

Dacetine ants of Panama : New records and description of a new species (Hymenoptera: Formicidae: Myrmicinae: Dacetini)

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Proceedings of the Entomological Society of Washington 108:814-821 (2006)

<http://biostor.org/reference/55407>



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**DACETINE ANTS OF PANAMA: NEW RECORDS AND DESCRIPTION OF A
NEW SPECIES (HYMENOPTERA: FORMICIDAE:
MYRMICINAE: DACETINI)**

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Abstract.—*Pyramica* and *Strumigenys* are the most speciose dacetine (Formicidae: Myrmicinae: Dacetini) genera in the world. A new ant species in the *Pyramica alberti* group is described from leaf-litter surveys conducted in the Canal Zone, Panama. *Pyramica panamensis*, new species, is similar to *P. fridericimuelleri*, *P. nigrescens*, and *P. parsauga*, but differs from those species in having strongly reduced eyes and a distinct promesonotal carina. A couplet is added to Bolton's (2000) key to *Pyramica* in order to accommodate the new species. New Central American records for two species in the dacetine genera *Pyramica* and one in *Strumigenys* are reported, and a checklist of the known Panamanian dacetine species is presented.

Resumen.—Los géneros *Pyramica* y *Strumigenys* contienen el mayor número de especies dentro de los dacetinos (Formicidae: Myrmicinae: Dacetini) en el mundo. Se describe una nueva especie dentro del grupo *alberti*, coleccionada en hojarasca en la zona del Canal de Panamá, Panamá. *Pyramica panamensis* sp. nov. es similar a las especies *P. fridericimuelleri*, *P. nigrescens*, y *P. parsauga*, pero se diferencia de estas en la presencia de ojos fuertemente reducidos y una carena promesonotal distintiva. Adiciones a la clave taxonómica para la identificación de las especies del género *Pyramica* para el Neotrópico (Bolton 2000) fueron necesarias para incluir *P. panamensis*. Dos especies en el género *Pyramica* y una en el género *Strumigenys* son reportados como nuevos registros para América Central, y se presenta una lista de las especies conocidas dentro de la tribu para Panamá.

Key Words: Central America, leaf litter, *Pyramica panamensis*, systematics, taxonomy

Ants (Hymenoptera: Formicidae) are one of the most ecologically important groups of insects due to their relative abundance in terrestrial ecosystems, especially in the tropics. Leaf-litter ants in particular are increasingly employed in biodiversity surveys (Agosti et al. 2000). Ants of the tribe Dacetini, worldwide in distribution and generally predaceous, are commonly encountered in such

surveys. The tribe includes ants that are morphologically distinct (e.g., antennal segment numbers are reduced, mandibles are elongate and traplike; hairs, especially on the head, are scalelike; and spongiform lobes occur on the petiolar and postpetiolar segments). A recent revision of the tribe (Bolton 2000) permits the accurate identification of known species and, consequently, the recognition of species hitherto unknown to science. Intensive ecological work in Panama on ants, including dacetine ants (Kaspari and Weisner 2000, Kaspari et al. 2001), requires that Panamanian dacetine ant taxonomy remain current.

Of the nine dacetine genera, *Pyramica* Roger and *Strumigenys* Fr. Smith are the most speciose, *Pyramica* being more speciose than *Strumigenys* in the Neotropics (Bolton 2000), and the only ones with worldwide distributions. Both genera occur throughout the Americas, but are more abundant in the Neotropics (Brown 1962, Bolton 2000), where their mostly cryptic species are typically encountered inhabiting leaf litter, rotten wood, or soil (Brown 1953, Dejean 1991). Entomobryid and isotomid collembolans appear to be the main prey items of *Pyramica* and *Strumigenys*, but some species also feed on mites, termites, and ant larvae (Wilson 1954, Bolton 2000).

