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A NEW SPECIES OF *PYRAMICA* (HYMENOPTERA: FORMICIDAE) FROM MISSISSIPPI, U.S.A.

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ABSTRACT

A new species of Dacetine ant, *Pyramica subnuda* **new species**, is described from Mississippi. The new species, known only from a single dealate queen, differs from most North American species of *Pyramica* in that it lacks spongiform tissue beneath the petiole and gaster and only has a reduced amount of spongiform tissue below the postpetiole. This species is provisionally placed in the *schultzi* group based on similarities of mandibular dentition, lack of spongiform tissue on the petiole, and other characters that define the group. Additionally, 6 new state records of ants in the genus *Pyramica* are reported for Mississippi: *Pyramica abdita* (Wesson and Wesson), *P. filirrhina* (Brown), *P. inopina* (Deyrup and Cover), *P. margaritae* (Forel), *P. pergandei* (Emery), and *P. wrayi* (Brown).

Key Words: Ants, Dacetini, *Pyramica subnuda*, new species, state records

RESUMEN

Se describe una nueva especie de hormiga de la subfamilia Dacetinae, *Pyramica subnuda,* del estado de Mississippi. La nueva especie, conocida solamente por un especimen de una reina dealatada (sin alas), difiere de la mayoria de las especies de *Pyramica* en norteamérica por la falta de tejido espongoso debajo del pecíolo y gastro y tiene solamente una cantidad reducida de tejido espongoso debajo del pos-pecíolo. Esta especie esta puesta provisionalmente en el grupo *schultzi* basado con su similutud a la dentadura de la mandíbula, la falta de tejido espongoso sobre el pecíolo, y otras caracteristicas que definen el grupo. Además, se reportan 6 nuevos registros estatales de hormigas del género *Pyramica* en Mississippi: *P. abdita*, *P. filirrhina, P. inopina, P. margaritae, P. pergandei* (Emery), y *P. wrayi* (Brown).

The genus *Pyramica* Roger (Hymenoptera: Formicidae: Dacetini) is composed of minute, cryptic ants that typically occur in soil and leaf litter and prey upon small arthropods (Hölldobler & Wilson 1990). In North America, species in this genus generally can be characterized by having 6-segmented antennae; triangular to subtriangular mandibles that are well separated and possess distinct dentition; specially modified hairs on some parts of the body that may be clavate, spoon-shaped, forked, or otherwise atypical; and the usual presence of spongiform tissue below the petiole and postpetiole. Urbani Baroni & de Andrade (2007) proposed that *Pyramica* be synonymized with *Strumigenys*. However, this treatment has not been widely accepted by ant taxonomists (e.g., Bolton et al. 2008; Deyrup & Cover 2009). Therefore, at this time, we continue to follow Bolton (2000) and recognize *Pyramica* as a valid genus. Indeed, based on the large number of species in *Strumigenys* and *Pyramica* (more than 800), and the extensive differences between species groups, it seems more probable that these genera will be split further, rather than combined.

Although the genus *Pyramica* includes 327 species worldwide (including the 1 described here), only 41 species are known to occur in North America (Fisher & Cover 2007). Thirty-seven of these species occur in the eastern United States (Bolton 2000; Deyrup 2006; Deyrup & Cover 1998; Deyrup & Lubertazzi 2001; MacGown & Forster 2005; MacGown et al. 2005), and all of these occur in the southeastern states, making this region the most speciose for the genus in North America. MacGown et al. (2005) reported 20 species from Mississippi. Seven additional species are now known to occur in the state including *P. abdita* (Noxubee, Scott, and Tishomingo Counties), *P. filirrhina* (Tishomingo County), *P. inopina* (Lauderdale and Madison Counties), *P. margaritae* (Oktibbeha County), *P. pergandei* (Attala, Marshall, and Noxubee Counties), *P. wrayi* (Leake County), and the new species described here. Of these 27 species, 23 are considered to be native, 3 to be introduced, and the new species may be introduced as well. One hypothesis to account for the high number of *Pyramica* species in the Southeast is that many of the native species may have persisted in mesic refuges during the Pleistocene, when dramatic climatic shifts occurred (Deyrup 1988).

The following new species is described based on a single dealate female. Structures were measured with an ocular micrometer mounted inside the left eyepiece of a Leica MZ16 stereomicroscope at 100X. All measurements are in mm. The following measurements were used.

WL: Weber's length of mesosoma, measured from anterior edge of pronotum to posterior edge of metapleural gland.

