Research Article / Artículo de Investigación

Species of *Peckia* Robineau-Desvoidy, 1830 (Diptera: Sarcophagidae) occurring in an Atlantic Rainforest fragment, Bahia, Brazil: new records reported

Especies de *Peckia* Robineau-Desvoidy, 1830 (Diptera: Sarcophagidae) presentes en un fragmento de la Mata Atlántica, Bahía, Brasil: nuevos registros reportados

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Abstract. Insects of forensic importance can be attracted to crime scenes, thus aiding in the estimation of post-mortem interval (PMI). For this, knowledge about the entomofauna of each particular region is essential, along with their life cycle, ecological and biological characteristics, and taxonomic identity. This study aimed to survey the sarcophagid flies of the genus *Peckia* Robineau-Desvoidy occurring in a fragment of the Atlantic Forest in Salvador, Bahia, Brazil. For this purpose, pig carcasses were used as bait and monitored throughout their decomposition process during both dry and rainy seasons. Seven species of *Peckia* were recorded: *P. chrysostoma* (Wiedemann), *P. collusor* (Curran & Walley), *P. lambens* (Wiedemann), *P. intermutans* (Walker), *P. pexata* (Wulp), *P. anguilla* (Curran & Walley), and *P. tridentata* (Hall). The highest occurrence of *Peckia* species was observed in the gaseous and initial decomposition phases (dry period), as well as advanced decomposition (rainy period). Temperature, humidity, and rainfall showed a tendency to directly influence the duration of the carcass decomposition phases.

Key words: Atlantic Rainforest; decomposition phases; entomofauna; pig carcasses.

Resumen. Los insectos de importancia forense pueden ser atraídos a las escenas del crimen, lo que ayuda en la estimación del intervalo post-mortem (PMI). Para ello, es fundamental el conocimiento sobre la entomofauna de cada región en particular, su ciclo de vida, características ecológicas y biológicas y la identidad taxonómica. Este estudio tuvo como objetivo estudiar las moscas sarcófagas del género *Peckia* Robineau-Desvoidy que se encuentran en un fragmento de la Mata Atlántica en Salvador, Bahía, Brasil. Para ello, se utilizaron cadáveres de cerdos como cebo y se monitorearon durante todo su proceso de descomposición, tanto en la época seca como en la lluviosa. Se registraron siete especies de *Peckia*: *P. chrysostoma* (Wiedemann), *P. collusor* (Curran y Walley), *P. lambens* (Wiedemann), *P. intermutans* (Walker), *P. pexata* (Wulp), *P. anguilla* (Curran y Walley) y *P. tridentata* (Hall). La mayor presencia de especies de *Peckia* se observó en las fases gaseosa y de descomposición inicial (período seco), así como en la de descomposición avanzada (período lluvioso). La temperatura, la humedad y las precipitaciones mostraron una tendencia a influir directamente en la duración de las fases de descomposición de los cuerpos.

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Palabras clave: Mata Atlántica; fases de descomposición; entomofauna; cadáveres de cerdos.

Introduction

Decomposing bodies serve as habitats that provide food substrates for various organisms, ranging from bacteria to vertebrates, with a predominant presence of arthropods (Smith 1986; Amendt *et al.* 2004). Due to their significant taxonomic and behavioral diversity, including necrophagous, omnivorous, or predatory feeding habits, arthropods, particularly insects, comprise the majority of decomposer fauna. As a result, they can be found in diverse locations, including crime scenes (Benecke 2001; Von Zuben 2001; Madeira-Ott *et al.* 2022).

In criminal investigations, the most significant contribution of Forensic Entomology is related to Forensic Medicine in calculating the estimation of the post-mortem interval (PMI) (Lord & Stevenson 1986). For this purpose, knowledge about cadaveric entomofauna, its life cycle, ecological and biological characteristics, particularly its precise taxonomic identity, are essential. This is due to the fact that each species has a specific duration in the larval development stages until reaching adulthood (Oliveira-Costa 2008; Beuter *et al.* 2012; Oliveira-Costa 2013; Ramos *et al.* 2018; Silva *et al.* 2023).

Given the existing diversity, some species are considered forensically important due to their role in colonizing cadavers, feeding on them, and using them as sites for the development of their immature stages. These species also appear at specific stages of decomposition. Notably, the dipterans of the Sarcophagidae family, which are ovoviviparous, can have a pioneering role in cadaver colonization. This family includes several necrophagous species, particularly those belonging to the genera *Peckia* Robineau-Desvoidy, 1830 and *Oxysarcodexia* Townsend, 1917 (Smith 1986; Haskell *et al.* 1997; Barros *et al.* 2006, 2008; Ramos *et al.* 2018; Silva *et al.* 2023).

