A remarkable Dominican amber species of *Cylindromyrmex* with Brazilian affinities and additions to the generic revision

*(Hymenoptera: Formicidae)*

With 7 figures

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**Summary**

*Cylindromyrmex inopinatus* n. sp. from Dominican amber is described on two winged gynes. The new amber species appears to be the sister species of the Recent Brazilian *longiceps*. *C. inopinatus* and *C. longiceps* can be easily distinguished from all other members of the genus by the head about 1/3 longer than broad and by the narrowest known frontal carinae. *C. inopinatus* is the third amber fossil species of the genus as compared with 10 known extant species. The previously unknown male of *C. longiceps* ANDRÉ is also described. Additional distribution data are given for the species *brasiliensis*, *brevitarsus*, *escobar*, *godmani*, *longiceps*, *meinerti* and *whymeri*. The identification key to the males of DE ANDRADE (1998) is partially re-worked in order to include *longiceps*.

**Zusammenfassung**


**Introduction**

The genus *Cylindromyrmex* was recently revised by DE ANDRADE (1998). In her revision, DE ANDRADE (l. c.) recognises 12 species of *Cylindromyrmex*, of which two, *C. antillanus* and *C. electrinus* are represent by fossil Dominican specimens based each on a single gynae. The opportunity to study new, additional material including a new fossil species, a previously undescribed male and some significant new locality records justifies the publication of the present update.
Material and Methods

The following two *Cylindromyrnex* specimens in two samples of amber from the Dominican Republic from the collection of Dr. George O. Poinar Jr. (Department of Entomology, Oregon State University, Corvallis, U.S.A.) were examined:

H 10-138 B (Fig. 1). A small (0.7x0.5 cm) yellow sample containing a winged gyne of *Cylindromyrnex* without gaster. The preservation conditions of the remaining specimen are very good.

H 10-138 C (Fig. 2). A light yellow sample (1.0x1.5 cm) containing only one winged gyne of *Cylindromyrnex*. The preservation conditions of the specimen are good, though fissures rend difficult the examination of some body parts.

The recent specimens of *Cylindromyrnex* examined in this study originate from the following collections:

CEPLAC: Centro de Pesquisa do Cacau, Itabuna, Bahia, Brazil. Courtesy of Dr. Jacques H. C. Delabie.
MZSP: Museu de Zoologia da Universidade de São Paulo, Brazil. Courtesy of Prof. Dr. Carlos Roberto Ferreira Brandão.
MEUV: Museo de Entomologia de la Universidad del Valle. Cortesy of Dr. Patricia Chacón and Fabio Herny Lozano.

Measurements and indices are as described by DE ANDRADE (1998) for this genus.

Results

*Cylindromyrnex inopinatus* DE ANDRADE sp. n.

Figs. 1, 2 & 3

**Holotype:** winged gyne in the amber sample H 10-138 C from the GOPC.

**Paratype:** winged gyne (with missing gaster) in the amber sample H 10-138 B, same collection as the holotype.

**Derivatio nominis:** From the Latin *inopinatus* (= unexpected).

**Diagnosis**

*Inopinatus* is the sister species of *longiceps* from which it differs for the total length smaller than 7 mm instead of larger than 7.4 mm and for the hypostomal bridge not reaching the postocciput instead of the hypostomal bridge broadly connected to the postocciput.

**Description**

Head about 1/3 longer than broad and with parallel sides. Vertex low. Vertexal angles round and protruding backwards. Distance between the frontal carinae about 1/4 of the maximum head width. Anterior third of the frontal carinae diverging backwards, remaining two thirds parallel and surpassing the anterior border of the eyes posteriorly. Dorsum of the frontal carinae with a median sulcus anteriorly. Frontal carinae shorter than the anterior border of the clypeus. Clypeus convex laterally and concave medially, its antero-median border with an irregular, minute denticle superficially bicarinate dorsally. Compound eyes very large, flat and on the middle of the dorsolateral part of the head; ocelli well defined. Scapes stout and not reaching the end of the frontal carinae posteriorly. Anterior fourth of the scapes about half as broad as the distal part. Mandibles short and flat dorsally. Masticatory margin of
the mandibles with a small basal tooth followed by a denticle, an edentate margin and a pointed apical tooth. Hypostomal bridge broad, the anterolateral border convex, the posteromedial border broad anteriorly and strongly narrowing posteriorly. Mesosoma weakly convex in side view. Pronotum and mesonotum subequal in size.

