



Revision of *Zosteragathis* Sharkey of Thailand (Hymenoptera, Braconidae, Agathidinae, Agathidini)

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Abstract

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Key Words

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Based on cladistic analyses recently conducted by Sharkey and Chapman, the genus *Zosteragathis* Sharkey is revised. Twenty-two species are reported from Thailand, three previously described species, *Z. samensis*, *Z. contrasta* and *Z. nuichuaensis*, and 19 new species, i.e., *Z. chaiyaphumensis*, *Z. eukos*, *Z. hinensis*, *Z. hongensis*, *Z. inthanonensis*, *Z. krachanensis*, *Z. lampangensis*, *Z. lampooensis*, *Z. luangensis*, *Z. ngamensis*, *Z. perknos*, *Z. petchaburiensis*, *Z. phahompokensis*, *Z. phuphanensis*, *Z. sakaerataensis*, *Z. sakonensis*, *Z. samensis*, *Z. surinensis*, *Z. taemensis*, *Z. tonensis*. Members of *Zosteragathis* are known from the Australian, Ethiopian, Oceania, Oriental, and eastern Palearctic regions.

Introduction

Agathidinae is a moderately large subfamily the members of which are koinobiont endoparasitoids of lepidopterous larvae. For more general information on Agathidinae see Sharkey et al. (2006). As of 2005, roughly 1,000 species were described (Yu et al. 2005). The senior author (MJS), based on the number of new species in recent revisions (see below), believes that there are a magnitude more undescribed species. *Zosteragathis* is restricted to the Old World. It is very diverse with species richness in the hundreds, but most of these are undescribed. This paper is part of a series that investigates members of the massively paraphyletic genus *Bassus* s.l. (Sharkey and Clutts 2011, Sharkey et al. 2011a and b, Sharkey and Stelb 2012 and 2013, Sharkey and Chapman 2017a, b). The generic concept *Bassus* is now confined to a small clade restricted to The Palearctic and Oriental realms, *Zosteragathis* Sharkey (Sharkey and Chapman 2017a), includes 25 previously described species (24 currently recognized

as valid), all of which were previously included in the polyphyletic concepts of *Agathis* s.l., *Bassus* s.l. and *Therophilus* s.l. i.e.:

- Z. annuliferus* (Achterberg & Long, 2010), **comb. n.**, from *Therophilus*
- Z. annulus* (Chou & Sharkey, 1989), from *Bassus*
- Z. asper* (Chou & Sharkey, 1989), from *Bassus*
- Z. conformis* (Bhat & Gupta, 1977), from *Agathis*
- Z. contrasta* (Achterberg & Long, 2010), from *Therophilus* (as *contrastus*)
- Z. coryphe* (Nixon, 1950), from *Agathis*
- Z. depressa* (Chou & Sharkey, 1989), from *Bassus* (as *depressus*)
- Z. dravida* (Bhat & Gupta, 1977), from *Agathis*
- Z. elongator* (Achterberg & Long, 2010), from *Therophilus*
- Z. festiva* (Muesebeck, 1953), from *Agathis*
- Z. festivoides* (Sharkey, 1996), from *Bassus*
- Z. fujianicus* (Chen & Yang, 2006), from *Bassus*
- Z. gracilis* (Bhat & Gupta, 1977), from *Agathis*

Z. lienhuachihensis (Chou & Sharkey, 1989), from *Bassus*
Z. lini (Chou & Sharkey, 1989), from *Bassus*
Z. masoni (Bhat & Gupta, 1977), from *Agathis*
Z. nigrolineatus (Achterberg & Long, 2010), from *Therophilus*
Z. nuichuaensis (Achterberg & Long, 2010), from *Therophilus*
Z. oranae (Watanabe, 1970), (syn. of *Agathis festiva*, by Sharkey 1996)
Z. parasper (Achterberg & Long, 2010), from *Therophilus*
Z. punctiscutum (Achterberg & Long, 2010), from *Therophilus*
Z. robusta (Achterberg & Long, 2010), from *Therophilus* (as *robustus*)
Z. scutellatus (Achterberg & Long, 2010), from *Therophilus*
Z. sungkangensis (Chou & Sharkey, 1989), from *Bassus*
Z. tanycoleosus (Chen & Yang, 2006), from *Bassus*

Methods

Morphological terms: The length of the first metasomal median tergite is measured from the apex of the tendon emanating from the propodeum to the posterior border of the tergite. Metasomal median tergites are abbreviated as follows, T1 = metasomal median tergite 1, T2 = metasomal median tergite 2. T2–3 = metasomal median syntergite 2 + 3. Other terms are from Sharkey and Wharton (1997). Morphological terms used in this revision can be found in the Hymenoptera Anatomy Ontology (HAO; Yoder et al. 2010). To find definitions for any structure search for the term at <http://glossary.hymao.org>.

Museum acronyms

HIC Hymenoptera Institute Collection, University of Kentucky, Department of Entomology, Lexington, Kentucky, USA.
QSBG Queen Sirikit Botanic Gardens, Chiang Mai, Thailand.

Species description format: Descriptions are of the holotype; variation is given in parentheses. Color is not extensively described because the images serve this purpose; however color characters that are variable or of diagnostic significance are detailed. All species are treated with a diagnosis and distributional data. They are illustrated with color photos using a JVC digital camera mounted on a Leica MZ16 microscope and Automontage-R stacking software.

Species delimitation: We used evidence from molecular data (COI and 28S) and morphology to arrive at species concepts. Details are given in Sharkey and Stoelb (2013). Table 1 gives details on the COI distances within species of *Zosteragathis* as well as distances to the nearest species.

Specimen collection: As part of the inventory of Thai insects, three Malaise traps at each of 30 different localities throughout Thailand were operated from 2007–2010, com-

Table 1. COI divergence data COI data for each species. If a species has more than one terminal, both intra- and interspecific uncorrected p-distances are reported. Interspecific p-distances are to the nearest OTU in the COI tree (not shown). Values are averaged if two or more comparisons are made.

Species	Intraspecific variation	Interspecific variation	Nearest species
<i>Z. contrasta</i>	0.318%	3.899%	<i>Z. taemensis</i>
<i>Z. eukos</i>	–	5.234%	<i>Z. ngamensis</i>
<i>Z. hongensis</i>	–	1.414%	<i>Z. sakonensis</i>
<i>Z. inthanonensis</i>	–	5.801%	<i>Z. ngamensis</i>
<i>Z. krachanensis</i>	–	4.683%	<i>Z. nuichuaensis</i>
<i>Z. lampangensis</i>	0.491%	5.2365%	<i>Z. inthanonensis</i>
<i>Z. lampooensis</i>	0%	1.514%	<i>Z. taemensis</i>
<i>Z. lunagensis</i>	–	0%	<i>Zosteragathis</i> sp. n. 2
<i>Z. ngamensis</i>	–	5.801%	<i>Z. inthanonensis</i>
<i>Z. nuichuaensis</i>	0%	3.038%	<i>Zosteragathis</i> sp. n. 2
<i>Z. perkios</i>	–	5.221%	<i>Z. ngamensis</i>
<i>Z. petchaburiensis</i>	–	6.428%	<i>Z. contrastus</i>
<i>Z. phahompokensis</i>	–	1.972%	<i>Z. tonensis</i>
<i>Z. sakonensis</i>	–	1.414%	<i>Z. hongensis</i>
<i>Z. samensis</i>	0.920%	4.074%	<i>Z. surinensis</i>
<i>Zosteragathis</i> sp. n. 2	–	0%	<i>Z. lunagensis</i>
<i>Z. surinensis</i>	–	4.074%	<i>Z. samensis</i>
<i>Z. taemensis</i>	–	1.514%	<i>Z. lampooensis</i>
<i>Z. tonensis</i>	–	1.972%	<i>Z. phahompokensis</i>

prising approximately 90 trap-years. The specimens dealt with here are primarily from these traps. Two numbers, beginning with the letters “H” and “T” are listed for each specimen collected by our collaborators in Thailand. The H-number is the specimen number. Specimen information is stored in the Symbiota database (Gries et al. 2014) under the Hymenoptera Institute Collection (HIC). (Symbiota Collections of Arthropods Network; <http://symbiota4.acis.ufl.edu/scan/portal/>). To search for a specimen in the database, do the following: Under the Search tab (upper left of the screen), select Search Collections. Deselect all collections, and scroll down the Southeast section, put a check in the box next to Hymenoptera Institute Collection, scroll back up and hit the Search > button (right side of screen). H-numbered specimens are stored with a 4-letter prefix (HICH) followed by a 6-digit number. Therefore, H660, as it appears in this publication, is stored as HICH000660. To search for this specimen, scroll down to the Specimen Criteria section, type this number in the box next to Catalog Number and hit the search button. This displays a page with a summary of the specimen information. Clicking on Full Record Details opens a new window with the full specimen record, including all available images. The T-number is the number associated with a single Malaise trap for a single trapping period (usually one week). A complete list of these numbers and associated collection events is available from the authors upon request.

Links to species maps in this paper were generated from the Symbiota database. These are not static maps and as georeferenced specimens are added to the database, the maps will update in real time such that a reader

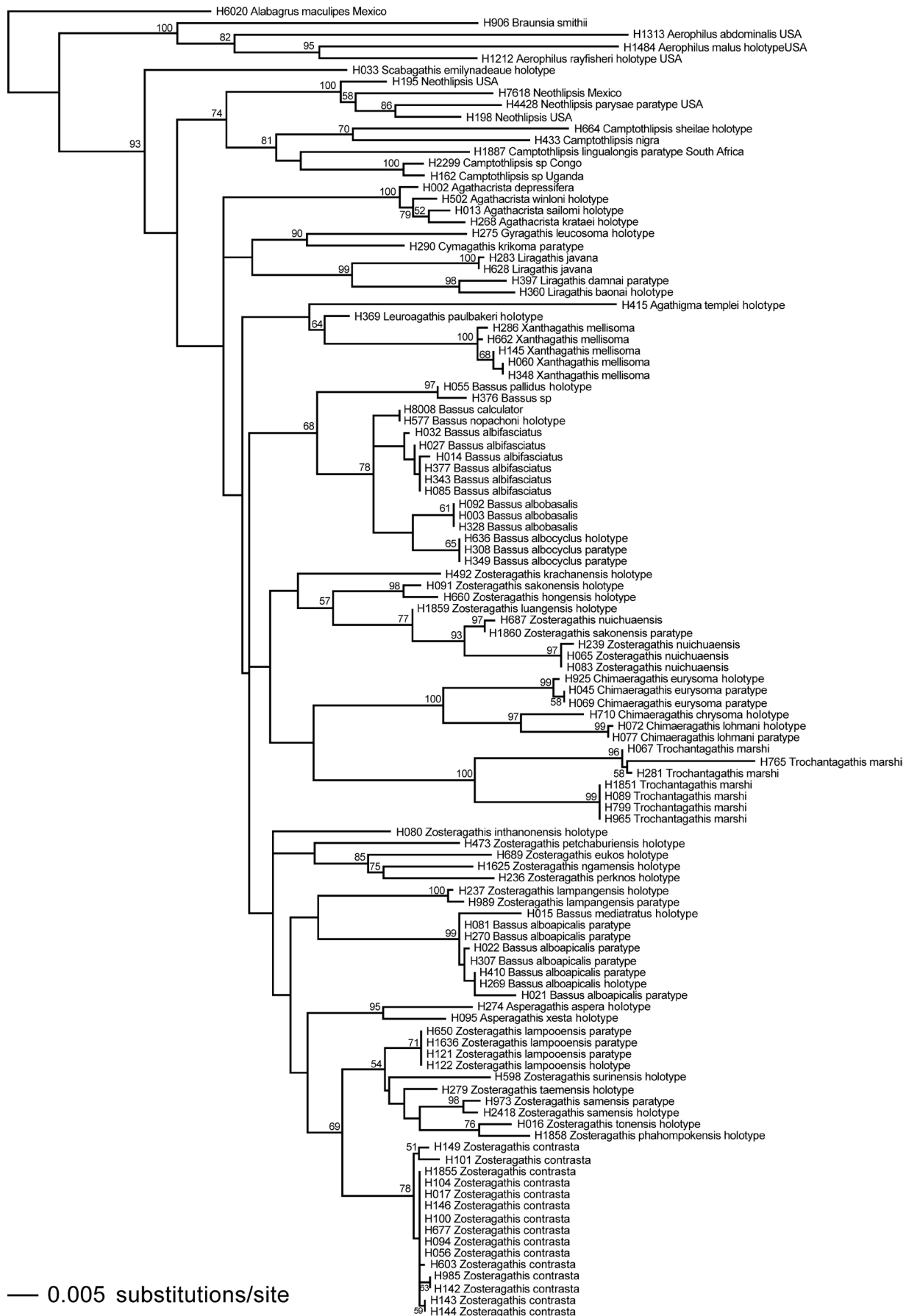


Figure 1. Tree of highest log-likelihood from 20 ML search reps of a combined COI+28S data set with bootstrap values $\geq 50\%$ (500 search replicates) plotted at the nodes. Tree modified from Sharkey and Chapman (2017a).

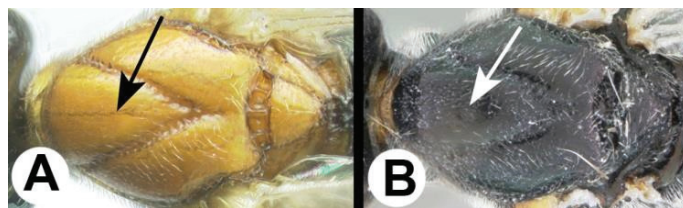
following a map link will see a map of all of the specimens of the taxon at hand in the database, including those that may have been added after this paper is published. Clicking on the dots on these maps links to the specimen record in the database.

Phylogenetic methods: The data set and analyses presented herein is from Sharkey and Chapman (2017a). In that paper, the *Zosteragathis* terminals were largely unnamed, leaving species descriptions for this paper. In short, we conducted maximum likelihood (ML) phylogenetic analyses on a concatenated COI + 28S dataset (1,313 total characters) using Garli (v. 2.01; Zwickl 2006). The 28S multiple alignment was assembled using the default settings on the MAFFT server (<http://mafft.cbrc.jp/alignment/server/>; v. 7; Katoh et al. 2006), and employing the Q-INS-i strategy which takes secondary RNA structure into account. All 28S bases were included in subsequent phylogenetic analyses. The data were partitioned by gene region and codon position (COI: 3 partitions; 28S: unpartitioned, total of 4 partitions). The most complex model available (GTR+I+G; Rodriguez et al. 1990) was applied to each partition as per recommendations of Huelsenbeck and Rannala (2004). A 20-replicate ML search for the tree of highest log-likelihood and a 500-replicate ML bootstrap analysis (Felsenstein 1985) were conducted using the default settings. Outgroup genera (*Alabagrus*, *Braunsia*, *Aerophilus*, *Camptothlipsis* and *Neothlipsis*) were selected based on two criteria: (1) they comprise genera that are members of three clades that are successively sister to the ingroup clade in the phylogeny in Sharkey and Chapman (2017b), and (2) full length sequences of COI and 28S were available for most of these OTUs. The data set analyzed herein is available from the authors upon request. All of the specimens for which we have DNA sequences are listed in Appendix I, including their accession numbers.

Phylogenetic considerations: Sharkey and Chapman (2017b) revised the agathidine tribes and showed that *Zosteragathis* falls within the Agathidini. They could not demonstrate the monophyly of *Zosteragathis*, but confounded with the choice of erecting four genera for morphologically uniform clades, or one genus for the lot, they opted for the latter. The cladogram in Figure 1 shows that none of basal clades that separate the four *Zosteragathis* clades have support, therefore it is entirely possible that the genus is monophyletic.

Key to Thai species of *Zosteragathis*

- 1 **A.** Mesoscutum pale, yellow to orange 2
- **B.** Mesoscutum melanitic, black 4



Results and discussion

Below is a discussion of the taxonomy of *Zosteragathis*, a key to the Thai species of this genus, and descriptions of each species.

Taxonomy

Zosteragathis Sharkey, 2017

Type species. *Zosteragathis samensis* Sharkey, 2017

Diagnosis. Most species can be recognized as members of this genus by the combination of finely microsculptured striae on T2 that end abruptly just anterior to the posterior margin of the tergite; this in combination with a pale colored band in the anterior half of T2, or T2 entirely black. Some species have reduced striae on T2 and are recognized by the lack of apomorphic structures that distinguish other closely related genera, e.g., claws not simple; interantennal space without a sharply declivous keel; T1 without prominent lateral carinae or medial carina; fore tarsus without spines or pegs.

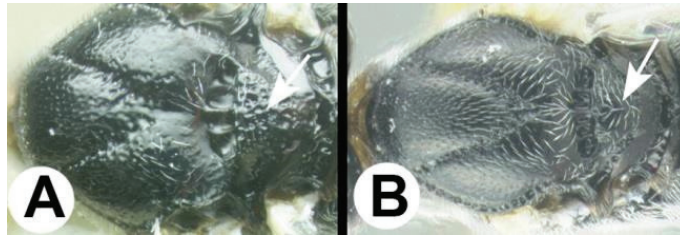
Description. See Sharkey and Chapman 2017a.

Biology. Hosts are unknown for all Thai species however there are records for three extra-Thailand species. These appear to suggest that the host range is wide. The records are: *Zosteragathis coryphe* was reared from *Phycodes radiata* (Sesioidea: Brachodidae) (Nixon 1950). *Zosteragathis festiva* (Muesebeck) was reared from *Grapholitha molesta*, oriental fruit moth, (Tortricoidea: Tortricidae) and many other Lepidoptera from a wide range of families, i.e., Blastobasidae, Gelechiidae, Cossidae, Carposinidae, Noctuidae, and Pyralidae. See Yu (2012) for a complete list. *Zosteragathis robusta* (Achterberg and Long) from Vietnam was reared from “*Omiodes indicata* (Lepidoptera: Pyralidae: Pyraustinae) on soybean (*Glycine max* (Linnaeus)), according to the label data”, (van Achterberg and Long 2010).

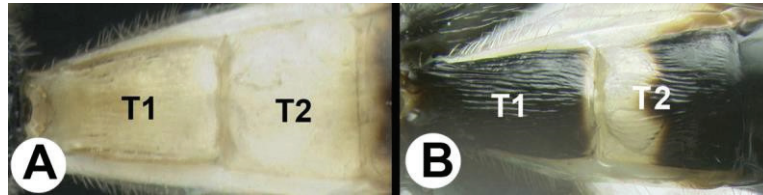
Distribution. Australian, Ethiopian, Oceania, Oriental, and eastern Palearctic regions.

Etymology. From the Greek *zoster*, meaning “belt or girdle” and *agathis* the type genus of the subfamily. *Zoster* is a reference to the diagnostic pale colored transverse band that is usually present on T2. The gender is feminine.

