

A Review of the Ant Genus *Dolichoderus* Lund, 1831 (Hymenoptera, Formicidae: Dolichoderinae) of Mexico¹

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Abstract—Mexican ants of the genus *Dolichoderus* are revised. Five species of the genus are recorded: *D. bispinosus* (Olivier, 1792), *D. diversus* Emery, 1894, *D. lutosus* (Smith, 1858), *D. mariae* Forel, 1885 and *D. plagiatus* (Mayr, 1870). *Dolichoderus tridentanodus* Ortega-De Santiago et Vásquez-Bolaños, 2012 is synonymized with *Camponotus mucronatus* Emery, 1890. Early records of *D. germaini* Emery, 1894 and *D. lugens* Emery, 1894 from Mexico are misidentifications and those species are excluded from the list of the Mexican fauna. *Dolichoderus mariae* Forel, 1885 is newly reported for the fauna of Mexico. Identification key to Mexican *Dolichoderus* species is given.

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The genus *Dolichoderus* Lund, 1831 belongs to the subfamily Dolichoderinae and has a worldwide distribution, with the exception of Africa and Antarctica. It comprises more than 130 extant and 50 fossil species in the World fauna. There are two centers of the species diversity, one in Australasia and the other one in South America. In Mexico, members of the Holarctic *quadripunctatus* species complex (*D. mariae* and *D. plagiatus*) and the Neotropical complexes *bispinosus* (*D. bispinosus*) and *diversus* (*D. diversus* and *D. lutosus*) (sensu MacKay, 1993) occur.

MATERIALS AND METHODS

This work is based on examination of the material stored in collections which are listed below and/or collected by the first author during field trips in Mexico in 2012–2017:

CNIN, Colección Nacional de Insectos, Universidad Nacional Autónoma de México, Ciudad de México, Distrito Federal, México;

MIFA, Museo de Insectos, Facultad de Agronomía, Universidad Autónoma de Tamaulipas, Ciudad Victoria, Tamaulipas, México;

ZISP, Zoological Institute of the Russian Academy of Sciences, St. Petersburg, Russia.

To denote various castes of ants, we use the following abbreviations:

W, worker/s; S, soldier/s; Q, queen/s; M, male/s.

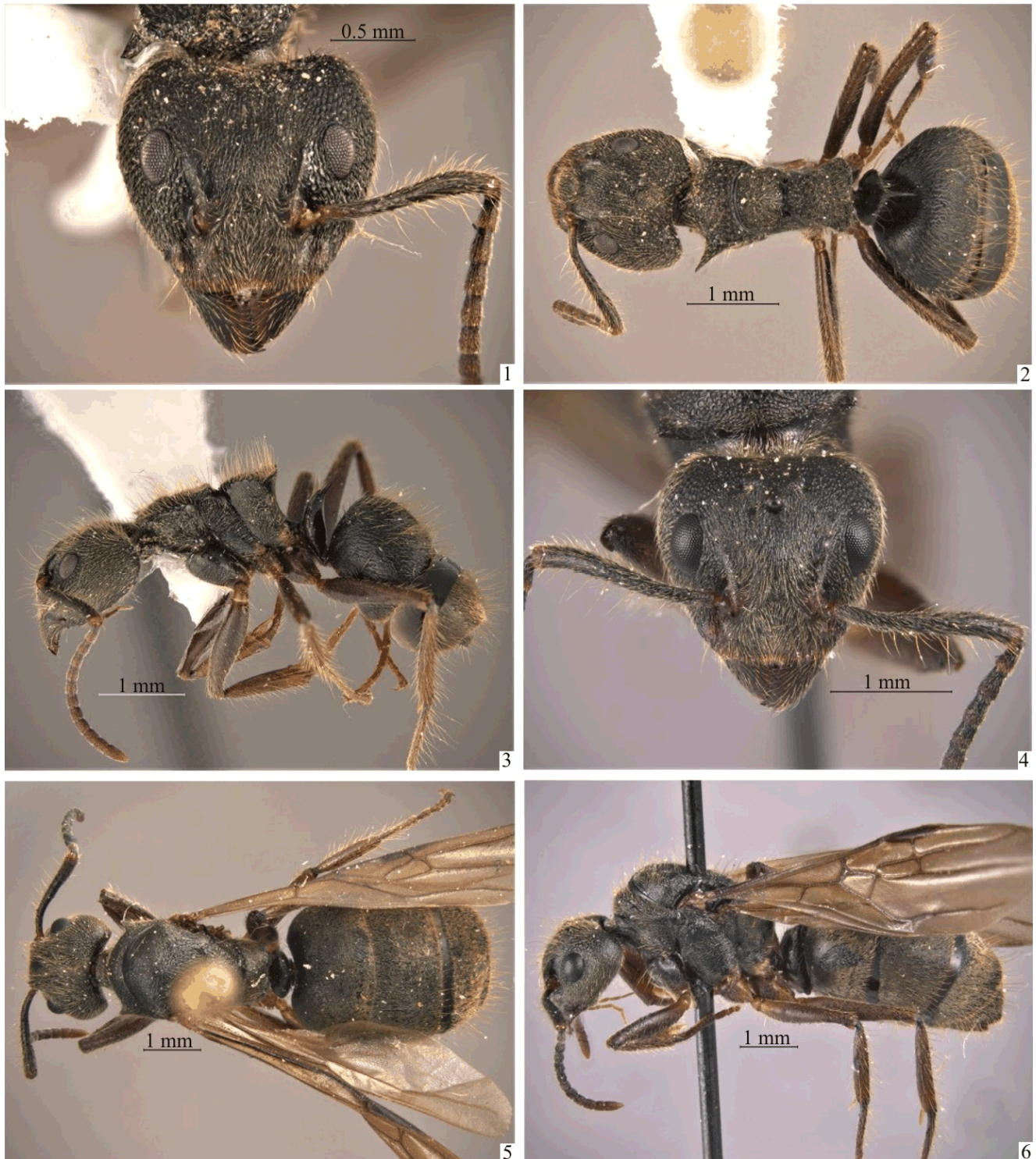
New records for Mexican states or for Mexico, based on our data, are marked by an asterisk (*).