Fig. 1: Specimen H-10-138 B. Dorsal view (top), head in frontal view (bottom left) and head in ventral view (bottom right) to show the broad hypostomal bridge and its short Y-shape.

Fig. 2: Specimen H-10-138 C. Dorsal view (left) and head in frontal view (right).
Parapsidal furrows superficially impressed. Basal face of the propodeum about twice as long as the declivous one and separated each other by a superficial margin. Propleurae slightly concave.

Fig. 3: *Cylindromyrmex inopinatus* sp. n. gyne, body in profile (top), head in frontal view (bottom).

Petiole almost 1/5 longer than broad. Anterior face of the petiole short and concave. Ventral process of the petiole anterior, small and pointed. Postpetiole broader than long. Postpetiolar sides gently diverging posteriorly. Postpetiolar sternite antero-medially with a poorly marked subtriangular “lip”. Pygidium truncate; its border with a semi-circle of small denticles.

Femora and tibiae inflate. Hind basitarsi ca.1/3 shorter than the maximum length of the hind tibiae. Outer apical edge of the hind and of the mid basitarsi respectively with 5 and 6 spine-like setae each.

Wings similar to those of *boliviæ* (DE ANDRADE, 1998, Fig. 4).

Sculpture. Head dorsum covered by thin longitudinal striae, more superficial and thinner close to the antennal scrobes. Ventral part of the head with longitudinal striae, fainter on the posterior half, absent on the centre, covered by punctuation only. Mesosoma with longitudinal striae thicker on the pronotum. Pronotum with 22-26 longitudinal striae thicker than those on the posterior half of the head dorsum. Pleuræ and petiolar sides with longitudinal striae similar to those on the antennal scrobes. Petiolar dorsum with 19-20 striae slightly thinner than those on the pronotum. Declivous face of the propodeum and anterior face of the petiole minutely punctate. Dorsum of the postpetiole with striae slightly thinner than on the petiole. First gastric tergite covered by striae thinner than those on the postpetiole. Second gastric tergite with thin and superficial striae on the center only. Remaining gastric tergites and sternites sparsely and minutely reticulate and densely punctate. Legs with very superficial, minute punctures. Ventral face of the coxae covered by thin longitudinal striae, thinner and less marked on the fore coxae.

Pilosity: Body with pointed hairs of at least three differentiable lengths and distributed as follows: (1) long, erect to suberect, one pair on the clypeus, one on each antennal scape, one close to each pronotal angle, rare on the gaster, sparse on the pygidium; (2)
**Fig. 4:** *Cylindromyrmex longiceps* ANDRÉ. Gyne from Porto Seguro, Bahia, Brazil. Head in ventral view to show the broad hypostomal bridge and its Y-shape.

**Fig. 5:** *Cylindromyrmex meinerti* FOREL. Gyne from Costa Rica, Heredia, Est. Biol. La Selva. Head in ventral view to show the broad hypostomal bridge and its U-shape.
shorter than the type (1) and sparsely distributed on the whole body; (3) shorter than type (2), sparse and suberect on the head dorsum and on the mesosoma, sparse and subdecumbent on the pedicel, on the gaster and on the legs. In addition the hypostomal bridge is surrounded by a layer of hairs similar to the type (1). Colour black.

**Measurements (in mm) and indices:** TL 6.93 (holotype), 3.99 (paratype without gaster); HL 1.12-1.30; HW 0.76-0.82; EL 0.31; SL 0.33-0.36; SW 0.13-0.14; WL 1.72-1.64; PeL 0.56-0.57; PeW 0.46-0.47; HFeL 0.50; HFeW 0.25; HTIL 0.52-0.53; HTW 0.18-0.19; HBA/L 0.30-0.36; HBA/W 0.07-0.08; CI 63.1-67.8; SI 38.9-39.4; HFeI 50.0; HTIL 34.6-35.8; HBA 22.2-23.3.

**Discussion**

In the phylogeny proposed by DE ANDRADE (1998) *C. longiceps* results as the sister species of *meinerti*. The new species described above, however, finds its optimal position between the two and is, hence, the new sister species of *longiceps*.