Considering their distribution in all zoogeographic regions, approximately 3,100 species of sarcophagids have already been described (Pape *et al*. 2011), with about 800 of these recorded for the Neotropical Region (Pape 1996). In Brazil, around 370 species of sarcophagids have been identified, with the genus *Peckia* presenting 20 recorded species (Pape 1996; Carvalho & Mello-Patiu 2008; Pape *et al.* 2011; Vairo *et al.* 2011; Buenaventura & Pape 2013; Vairo *et al.* 2014).

It is important to emphasize that the composition of cadaveric fauna varies across different geographic regions, making it impractical to apply information from studies in one location to another. Therefore, for the accurate use of entomological data in crime resolution, it is essential to conduct studies that identify the local fauna through faunistic surveys of species in the regions of interest.

Given the forensic importance of dipterans from the Sarcophagidae family, this study aims to survey sarcophagids of the genus *Peckia* occurring throughout the process of decomposition of pig carcasses (*Sus scrofa* Linnaeus, 1758) in an urban fragment of the Atlantic Forest, associating their occurrence with decomposition stages and the studied periods (dry and rainy).

Materials and Methods

The experiment was conducted in an urban fragment of the Atlantic Forest located at the 51st Telematics Center of the Army Police barracks, situated in the city of Salvador, Bahia, Brazil (12°58′ 27.54″ S; 38°26′47.68″ W) (Fig. 1).

The specimens were collected daily during the periods of July to August (rainy season) and November to December (dry season) in 2012. Two pig carcasses (*Sus scrofa* L., 1758)

weighing approximately 18 kg each were used as bait in each study period, placed at two experimental points (point 1: lat 12°58'27.9" S, long 38°26'34.4" W and point 2: lat 12°58'27.6" S, long 38°26'47.7" W). The decomposition process was observed for 50 days in each study period, and five stages of decomposition were considered according to the classification proposed by Bornemissza (1957). The pigs were euthanized by gunshot at the experiment site. The procedure was approved by the animal experimentation ethics committee of the State University of Feira de Santana, Bahia, Brazil.

The pig carcasses were placed on the ground and protected by a Shannon-type cage trap adapted by Oliveira-Costa (2007). On the top of the trap, an opening was left for attaching a "collection container" to capture adult winged insects after visiting the carcass. The specimens collected were sent to the Laboratory of Bionomics, Biogeography, and Insect Systematics (BIOSIS), a unit associated with the Museum of Natural History of Bahia (MHNBA), at the Biology Institute of the Federal University of Bahia (IBIO-UFBA), located on the Ondina campus in Salvador, Bahia, for identification.

