On a new cave-dwelling Nicoletiidae (Zygentoma: Insecta) from Brazil

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"SOBRE UM NOVO NICOLETIIDAE (ZYGENTOMA: INSECTA) CAVERNÍCOLA DO BRASIL" - Uma nova espécie de *Coletinia* (Zygentoma: Nicoletiidae: Coletiniinae) é descrita sobre exemplares obtidos numa gruta do noroeste do Estado da Baía, Brasil, e comparada com as restantes conhecidas no género. Esta nova espécie é especialmente interessante dado que *Coletinia* só era conhecido até ao presente da bacia mediterrânica setentrional, desde Portugal até à Turquia, e que os Coletiniinae eram tidos como uma subfamília exclusiva do Velho Mundo.

Palavras-chave: Zygentoma; Nicoletiidae; *Coletinia*; espécie nova; Brasil

One new species of *Coletinia* (Zygentoma: Nicoletiidae: Coletiniinae) is described from a cave in the Northwestern Bahia State, Brazil, and compared with the remaining taxa known in the genus. This new species is particularly interesting as *Coletinia* was thought to occur along the northern mediterranean basin only, from Portugal to Turkey; besides, the Coletiniinae were believed to be an Old World subfamily

Key-words: Zygentoma; Nicoletiidae; *Coletinia*; new species; Brazil.

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Coletinia (WYGODZINSKY, 1980) is a genus of Nicoletiidae (Zygentoma) known so far to distribute along the Northern Mediterranean countries, from Portugal to Turkey. Among the 11 described species, a few ones seem to correspond to true troglobionts, though other do occur under stones and in deep soil, as edaphobionts (see CHOPARD, 1924, SILVESTRI, 1938, KOSAROFF, 1939, WYGODZINSKY, 1980, BACH *et al.*, 1985, MENDES, 1988 and MOLERO *et al.*, 1997). In the present paper a new species of this genus collected in a cave in the Northwestern Bahia State, Brazil, will be described, which corresponds to the very first *Coletinia* signed to the Neotropical Region, from where none Coletiniinae (MENDES, 1988) has been formerly reported.

The surprisingly presence of *Coletinia* in the New World seems to reflect the poor knowledge that still exists about the Nicoletiidae. It seems, otherwise, to reinforce the proposed phylogenetic arrangement of this genus inside the family (MENDES, 1994) : as a matter of fact, *Coletinia* was considered the most plesiomorphic genus of one of the most primitive subfamilies, that of the Coletiniinae, what points to the very long evolutive history of the group. A future increase of the knowledge of the Nearctic Nicoletiidae (the North American thysanurans -and mainly the Zygentoma- remain scarcely known) shall contribute to a better understanding of this apparently aberrant geographical distribution, which may correspond to the actual remains of a genus that formerly presented an Western Laurasian distribution.

The studied specimens are deposited in the arachnoentomological collection of the Centro de Zoologia/ /IICT, in Lisbon, Portugal (CZ) and in the Universidade Federal de Minas Gerais collection, in Belo Horizonte, Brazil (UMG).

Coletinia brasiliensis sp.n.

EXAMINED MATERIAL: BRAZIL — Bahia State: Toca do Morrinho Cave, Campo Formoso county (10° 12' 32" S, 40° 55' 05" W), n° 35, 1 male holotype 1 female alotype (CZ) 2 males paratype (UMG); Ibid., n° 32, 1 young female paratype (UMG); Ibid., n° 33, 1 male paratype 1 young male paratype 1 young female paratype (UMG); Ibid., n° 34, 1 male paratype (CZ), 1 incomplete male (UMG)

DESCRIPTION:

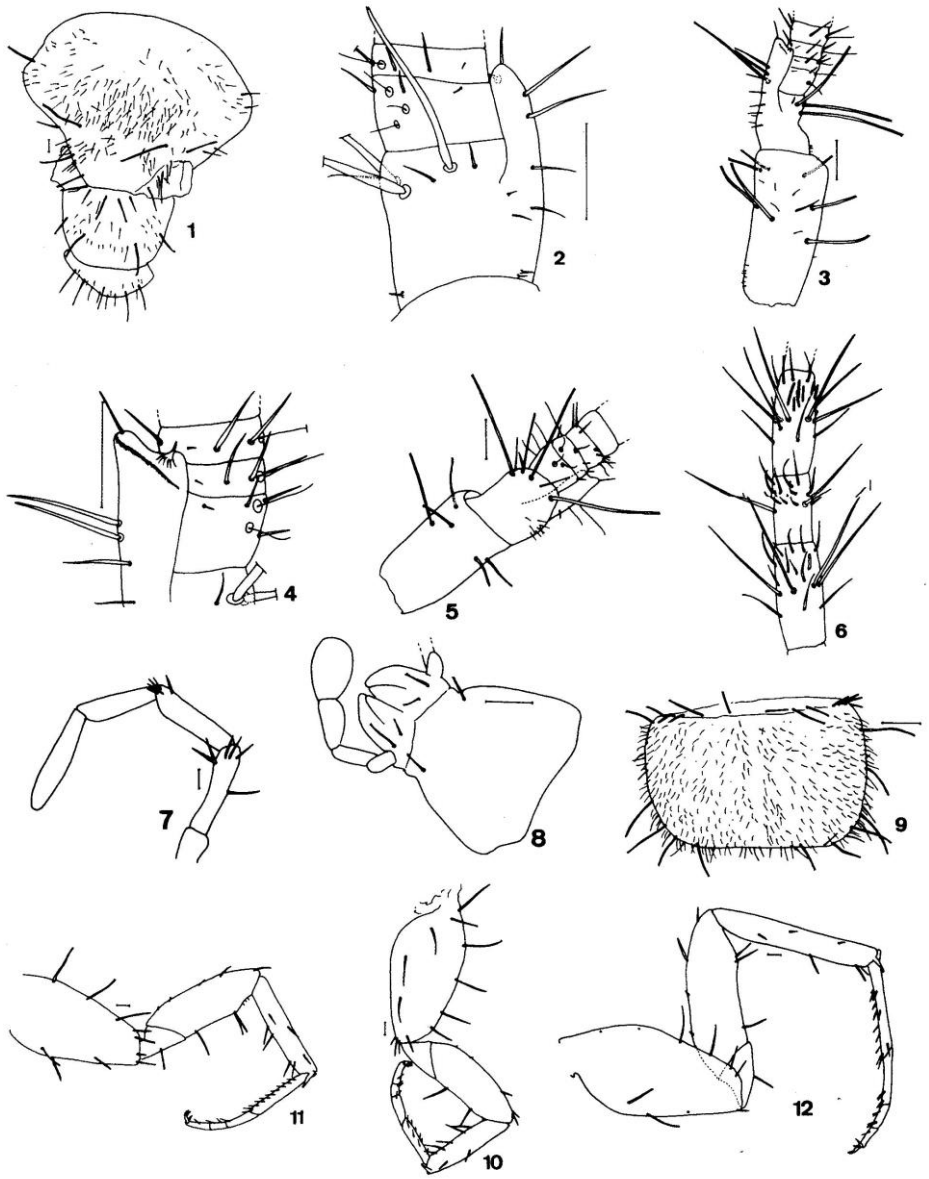
Body length: 9.5-10.3 mm (m) 9.7 mm (f); thorax length: 3.2-3.5 mm (m) 3.1 mm (f); thorax width: 1.7-2.1 mm (m) 1.5 mm (f); antennae length: maximum preserved of 9.8 mm (damaged) in the holotype; cerci length: maximum of 17.4 mm in the holotype (never completely preserved). Maximum body length of 17.4 mm in the holotype (paracercum damaged).

Body lacking pigment, thin and more or less parallel-sided, with long appendages, scaleless and covered by abundant thin, hyalin, short setae; macrochaetae caramel-coloured.

Head much wider than long, with some elongated robust macrochaetae and with numerous thin and short cilia (Fig. 1). Antennae of female without special features, devoid of modified pedicellus. Antennae of male (Figs. 2-6) asymmetrical. Right pedicellar apophysis cylindrical and simple (Fig. 2), not attaining the distal border of the second flagellar article and with a praeterminal minute thin conule. Left pedicellar apophysis more robust (Fig. 3-5) surpassing the level of the second flagellar article, distally enlarged and more or less spatulated, with a sclerotized oblique inner ridge, and apically with a developed conule; outer surface of the apophysis somewhat dilated basally and with some stift setae, lacking glandular area (Fig. 5). Most distally preserved antennal chains with 4 elongated unities (Fig. 6) their apical subarticle with not specially long cylindrical sensilla.