*C. inopinatus* possesses both synapomorphies previously shared by *longiceps* and *meinerti*, i.e., the highest values of HFeI (Hind Femora Index 50) and the broad hypostomal bridge. In addition, *C. longiceps* shares with *inopinatus* only the mid basitarsi longer than 1/2 of the hind basitarsi a previous autapomorphy for *longiceps*. At least another, new synapomorphy for *longiceps* and *inopinatus* could be added to the data matrix used by DE ANDRADE (1998) to infer her phylogeny: *longiceps* and *inopinatus* are the sole species sharing flat mandibles with almost edentate margin. Other potential synapomorphies for these two species are the frontal carinae much shorter than the anterior border of the clypeus and the reduced ventral process of the petiole. I refrain, however, from adding these characters to the original data matrix because they re-appear in an unpredictable way among other species of the genus.

It is worth recalling that the connection of the hypostomal bridge to the postocciput in *C. inopinatus* shows an intermediate condition between the one of *C. longiceps* and *C. meinerti* (Figs. 1 bottom right, 4 and 5).

**New locality records**

**Cylindromyrnex brasiliensis EMERY**

Fig. 6

**BRAZIL:** BAHIA: Porto Seguro, 4.XI.1997, 1 male, JRMS & HJS [CPCC].

This male differs from the previously known male from Santa Catarina (DE ANDRADE, 1998) in the following: size smaller (see measurements below), body striae thinner, body foveae less impressed, metapleural irregularly striate-foveolate.

**Male, measurements (in mm) and indices:** TL 7.20-8.78; HL 1.04-1.16; HW 1.00-1.16; EL 0.51-0.59; SL 0.27-0.32; SW 0.15-0.17; WL 2.32-2.76; PeL 0.75-0.81; PeW 0.58-0.72; HFeL 0.86-1.00; HFeW 0.21-0.23; HTIL 0.76-0.88; HWT 0.16-0.18; HBA/L 0.64-0.77; HBA/W 0.06-0.07; CI 96.1-100.0; SI 53.1-55.5; HFeI 23.0-24.4; HTIL 20.4-21.0; HBA 9.4-10.4.

**Cylindromyrnex brevitarsus SANTSCHI**

**COSTA RICA:** Heredia: Est. Biol. La Selva, 50-150 m, 10° 26' N 84° 01' W, 16.III.1993, 1 gyne, INBio-OET [INBC]. ECUADOR: Sucumbios: 0.5° S 76.5° W, Sacha Lodge, 290 m, 22.III-4.III.1994, 1 gyne, 1 male, P. Hibbs [LACM]. BRAZIL: BAHIA: Porto Segu-
ro, 30.VIII. 1997, 23.IX.1997, 25.X.1997, 8.XI.1997, 2.XII.1997, 7 males, JRMS & HJS [CPCC]; same locality, 4.XI.1997, 11.XI.1997, 6 males, JRM Santos [CPCC]. As already noted by DE ANDRADE (1998) separation between this species and the Cuban endemic *darlingtoni* relies largely on the geographic insulation of the latter. The material studied for the present paper does not help solving the problem of the specific value of *darlingtoni*. To do this, however, more Cuban material would be necessary.

**Cylindromyrmex escobari** DE ANDRADE

COSTA RICA: Province Puntarenas, Monteverde, 1500 m, 18.II.1989, 1 gyne, B. Fisher [INBC]. This species was described by DE ANDRADE (1998) and known only on the holotype worker from Colombia. The gyne from Costa Rica was figured and described by LONGO (1999). The gyne is larger than the worker and its measurements and indices are the following:

**Gyne, measurements (in mm) and indices:** TL 9.74; HL 1.64; HW 1.32; EL 0.50; SL 0.71; SW 0.24; WL 2.84; Pcl 0.94; Pw 0.80; HFeL 1.03; HFeW 0.41; HtL 0.86; HtW 0.28; HBaL 0.52; HBaW 0.10; CI 80.5; SI 33.8; HFeL 39.8; HtL 32.5; HBaL 19.2.