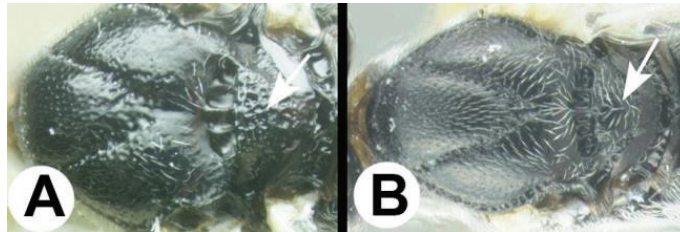
- 2 **A.** Scutellum rugose; T2 distinctly longer than wide; head mostly or entirely yellow to orange *Z. ngamensis*
 – **B.** Scutellum smooth with punctures; T2 as wide as long or wider; head mostly or entirely black; pale color, if present restricted to the gena 3



- 3 **A.** T1 mostly or entirely pale (white to yellow) *Z. hongensis*
 – **B.** T1 mostly or entirely melanic (brown to black) *Z. contrasta*



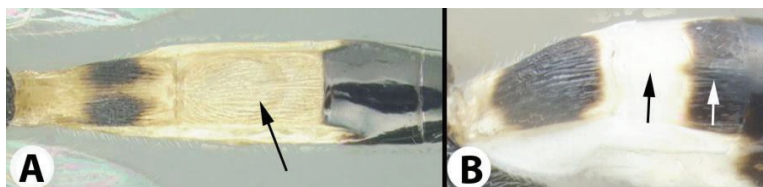
- 4 **A.** Scutellum rugose 5
 – **B.** Scutellum smooth with punctures 7



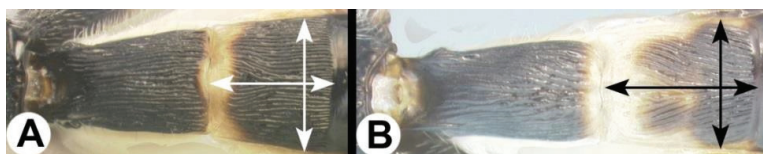
- 5 **A.** T2 as wide as long or wider *Z. nuichuaensis*
 – **B.** T2 distinctly longer than wide 6



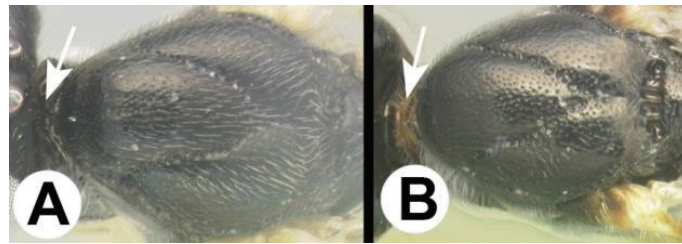
- 6 **A.** T2 entirely or almost entirely (80%) pale (white to yellow) *Z. krachanensis*
 – **B.** T2 mostly pale (white to yellow) in anterior half and mostly melanic (brown to black) in posterior half .. *Z. luangensis*



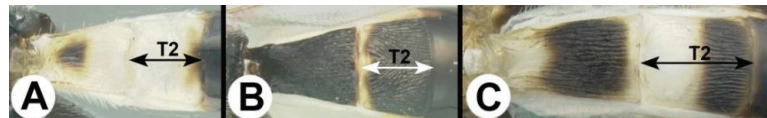
- 7 **A.** T2 as wide as long or wider 18
 – **B.** T2 distinctly longer than wide 8



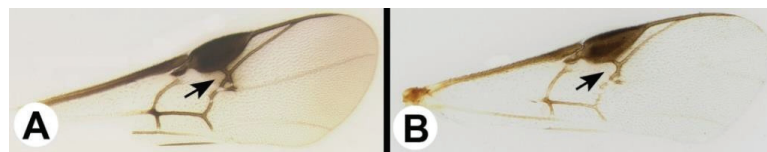
- 8 **A.** Pronotum melanic dorsomedially, concolorous with lateral surfaces of pronotum 9
 – **B.** Pronotum pale dorsomedially (yellow to orange), contrasting with melanic lateral surfaces of pronotum 11



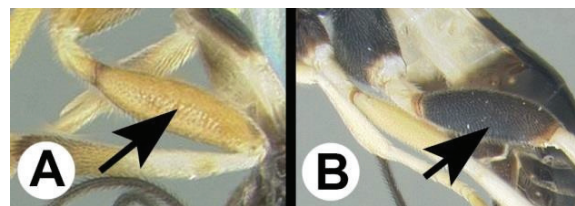
- 9 **A.** T2 entirely or almost entirely (>70%) pale (white to yellow) *Z. lampangensis*
 – **B.** T2 entirely or almost entirely (>70%) melanic (dark brown to black) 10
 – **C.** T2 mostly pale (white to yellow) in anterior half and mostly melanic (brown to black) in posterior half *Z. inthanonensis*



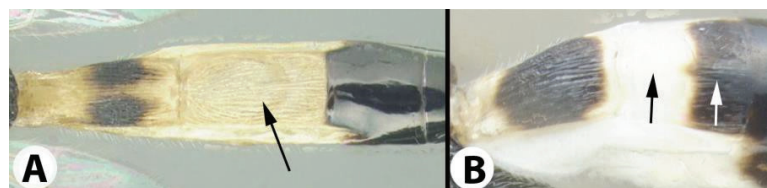
- 10 **A.** Fore wing with a small infusate area posterior to stigma; apex of T1 yellow *Z. inthanonensis*
 – **B.** Fore wing without a small infusate area posterior to stigma; apex of T1 melanic (brown to black) *Z. perkno*



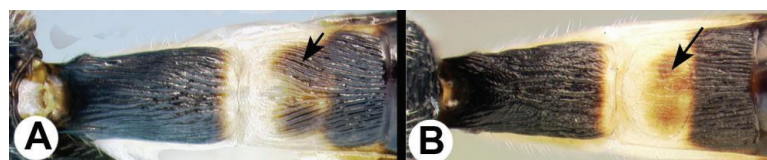
- 11 **A.** Hind femur mostly or entirely pale, yellow to orange 12
 – **B.** Hind femur mostly or entirely melanic, brown to black 13



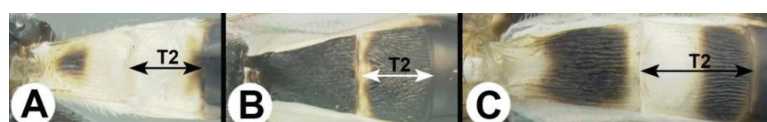
- 12 **A.** T2 entirely or almost entirely (80%) pale (white to yellow) *Z. lampangensis*
 – **B.** T2 mostly pale (white to yellow) in anterior half and mostly melanic (brown to black) in posterior half ... *Z. surinensis*



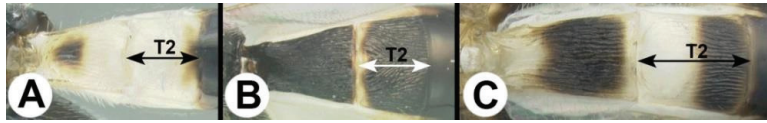
- 13 **A.** Striae of T2 curving towards the midline 14
 – **B.** Striae of T2 relatively straight 15



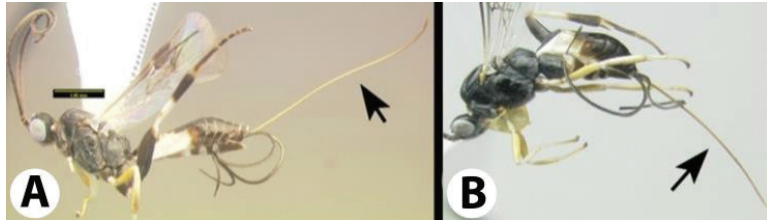
- 14 **A.** T2 entirely or almost entirely (>70%) pale (white to yellow) *Z. lampangensis*
 – **B.** T2 entirely or almost entirely (>70%) melanic (dark brown to black); or **C.** T2 mostly pale (white to yellow) in anterior half and mostly melanic (brown to black) in posterior half *Z. phuphanensis*



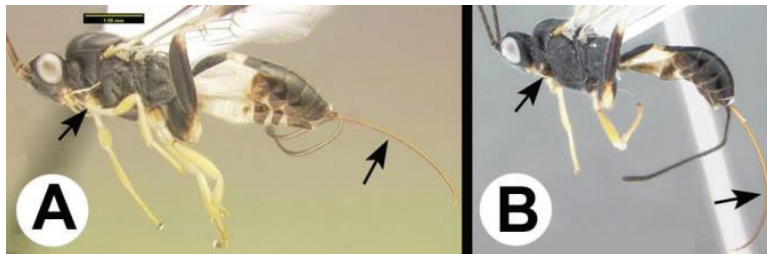
- 15 **A.** T2 entirely or almost entirely (>70%) pale (white to yellow) *Z. lampangensis*
 – **B.** T2 entirely or almost entirely (>70%) melanic (dark brown to black) *Z. lampooensis*
 – **C.** T2 mostly pale (white to yellow) in anterior half and mostly melanic (brown to black) in posterior half 16



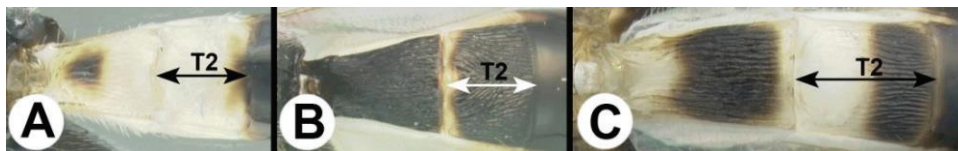
- 16 **A.** Exposed portion of ovipositor longer than body length *Z. tonensis*
 – **B.** Exposed portion of ovipositor equal to or shorter than body length 17



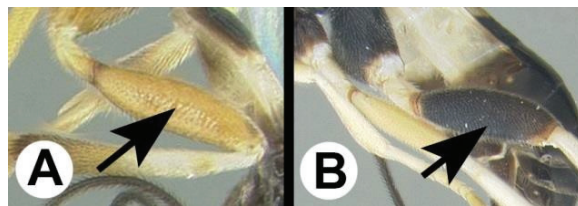
- 17 **A.** Fore coxa mostly or entirely yellow *Z. lampooensis*
 – **B.** Fore coxa mostly or entirely melanic *Z. hinensis*



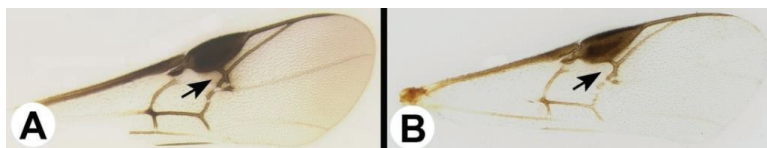
- 18 **A.** T2 entirely or almost entirely (>70%) pale (white to yellow) *Z. sakonensis*
 – **B.** T2 entirely or almost entirely (>70%) melanic (dark brown to black) 19
 – **C.** T2 mostly pale (white to yellow) in anterior half and mostly melanic (brown to black) in posterior half 22



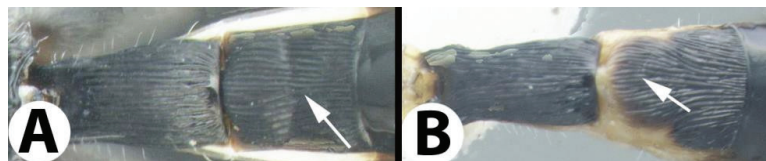
- 19 **A.** Hind femur mostly or entirely pale, yellow to orange *Z. sakaeratensis*
 – **B.** Hind femur mostly or entirely melanic, brown to black 20



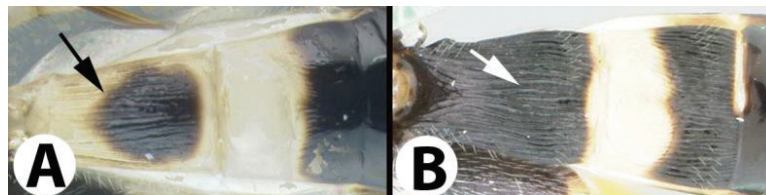
- 20 **A.** Fore wing with a small infusate area posterior to stigma *Z. chaiyaphumensis*
 – **B.** Fore wing without a small infusate area posterior to stigma 21



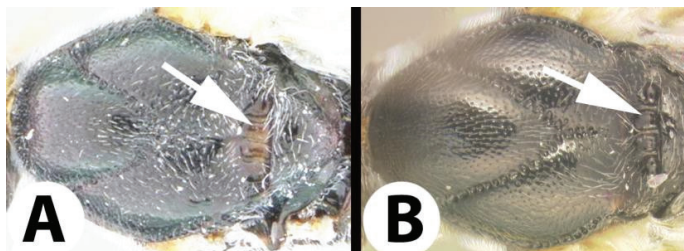
- 21 **A.** T2 almost entirely melanic *Z. eukos*
 – **B.** T2 mostly melanic, but pale, yellow to orange, anteriorly and anterolaterally *Z. petchaburiensis*



- 22 **A.** T1 extensively pale, white to yellow, basally *Z. phahompokensis*
 – **B.** T1 mostly or entirely melanic basally 23



- 23 **A.** Scutellar groove pale, yellowish brown, significantly lighter than remainder of mesonotum *Z. taemensis*
 – **B.** Scutellar groove melanic, concolorous with remainder of mesonotum *Z. samensis*



Species descriptions

Zosteragathis chaiyaphumensis Sharkey, sp. n.

<http://zoobank.org/E98CD31C-4FC2-469C-995B-CB9AFBC9B0C5>

Diagnosis. Fore wing with a small infuscate area posterior to stigma. T2 entirely or almost entirely (80%) melanic. T2 as wide as long or wider.

Description. Body length 5.6 mm. Ovipositor length 3.7 mm. Ovipositor 0.7× body length. Number of flagellomeres 32. Notauli sculpture not significantly wider posteriorly. Scutellum smooth with punctures. Mid tibia with 4 apical and 3 preapical spines. Hind tibia with 10 spines/pegs. Second submarginal cell diameter large, about same size as pedicel length. Wing hyaline with an infuscate patch posterior to stigma. T2 0.9× longer than wide. T2 entirely striate, striae converging anteromedially.

Color. head black except gena yellow; mesosoma black; fore and mid coxa black; T1 entirely black; anterior margin of T2 yellow.

Etymology. Named after the type locality Chaiyaphum Province.

Material examined. Holotype: Female: *Thailand*, Chaiyaphum: Pa Hin Ngam NP, Mix deciduous forest, 15.578°N, 101.435°E, 419 m elev., Malaise trap, 19–25.v.2007 (H2442, T2601), Katae Sa-nog & Buakaw Adnafai. **Paratype:** Female: *Thailand*, Chiang Mai, Doi Chiangdao NP, Pha Tang substation, 19.416°N, 98.915°E,

526 m elev., Malaise trap, 3–9.v.2008 (H2434, T5802), S. Jugsu & A. Watwanich.

For a map of examined material, see: <https://bit.ly/2DZycUy>

Zosteragathis contrasta (Achterberg & Long)

Therophilus contrastus Achterberg & Long, 2010

Diagnosis. Head black; mesoscutum orange.

Description. Body length 5.2 mm. Ovipositor length 3.5 mm. Ovipositor 0.7× body length. Number of flagellomeres 34 (32–39). Sculpture of notauli slightly increasing in width posteriorly but not extending onto lateral lobes of mesoscutum. Scutellum smooth with punctures. Mid tibia with 2 apical and 3 preapical spines. Hind tibia with 7 spines/pegs. Second submarginal cell diameter small, not much larger than width of pedicel. Wing hyaline, without distinct infuscate areas. T2 1× longer than wide. T2 mostly smooth with hints of longitudinal striae especially medially. **Color:** head black except lower gena yellow; pro and mesothorax orange except ventral mesopleuron melanic; metathorax and propodeum melanic; fore and mid coxae mostly yellow; apex of T1 and lateral and anterior margins of T2 yellow.

Material examined. Holotype: not examined. **Paratypes:** not examined. **Non-type specimens:** All female: *Thailand:* Hua Khakhaer 6, iii.1986 (H5908, H5998,

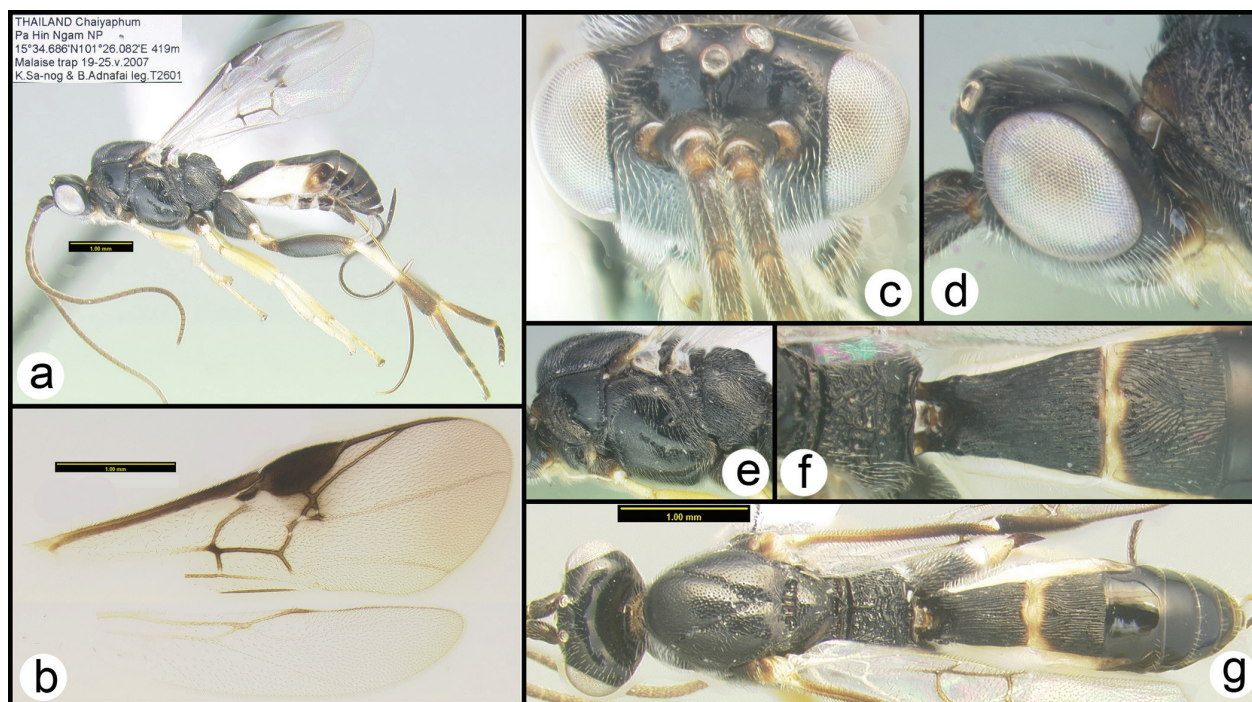


Figure 2. *Z. chalybaphumensis*: **a)** lateral habitus. **b)** wings. **c)** dorsal head. **d)** lateral head. **e)** lateral mesosoma. **f)** dorsal propodeum and T1-2. **g)** dorsal habitus.

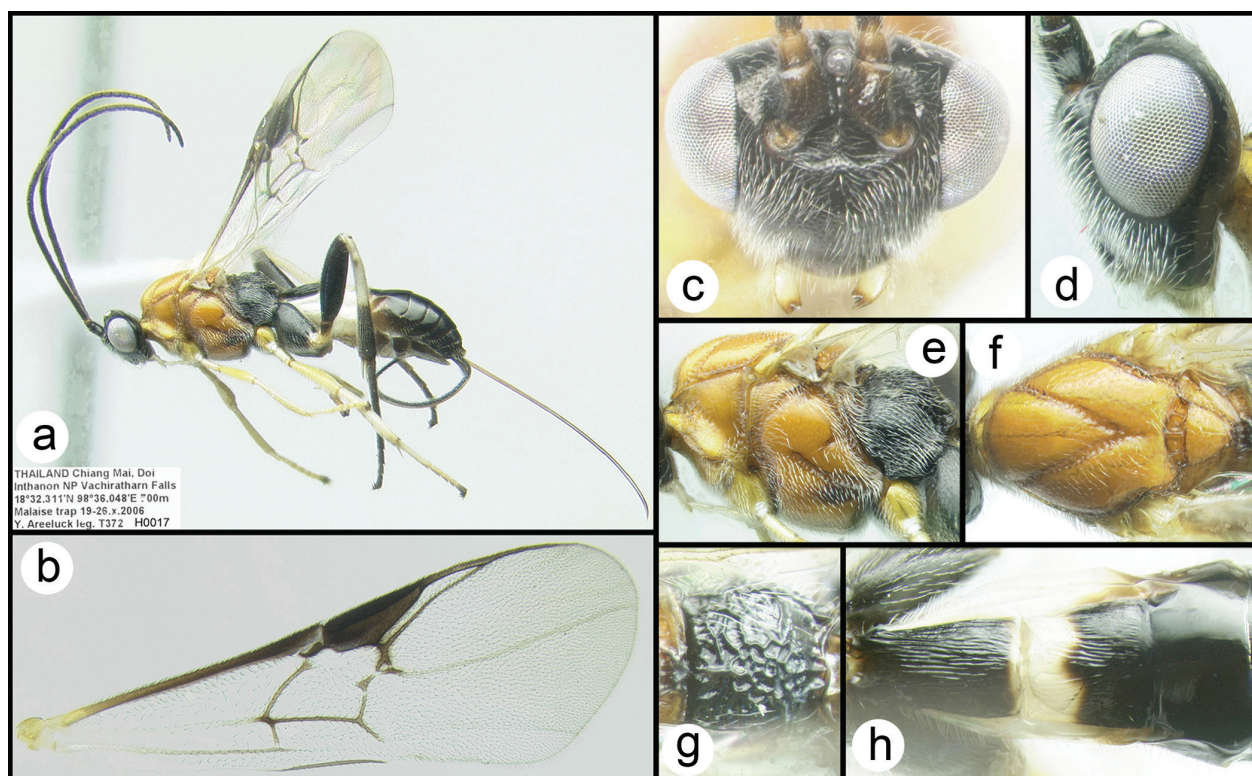


Figure 3. *Z. contrasta*: **a)** lateral habitus. **b)** fore wing. **c)** anterior head. **d)** lateral head. **e)** lateral mesosoma. **f)** dorsal mesoscutellum. **g)** propodeum. **h)** T1-3.