Synonymic and nomenclature data are given according to “An Online Catalog of the Ants of the World” (Bolton, 2017).

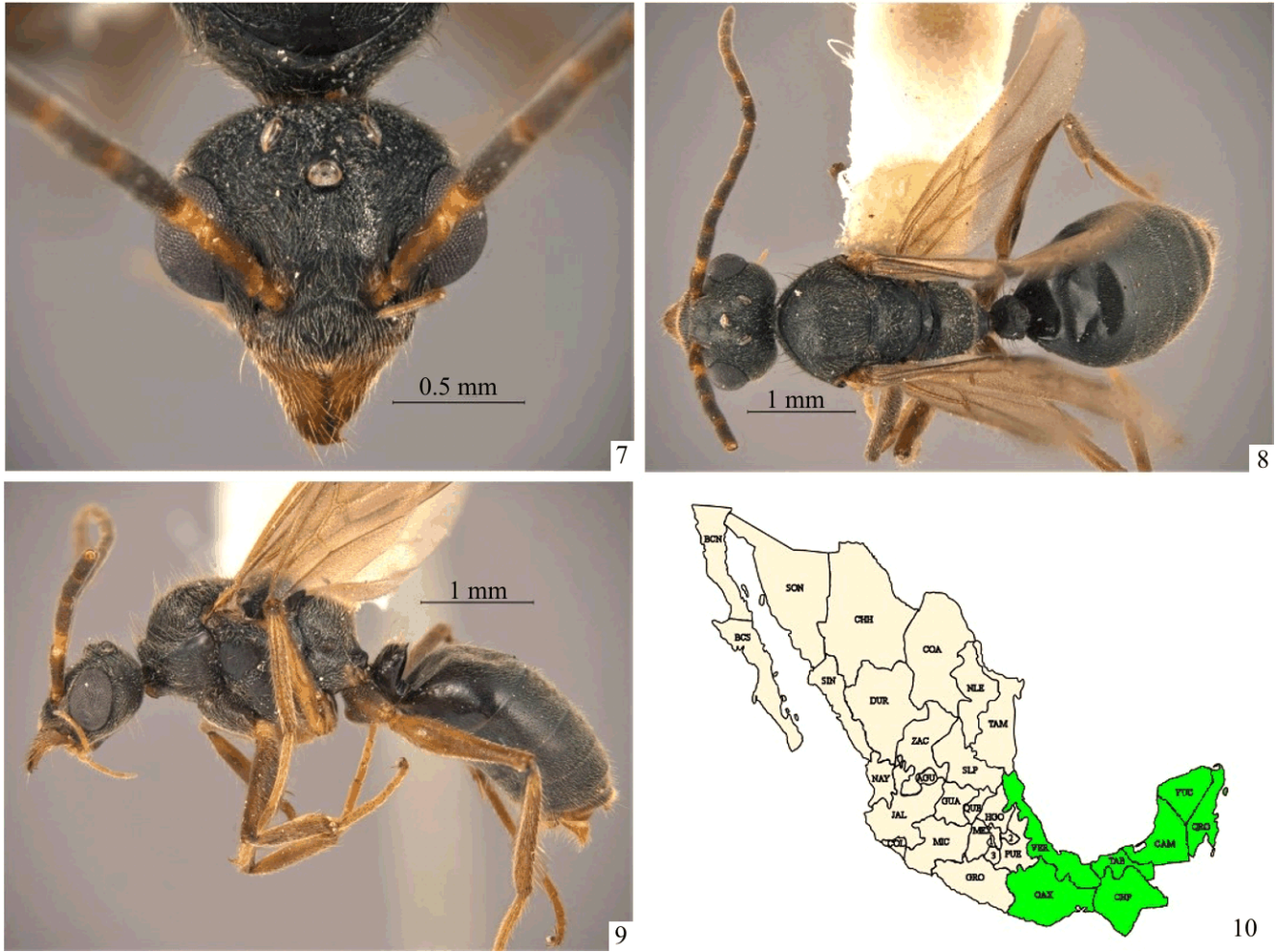
RESULTS

Before the present study, seven species of the genus *Dolichoderus* were recorded for the Mexican fauna (MacKay, 1993; Vásquez-Bolaños, 2011; Ortega-De Santiago and Vásquez-Bolaños, 2012). After examination of collection material and our field trips in 16 states of Mexico, we present here a list of five species from Mexico with data on their distribution. Three species which were recorded for the Mexican fauna before are excluded from the list of Mexican *Dolichoderus* as based on misidentifications. One species, *D. mariae*, is recorded from Mexico for the first time.