HL: Head length; in full-face view, the perpendicular distance from a line tangent to the anteriormost projection of the clypeus to a line tangent to the posteriormost part of the rear border of vertex.

HW: Head width; maximum width of head in full-face view, including compound eyes.

SL: Length of antennal scape from base to apical tip.

EL: Maximum eye length.

ML: Straight-line length of fully closed mandible, measured from apex of mandible to anterior clypeal margin.

FFL: Length of fore femur.

MFL: Length of mid femur.

HFL: Length of hind femur.

PSL: Propodeal spine length; measured from posterior edge of propodeal spiracle to apex of spine.

PNW: In dorsal view, maximum width of node of petiole

PNL: In dorsal view, maximum length of node of petiole.

PPNW: In dorsal view, maximum width of node of postpetiole.

PPNL: In dorsal view, maximum length of node of postpetiole.

Pyramica subnuda MacGown and Hill, **new species**

Description of dealate female (Fig. 1)

WL: 0.70; HL: 0.61; HW: 0.44; SL: 0.35; EL: 0.15; ML: 0.15; FFL: 0.39; MFL: 0.40; HFL: 0.42; PSL: 0.09; PNW: 0.18; PNL: 0.10; PPNW: 0.28; PPNL: 0.17.

Color yellowish-brown, appendages slightly paler. Head widest near occiput, pyriform (in frontal view). Mandible in frontal view triangular; lacking diastema; basal lamella in the shape of a large equilateral triangle with rounded apex, followed by 5 teeth: teeth 1, 3, and 5 longer and more acute than teeth 2 and 4, followed by 2 slightly smaller teeth with tooth 7 longer and more acute than tooth 6, followed by 4 small denticles, and terminating in a slightly enlarged apical tooth. Clypeus wide, pentagonal, with light sculpturing, not shining; anterior edge straight; hairs on clypeal dorsum and margins slightly clavate, of approximately the same length, and all curving anteriorly toward the midline of clypeus. Remainder of head reticulate-punctate with scattered, appressed, simple to coarse hairs all curving in toward midline of head (in frontal view); elongate flagelliform cephalic hairs absent; antennal scrobes absent. Scape subequal to antennal segments 5+6, hairs on scape rather sparse, proclinate, tapering, except those found on leading edge of scape, which are more coarse to slightly clavate with 4 hairs curving toward base of scape and other hairs curving toward apex; funicular segments with relatively dense, short, tapering proclinate hairs. Eye large, with 12 facets in greatest diameter, approximately 0.29 X length of head, placed in approximately middle of side of head. Three ocelli present, arranged in an equilateral triangle near the occiput in center of head (in frontal view).

Dealate, wing stumps present; pronotal angle rounded; pronotum, mesonotum, metanotum, propodeum (including declivity) with reticulate-punctate sculpture; mesopleuron mostly shiny, lacking sculpture except at extreme upper region of anepisternum and lower posterior region of katepisternum; scattered short, coarse, curved, reclinate hairs present on pronotum, mesonotum, and metanotum, lacking on mesopleuron, metapleuron, and propodeum; one pair of suberect, clavate hairs on posterior region of mesonotum and metanotum, elongate hairs absent on mesosoma; propodeal spine short, about as long as width of base, directed straight backward toward gaster, not subtended by a lamina. Coxae lightly reticulate-punctate, appearing somewhat shiny with sparse, coarse, proclinate hairs. Femora and tibiae smooth, shining, anterior surfaces with relatively sparse proclinate, tapering hairs. Tarsi with relatively dense, proclinate tapering hairs; dorsal surfaces of middle and hind basitarsi lacking projecting flagellate hairs.

Spongiform appendages absent from petiole and gaster, postpetiole with reduced spongiform tissue ventrally; petiole and postpetiole with lamina at posterior edges; dorsum and sides of petiole and postpetiole smooth and shining, petiolar stalk reticulate-punctate, with sparse reclinate tapering hairs; in dorsal view, petiole rectangular with rounded edges; postpetiole oval, approximately twice as wide as long and slightly more than 1.5 times as wide as petiole. First tergite of gaster lacking grooves, lightly shagreened, remainder of gaster shiny; gastral tergites with sparse, curved, simple to coarse appressed hairs placed approximately 1 hair's length apart or more; longer, simple to bifurcate erect hairs present at edges of sclerites.