H5999), M.G. Allen; Chaityaphum, Pa Hin Ngam NP, Dry dipterocarp, 15.635°N, 101.399°E, 698 m elev., Malaise trap, 18–24.viii.2006 (H1855, T448), Katae Sa-nog & Buakaw Adnafai; Chaityaphum, Pa Hin Ngam NP, Dry ev-

ergreen next to creek, 15.676°N, 101.445°E, 461 m elev., Malaise trap, 19–23.xii.2006 (H5916, T1353), Katae Sa-nog & Buakaw Adnafai; Chaityaphum, Pa Hin Ngam NP, Mixed deciduous forest (Thepana waterfall), 15.649°N,

- 101.418°E, 614 m elev., Malaise trap, 13–19.x.2006 (H5918, T662), Katae Sa-nog & Buakaw Adnafai; Chaiyaphum, Tat Tone NP, Chaiyapoom forest fire station, 16.013°N, 102.021°E, 195 m elev., Malaise trap, 19–23.xii.2006 (H100, T1372), Tawit Jaruphan & Orawan Budsawong; Chaiyaphum, Tat Tone NP, beside Sapsomboon substation, 16.013°N, 101.975°E, 648 m elev., Malaise trap, 5–12.v.2007 (H437, T2569), Tawit Jaruphan & Orawan Budsawong; Chiang Mai, Doi Chiang Dao WS, Nature trail, 19.4046°N, 98.9218°E, 491 m elev., Malaise trap, 30.ix–7.x.2007 (H5539, T3174), Songkran & Apichart; Chiang Mai, Doi Chiangdao NP, Headquarter, 19.405°N, 98.922°E, 491 m elev., Malaise trap, 1–8.iv.2008 (H924, T5780), 8–15.iv.2008 (H5979, T5792), S. Jugsu & A. Watwanich; Chiang Mai, Doi Inthanon NP, Vachirathan Falls, 18.539°N, 98.601°E, 700 m elev., Malaise trap, 21–27.ix.2006 (H5922, T341), 19–26.x.2006 (H017, T372), 17–24.xi.2006 (H094, T1861), 8–15.xii.2006 (H5913, T1933), 22–29.xii.2006 (H5923, T1935), Y. Areeluck; Chiang Mai, Doi Inthanon NP, campground pond, 18.544°N, 98.525°E, 1200 m elev., Malaise trap, 15–22.vii.2006 (H5930, T68), 9–16.viii.2006 (H5917, T175), Y. Areeluck; Chiang Mai, Queen Sirikit Botanic Garden, 18.881°N, 98.862°E, 811 m elev., Malaise trap, 4–13.iii.2009 (H399), 20–27.iii.2009 (H385), 3–18.iv.2009 (H643), 8–30.iv.2009 (H688), 30.iv–12.v.2009 (H341), 19–26.v.2009 (H312), 9–16.vi.2009 (H695), 16–23.vi.2009 (H569, H570, H571), 23–30.vi.2009 (H566, H567, H568), 30.vi–10.vii.2009 (H520), K. Kaewjanta & R. Sawkord; Kanchanaburi, Khuean Srinagarindra NP, Tha Thung-na, Chong Kraborg, 14.5°N, 98.884°E, 210 m elev., Malaise trap, 26.ii–5.iii.2009 (H534, H536, T4779), 12–19.iii.2009 (H985, T4781), 19–26.iii.2009 (H2437, T4780), Boonnam & Phumarin; Lampang, Chae Son NP, Campground#3, 18.831°N, 99.471°E, 487 m elev., Malaise trap, 8–14.x.2007 (H4112, T5324), 21–28.x.2007 (H4100, H4105, T5313), B. Kwannui & A. Sukpeng; Lampang, Chae Son NP, Hot spring, 18.835°N, 99.475°E, 493 m elev., Malaise trap, 1–8.xii.2007 (H5920, T2892), 14–21.xii.2007 (H5915, T2893), Boonruen & Acharapaun; Lampang, Chae Son NP, Nursery, 18.832°N, 99.469°E, 485 m elev., Malaise trap, 21–28.xi.2007 (H983), B. Kwannui & A. Sukpeng; Lampang, Chae Son NP, Youthcamp, 18.8304°N, 99.4709°E, 455 m elev., Malaise trap, 15–21.iv.2008 (H5532, T5418), B. Kwannui & A. Sukpeng; Lampang, Chae Son NP, beside office, 18.834°N, 99.473°E, 447 m elev., Malaise trap, 1–8.x.2007 (H5921, T2840), Bunruen Kwannui & Acharaporn Sukpeng; Loei, Phu Kradueng NP, Mixed deciduous forest south of Na Noy Forest Unit, 16.818°N, 101.794°E, 275 m elev., Malaise trap, 14–20.xi.2006 (H104, T1074), Suthin Gong-lasae; Loei, Phu Kradueng NP, Mixed deciduous, N Na Noy office, 16.803°N, 101.795°E, 276 m elev., Malaise trap, 14–21.v.2008 (H601, T5007), 21–28.v.2008 (H2405, H2414, T5015), Thonghuay Phatai; Thailand, Loei, Phu Ruea NP, Reservior, 17.48°N, 101.356°E, 931 m elev., Malaise trap, 19–26.i.2007 (H101), Patikhom Tumtip; Mae Hong Son, Namtok Mae Surin NP, E Huai Fai Kor reservoir, 19.344°N, 97.988°E, Malaise trap, 27.i–3.ii.2008 (H451, T3496), 6–13.iv.2007 (H936, T6033), 9–16.ix.2007 (H984, T5891), 14–21.x.2007 (H994, T5917), 28.x–4.xi.2007 (H982, T5924), 18–25.xi.2007 (H980, T5942), A. Kamkhun & M. Kaewmanee; Mae Hong Son, Namtok Mae Surin NP, 19.36°N, 97.988°E, 228 m elev., Malaise trap, 30.iii–6.iv.2008 (H919, T6024), 4–11.v.2008 (H472, T3512), Manu Kaewmanee; Mae Hong Son, Namtok Mae Surin NP, E Huai Fai Kor reservoir, 19.344°N, 97.988°E, Malaise trap, 3–10.ii.2008 (H616, T3497), 4–11.v.2008 (H327, T3516), A. Kamkoon; Mae Hong Son, Namtok Mae Surin NP, Haad Saen, 19.348°N, 97.985°E, Malaise trap, 1–8.vi.2008 (H445, H446, H5976, T3527), 4–11.v.2008 (H311, T3508), J. Kaewmanee; Mae Hong Son, Namtok Mae Surin NP, Nature trail, 19.344°N, 97.988°E, 334 m elev., Malaise trap, 30.ix–7.x.2007 (H2420, T5901), 7–14.x.2007 (H969, T5904), 21–28.x.2007 (H959, T5921), Areerat Kamkhun; Mae Hong Son, Namtok Mae Surin NP, Visitor's center, 19.36°N, 97.988°E, 228 m elev., Malaise trap, 11–18.xi.2007 (H976, T5930), Manu Namadkum; Nakhon Nayok, Khao Yai NP, Lum Ta Kong View Point, 14.426°N, 101.391°E, 726 m elev., Malaise trap, 12–19.iv.2007 (H5909, T2124), Wirat Sukho; Nakhon Nayok, Khao Yai NP, secondary forest near Hnong Pakchee, 14.453°N, 101.364°E, 758 m elev., Malaise trap, 5–12.v.2007 (H142), Pong Sandao; Petchaburi, Kaeng Krachan NP, Panernthung, km27, 12.822°N, 99.371°E, Malaise trap, 11–18.i.2009 (H651, T4401), Sirichai; Phetchabun, Khao Kho NP, Deciduous forest at Ta Pol river, 16.543°N, 101.041°E, 242 m elev., Malaise trap, 26.v–2.vi.2007 (H491, T2557), Somchai Chachumnan & Saink Singtong; Phetchabun, Khao Kho NP, Mixed deciduous forest, 16.542°N, 101.041°E, 524 m elev., Malaise trap, 5–12.xii.2006 (H143, H144, H149, T1179), 19–26.xii.2006 (H146, T1184), 26.xii.2006–2.i.2007 (H5919, T1189), Somchai Chachumnan & Saink Singtong; Prachuab Khiri Khan, Khao Sam Roi Yot NP, 30m N, protection unit4, 12.268°N, 99.944°E, 1 m elev., Malaise trap, 24–31.v.2009 (H489, T4833), Yai Amnad; Prachuab Khiri Khan, Khao Sam Roi Yot NP, Don Tone Sone beach, 12.122°N, 99.968°E, 1 m elev., Malaise trap, 10–17.v.2009 (H2784), Yai Amnad; Prachuab Khiri Khan, Khao Sam Roi Yot NP, Khao Look Glang, 12.107°N, 99.955°E, Malaise trap, 1–8.ii.2009 (H378, H387, H392, T4187), 2–9.xi.2008 (H429, T4124), 9–16.xi.2008 (H2417, T4125), 23–30.xi.2008 (H402, T4140), 7–14.xii.2008 (H382, H669, T4142), 8–15.ii.2009 (H629, T4188), Yai, Amnad; Prachuab Khiri Khan, Khao Sam Roi Yot NP, Laem Sala beach, 12.204°N, 100.013°E, Malaise trap, 20–27.vii.2008 (H5902, T3014), Yai & Amnad; Prachuab Khiri Khan, Khao Sam Roi Yot NP, Nursery, 12.126°N, 99.958°E, Malaise trap, 29.vi–6.vii.2008 (H5900, T3049), 6–13.vii.2008 (H5912, T3035), Pan trap, 2–3.vii.2008 (H5903, T3034), Amnad & Yai; Prachuab Khiri Khan, Khao Sam Roi Yot NP, Saline wetland, Pa Gwad, N, 12.153°N, 99.972°E, Malaise trap, 28.xii.2008–4.i.2009 (H317, T4169), 25.i–1.ii.2009 (H2426, T4190), Yai & Amnad; Prachuab Khiri Khan, Khao Sam Roi Yot NP, foot of Khao Taen, 12.146°N, 99.966°E, 1 m elev., Malaise trap, 10–

17.v.2009 (H364, H2872, T4828), 17–24.v.2009 (H362, T4831), 24–31.v.2009 (H709, H711, T4834), Yai & Amnad; Sakon Nakhon, Phu Phan NP, Dry evergreen near house no. 1567, 16.81°N, 103.892°E, 512 m elev., Malaise trap, 16–22.vi.2007 (H1856), 22–28.vi.2007 (H5911, T2501), Winlon Kongnara; Suphanburi, Pu Toei NP, Huai Mongpae, red road, 14.95°N, 99.446°E, 300 m elev., Malaise trap, 24–31.vii.2008 (H5907, T3120); Suphanburi, Pu Toei NP, Phu Toei hill top, road, 14.955°N, 99.45°E, 650 m elev., Malaise trap, 24–31.vii.2008 (H5910, T3134), L. Saunbua; Suphanburi, Pu Toei NP, Pu Krathing waterfall, 14.815°N, 99.46°E, 200 m elev., Malaise trap, 21–28.v.2009 (H677), P. Wangkum; Surat Thani, Khao Sok NP, Headquarter, 8.915°N, 98.53°E, 115 m elev., Malaise trap, 31.viii–8.ix.2008 (H672, T3359), 17–24.iii.2009 (H603, H608, H609, H622, T4471), Buathong & Pongphan; Trang, Khaochong, 7.551°N, 99.789°E, 75 m elev., Malaise trap, 18–21.iii.2005 (H056); **Vietnam**, Dak Lak Prov., EASO National Park, 12.918°N, 108.633°E, Malaise trap, 18.iii.2009 (H7995).

For a map of examined material, see: <https://bit.ly/2q4eDp2>

Distribution. Vietnam and Thailand.

Zosteragathis eukos Sharkey, sp. n.

<http://zoobank.org/0F316EA6-9110-4218-8415-79F01AD086F6>

Etymology. *Eukos* is Greek for milky white; here it is a reference to the color of the base of the hind tibia.

Diagnosis. T2 almost entirely melanic and longer than wide; fore wing lacking infusate patch posterior to stigma; similar to *Z. annuliferus* (Achterberg and Long 2010) but dimensions of T1 and T2 differ.

Description. Body length 4.9 mm. Ovipositor length/body length ratio = 0.8. Interantennal space with a flat triangular elevation that narrows to a short ridge posteriorly and then divides into two short indistinct carinae that approach the median ocellus. Antenna with 32 flagellomeres. Third labial (penultimate) palpomere minute, barely visible and much smaller than apical palpomere. Scutellar groove with 3 longitudinal ridges. Fore tibia lacking thickened spines; mid tibia with 3 pegs; hind tibia with 10 pegs.

Specimens examined. Holotype female, THAILAND, Suphanburi, Pu Toei NP, car park, Pu Krathing waterfall, 14°48.922'N, 99°27.52'E, 200 m elev., Malaise trap, 21–28.iv.2009 (H689, T4610), Wangkum, leg.

For a map of examined material, see: <https://bit.ly/2I4SQEY>

Zosteragathis hinensis Sharkey, sp. n.

<http://zoobank.org/3D4A0CE0-16B9-442F-9B17-3110C1EADD9B>

Diagnosis. Mesoscutum black. Fore coxa mostly melanic. Hind femur melanic, brown to black. T2 mostly pale in anterior half and mostly melanic in posterior half. T2 as wide as long or wider.

Description. Body length 4.5 mm. Ovipositor length 3.6 mm. Ovipositor 0.8× body length.

Number of flagellomeres 31. Notauli sculpture not significantly wider posteriorly. Scutellum smooth with punctures. Mid tibia with 2 apical and 3 preapical spines. Hind tibia with 6 spines/pegs. Second submarginal cell diameter large, about same size as pedicel length. Wing hyaline with an infusate patch posterior to stigma. T2 0.9× longer than wide. T2 entirely striate, striae relative straight throughout.

Color. Head black; mesosoma black; fore and mid coxa black; posterior border of T1 yellow; T2 yellow in basal half.

Etymology. Named after the type locality Pa Hin Ngam National Park.

Material examined. **Holotype:** Female: **Thailand**, Chaiphaphum, Pa Hin Ngam NP, Deciduous forest, 15.666°N, 101.453°E, 357 m elev., Malaise trap, 1–7.vi.2007 (H278, T2472), Katae Sa-nog & Buakaw Adnafai.

For a map of examined material, see: <https://bit.ly/2E2Qcxq>

Zosteragathis hongensis Sharkey, sp. n.

<http://zoobank.org/DC9A51BD-C186-48FF-87DE-344387B377DA>

Diagnosis. Head mostly black; mesoscutum orange; T1 mostly and T2 entirely white of pale whitish yellow.

Description. Body length 3.6 mm. Ovipositor length 2.8 mm. Ovipositor 0.8× body length. Number of flagellomeres 30. Notauli sculpture not significantly wider posteriorly. Scutellum smooth with punctures. Mid tibia with 3 apical and 2 preapical spines. Hind tibia with 7 spines/pegs. Second submarginal cell diameter minute, about equal to width of pedicel. Wing hyaline, without distinct infusate areas. T2 0.8× longer than wide. T2 mostly smooth with fine wrinkles, only a hint of longitudinal striae. **Color:** head black except lower gena and clypeus yellow; pronotum and mesonotum orange; propodeum, mesopleuron and metapleuron black; T1 and T2 mostly or entirely white or pale whitish yellow; anterior margin of T3 white or pale whitish yellow.

Etymology. Named after the type locality Mae Hong Song Provence.

Material examined. **Holotype:** Female: **Thailand**, Mae Hong Son, Namtok Mae Surin NP, E Huai Fai Kor reservoir, 19.344°N, 97.988°E, 311 m elev., Malaise trap, 18–25.v.2008 (H660, T3518), Kamkoon, A. **Paratype:** Female: **Thailand**, Mae Hong Son, Namtok Mae Surin NP, Visitor's center, 19.3598°N, 97.9875°E, 228 m elev., Malaise trap, 20–27.iv.2008 (H3819, T6045), Areerat Kamkhun.

For a map of examined material, see: <https://bit.ly/2E2QgNG>

Zosteragathis inthanonensis Sharkey, sp. n.

<http://zoobank.org/44EBAC09-1B13-44BD-8AD1-0CCB808F5E05>

Diagnosis. Pronotum melanic dorsomedially, concolorous with lateral surfaces of pronotum.

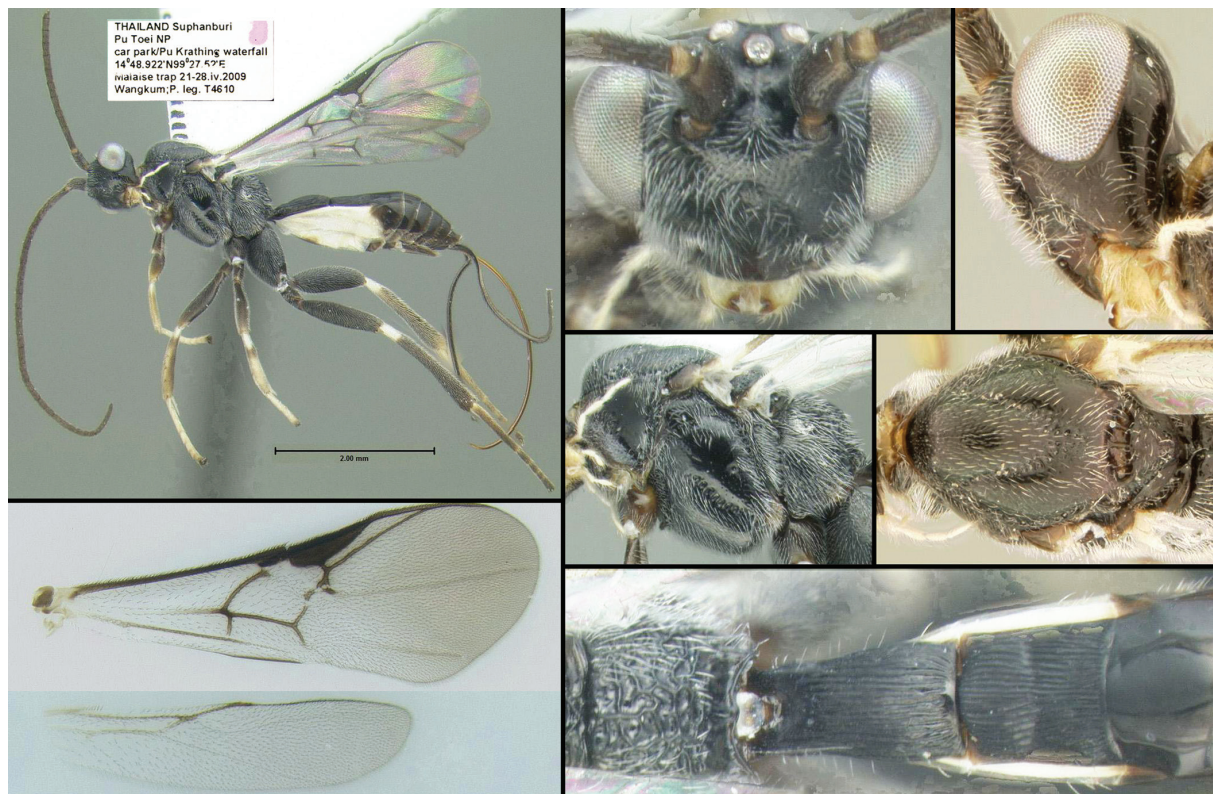


Figure 4. *Zosteragathis eukos* holotype female. **a)** lateral habitus. **b)** wings. **c)** anterodorsal head. **d)** lateral head. **e)** lateral mesosoma. **f)** dorsal thorax. **g)** propodeum and metasomal terga 1-3.

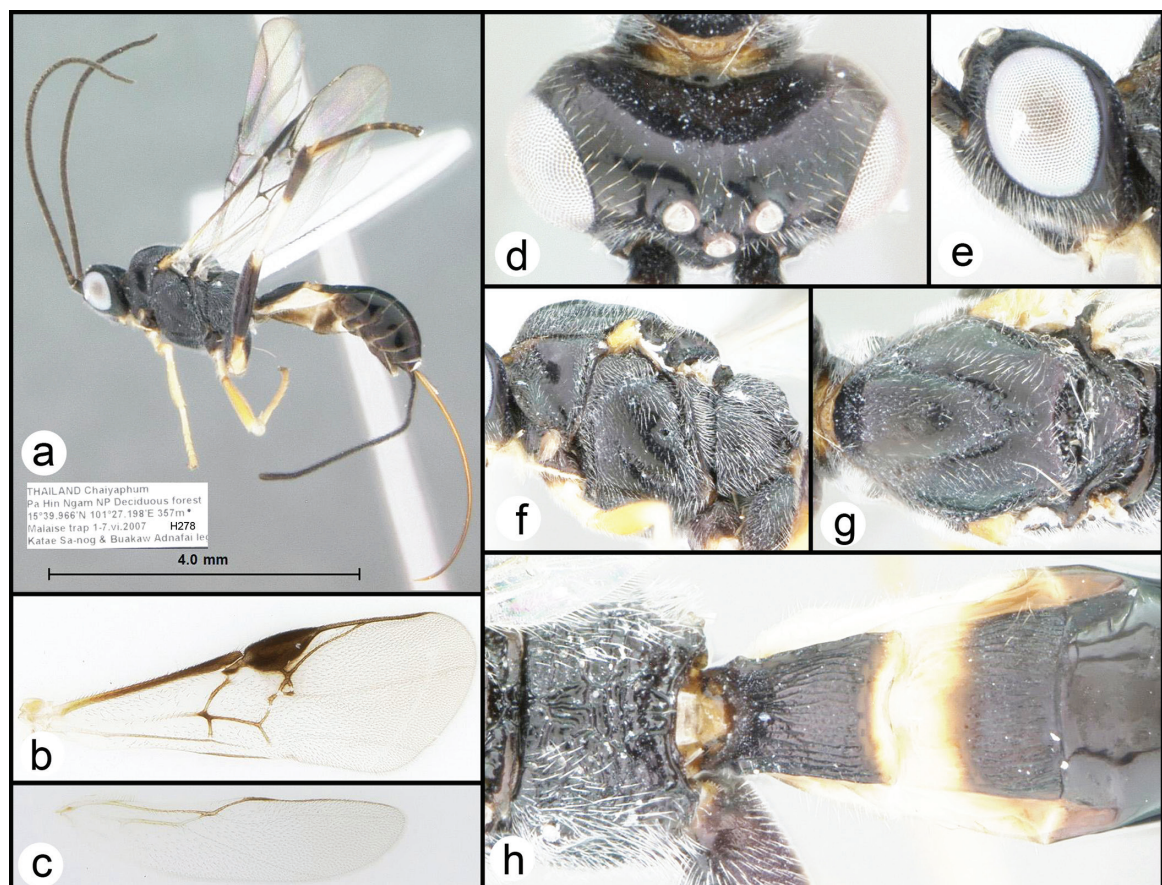


Figure 5. *Z. hinensis*: **a)** lateral habitus. **b)** fore wing. **c)** hind wing. **d)** dorsal head. **e)** lateral head. **f)** lateral mesosoma. **g)** dorsal mesoscutum **h)** dorsal propodeum and T1-3.