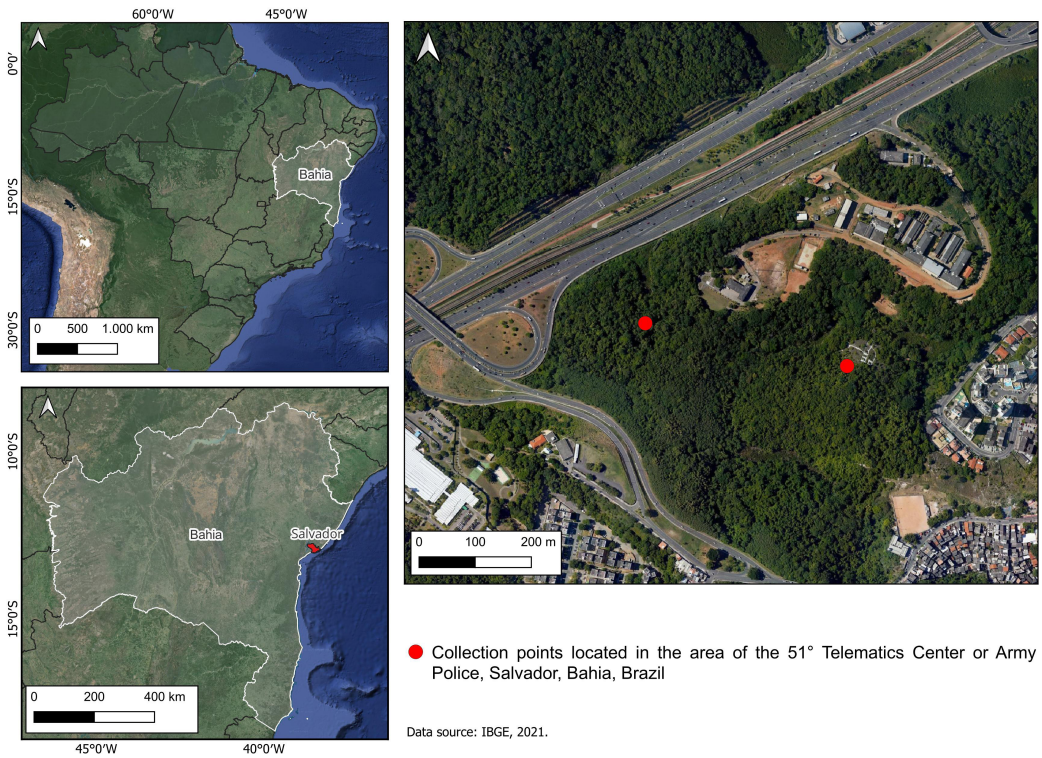

Figure 1. Location map of the collection points in the Atlantic Forest fragment in the city of Salvador, Bahia, Brazil. / **Figura 1.** Mapa de localización de los puntos de colecta en el fragmento de Mata Atlántica en la ciudad de Salvador, Bahía, Brasil.

Taxonomic identification was performed based on male individuals of the Sarcophagidae family, particularly of the genus *Peckia*, as the distinction of species in this family is primarily based on male genital characteristics. For identification, a Leica M165C Stereomicroscope was used, aided by taxonomic identification keys (Carvalho & Mello-Patiu 2008; Vairo *et al.* 2011; Buenaventura & Pape 2013; Vairo *et al.* 2014), comparison of collected species with specimens from the reference collection of BIOSIS, and confirmation of identification by one of the authors, an expert in Sarcophagidae

(Cátia Mello-Patiu, National Museum, UFRJ). All the collected material was deposited in the Entomological Collection of MHNBA (IBIO-UFBA).

During each study period (dry and rainy), daily local temperature, humidity, and rainfall data were recorded, and extracted from the National Institute of Meteorology (INMET).

Results and Discussion

During the study, a total of 128 male specimens of *Peckia* species were collected, of which 56 were collected in the rainy period and 72 in the dry period (Tab. 1), distributed among the following species: *Peckia* (*Peckia*) *chrysostoma* (Wiedemann, 1830) (n= 52); *Peckia* (*Euboettcheria*) *collusor* (Curran & Walley, 1934) (n= 35); *Peckia* (*Sarcodexia*) *lambens* (Wiedemann, 1830) (n= 31); *Peckia* (*Pattonella*) *intermutans* (Walker, 1861) (n= 4); *Peckia* (*Peckia*) *pexata* (Wulp, 1895) (n= 3); *Peckia* (*Euboettcheria*) *anguilla* (Curran & Walley, 1934) (n= 3) and *Peckia* (*Sarcodexia*) *tridentata* (Hall, 1937) (n= 1).

Table 1. Species of *Peckia* collected in two periods (dry and rainy) during the decomposition process of pig carcasses exposed in a fragment of Atlantic forest in the city of Salvador, Bahia, Brazil. (F) Fresh Phase; (G) Gas Phase; (ID) Initial Decomposition; (AD) Advanced Decomposition; (F) Final Phase (FA) Frequencia absoluta e (FR)Frequncia relativa. / **Tabla 1.** Especies de *Peckia* recolectadas en dos períodos (seco y lluvioso) durante el proceso de descomposición de cadáveres de cerdos expuestos en un fragmento de Mata Atlántica en la ciudad de Salvador, Bahia, Brasil. (F) Fase fresca; (G) Fase gaseosa; (ID) Descomposición inicial; (AD) Descomposición avanzada; (F) Fase final (FA) Frecuencia absoluta y (FR) Frecuencia relativa.

Species	Rainy Period						Dry Period							
	F	G	ID	AD	F	Total	F	G	ID	AD	F	Total	FA	FR (%)
Peckia (*Euboettcheria*) *anguilla* (Curran & Walley, 1934)	0	0	0	1	0	1	0	0	2	0	0	2	3	2.3
Peckia (*Euboettcheria*) *collusor* (Curran & Walley, 1934)	0	0	0	15	7	22	0	4	9	0	0	13	35	27.3
Peckia (*Pattonella*) *intermutans* (Walker, 1861)	0	0	0	0	0	0	0	0	2	0	2	4	4	3.1
Peckia (*Peckia*) *chrysostoma* (Wiedemann, 1830)	0	0	0	17	13	30	0	6	13	0	3	22	52	40.6
Peckia (*Peckia*) *pexata* (Wulp, 1895)	0	0	0	0	0	0	0	2	1	0	0	3	3	2.3
Peckia (*Sarcodexia*) *lambens* (Wiedemann, 1830)	1	0	0	2	0	3	0	17	2	9	0	28	31	24.2
Peckia (*Euboettcheria*) *tridentata* (Hall, 1937)	0	0	0	0	0	0	0	1	0	0	0	1	1	0.8
Total	**1**	**0**	**0**	**35**	**20**	**56**	**0**	**29**	**29**	**9**	**5**	**72**	**128**	**100.0**

According to the literature (Tab. 2), the species *P. collusor* and *P. pexata* have previously been recorded in the state of Bahia. However, the species *P. anguilla, P. tridentata, P. chrysostoma, P. intermutans*, and *P. lambens* were recorded for the first time in the state of Bahia in this study. In the case of *P. tridentata*, our study also registers, for the first time, its occurrence in the Northeast region.