The New World tropics contain 85 described species of *Strumigenys* and 100 species of *Pyramica*. Here we present new species records for Central America and describe a new species, *P. panamensis*, within the *P. alberti* (Forel) species group. The *P. alberti* species group is broadly distributed in the Neotropical Region and frequently collected. *Pyramica panamensis* appears to be closely related to *P. fridericimuelleri* (Forel), *P. nigrescens* (Wheeler), and *P. parsauga* Bolton. A list of dacetine ants from Panama is presented, along with a mod-

ification of Bolton's (2000) key to accommodate *P. panamensis*.

MATERIALS AND METHODS

Measurements and terminology follow Bolton (2000). Specimens examined were borrowed from or have been deposited in the following collections:

- | | |
|------|---|
| BMNH | The Natural History Museum, London, U.K. |
| JTLC | J. T. Longino Collection, Evergreen State College, Olympia, Washington, U.S.A. |
| MZSP | Museu de Zoologia da Universidade de São Paulo, São Paulo, Brazil. |
| USNM | National Museum of Natural History, Smithsonian Institution, Washington, DC, U.S.A. |

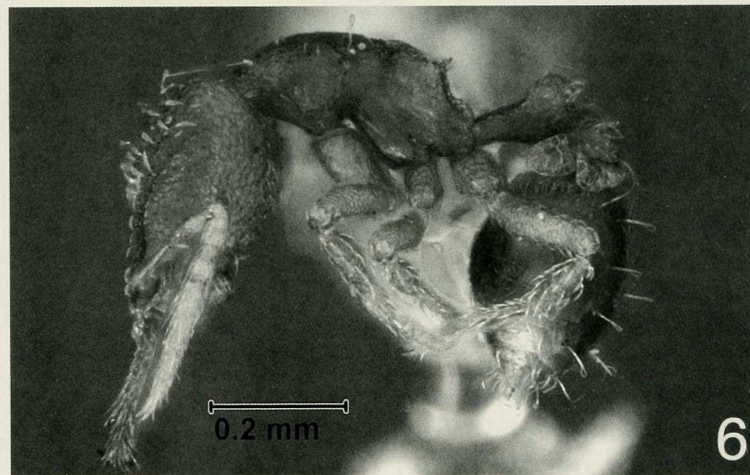
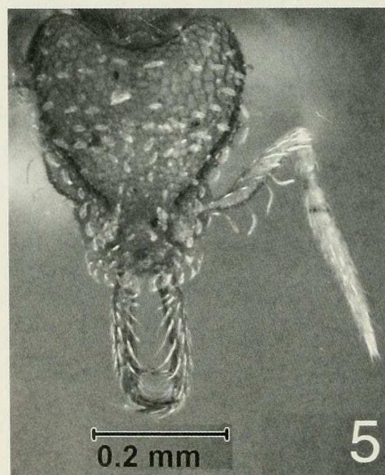
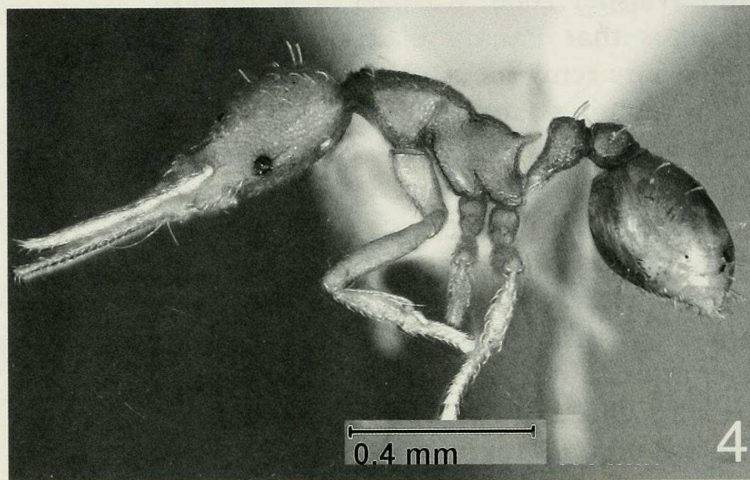
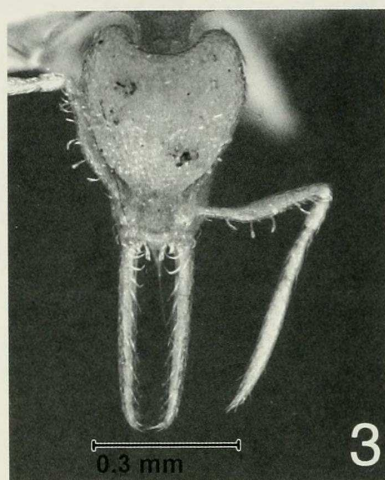
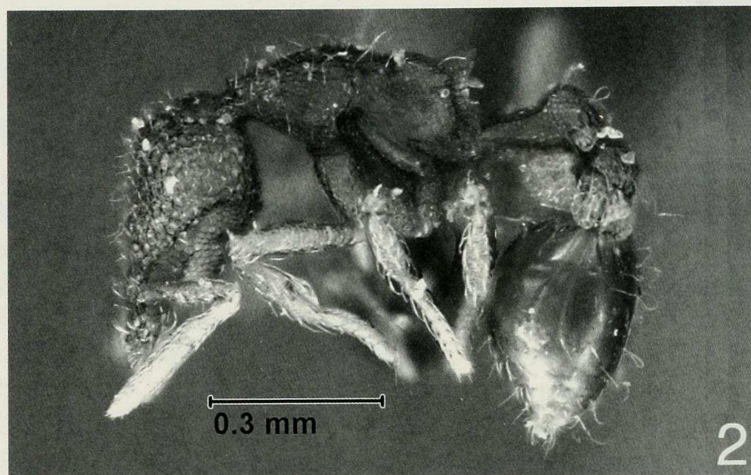
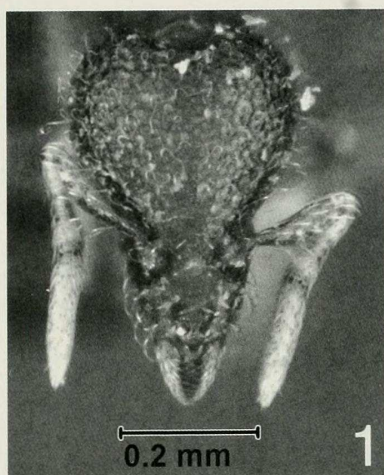
The holotype of *P. panamensis* was examined and measured using a Leica MZ125 stereomicroscope and photographed using a ProgRes 3012 digital camera (Jenoptik) attached to Leica MZ16 stereomicroscope. Specimens of *P. cincinnata* (Kempf), *P. denticulata* (Mayr), *P. fridericimuelleri*, *P. nigrescens*, and *Strumigenys perparva* Brown were photographed using a JVC KY-F70B video camera mounted on a Leica M420 microscope. All images were prepared using Auto-Montage Version 3.04 software (Synoptics Ltd.) and Photoshop® (Adobe Inc.).

