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Coleoptera species of forensic importance from Brazil: an updated list

Lúcia Massutti de Almeida [a,*], Rodrigo César Corrêa [a], Paschoal Coelho Grossi [b]

[a] Laboratório de Sistemática e Bioecologia de Coleoptera, Departamento de Zoologia, Universidade Federal do Paraná, Curitiba, PR, Brazil
[b] Universidade Federal Rural de Pernambuco, Recife, PE, Brazil

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ABSTRACT

A list of the Coleoptera of importance from Brazil, based on published records was compiled. The checklist contains 345 species of 16 families allocated to 16 states of the country. In addition, three species of two families are registered for the first time. The fauna of Coleoptera of forensic importance is still not entirely known and future collection efforts and taxonomic reviews could increase the number of known species considerably in the near future.

Introduction

The development of forensic entomology in Brazil was well reported by Pujol-Luz et al. (2008). It started in 1908, with the pioneers Roquette-Pinto and Oscar Freire, who noted the high diversity of the native fauna of necrophagous insects and the impossibility of direct application of the methods developed in Europe. Oscar Freire (1914a,b) was the first to present a collection of insects associated with his investigations, mainly obtained from human corpses and small animals in Bahia State. Herman Lüderwaldt (1911) published a list of Coleoptera associated with several kinds of carrion in São Paulo, which is still an important reference on the subject. In 1941, Samuel Pessôa and Frederick Lane published a paper regarding Scarabaeidae of medico-legal importance (Pessôa and Lane, 1941). After this period, the studies and the information regarding forensically important species of Coleoptera from Brazil became disperse and available in books, articles, catalogues, reports and collections or other non-indexed sources (i.e. monographs, dissertations and theses).

Almeida and Mise (2009) published the first list of South American Coleoptera, comprising 15 families and Vasconcelos and Araújo (2012) presented a list of insects collected in northeastern Brazil.

The forensic importance of Coleoptera is often underestimated due to the belief that they occur only at late stages of decomposition. However, more studies about their taxonomy, biology and behaviour are needed before their importance can be fully understood (see Midgley et al., 2010). The diversity of Coleoptera and the lack of taxonomic studies have direct effect in how the beetles can be used in forensic entomology, mostly because unidentified material cannot be used for a postmortem interval estimative.

Coleoptera families with known predatory and necrophagous habit (i.e. carrion feeders) are listed as having potential forensic importance (see Smith, 1986; Byrd and Castner, 2010). The necrophilous habit (i.e. associated with carrion/corpses) is an indicative of the potential forensic importance, but the correct identification is the first step for the better understanding of the role of the species at their environment and guide future studies about its biology and distribution.

The main objective of this study was to present an updated list of Coleoptera species associated with carrion/corpses in Brazil. More specifically, it aimed to provide updated data about the geographical distribution and substratum in which species were collected, as well as to provide a checklist of current valid names.

Material and methods

The list of species of Coleoptera was based on information collected from published literature from 1908 to 2014 with some new data included (Table 1) and consider mostly studies of forensic entomology, ecological succession and fauna surveys performed in Brazil.

The taxa considered of potential forensic importance followed two criteria: lists of Coleoptera families associated with carrion available in previous studies (e.g. Payne, 1969; Smith, 1986; Mise

* Corresponding author.
E-mail: lalmeida@ufpr.br (L.M. de Almeida).

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Table 1
Compiled list of Coleoptera species of forensic importance from Brazil.

