorsal view; **CI** – cephalic index (HW x 100/HL); **SI** – scape index (SL x 100/HW).

TAXONOMY

Genus *Plagiolepis* Mayr, 1861

Plagiolepis Mayr, 1861: 42. Type-species: *Formica pygmaea*, by monotypy.

Anacantholepis Santschi, 1914: 36 [as subgenus of *Plagiolepis*]. Type-species: *Plagiolepis* (*Anacantholepis*) *decora*, by original designation.

Aporomyrmex Faber, 1969: 52. Type-species: *Aporomyrmex ampeloni*, by original designation.

Paraplagiolepis Faber, 1969: 65 [as subgenus of *Plagiolepis*]. Type-species: *Plagiolepis xene*, by monotypy.

DIAGNOSIS OF WORKER. Sharaf *et al*. (2011) defined the worker of the genus as follows: 1) mandibles armed with five teeth; 2) clypeus large and projecting over basal borders of mandibles; 3) palp formula 6,4; 4) antennae 11-segmented, and eyes well developed; 5) in dorsal view, mesonotum separated from propodeum by a conspicuous transverse groove or impression, therefore metanotum forming distinctly isolated sclerite; 6) propodeum unarmed; and 7) petiole reduced scale, inclined forward and sometimes overhung by first gastral segment.

Plagiolepis chomphuphuangi Phosrithong et Jaitrong sp. n.

https://zoobank.org/NomenclaturalActs/26617545-983D-440B-A679-CB04B498BBF7

Figs 1–3, 5

TYPE MATERIAL. Holotype: worker THNHM-I-00018330, THNHM), **Laos**: Champasak Province, Paksong District, Tad Fane Waterfall, coffee plantation, 15º10'57.96"N, 106º7'37.10"E, 25.VIII.2023, P. Sriranan leg., LAO23-WJT-046. Paratypes: 2 workers (THNHM-I-00018331 to THNHM-I-00018332, THNHM), same data as holotype.

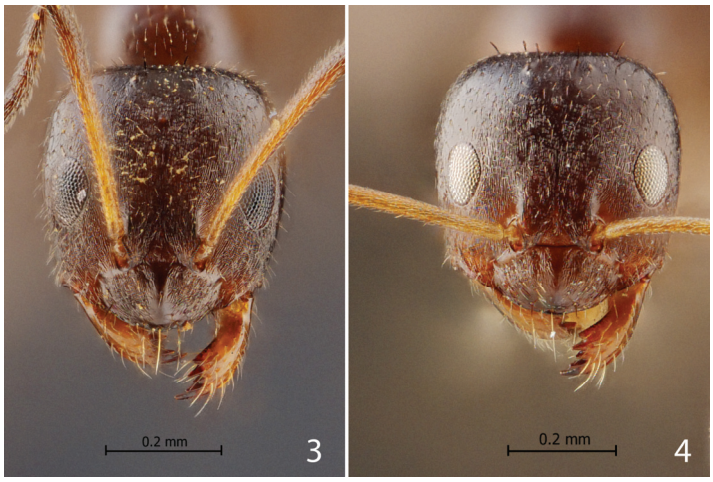
MEASUREMENTS AND INDICES. Holotype: TL 2.41, HW 0.66, HL 0.63, SL 0.63, EL 0.20, ML 0.73, PRW 0.43, PL 0.30, PW 0.17, CI 95, SI 100.

Figs 1–2. *Plagiolepis chomphuphuangi* sp. n., holotype worker (THNHM-I-00018330). 1 – body in profile view; 2 – body in dorsal view.

Paratypes (n = 3): TL 2.41–2.44, HW 0.63–0.66, HL 0.66–0.69, SL 0.63–0.66, EL 0.20, ML 0.73–0.76, PRW 0.43, PL 0.30–0.33, PW 0.17, CI 95, SI 100.