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Figs. 1–6. *Dolichoderus bispinosus* (Ol.), head (1, 4), general dorsal (2, 5) and lateral view (3, 6): (1–3) worker, (4–6) queen.



Figs. 7–10. *Dolichoderus bispinosus* (Ol.): (7–9) male [(7) head, (8) general dorsal view, (9) general lateral view], (10) distribution in Mexico (green, recorded distribution).

Order **HYMENOPTERA**

Family **FORMICIDAE**

Subfamily **Dolichoderinae**

Genus *Dolichoderus* Lund, 1831

*List of the Mexican Species
of the Genus Dolichoderus Lund, 1831*

Dolichoderus bispinosus (Olivier, 1792)
(Figs. 1–10)

Formica bispinosa Olivier, 1792 : 502 (W), French Guiana. Roger, 1862 : 236 (Q); Forel, 1908 : 60 (M).

General distribution. Mexico south to Uruguay, southern Brazil and northern Argentina (MacKay, 1993).

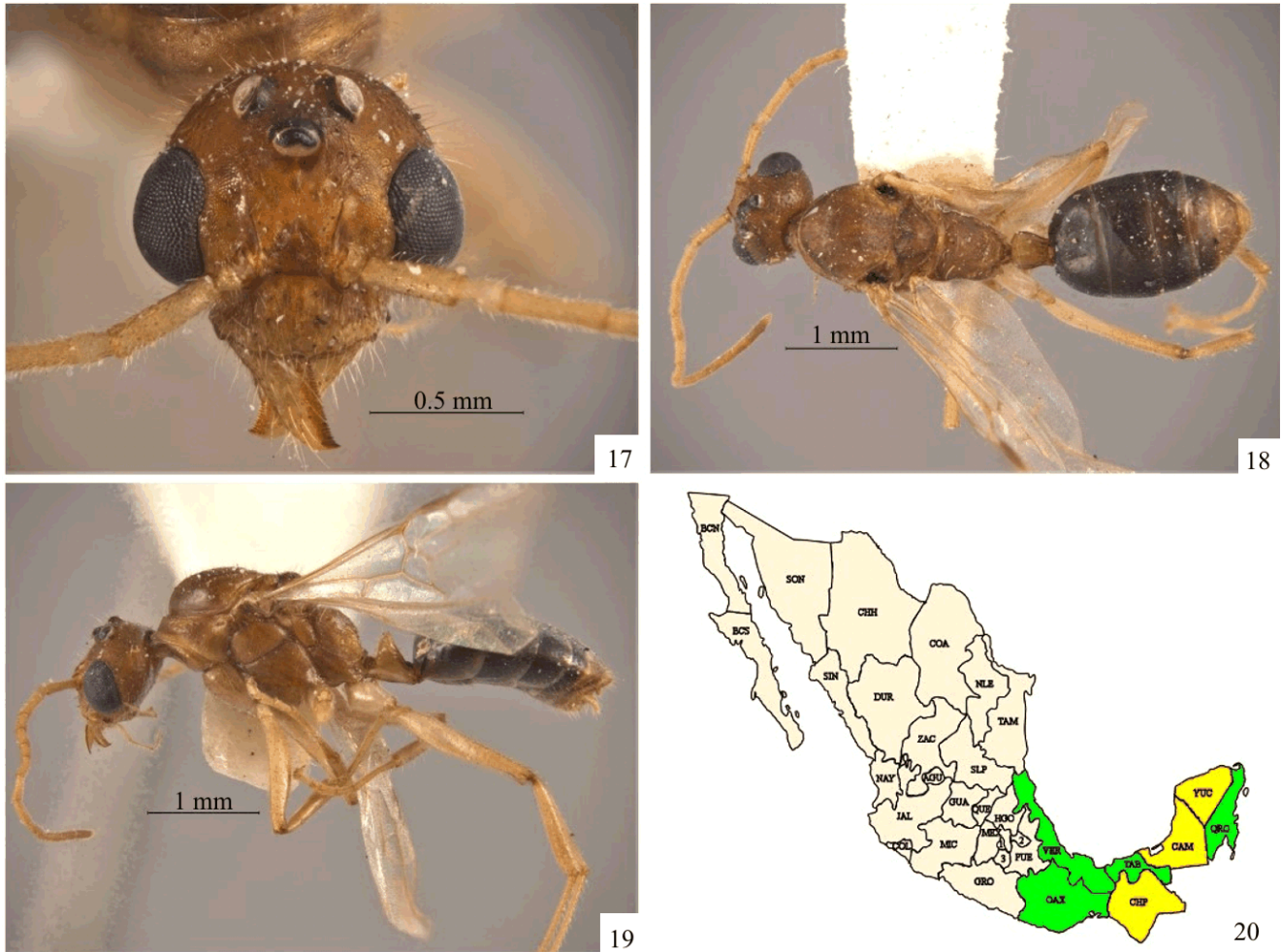
Distribution in Mexico (Fig. 10). Campeche, Chiapas, Quintana Roo, Tabasco, Veracruz, Yucatán, Oax-

