

# Two new species of *Centris* (*Trachina*) Klug, 1807 (Hymenoptera: Apidae) from the state of Minas Gerais, Brazil, with a note on *Centris pachysoma* Cockerell, 1919.

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## Abstract

Two new bee species belonging in *Centris* (*Trachina*) Klug, 1807 – *C. machadoi* sp. n., and *C. rupestris* sp. n. – are described and some of their characters are illustrated. Comments on the identity of *C. pachysoma* Cockerell, 1919 are also presented.

**Keywords:** bees, *Centris*, *Trachina*, Centridini, taxonomy, Neotropics

## Introduction

Representatives of the subgenus *Trachina* Klug are distributed from Argentina and Uruguai (Roig-Alsina, 2000), north to Mexico (Snelling, 1984, Michener, 2000). This subgenus includes about 15 species (Michener, 2000), of which the nine occurring in Central America and Mexico were revised by Snelling (1984). Five species were listed for Brazil by Silveira et al. (2002) – *C. longimana* Fabricius, 1804, *C. similis* (Fabricius, 1804), *C. fuscata* Lepeletier, 1841; *C. dentata* Smith, 1854 and *C. proxima* Friese, 1899. The first three are widely distributed in this country but it passed unnoticed to Silveira et al. (2002) that the last two were considered to be synonyms by Michener (1954) and Snelling (1984).

In revising the species of *Trachina* occurring in Brazil, two new species were found among material collected in faunistic inventories and pollination studies in the state of Minas Gerais. These two species are described below, taking advantage of the opportunity to pay homage to Dr. Angelo Machado and to make their names available for publication of papers currently in preparation.

## Material and methods

The species described below are easily distinguished from all other species currently recognized in *Trachina* (e.g. Moure, 1960; Michener, 1951, 1954; Snelling, 1974, 1984). They were confronted with the identification keys and compared with published descriptions and redescriptions of species in *Trachina* and other subgenera of *Centris* and to notes on their types available in the literature (Friese, 1901; Schrottkey, 1902;

Cockerell, 1919; Michener, 1951; Moure, 1960; Snelling, 1974, 1984; Roig-Alsina, 2000). No extensive examination of specimens from out of the Brazilian state of Minas Gerais was carried out for this paper, with most specimens examined being those in the main collection in the state (Universidade Federal de Minas Gerais, in Belo Horizonte – UFMG). A few specimens in the collection of the Universidade Federal do Paraná, in Curitiba, Brazil (UFPR) were available and were also included in this study. Hereafter, the acronyms between brackets above are used for reference to those collections. Acronyms of other institutions where type specimens were deposited are: Snow Entomological Collection of the Natural History Museum of the University of Kansas, in Lawrence, USA (SNOW); Museu de Zoologia da Universidade de São Paulo, in São Paulo, Brazil (MZUSP).

Special terms in the descriptions of species are: Metasomatic terga and sterna are referred to as T1, T2, T3, etc and S1, S2, S3, etc, respectively; the antennal flagellomeres are referred to as F1, F2, etc. The *antennocular distance* is the distance between the outer margin of the antennal socket and the internal margin of the compound eye; the *clypeocellar distance* is the distance between the lower margin of the mid ocellus and the superior margin of the clypeus; the *interantennal distance* is the shortest distance between the inner margins of the antennal sockets and *ocellocular distance* is the shortest distance between the external margin of the lateral ocellus and the internal margin of the compound eye.

## *Centris* (*Trachina*) *machadoi* sp. n. (Figs. 1,3,5,7)

*C. machadoi* can be distinguished from the other species of *Trachina* by the following set of characters: In both sexes – body approximately 2.0 cm in length; dorsal hairs of thorax homogeneously fulvous; tegula with a large posterolateral yellow spot on the external margin; pubescence on hind tibia and basitarsus

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completely black; metasoma black; pubescence on all terga whitish. In female – labrum totally black; pilosity on T4 and T5 sparse, composed of long, simple hairs; primary basitibial plate elliptic, elongate and with an acuminate apex, its disc with a shallow, shining depression near the apical margin of the secondary plate; secondary plate distinct with transverse margin. In male – basal half and lateral parts of clypeus micro-reticulate and densely punctate; pilosity on T4 sparse, composed of simple hairs; ventral process of hind femur produced as a broad and short spine; spine on anterior margin of hind tibia relatively short and pointed; internal margin of hind tibia ending as a carina, behind spur. See also the note on *C. pachysoma* Cockerell, below.

In using Schrottky's (1902) key for the species of *Centris* in the state of São Paulo, both male and female of *C. machadoi* are identified as *C. furcata* (Fabricius, 1804) [= *C. dimidiata* (Olivier, 1789)], which is a *Melacentris* (Moure, 1960).