**Cylindromyrmex godmani** FOREL

COSTA RICA: Guanacaste, Volcán Cacao, Cerro Pedregal, 1000 m, II-IV.1989, 1 male, I. Gauld [INBC]; Limón, 16 km W Guápiles, 400m, VIII-IX.1989, 1 gyne, P. Hanson [INBC]. This species is known on a few specimens only. The gyne from Costa Rica differs from the holotype from Panama mainly by the smaller size (see measurements below).

**Gyne, measurements (in mm) and indices:** TL 12.20-14.38; HL 2.04-2.18; HW 1.44-1.54; EL 0.58-0.64; SL 0.75-0.82; SW 0.29-0.31; WL 3.56-4.04; Pcl 1.16; Pw 0.96-1.00; HFeL 1.08-1.16; HFeW 0.44-0.49; HtL 0.90-1.00; HtW 0.33-0.39; HBaL 0.66-0.71; HBaW 0.13-0.14; CI 70.6; SI 37.8-38.6; HFeL 40.7-42.2; HtL 36.7-39.0; HBaL 19.7.

**Cylindromyrmex longiceps** ANDRÉ

Figs. 4 & 7

Male (previously undescribed) (Fig. 7). Head longer than broad. Vertexal margin convex. Ocelli proterrant. Compound eyes broadly convex and largely on the anterior part of the head. Frontal carinae with slightly raised borders and partially covering the antennal socket. Sides of the frontal carinae subparallel anteriorly, slightly diverging and broadly separate posteriorly. Frons concave anteriorly, strongly raised medially and declivous posteriorly. Anterior border of the clypeus straight. Mandibles relatively short, thin, with the base of the external border gently impressed. Masticatory margin of the mandibles with a small basal tooth followed by an edentate margin and a pointed apical tooth. Scapes about 1/3 longer than broad. Funicle joints stout. Mesosoma elongate. Pronotum in dorsal view with subparallel sides. Scutellum about as high as the mesonotum. Parapsidal furrows superficially impressed. Basal face of the propodeum separate from the declivous one by a marked carina. Petiole subcylindric; anterior face short and concave, dorsal face gently convex. Ventral process of the petiole small and subtriangular. Postpetiole broadening backwards, slightly shorter and less broad than the first gastric tergite.
Fig. 6: *Cylindromyrmex brasiliensis* EMERY. Male from Porto Seguro, Bahia, Brazil. Head in dorsal view (top), body in dorsal view (middle), body in profile (bottom).
Fig. 7: \textit{Cylindromyrmex longiceps} ANDRL. Male from Porto Seguro, Bahia, Brazil. Head in dorsal view (top), body in dorsal view (middle), body in profile (bottom).
Genitalia not dissected. Distal half of the hypopygium visible. Apodemes of the subgenital plate similar to those of *meinerti* (DE ANDRADE, 1998, Fig. 34 B) and median projection between the apodemes similar to the one of *godmani* (DE ANDRADE, 1998, Fig. 27 B) but less pointed.

Femora not inflate. Mid and hind basitarsi long.

Wings similar to those of *godmani* (DE ANDRADE, 1998, Fig. 5).

Sculpture. Head dorsum covered by striae converging from the internal border of the eyes to the ocelli; striae between the pair ocelli longitudinal. Frons with irregular striae, transversal anteriorly and longitudinal posteriorly. Area between the vertexal border and the eyes with small foveae. Ventral part of the head variably punctate and with piligerous foveae fainter posteriorly; antero-ventral part of the head with additional transversal, thin, striae between the piligerous foveae. Pronotum irregularly foveolate-striate on the center and with slightly longitudinal striae on the sides. Mesonotum smooth, with small, sparse piligerous foveae. Scutellum sculptured as the mesonotum but with few additional, thin, longitudinal rugosities. Basal face of the propodeum, metapleurae, petiole, postpetiole, first gastric tergite and postpetiolar sternite with irregular longitudinal striae and foveae; this sculpture more superficial and sparser on the postpetiolar sternite. Declivous face of the propodeum punctate and with longitudinal striae. Pro- and mesopleurae superficially punctate, with thin, short longitudinal striae and small piligerous foveae; the punctures and striae rare on the center of the mesopleurae. Remaining gastral segments punctate and with superficial piligerous foveae.