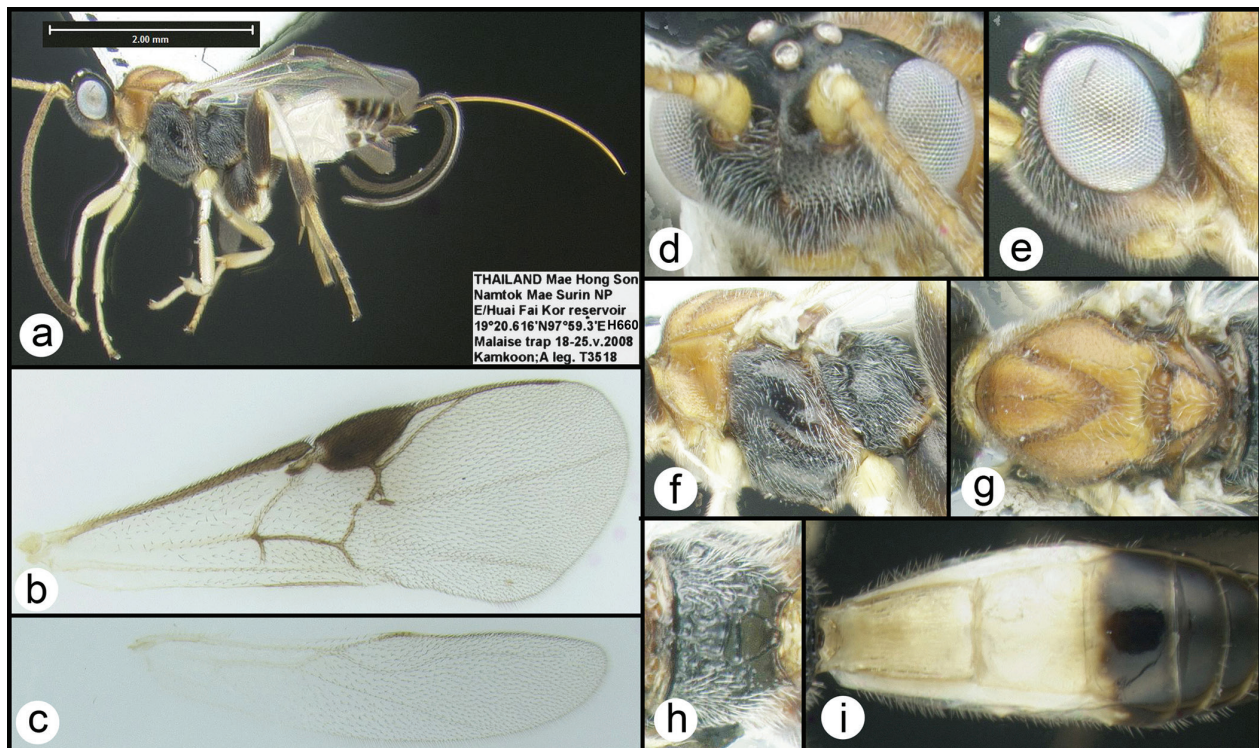


Figure 6. *Z. hongensis*: a) lateral habitus. b) fore wing. c) hind wing. d) anterior head. e) lateral head. f) lateral mesosoma. g) dorsal mesoscutum h) propodeum. i) T 1–5.

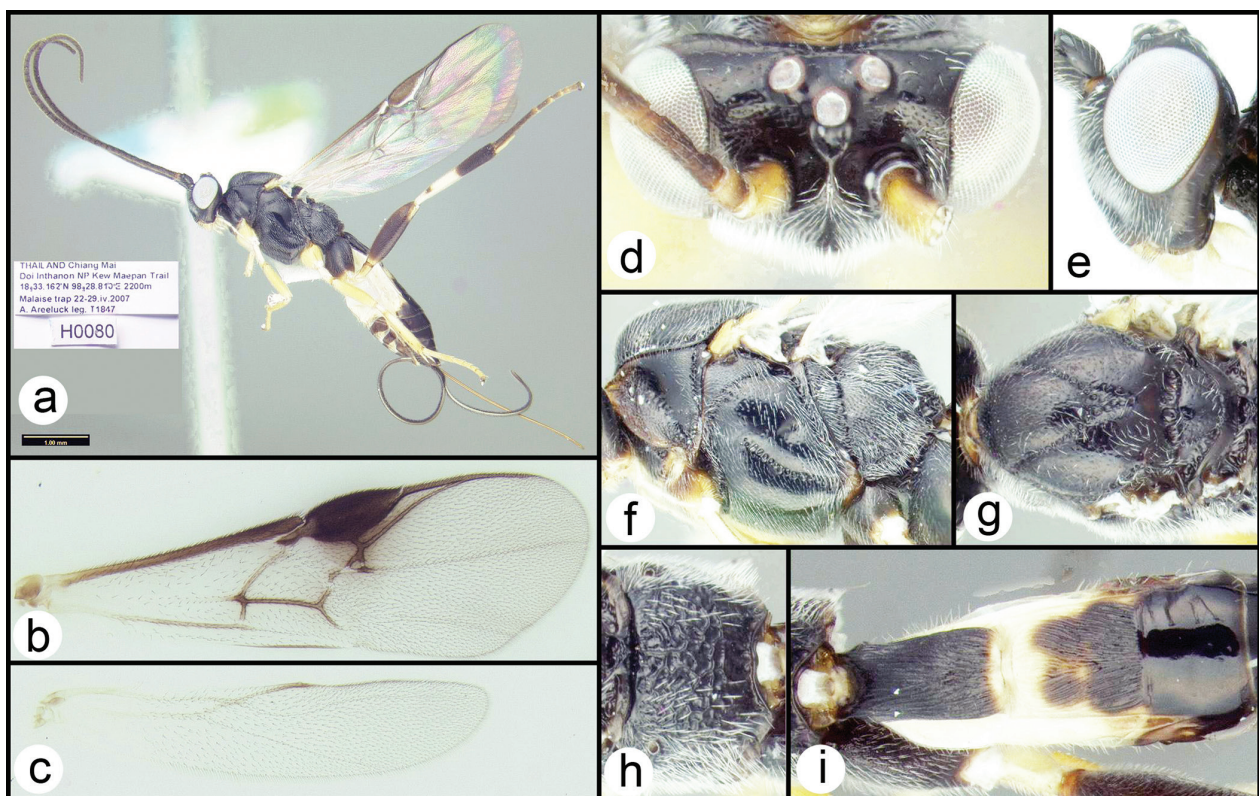


Figure 7. *Z. inthanonensis*: a) lateral habitus. b) fore wing. c) hind wing. d) dorsal head. e) lateral head. f) lateral mesosoma. g) dorsal mesoscutum h) propodeum. i) T1–3.

Scutellum sculpture smooth with punctures.

Description. Body length 4.7 mm. Ovipositor length 3.7 mm. Ovipositor $0.8\times$ body length. Number of flagellomeres 34. Notauli sculpture not significantly wider posteriorly. Scutellum smooth with punctures. Mid tibia with 2 apical and 3 preapical spines. Hind tibia with 6 spines/pegs. Second submarginal cell diameter small, slightly larger than pedicel width (varying to minute and about the same size as width of pedicel). Wing hyaline with an infusate patch posterior to stigma. T2 $1.1\times$ longer than wide. T2 entirely striate, striae relative straight throughout. **Color:** head black; mesosoma black; fore and mid coxa yellow; posterior border of T1 yellow; T2 yellow anteriorly and anterolaterally (varying to yellow in entire anterior half).

Etymology. Named after the type locality Doi Inthanon National park.

Material examined. Holotype: Female: *Thailand*, Chiang Mai, Doi Inthanon NP, Kew Maepan Trail, 18.553°N, 98.48°E, 2200 m elev., Malaise trap, 22–29.iv.2007 (H080, T1847), Y. Areeluck.

Paratypes: All female: *Thailand*, Lampang, Chae Son NP, Behind youthcamp, 18.8308°N, 99.458°E, 445 m elev., Malaise trap, 14–21.ii.2008 (H3818, T5376), 7–14.ii.2008 (H5953, T5377), B. Kwannui & A. Sukpeng; Lampang, Chae Son NP, Mae Paan unit, 18.8274°N, 99.4118°E, 815 m elev., Malaise trap, 21–27.v.2008 (H5515, T5290), B. Kwannui & A. Sukpeng; Lampang, Chae Son NP, campground, lavatory, 18.832°N, 99.473°E, 467 m elev., Malaise trap, 21–30.v.2008 (H2440, T5305), B. Kwannui & A. Sukpeng.

For a map of examined material, see: <https://bit.ly/2uqJOjH>

Zosteragathis krachanensis Sharkey, sp. n.

<http://zoobank.org/CBD43CE1-12C1-4605-A5B0-845B450CD449>

Diagnosis. Scutellar triangle rugose; T2 elongate ($1.6\times$ longer than wide); t2 entirely pale yellow.

Description. Body length 6.7 mm. Ovipositor length 6.4 mm. Ovipositor $1.0\times$ body length. Number of flagellomeres broken after the 33rd flagellomere. Sculpture of notauli increasing in width posteriorly where it extends over onto lateral lobes of mesoscutum. Scutellum rugose. Mid tibia with 1 apical and 2 preapical spines. Hind tibia with 7 spines/pegs. Second submarginal cell diameter large, about as large as pedicel length. Wing hyaline with weak infuscation posterior to stigma. T2 $2\times$ longer than wide. T2 entirely and evenly striate, striae diverging anteriorly, otherwise approximately straight. **Color:** head and mesosoma melanistic, except lower gena and clypeus yellow; fore and mid coxae yellow; T1 mostly pale yellow with a pair of large melanistic spots; T2 entirely pale yellow.

Etymology. Named after the type locality Kaeng Krachan National Park.

Material examined. Holotype: Female: *Thailand*, Petchaburi, Kaeng Krachan NP, Panernthung, km 27,

12.822°N, 99.371°E, 950 m elev., Malaise trap, 18–25.iii.2009 (H492, T4732), Sirichai & Prasit.

For a map of examined material, see: <https://bit.ly/2utGnJc>

Zosteragathis lampangensis Sharkey, sp. n.

<http://zoobank.org/4F684A4F-BB25-4A31-8DB4-07A2BC5E34F5>

Diagnosis. Clypeus melanistic. Mesoscutum black. Scutellum sculpture smooth with punctures. T2 entirely or almost entirely (80%) pale.

Description. Body length 4.2 mm. Ovipositor length 3.1 mm. Ovipositor $0.7\times$ body length. Number of flagellomeres 29. Notauli sculpture not significantly wider posteriorly. Scutellum smooth with punctures. Mid tibia with 4 apical and 4 preapical spines. Hind tibia with 9 spines/pegs. Second submarginal cell diameter minute, about equal to width of pedicel. Wing hyaline, without distinct infusate areas. T2 $1\times$ longer than wide. T2 entirely striate, striae relatively straight. **Color:** head black; mesosoma black; fore and mid coxa yellow; anterior and posterior borders of T1 yellow; T2 yellow; anterior margin of T3 yellow.

Etymology. Named after the type locality Lampang Province.

Material examined. Holotype: Female: *Thailand*, Lampang, Chae Son NP, behind visitor center, 18.835°N, 99.474°E, 421 m elev., Malaise trap, 1–8.ix.2007 (H237, T2832), Bunruen Kwannui & Acharaporn Sukpeng. **Paratype:** Female, *Thailand*, Petchaburi, Kaeng Krachan NP, Panernthung, km 27, 12.822°N, 99.371°E, 950 m elev., Malaise trap, 8–15.vi.2009 (H989, T5264), Sirichai.

For a map of examined material, see: <https://bit.ly/2pK371W>

Zosteragathis lampooensis Sharkey, sp. n.

<http://zoobank.org/482BC0EC-C427-4352-AE96-5BC323A27286>

Diagnosis. Subgenal groove poorly developed, shallow and narrow. Scutellum sculpture smooth with punctures. Mesoscutum black. Hind femur melanistic. Fore wing not distinctly infusate in apical half. T1 color mostly or entirely melanistic (brown to black) in basal 1/5, sometimes extreme base pale. T2 distinctly longer than wide. Striae of T2 relatively straight. Exposed portion of ovipositor shorter than body length.

Description. Body length 4.6 mm. Ovipositor length 4.7 mm. Ovipositor $1.0\times$ body length. Number of flagellomeres 31. Notauli sculpture not significantly wider posteriorly. Scutellum smooth with punctures. Mid tibia with 3 apical and 3 preapical spines. Hind tibia with 10 spines/pegs. Second submarginal cell diameter minute, about equal to width of pedicel. Wing hyaline with an infusate patch posterior to stigma. T2 $1.1\times$ longer than wide. T2 entirely striate, striae relative straight throughout.

Color. Head and mesosoma melanistic, except tegula and lowermost extremity of gena yellow; fore coxa yellow.

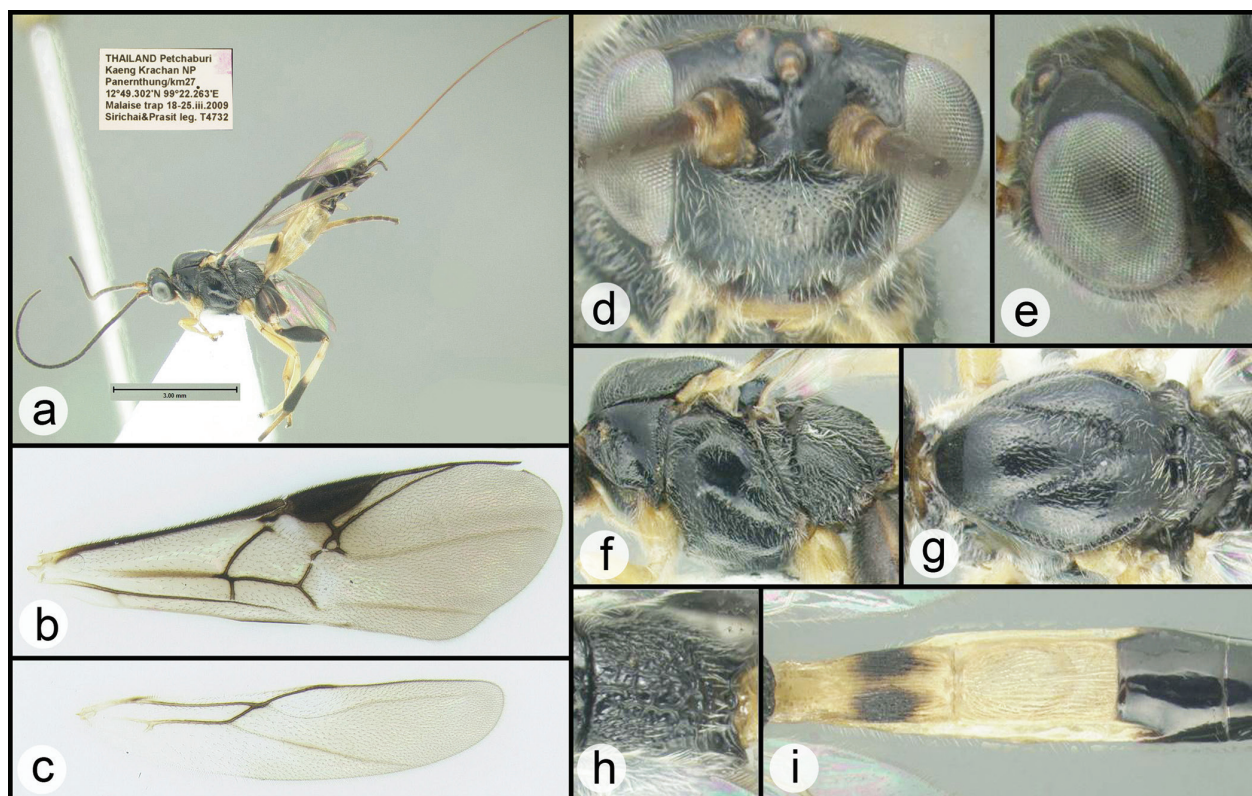


Figure 8. *Z. krachanensis*: a) lateral habitus. b) fore wing. c) hind wing. d) anterior head. e) lateral head. f) lateral mesosoma. g) dorsal mesoscutum h) propodeum. i) T1–3.

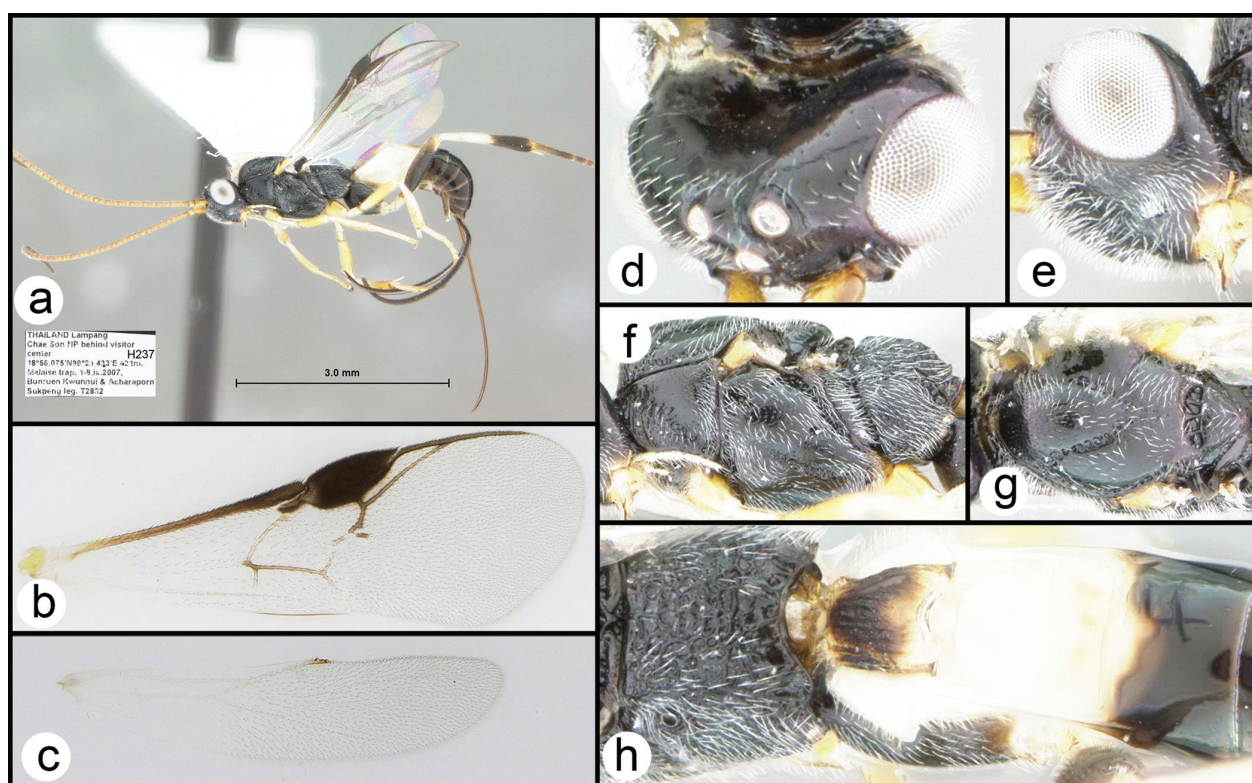


Figure 9. *Z. lampangensis*: a) lateral habitus. b) fore wing. c) hind wing. d) dorsal head. e) lateral head. f) lateral mesosoma. g) dorsal mesoscutum h) propodeum and T1–3.