DESCRIPTION (holotype and paratypes). Head: in full face view, subrectangular, almost as long as broad; lateral and posterior margins weakly convex; posterolateral corner of head roundly convex. Mandible subtriangular; masticatory margin with five teeth, including largest apical tooth, followed by medium-sized preapical tooth, a small tooth, medium-sized prebasal tooth, and small basal tooth; basal margin almost straight, without denticles. In dorsal view, clypeus broad, slightly shorter than broad, its anterior margin broadly convex, without denticles, with median keel that fails to reach anterior margin; in profile view, clypeus roundly convex medially. Eye moderately large (130–140 ommatidia), oval, weakly convex, located anterior to med-length of head; with head in full face view outer margin of eye not reaching lateral margin of head. Ocelli present, small; distance between lateral ocelli almost as long as distance between median ocellus to lateral ocellus. Antenna

11-segmented, scape slender, clavate, extending beyond posterolateral corner of head by about one-third of its length; antennal segment II (pedicel) clearly longer than broad, slightly shorter than III–V combined; III as long as each of IV and V; III–V each slightly longer than broad; VI–XI each clearly longer than broad. Frontal lobe narrow, not covering antennal socket; frontal carina relatively short, slightly extending beyond level of anterior margin of eye.



Figs 3–4. *Plagiolepis* workers, head in full-face view. 3 – *P. chomphuphuangi* sp. n. (holotype, THNHM-I-00018330); 4 – *P. silpaarchai* sp. n. (holotype, THNHM-I-27222).

Mesosoma: in profile view pronotum with convex dorsal outline; mesonotum slightly sloping gradually to metanotal groove; in dorsal view pronotum slightly longer than broad (posterior margin distinctly concave) and clearly broader than mesonotum and propodeum; promesonotal suture weak, medially almost straight; mesonotum small much narrower than pronotum, posteriorly convex; in dorsal view metanotum narrow anteriorly, clearly separated from propodeum by deep groove; in profile view mesothorax reduced; metathoracic spiracle located dorsally, with opening on conical base; mesopleuron clearly demarcated from metapleuron by distinct groove; metapleuron not clearly demarcated from lateral face of propodeum. Propodeum in profile view with weakly convex dorsal outline and sloping evenly; declivity large and flat, bluntly margined laterally.

Petiole in profile sessile, subtriangular, much longer than high, with its anterior slope much shorter than posterior slope. Gaster in dorsal view, elliptical; first tergite anteriorly with shallow concavity to partly receive petiole.

Dorsum of head including clypeus striate, vertex partly reticulate with smooth interspaces; ventral surface of head smooth and shiny; clypeus with smooth area around median keel; antennal scape finely micropunctate; mandible smooth and shiny, with scattered punctures. Dorsum of pronotum, mesonotum, and propodeum entirely smooth and shiny; legs somewhat smooth and shiny. Petiole smooth and shiny. Gastral segments smooth and shiny.

Dorsum of head entirely covered with dense short erect setae; pronotum with sparse suberect setae; dorsum of petiole sparsely with very short setae; gastral tergites I and II with dense short suberect setae (setae on pronotum and gatral tergites I and II shorter than maximum width of antennal scape), except along edges of segments with longer erect setae; mandibles with sparse suberect setae; clypeus anteriorly with two pairs of long suberect setae and long median seta; antenna with dense pubescence. Head and mesosoma dorsally, and entire gaster (mesosoma generally paler than head and gaster) lateral and ventral sides of head, and lateral side of mesosoma reddish brown, somewhat paler than dorsum of the body. Mandible, antenna, and legs reddish brown.

Figs 5–6. *Plagiolepis* workers, Mesosoma in dorsal view. 5 – *P. chomphuphuangi* sp. n. (holotype, THNHM-I-00018330); 6 – *P. silpaarchai* sp. n. (holotype, THNHM-I-27222).

DIAGNOSIS. *Plagiolepis chomphuphuangi* sp. n. can be easily distinguished from other congeners by the following characteristics 1) body large and dark brown; 2) dorsum of head, pronotum, and gastral tergites with dense short suberect setae; 3) dorsum of head finely and densely striate; 4) mesosomal dorsum entirely smooth and shiny; 5) setae on dorsum of pronotum and gastral tergites relatively short, usually shorter than maximum width of antennal scape.

