

## Preliminary contribution to the knowledge of Coleoptera Buprestidae from Atlantic rainforest regions of Rio Doce and Itacolomi State Parks of Minas Gerais, Brazil. The genera *Agrilus* Curtis, 1825, *Autarcontes* Waterhouse, 1887, and *Geralius* Harold, 1869

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### ABSTRACT

A checklist of species belonging to *Agrilus* Curtis, 1825, *Autarcontes* Waterhouse, 1887, and *Geralius* Harold, 1869 genera found in Rio Doce and Itacolomi Estadual Parks is given. 19 species are listed, 5 of which are new for the science and here described: *Agrilus pirilampo* n. sp., *A. disorientatus* n. sp., *A. coal* n. sp., *A. rarestriatus* n. sp., *A. taediosus* n. sp. Most species were found in one sampling season and reflect a quite favourable rainforest for xylophagous species. The high dominance of Leguminosae large tree species could be related to this pattern.

### KEY WORDS

Coleoptera; *Agrilus*; *Autarcontes*; *Geralius*; Brasil; Rio Doce; Itacolomi.

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### INTRODUCTION

The present fauna has been collected in two State parks covered predominantly with Atlantic rainforest, at upper and mid-basin of the Doce river, in the Central region of Minas Gerais State, Brazil. The forests of these parks have been monitored for insect herbivores and ants for many years. For the Rio Doce State Park, a lowland forest, 13 years of research were accomplished on canopy insects from three distinct geomorphologies, as part of a long term study of natural (lake-forest) and human made (pasture-forest) ecotones, based on insect interactions with the main dominant tree species, *Mabea fistulifera* Mart. (Euphorbiaceae) and *Byrsonima sericea* DC (Malpigiaceae), respectively. In the montane Park of Itacolomi, another long term re-

search area, comparative entomological studies were set in three permanent plots in distinct successional forests, running since 2006.

Any of those entomological researches showed that, in general, the number of species per sample unit (tree crowns) were below expected for a tropical forests (Campos et al., 2006a; Ribeiro et al., 2008; Fagundes et al., 2012; Neves et al., 2013), and different causes may influence these findings. In Rio Doce, the rainforest may be extremely recent, coming from a xeric habitat that suffered a climatic change no longer than 9 thousand years ago (Overloop, 1981; Werneck et al., 2011). In Itacolomi, the locally cold and unpredictable winter may be related to a severe lack of large tropical invertebrate species (Espírito Santo et al., 2012), along with the loss of connections with other moun-

tain ecosystems due to hundreds of years since first human occupation. Nevertheless, both forests may favour xylophagous insects due to an intense gap dynamic found in both.

The present study shows preliminary results from a first survey on xylophagous, namely Buprestidae species, in both regions.

**ACRONYMS AND ABBREVIATIONS.** The Natural History Museum, London, England (BMNH); Museo Civico di Storia Naturale, Carmagnola, Italy (MCCI); Musée National d'Histoire Naturelle, Paris, France (MNHN); Museu de Zoologia Universidade São Paulo, Brazil (MZUSP); Národní Muzeum, Prague, Czech Republic (NMPC); Parque Estadual Itacolomi, Brazil (PEIT); Parque Estadual Rio Doce, Brazil (PERD).

### *Study area*

**Rio Doce State Park - PERD.** This is the largest continuous preserved Atlantic rainforest fragment (35,974 ha) in Minas Gerais State, Brazil (19°48'18"–19°29'24"S, 42°38'30"–42°28'18"W). Altitude varies from 230 to 515 m above sea level; climate type is Aw (tropical hot semi-humid), with wet seasons from October to March and dry seasons from April to September (Gilhuis, 1986). The predominant vegetation is semi-deciduous seasonal forest, with 20% to 50% deciduous trees (Veloso et al., 1991). Also, this is the largest natural lake system of South America, and 10% of the Park is covered with lakes, result of changes in the Doce river positioning and blocking of old drainages, along with increasing rainfall (see below).