TAXONOMIC TREATMENT

Genus *Pyramica* Roger 1862
Pyramica cincinnata (Kempf 1975)

(Figs. 1–2)

This is the first record for this species for Central America. *Pyramica cincinnata* has been recorded previously only from Brazil (Bolton 2000). The Panamanian specimens are slightly larger than the ones examined by Bolton (2000).



Figs. 1-6. Frontal and lateral views. 1-2, *Pyramica cincinnata*. 3-4, *P. denticulata*. 5-6, *Strumigenys perparva*.

Measurements (measurements in parentheses from Bolton [2000]): TL 1.85-1.89 (1.6-1.8), HL 0.47 (0.46-0.48), HW 0.34 (0.30-0.32), CI 72 (65-68), ML 0.08-0.09 (0.07-0.08), MI 17-20 (15-18), SL 0.24 (0.20-0.22), SI 68 (67-69), PW 0.20 (0.19-0.21), AL 0.52-0.53 (0.43-0.47).

Material examined.—2 workers, labeled “PANAMA, Panama Prov.: Gamboa, Pipeline Road nr. Rio Frijolito; 09°09'00"N 79°43'56"W, 18 viii 2003; litter sample; J. Sosa-Calvo,” “USNM No. 00445071, 00445072”. PARATYPES: 2 workers, labeled “BRAZIL, Amazonas: Ponta Negra, N. of Manaus; Sept. 1962; W. L. Brown.” Deposited in the MZSP.

Pyramica denticulata (Mayr 1887)

(Figs. 3–4)

This is the first record for this species for Central America. *Pyramica denticulata* has been recorded previously from Trinidad, Suriname, Guyana, French Guiana, Brazil, Bolivia, Paraguay, Venezuela, Colombia, Ecuador, and Argentina (Bolton 2000, Lattke and Goitia 1997).

Material examined.—2 workers and 1 gyne, labeled “PANAMA, Panama Prov.: Gamboa, Pipeline Road between Rios Frijoles and La Seda; 72 m, 6 vi 2002 to 8 vi 2002; litter sample; C.J. Marshall,” “USNM No. 00411461, 00411459, 00411798.” 1 gyne, labeled “BRAZIL, Sao Paulo: Agudos, 4 iii 1953; berlese; W. Kempf.” 3 workers, labeled “BRAZIL, Sao Paulo: Agudos, 6 iii 1955; C. Gilbert.” 3 workers, labeled “SURINAME, (no locality), 15 vii 42; Geijskes (coll).”

Pyramica panamensis Sosa-Calvo, Shattuck, and Schultz, new species

(Figs. 11–12, 15)