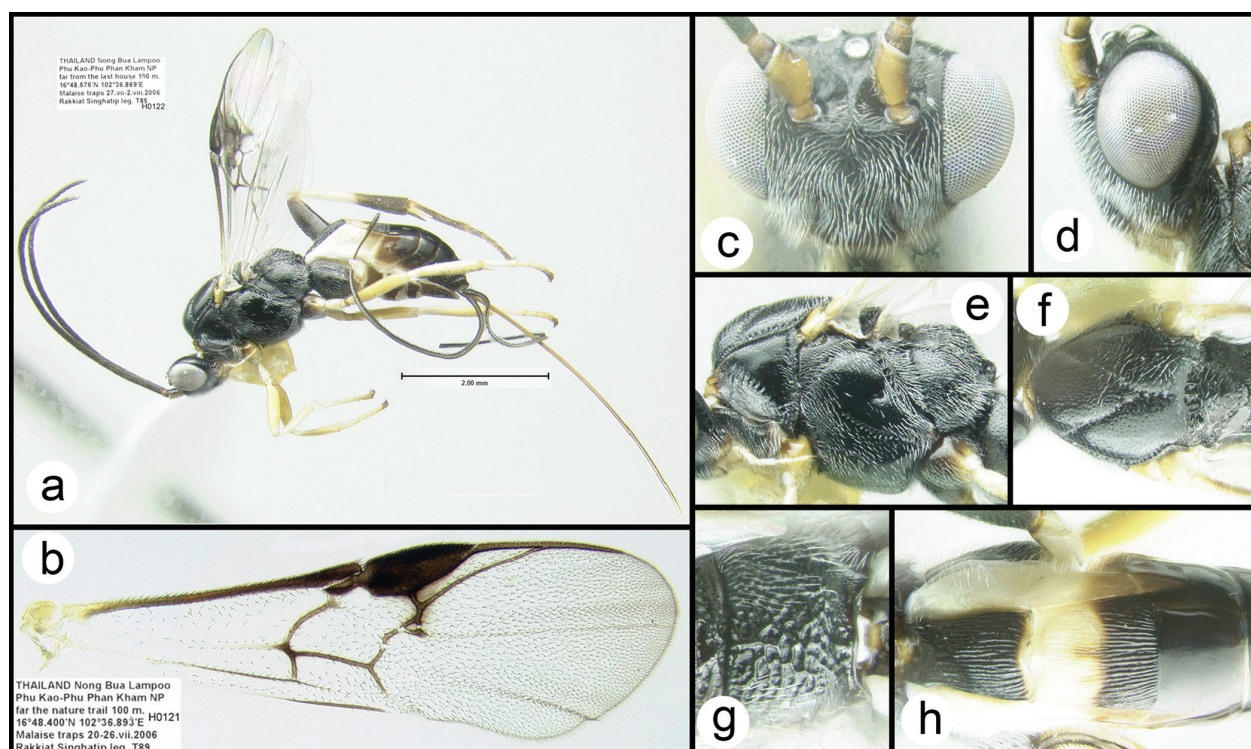


Figure 10. *Z. lampoensis*: a) lateral habitus. b) fore wing. c) anterior head. d) lateral head. e) lateral mesosoma. f) dorsal mesoscutum. g) propodeum. h) T1–3.

low; mid coxa mostly melanic; T1 mostly melanic except posterior margin pale yellow; T2 pale yellow anterior to transverse depression.

Etymology. Named after the type locality Nong Bua Lampoo Province.

Material examined. Holotype: Female, *Thailand*, Nong Bua Lampoo, Phu Kao-Phu Phan Kham NP, far from the old house 100 m (east), 16.81°N, 102.614°E, 100 m elev., Malaise trap, 27.vii–2.viii.2006 (H122, T85), Rakkiat Singhatip. **Paratypes:** All female: *Thailand*, Nakhon Si Thammarat, Namtok Yong NP, TV aerial, 8.238°N, 99.805°E, 966 m elev., Malaise trap, 1–8. ix.2008 (H995, T3538), Paiboon; Phetchabun, Khao Kho NP, Mix deciduous forest, 16.542°N, 101.041°E, 524 m elev., Malaise trap, 26.vi–2.vii.2007 (H650, T2460), Somchai Chachumnan & Saink Singtong; Ubon Ratchathani, Pha Taem NP, Phu Krajeaw foothill, 15.6664°N, 105.5078°E, 238 m elev., Malaise trap, 2–9.vi.2007 (H1636, T2206), Tongcam & Banlu; Nong Bua Lampoo, Phu Kao-Phu Phan Kham NP, tank, 16.807°N, 102.615°E, 199 m elev., Malaise trap, 27.vii–2.viii.2006 (H121, T89), Rakkiat Singhatip.

For a map of examined material, see: <https://bit.ly/2Gccq5J>

Zosteragathis luangensis Sharkey, sp. n.

<http://zoobank.org/68E596E9-F85C-40E9-8945-0BFA8A916771>

Diagnosis. Ovipositor slightly more than 1/2 body length; scutellum rugose.

Description. Body length 4.0 mm. Ovipositor length 2.3 mm. Ovipositor 0.6× body length. Number of flagellomeres 30. Sculpture of notauli increasing in width posteriorly where it extends over onto lateral lobes of mesoscutum. Scutellum rugose. Mid tibia with 2 apical and 2 preapical spines. Hind tibia with 4 spines/pegs. Second submarginal cell diameter small, smaller than pedicel length, but larger than pedicel width. Wing hyaline with a weak infuscate area posterior to stigma. T2 1.2× longer than wide. T2 striate, striae straight and weak to absent anteriorly. **Color:** head black except lower gena and clypeus partly yellow; mesosoma black; fore and hind coxa melanic; T1 whitish yellow basally and apically; T2 whitish yellow in basal 1/2.

Etymology. Named after the type locality Thung Salaeng Luang National Park.

Material examined. Holotype: Female, *Thailand*, Phitsanulok, Thung Salaeng Luang NP, Moist evergreen forest, 16.844°N, 100.882°E, 557 m elev., Malaise trap, 25.viii–1.ix.2006 (H1859, T572), Pongpitak Pranee.

For a map of examined material, see: <https://bit.ly/2pMnf3r>

Zosteragathis ngamensis Sharkey, sp. n.

<http://zoobank.org/F48AA80D-60AB-4E7C-A2C3-6B95C23C787A>

Diagnosis. Head, prothorax and mesothorax yellow; ovipositor short, about 1/2 body length; scutellar triangle rugose.

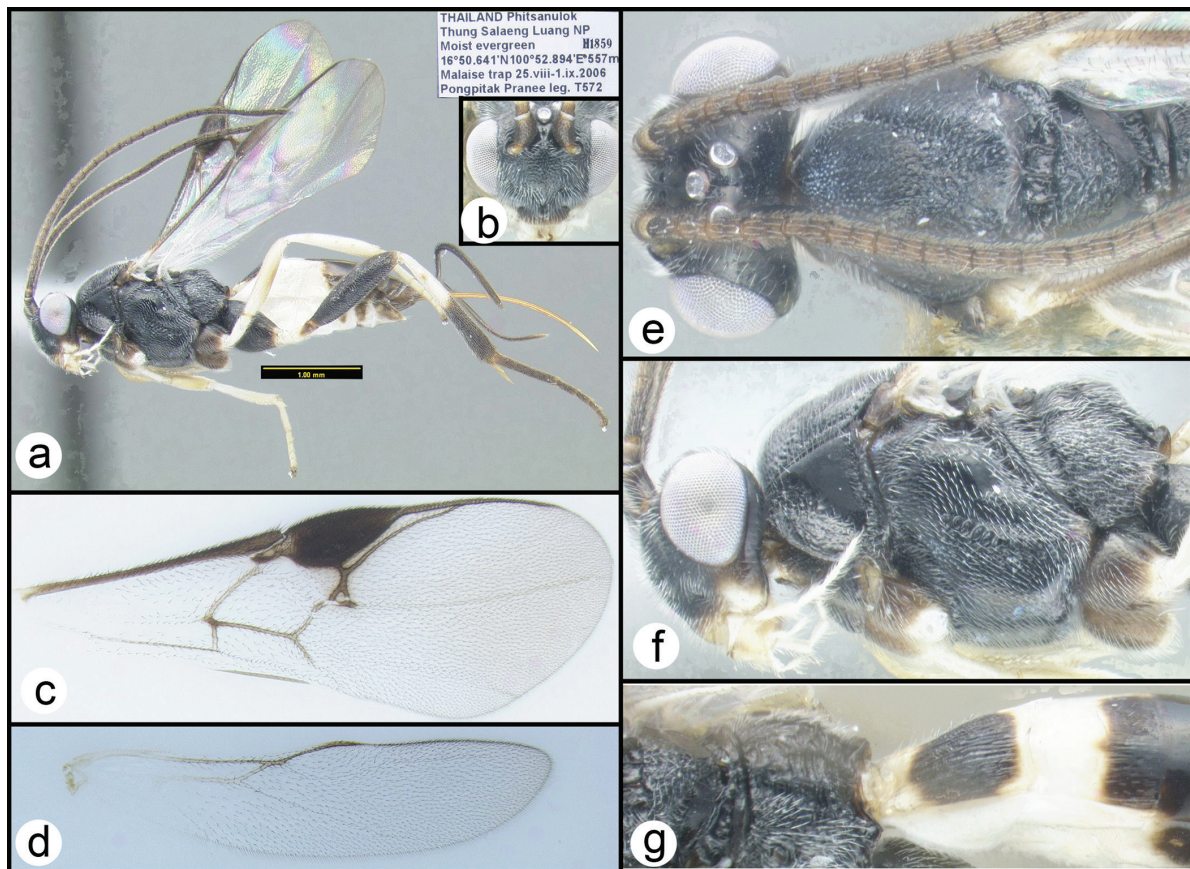


Figure 11. *Z. luangensis*: a) lateral habitus. b) anterior head. c) fore wing. d) hind wing. e) dorsal head and mesoscutum. f) lateral head and mesosoma. g) dorsal propodeum and T1–3.

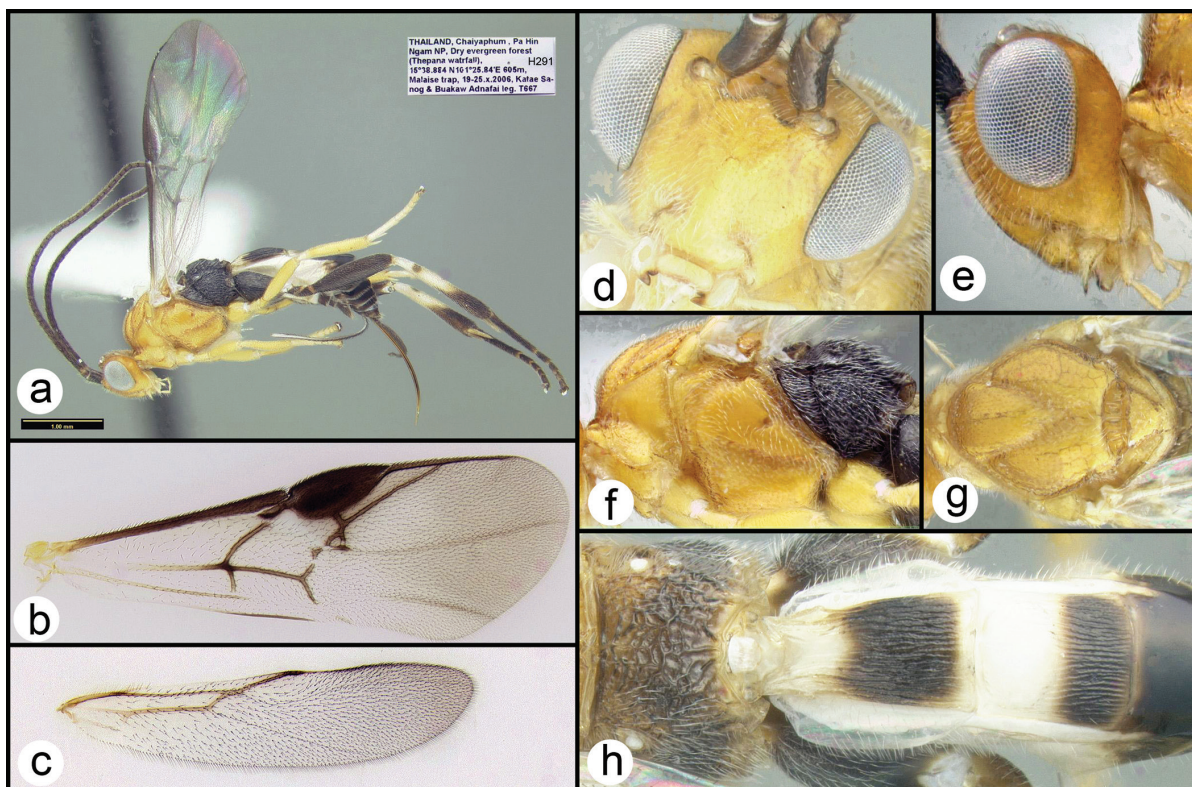


Figure 12. *Z. ngamensis*: a) lateral habitus. b) fore wing. c) hind wing. d) anterior head. e) lateral head. f) lateral mesosoma. g) dorsal mesoscutum. h) propodeum and T1–3.

Description. Body length 4.1 mm. Ovipositor length 2.0 mm. Ovipositor $0.5\times$ body length. Number of flagellomeres 34. Sculpture of notauli increasing in width posteriorly where it extends over onto lateral lobes of mesoscutum. Scutellum rugose. Mid tibia with no apical and 2 preapical spines. Hind tibia with 5 spines/pegs. Second submarginal cell diameter large, about as high as pedicel. Wing hyaline, apical half of wing weakly infuscate, as is area posterior to stigma (infuscate areas may not be evident unless lighting is optimal). T2 $1.2\times$ longer than wide. T2 entirely striate, striae relative straight throughout. **Color:** head, prothorax and mesothorax yellow, metathorax and propodeum black; fore and mid coxae yellow; basal 1/3 and apical margin of T1 yellow; anterior 1/2 of T2 yellow.

Etymology. Named after the type locality Pa Hin Ngam National Park.

Specimens examined. Holotype: Female, *Thailand*, Chaiyaphum, Pa Hin Ngam NP, Mixed deciduous forest (Thepana waterfall), 15.6486°N, 101.4179°E, 614 m elev., Malaise trap, 7–13.x.2006, Katae Sa-nog & Buakaw Adnafai. (H1625, T659). **Paratypes: Thailand:** Female, Chaiyaphum, Pa Hin Ngam NP, Dry evergreen forest near stream, 15.676°N, 101.445°E, 461 m elev., Malaise trap, 19–20.vi.2007, Katae Sa-nog & Buakaw Adnafai, (H277, T2482). Female, Chaiyaphum, Pa Hin Ngam NP, Dry evergreen forest (Thepana waterfall), 15.648°N, 101.431°E, 605 m elev., Malaise trap, 19–25.x.2006, Katae Sa-nog & Buakaw Adnafai. (H291, T667).

For a map of examined material, see: <https://bit.ly/2G-c89iq>

Zosteragathis nuichuaensis (Achterberg & Long)

Therophilus nuichuaensis Achterberg & Long, 2010

Diagnosis. Scutellar triangle rugose.

Description. Body length 3.2 mm. Ovipositor length 2.7 mm. Ovipositor $0.8\times$ body length. Number of flagellomeres (26–28 in Thai specimens) incomplete in holotype. Sculpture of notauli increasing in width posteriorly where it extends over onto lateral lobes of mesoscutum. Scutellum rugose. Mid tibia with 2 apical and 3 preapical spines. Hind tibia with 6 spines/pegs. Second submarginal cell diameter large, almost as large as pedicel length. Wing hyaline, without distinct infuscate areas. T2 $0.9\times$ longer than wide. T2 mostly smooth with striae indicated especially posteromedially (to entirely striate, with striae weaker medially), striae relatively straight. **Color:** head black except gena yellow ventrally; fore and mid coxae mostly melanitic; apex of T1 and anterior half of T2 yellow.

Material examined. Holotype: not examined. **Paratypes:** not examined. **Non-type specimens:** All female: *Thailand*, Trang, Khoa Chong, Forest Research Stn., 7.551°N, 99.789°E, 75 m elev., xi.2005 (H083, T6372), viii.2005 (H065, T3595), D. Lohman; Trang, Khao Pu-Khao Ya NP, 7.551°N, 99.789°E, 75 m elev., Mal-

aise trap, 7–12.vi.2006 (H288, T1968), 31.iii–3.iv.2006 (H239, T2049), M. Sharkey; Trang, Khao Pu-Khao Ya NP, 7.551°N, 99.789°E, 147 m elev., Malaise trap, 3–5.viii.2005 (H5901, T1762), M. Sharkey; *Taiwan*, Taipei Co., Wulai, 24.87°N, 121.55°E, Malaise trap, 15.vii–2003, L. Stange & H. Wang.

For a map of examined material, see: <https://bit.ly/2pGpC8T>

Zosteragathis perknos Sharkey, sp. n.

<http://zoobank.org/1FC70495-DB98-45B3-857B-6CF146CB6025>

Diagnosis. Fore wing clear basally, infuscate in apical half; T2 much narrower basally than apically; close to *Z. nigrolineatus* (Achterberg & Long, 2010), but differing in the dimensions of T2.

Description. Body length 6.2 mm. Ovipositor length/body length ratio = 0.8. Interantennal space with a flat triangular elevation that narrows to a short ridge posteriorly and then divides into two short indistinct carinae that approach the median ocellus. Antenna with 35 flagellomeres. Third labial (penultimate) palpomere small, 1/3 as long as apical palpomere. Scutellar groove with 3 longitudinal ridges. Fore tibia lacking thickened spines; mid tibia with 4 pegs; hind tibia with 8 pegs.

Etymology. *Perknos* is Greek for dusky; here it is a reference to the dark color of the base of the hind tibia.

Specimens examined. Holotype ♀, THAILAND, Chiang Mai, Doi Phahompok NP, Doi Phaluang, 20°1.06'N, 99°9.581'E, 1449 m elev., Malaise trap, 3–10.viii.2007 (H236, T2931), Wongchai, leg.

Paratypes: THAILAND: ♀, Petchaburi, Kaeng Krachan NP, Panernthung, km27, water pump, 12°49.151'N, 99°22.483'E, 970 m elev., Malaise trap, 17–24.x.2008 (H970, T4386), Sirichai leg. ♀, Mae Hong Son, Namtok Mae Surin NP, visitor's center, 19°21.593'N, 97°59.254'E, 228 m elev., Malaise trap, 26.viii–2.ix.2007 (H958, T5874), Manu Namadkum leg.

For a map of examined material, see: <https://bit.ly/2GbdAP7>

Zosteragathis petchaburiensis Sharkey sp. n.

<http://zoobank.org/15DCE0F9-7207-4D97-A957-C3A7C7CB7F61>

Diagnosis. Ovipositor longer than body; T2 almost entirely black; fore and mid femur partly black; propodeum smooth along posterior margin.

Description. Body length 3.6 mm. Ovipositor length 3.8 mm. Ovipositor $1.0\times$ body length. Number of flagellomeres 33. Notauli sculpture not significantly wider posteriorly. Scutellum smooth with punctures. Mid tibia with 7 apical and 2 preapical spines. Hind tibia with 10 spines/pegs. Second submarginal cell diameter small, smaller than pedicel length, but larger than pedicel width. Wing mostly hyaline, weakly infuscate in distal half, not distinctly infuscate posterior to stigma. T2 $1.2\times$ longer than

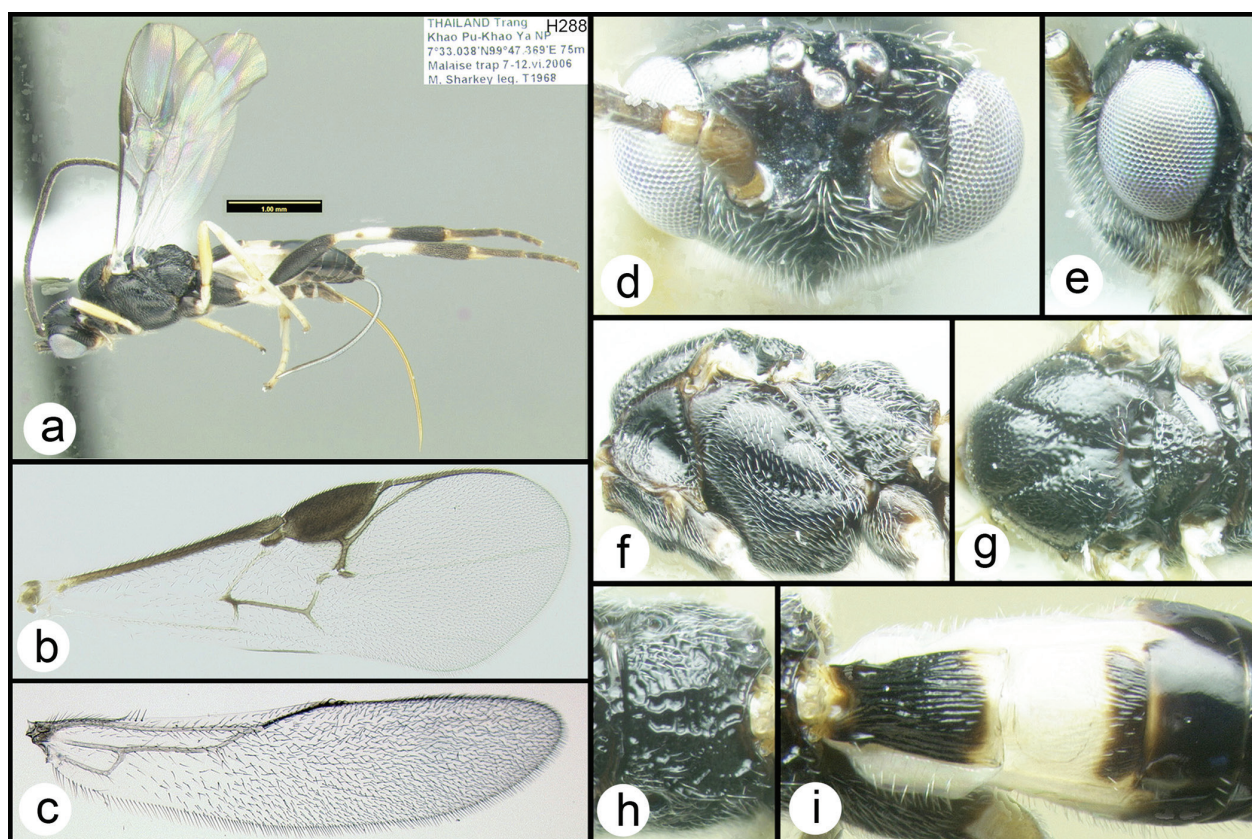


Figure 13. *Z. nuichuaensis*: **a)** lateral habitus. **b)** fore wing. **c)** hind wing. **d)** dorsal head. **e)** lateral head. **f)** lateral mesosoma. **g)** dorsal mesoscutum. **h)** propodeum. **i)** T1–3.