#### FEMALE (Holotype)

*Structure and measurements* (mm) – approximate body length 20.0; length of forewing 15.0; head width 6.08; head length 3.9; labrum 1.7 times as wide as long ( $1.6 \times 0.96$ ); length of clypeus 1.28; clypeocellar distance 1.68; ocellocular distance 0.67; midocellar diameter 0.42; length of F1-F4 1.2, 0.35, 0.4, 0.4; interantennal distance 1.10; antennocular distance 0.7; clypeus protuberant; ocellocular distance greater ( $1.6 \times$ ) than diameter of mid ocellus. Mandible tridentate (first tooth longer than others, third one wider than second), its upper inner carina ending near third tooth and forming a fourth small tooth; primary basitibial plate elliptic and elongate with acuminate apex, its disc with a shallow shining depression near apical margin of secondary plate; secondary plate distinct with transverse margin; surface of pygidial plate micro-reticulate, its margins well delimited, gently incurved, its apex narrowly truncate.

*Body color* – black, except yellow on: basal third of mandible; inverted "T" mark on clypeus; lower paraocular area; spots on anterior surface of scape; small basal spots on front and mid tibiae; large posterolateral spot on the external margin of tegula. Wings fuscous and hyaline, veins and pterostigma black. Distitarsi, tarsal claws and tibial spurs blackish-ferruginous.

*Pubescence* – whitish-yellow on frons, paraocular area, labrum, upper portions of gena and mesepisternum, dorsal surface of T1 and sterna; on coxa, trochanter and femur of all legs; on posterior fringe and external surface of front tibia; fulvous on vertex behind ocelli, dorsal surface of thorax, base and median longitudinal strip of mid tibia, and on apical fringes of T5 and T6; white on lateral and lower portions of gena, on ventral portion of mesepisternum, on lateral surface of propodeum and on T2-T5; fuscous on midleg, on anterior, posterior and apical margins and on internal surface of tibia, on external surface of basitarsus, on internal surface of tarsus, except for basitarsal comb; on hind legs, on tibial scopa and tarsus; dark-ferruginous on anterior and internal surfaces of tibia and front basitarsus; on anterior surface and posterior fringe of tibia and comb of basitarsus of midlegs.

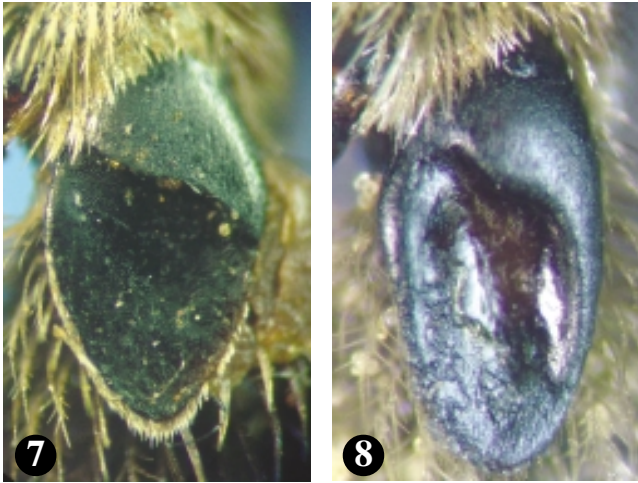
Pubescence, on labrum, long, coarse, simple, sub-erect on apex, short, branched and more sparse on rest; on clypeus, simple, minute and sparse on disc, becoming longer and coarser