**Itacolomi State Park - PEIT.** The Itacolomi State Park is a 7,543 ha conservation area, at south of Serra do Espinhaço (20°22'30"S–43°32'30"W). The area is located in a transition between Atlantic Forest and Cerrado, with physiognomies of grassland and montane evergreen forest types, with altitudes between 700 and 1700 m above sea level. The climate is typically seasonal tropical, understanding the types Cwa and Cwb of Koppen, in lowest and highest areas, respectively (SEMAD/IEF/PRO-MATA, 2007). The studied areas are reported as human disturbed since the colonial times. More recently, it belonged to a farm of tea, *Camellia sinensis* (L.) Kuntze. After the abandonment of the culture about 40 years ago, the species *Eremanthus*

*erythropappus* DC (Asteraceae) colonized the most former plantations, resulting in a monodominant forests, which have been gradually substituted by a more diverse wet forest along time. In deep valleys, a more wet and diverse forest always existed and was preserved due to difficult access and water protection for the farms. Flooded small valleys are dominated by *Myrcia* species and resemble subtropical flood forests.

### *General ecology and biogeographic evolution*

For reasons still under study, these forest canopies tend to have a particularly poorer leaf-herbivore insect fauna than observed in canopies of wet and close equatorial forests (Campos et al., 2006b, Ribeiro et al., 2008). However, the present findings for Buprestidae are astonishingly diverse, especially for Rio Doce State Park. Most species were found in one sampling season and reflect a quite favourable rainforest for xylophagous species. The dominance of large deciduous and semi-deciduous Leguminosae tree species could be related to this pattern. Although this is a wet continuous forests, Rio Doce Park is quite heterogeneous, and the area where most of species were found was probably a drier vegetation type no longer than four thousand years ago (Overloop, 1981; Werneck et al., 2011). The climate shift during the Holocene contributed to the origin of the lakes in the Doce river mid-basin, that define enormously this landscape (Pflug, 1969; Meis & Monteiro, 1979; Meis & Tundisi, 1986; Perônico & Castro, 2008). Hence, adaptations to a climate shifted toward a wetter seasonal ecosystem may be on course, and severe and frequent tree death is normally observed even within natural and well preserved forest spots. Campos et al. (2006a, b) and Ribeiro et al. (2008) suggest that high gap formation influences canopy insect fauna. In addition, Castro et al. (2012) found a highly diverse litter ant fauna, and clearly an intense debris production ought to influence such finding.

### **MATERIALS AND METHODS**

The material was taken by several methods during expeditions in November 2010, March 2012, and September 2012. The priority was the use of entomological umbrella, which was positioned

below branches of trees in the upper canopy or in the foliage in the borders of forest as mentioned above. Systematic samplings by beating on the branches have been developed along both projects on several marked trees. In addition, qualitative and semi-quantitative methods, such as spider net, sticky traps, breeding larvae and direct sampling were added specifically for Buprestidae sampling. The use of sticky traps, contrary to African and Palearctic faunas, was ineffective, probably because the Neotropical Buprestidae species are not attracted by the colours, surely not by the yellow colour (G. Curletti, pers. obs.).

The specimens collected are preserved dry, after extraction of genitalia. The pictures are made with microscope and assembled with Combine Z4 program.

## RESULTS

### List of species found in PERD

#### *Geralius furciventris* (Chevrolat, 1838)

EXAMINED MATERIAL. 1 specimen female: Brazil, Minas Gerais, Marliéria, PERD, SD - Mab. PL7B - 6.II.2001, Ribeiro S.P. leg.

REMARKS. Species (Chevrolat, 1838: 88 sub *Stenogaster*) known for Argentina, Bolivia, Brazil, Paraguay, Peru. Biology unknown.

#### *Autarcontes mucoreus* (Klug, 1825)

EXAMINED MATERIAL. 1 specimen female: Brazil, Minas Gerais, Marliéria, PERD, SD - Mab. PL7B - 6.II.2001, Ribeiro S.P. leg.

REMARKS. Species described of Minas Gerais, Uberaba (Klug, 1825: 428, sub *Buprestis*). Known for Brazil only.

#### *Agrilus (Agrilus) gracchus* Obenberger, 1935

EXAMINED MATERIAL. Three specimens females: Brazil, P. E. Rio Doce, 20.XI.2010, G. Curletti and L. Migliore leg. (MCCI).

REMARKS. Species described from Minas Gerais, Mar de Hespanha (Obenberger, 1935: 135); type NMPC. Endemic of Brazil. Biology unknown.

#### *Agrilus (Agrilus) zikani* Obenberger, 1935

EXAMINED MATERIAL. 1 female specimen: Brazil, P. E. Rio Doce, 20.XI.2010, G. Curletti and L. Migliore leg.