Diagnosis

In North America, *P. subnuda* is most similar to *P. margaritae* (Fig. 2), from which it differs by

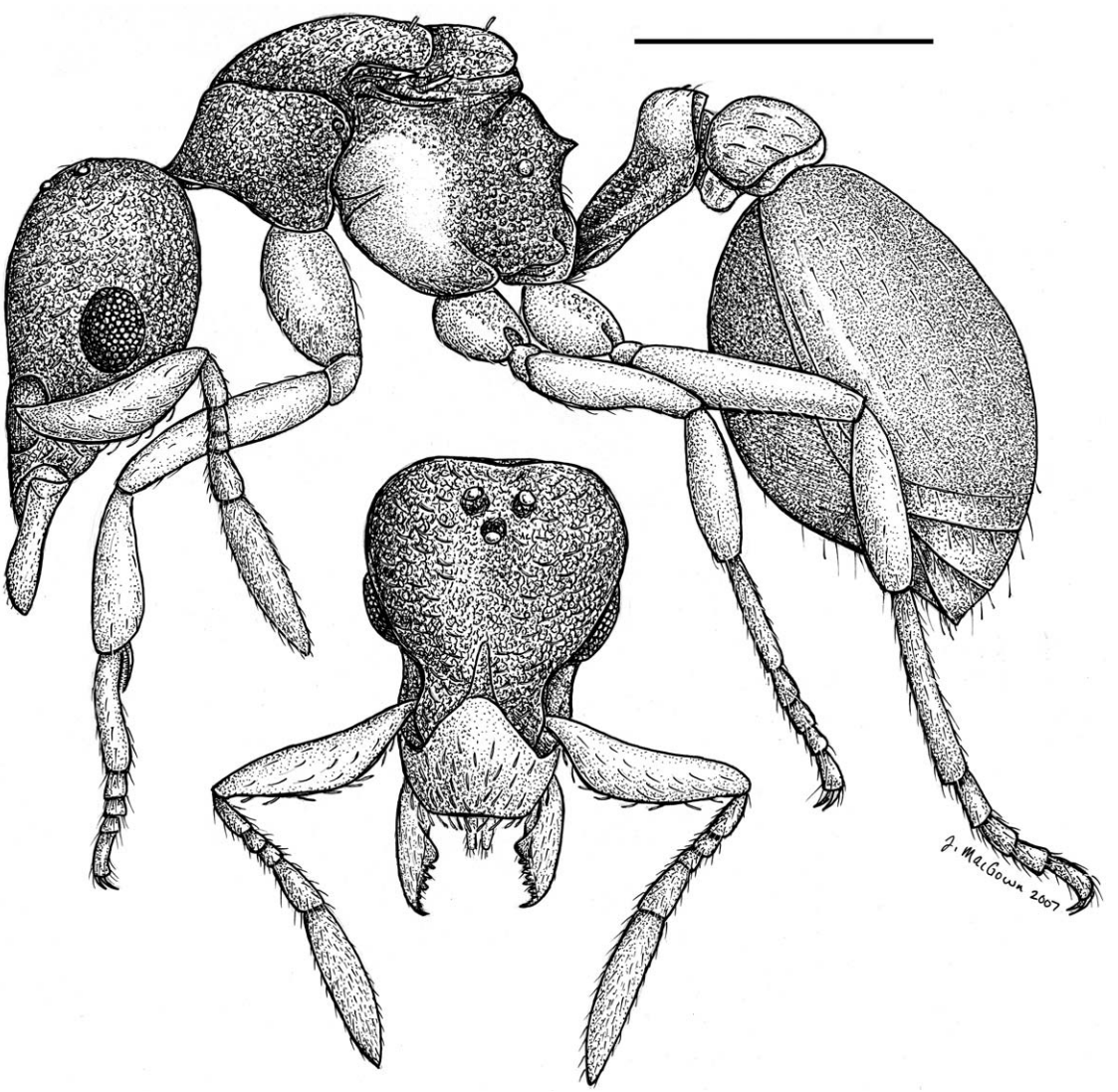

Fig. 1. *Pyramica subnuda* **new species**, profile and full-face view of dealate female. Scale bar equals 0.50 mm.