Table 2. Record of the occurrence of *Peckia* species (Diptera: Sarcophagidae) in the regions of Brazil. New records are in boldface. / **Tabla 2.** Registro de la presenciade especies de *Peckia* (Diptera: Sarcophagidae) en las regiones de Brasil. Los nuevos registros están en negrita.

Species	Regions of Brazil					Literature cited
	North	Northeast	Center-West	Southeast	South	
Peckia (*Euboettcheria*) *anguilla* (Curran & Walley, 1934)	Amazonas Roraima	**Bahia** Ceará Maranhão	Distrito Federal Mato Grosso	Minas Gerais Rio de Janeiro São Paulo	Paraná	Barros *et al.* 2008; Buenaventura & Pape 2013; Lopes & Tibana 1991; Madeira-Ott *et al.* 2022; Pape 1996; Rosa *et al.* 2011; Sousa *et al.* 2011; Sousa *et al.* 2015; Vairo *et al.* 2014.
Peckia (*Euboettcheria*) *collusor* (Curran &Walley, 1934)	Amazonas Roraima	Bahia Ceará Maranhão Pernambuco	Distrito Federal Goias Mato Grosso Mato Grosso do Sul	Minas Gerais Rio de Janeiro São Paulo	Paraná Rio Grande do Sul Santa Catarina	Barbosa *et al.* 2009; Sousa *et al.* 2011; Barros *et al.* 2008; Buenaventura & Pape 2013; Carmo *et al.* 2017; Lopes & Tibana 1991; Madeira-Ott *et al.* 2022; Mello-Patiu *et al.* 2017; Pape 1996; Rosa *et al.* 2011; Silva *et al.* 2023; Sousa *et al.* 2015; Souza & Von Zuben 2016; Vairo *et al.* 2014.
Peckia (*Pattonella*) *intermutans* (Walker, 1861)	Amazonas Pará Roraima	**Bahia** Ceará Maranhão Penambuco	Distrito Federal Goias Mato Grosso	Minas Gerais Rio de Janeiro São Paulo	Paraná Santa Catarina	Barbosa *et al.* 2009; Barbosa *et al.* 2017; Barros *et al.* 2008; Buenaventura & Pape 2013; Couri *et al.* 2000; Lopes & Tibana 1991; Madeira-Ott *et al.* 2022; Mello-Patiu *et al.* 2017; Pape 1996; Rosa *et al.* 2011; Sousa *et al.* 2011; Sousa *et al.* 2015; Souza & Von Zuben 2016; Vairo *et al.* 2011; Vairo *et al.* 2014.
Peckia (*Peckia*) *chrysostoma* (Wiedemann, 1830)	Amapá Amazonas Roraima	**Bahia** Ceará Maranhão Paraíba Pernambuco	Distrito Federal	Espirito Santo Minas Gerais Rio de Janeiro São Paulo	Paraná Rio Grande do Sul Santa Catarina	Alves *et al.* 2014; Barbosa *et al.* 2009; Barbosa *et al.* 2017; Barros *et al.* 2008; Buenaventura & Pape 2013; Carmo *et al.* 2017; Couri *et al.* 2000; Lopes & Tibana 1991; Madeira-Ott *et al.* 2022; Pape 1996; Rosa *et al.* 2011; Sousa *et al.* 2011; Sousa *et al.* 2015; Vasconcelos *et al.* 2016.

Table 2 (continuation). Record of the occurrence of *Peckia* species (Diptera: Sarcophagidae) in the regions of Brazil. New records are in boldface. / **Tabla 2 (continuación).** Registro de la presenciade especies de *Peckia* (Diptera: Sarcophagidae) en las regiones de Brasil. Los nuevos registros están en negrita.