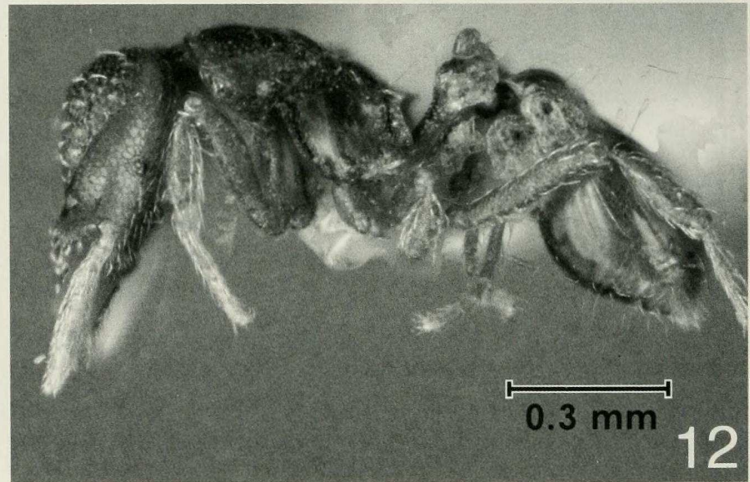
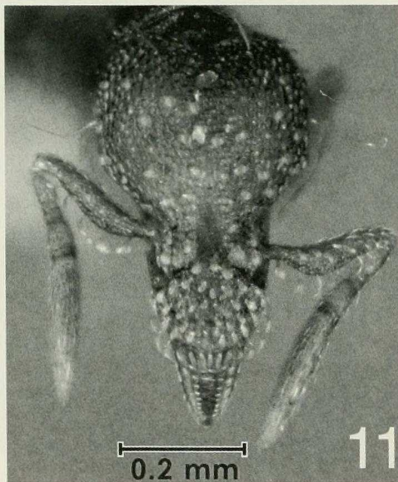
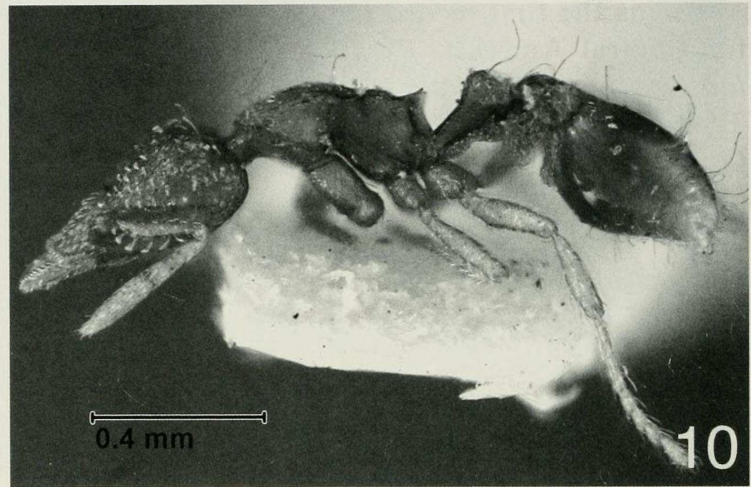
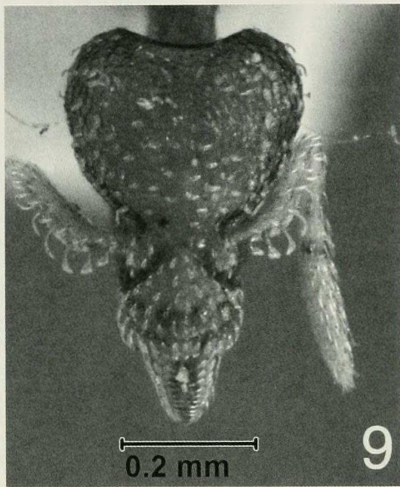
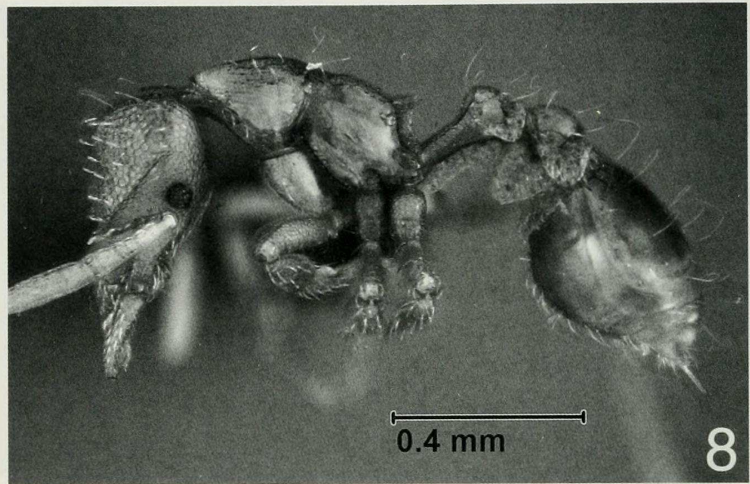
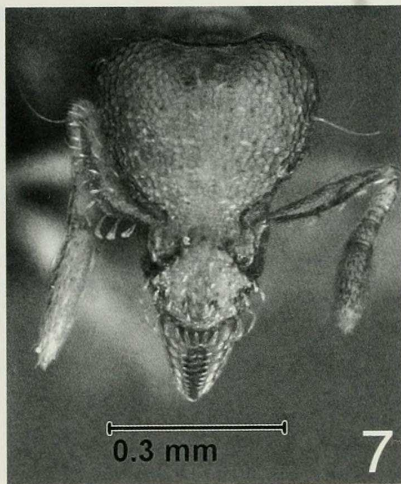
Diagnosis.—*Pyramica panamensis* is a member of the *P. alberti* species group and is most similar to *P. fridericimuelleri* (Figs. 7–8, 13), *P. nigrescens* (Figs. 9–10, 14), and *P. parsauga*. *Pyramica panamensis* can be distinguished from these species by the presence of small eyes and promesonotum with a complete median longitudinal carina.