the following: in *P. subnuda,* hairs on the body are slightly coarse to slightly clavate, whereas in *P. margaritae*, all hairs on the head, mesosoma, waist, and gaster are distinctly clavate and somewhat translucent, more erect, and more abundant; the mesopleuron and dorsum of petiole and postpetiole are smooth and shining in *P. subnuda,* whereas they are reticulate-punctate in *P. margaritae*; the propodeal spine length is much shorter in *P. subnuda;* and the gaster is only weakly shagreened, appearing shiny in *P. subnuda,* whereas it is densely striolate-punctate to shagreened with dense striolae in *P. margaritae*. The only other species of *Pyramica* lacking or with reduced spongiform appendages known to occur in the United States is *P. inopina* (Fig. 3). It was previously reported only from Florida (Deyrup & Cover 1998), where it was described from 3 females, with no workers known. A dealate female of this species was collected on 17 Sep 2008 in Lauderdale County, Mississippi, by J. G. Hill, and an alate female was collected in a Lindgren funnel trap that was run from 25 Jul to 10 Aug 2005 in Ballard, Madison County, Mississippi. *Pyramica inopina* is easily distinguished from *P. subnuda* by its more triangular shaped face, entire side of the mesosoma being shiny, having numerous, dense, long hairs, and total absence of spongiform appendages beneath the postpetiole.

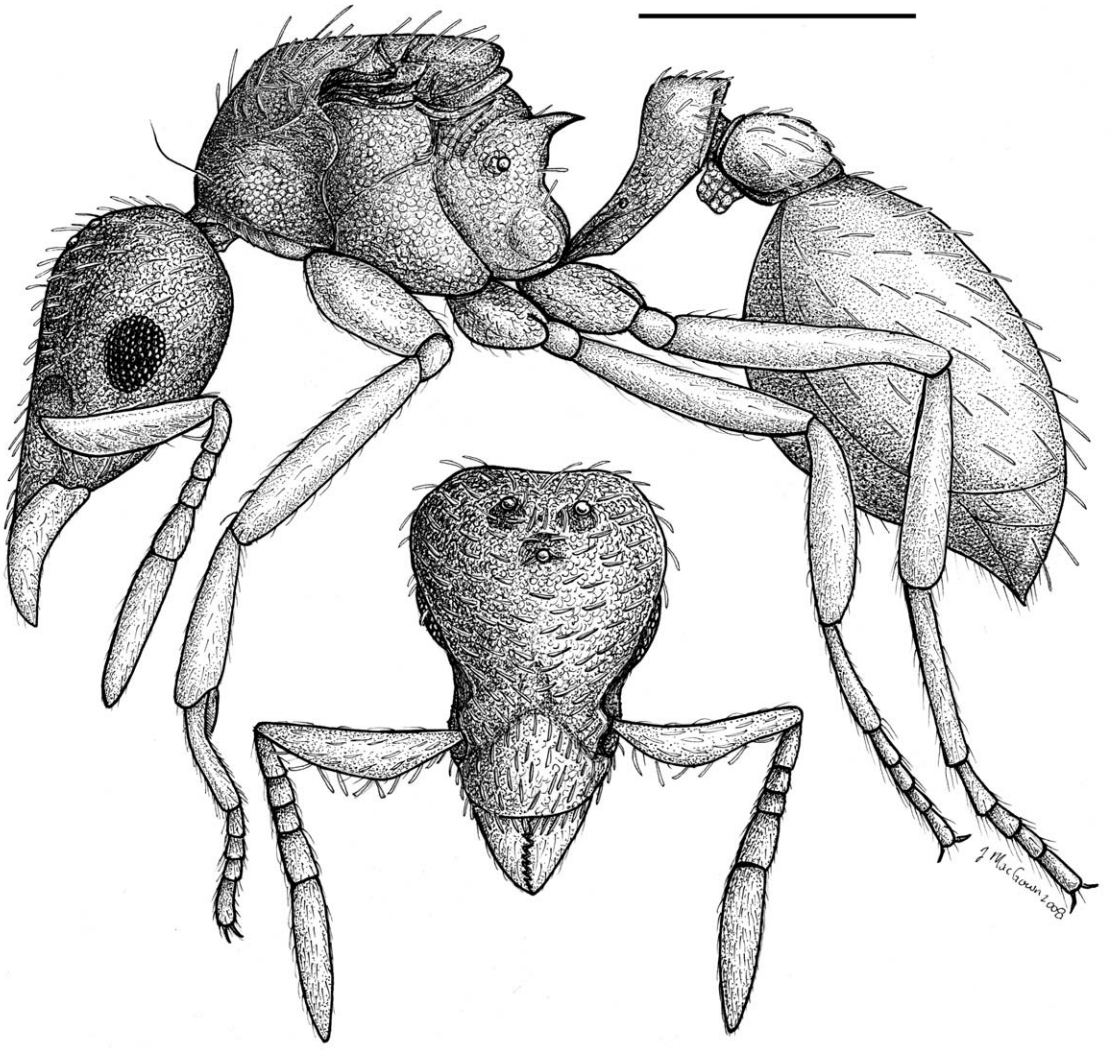

Fig. 2. *Pyramica margaritae*, profile and full-face view of dealate female. Scale bar equals 0.50 mm.