aca (Vásquez-Bolaños, 2011; Ortega-De Santiago and Vásquez-Bolaños, 2012).

Material. *Campeche:* Municipio de Calakmul, 17.XI.2001 (H. Brailovsky, E. Barrera, L. Cervantes), 2 W (CNIN); Escarcega El Tormento, 16.VI.1989 (L. Cervantes, A. Cadena), 5 M (CNIN); Escarcega El Tormento, 18.VI.1989 (L. Cervantes, A. Cadena), 13 Q (CNIN). *Chiapas:* Huixtla, 15.20481°N 92.41318°W, 250 m a.s.l., 16.IX.2014 (D. Dubovikoff, A. Zaldivar), 6 W (ZISP); Ocosingo, Montes Azules, 3.VI.1999 (L. Cervantes), 8 Q (CNIN); Ocosingo, Montes Azules, 2.VI.1999 (L. Cervantes), 6 Q, 1 M, (CNIN); Ocosingo, Montes Azules, 4.VI.1999 (L. Cervantes), 1 M (CNIN); Chatul, 8.XI.1986 (J. Galvan), 1 W (CNIN); Ocozocuatla El Aguacero, 571 m a.s.l., 15.III. 2007, 16°45'31"N, 93°31'30"W, 3 W (CNIN); Milsol Ita, 9.VIII.1983 (O. Canul), 3 W (CNIN). *Oaxaca:* Chiltepec, 17.III.1990, 70 m a.s.l. (E. Bar-



Figs. 11–16. *Dolichoderus diversus* Emery, head (11, 14), general dorsal (12, 15) and lateral view (13, 16): (11–13) worker, (14–16) queen.



Figs. 17–20. *Dolichoderus diversus* Emery: (17–19) male [(17) head, (18) general dorsal view, (19) general lateral view], (20) distribution in Mexico (green, recorded distribution; yellow, possible distribution).

ra, A. Cadena), 5 W (CNIN); km 29 carretera Tuxtepec—Jalapa de Diaz, 29.V.1990 (E. Barrera, A. Cadena), 2 W, (CNIN); km 2 carretera San Juan Guichicovi—Zacatal, 420 m a.s.l., 19.III.1990 (E. Barrera, A. Cadena), 1 W (CNIN); Bethania, 110 m a.s.l., 18.III.1990 (E. Barrera, A. Cadena), 1 W (CNIN); Santiago Laolloga—Rio Los Perros, 110 m a.s.l., 21.III.1990 (E. Barrera, A. Cadena), 1 W (CNIN); Valle Nacional San Mateo Yetla, 12.X.1990 (E. Barrera, E. Ramirez, A. Cadena), 5 W (CNIN); Piedra Blanca, 140 m a.s.l., 20.III.1990 (E. Barrera, A. Cadena), 3 W (CNIN). *Quintana Roo*: km 146 carretera Chetumal—Puerto Juarez, 3.V.1982 (M. Garcia, V. Melendez, A. Ibarra), 3 M (CNIN); Puerto Juarez, km 90 Carretera a Chetumal, 14.III.1982 (A. Ibarra, M. Garcia), 11 W (CNIN); Rancho el Ramonal, 13.VI.1983 (O. Canul), 6 W (CNIN); Otón Pompeyo

Blanco, Chetumal, Reserva de Biosfera San Felipe Bacalar, 18 m a.s.l., 18°46'19.9"N, 88°24'53.3"W, 6.IX.2011 (M. Vásquez-Bolaños), 1 W (CNIN); Felipe Carrillo Puerto, Sian Ka'an, 18°59'31.3"N, 87°43'50.1"W, 1.VIII.2011, 2 m a.s.l. (G. Conteras), 2 W (CNIN). *Tabasco*: Villahermosa Agua Blanca, 17.VI.1989 (A. Cadena, L. Cervantes), 1 Q (CNIN); Teapa, km 3 a Ixtapangajoya, 114 m a.s.l., 17°31'52"N, 92°59'11"W, 25.VI.2007 (C. Mayorga, L. Cervantes, G. Ortega), 1 Q (CNIN). *Veracruz*: Estación de Biología Los Tuxtlas: VI.2002 (D. Phyles), 2 M (CNIN); 14.IX.1989 (J.L. Colin, H. Rojas), 1 W (CNIN); Camino a Monte Pio, 19.VIII.1990 (E. Gonzales, S. Rodriguez), 4 W (CNIN); 20.IX.1989 (J.L. Colin, H. Rojas), 2 W (CNIN); 172 m a.s.l., 2–5.V.2012 (D. Dubovikoff), > 100 W (ZISP); Malaise trap, different dates (M. Madora), > 50 W (CNIN, ZISP).