Mandibles robust, typical. Maxillae as usual, the lacinia and galea equally developed, this last one with two big apical conules. Maxillary palp (Fig. 7) with the apical article about 4.5 times longer than wide and much longer than the preceeding (n/n-1 = 1.35-1.43); one very strong and dark macrochaeta occurs on the dorsal 2/3 of the second article and similar setae are arranged as a crown on the apical areas of articles 2 and 3 (those of the second more developed); on the distal article, besides the typical 6 subcylindrical apical sensillae and the usual setae, one rounded ?coeloconic? sensillum. Labium without special features, the labial palp as in Fig. 8, its distal article ovoid and clearly longer than wide, with 5 apical papillae, 2 of them subcylindrical and similar to the maxillary palp sensillae, the remaining ones not pedunculated, typical.

Thorax about 1/3 as long as the body, the nota with straight posterior borders, covered by abundant thin setae and with 6+6 macrochaetae (4 lateral, 1 infralateral and 1 posterior pairs), the pronotum (Fig. 9) with an anterior row of short macrochaetae also. Legs long and delicate (Figs. 10-12). Tibia I about 1/2 the length of tibia III, the former almost 4 times longer than wide and with 2 dorsal and 5 ventral delicate spines; hind tibia about 6.5 times longer than wide and with 3 dorsal and 3-4 ventral spines. Femur



Coletinia brasiliensis sp.n. Fig. 1 — Head; Fig. 2 — Base of male right antenna, inner view; Fig. 3 — Ibid., of left antenna; Fig. 4 — Ibid., outer view; Fig. 5 — Ibid., detail of the pedicellar apophysis, inner view; Fig. 6 — Distal flagellar chain; Fig. 7 — Maxillary palp; Fig. 8 — Labium and labial palp; Fig. 9 — Pronotum; Fig. 10 — P I; Fig. 11 — P II; Fig. 12 — P III. Scales: 0.1 mm

of all the legs dorsally with 2-3 macrochaetae and with 2 minute sub-basal spines (Fig. 13).

Urotergites I-IX setose, with 4-5 pairs of posterior macrochaetae, the bigger ones (in the posterolateral area) not longer than 1/2 of the tergite length (Fig. 14). Xth urotergite of male short and wide (Figs. 15-16), with numerous dorsal setae, the posterior median depression deep and narrow; ventrally, 5-7 little, ovoid, sclerotized conules along each posterior expansion, being the apical one the most developed. Xth urotergite of female devoid of special features, with the posterior margin clearly excavated, as in Fig. 17; distance between the apical macrochaetae similar to their own length.

Urosternite I setose, divided in one median sternite and 1+1 lateral coxites, devoid of stylets and lacking vesicular structures (Fig. 18). Urosternites II-VII entire, setose, their posterior border straight. Stylets on urosternites II-IX, with denticulated apical spine; abdominal segments II-VI with vesicles, the VII with pseudovesicles. Each urosternite II-VII (Fig. 19) presents 1+1 central (discal), 1+1 posterior submedian (close to the inner limit of the vesicles) and 1+1 posterior sublateral (above the stylets insertion) short macrochaetae; male urosternite VIII (Fig. 20), with the posterior border strongly protruding, almost semicircular, the discal macrochaetae absent. IXth male coxites free, setose (Fig. 20), the paramera subcylindrical, robust, with thin setae only and about 4 times longer than wide. Penis typical. Subgenital plate of the female as in Fig. 21, wider than long, posteriorly rounded. Ovipositor elongated, exceeding the level of the IXth stylets by about twice their own length, the gonapophyses with 20-21 divisions and with the typical chaetotaxy.

Terminal filaments in both sexes with abundant long and robust macrochaetae and with numerous long trichobothria. Paracercum of male as in the female, the cerci with some very thin and acute spines in the inner margin of the 2 basal articles, as in Fig. 22.