REMARKS. Species described from Minas Gerais (Obenberger, 1935: 126); type NMPC. Endemic of Brazil. Biology unknown.

#### *Agrilus (Agrilus) pirilampo* n. sp.

EXAMINED MATERIAL. Holotype female (Fig. 1): Brazil, P. E. Rio Doce, Perd Vinhático, 08.IX.2000, S. Ribeiro leg. (MZUSP).

DESCRIPTION OF HOLOTYPE. Length 14 mm, elongate. Dorsal color black with green reflections on elytra and two orange spots at the apex. Vertex strongly depressed, as wide as half anterior edge of pronotum. Frons concave with orange round spot at the base. Clypeus small, without carina. Pronotum wider anteriorly, with lateral edges subrounded but sinuate before the base forming posterior angles acute. Anterior edge incise in middle. Disc gibbous, with two round depressions in the medium-anterior part. Sculpture composed by thin and thickened striae. Premarginal carinula absent. Lateral carinae very open ahead, separate at the base. Prosternal gular lobe small, widely sinuate. Scutellum concave, small, with transversal carina nearly visible. Elytra with both apices rounded and microdentate. Ventral side black, glabrous, with a lateral orange spot at the sides of the antepenultimate ventrite. Same spot at the corresponding laterotergum. Legs black, with all claws mucronate. Metatarsus shorter than metatibia. First metatarsomere longer than the sum of the following three ( $1 > 2+3+4$ ).

ETYMOLOGY. The two yellow spots on elytra are very evident and for this reason *A. pirilampo* n. sp. remember the lights produced by the Elateridae species belonging to the Pyrophorini tribe, named *pirilampo* by the Brazilian people.

REMARKS. For the dimensions, color and elytral spots, *A. pirilampo* n. sp. appears unique on the South American fauna.

#### *Agrilus (Agrilus) sedyi* Obenberger, 1933

EXAMINED MATERIAL. 1 male: Brazil, P. E. Rio Doce, 19.XI.2010, G. Curletti and L. Migliore leg.

REMARKS. Species described from São Paulo (Obenberger, 1933a: 12), endemic of Brazil.

*Agrilus (Agrilus) luederwaldti* Obenberger, 1933

EXAMINED MATERIAL. 1 male: Brazil, P. E. Rio Doce, 19.XI.2010, G. Curletti and L. Migliore leg.

REMARKS. Species described from Santa Catharina (Obenberger, 1933a: 11), endemic of Brazil.

*Agrilus (Agrilus) arnus* Gory, 1841

EXAMINED MATERIAL. 1 female, Brazil, P. E. Rio Doce, 19.XI.2010, G. Curletti and L. Migliore leg.

REMARKS. Species widespread (Gory, 1841: 232), quoted from Brazil, Argentina, Colombia. Type in MNHN.

*Agrilus (Agrilus) disorientatus* n. sp.

EXAMINED MATERIAL. Holotype female (Fig. 2): Brazil, P. E. Rio Doce, 16.III.2012, G. Curletti and L. Migliore leg. (MZUSP).

DESCRIPTION OF HOLOTYPE. Length 6.8 mm. Elytra brown with 8 (4+4) spots of yellow pubescence along the suture. Pronotum as wide as 1/3 of anterior edge of pronotum, darker than the vertex, reddish. Frons black, with red reflections at the base, glabrous. Clypeus separate by frons by a transversal small carina. Antennae serrate from IV antennomere. Pronotum wider anteriorly, posterior angles right. Yellow pubescence along the lateral edges; disc with regular, transverse, thin sculpture. Premarginal carinae entire, joined to lateral edge before the half length. Marginal carinae subparallel, separate from base. Prosternal gular lobe rounded; prosternal plate with lateral edges sinuate in middle. Scutellum transversely carinate. Elytra with apex acute, ending by a tip. The pubescent spot are placed respectively in the humeral callus, at 1/3, at 2/3 and before the apex: the basal (humeral) couple rounded, the second elongate, the third oval, the fourth smaller, less visible, reduced to a short line along the suture. Ventral side bronze, with a line of white pubescence in median part of the basal sternite and a round spot at the margins of all remaining. Legs brown like the ventral side; metatarsus shorter than metatibia, with a first article longer than the sum of the following two (1>2+3). All claws bifid, but with the teeth separate.