Description.—*Holotype worker*: TL 1.8, HL 0.50, HW 0.35, CI 70, ML 0.11, MI 22, SL 0.28, SI 80, PW 0.23, AL 0.48. Possessing characters of *alberti* complex. Masticatory margin of mandibles with a series of acutely triangular apical teeth (mandibles closed in holotype and basal region not visible). Anterior clypeal margin broadly and very shallowly convex between points where outer margins of closed mandibles intersect clypeal margin. Apicoscrobial hair flagellated, long, and fine. Eye very small, with only 2 ommatidia in longest row and only 4 in total. Promesonotum with a well-developed median longitudinal carina that extends through the entire length of pronotum and most of mesonotum. Pronotum dorsally entirely sculptured with fine punctation. Petiolar node in dorsal view slightly broader than long, with sides slightly converging anteriorly. Lateral spongiform lobes of node extending forward almost to anterolateral angles.

Gyne and male: Unknown

Type material.—Holotype worker, labeled “PANAMA: Panama Prov.: Gamboa, Pipeline Road between Rios Frijoles and La Seda; 72 m, 6 vi 2002 to 8 vi 2002; litter sample; C. J. Marshall,” “USNM, No. 00410482.”

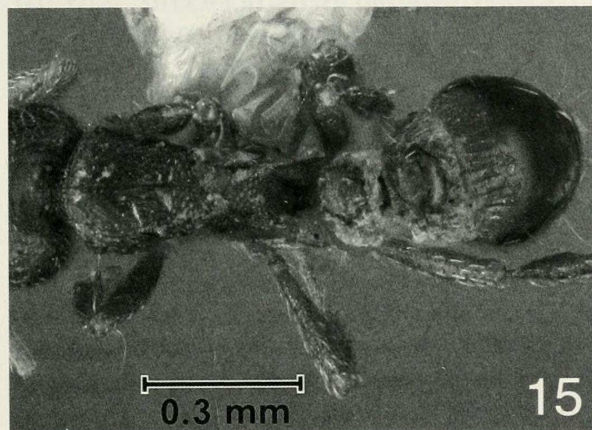
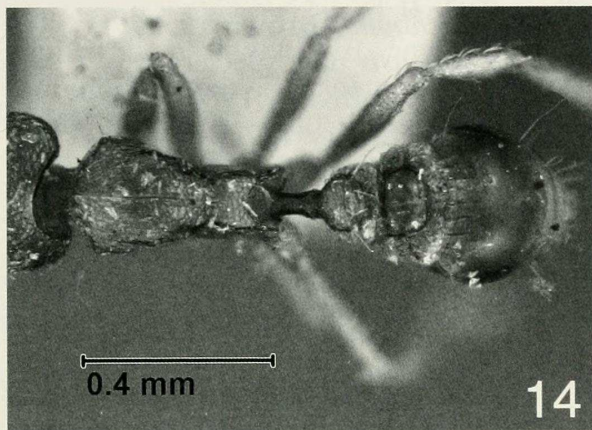
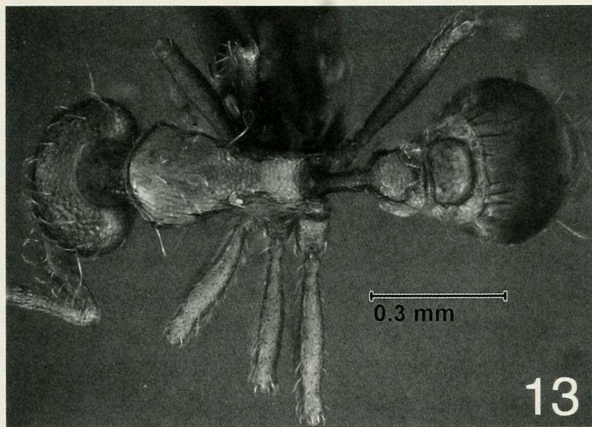
Distribution and natural history.—*Pyramica panamensis* is known only from its type locality, Soberania National Park in Gamboa, Panama Province. This species was collected from leaf-litter samples taken in a successional rain forest containing *P. cincinnata*, *P. denticulata*, and *S. perparva*. None of the species closely related to *P. panamensis* (*P. fridericimuelleri*, *P. nigrescens*, and *P. parsauga*) are known from this particular lowland rain forest (Bolton 2000), although *P. fridericimuelleri*, the species apparently most closely related to *P. panamensis* and one of two species (the other *P. alberti*) within the *P. alberti* species group that occur in Panama, is