Figs. 21–25. *Dolichoderus lutosus* (Smith), head (21, 23), general dorsal (24) and lateral view (22, 25): (21, 22) worker, (23–25) queen.



Figs. 26–29. *Dolichoderus lutosus* (Smith): (26–28) male [(26) head, (27) general dorsal view, (28) general lateral view], (29) distribution in Mexico (green, recorded distribution; yellow, possible distribution).

Remarks. 3 workers of this species (CNIN) from Baja California Sur (Isla Monserrat, 19.V.1975) are probably mislabeled.

Dolichoderus diversus Emery, 1894
(Figs. 11–20)

Dolichoderus diversus Emery, 1894 : 237 (W), Colombia. MacKay, 1993 : 52 (Q, M).

General distribution. Mexico south to Bolivia and southern Brazil (MacKay, 1993).

Distribution in Mexico (Fig. 20). Quintana Roo, Tabasco (Vásquez-Bolaños, 2011; Ortega-De Santiago and Vásquez-Bolaños, 2012), Oaxaca*, Veracruz*.

Material. *Oaxaca**: Chitepec, 24.V.1990 (E. Barrera, A. Cadena), 1 Q (CNIN). *Quintana Roo*: Bacalar, Reserva de Biosfera San Felipe Bacalar, 18 m a.s.l.,

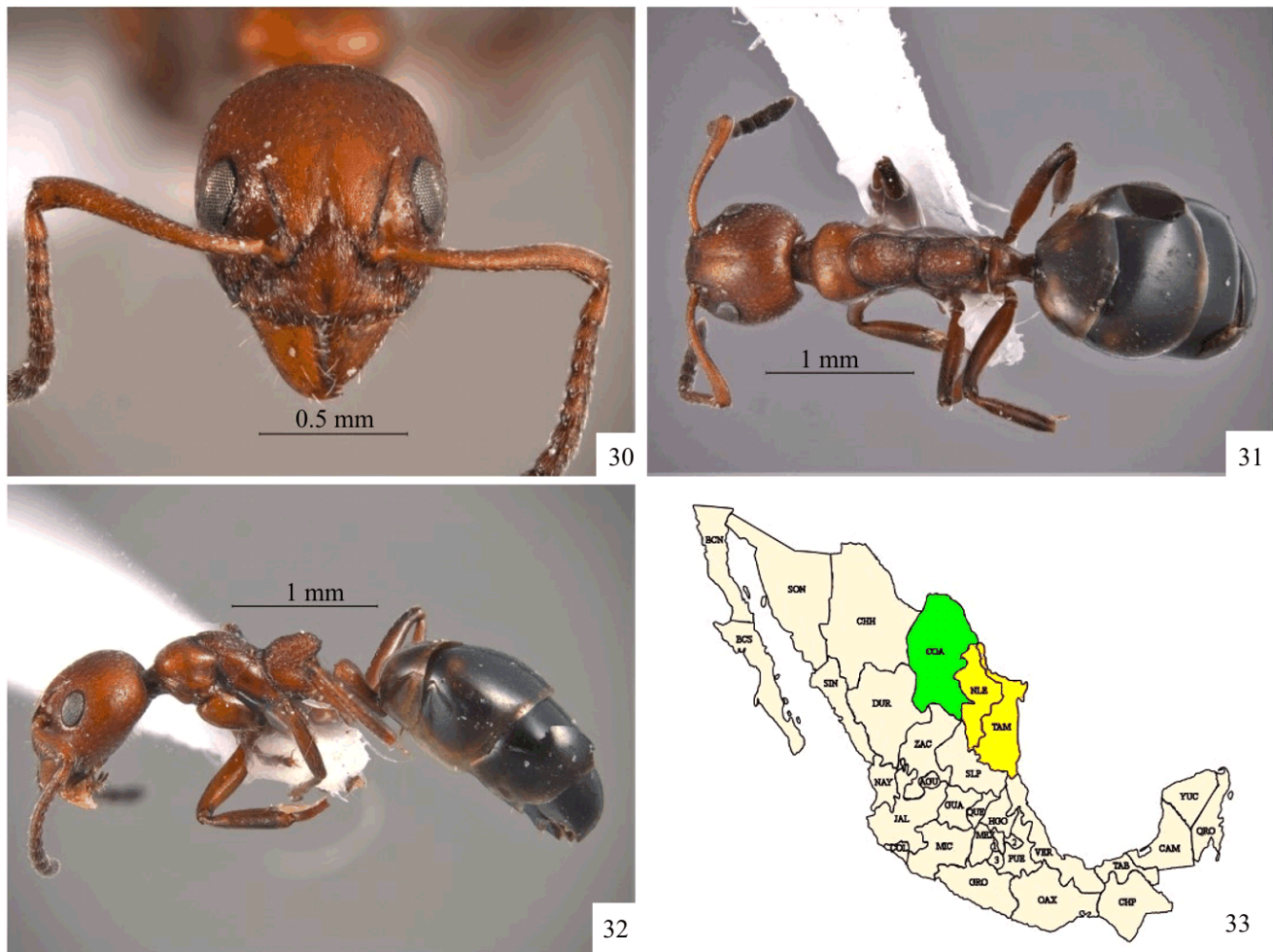
18°46'19.9"N, 88°24'53.3"W, 6.IX.2011 (M. Vásquez-Bolaños), 1 W (CNIN); Otón Pompeyo Blanco, Rio Hondo, 5 m a.s.l., mangrove forest (H. Suárez), 1 W (CNIN). *Veracruz**: Sontecomapan, 25.V.1959 (C. Noet), 2 Q (CNIN).