toward sides, branched near base; on lower and mid paraocular area, frons, supraclypeal area and behind ocelli, densely plumose, more sparse on lower paraocular area; on upper paraocular area, fine, short and sparse; on preoccipital fringe, long, densely plumose, shorter laterally; on gena, long, plumose and sparse, shorter on upper gena and shorter and semi-erect along posterior eye margin; plumose, very dense and erect, on thorax, dorsally and laterally on meso and metepisterna and propodeum, longer and sparser on lower areas and on propodeum; on ventral areas of thorax, simple, long, fine and sparse, intermixed with long, fine, branched hairs, specially anteriorly; on posterior fringes of front femur, tibia and basitarsus, coarse, very long and simple, intermixed with fine, long and simple hairs and with fine, short and branched hairs, shortening toward apex on femur and basally on tibia; on external surface of front and mid tibiae, simple, semi-decumbent (except a median longitudinal band of plumose hairs in the middle of mid tibia), coarser, longer and denser on mid tibia; on dorsal, ventral and anterior surfaces of all femora, simple, short and sparse, except anterior surface of hind femur, longer, denser and branched and its ventral surface longer and branched; on posterior surface of mid femur, short, fine, sparse and simple, intermixed with longer plumose hairs; on hind femur, fine, short, dense and decumbent apically and dorsad on posterior surface and long and branched basally and ventrad on posterior surface; on anterior surface of front tibiae, composed of lightly curved, pointed bristles; on anterior surface of front basitarsus and internal surface of mid basitarsus, coarse, dense and long; forming combs of flat setae on anterior margin of front and mid basitarsi; forming combs of coarse bristles on apical margins of front and mid basitarsi; on posterior surface of front basitarsus, as a patch of short plumose hairs; on external surface of mid basitarsus, dense, short and plumose, intermixed with coarse simple bristles; on tibial and basitarsal scopae composed of a mixture of simple and plumose hairs; on posterior internal surface of hind tibia forming brush of short erect bristles, gently curved downwards with flat, v-shaped apices, longer along internal margin; on internal surface of hind basitarsus, forming brush of long bristles bent downwards; on dorsal surface of T1, plumose and dense laterally, simple, shorter and sparser on mid longitudinal band; on T2, T3 and T5, short, simple, fine and semi-decumbent, on T5 with long hairs intermixed; long, simple and sub-erect on T4; longer laterally on T4 and T5, with shorter plumose hairs; marginal band of T2-T4 ill-defined, receding from tergal margin medially; apical fringe of T5, dense and plumose; on T6 dense, composed of long, flat bristles on the sides of the pygidial plate; on disc of S2-S5, short, fine, erect and sparse, shorter and decumbent laterad and leaving a glabrous longitudinal mid line on S2 and S3, forming long submarginal fringes of branched hairs on S2-S6, interrupted on mid on S2, longer on S4.

*Punctures* – on labrum, fine and dense on disc, coarser toward base, the integument smooth and shining; on clypeus, moderately fine and dense basally, along epistomal suture, fine and sparse toward sides and apex and leaving a mid longitudinal band impunctate, integument micro-reticulate basally and on disc, smooth and shining on sides; on supraclypeal area, moderately fine and dense; on lower paraocular area, minute and very sparse, denser close to antennal socket; on upper paraocular area, fine and sparse, denser and coarser toward frons,



**Figures 1-6** - Clypeus and labrum of female *Centris machadoi* (1) and *C. rupestris* (2); clypeus and labrum of male *C. machadoi* (3) and *C. rupestris* (4); lateral views of female *C. machadoi* (5) and *C. rupestris* (6).



Figures 7-8 - Basitibial plates of female *Centris machadoi* (7) and *C. rupestris* (8).

integument micro-rugulate, shining near lateral ocellus; on vertex, fine and moderately dense; on gena, very fine and moderately sparse along eye margin, coarser and denser toward occipital margin; on mesosoma, hidden by pubescence; on dorsal surface of T1 and T5, very fine and sparse; on T2, fine and dense, on T3 coarser and denser, on T4 coarser and sparse; on T1-T5 integument micro-reticulate and shining; on S2-S4 moderately fine and sparse, S2-S3 with median impunctate apical area smooth and shining, denser on S5.

#### MALE

*Structure and measurements* (mm) – approximate body length 22.0; length of forewing 15.0; head width 5.56; head length 3.9; labrum 1.5 times as wide as long ( $1.6 \times 1.04$ ); length of clypeus 1.15; clypeocellar distance 1.6; ocellocular distance 0.35; midocellar diameter 0.43; length of F1-F4 1.15, 0.27, 0.32, 0.35; interantennal distance 0.9; antennocellar distance 0.35; ocellocular distance shorter (0.8x) than diameter of mid ocellus. Clypeus protuberant; mandibular teeth hidden on specimen (in other paratypes, tridentate, first tooth longer than others, third larger than second, broad and biangulate; inner superior carina ending near third and forming a fourth tooth); ventral process of hind femur produced as broad and short spine; anterior margin of hind tibia with a relatively short, pointed, submedian spine; internal margin of hind tibia ending as a carina, behind spur; hind basitarsus with carina along posterior margin ending as a spine among pilosity; pygidial plate absent.

*Body color* – black, with yellow areas distributed similarly to those described for females, except labrum, yellow but for apical margin; transverse marginal stripe of clypeus broader; right tegula ferruginous with yellow marginal-line; left tegula with large yellow posterolateral spot on external margin. Wings fuscous and hyaline, veins and pterostigma black. Distitarsi, tarsal claws and tibial spurs blackish-ferruginous.