REMARKS. *Plagiolepis chomphuphuangi* is most similar to *P. silpaarchai* sp. n. in having striation on dorsum of head; the differences of both species are discussed below. New species is also similar to *P. rogeri* (Forel, 1894) and *P. jerdonii* Forel, 1894 from India; *P. adynata* Bolton, 1995 and *P. demangei* Santschi, 1920 from Vietnam; and *P. nitida* Karavaiev, 1935 from Cambodia in having a dark body colour. However, *P. chomphuphuangi* sp. n. can be easily separated from them by the head being finely striated (in other species smooth and shiny). New species is similar to *P. demangei* in having dense erect setae on the body dorsum but differs from latter by 1) head slightly longer than broad (clearly shorter than broad in *P. demangei*); 2) head striate (smooth and shiny in *P. demangei*); 3) setae on pronotun clearly shorter than those on pronotum and gastral tergite II (distinctly longer in *P. demangei*). This new species can be separated from *P. jerdonii* by the follow: 1) head relatively shorter (CI 95 in new species; CI 88 in *P. jerdonii*); 2) mesothorax distinctly reduced, metanotum deep (mesothorax broad and metanotum shallow in *P. jerdonii*); 3) pronotum with suberect setae (setae appressed in *P. jerdonii*).

ETYMOLOGY. The specific name is dedicated to Dr. Narin Chomphuphuang (Khon Kaen University, Thailand), who invited W. Jaitrong to join a field survey in Laos.

BIONOMICS. This new species inhabits highland (ca. 1000 m a.s.l.). The type series was collected on the ground in a coffee plantation (Fig. 9).

DISTRIBUTION. Laos (Champasak Province, Fig. 21).

***Plagiolepis silpaarchai* Phosrithong et Jaitrong sp. n.**

https://zoobank.org/NomenclaturalActs/914BEB3C-19FF-4A22-B2CE-EC14401709AA

Figs 4, 6–8

TYPE MATERIAL. Holotype: worker (THNHM-I-27222, THNHM), **Thailand**: Kamphaeng Phet Province, Kosamphi Nakhon District, Ban Kosomphi, Khlong Wang Chao National Park, mixed deciduous forest, 16°30'16" N, 99°10'05" E, 18.XI.2021. Paratypes: 16 workers (THNHM-I-27223 to THNHM-I-27238, THNHM), same data as holotype.

NON-TYPE MATERIAL EXAMINED. **Laos**: 3 workers (THNHM-I-00018333, THNHM), Vientiane Province, Naxaythong District, Sivilay Village, 11.VI.2010, W. Jaitrong leg., general collection.

MEASUREMENTS AND INDICES. Holotype: TL 2.80, HW 0.62, HL 0.66, SL 0.69, EL 0.13, ML 0.50, PRW 0.40, PL 0.17, PW 0.13, CI 94, SI 111.

Paratypes (n = 16): TL 2.34–2.94, HW 0.56–0.69, HL 0.59–0.73, SL 0.53–0.73, EL 0.13–0.17, ML 0.43–0.56, PRW 0.36–0.53, PL 0.13–0.23, PW 0.13–0.20, CI 89–105, SI 95–117.

DESCRIPTION (holotype and paratypes). Head: in full face view, subrectangular, slightly longer than broad; lateral margin weakly convex, and posterior margin almost straight (shallowly emarginate in larger specimens); posterolateral corner of head roundly convex. Mandible subtriangular; masticatory margin with five teeth, including largest apical tooth, followed by medium-sized preapical tooth,

a small tooth, medium-sized prebasal tooth, and small basal tooth; basal margin almost straight, without denticles. In dorsal view, clypeus broad, clearly shorter than broad, its anterior margin broadly and shallowly convex, medially margined with carina, without denticles, with median keel that fails to reach anterior margin; in profile view, clypeus roundly convex medially. Eye moderately large (138–143 ommatidia), oval, weakly convex, located anterior to med-length of head; with head in full face view outer margin of eye not reaching lateral margin of head. Ocelli present, small; distance between lateral ocelli almost as long as distance between median ocellus to lateral ocellus. Antenna 11-segmented, scape slender, clavate, extending beyond posterolateral corner of head by about one-third of its length; antennal segment II (pedicel) clearly longer than broad, almost as long as III–V combined; III as long as IV; III–V each slightly longer than broad; VI–XI each clearly longer than broad. Frontal lobe narrow, not covering antennal socket; frontal carina relatively short, slightly extending beyond level of anterior margin of eye.