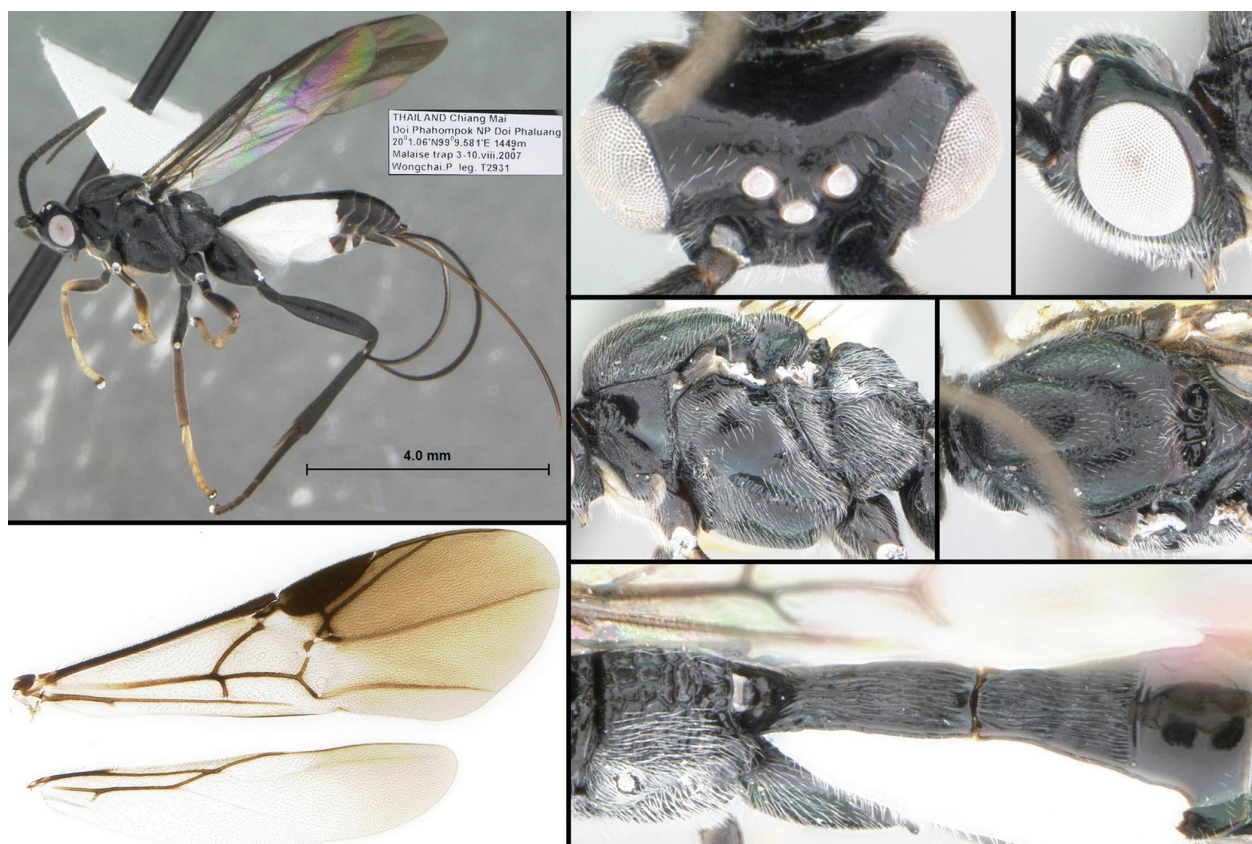


Figure 14. *Zosteragathis perknos* holotype female. **a)** lateral habitus. **b)** wings. **c)** dorsal head. **d)** lateral head. **e)** lateral mesosoma. **f)** dorsal thorax. **g)** propodeum and metasomal terga 1–3.

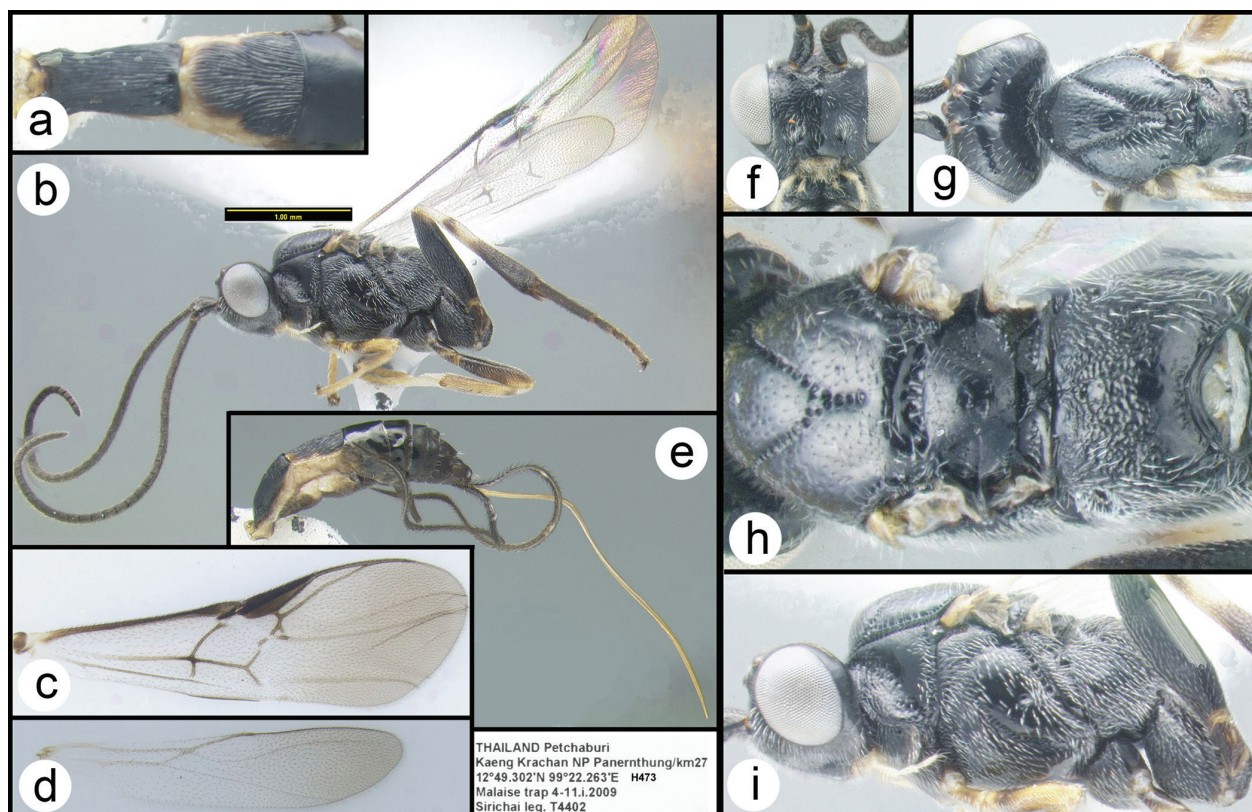


Figure 15. *Zosteragathis petchaburiensis*: a) T1–3. b) lateral head and mesosoma. c) fore wing. d) hind wing. e) lateral metasoma. f) anterior head. g) dorsal head and mesoscutum. h) dorsal mesosoma. i) lateral head and mesosoma.

wide. T2 entirely striate, striae converging somewhat posteromedially. **Color:** head black; mesosoma black; mid and fore coxa black; fore femur partly black; mid femur mostly black; T1 entirely black; T2 mostly black except anterior and anterolateral margins yellow.

Etymology. Named after the type locality Petchaburi Province.

Specimens examined. Holotype: Female: *Thailand*, Petchaburi, Kaeng Krachan NP, Panernthung km 27, 12.822°N, 99.371°E, 950 m elev., Malaise trap, 4–11.i.2009 (H473, T4402), Sirichai.

For a map of examined material, see: <https://bit.ly/2umu41q>

Zosteragathis phahompokensis Sharkey, sp. n.

<http://zoobank.org/85E264EF-33AC-4771-BD66-EF5D071F28B9>

Diagnosis. Scutellum smooth with punctures. T1 mostly or entirely pale in basal 1/5 or more. T2 mostly pale in anterior half and mostly melanic in posterior half.

Description. Body length 4.1 mm. Ovipositor length 3.2 mm. Ovipositor 0.8× body length. Number of flagellomeres 31. Notauli sculpture not significantly wider posteriorly. Scutellum smooth with punctures. Mid tibia with 2 apical and 4 preapical spines. Hind tibia with 7 spines/pegs. Second submarginal cell diameter large, about same size as pedicel length (to 1/3 length of pedicel but always

wider than pedicel). Wing hyaline, without distinct infusate areas. T2 0.9× longer than wide. T2 mostly smooth with short longitudinal carinae restricted to area near median transverse depression. **Color:** head black except ventral gena and ventral clypeus yellow; mesosoma black; fore and mid coxa yellow; T1 yellow with large black patch posteromedially; T2 yellow in anterior half.

Etymology. Named after the type locality Doi Phahompokensis National Park.

Material examined. Holotype: Female: *Thailand*, Chiang Mai, Doi Phahompok NP, Headquarter, 19.966°N, 99.156°E, 569 m elev., Malaise trap, 28.ii-7.iii.2008 (H1858, T2939), Seesom, K. **Paratype:** Female: *Thailand*, Sakon Nakhon, Phu Phan NP, Behind national park office, 17.058°N, 103.975°E, 318 m elev., Malaise trap, 23–30.i.2007 (H097, T1527), Sailom Tongboonchai.

For a map of examined material, see: <https://bit.ly/2pIAJaK>

Zosteragathis phuphanensis Sharkey, sp. n.

<http://zoobank.org/F1C9129E-DC7F-4106-81D4-FBB1B30D93FD>

Diagnosis. Scutellum smooth with punctures. Mesoscutum black. Fore wing with a small infusate area posterior to stigma. T2 distinctly longer than wide. Striae of T2 curving towards the midline, especially anteromedially.

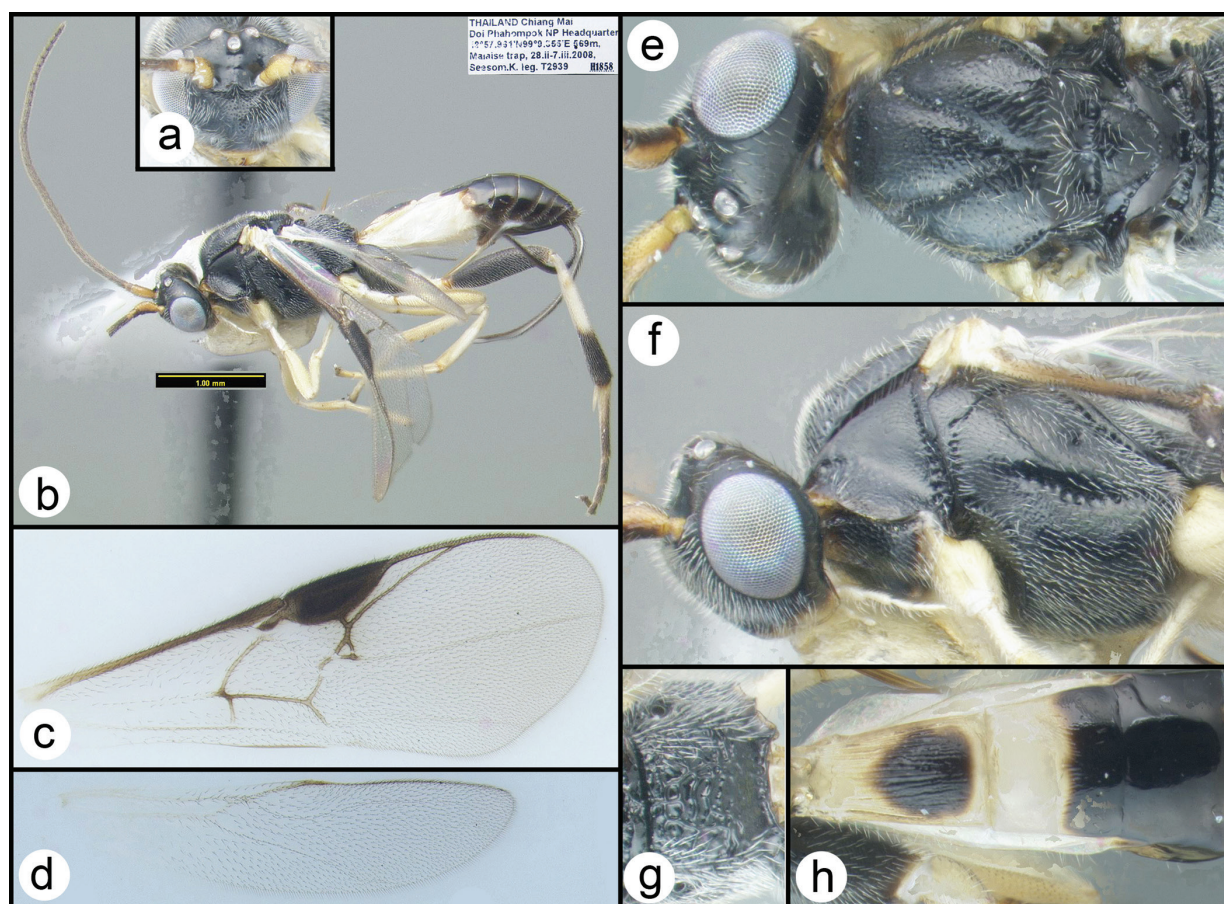


Figure 16. *Z. phahompokensis*: a) anterior head. b) lateral habitus. c) fore wing. d) hind wing. e) dorsal head and mesoscutum. f) lateral head and mesosoma. g) propodeum. g) propodeum. h) T1–3.

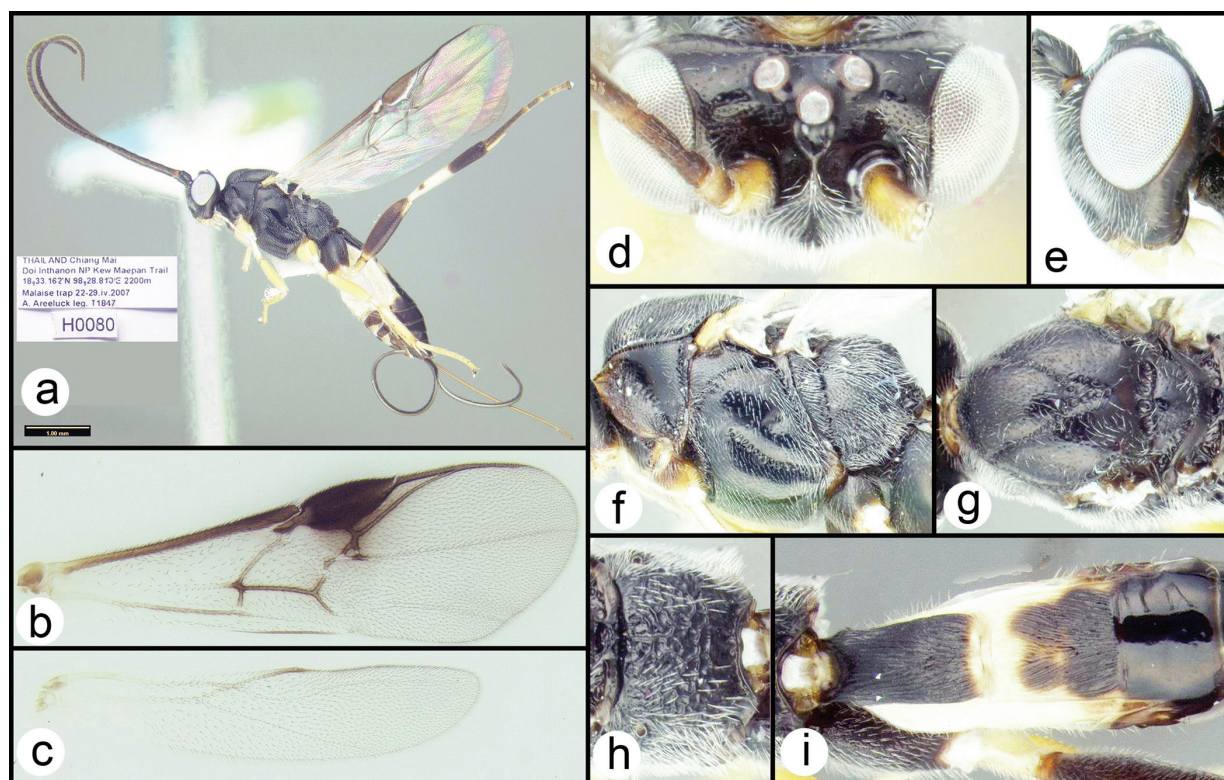


Figure 17. *Z. phuphanensis*: a) lateral habitus. b) fore wing. c) hind wing. d) dorsal head. e) lateral head. f) lateral mesosoma. g) dorsal mesoscutum. h) propodeum. i) T1–3.

Description. Body length 4.7. Ovipositor length 4.8. Ovipositor $1.0\times$ body length. Number of flagellomeres 32. Notauli sculpture not significantly wider posteriorly. Scutellum smooth with punctures. Mid tibia with 2–3 apical and 4 preapical spines. Hind tibia with 8 spines/pegs. Second submarginal cell diameter small, smaller than pedicel length, but larger than pedicel width. Wing hyaline with an infusate patch posterior to stigma. T2 $1.1\times$ longer than wide. T2 entirely striate, striae converging medially.

Color. Head black except ventral extremity of gena yellow; mesosoma black; fore and mid coxa yellow; posterior margin of T1 yellow; T2 yellow anteriorly and anterolaterally.

Etymology. Named after the type locality Phu Phan National Park.

Material examined. Holotype: Female: *Thailand*, Sakon Nakhon, Phu Phan NP, Dry evergreen near house no.1567, 16.81°N, 103.892°E, 512 m elev., Malaise trap, 4–10.vi.2007 (H280, T1567), Winlon Kongnara. **Paratype:** Female, *Thailand*, Nakhon Si Thammarat, Namtok Yong NP, Behind campground lavatory, 8.174°N, 99.742°E, 80 m elev., Malaise trap, 29.x-5.xi.2008 (H550, T4253), U-prai;K.

For a map of examined material, see: <https://bit.ly/2DYkTUg>

Zosteragathis sakaeratensis Sharkey, sp. n.

<http://zoobank.org/39028CA9-4ABA-43C6-8845-457E9F88D7B9>

Diagnosis. Fore wing without a small infusate area posterior to stigma. T2 entirely or almost entirely (80%) melanic. T2 as wide as long or wider.

Description. Body length 4.2 mm. Ovipositor length 2.8 mm. Ovipositor $0.7\times$ body length. Number of flagellomeres 29. Notauli sculpture not significantly wider posteriorly. Scutellum smooth with punctures. Mid tibia with 3 apical and 1 preapical spines. Hind tibia with 9 spines/pegs. Second submarginal cell diameter small, slightly smaller than pedicel length. Wing hyaline with a slight infuscation posterior to stigma. T2 $0.8\times$ longer than wide. T2 entirely striate, striae relative straight throughout. **Color:** fore coxa melanic; mid coxa yellow; hind femur yellowish brown; T1 and T2 mostly melanic; posterior margin of T1 pale; T2 with some pale infusions medially and anterolaterally.

Etymology. Named after the type locality Sakaerat Experimental Station.

Material examined. Holotype: Female: *Thailand*, Nakhon Ratchasima, 60 km S, Sakaerat Expt. Stn., 14.5°N, 101.917°E, 450 m elev., Malaise trap, 2–4.iii.1971 (H238), P&P Spangler.