ETYMOLOGY. *Disorientatus* = out of bearings. The specimen was found in a dead branch of *Platymania foliosa* Benth incised and killed by *Oncideres* sp. (Cerambycidae). All specimens had already come out from the wood; only this specimen, still alive, was in the pupal cell, destined to a sure death because it was turned to the inside of the branch.

REMARKS. Several South-American species have four spots on elytra, but *A. disorientatus* is unique for the shape of the apical acute apex.

*Agrilus (Agrilus) consentaneus* Kerremans, 1897

EXAMINED MATERIAL. 3 specimens, 2 males and 1 female, found in PERD the 07-15.II.2011, L. Migliore leg.

REMARKS. To this species (Kerremans, 1897: 89) we attribute the specimens collected.

*Agrilus (Agrilus) gileti* Obenberger, 1933

EXAMINED MATERIAL. 1 male: Brazil, Minas Gerais, PERD, 19.XI.2010 G. Curletti and L. Migliore leg. (MZUSP).

REMARKS. Species described from São Paulo (Obenberger, 1933a: 19); type in NMPC.

*Agrilus (Agrilus) coal* n. sp.

EXAMINED MATERIAL. Holotype male (Figs. 3, 4): Brazil, P.N. Rio Doce, 19°45'48"S–42°37'54"W, 18.XI.2010, 288 m, G. Curletti and L. Migliore leg. (MZUSP).

DESCRIPTION OF HOLOTYPE. Length 5.6 mm. Pronotum and elytra black. Vertex as wide as 1/3 of anterior edge of pronotum with punctiform sculpture. Frons golden, flat, glabrous. Clypeus without transversal carina. Antennae serrate from article IV, black at the base, gold from antennomere V. White pubescence on the cheek. Pronotum wider in the middle of length, with lateral margins rounded but sinuate before the base forming acute angles. Disc with two elongate small depressions in middle, after the vertex and before the scutellum. Sculpture formed by transversal striae alternate to interstriae composed by other more superficial and thin striae in number of 3-5 every interstria. White pubescence little visible along the lateral edges. Pre-



marginal carina entire, joined to the edges before the half length. Marginal carinae subparallel, separate from the base. Prosternal gular lobe entire but not rounded. Scutellum transversely carinate. Elytra glabrous; apex hardly denticulate with median tooth bigger and stumpy. Ventral side bronze with latero-marginal spot of white pubescence on the ventrites. Legs with all claws bifid, but with internal median and posterior teeth shorter and squat. Metatarsus shorter of metatibia; first metatarsomere longer than the sum of the following two ( $1 > 2+3$ ). Aedeagus fusiform, median lobe acute (Fig. 4).

ETYMOLOGY. After the black colour.

REMARKS. For the shape, color, abdominal pubescence, *A. coal* n. sp. is similar to *A. lestageanus* Obenberger, 1935 from Brazil (type in NMPC). This last differs especially for having different pronotum sculpture, apical apex, frons green.

*Agrilus (Agrilus) rarestriatus* n. sp.

EXAMINED MATERIAL. Holotype female (Figs. 5, 6): Brazil, Minas Gerais, PERD, 19.XI.2010 G. Curletti and L. Migliore leg. (MZUSP).

DESCRIPTION OF HOLOTYPE. Length 5.8 mm. Pronotum dark green like the vertex, but reddish along the sides, elytra black. Vertex as wide as the half of anterior edge of pronotum. Frons glabrous, red wine brilliant. Clypeus without transversal carina. Antennae brief, serrate from antennomere IV. Pronotum wider anteriorly, sinuate before the posterior angles that are acute. Anterior edge protruding in middle, between the eyes. Disc with superficial striae, with unusual structure remembering the afrotropical *A. buani* Curletti et Vayssieres, 2007, but more rarefied (Fig. 6). Premarginal carina absent; marginal carinae joined at the base. Prosternal gular lobe cut in middle of anterior edge. Scutellum transversely carinate. Elytrae with each apex rounded and denticulate. Disc with white pubescence very short but well visible, regularly disposed. Lateroterga whit longer white pruinose pubescence. Abdomen dark bronze, with pubescence like elytra. Same colour in the legs: all claws like *A. disorientatus* n. sp. Metatarsus shorter than metatibia; first metatarsomere as long as the sum of the following two ( $1 = 2+3$ ).