ETIMOLOGY: The new species is nominated after its geographical origin

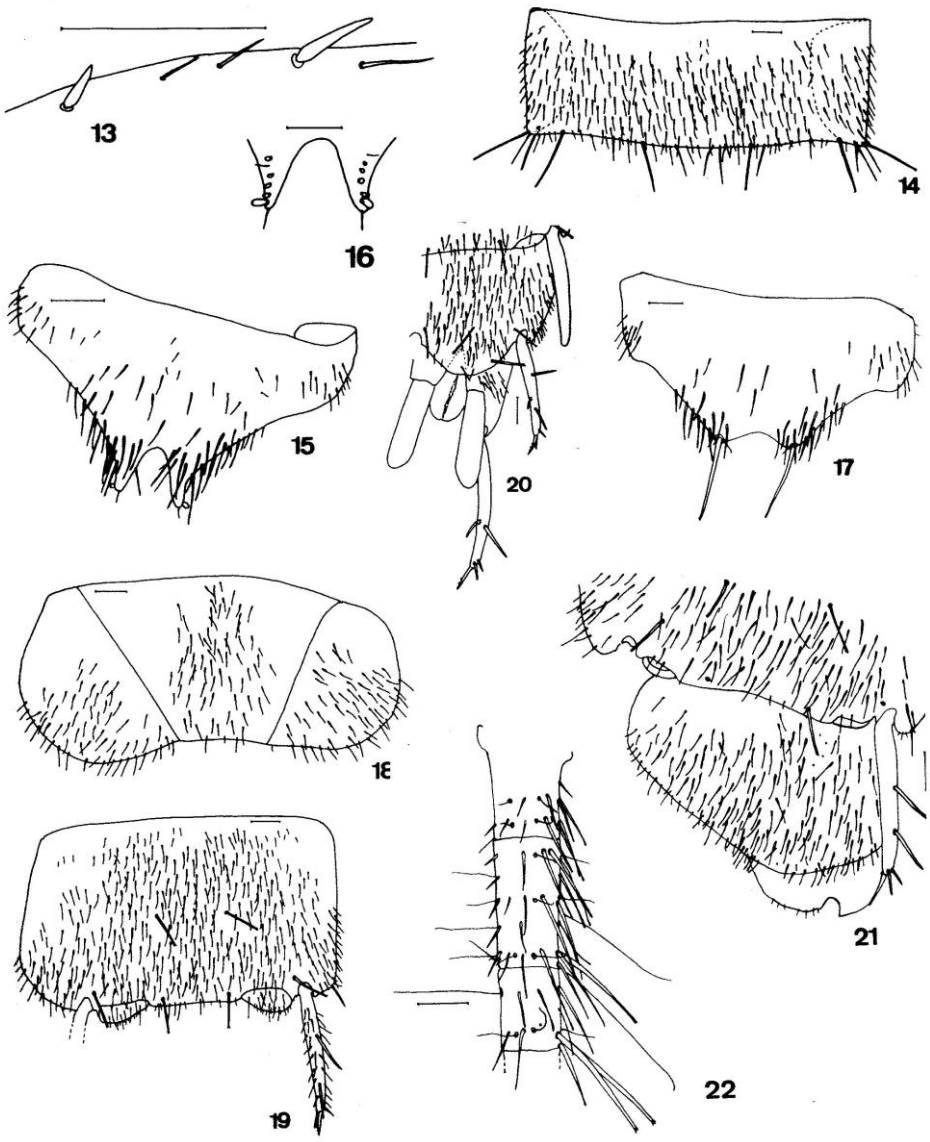
DISCUSSION: *C. brasiliensis* sp.n. is one of the few species in the genus to present asymmetrical pedicellar apophysis in the male antenna, a characteristic shared only with *C. asymetrica* (BACH *et al.*, 1985) from Southern Spain and with *C. subterranea* (SILVESTRI, 1902, redescribed by WYGODZINSKY, 1980) from continental Italy, Sardinia and Greece (Corfu island only). Both are, however, completely different from the new brazilian taxon, being one of the most striking distinctions the shape of the more developed (in all the cases, the left) pedicellar apophysis; further, both species present developed pegs along the male cerci and paracercus (lacking in *C. brasiliensis* sp.n.), very distinct Xth urotergites and quite different VIIIth urosternites. *C. subterranea* presents, further, a much longer ovipositor and brownish apical abdomen.

C. setosula from Sicily (WYGODZINSKY, 1980), and *C. mendesi* described as an edaphobiont from Southern Portugal (WYGODZINSKY, *op.cit.*) -later, registered to deep soils in Southern Spain (BACH *et al.*, 1985), and noticed as cavernicolous, again to Portugal (MENDES, 1996)- present, both, a completely different frontal chaetotaxy, with a much higher number of macrochaetae and with few short cilia; besides, their Xth male urotergites are very distinct (much wider and lower depression in the two species) and both present cercal and (at least in *C. mendesi*, as the terminal filament in *C. setosula* was lost) paracercal subcylindrical pegs; further, the ovipositor is longer in the new species than in *C. mendesi* and the Xth female urotergite distinct.