*Pubescence* – whitish-yellow, on frons, paraocular area, vertex behind ocelli, labrum, upper portion of gena, sides and ventral portion of mesepisternum, dorsal surface of T1, coxa and

trochanter of all legs, external surface of mid tibia and on front femur; yellow on dorsal surface of thorax; white on lower portion of gena, lateral surface of propodeum, margin of T2 and T3, all of T4-T6 and on all sterna; fuscous on anterior and internal surfaces and posterior fringe of mid tibia (except a line of shorter, reddish-fuscous hairs), on mid tarsus, hind tibia and hind tarsus and on disc of T2; reddish-fuscous on anterior and internal surfaces and on posterior fringe of front tibia and front basitarsus, on external surface and line of short hairs on posterior fringe of mid tibia and on hind femur.

*Pubescence*, on labrum, dense, short and plumose with some fine, erect bristles intermixed; on clypeus, long, simple and erect, intermixed with short, plumose hairs on lateral margins; on disc, fine, short and simple; on lower paraocular area, finely branched; on mid paraocular area, frons, supraclypeal area and behind ocelli, densely plumose; on upper paraocular area, very fine, minute and sparse; on preoccipital fringe, long, densely plumose, shorter laterally; on gena, long, plumose and dense; on mesosoma, dense and plumose, sparser on ventral areas, shorter on mesoscutum and disc of scutellum, finer and sparser on propodeum; on posterior fringes of front femur, front and mid tibia and basitarsi, dense, fine and plumose, longer on tibia and basitarsi; on external surface of front and mid tibiae, simple, semi-decumbent, denser on mid tibia; anterior surface of front femur and dorsal surface of mid femur, finely branched; dorsal surface of front femur, minute and simple; anterior surface of mid femur, minute and finely branched; on anterior surfaces of front tibiae, short, semi-erect, pointed bristles; anterior surfaces on front basitarsus, long, lightly curved, semi-erect, coarse, bristles; apically, on ventral surface of mid trochanter and basally on ventral surface of mid femur, dense, short, semi-erect and simple, forming brush; on internal surface of mid basitarsus, long, semi-erect, pointed, thin bristles; on external surface of mid basitarsus, thin, semi-erect, dense and plumose; on hind femur, plumose, fine and sparse on all surfaces; on internal surface of hind tibia forming a brush of thin, short, erect bristles, gently curved downwards with flat, v-shaped apices; on internal surface of hind basitarsus, forming brush of long bristles bent downwards; on anterior and posterior fringes of hind tibia and basitarsus, long, plumose and dense, shorter basally on tibia; on dorsal surface of T1, long, plumose and dense laterally, short, thin and sparse on a mid longitudinal band; on T2 and T3, minute, simple, fine and decumbent; on T4, thin, simple and semi-erect, plumose on sides; on T5 and T6, simple and sub-erect intermixed with long and plumose hairs, denser laterally; on T7, dense, simple, fine, decumbent intermixed with branched hairs on pigdial area; on S2-S5, semi-erect, long, fine and plumose, sparser on S2 and S3.

*Punctures* – on labrum, fine and moderately dense on disc, dense on apical margin, integument smooth and shining; on clypeus, moderately fine and dense basally, along epistomal suture, progressively coarser and sparser toward sides and apex and leaving a mid longitudinal band impunctate, the integument micro-reticulate, except smooth and shining on apical margin and laterally along epistomal suture; on lower paraocular area, fine and sparse; on upper paraocular area, moderately fine and sparse, denser close to antennal socket and toward frons, integument micro-rugulate and shining near lateral ocellus; on gena, fine and dense; on mesosoma, hidden by pubescence; on dorsal surface of T1, very fine and sparse; on T2-T4, fine and

dense, on T5 sparse and on T6 dense, integument of T1-T6 micro-reticulate and shining; on S2-S4 moderately fine and dense; on apical sterna hidden by pubescence.

*Holotype* – female, “sucupira-preta, Faz[enda]. Vargem Grande, 8538-25987”; “Bocaiúva MG, BRASIL 11/08/2003, A.A.Azevedo”; “*Centris machadoi* Azevedo & Silveira, sp.n. HOLOTYPE”. Deposited at UFMG.

*Paratypes* – same locality and date as holotype: 6 ♀♀ and 2 ♂♂ (A. A. Azevedo, 8538-25978, 25979, 25980, 25981, 25982, 25986 and 8538-25983, 25985); 3 ♀♀, 4 ♂♂ (R. M. Carmo, 8539-25994, 25995, 25996 and 8539-25990, 25991, 25992, 25993). From Brasilândia de Minas, MG, Brazil, July 30, 1999: 1 ♀ (A.A.Azevedo, 4784-13179). From Itacambira, MG, Brazil, October 01, 2005: 1 ♂ (A.A.Azevedo, 10537-30679); 1 ♂ (C.F.Cardoso, 10539-30714). From São Gonçalo do Rio Preto (Pq. Es. Rio Preto), MG, Brazil, September 13, 2003: 1 ♀ (Y. Antonini, 9089-27145). From Januária (Pq. Nac. do Peruaçu, Lagoa Form[osa]), MG, Brazil, August 03, 2003: 1 ♀ (Y. Antonini). Deposited at UFMG, MZUSP, UFPR and SNOW.