Species	Regions of Brazil					Literature cited
	North	Northeast	Center-West	Southeast	South	
Peckia (*Peckia*) *pexata* (Wulp, 1895)	Amapá Amazonas Rondônia Roraima	Bahia Ceará Maranhão Paraíba Pernambuco Piaui	Distrito Federal	Espirito Santo Minas Gerais Rio de Janeiro São Paulo		Alves *et al.* 2014; Barbosa *et al.* 2017; Barros *et al.* 2008; Buenaventura & Pape 2013; Couri *et al.* 2000; Pape 1996; Rosa *et al.* 2011; Sousa *et al.* 2011; Sousa *et al.* 2015; Vasconcelos *et al.* 2016.
Peckia (*Sarcodexia*) *lambens* (Wiedemann, 1830)	Amapá Amazonas Roraima	**Bahia** Ceará, Maranhão Paraíba Pernambuco	Distrito Federal Mato Grosso	Minas Gerais Rio de Janeiro São Paulo	Paraná Rio Grande do Sul Santa Catarina	Alves *et al.* 2014; Barbosa *et al.* 2009; Barbosa *et al.* 2017; Buenaventura & Pape 2013; Carmo *et al.* 2017; Couri *et al.* 2000; Lopes & Tibana 1991; Madeira-Ott *et al.* 2022; Pape 1996; Rosa *et al.* 2011; Sousa *et al.* 2011; Sousa *et al.* 2015; Souza & Von Zuben 2016; Vairo *et al.* 2011; Vairo *et al.* 2014; Vasconcelos *et al.* 2016.
Peckia (*Euboettcheria*) *tridentata* (Hall, 1937)	Amazonas	**Bahia**	Mato Grosso	Minas Gerais		Buenaventura & Pape 2013; Vairo *et al.* 2014.

Peckia chrysostoma (Fig. 2d) was the most abundant species, representing 40.6% of the studied sarcophagids (Tab. 1). Its occurrence was observed in the final stages of decomposition during the rainy period and, in the dry period, with a higher occurrence in the initial decomposition phase, which was also observed by Barros *et al.* (2008) in an experiment conducted in the Federal District using pig carcasses. In this study, *P. chrysostoma* was the most abundant species in the rainy period, in contrast to Rosa *et al.* (2009) findings in a study with pig carcasses in Minas Gerais, which observed a higher abundance of this species in the dry period. This species was also found colonizing rodent carcasses (Moretti *et al.* 2008), pig carcasses (Alves *et al.* 2014; Gomes *et al.* 2009), and human corpses in Rio de Janeiro, RJ (Oliveira-Costa *et al.* 2001), highlighting its importance in forensic sciences.

Peckia collusor (Fig. 2b) was the second most abundant species, comprising 27.3% of the relative samples, showing a similar pattern with higher occurrence in the final stages during the rainy period and greater occurrence in the initial decomposition phase during the dry period. Rosa *et al.* (2009), in a study with pig carcasses, also observed the occurrence of this species in both dry and rainy periods, while Barros *et al.* (2008) found its highest occurrence in the initial decomposition phase. This species was equally associated with pig carcasses in Rio de Janeiro (Barbosa *et al.* 2009) and Paraná (Vairo *et al.* 2011).

Peckia lambens (Fig. 2f) the third species with the highest relative abundance (24.2%), showed a higher occurrence in the advanced decomposition phase, corresponding to the only species with occurrence recorded in the fresh phase, both in the rainy and dry periods, with a higher occurrence in the gaseous phase during the dry period (Tab. 1). This higher abundance of *P. lambens* in the dry period was also observed by Rosa *et al.* (2009) in Minas Gerais, and it has also been collected in pig carcasses in different studies by various other authors (Carvalho & Linhares 2001; Alves *et al.* 2014; Vairo *et al.* 2011) and in human corpses in Rio de Janeiro (Oliveira-Costa *et al.* 2001), highlighting its forensic importance.

The species *Peckia intermutans* (Fig. 2c), *P. pexata* (Fig. 2e), *P. anguilla* (Fig. 2a), and *P. tridentata* (Fig. 2g) were recorded with low relative frequencies of 3.1%, 2.3%, 2.3%, and 0.8%, respectively (Tab. 1). *Peckia intermutans*, *P. pexata*, and *P. tridentata* were observed only in the dry period, occurring in the gaseous phase, initial deterioration, and remains (*P. intermutans*). In a study conducted by Rosa *et al.* (2011) with pig carcasses, *P. intermutans* and *P. pexata* were observed in both dry and rainy periods. Among these three aforementioned species, *P. intermutans* was the only one recorded in a human corpse in Campinas, SP (Carvalho *et al.* 2000). Regarding *P. tridentata*, this species was also collected by Vairo *et al.* (2014) in a survey conducted with pig carcasses in Amazonas, Brazil.

In this study, *P. anguilla* (Fig. 2a), was observed in both study periods, a result also found by Rosa *et al.* (2011) and Barros *et al.* (2008), with its occurrence recorded in the advanced decomposition phase (rainy period) and initial deterioration phase (dry period).