Figs 7–8. *Plagiolepis silpaarchai* sp. n., holotype worker (THNHM-I-27222). 8 – body in profile view; 9 – body in dorsal view.

Mesosoma: in profile view pronotum with convex dorsal outline; mesonotum slightly sloping gradually to metanotal groove; in dorsal view pronotum almost as long as broad (posterior margin distinctly concave) and clearly broader than mesonotum but only slightly broader than propodeum; promesonotal suture weak, medially

almost straight; mesonotum small much narrower than pronotum, posteriorly convex; metanotum (see Bolton's key book, 1997: p. 45) broad from front to rear, clearly separated from propodeum by deep groove; in profile view mesothorax reduced; metathoracic spiracle located dorsally, with opening on conical base; mesopleuron clearly demarcated from metapleuron by distinct groove; metapleuron not clearly demarcated from lateral face of propodeum. Propodeum in profile view with weakly convex dorsal outline and sloping evenly; declivity large and flat, bluntly margined laterally.

Petiole in profile sessile, subtriangular, much longer than high, with its anterior slope much shorter than posterior slope. Gaster in dorsal view, elliptical; first tergite anteriorly with shallow concavity to partly receive petiole.

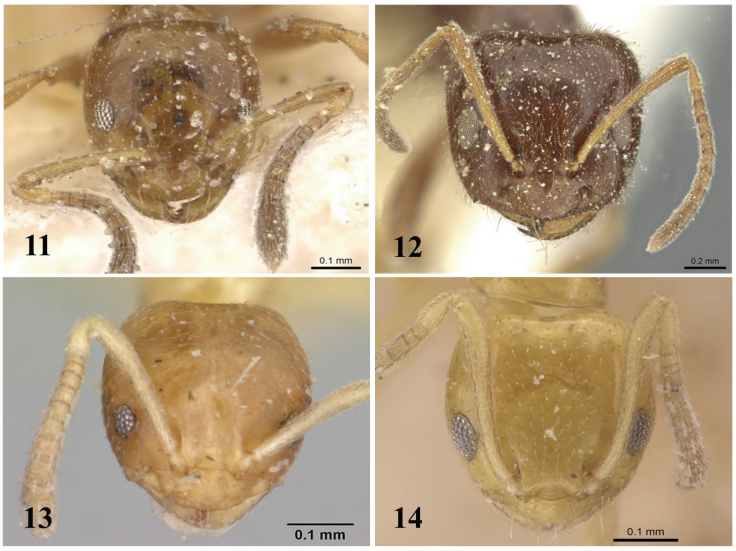
Head dorsally including clypeus striate, vertex partly reticulate with smooth interspaces; head ventrally smooth and shiny; clypeus with smooth area around median keel; antennal scape finely micropunctate; mandible smooth and shiny, with scattered punctures. Dorsum of pronotum, mesonotum, and propodeum finely punctate; metanotum more sparsely sculptured and shiny; lateral sides of pronotum, mesopleuron, and metapleuron smooth and shiny; legs somewhat smooth and shiny. Petiole smooth and shiny. Gastral segments superficially shagreened with smooth and shining interspaces.

Figs 9–10. Type localities of the new species. 9 – type locality of *Plagiolepis chomphuphuangi*; 10 – type locality of *Plagiolepis silpaarchai*.

Dorsal side of head entirely covered with dense short erect setae mixed with two longer erect setae located on vertex; dorsum of mesosoma with sparse erect setae; dorsum of petiole sparsely with very short setae; gaster with dense suberect setae (setae on gaster clearly longer than on head and mesosoma); mandibles with sparse suberect setae; clypeus anteriorly with two pairs of long suberect setae and long median seta; antenna with dense pubescence. Dorsal side of head and mesosoma, and entire gaster (mesosoma generally paler than head and gaster) lateral and ventral sides of head, and lateral side of mesosoma reddish brown, somewhat paler than dorsum of the body. Mandible, antenna, and legs reddish brown.