Holotype

Dealate female, Miss., Jeff. Davis Co., Jeff Davis Lake, 31°33'47"N 89°50'39"W, 11 August 2005, J. G. Hill, J.A.MacGown, in grass clippings at base of *Quercus falcata* in open woods near lake. Deposited in the Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts.

Etymology

The species name *subnuda* (Latin) refers to the general lack of spongiform appendages and the overall scarcity of hairs.

Position in Taxonomic Keys

The single specimen of *P. subnuda* differs from other species of *Pyramica* known to occur in the southeastern United States by its lack of spongiform appendages beneath the petiole, smooth mesopleuron, and somewhat sparse setation. Attempts to identify the specimen with keys to species for all regions of the world in the worldwide revision of Dacetini by Bolton (2000) were unsuccessful. The closest match was at couplet 6 of the Nearctic *Pyramica* key, where it keyed to *P. margaritae,* but did not match all of the key characters or the description. The only other species similar to *P. subnuda* is *P. inopina*, which was not

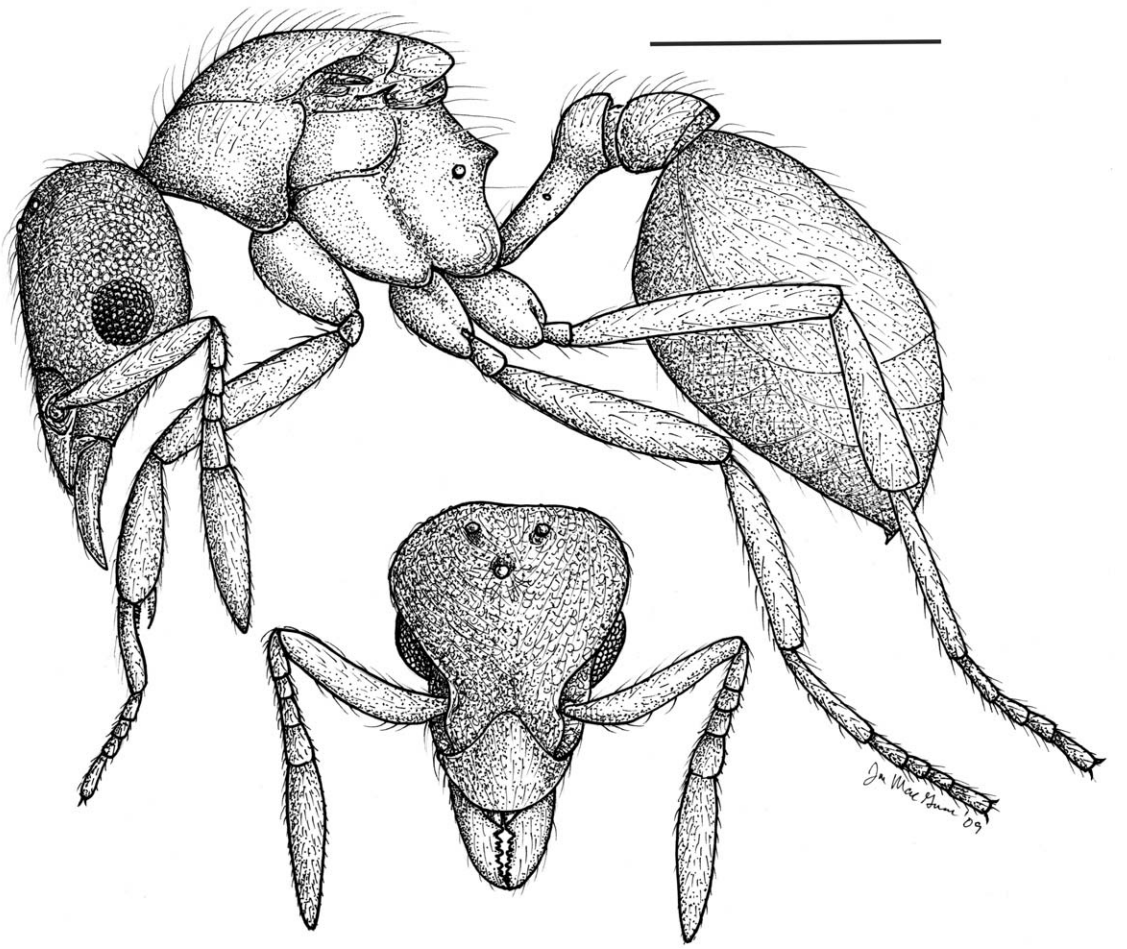

Fig. 3. *Pyramica inopina*, profile and full-face view of dealate female. Scale bar equals 0.50 mm.

included in Bolton's key to workers because workers for this species have not been discovered. Although the keys were written for workers, they also work well for queens, which share similar characters. Additionally, the new species was compared to and differed from a dealate queen of *P. margaritae,* which was collected in Alabama and the 2 specimens of *P. inopina* from Mississippi, both of which are deposited in the Mississippi Entomological Museum (MEM).

Discussion

The single specimen of *P. subnuda* was collected on 11 Aug 2005 in a Berlese litter sample of grass clippings piled at the base of *Quercus falcata* Michx. (Fagaceae) in an open area near Jeff Davis Lake (Jefferson Davis County) with scattered trees present. A mixed hardwood-pine forest surrounded the entire area. Other ants collected in the same Berlese sample included *Brachymyrmex patagonicus* Mayr, *Hypoponera opaciceps* (Mayr), *Pyramica membranifera* (Emery), *Cyphomyrmex rimosus* (Spinola), *Solenopsis invicta* Buren, and *Pheidole moerens* Wheeler, all of which are considered to be exotic species. An exotic tenebrionid beetle known to be associated with introduced fire ants, *Poecilocrypticus formicophilus* Gebien (MacGown 2005), also was found in large numbers in the sample. All of these species, including the tenebrionid beetle, were found in relative abundance on 2 subsequent trips to the site.