In light of the aforementioned, when we analyze the occurrence of *Peckia* species in the two studied periods, we observe a higher incidence during the gaseous and initial decomposition phases in the dry period, and during advanced decomposition in the rainy period. As noted by Carvalho & Linhares (2001) in the Cerrado Biome area, and in the present study in the Atlantic Forest Biome area, there seems to be a close association of *Peckia* species with the more advanced stages of decomposition during the rainy period. Conversely, in drier periods, their greater abundance appears to be associated with the initial stages of decomposition (gaseous phase and initial deterioration), as observed in this study and also by Barros *et al.* (2008); in a Cerrado area, which may be related to substrate characteristics and its higher or lower percentage of water.

Although Barros *et al.* (2008) argue that, unlike the results obtained by Carvalho & Linhares (2001), their study did not demonstrate an association of Sarcophagidae with advanced stages of decomposition, but rather a higher abundance and diversity in the bloating phase of the carcass, it is important to note that their experiment was conducted in Brasília (DF), during the months of June-July, which correspond precisely to the period of lowest precipitation in that municipality (according to the INMET/CFS/Interpolation website), which fully agrees with the observations made in the present study and with the results of the other aforementioned authors. From the perspective of Forensic Entomology, this is extremely relevant data, as depending on the time of year (higher or lower temperature and humidity), species may be associated with one phase of decomposition or another.

Denno & Cothran (1976) observed that different families of diptera can exploit the carcass in different ways, and this does not necessarily indicates competition. For Sarcophagidae, being ovoviviparous and depositing fewer larvae that are immediately able to feed, their higher occurrence in the advanced stages of decomposition may be linked to this unique developmental characteristic, which provides them an advantage in exploiting the food substrate (Ramos *et al.* 2022). On the other hand, species that oviposit require more time for larval hatching and colonization of the substrate, as exemplified by the family Calliphoridae (Pamponet *et al*. 2019). This would result in a pioneering role of the Sarcophagidae family in exploiting the carcass compared to Calliphoridae, for example (Smith 1986; Oliveira-Costa 2007; Ramos *et al.* 2018).

As proposed by Bornemissza (1957), during the carcass decomposition process, five phases were observed, which was also reported by other authors who monitored the decomposition of pig carcasses (Rosa *et al.* 2009; Souza & Linhares 1997; Salviano *et al.* 1996). The five phases were observed in both study periods, with the process up to the remains phase lasting 8 days during the dry period, while in the rainy period, this process lasted 11 days. Collections were concluded when the carcasses had been exposed for 50 days in both periods.

The duration of the carcass decomposition phases was the same in the first two stages (1 day and 2 days, respectively). In the other three stages, a difference in decomposition duration was observed between the two study periods. Abiotic factors appear to have directly caused this difference (Campobasso *et al.* 2001). In the dry period (Fig. 3), due to the higher average temperatures (26.5 °C) (Fig. 3a), lower relative humidity (74.9%) (Fig. 3b) and precipitation (0.005 mm^3) (Fig. 3c) compared to the rainy period (temperature = 23.7 °C, relative humidity = 76.9%, and precipitation = 0.145 mm^3), there was a greater speed in the decomposition process of organic matter. A greater availability of resources in a shorter time would result in faster consumption by decomposer fauna, which could explain the higher abundance of sarcophagids in the dry period (n=72).

As mentioned above, lower temperatures, higher humidity, and precipitation as observed in the rainy period would result in slower carcass consumption, leading to an increase in decomposition time (Monteiro-Filho & Penereiro 1987). The same was observed by Rosa *et al.* (2009), who found in their study that the period with higher temperatures resulted in a faster decomposition process; however, in this case, the experiment was conducted in a Cerrado area where humidity was also higher, which differed from the present study.

In this context, being thermoconformers (depending on an external heat source), insects have their development rate directly dependent on the ambient temperature (Campobasso *et al.* 2001; Oliveira-Costa 2007). Therefore, at higher temperatures, their metabolism increases, accelerating their development, and thus, by voraciously feeding, decomposition is faster, potentially leading to an erroneous estimation of the post-mortem interval (PMI).