DIAGNOSIS. *Plagiolepis silpaarchai* sp. n. can be easily distinguished from other congeners by the following characteristics 1) body large and dark brown; 2) dorsa of head and gastral tergites with dense erect setae; 3) dorsum of head finely and densely striate; 4) dorsum of mesosoma densely punctate; 5) setae on dorsa of pronotum and gastral tergites relatively long, usually longer than maximum width of antennal scape.

REMARKS. *Plagiolepis silpaarchai* sp. n. is similar to *P. rogeri* (Forel, 1894) and *P. jerdonii* Forel, 1894 from India; *P. adynata* Bolton, 1995 and *P. demangei* Santschi, 1920 from Vietnam; and *P. nitida* Karavaiev, 1935 from Cambodia in having a dark body colour. However, this new species can be easily separated from them by the head being finely striated (in other species smooth and shiny). *Plagiolepis silpaarchai* sp. n. is similar to *P. demangei* and *P. jerdonii* in having dense erect setae on the body dorsum. This species can be distinguished from *P. demangei* by 1) head slightly longer than broad (clearly shorter than broad in *P. demangei*); 2) head striate (smooth and shiny in *P. demangei*); 3) setae on pronotun clearly shorter than those on gastral tergite II (distinctly longer in *P. demangei*). The new species can be separated from *P. jerdonii* by the following characteristics: 1) head relatively shorter (CI 89-105 in new species; CI 88 in *P. jerdonii*); 2) mesothorax distinctly reduced, metanotum deep (mesothorax broad and metanotum shallow in *P. jerdonii*); 3) pronotum with erect setae (setae appressed in *P. jerdonii*).



Figs 11–14. *Plagiolepis* workers (syntypes), head in full-face. 11 – *Plagiolepis bicolor* (CASENT0909845); 12 – *Plagiolepis demangei* (CASENT0912417); 13 – *Plagiolepis exigua* (CASENT0101305); 14 – *Plagiolepis adynata* (CASENT0917319).

Plagiolepis silpaarchai sp. n. is also similar to *P. chomphuphuangi* sp. n. in having dense striation on dorsum of head. However, *P. silpaarchai* sp. n. can be separated from *P. chomphuphuangi* sp. n. by 1) dorsum of mesosoma entirely punctate (smooth and shiny in *P. chomphuphuangi* sp. n., see Figs. 5 and 6 for comparison); 2) setae on dorsa of pronotum and gastral tergites relatively long, usually longer than maximum width of antennal scape (usually shorter than maximum width of antennal scape); 3) pronotum and first gastral tergite with erect setae (suberect setae in *P. chomphuphuangi* sp. n., see Figs. 1 and 7 for comparison); 4) posterior margin of head almost straight or feebly concave (weakly convex in *P. chomphuphuangi* sp. n., see Figs. 3 and 4 for comparison).

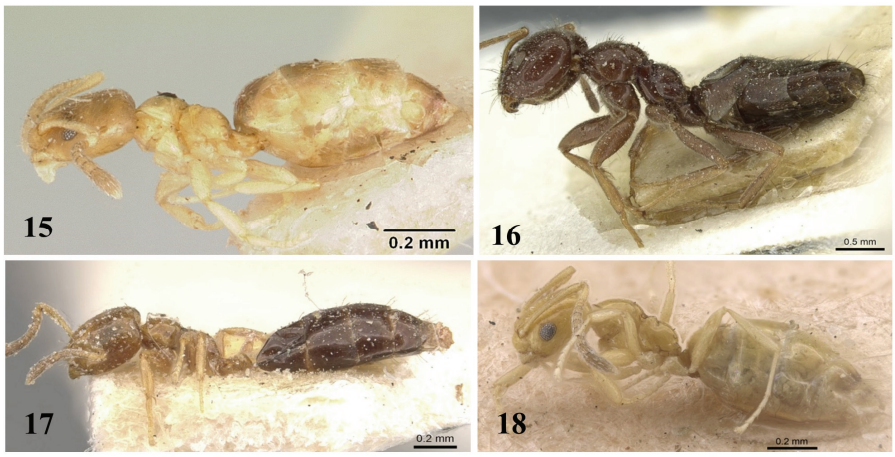
ETYMOLOGY. The specific name is dedicated to Mr. Varawut Silpa-archa, the former Minister of Natural Resources and Environment (from July 2019 – September 2023) and his family who supported the conservation of natural resources in Thailand.