Due to the extremely cryptic nature of dacetine ants, many species are infrequently collected and have been described from only 1 or very few specimens. Despite this, we hesitated to describe this species based on only 1 specimen, hoping to find additional specimens, especially workers. Unfortunately, the type locality was devastated by Hurricane Katrina on 28 Aug 2005, only 2 weeks after the specimen was collected. Two subsequent col-

lecting trips were made to the site on 25 Mar 2006 and 8 Sep 2006. Although hand collecting was conducted and twenty five 3.8-liter bags of litter and grass clippings were collected on the 2 dates, including three 3.8-liter bags of litter from the base of the same tree where the original collection was made, no additional specimens of the new species were discovered. Similarly, we have not collected any other specimens of this species during other collecting trips in southern portions of Mississippi.

Pyramica subnuda is provisionally placed in the *schultzi* group, of which it has several affinities. The *schultzi* group is comprised of 17 species, not including the species described here, with only 1 species, *P. margaritae,* known to occur north of Mexico (Bolton 2000). Members of this group have ventral spongiform appendages reduced or absent, lack flagellate hairs, have dense reticulate-punctation on head, mesosoma, and waist, possess large eyes, and tend to be associated with plants instead of being found in soil/litter or rotting wood. Mandibular dentition in this group is somewhat variable, with the general pattern consisting of a basal lamella (with or without a diastema), followed by 5 larger teeth, followed by 2 smaller teeth, then 4 denticles, and ending with an apical tooth (Bolton 2000). *Pyramica margaritae* is unique in the group in that teeth 1, 3, and 5 are acute and longer than teeth 2 and 4, which are blunt, and this sequence is continued with tooth 7 being acute and longer than tooth 6, which is blunt. All other species in the group have slightly different dental patterns. However, the new species, *P. subnuda,* has a similar dental array to *P. margaritae*, and otherwise appears to be most similar to this species.

Members of the *schultzi* group are largely tropical, with only *P. margaritae* known to occur in the United States in Alabama, Florida, Georgia, Louisiana, Mississippi, and Texas, where it is considered to be exotic (Bolton 2000; Dash 2005). It is not known for certain whether *P. subnuda* is native or an undescribed exotic species. Because the rest of the group is tropical, and because many of the species collected at the type locality were also exotic species, it raises the likelihood that *P. subnuda* could be an exotic species.

Acknowledgments

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