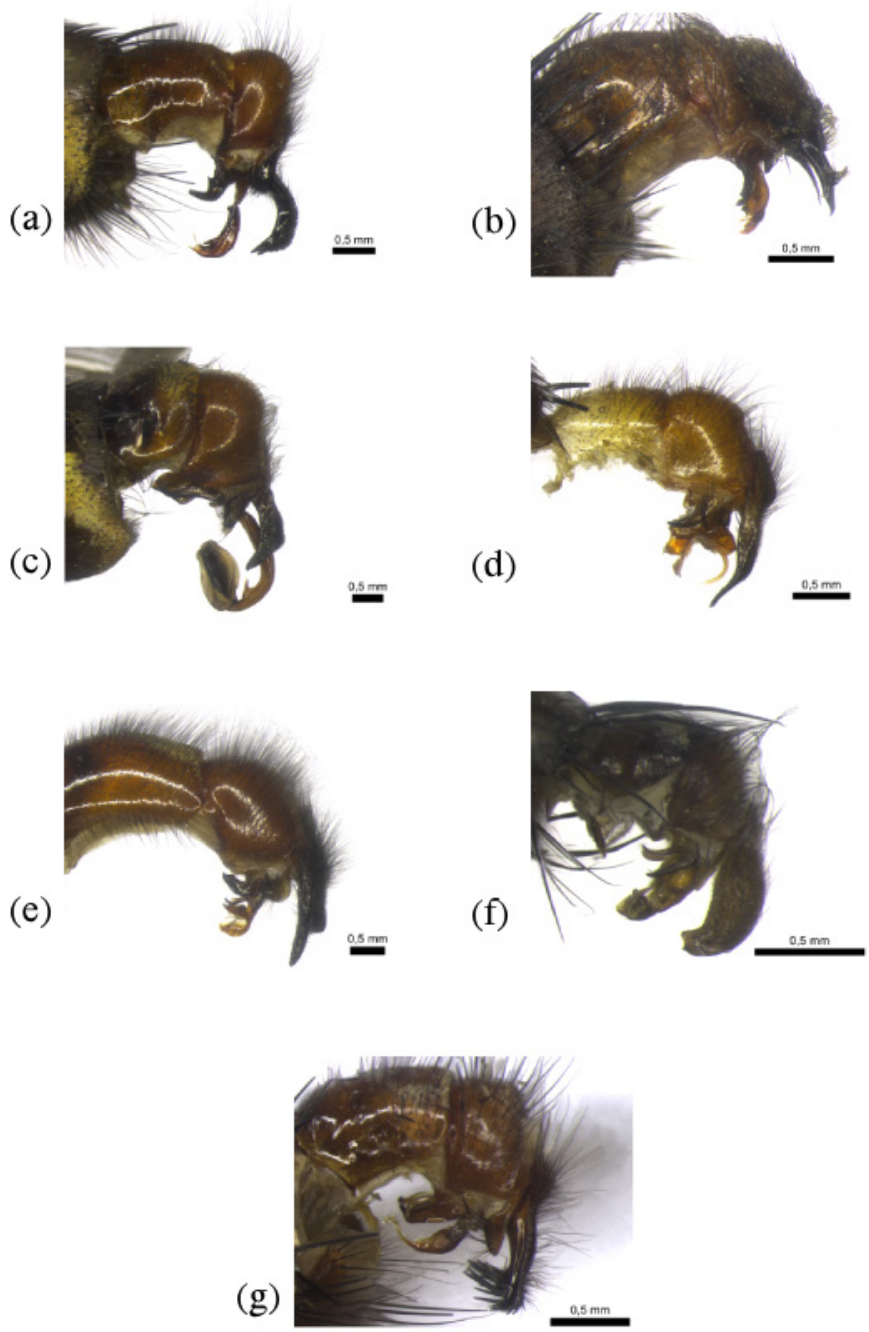

Figure 2. Lateral view of the male terminalia of *Peckia* specimens collected from exposed carcasses in the city of Salvador, Bahia, Brazil. **(a)** *P.* (*Euboettcheria*) *anguilla* (Curran & Walley, 1934). **(b)** *P.* (*Euboettcheria*) *collusor* (Curran & Walley, 1934). **(c)** *P.* (*Pattonella*) *intermutans* (Walker, 1861). **(d)** *P.* (*Peckia*) *chrysostoma* (Wiedemann, 1830). **(e)** *P.* (*Peckia*) *pexata* (Wulp, 1895). **(f)** *P.* (*Sarcodexia*) *lambens* (Wiedemann, 1830). **(g)** *P.* (*Sarcodexia*) *tridentata* (Hall, 1937). Scale: 0.5 mm. / **Figura 2.** Vista lateral de la terminalia masculina de los especímenes de *Peckia* recolectados de las carcasas expuestas en la ciudad de Salvador, Bahía, Brasil. **(a)** *P.* (*Euboettcheria*) *anguilla* (Curran y Walley, 1934). **(b)** *P.* (*Euboettcheria*) *collusor* (Curran y Walley, 1934). **(c)** *P.* (*Pattonella*) *intermutans* (Walker, 1861). **(d)** *P.* (*Peckia*) *chrysostoma* (Wiedemann, 1830). **(e)** *P.* (*Peckia*) *pexata* (Wulp, 1895). **(f)** *P.* (*Sarcodexia*) *lambens* (Wiedemann, 1830). **(g)** *P.* (*Sarcodexia*) *tridentata* (Hall, 1937). Escala: 0,5 mm.