BIONOMICS. This species inhabits lowland (ca. 250 m a.s.l.). The type series was collected with a pitfall trap in a disturbed area near a mixed deciduous forest (Fig. 10) during the dry season.

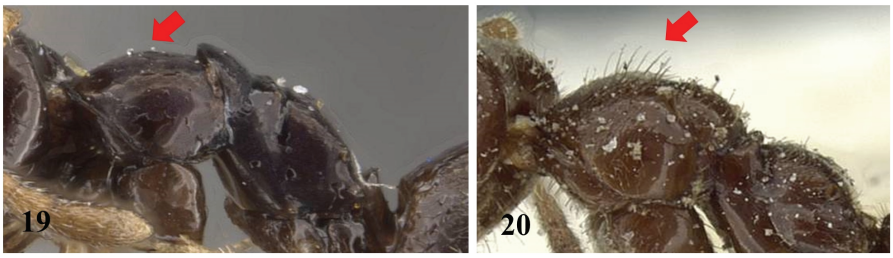
DISTRIBUTION. Laos (Vientiane Province) and Thailand (Kamphaeng Phet Province, Fig. 21).

Key to the Southeast Asian species of the genus *Plagiolepis* based on worker caste

1. Dorsum of head finely striate and matt (Figs. 3–4) 2
– Dorsum of head smooth and shiny (Figs. 11–14) 3
2. Dorsum of mesosoma entirely punctate (Fig. 6); setae on dorsa of pronotum and gastral tergites relatively long, usually longer than maximum width of antennal scape; pronotum and first gastral tergite with erect setae (Fig. 7); posterior margin of head almost straight or feebly concave (Fig. 4) ..... ***P. silpaarchai* sp. n.**
– Dorsum of mesosoma entirely smooth and shiny (Fig. 5); setae on dorsa of pronotum and gastral tergites relatively short, usually shorter than maximum width of antennal scape; pronotum and first gastral tergite with suberect setae (Fig. 1); posterior margin of head weakly convex (Fig. 3) ..... ***P. chomphuphuangi* sp. n.**
3. Head and mesosoma yellow to yellowish brown (Figs. 15, 17, 18) 4
– Head and mesosoma black to dark brown (Figs. 16, 19, 20) 6
4. Gaster darker (dark brown) than head and mesosoma (Fig. 17) ..... ***P. bicolor*** Forel, 1901
– Gaster same colour as in head and mesosoma (Figs. 15, 18) 5
5. Scape short (SL 0.27), not reaching posterior margin of head in full-face view (Fig. 13) ..... ***P. exigua*** Forel, 1894
– Scape longer (SL 0.33) and surpassing posterior margin of head in full-face view (Fig. 14) ..... ***P. adynata*** Bolton, 1995
6. Mesosoma dorsum without erect setae (Fig. 19) ..... ***P. rogeri*** Forel, 1894
– Mesosoma dorsum with sparse to dense erect setae (Fig. 20). 7
7. Head clearly shorter than broad; entire body brown (Fig. 12) ..... ***P. demangei*** Santschi, 1920
– Head slightly longer than broad; entire body dark coffee brown to black ..... ***P. nitida*** Karavaiev, 1935



Figs 15–18. *Plagiolepis* workers (syntypes), body in profile view. 15 – *P. exigua* (CASENT0101305); 16 – *P. demangei* (CASENT0912417); 17 – *P. bicolor* (CASENT0909845); 18 – *P. adynata* (CASENT0917319).



Figs 19–20. *Plagiolepis* workers (syntypes), in profile view. 19 – *P. rogeri* (CASENT0909857); 20 – *P. demangei* (CASENT0912417).

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Fig 21. Distributions of the new species of *Plagiolepis* in Indochina.

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