Family/species	Diet/carcass	Geographical distribution	References
Carabidae			
Arthrostictus speciosus (Drury, 1829)	Pig	Serra Talhada (PE)	Mayer and Vasconcelos, 2013
Clivina sp.	Pig	Serra Talhada (PE)	Mayer and Vasconcelos, 2013
Galerita sp.	Pig	Serra Talhada (PE)	Mayer and Vasconcelos, 2013
Taeniolobus crenulatus Chaudoir, 1842 (?)	Not specified	São Paulo (SP)	Luederwaldt, 1911
Carabidae sp.	Human	Campinas (SP)	Carvalho et al., 2000
Carabidae sp.	Pig	Recife (PE)	Cruz and Vasconcelos, 2006
Carabidae sp. 1	Pig	Itumbiara (GO)	Marchiori et al., 2000
Carabidae sp. 1	Pig	Curitiba (PR)	Mise et al., 2007
Carabidae sp. 2	Pig	Curitiba (PR)	Mise et al., 2007
Carabidae sp. 3	Pig	Curitiba (PR)	Mise et al., 2007
Carabidae sp. 4	Pig	Curitiba (PR)	Mise et al., 2007
Carabidae sp. 5	Pig	Curitiba (PR)	Mise et al., 2007
Cleridae			
Necrobia ruficollis (Fabricius, 1775)	Pig, not specified	Campinas (PR), São Paulo (SP), Curitiba (PR)	Luederwaldt, 1911; Mise et al., 2007
Necrobia rufipes (De Geer, 1775)	Human, pig, rabbit, not specified	São Paulo (SP), Campinas (SP), Curitiba (PR), Ribeirão do Pinhal (PR), Uberlândia (MG), Serra Talhada (PE)	Luederwaldt, 1911; Souza and Linhares, 1997; Carvalho et al., 2000; Carvalho et al., 2004; Mise et al., 2007; Rosa et al., 2011; Silva and Santos, 2012; Mayer and Vasconcelos, 2013; Mise et al., 2013
Cleridae sp.	Pig	Recife (PE)	Cruz and Vasconcelos, 2006
Dermestidae			
Dermestes maculatus (De Geer, 1774)	Human, pig, rat, rabbit	Campinas (SP), Curitiba (PR), Uberlândia (MG), Serra Talhada (PE)	Souza and Linhares, 1997; Carvalho et al., 2000; Carvalho et al., 2004; Mise et al., 2007; Rosa et al., 2011; Mayer and Vasconcelos, 2013; Mise et al., 2013
Dermestes peruvianus Laporte, 1840	Pig	Campinas (SP)	Souza and Linhares, 1997
Dermestes sp.	Not specified	São Paulo (SP)	Luederwaldt, 1911
Dermestidae sp. 1	Pig	Itumbiara (GO)	Marchiori et al., 2000
Geotrupidae			
Bolpapium striatopunctatum (Laporte, 1840)	Pig	Uberlândia (MG)	Rosa et al., 2011
Histeridae			
Aeletes nicolasi Leivas, 2012	Rabbit	Curitiba (PR)	Leivas et al., 2012
Aeletes sp.	Rabbit	Curitiba (PR)	Mise et al., 2013
Atholus sp.	Pig	Serra Talhada (PE)	Mayer and Vasconcelos, 2013
Euspilotus azureus (Sahlberg, 1823) (=*Euspilotus* "grupo" *azureus*; *Saprinus azureus* Sahlberg, 1823); (=*Euspilotus nigrita* (Blanchard, 1842))	Pig, rabbit	Campinas (SP), Curitiba (PR), Manaus (AM), Capão do Leão (RS)	Souza and Linhares, 1997; Mise et al., 2007; Mise et al., 2010; Souza et al., 2008; Mise et al., 2013
Euspilotus (Hesperosaprinus) sp.	Pig	Serra Talhada (PE)	Mayer and Vasconcelos, 2013
Euspilotus sp.	Pig	Serra Talhada (PE)	Mayer and Vasconcelos, 2013
Euspilotus sp.	Pig	Manaus (AM)	Mise et al., 2010
Euspilotus sp.	Pig	Campinas (SP)	Souza and Linhares, 1997
Euspilotus sp.	Pig	Campinas (SP)	Carvalho et al., 2000
Euspilotus sp.	Pig	Curitiba (PR)	Mise et al., 2007
Euspilotus spp.	Pig	Uberlândia (MG)	Rosa et al., 2011
Hister sp.	Pig	Manaus (AM)	Mise et al., 2010
Hister sp.	Pig	Cutitiba (PR)	Mise et al., 2007
Hololepta sp.	Pig	Serra Talhada (PE)	Mayer and Vasconcelos, 2013
Omalodes (*Omalodes*) *bifoveolatus* Marseul, 1853	Pig	Manaus (AM)	Almeida and Mise, 2009; Mise et al., 2010
Omalodes (*Omalodes*) *foveola* Erichson, 1834	Pig	Manaus (AM), Serra Talhada (PE)	Mise et al., 2010; Mayer and Vasconcelos, 2013
Omalodes (*Omalodes*) *lucidus* Erichson, 1834	Pig	Manaus (AM)	Mise et al., 2010
Omalodes (*Omalodes*) *planifrons* Marseul, 1853	Pig	Serra Talhada (PE)	Mayer and Vasconcelos, 2013
Omalodes sp.	Pig	Campinas (SP)	Carvalho et al., 2000
Omalodes sp.	Pig	Campinas (SP)	Souza and Linhares, 1997
Operclipygus subterraneus Caterino and Tisheckin, 2013 (=*Operclipygus hospes* (Lewis, 1902))	Rabbit	Curitiba (PR)	Corrêa et al., 2012; Caterino and Tishechkin, 2013
Phelister sanguinipennis Marseul, 1853	Pig	Manaus (AM)	Mise et al., 2010
Phelister sp.	Rabbit	Curitiba (PR)	Mise et al., 2013
Phelister sp.	Pig	Curitiba (PR)	Mise et al., 2007