Figs. 7-12. Frontal and lateral views. 7-8, *Pyramica fridericimuelleri*. 9-10, *P. nigrescens*. 11-12, *P. panamensis*.

found in the Chiriqui Mountains and Costa Rica. The other two species in the *P. alberti* group, however, are found in the northern part of Central America (*P.*

nigrescens) or reported exclusively from Costa Rica (*P. parsauga*). The natural history of *P. panamensis* remains unknown.



Figs. 13–15. Dorsal views. 13, *Pyramica fridericimuelleri*. 14, *P. nigrescens*. 15, *P. panamensis*.

Discussion.—The *P. alberti* group includes seven exclusively New World species. Of these seven species, *P. conspersa*, *P. furtiva*, and *P. sublucida* are known only from South America. *P. alberti* and *P. fridericimuelleri* are apparently more widely distributed, occurring in both Central and South America. *Pyramica nigrescens* and *P. parsauga* are known only from Central America.

Pyramica panamensis shares with *P. parsauga* the reduced eyes (about 4 facets in total), but can be distinguished by promesonotal dorsum bearing a median longitudinal carina and dorsum of propodeum reticulate (smooth in *P. parsauga*). With *P. fridericimuelleri* and *P. nigrescens*, *P. panamensis* shares the fine median longitudinal carina on the promesonotal dorsum, the anterior clypeal margin, which in full face view is shallowly convex between the points where outer margins of the fully closed mandibles intersect the clypeal margin, and the sculpture on the dorsum of the mesosoma (most similar to *P. nigrescens*). *Pyramica panamensis* can be separated from *P. fridericimuelleri* and *P. nigrescens* by the compound eye composed of 4 facets (approximately 10 facets in *fridericimuelleri* and *nigrescens*), and the disc of the petiolar node slightly broader than long and with the sides only slightly converging anteriorly (intermediate between *fridericimuelleri* and *nigrescens*).

Genus *Strumigenys* F. Smith 1860

Strumigenys perparva Brown 1958

(Figs. 5–6)

This is the first record for this species for Central America. *Strumigenys perparva* has been recorded previously from Trinidad, Venezuela, Colombia, Bolivia, Guyana, Suriname, and Peru (Bolton 2000).

Material examined.—4 workers and 1 gyne, labeled “PANAMA, Bocas del Toro: Km 26 rd. to Chiriqui Grande; 09°01'34.92"N 82°18'20.04"W; 2 vi 2002 to 4 vi 2002; litter sample; C.J. Marshall,” “USNM No. 00410903, 00410910.” 1 gyne, labeled “Panama Prov.: Gamboa, Pipeline Road between Rios Frijoles and La Seda; 72 m, 6 vi 2002 to 8 vi 2002; litter sample; C.J. Marshall,” “USNM No. 00445073.” PARATYPE, 1 worker, labeled “BRA-

ZIL, Sao Paulo: Agudos; 6 iii 1955; C. Gilbert." 2 workers, labeled "SURI-NAME, Tambahredjo; vi 1959; I. v. d. Drift."

MODIFICATION OF BOLTON'S (2000) KEY TO NEOTROPICAL *PYRAMICA* SPECIES

Here we add two couplets (number 48a and 48b) to Bolton's (2000, p. 137) key in order to accommodate *P. panamensis*.