For a map of examined material, see: <https://bit.ly/2Gvhsd0>

Zosteragathis sakonensis Sharkey, sp. n.

<http://zoobank.org/F7739620-FD6B-4ECE-8C7B-D960CD6A221C>

Diagnosis. Head black except clypeus and lower gena yellow, T1 and T2 predominantly pale yellow, T1 with a

large melanic spot in basal half, T2 with (or without) melanic infusion posteromedially; second submarginal cell minute pedicel much longer than cell height, diameter about equal to width of pedicel.

Description. Body length 3.6 mm. Ovipositor length 3.0 mm. Ovipositor $0.8\times$ body length. Number of flagellomeres 29. Notauli sculpture not significantly wider posteriorly. Scutellum smooth with punctures. Mid tibia with 2 apical and 3 preapical spines. Hind tibia with 6 spines/pegs. Second submarginal cell diameter minute, about equal to width of vein. Wing hyaline with an infusate patch posterior to stigma. T2 weakly striate, striae almost absent anteromedially, weakly converging in posterior half.

Color: head black except clypeus and lower gena yellow; mesosoma black; fore and mid coxae yellow; T1 and T2 predominantly pale yellow, T1 with a large melanic spot in basal half, T2 with melanic infusion posteromedially.

Etymology. Named after the type locality Sakon Nakhon Provence.

Material examined. Holotype: Female: *Thailand*, Sakon Nakhon, Phu Phan NP, Behind forest protection unit at Huay Wien Prai, 17.114°N, 104.005°E, 318 m elev., Malaise trap, 17–25.ii.2007 (H091, T1690), Sailom Tongboonchai. **Paratypes:** All female: *Thailand*, Surat Thani, Khao Sok NP, Headquarter, 8.9149°N, 98.5301°E, 115 m elev., Malaise trap, 2–9.xii.2008 (H3805, T3870), Pongphan; Phetchabun, Khao Kho NP, Mixed deciduous forest, 16.543°N, 101.041°E, 537 m elev., Malaise trap, 5–12.xii.2006 (H148, T1178), Somchai Chachumnan & Saink Singtong.

For a map of examined material, see: <https://bit.ly/2G-3UTu>

Zosteragathis samensis Sharkey, sp. n.

<http://zoobank.org/39CBB49C-FAE4-4034-8677-D2B1CBF988DE>

Diagnosis. Fore coxa yellow. Hind femur black. T2 mostly pale in anterior half and mostly melanic in posterior half. Scutellum sculpture smooth with punctures. T2 dimensions as wide as long or wider.

Description. Body length 5.4 mm. Ovipositor length 3.3 mm. Ovipositor $0.6\times$ body length. Number of flagellomeres 31. Notauli sculpture not significantly wider posteriorly. Scutellum smooth with punctures. Mid tibia with 3 apical and 2 preapical spines. Hind tibia with 8 spines/pegs. Second submarginal cell diameter small, smaller than pedicel length, but larger than pedicel width. Wing hyaline with an infusate patch posterior to stigma. T2 $0.9\times$ longer than wide. T2 entirely striate, striae weak anteromedially where they converge medially. **Color:** head black except gena yellow; mesosoma black; fore and mid coxa yellow; posterior margin of T1 yellow; anterior half of T2 yellow.

Etymology. Named after the type locality Khao Sam Roi Yot National Park.

Material examined. Holotype: Female: *Thailand*, Prachuab Khiri Khan, Khao Sam Roi Yot NP, Khao Look

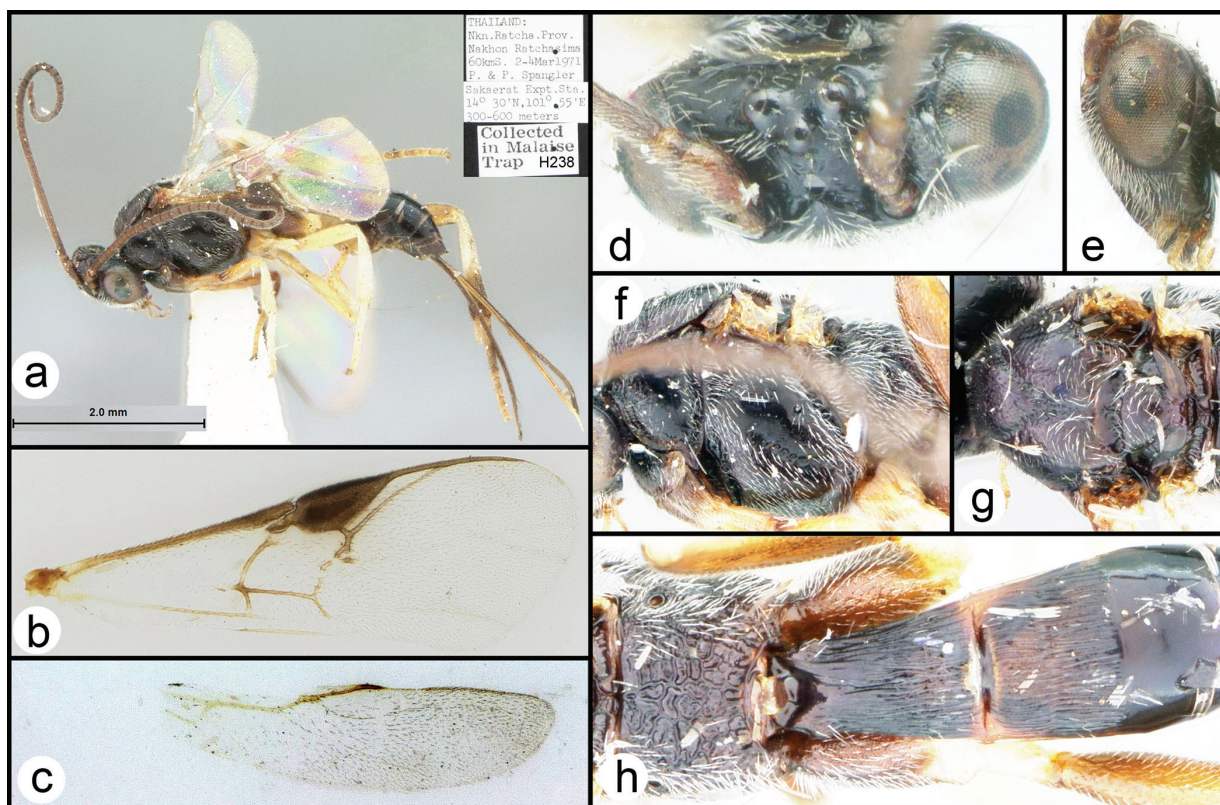


Figure 18. *Z. sakaeratensis*: **a)** lateral habitus. **b)** fore wing. **c)** hind wing. **d)** dorsal head. **e)** lateral head. **f)** lateral mesosoma. **g)** dorsal mesoscutum. **h)** propodeum and T1–3.

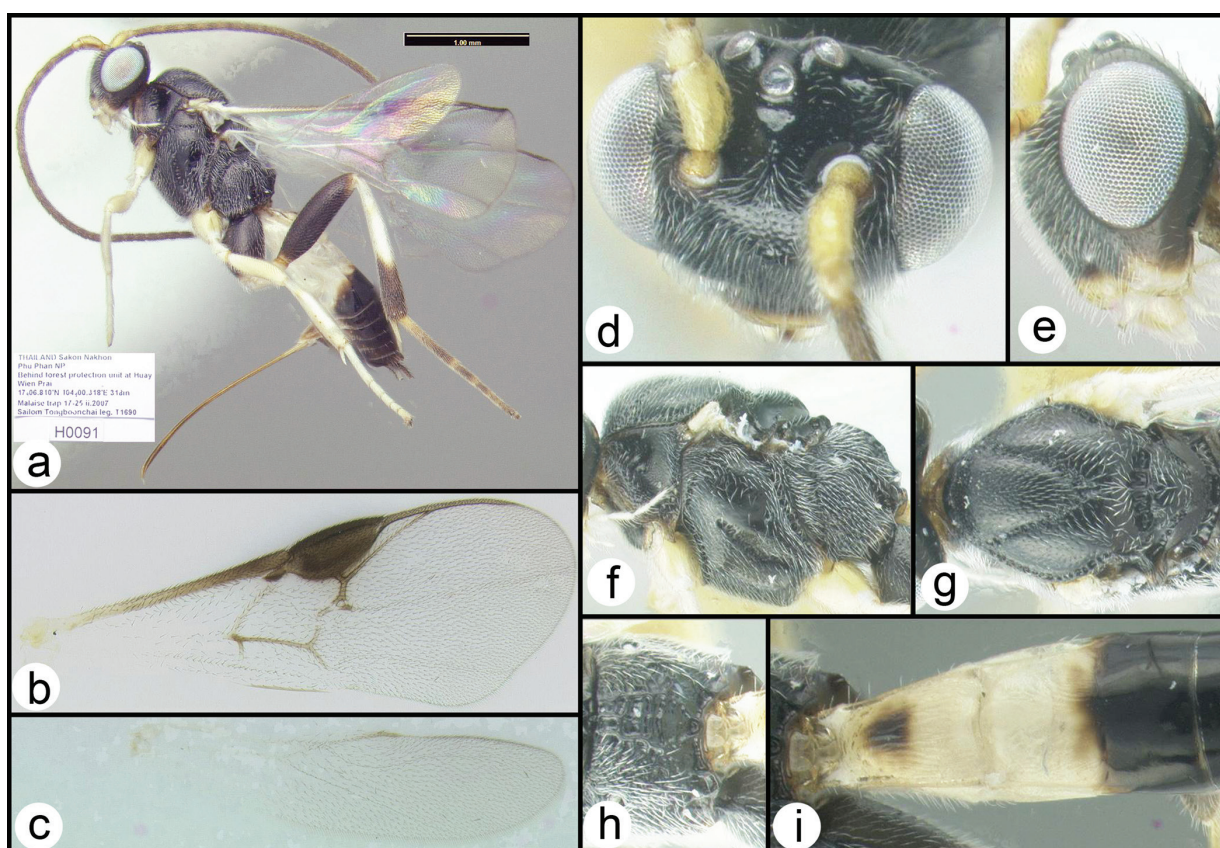


Figure 19. *Z. sakonensis*: **a)** lateral habitus. **b)** fore wing. **c)** hind wing. **d)** dorsal head. **e)** lateral head. **f)** lateral mesosoma. **g)** dorsal mesoscutum. **h)** propodeum. **i)** T1–3.

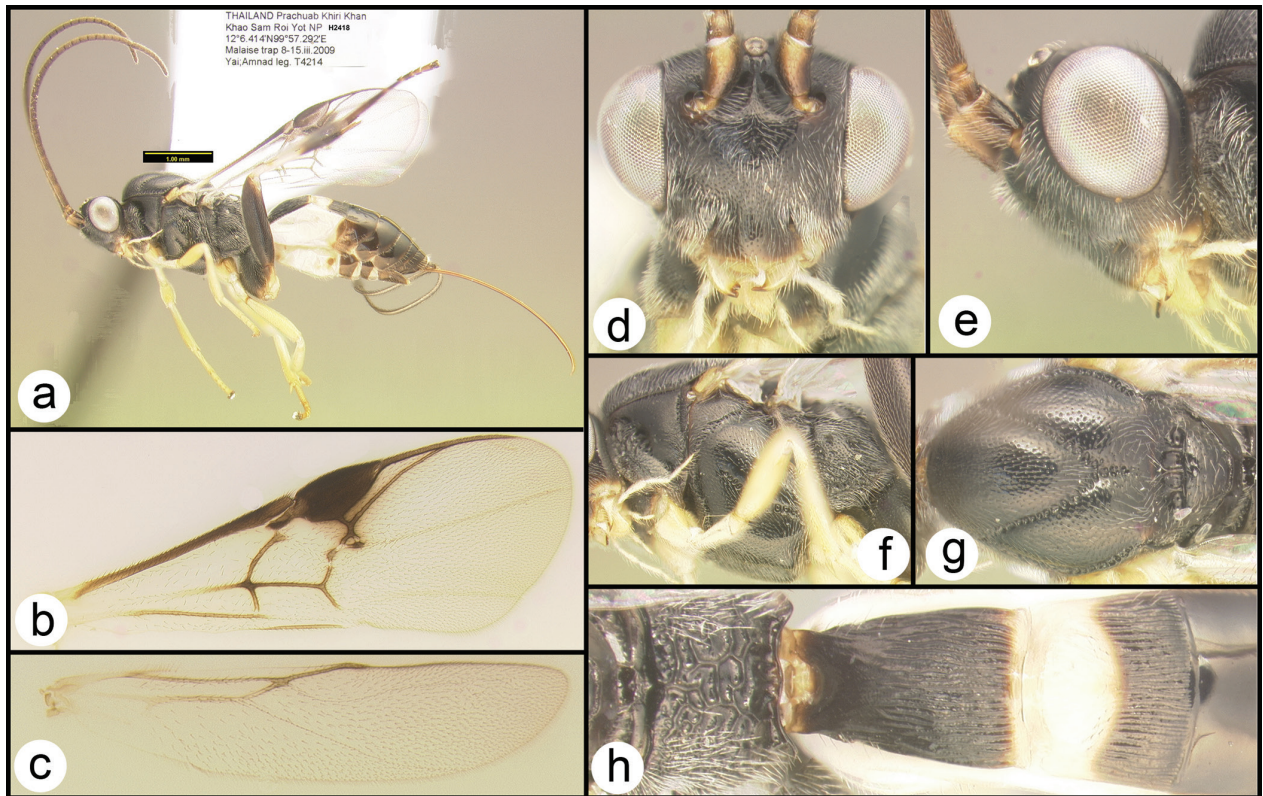


Figure 20. *Z. samensis*: **a)** lateral habitus. **b)** fore wing. **c)** hind wing. **d)** anterior head. **e)** lateral head. **f)** lateral mesosoma. **g)** dorsal mesoscutum. **h)** propodeum and T1–3.

Glang, 12.107°N, 99.955°E, 20 m elev., Malaise trap, 8–15.iii.2009 (H2418, T4214), Yai Amnad. **Paratypes:** All female: **Thailand**, Prachuab Khiri Khan, Khao Sam Roi Yot NP, foot of Khao Taen, 12.146°N, 99.966°E, 1 m elev., Malaise trap, 3–10.v.2009 (H638, H968, T4825), Yai Amnad; Prachuab Khiri Khan, Khao Sam Roi Yot NP, 30m N, protection unit4, 12.268°N, 99.944°E, 1 m elev., Malaise trap, 3–10.v.2009 (H973, T4824) 24–31.v.2009 (H490, T4833), Yai Amnad; Lampang, Chae Son NP, Youthcamp, 18.83°N, 99.471°E, 455 m elev., Malaise trap, 1–7.iv.2008 (H901, T5421), B. Kwannui & A. Sukpeng; Mae Hong Son, Namtok Mae Surin NP, Haad Saen, 19.348°N, 97.985°E, 257 m elev., Malaise trap, 27.iv–4.v.2008 (H481, T3507), Na-maadhkam, M; Prachuab Khiri Khan, Khao Sam Roi Yot NP, Saline wetland, Pa Gwad, N, 12.153°N, 99.972°E, 1 m elev., Malaise trap, 15–22.iii.2009 (H670, T4216), Yai Amnad.

For a map of examined material, see: <https://bit.ly/2IZCper>

Zosteragathis surinensis Sharkey, sp. n.

<http://zoobank.org/5FCED594-58B2-4EED-BD95-BC2D4A875A67>

Diagnosis. Hind femur yellow, hind coxa mostly yellow; hind tibia with many spines (9 or more).

Description. Body length 3.6 mm. Ovipositor length 3.4 mm. Ovipositor 1.0× body length. Number of flagellomeres 29. Notauli sculpture not significantly wider posteriorly. Scutellum smooth with punctures. Mid tibia with

3 apical and 3 preapical spines. Hind tibia with 11 spines/pegs. Second submarginal cell diameter large, larger than length of pedicel. Wing hyaline, without distinct infusate areas. T2 1.2× longer than wide. T2 entirely striate, striae weak anteromedially, striae relatively straight. **Color:** head black except gena ventrally and clypeus yellow; mesosoma melanic; fore and mid coxae yellow; hind coxa yellow in apical half; hind femur yellow; apex of T1 yellow; T2 yellow in basal half.

Etymology. Named after the type locality Namtok Mae Surin National Park.

Material examined. Holotype: Female: **Thailand**, Mae Hong Son, Namtok Mae Surin NP, E Huai Fai Kor reservoir, 19.344°N, 97.988°E, 311 m elev., Malaise trap, 18–25.v.2008 (H598, T3518), Kamkoon, A.

For a map of examined material, see: <https://bit.ly/2IYZA91>

Zosteragathis taemensis Sharkey, sp. n.

<http://zoobank.org/038CCAA1-97ED-42BB-8433-39D600685C15>

Diagnosis. Fore and mid coxae mostly melanic; scutellar groove pale; area posterior to fore wing stigma distinctly infusate.

Description. Body length 6.1 mm. Ovipositor length 5.3 mm. Ovipositor 0.9× body length. Number of flagellomeres 34. Notauli sculpture not significantly wider posteriorly. Scutellum smooth with punctures. Mid tibia with 4 apical and 4 preapical spines. Hind tibia with 9 spines/

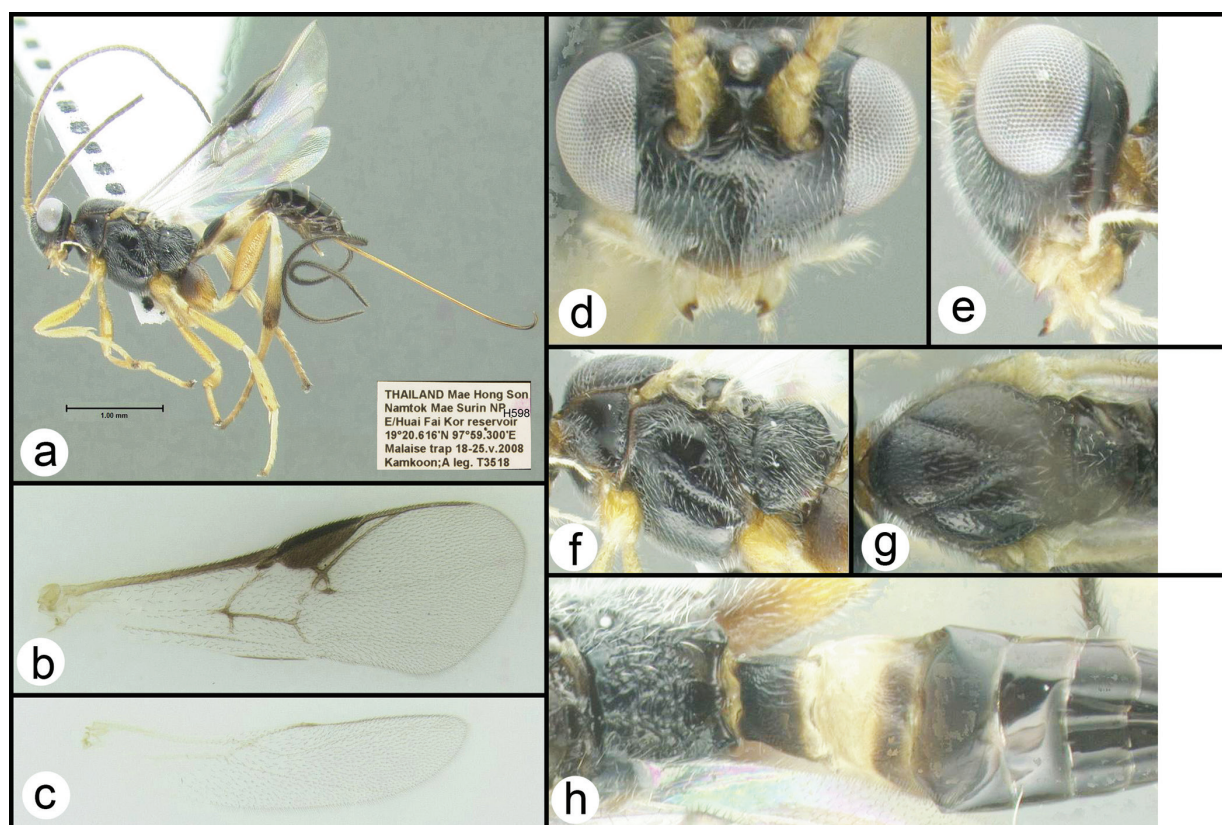


Figure 21. *Z. surinensis*: **a)** lateral habitus. **b)** fore wing. **c)** hind wing. **d)** anterior head. **e)** lateral head. **f)** lateral mesosoma. **g)** dorsal mesoscutum. **h)** propodeum and T1–3.