Pilosity. Body covered mainly by pointed hairs of three types: (1) long, rare on the head, sparse and subdecumbent on the mesosoma, on the petiole, on the postpetiole, on the first gastric tergite, and on the legs, dense and appressed on the remaining gastral tergitae and on all sternites; (2) shorter than type (1), sparse on the head, on the mesosoma, dense and mixed with hair type (1) on the second and on the remaining gastric tergitae and on all sternites and on the legs; (3) short and thick on the funicular joints.


**Male, measurements (in mm) and indices:** TL 6.44; HL 1.08; HW 0.92; EL 0.60; SL 0.23; SW 0.14; W 1.40; PeL 0.65; PeW 0.62; HFeL 0.80; HFeW 0.20; HTIL 0.72; HTiW 0.18; HBal 0.61; HBaW 0.06; Cl 185.2; SI 60.7; HFeL 25.0; HTIL 25.0; HBA 9.84.

**BRAZIL:** BAHIA: Porto Seguro, 4.XI.1997, 1 male, JRMS & HJS [CPCC]; Porto Seguro, 2.XII.1997, 1 gyne, JRMS & HJS [CPCC].

**Note:** The Bahian gyne of *longiceps* differs from the unique previously known gyne from São Paulo described by KEMPF (1968) and by DE ANDRADE (1998) in the following details: size smaller (see measurements below) and number of striae on the pronotum 18 instead of 28. It is worth mentioning that some workers of *C. longiceps* from Rio de Janeiro are also larger (TL 7.44-8.50 mm) than the gyne from Bahia (TL 7.90 mm).

**Gyne, measurements (in mm) and indices:** TL 7.90-9.94; HL 1.46-1.84; HW 1.02-1.18; EL 0.45-0.54; SL 0.45-0.49; SW 0.20-0.21; W 2.12-2.76; PeL 0.68-0.74; PeW 0.70-0.76; HFeL 0.63-0.73; HFeW 0.32-0.38; HTIL 0.67-0.75; HTiW 0.24-0.27; HBal 0.43-0.44; HBaW 0.11; Cl 64.1-70.0; SI 42.8-44.4; HFeL 50.8-52.0; HTIL 35.8-36.0; HBA 25.0-25.6.
Cylindromyrmex meinerti FOREL

Fig. 5

COSTA RICA: Puntarenas, Golfo Dulce, 24 km W Piedras Blancas, 200 m, XII.1989-III.1990, 1 male, Hanson [INBC]; Puntarenas, Golfo Dulce, 3 km SW Rincón, 10 m, II-III.1989, 1 gyne, Hanson [INBC]; Puntarenas, Peninsula Osa, Rancho Quemado, 270 m, I.1991, 1 male, P. Hanson [INBC]; Guanacaste, Cerro El Hacha, NW Volcán Orosi, 300 m, 1988, 1 gyne, [INBC]; Heredia, Est. Biol. La Selva, 50-150 m, 10°26' N 84°01' W, 1 gyne, 15.III.1993 [INBC].

Cylindromyrmex whymperi (CAMERON)


Identification keys

A printing mistake occurred in the first two couplets of the identification key for the workers. The numeration of the second description in each must be corrected as follows:

Workers

- Eyes small or of medium size (>16 and <200 ommatidia) .... (4) [erroneously given as 3]
- Legs dark ferrugineous to black ................................................. (3) [erroneously given as 4]

Trying to identify the new species inopinatus by means of the key proposed by DE ANDRADE (1998) leads to its sister species, longiceps from which inopinatus can be easily separated by the characters already given, i. e. shorter hypostomal bridge, smaller size, etc. as already detailed in the description.

In order to add the male of C. longiceps, described in this paper, it was necessary to re- elaborate the identification key to the males of DE ANDRADE (1998).