*Comments* – All specimens examined were collected in the *cerrado* domain and mostly during the dry season (July – October). The specimens collected in Bocaiúva, including the holotype, were captured on flowers of *Bowdichia virgilioides* (Fabaceae – the “sucupira-preta”), at a disturbed area of *cerrado*. No information on bionomy exists for this species.

*Etymology* – the species is named after Dr. Angelo B. M. Machado.

***Centris (Trachina) rupestris* sp. n.**  
(Figs. 2,4,6,8)

*C. rupestris* can be distinguished from other species of *Trachina* by the following set of characters: In both sexes – approximate body length 1.5 cm; metasoma black. In female – primary basitibial plate deeply convex, spoon-like; secondary plate much reduced, restricted to right basal portion, not overhanging primary plate; scopa predominantly black on basitarsus, whitish-yellow on tibia. In male – apex of clypeus sparsely punctate, smooth and shining; hairs on hindlegs, mostly whitish on tibia and mostly black on basitarsus; ventral process of hind femur flat and triangular; spine on anterior margin of hind tibia close to spur base, short and blunt; pygidial plate ill-defined.

In using Schrottky’s (1902) key for the species of *Centris* in the state of São Paulo, males of *C. rupestris* are identified as *C. bicolor* Lepeletier, 1841 which is a *Xanthemisia* (Silveira et al. 2002), and the female as *C. furcata* (Fabricius, 1804) [= *C. dimidiata* (Olivier, 1789)], a *Melacentris* (Moure, 1960). This species also superficially resembles *C. (Paracentris) xanthomelaena* Moure & Castro, 2001 and *C. (Xanthemisia) bicolor* Lepeletier, 1841 for the equivalent body size, the black metasomatic terga and for the bright yellow thoracic pilosity. It can be easily distinguished from those species, though, by the subgeneric characters.

**FEMALE (Holotype)**

*Structure and measurements* (mm) – approximate body length 15.0; length of front wing 11.0; head width 5.0; head length 2.9; labrum 1.3 times as wide as long (1.2 × 0.9); length

of clypeus 1.4; clypeocellar distance 1.2; ocellocular distance 0.6; midocellar diameter 0.40; length of F1-F4 1.08, 0.24, 0.30, 0.30; interantennal distance 0.90; antennocular distance 0.55. Clypeus protuberant; mandible quadridentate, teeth homogeneously spaced, the first larger than the others; primary basitibial plate deeply concave (spoon-like), secondary basitibial plate much reduced, indistinct and restricted to the right basal portion of the primary plate and not overhanging it; pygidial plate narrow and acuminate.

*Body color* – black, except: yellow on basal two-thirds of mandible; large spot on basal half of labrum; spot on anterior surface of scape; lower paraocular area; inverted “T” mark on clypeus; small basal spots on front and mid tibiae. Tegula translucent and ferruginous with yellow lateral marginal-line and yellow posterior spot. Wings fuscous and hyaline; wing veins blackish-brown, lighter toward wing apex; pterostigma black. Distitarsi, tarsal claws, and tibial spurs blackish-ferruginous.

*Pubescence* – whitish-yellow on frons, paraocular area, vertex behind ocelli, labrum, upper portion of gena, lower side of mesepisternum, dorsal surface of T1, coxa and trochanter of all legs, on all front and mid femora, posterior fringe and external surface of front and mid tibiae (except on anterior margin of mid tibia), long curved bristles posteriorly on external surface of front and mid tarsi (less evident on mid basitarsus), anterior and posterior surfaces and apex of hind femur, tibial scopa and a line of long hairs before fringe of T5; yellow on upper third of mesepisternum and dorsal surface of thorax (on this, hairs with ferruginous tips); white on mid and lower portion of gena, ventral portion of mesepisternum, lateral surface of propodeum, lateral margin of T2 and T3 (on T2, extending postero-laterally to tergal base), apical margin of T4, T5 and on apical margin of sterna; fuscous on superior paraocular area, frons below ocelli, preoccipital fringe, anterior and internal surfaces of front tibia and basitarsus, anterior and internal surfaces of mid tibia and tarsus, except on basal portion of posterior fringe, infero-basal posterior surface of hind femur, posterior surface of hind tibia and all hind tarsus, T2 and T3, except laterally on the apical fringe, disc of T4 and apical fringes of T5 and T6 with mixture of yellow bristles; blackish-ferruginous on posterior surface of front tarsus and on basitarsal comb.