Dolichoderus lutosus (Smith, 1858)
(Figs. 21–29)

Formica lutosus Smith, 1858 : 42 (W), Brazil. Mann, 1916 : 468 (Q, M).

General distribution. Mexico south to Bolivia and southern Brazil (MacKay, 1993).

Distribution in Mexico (Fig. 29). Chiapas, Quintana Roo, Tabasco, Veracruz (Vásquez-Bolaños, 2011; Ortega-De Santiago and Vásquez-Bolaños, 2012), Campeche*, Oaxaca*, Tamaulipas*.



Figs. 30–33. *Dolichoderus mariae* Forel: (30–32) worker [(30) head, (31) general dorsal view, (32) general lateral view, (33) distribution in Mexico (green, recorded distribution; yellow, possible distribution).

Material. *Campeche**: Microondas El Cuyo, 19.VI.1989 (A. Cadena, L. Cervantes), 1 Q (CNIN). *Oaxaca**: km 6 de carretera a Matias Romero Palomares, 90 m a.s.l., 20.III.1990 (E. Barrera, A. Cadena), 1 W (CNIN); Piedra Blanca, 140 m a.s.l., 20.III.1990 (E. Barrera, A. Cadena), 1 W (CNIN). *Quintana Roo*: km 146 de carretera Chetumal—Cancún, 3.V.1982 (M. Garcia), 1 Q (CNIN); km 146 carretera Chetumal—Puerto Juarez, 3.V.1982 (V. Melendez, M. Garcia), 4 Q (CNIN); Othón Pompeyo Blanco, Rio Hondo, 3 m a.s.l., mangrove forest (H. Suárez), 1 W (CNIN). *Tabasco*: Villahermosa Agua Blanca, 17.VI.1989 (A. Cadena, L. Cervantes), 1 W (CNIN). *Tamaulipas**: Gomez Farias, Reserva de Biosfera El Cielo, 23°03'59"N, 099°10'10"W, 359 m a.s.l., 7–9.III.2012 (D. Dubovikoff), 10 W (MIFA, ZISP); Gomez Farias, Centro Interpretativo Ecológico, 23.06654°N, 99.16885°W, 16.IX.2016 (D. Dubovikoff), 4 W (ZISP). *Veracruz*: Gutierrez Zamora el

Coco, 20°26'48"N, 97°08'57"W, 50 m a.s.l., 28.I.2007, orangery (E. Barrera, L. Cervantes), 1 Q (CNIN); Municipio Teocelo, Tejerias, 19°21'N, 96°54'W, 924 m a.s.l., 5 W (CNIN, ZISP); Estación de Biología Los Tuxtlas: 20.XI.1989 (J.L. Colin, H. Rojas), 1 W (CNIN); Malaise trap, different dates (M. Madora), 15 W (CNIN, ZISP).