Males of C. darlingtoni do appear to have been already collected and were offered to me for study by Dr. Jorge Luis Fontenla Rizo. Two successive requests of this material to Dr. Fontenla Rizo remained unanswered.
Males

1. Frontal carinae strongly converging and almost touching each other posteriorly and broadly separated anteriorly (Figs. 26, 33 of DE ANDRADE 1998) ............ (2)
   - Frontal carinae not strongly converging posteriorly (Figs. 6, 7, 10, 15, 22 of DE ANDRADE 1998), if almost touching each other posteriorly (few males of brevitarus) then never broadly separated anteriorly ............................................................... (3)

2. Total length (TL) > 9.5 cm. Mesosoma massive. Petiole with traces of striae anteriorly only. Postpetiole smooth. Costa Rica, Panama, Ecuador ............... godmani
   - Total length (TL) < 8.5 cm. Mesosoma elongate. Petiole entirely striate. Postpetiole superficially striate. Costa Rica, Panama, Venezuela, Brazil .......... meinerti

3. Hypopygium smooth, finely denticulate or with a simple median projection between the distal apodemes (Figs. 7B, 11B, 13B, 27B of DE ANDRADE 1998) ............ (4)
   - Hypopygium with a bidentate median projection between the apodemes (Figs. 16B, 23B, 24B of DE ANDRADE 1998) ......................................................... (6)

4. Postpetiole and first gastric tergite sculptured. Masticatory margin of the mandibles with a basal tooth. CI = 85.2. Hypopygium with a simple median projection between the distal apodemes. Brazil ................................................. longiceps
   - Postpetiole and first gastric tergite smooth. Masticatory margin of the mandibles without a basal tooth. CI > 95.2 ................................................................. (5)

5. Anterior clypeal border slightly convex (Fig. 6). Hypopygium finely denticulate between the distal apodemes (Fig. 7B of DE ANDRADE 1998). Brazil and Paraguay ......................................................... brasiliensis
   - Anterior clypeal border straight (Fig. 10 of DE ANDRADE 1998). Hypopygium smooth between the distal apodemes. (Figs. 11B, 13B of DE ANDRADE 1998)
   Guatemala, Costa Rica, Colombia, Galapagos Island, Ecuador, Peru, Bolivia, Chile, Brazil ............................................................... whymperi
   Surinam, French Guyana, Brazil ......................................................... striatus

6. Coxae black with the remaining parts of the legs yellow to light brown. Ventral border of the aedeagus with at least 42 denticles. Costa Rica, Venezuela, Ecuador, Peru and Brazil ............................................. brevitarus
   - Coxae dark or black, concolour with the remaining parts of the legs. Ventral border of the aedeagus with at most 32 denticles. Colombia, Venezuela, Peru and Bolivia ......................................................... boliviae

Acknowledgements

I would like to express my warmest thanks to CESARE BARONI URBANI for the suggestions and helps during this study. I am grateful to the persons who send material in study. Particular warm acknowledgements are due to DANIEL MATHYS and MARCEL DUGGELIN for the help at the Centre of Scanning Electron Microscopy of the Basel University.
References


http://www.evergreen.edu/user/serv_res/research/arthropod/genera/Cylindromyrmex/specieslist.html.
World Wide Web document.

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Besprechungen


Auch im Jahr 2000 kann hier das Erscheinen weiterer Teile der Serie angezeigt werden.


the mandibles with a small basal tooth followed by a denticle, an edentate margin and a pointed apical tooth. Hypostomal bridge broad, the anterolateral border convex, the posteromedial border broad anteriorly and strongly narrowing posteriorly. Mesosoma weakly convex in side view. Pronotum and mesonotum subequal in size.

Fig. 1: Specimen H-10-138 B. Dorsal view (top), head in frontal view (bottom left) and head in ventral view (bottom right) to show the broad hypostomal bridge and its short Y-shape.

Fig. 2: Specimen H-10-138 C. Dorsal view (left) and head in frontal view (right).
Fig. 4: Cylindromyrmex longiceps ANDRÉ. Gyne from Porto Seguro, Bahia, Brazil. Head in ventral view to show the broad hypostomal bridge and its Y-shape.

Fig. 5: Cylindromyrmex meinerti FOREL. Gyne from Costa Rica, Heredia, Est. Biol. La Selva. Head in ventral view to show the broad hypostomal bridge and its U-shape.
Fig. 6: *Cylindromyrmex brasilensis* EMERY. Male from Porto Seguro, Bahia, Brazil. Head in dorsal view (top), body in dorsal view (middle), body in profile (bottom).
Fig. 7: *Cylindromyrmex longiceps* ANDRE. Male from Porto Seguro, Bahia, Brazil. Head in dorsal view (top), body in dorsal view (middle), body in profile (bottom).