Pubescence, on labrum forming an apical tuft of coarse, simple, erect bristles; short and plumose forming lateromarginal fringes and sparsely distributed on disc; on clypeus, long, simple and erect on lateral margins, shortening toward apex, plumose and short laterally on the base, fine and short on disc; on lower and mid paraocular area, frons, supraclypeal area and on tuft behind mid ocellus, densely plumose, more sparse on lower paraocular area; on upper paraocular area, fine, short and sparse; on preoccipital fringe, long, finely plumose, shorter laterally; on gena, long, plumose and dense, decumbent along posterior eye margin; dorsally on thorax, laterally on meso and metepisterna and propodeum, plumose, very dense and erect, longer, finer and sparser on lower areas and on propodeum; on ventral areas of thorax, simple, long, fine and sparse; on posterior fringes of front femur and tibia, simple, long, fine and sparse, with shorter plumose hairs intermixed; on external surface of front and mid tibiae, simple, semi-decumbent, on mid tibia coarser and denser and with a mid longitudinal band of short plumose hairs intermixed on apical half; on anterior surfaces of front and mid

tibiae and front basitarsus and on internal surface of mid basitarsus, composed of lightly curved, pointed bristles, shorter and finer on anterior margins of tibiae, coarser on front basitarsus and mid tibia; forming combs of flat setae on anterior margin of front and mid basitarsi; forming combs of coarse bristles on apical margins of all tarsomeres of front and mid basitarsi; on external surface of front basitarsus, composed of long, coarse setae curved backwards over a posterior fringe of plumose hairs; on external surface of mid basitarsus dense, short and plumose; on tibial and basitarsal scopae, composed by a mixture of simple and plumose hairs; on internal surface of hind tibia, forming brush of short erect bristles, gently curved downwards with flat, v-shaped apices, longer along internal margin; on internal surface of hind basitarsus, forming brush of long bristles bent downwards; on dorsal surface of T1, plumose, fine and long, finer and shorter on a narrow, mid, longitudinal band and denser laterally; on T2 and T3, simple, fine and semi-erect; on T4, similar to that on T2 and T3, more erect, with longer hairs intermixed, longer laterally, forming complete and sparse submarginal band of thin, sub-erect, poorly branched hairs; on T5, similar to that on T4, with dense apical fringe composed of densely-plumose hairs; on T6, dense, composed of long, flat bristles on the sides of the pygidial plate; on discs of S2-S6, sparse, erect and pointed, shorter on S5 and S6, denser on S6; forming submarginal, decumbent fringe on S2 and S3, longer and sub-erect on S4 and S5, with long, plumose hairs apically curved downwards on S6.

*Punctures* – on labrum, fine and sparse on disc, coarse and dense toward sides and apex, leaving an impunctate basal band, the integument smooth and shining; on clypeus, moderately fine and dense basally, along epistomal suture, progressively coarser, beveled, and sparse toward sides and apex and leaving the apical margin and a mid longitudinal band impunctate, the integument micro-reticulate basally, smooth and shining elsewhere; on supra-clypeal area, moderately fine and dense, minute and sparse near antennal socket; on lower paraocular area, minute and very sparse, fine and dense closer to antennal socket; on upper paraocular area, moderately fine, dense and shallow, denser and fine toward frons; on vertex, moderately fine and dense, finer and sparse toward lateral ocellus, leaving small impunctate area near the ocellus, the integument micro-reticulate and shining; on gena, fine and dense, finer and denser along posterior margin of eye; on mesoscutum, moderately fine and dense on disc, the integument micro-reticulate and shining; on ventral portion of mesepisternum, moderately coarse and dense, with fine, dense punctures intermixed; on rest of mesosoma, hidden by pubescence; on dorsal surface of T1, very fine and sparse, integument micro-reticulate and somewhat dull; on T2 and T3, fine and dense, integument micro-reticulate and shining; on T4 and T5, moderately fine and moderately dense, beveled, integument shining, on T4 with micro-reticulate areas; narrow marginal bands smooth and shining on T1-T4; S2-S4, moderately fine and sparse; S5 denser; S2-S5 with an ill-defined mid longitudinal band impunctate, smooth and shining.