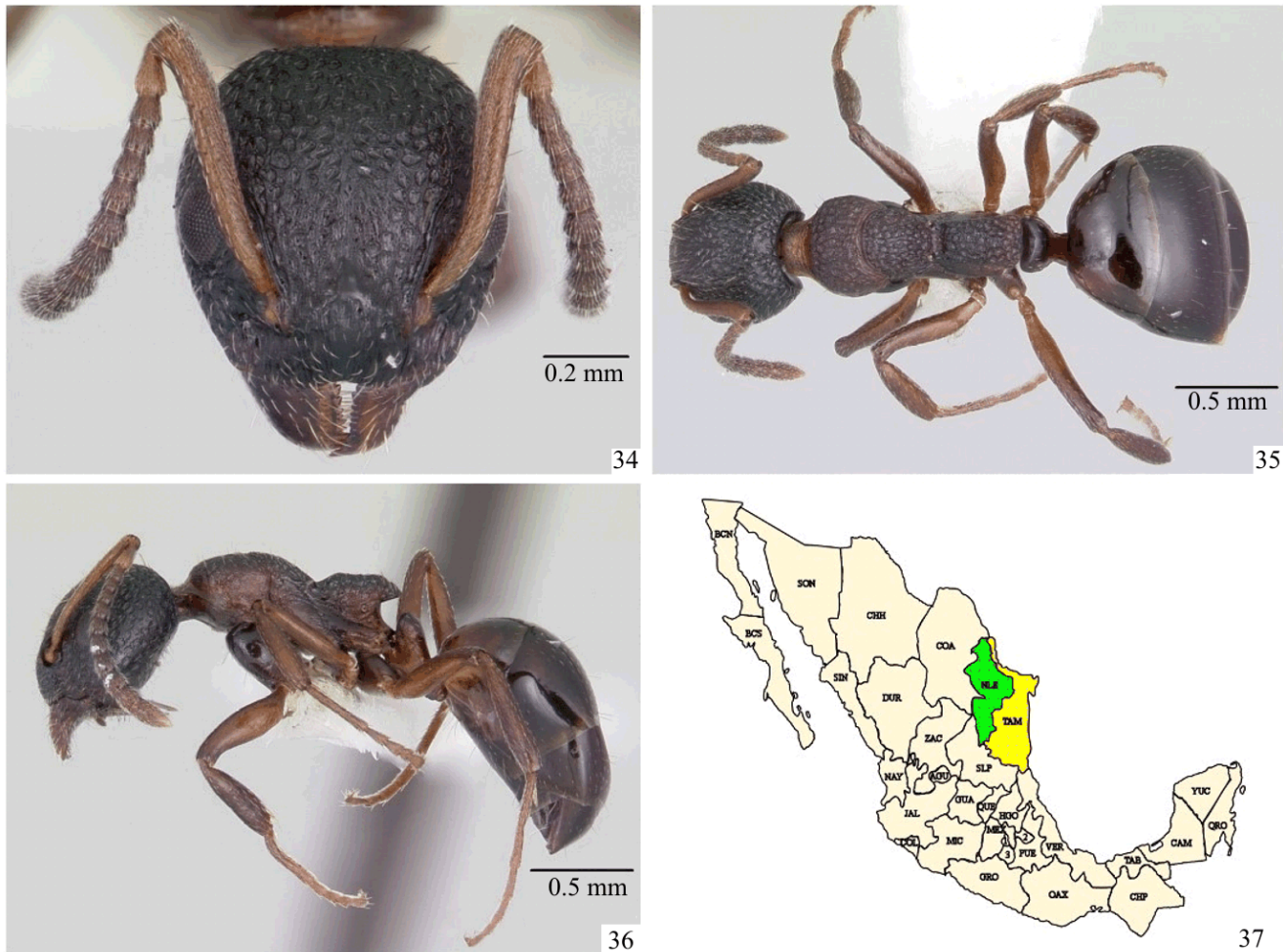
Dolichoderus mariae Forel, 1885
(Figs. 30–33)

Dolichoderus mariae Forel, 1885 : 349 (W), USA. Mayr, 1886 : 436 (Q); Wheeler, 1905 : 306 (M).

General distribution. Eastern USA (MacKay, 1993), Mexico*.

Distribution in Mexico (Fig. 33). Coahuila*.

Material. *Coahuila**: Antiguas mineros, 27.IX.2011 (U. Garcia), 1 W (CNIN).



Figs. 34–37. *Dolichoderus plagiatus* (Mayr): (34–36) worker (from www.antweb.org) [(34) head, (35) general dorsal view, (36) general lateral view], (37) distribution in Mexico (green, recorded distribution; yellow, possible distribution).

Dolichoderus plagiatus (Mayr, 1870)
(Figs. 34–37)

Hypoclinea plagiata Mayr, 1870 : 960 (W) USA.
Wheeler, 1905 : 311 (Q, M).

General distribution. Northern and Eastern USA
and Mexico (Nuevo León) (MacKay, 1993).

Distribution in Mexico (Fig. 37). Nuevo León
(García-Pérez et al., 1992; MacKay, 1993; Vásquez-
Bolaños, 2011; Ortega-De Santiago and Vásquez-
Bolaños, 2012).

The following species are excluded from the list of
the Mexican fauna.

Dolichoderus tridentanodus Ortega-De Santiago
et Vásquez-Bolaños, 2012

This species was described from the Mexican state
of Jalisco based on 12 workers. Having examined two

paratypes, the original description, photographs of
other specimens from the type series, and additional
material which was identified as *D. tridentanodus* by
Miquel Vásquez-Bolaños, we are sure that these
specimens belong to *Camponotus mucronatus* Emery,
1890 from the subfamily Formicinae. Correspond-
ingly, a new synonymy is established here:

Camponotus mucronatus Emery, 1890 = *Dolicho-
derus tridentanodus* Ortega-De Santiago et Vásquez-
Bolaños, 2012, **syn. n.**

Before the present study *C. mucronatus* was known
in Mexico from Chiapas and Quintana Roo (Vásquez-
Bolaños, 2011) and was recorded as *Dolichoderus
tridentanodus* from Jalisco, Nayarit and San Luis Po-
tosi (new records for *C. mucronatus*) (Ortega-De
Santiago and Vásquez-Bolaños, 2012). We have addi-
tional new records of *C. mucronatus* for the Mexican

fauna from Veracruz*: The Biological Station Los Tuxtlas, different dates and collectors, 20 W (CNIN), 7 W (ZISP); and from the state of Colima*: Comala, 19°19'06"N, 103°45'33"W, 600 m, 17.V.2014 (Dubovikoff, Zaldivar), 8 W (ZISP).