47. Basal lamella of mandible followed distally by a long edentate second lamella that extends forward about half exposed length of fully closed mandible, lamellae separated only by a minute cleft; mandibles relatively long, MI 27-33 *alberti*
 - Basal lamella of mandible immediately followed distally by tooth row, without a second lamella that extends forward for half exposed length of fully closed mandible; mandibles shorter, MI 19-24 48a
- 48a. Eye small, with only 4 ommatidia in total 48b
 - Eye larger, with 10 or more ommatidia in total 49
- 48b. Promesonotal dorsum without a median longitudinal carina. Pronotal dorsum entirely smooth and shining. Propodeal dorsum smooth and shining *parsauga*
 - Promesonotal dorsum with a median longitudinal carina. Pronotal and propodeal dorsum entirely sculptured with fine punctation *panamensis*, n. sp.
49. Basal tooth row of mandible consisting only of narrowly triangular high acute teeth. Disc of petiole node in dorsal view as long as broad and with the sides of node converging anteriorly *fridericimuelleri*
 - Basal tooth row of mandible consisting of alternating high narrow acutely triangular teeth and lower bluntly rounded broader teeth; tooth 4 from base particularly broad and rounded. Disc of petiole node in dorsal view much broader than long, roughly transversely rectangular, sides not converging anteriorly *nigrescens*

Checklist of Dacetini of Panama (modified from Bolton 2000)

Genus *Acanthognathus* Mayr 1887

- A. brevicornis* M. R. Smith 1944
A. ocellatus Mayr 1887

Genus *Pyramica* Roger 1862

- P. alberti* (Forel 1893)
P. brevicornis (Mann 1922)
P. cincinnata (Kempf 1975)#
P. crementa Bolton 2000
P. denticulata (Mayr 1887)#
P. depressiceps (Weber 1934)
P. fridericimuelleri (Forel 1886)
P. gundlachi Roger 1862
P. lalassa Bolton 2000
P. margaritae (Forel 1893)
P. metopia (Brown 1959)
P. myllorhapha (Brown 1959)
P. panamensis new species#
P. probatrix (Brown 1964)
P. schulzi (Emery 1894)
P. subdentata (Mayr 1887)
P. trieces (Brown 1960)
P. wheeleri (Smith 1944)
P. zeteki (Brown 1959)

Genus *Strumigenys* F. Smith 1860

- S. biolleyi* Forel 1908
S. cordovens Mayr 1887
S. deltisquama Brown 1957
S. dolichognatha Weber 1934*
S. elongata Roger 1863
S. emmae (Emery 1890)
S. extirpa Bolton 2000
S. fairchildi Brown 1961
S. godmani Forel 1899
S. humata Lattke & Goitia 1997
S. lacacoca Brown 1959
S. lanuginosa Wheeler 1905
S. longispinosa Brown 1958
S. louisianae Roger 1863
S. ludia Mann 1922*
S. marginiventris Sanstchi 1931
S. perparva Brown 1958#
S. planeti Brown 1953*
S. precava Brown 1954
S. rogeri Emery 1890
S. smithii Forel 1886
S. tococae W. M. Wheeler & Bequaert 1929*
S. trinidadensis Wheeler 1922

* From Kaspari's ants of the Barro Colorado Island Monument (BCIM),

Panama, website (http://faculty-staff.ou.edu/K/Michael.E.Kaspari-1/K/Michael.E.Kaspari-1/bcnm_ants_home.htm). Specimens not seen by authors.

New record for Panama

Unmarked (with either * or #) indicates recorded in Bolton (2000)

ACKNOWLEDGMENTS

We are indebted to C. Marshall for collecting the holotype specimen and to B. Bolton for confirming that this specimen represents a new species. C. R. F. Brandão loaned the paratype of *P. cincinnata*, J. T. Longino loaned specimens of *Pyramica fridericimuelleri*, and M. E. Kaspari loaned specimens of *Pyramica* and *Strumigenys* from Barro Colorado Island. Natalie Barnett (ANIC) prepared the images of *P. panamensis*. For corrections and comments on previous versions of this manuscript we thank A. Kawahara, J. S. LaPolla, J. T. Longino, D. R. Smith, and one anonymous reviewer. We are grateful to the Smithsonian Tropical Research Institute for providing logistical support and facilities in Gamboa and to the Autoridad Nacional del Ambiente for permission to collect ants in Panama. This work was supported by the NSF-IRCEB DEB 0110073 to TRS and the Andrew W. Mellon Research Exploration Award in Tropical Biology to JSC.

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