#### MALE

*Structure and measurements* (mm) – approximate body length 12.0; length of anterior wing 12.0; head width 4.4; head length 2.9; labrum 1.3 times as wide as long (1.18 × 0.9); length

of clypeus 1.2; clypeocellar distance 1.28; ocellocular distance 0.27, shorter (0.7×) than diameter of mid ocellus; midocellar diameter 0.37; length of F1-F4 1.05, 0.2, 0.3, 0.3; interantennal distance 0.6; antennocellar distance 0.35. Clypeus protuberant; mandible tridentate (first tooth longer than others, third broader than second and biangulate); ventral process of hind femur, flat and triangular; spine on anterior margin of hind tibia close to spur base, short and blunt; hind basitarsus with carina along posterior margin produced as an apical spine among hairs; pygidial plate ill-defined, its surface smooth and shining, its margins fused to tergal surface.

*Body color* – black, with yellow areas distributed as described for females, except labrum, yellow but for apical margin; yellow stripes on clypeus, wider; left tegula without yellow posterior spot. Wings, distitarsi, tarsal claws, and tibial spurs as described for female.

*Pubescence* – whitish-yellow on frons, paraocular area, vertex behind ocelli, labrum, upper portion of gena, lower side of mesepisternum, dorsal surface of T1, all of S1-S2; coxae of all legs; trochanter of front and, partly, of mid and hind legs, posterior fringe of front femur, posterior fringe of front and mid tibiae and basitarsi (on mid leg, only basally on basitarsus), external surface of all tibiae (except on anterior margin of mid tibia); on anterior and dorsal surfaces of hind femur and on a longitudinal band on external surface of hind tibia; yellow on upper third of mesepisternum and dorsal surface of thorax; white on lower portion of gena, ventral portion of mesepisternum, lateral surface of propodeum, lateral margin of T2-T4, sparse marginal fringe of T4 and on all of T5 and T6; fuscous on upper paraocular area, frons below ocelli, preoccipital fringe, ventral surface of front femur, all surfaces of mid femur except apically, ventral and posterior surface of hind femur, on anterior and internal surfaces of all tibiae and basitarsi (on hind legs, all basitarsi) and all distitarsi, part of mid and hind trochanters, all of T2, T3, except laterally, T4 except for sparse apical fringe, some long bristles on mid disc of T5 and T6 and on all S3-S6.

Pubescence, on labrum, long, fine, simple, erect bristles on apex, short and plumose forming lateromarginal fringe; longer and sparsely distributed on disc; on clypeus, long, simple and erect on lateral margins, shortening toward apex, plumose laterally on base, very fine and short on disc; on lower and mid paraocular area, frons and supra-clypeal area, sparse and plumose; behind ocelli, dense and plumose; on upper paraocular area, minute and sparse; on preoccipital fringe, long, plumose, shorter laterally; on gena, long, plumose and dense; dorsally and laterally on mesosoma, plumose, dense and erect; on ventral areas of thorax, plumose, long, fine and sparse; on posterior fringes of front femur and tibia, fine and plumose, longer and sparser on tibia; on external surface of front and mid tibiae, simple, semi-decumbent, denser on mid tibia; on anterior surfaces of front tibia and front basitarsus, composed of lightly curved, pointed bristles, shorter and finer on tibia; apically, on ventral surface of mid trochanter and basally on ventral surface of mid femur, dense, semi-erect, very short and simple, forming brush; on posterior fringe of mid femur, moderately long and sparse; on posterior fringes of mid tibia and basitarsus, long, dense and plumose; anterior and posterior surfaces on mid femur, finely plumose, short and sparse; on hind femur, plumose and sparse on all surfaces; on internal surface of hind tibia forming a brush of erect bristles, gently curved downwards with

flat, v-shaped apices; on internal surface of hind basitarsus, forming brush of long bristles bent downwards; on anterior and posterior fringes of hind tibia and basitarsus, long, plumose and dense, shorter basally on tibia and apically on basitarsus; on dorsal surface of T1, plumose, fine, long and sparse, denser toward sides; on T2-T5, fine, mostly simple, semi-erect and moderately sparse, longer and more erect toward T5, finely plumose laterally; on T2, finally plumose basally; on T3 with submarginal line of branched hairs medially; on T4-T6 with branched hairs intermixed; on T7, finely plumose and appressed on sides of pygidial plate; on sterna, long, plumose, sparse and erect; on S2 with curved apices.