Dolichoderus germaini

Emery, 1894

“Sin localidad” (Vásquez-Bolaños, 2011).

The species is known only from Brazil; most likely, record from Mexico refers to *D. diversus*.

Dolichoderus lugens

Emery, 1894

Records of this South American species for Mexico are based on misidentifications. We have examined specimens from different states of Mexico determined by M. Vásquez (Vásquez-Bolaños, 2011; Ortega-De Santiago and Vásquez-Bolaños, 2012) as *D. lugens*; they all belong to *Camponotus striatus* (Smith, 1862).

Key to the Mexican Species of the Genus Dolichoderus
(Based on Workers)

1. Basal surface of propodeum longer than declivious part, prolonged posteriad and overhanging petiole (Figs. 31, 32, 35, 36) 2.
- Basal surface of propodeum subequal to declivious part, not overhanging petiole (Figs. 2, 3, 12, 13, 22) 3.
2. Head, antennal scape and pronotum with numerous erect setae. Sculpture of head with deep and coarse foveolae. Color brown (head often darker) ***plagiatus***.
- Erect setae on thorax very sparse. Scape without setae, head with only two pairs of setae on frons and pronotum bearing one pair of erect setae. Bicolored, with reddish head and mesosoma and with dark brown gaster ***mariae***.
3. Humeri strongly developed, with long spines (Fig. 2). Petiole with long, backward-pointed spine (Figs. 2, 3) ***bispinosus***.
- Humeri not developed. Petiole apically with weakly developed carina or two very small teeth (Figs. 12, 22) 4.

4. Body without erect setae (Fig. 22) ***lutosus***.
- Body with numerous erect setae (Fig. 13) ***diversus***.

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REFERENCES

1. Bolton, B., *An Online Catalog of the Ants of the World*. Available from <http://antcat.org>. (accessed [28.II.2017]) 2017.
2. Emery, C., “Studi sulle formiche della fauna neotropica,” *Bullettino della Società Entomologica Italiana* **26**, 137–241 (1894).
3. Forel, A., “Études myrmécologiques en 1884 avec une description des organes sensoriels des antennes,” *Bulletin de la Société Vaudoise des Sciences Naturelles* **20**, 316–380 (1885).
4. Forel, A., “Fourmis de Costa-Rica récoltées par M. Paul Biolley,” *Bulletin de la Société Vaudoise des Sciences Naturelles* **44**, 35–72 (1908).
5. García-Pérez, J.A. and MacKay, W.P., González-Villareal D., and Camacho-Trujillo R., “Estudio preliminar de la mirmecofauna del Parque Nacional Chipinque, Nuevo León, México y su distribución altitudinal,” *Folia Entomológica Mexicana* **86**, 185–190 (1992).
6. MacKay, W.P., “A Review of the New World Ants of the Genus *Dolichoderus* (Hymenoptera: Formicidae),” *Sociobiology* **22**, 1–148 (1993).
7. Mann, W.M., “The Stanford Expedition to Brazil, 1911, John C. Branner, Director. The ants of Brazil,” *Bulletin of the Museum of Comparative Zoology* **60**, 399–490 (1916).
8. Mayr, G., “Neue Formiciden,” *Verhandlungen der Kaiserlich-Königlichen Zoologisch-Botanischen Gesellschaft in Wien* **20** 939–996 (1870).

9. Mayr, G., "Die Formiciden der Vereinigten Staaten von Nordamerika," *Verhandlungen der Kaiserlich-Königlichen Zoologisch-Botanischen Gesellschaft in Wien* **36**, 419–464 (1886).
10. Olivier, A.G., *Encyclopédie méthodique. Histoire naturelle. Insectes VI, Vol. 2* (Paris, Panckoucke, 1792), pp. 369–704.
11. Ortega-De Santiago, J.L., Vásquez-Bolaños, M., "Especie nueva de *Dolichoderus* (Hymenoptera: Formicidae) de Puerto Vallarta, Jalisco y nuevos registros para México," *Revista Mexicana de Biodiversidad* **83**, 1004–1008 (2012).
12. Roger, J., "Einige neue exotische Ameisen-Gattungen und Arten," *Berliner Entomologische Zeitschrift* **6**, 233–254 (1862).
13. Smith, F., *Catalogue of hymenopterous Insects in the Collection of the British Museum. Part VI. Formicidae*. (London, British Museum, 1858), 216 pp.
14. Vásquez-Bolaños, M., "Lista de hormigas (Hymenoptera: Formicidae) de México," *Dugesiana* **18** (1), 95–133 (2011).
15. Wheeler, W.M., "The North American Ants of the Genus *Dolichoderus*," *Bulletin of the American Museum of Natural History* **21**, 305–319 (1905).