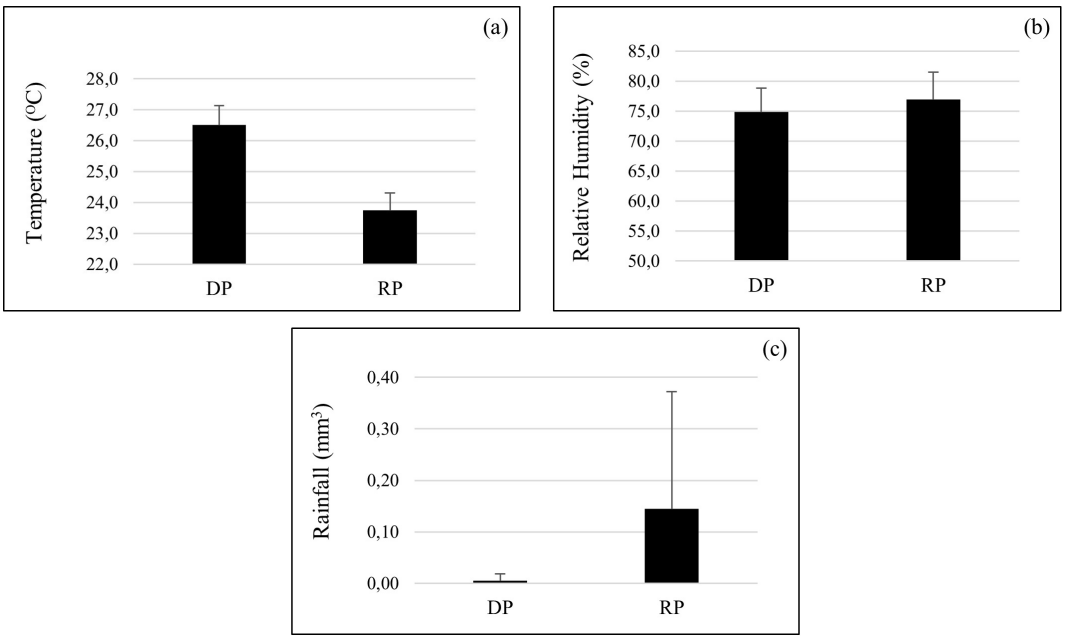

Figure 3. Environmental variables (temperature (a), relative humidity (b) and rainfall (c)) verified during the experiment in the dry (DP) and rainy periods (RP), in the city of Salvador, Bahia, Brazil. / **Figura 3.** Variables ambientales (temperatura (a), humedad relativa (b) y precipitación (c)) verificadas durante el experimento en los períodos seco (DP) y lluvioso (RP), en la ciudad de Salvador, Bahía, Brasil.

Conclusions

Among the species collected, *P. anguilla*, *P. tridentata*, *P. chrysostoma*, *P. intermutans*, and *P. lambens* had their first records confirmed for the state of Bahia, while *P. tridentata* was recorded for the first time in the Northeast Region.

Regarding the occurrence of *Peckia* species during the decomposition phases, a higher occurrence of flies of this genus was observed in the gaseous and initial decomposition phases (dry period) and advanced decomposition (rainy period). Temperature, humidity, and precipitation showed a tendency to directly influence the duration of the decomposition phases of the carcasses.

With the presented data, this study makes a significant contribution to the field of Forensic Entomology in the Northeast Region. The documented species and their association with decomposition phases serve as important tools for interpreting information about these species and their use in criminal investigations. By understanding the behavior and ecology of these insects in the local context, forensic practitioners can make more accurate estimations post-mortem interval determinations, aiding in criminal investigations and legal proceedings. This study underscores the importance of regional studies in forensic entomology and highlights the relevance of understanding local insect fauna for forensic purposes.

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Author Contributions

FP: Conceptualization, methodology, validation, formal analysis, investigation, data curation, writing - original draft, writing - review & editing, visualization. **DL:** Conceptualization, methodology, validation, formal analysis, investigation, data curation, writing - original draft. **FO:** Conceptualization, methodology, validation, investigation, resources, writing - original draft, writing - review & editing, supervision, project administration, funding acquisition. **TT:** Conceptualization, methodology, validation, investigation, resources, supervision, project administration. **CMP:** Conceptualization, methodology, resources, writing - original draft, writing - review & editing, supervision.

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