*Punctures* – on labrum, fine and sparse on disc, finer and dense toward sides and apex, leaving a narrow transverse impunctate basal band, integument smooth and shining; on clypeus, moderately fine and dense basally, along epistomal suture, progressively coarser, beveled, and sparse toward sides and apex and leaving a mid longitudinal band impunctate, integument micro-reticulate basally, smooth and shining elsewhere; on supraclypeal area, moderately fine and very dense; on lower paraocular area, minute and sparse, moderately fine and dense near antennal socket; on upper paraocular area and frons, moderately fine and dense; on vertex between eye and lateral ocellus, fine and dense, integument micro-reticulate; on gena, minute and sparse on a mostly impunctate band along posterior margin of eye, fine and dense elsewhere; on mesoscutum, moderately coarse and very dense, integument shining and obscurely micro-reticulate on disc; on scutellum, moderately coarse and dense, integument smooth and shining; on rest of mesosoma, hidden by pubescence; on mid dorsal surface of T1, fine and sparse, integument micro-rugulate and shining, denser toward sides; on T2-T5, moderately dense and fine, denser on T2, coarser and sparser toward T6, integument micro-reticulate and shining; on T3 with micro-reticulate areas, mostly restricted to apical depression; T1-T4 with narrow margins smooth and shining; S4-S5 fine and dense.

*Holotype* female – “*Chamaecrista semaphora*, S[erra]. do Cipó, 7788-23499”; “Santana do Riacho MG, BRASIL 02/06/2001, M. F. Goulart”; “*Centris rupestris* Azevedo & Silveira, sp.n., HOLOTYPUS”. Deposited at UFMG.

*Paratypes* – same locality and date as holotype: 5 ♀♀ and 1 ♂ (A. A. Azevedo, 7773-23449, 7778-23465, 7779-23472, 7780-23479, 7782-23486 and 7776-23457), 2 ♀♀ (B. A. Ribeiro, 7796-23517, 7801-23531), 2 ♀♀ (M. F. Goulart, 7787-23497, 7790-23507); same locality as holotype, May 27, 1998: 2 ♂♂ and 1 ♀ (R. M. Carmo, 2257-7107, 2264-7122 and 2258-7108), (1,270 m) 1 ♂ (R. S. Oliveira, 2348-7290); June 3, 1998: 1 ♀ (R. Oliveira & R. M. Carmo, 2316-7227). From Brumadinho (S. da Moeda – 20°05’ S, 43°59’ W, 1400 m), MG, Brazil, June 6, 1998: 1 ♂ (F. A. Silveira, 2277-7139); May 23, 1998: 3 ♂♂ (G. A. R. Melo). From Itacambira, MG, Brazil, October 01, 2005: 2 ♂♂ (A.A.Azevedo, 10538-30680/30681) and 1 ♀ (A.A.Azevedo, 10538-30682). From São Gonçalo do Rio Preto (Pq. E. do Rio Preto), MG, Brazil, August 17, 2002: 1 ♀ (Y. Antonini). From 18 km West of Capitólio (20°38’ S, 46°13’ W, 950 m), MG, Brazil, May 15, 1999: 2 ♂♂ (G. A. R. Melo). Deposited at UFMG, UFPR, MZUSP and SNOW.

*Variation* – the yellow, mid longitudinal line of clypeus may be reduced to a short line isolated inside the largely dark clypeus, which, in this case, contains two lateral yellow maculae.

*Comments* – Many of the specimens were captured on flowers of *Chamaecrista semaphora* (Fabaceae), an endangered species endemic to the Serra do Cipó (Mendonça & Lins, 2000). All known specimens were collected above 950 m altitude, at the so called “campos rupestres” (rocky fields) of southeastern Brazil, in May, June, August and October, mostly during the regional dry season.

*Etymology* – the name *rupestris* is a reference to the species habitat (see “Comments,” above).

### *Centris pachysoma* Cockerell, 1919

When Moure (1945) erected the subgenus *Paremisia* (= *Trachina*), he included *C. pachysoma* in it with uncertainty, since he had not seen its type. His decision was followed later by Michener (1951). The description of *C. pachysoma* by Cockerell (1919) suggests a female bee resembling both *C. similis* and *C. machadoi*. However, the following set of characters in Cockerell’s description distinguishes his *C. pachysoma* from *C. machadoi*: “labrum pale yellow, with a large pale brown spot” (completely black in *C. machadoi*); “clypeus with lower margin broadly rufous” (in *C. machadoi*, completely black); “hair of apical part of abdomen pale, beginning on middle of fourth segment, that at extreme apex red” (in *C. machadoi*, the pilosity is pale on all terga). All these characters, however, apply to *C. similis*. Characters in Cockerell’s (1919) description of *C. pachysoma* distinguishing it from *C. similis*, on the other hand, are not as convincing: “mandible largely yellow” (in *C. similis*, yellow only basally); “tegulae ferruginous” (blackish brown in *similis*). All other characters listed by Cockerell can be applied for all or most species of *Trachina*, although no subgenus-defining character was mentioned by him. Thus, the evidence at hand suggests that *C. pachysoma* may be a synonym of *C. similis*.

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