ETYMOLOGY. After the peculiar structure of the pronotum striae.

REMARKS. For the pronotum sculpture *A. rarestriatus* n. sp. is unique in the Brazilian agrilofauna. The specimen was collected on herbaceous small bush, still unidentified, that is probably the host plant.

*Agrilus (Agrilus) taediosus* n. sp.

EXAMINED MATERIAL. Holotype male (Figs. 7, 8): Brazil, Minas Gerais, PERD, 17.XI.2010 G. Curletti and L. Migliore leg. (MZUSP).

DESCRIPTION OF HOLOTYPE. Length 6.5 mm. Dorsal colour dark bronze. Vertex as wide as the half of the anterior edge of pronotum. Eyes small, little visible from the back. Frons green-bronze, glabrous, widely furrowed, without transverse carina before the clypeus. Antennae bronze, brief, serrate from IV antennomere. Pronotum gibbous, depressed at the sides, wider anteriorly, with curved lateral edges and sinuate before the posterior angles that are acute. A wide superficial, longitudinal furrow in middle. Sculpture composed by numerous transversal striae alternate to small points. Premarginal carina entire, superficial, little visible. Marginal carinae joined at the base. Prosternal gular lobe cut in middle of anterior edge. Scutellum transversely carinate. Elytrae with each apex rounded and denticulate. Elytra stumpy, glabrous, with apices rounded and microdenticulate. White pubescence on the lateroterga only, with glabrous abdomen. All claws mucronate. Metatarsus shorter than metatibia. First metatarsomere as long as the sum of the following two ( $1 = 2+3$ ). Aedeagus small and thin with median lobe acute (Fig. 8).

ETYMOLOGY. From the Latin *taedium* = boredom, for the want of remarkable characters.

REMARKS. On the whole of cited characters, *A. taediosus* n. sp. is close to *A. needhami* Obenberger, 1933b described from São Paulo (type in NMPC). The two species are principally distinguishable for having the very different shape of aedeagus.

*Agrilus (Agrilus) vanini* Curletti et Migliore, in press

EXAMINED MATERIAL. 1 female: Brazil, Minas Gerais, PERD, (19°45'48"S - 42°37'54"W), 20.XI.2010, G. Curletti and L. Migliore leg. (type in MZUSP).



Figure 1. *Agrilus (Agrilus) pirilampo* n. sp., holotype. Figure 2. *A. (A.) disorientatus* n. sp., holotype. Figure 3. *A. (A.) coal* n. sp., holotype. Figure 4. Idem, aedeagus in dorsal view, 1.2 mm. Figure 5. *A. (A.) rarestriatus* n. sp., holotype. Figure 6. Idem, pronotum. Figure 7. *A. (A.) taediosus* n. sp. holotype. Figure 8. Idem, aedeagus in dorsal view, 1.5 mm. Scale bar = 1 mm.

### List of species found in PEIT

#### *Agrilus (Agrilus)* sp.

EXAMINED MATERIAL. 1 female specimen: Brazil, Minas Gerais, PEIT, 11.XI.2007, G. Curletti and L. Migliore leg.

REMARKS. This specimen close to *A. gileti* Obenberger, 1933, belongs probably to a new species, but the morphological characters are not sufficient for the description.

#### *Agrilus (Agrilus) clazon* Obenberger, 1933

EXAMINED MATERIAL. 1 female specimen: Brazil, Minas Gerais, PEIT, 11.XI.2007, G. Curletti and L. Migliore leg.

REMARKS. Species described from São Paulo (Obenberger, 1933b: 80); type in NMPC. The specimen from Itacolomi is more bronze, probably for the recent capture.

#### *Agrilus (Agrilus) badius* Kerremans, 1897

EXAMINED MATERIAL. 1 male specimen: Brazil, Minas Gerais, PEIT, 11.XI.2007, G. Curletti and L. Migliore leg.

REMARKS. Species described from Minas Gerais (Kerremans, 1897: 79, Caraça); type in BMNH.

#### *Agrilus (Agrilus) octavius* Obenberger, 1935

EXAMINED MATERIAL. 1 female specimen, Brazil, Minas Gerais, PEIT, 15-30.III.2012, G. Curletti and L. Migliore leg.

REMARKS. Species described from São Paulo (Obenberger, 1935: 124); type in NMPC.

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