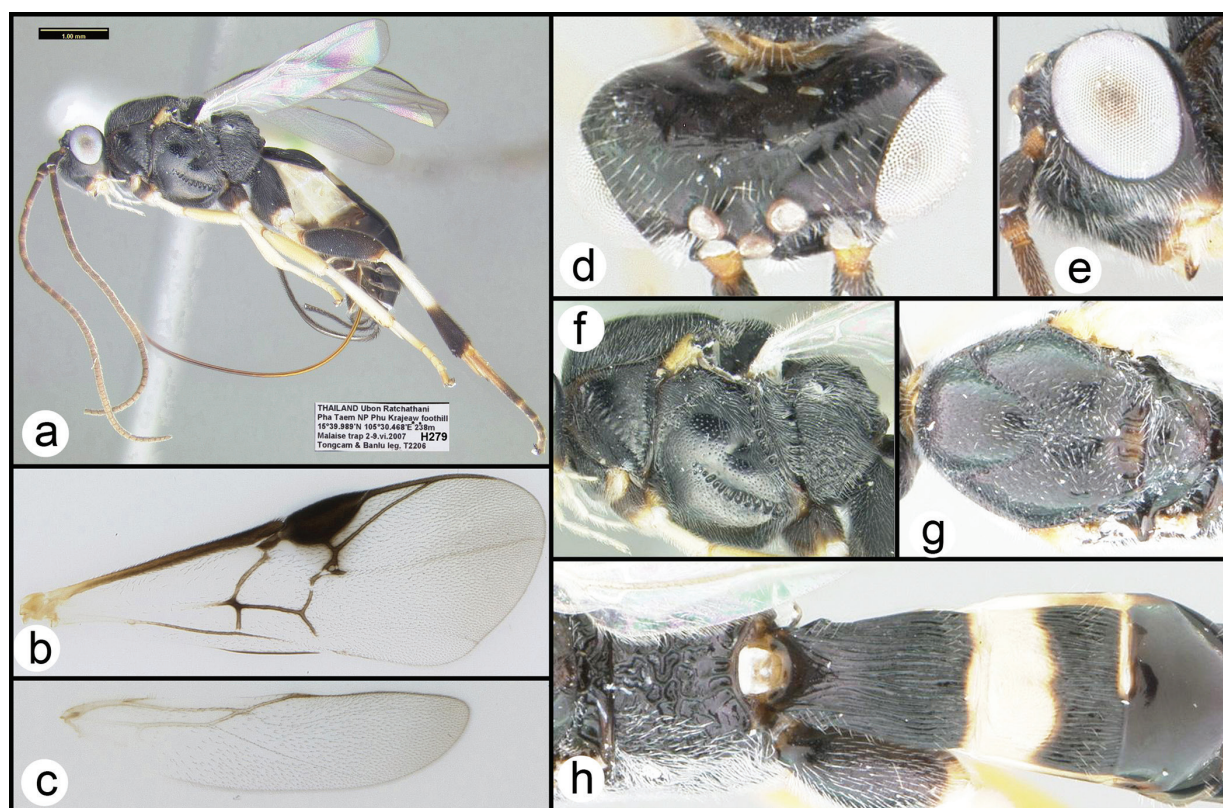


Figure 22. *Z. taemensis*: **a)** lateral habitus. **b)** fore wing. **c)** hind wing. **d)** dorsal head. **e)** lateral head. **f)** lateral mesosoma. **g)** dorsal mesoscutum. **h)** propodeum and T1–3.

pegs. Second submarginal cell diameter minute, about equal to width of vein. Wing hyaline with an infuscate patch posterior to stigma. T2 0.9× longer than wide. T2 entirely striate, semicircular pattern anteromedially, striae converging posterior to this pattern. **Color:** head black except ventral gena and ventral clypeus yellow; mesosoma black except scutellar groove pale; fore and mid coxae predominantly melanic; T1 black except posterior margin yellow; T2 yellow in anterior half.

Etymology. Named after the type locality Pha Taem National Park.

Material examined. Holotype: Female: *Thailand*, Ubon Ratchathani, Pha Taem NP, Phu Krajeaw foothill, 15.666°N, 105.508°E, 238 m elev., Malaise trap, 2–9.vi.2007 (H279, T2206), Tongcam & Banlu.

For a map of examined material, see: <https://bit.ly/2uq1wnv>

Zosteragathis tonensis Sharkey, sp. n.

<http://zoobank.org/7B26BD3D-743D-41B7-8F4F-D86A7D4EA605>

Diagnosis. Ovipositor longer than body.

Description. Body length 4.5 mm. Ovipositor length 5.2 mm. Ovipositor 1.2× body length. Number of flagellomeres 31. Notauli sculpture not significantly wider posteriorly. Scutellum smooth with punctures. Mid tibia with 3 apical and 3 preapical spines. Hind tibia with 7 spines/pegs. Second submarginal cell diameter small, smaller than pedicel length, but larger than pedicel width. Wing hyaline with an infuscate patch posterior to stigma. T2 1.1× longer than wide. T2

entirely striate, striae relatively straight. **Color:** head black except ventral gena yellow; mesosoma black; fore and hind coxa black; posterior margin of T1 yellow; T2 mostly yellow in basal half with melanic tones posteromedially.

Etymology. Named after the type locality Tat Tone National Park.

Material examined. Holotype: Female: *Thailand*, Chaiphaphum, Tat Tone NP, Near stream, 15.98°N, 102.04°E, 305 m elev., Malaise trap, 12–19.vii.2006 (H016, T220), T. Jaruphan & O. Budsawong.

For a map of examined material, see: <https://bit.ly/2I-W47ZC>

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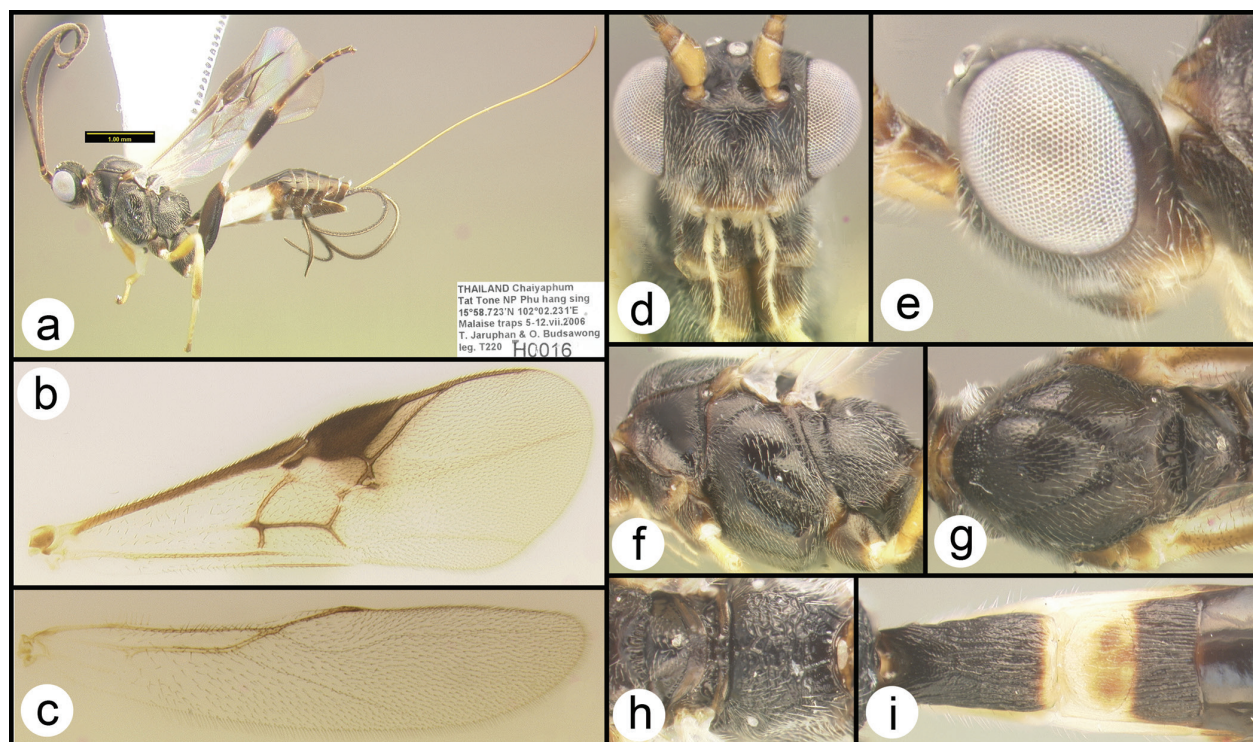


Figure 23. *Z. tonensis*: a) lateral habitus. b) fore wing. c) hind wing. d) anterior head. e) lateral head. f) lateral mesosoma. g) dorsal mesoscutum. h) scutellum and propodeum. i) T1–3.

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Appendix 1

Table 2. Specimens used in the phylogenetic analyses, including specimen numbers, and GenBank and BOLD accession numbers and rough geographical information.

Taxon name	Number	Country: Region	Type status	COI	28S
<i>Aerophilus abdominalis</i>	H1313	USA: KY		ATRMK294-11	KP943685
<i>Aerophilus malus</i>	H1484	USA: WV	holotype	ATRMK309-11	KP943693
<i>Aerophilus rayfisheri</i>	H1212	USA: KY	holotype	ATRMK278-11	KP943675
<i>Agathacrista depressifera</i>	H002	Thailand: Phetchabun		KP943596	KC556782
<i>Agathacrista krataei</i>	H268	Thailand: Kalasin	holotype	KP943614	KC556781
<i>Agathacrista sailomi</i>	H013	Thailand: Chiang Mai	holotype	KX431796	KC556780
<i>Agathacrista winloni</i>	H502	Thailand: Phetchabun	holotype	ATRMK218-11	KC771135
<i>Agathigma templei</i>	H415	Thailand: Kamphaeng	holotype	ATRMK211-11	KX431753
<i>Alabagrus maculipes</i>	H6020	Mexico: Jalisco		ATRMK370-11	KP943698
<i>Asperagathis aspera</i>	H274	Thailand: Phetchabun	holotype	KX431797	KX431706
<i>Asperagathis xesta</i>	H095	Thailand: Chaiyaphum	holotype	KX431798	KX431707
<i>Bassus albifasciatus</i>	H014	Thailand: Sakon Nakhon		–	KX431714
<i>Bassus albifasciatus</i>	H027	Thailand: Trang		KX431800	KX431716

Taxon name	Number	Country: Region	Type status	COI	28S
<i>Bassus albifasciatus</i>	H032	Thailand: Trang		KX431799	KX431715
<i>Bassus albifasciatus</i>	H085	Thailand: Trang		KX431801	KX431719
<i>Bassus albifasciatus</i>	H343	Thailand: Chiang Mai		–	KX431718
<i>Bassus albifasciatus</i>	H377	Thailand: Nakhon Si Thammarat		–	KX431717
<i>Bassus alboapicalis</i>	H021	Thailand: Trang	paratype	KX431821	KX431767
<i>Bassus alboapicalis</i>	H022	Thailand: Trang	paratype	KX431819	KX431764
<i>Bassus alboapicalis</i>	H081	Thailand: Trang	paratype	KX431817	KX431762
<i>Bassus alboapicalis</i>	H269	Thailand: Trang	holotype	KX431820	KX431766
<i>Bassus alboapicalis</i>	H270	Thailand: Trang	paratype	KX431818	KX431763
<i>Bassus alboapicalis</i>	H307	Thailand: Surat Thani	paratype	ATRMK195-11	KX431765
<i>Bassus alboapicalis</i>	H410	Thailand: Nakhon Si Thammarat	paratype	–	KX431761
<i>Bassus albobasalis</i>	H003	Thailand: Phetchabun		KX431802	KX431721
<i>Bassus albobasalis</i>	H092	Thailand: Trang		–	KX431720
<i>Bassus albobasalis</i>	H328	Thailand: Phetchabun		JQ763436	KX431722
<i>Bassus albocyclus</i>	H308	Thailand: Phetchabun	paratype	–	KX431724
<i>Bassus albocyclus</i>	H349	Thailand: Chiang Mai	paratype	–	KX431725
<i>Bassus albocyclus</i>	H636	Thailand: Suphan Buri	holotype	ATRMK230-11	KX431723
<i>Bassus calculator</i>	H8008	Sweden: Stockholms län		–	KX431712
<i>Bassus mediatratus</i>	H015	Thailand: Chiang Mai	holotype	KX431816	KX431760
<i>Bassus nopachoni</i>	H577	Thailand: Kamphaeng	holotype	ATRMK223-11	KX431713
<i>Bassus pallidus</i>	H055	Thailand: Chanthaburi	holotype	–	KX431710
<i>Bassus</i> sp.	H376	Thailand: Phetchaburi		ATRMK204-11	KX431711
<i>Braunsia smithii</i>	H906	Thailand: Chiang Mai		ATRMK261-11	HQ667949
<i>Camptothlipsis lingualongis</i>	H1887	South Africa: Western Cape	paratype	ATRMK334-11	JN564494
<i>Camptothlipsis nigra</i>	H433	Thailand: Prachuap Khiri Khan		ATRMK430-11	HQ667951
<i>Camptothlipsis sheilae</i>	H664	Thailand: Kanchanaburi	holotype	ATRMK235-11	HQ667954
<i>Camptothlipsis</i> sp.	H162	Uganda: Homa Bay		–	KX431699
<i>Camptothlipsis</i> sp.	H2299	Congo: Pool		–	KX431698
<i>Chimaeragathis chrysoma</i>	H710	Thailand: Phetchaburi	holotype	ATRMK240-11	KX431738
<i>Chimaeragathis eurysona</i>	H045	Thailand: Trang	paratype	KX431805	KX431736
<i>Chimaeragathis eurysona</i>	H069	Thailand: Trang	paratype	KX431806	KX431737
<i>Chimaeragathis eurysona</i>	H925	Thailand: Phetchaburi	holotype	ATRMK265-11	KX431735
<i>Chimaeragathis lohmani</i>	H072	Thailand: Trang	holotype	KX431807	KX431739
<i>Chimaeragathis lohmani</i>	H077	Thailand: Trang	paratype	KX431808	KX431740
<i>Cymagathis krikoma</i>	H290	Thailand: Chaiyaphum	paratype	ATRMK192-11	KX431701
<i>Gyragathis leucosoma</i>	H275	Thailand: Nakhon Ratchasima	holotype	KX431794	KX431700
<i>Leurogathis paulbakeri</i>	H369	Thailand: Prachuap Khiri Khan	holotype	–	KX431709
<i>Liragathis baonai</i>	H360	Thailand: Nakhon Si Thammarat	holotype	ATRMK200-11	KX431705
<i>Liragathis damnai</i>	H397	Thailand: Chiang Mai	paratype	ATRMK210-11	KX431704
<i>Liragathis javana</i>	H283	Thailand: Trang		KX431795	KX431702
<i>Liragathis javana</i>	H628	Thailand: Phetchabun		ATRMK228-11	KX431703
<i>Neothlipsis</i> sp.	H195	Thailand: Surat Thani		KP943607	KP943660
<i>Neothlipsis</i> sp.	H198	USA: KY		KX431793	KX431697
<i>Neothlipsis</i> sp.	H7618	Mexico: Yucatan		ATRMK403-11	KP943709
<i>Neothlipsis parysae</i>	H4428	USA: KY	paratype	ATRMK364-11	KX431696
<i>Scabagathis emilynadeauae</i>	H033	Thailand: Trang	holotype	KX431792	KX431695
<i>Trochantagathis marshi</i>	H067	Thailand: Trang		KX431809	KX431742
<i>Trochantagathis marshi</i>	H089	Thailand: Trang		KX431811	KX431745
<i>Trochantagathis marshi</i>	H1851	Thailand: Trang		–	KX431744
<i>Trochantagathis marshi</i>	H281	Thailand: Trang		KX431810	KX431743
<i>Trochantagathis marshi</i>	H765	Thailand: Ubon Ratchathani		ATRMK242-11	KX431741
<i>Trochantagathis marshi</i>	H799	Thailand: Suphan Buri		–	KX431746
<i>Trochantagathis marshi</i>	H965	Thailand: Nakhon Si Thammarat		ATRMK266-11	KX431747
<i>Xanthagathis mellisoma</i>	H060	Thailand: Trang		KX431812	KX431749
<i>Xanthagathis mellisoma</i>	H145	Thailand: Phetchabun		–	KX431748
<i>Xanthagathis mellisoma</i>	H286	Thailand: Chaiyaphum		ATRMK191-11	KX431751
<i>Xanthagathis mellisoma</i>	H348	Thailand: Chiang Mai		ATRMK199-11	KX431750
<i>Xanthagathis mellisoma</i>	H662	Thailand: Phetchaburi		ATRMK234-11	KX431752
<i>Zosteragathis contrasta</i>	H017	Thailand: Chiang Mai		KX431828	KX431783
<i>Zosteragathis contrasta</i>	H056	Thailand: Trang		KX431834	KX431790

Taxon name	Number	Country: Region	Type status	COI	28S
<i>Zosteragathis contrasta</i>	H094	Thailand: Chiang Mai		KX431833	KX431789
<i>Zosteragathis contrasta</i>	H100	Thailand: Chaiyaphum		KX431832	KX431787
<i>Zosteragathis contrasta</i>	H101	Thailand: Loei		KX431827	KX431781
<i>Zosteragathis contrasta</i>	H104	Thailand: Loei		–	KX431782
<i>Zosteragathis contrasta</i>	H142	Thailand: Nakhon Ratchasima		–	KX431779
<i>Zosteragathis contrasta</i>	H143	Thailand: Phetchabun		KX431829	KX431784
<i>Zosteragathis contrasta</i>	H144	Thailand: Phetchabun		KX431830	KX431785
<i>Zosteragathis contrasta</i>	H146	Thailand: Phetchabun		KX431831	KX431786
<i>Zosteragathis contrasta</i>	H149	Thailand: Phetchabun		KX431826	KX431780
<i>Zosteragathis contrasta</i>	H1855	Thailand: Chaiyaphum		ATRMK501-11	–
<i>Zosteragathis contrasta</i>	H603	Thailand: Surat Thani		ATRMK226-11	KX431791
<i>Zosteragathis contrasta</i>	H677	Thailand: Suphan Buri		–	KX431788
<i>Zosteragathis contrastus</i>	H985	Thailand: Kanchanaburi		–	KX431778
<i>Zosteragathis eukos</i>	H689	Thailand: Suphan Buri	holotype	ATRMK238-11	KX431755
<i>Zosteragathis hongensis</i>	H660	Thailand: Mae Hong Son	holotype	ATRMK233-11	KX431727
<i>Zosteragathis inthanonensis</i>	H080	Thailand: Chiang Mai	holotype	KX431814	KX431757
<i>Zosteragathis krachanensis</i>	H492	Thailand: Phetchaburi	holotype	ATRMK217-11	KX431728
<i>Zosteragathis lampangensis</i>	H237	Thailand: Lampang	holotype	KX431815	KX431758
<i>Zosteragathis lampangensis</i>	H989	Thailand: Phetchaburi	paratype	ATRMK271-11	KX431759
<i>Zosteragathis lampooensis</i>	H121	Thailand: Nong Bua Lam Phu	paratype	KX431822	KX431771
<i>Zosteragathis lampooensis</i>	H122	Thailand: Nong Bua Lam Phu	holotype	KX431823	KX431772
<i>Zosteragathis lampooensis</i>	H650	Thailand: Phetchabun	paratype	ATRMK232-11	KX431769
<i>Zosteragathis lampooensis</i>	H1636	Thailand: Ubon Ratchathani	paratype	ATRMK325-11	KX431770
<i>Zosteragathis luangensis</i>	H1859	Thailand: Phitsanulok	holotype	ATRMK329-11	KX431729
<i>Zosteragathis ngamensis</i>	H1625	Thailand: Chaiyaphum	holotype	ATRMK323-11	KX431754
<i>Zosteragathis nuichuaensis</i>	H065	Thailand: Trang		KX431803	KX431733
<i>Zosteragathis nuichuaensis</i>	H083	Thailand: Trang		KX431804	KX431734
<i>Zosteragathis nuichuaensis</i>	H239	Thailand: Trang		–	KX431732
<i>Zosteragathis petchaburiensis</i>	H473	Thailand: Phetchaburi	holotype	ATRMK216-11	KX431708
<i>Zosteragathis phahompokensis</i>	H1858	Thailand: Chiang Mai	holotype	ATRMK328-11	KX431777
<i>Zosteragathis sakonensis</i>	H091	Thailand: Sakon Nakhon	holotype	KX443589	KX431726
<i>Zosteragathis samensis</i>	H2418	Thailand: Prachuap Khiri Khan	holotype	ATRMK475-11	KX431775
<i>Zosteragathis samensis</i>	H973	Thailand: Prachuap Khiri Khan	paratype	ATRMK269-11	KX431774
<i>Zosteragathis surinensis</i>	H598	Thailand: Mae Hong Son	holotype	ATRMK225-11	KX431768
<i>Zosteragathis taemensis</i>	H279	Thailand: Ubon Ratchathani	holotype	KX431824	KX431773
<i>Zosteragathis tonensis</i>	H016	Thailand: Chaiyaphum	holotype	KX431825	KX431776
<i>Zosteragathis</i> sp. n. 1	H687	Thailand: Nakhon Si Thammarat		–	KX431730
<i>Zosteragathis</i> sp. n. 2	H1860	Thailand: Surat Thani		ATRMK330-11	KX431731

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