C. capolongoi from the Central Eastern Spain (WYGODZINSKY, 1980) is, like the new neotropical species, a cavernicolous; however, the biggest of all the known *Coletinia* (19.5 mm of body length) shows, yonder the distinct body size, a quite different Xth male urotergite with lamp-like pegs (on the female the setal distribution is also different), a clearly less protruding VIIIth urosternite and all the posterior filaments with pegs; the (symmetrical) pedicellar apophysis, though superficially similar to that of the left antenna of *C. brasiliensis* sp.n., are clearly distinct, with two lamellar structures at the praeapical area of the apophysis.

One other troglobiont, *C. longissima*, from the Southern Anatolia, Turkey (MENDES, 1988 and 1992), with the palps and legs even longer than those of the brazilian new species, is well individualized due to the very high number of conules on the ventral surface of the male Xth urotergite and to the shape of this sclerite, due to the morphology and chaetotaxy of the paramera and on account of the exclusive shape of the pedicellar (symmetrical) apophysis; the shape of the male VIIIth urosternite (almost semicircular) is, however, quite similar in both species; further, the ovipositor is clearly shorter and the subgenital plate quite distinct.

One more cavernicolous taxon, *C. tinauti*, recently described upon the male sex from Southern Spain (MOLERO *et al.*, 1997), seems closer to the brazilian endemic; however, the pedicellar apophysis are different from the left (more developed) apophysis in *C. brasiliensis* sp.n., the hind notch is much wider, less excavated and with distinct conules (in the spanish



Coletinia brasiliensis sp.n. Fig. 13 — P I, dorsal short spines of the basal femur; Fig. 14 — VIIth urotergite; Fig. 15 — Xth male urotergite, dorsal view; Fig. 16 — Ibid., disposition of the ventral pegs; Fig. 17 — Xth female urotergite; Fig. 18 — Ist urosternite; Fig. 19 — VIth urosternite; Fig. 20 — Coxites VIII and IX of male with paramera and penis; Fig. 21 — Posterior border of female VIIth coxite and subgenital plate; Fig. 22 — Right cercus of male, dorsal basal view. Scales: 0.1 mm

species, they are more boulbous, lamp-shaped), the paramera are longer and thiner, the VIIIth urosternite is distinct and there are conules on the three posterior filaments.

C. maggii Grassi, 1887, an edaphobiont known to occur in continental Italy, Sicily, Malta, Croatia, France, Hungry, Austria and Poland (see WYGODZINSKY, 1980 for the redescription and CHRISTIAN & PACLT, 1996 for the distribution in Central Europe) is completely different, with simple male pedicellar apophysis, shorter and wider paramera and developed pegs on the cerci and terminal filament; further, its VIIIth urosternite presents a straight posterior border and the Xth urotergite is also very distinct in both sexes.

Two other cavernicolous species, *C. jeanneli* from the Var Department, Southern France (SILVESTRI, 1938) and *C. bulgarica*, from Southwestern Bulgaria (KOSAROFF, 1939), are quite different from the new species due to their (symmetrical) falcate pedicellar apophysis -double in *C. jeanneli*, simple in *C. bulgarica*; the french taxon presents, besides, a quite typical VIIIth male urosternite, a very distinct Xth urotergite, cerci and paracercus with pegs and a different subgenital plate, posteriorly truncate; the species from Bulgaria, much smaller than the new taxon from Brazil (body length registered as 5-6.5 mm), seems to present, further, shorter and stronger appendages, different subgenital plate, distinct Xth urotergite, and conules on all the posterior filaments.

One last species has been reported to Europe, the problematic *C. corsica*, described from the Corsica island (CHOPARD, 1924) upon one only female; it was reported as eventually close to *C. subterranea* (as registered noticed to Sardinia) with which it shares the long and delicate ovipositor among other features (shall both be the same species ?). As WYGODZINSKY (1980) discusses, the absence of males unables a clear understanding of the position of this edaphobiont (and not a cavernicolous as he registered) relatively to the remaining species in the genus, though it is completely different from *C. brasiliensis* sp.n.

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