

## Insetos (Insecta Linnaeus, 1758) presentes em grafites da cidade de Salvador, Bahia, Brasil

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Resumo: Os insetos são organismos presentes nos mais variados ambientes e dominam praticamente todos os habitats do planeta. Até mesmo nas artes urbanas podemos encontrá-los através de representações artísticas, entre elas, o grafite. No presente trabalho, foram inventariados desenhos ilustrando diversos grupos de insetos existentes espalhados pela cidade de Salvador, Bahia, Brasil. Além da busca ativa por painéis de grafite nos bairros de Salvador, utilizamos a rede social Instagram para coletar esses dados. Entre os resultados obtidos, os seguintes grandes grupos taxonômicos foram observados: Coleoptera, Lepidoptera, Diptera, Hymenoptera, Hemiptera e Odonata. Podemos concluir que os insetos estão muito representados, sendo a ordem Lepidoptera a mais numericamente destacada. O estudo em questão demonstra a importância zoocultural que a classe Insecta representa para a sociedade, cultura e arte.

Palavras-chave: arte urbana; etnoentomologia; etnobiologia; zoologia cultural.

# Insects (Insecta Linnaeus, 1758) found in graffiti in the city of Salvador, Bahia, Brazil

**Abstract:** Insects are organisms found in a wide variety of environments and they inhabit virtually every habitat on the planet. Even in urban art, we can find representations of them, including graffiti. In this study, drawings depicting various groups of insects were inventoried throughout the city of Salvador, Bahia, Brazil. In addition to actively searching for graffiti panels in Salvador's neighborhoods, we used the social media platform Instagram to collect this data. Among the results obtained, the following major taxonomic groups were observed: Coleoptera, Lepidoptera, Diptera, Hymenoptera, Hemiptera, and Odonata. We can conclude that insects are well-represented, with the order Lepidoptera being the most numerically prominent. This study demonstrates the zoocultural importance that the class Insecta represents for society, culture, and art.

**Keywords**: urban art; ethnoentomology; ethnobiology; cultural zoology.



# Insetos (Insecta Linnaeus, 1758) presentes en graffitis da cidade de Salvador, Bahia, Brasil

Resumen: Los insectos son organismos presentes en los más variados ambientes y dominan prácticamente todos los hábitats del planeta. Incluso en las artes urbanas podemos encontrarlos a través de representaciones artísticas, incluido el graffiti. En el presente trabajo se inventariaron dibujos que ilustran diferentes grupos de insectos distribuidos por la ciudad de Salvador, Bahia, Brasil. Además de buscar activamente paneles de graffiti en los barrios de Salvador, utilizamos la red social Instagram para recopilar estos datos. Entre los resultados obtenidos se observaron los siguientes grupos taxonómicos principales: Coleoptera, Lepidoptera, Diptera, Hymenoptera, Hemiptera y Odonata. Podemos concluir que los insectos están muy representados, siendo el orden Lepidoptera el más destacado numéricamente. El estudio en cuestión demuestra la importancia zoocultural que representa la clase Insecta para la sociedad, la cultura y el arte.

Palabras clave: arte urbano; etnoentomología; etnobiología; zoología cultural.

#### Introduction

The earliest records of graffiti-like designs in the history of Art and Humanity were drawings made on cave walls, known as cave paintings (Gitahy, 1999). According to Blauth and Possa (2012), it can be considered that since antiquity, humans have been social and cultural beings, constantly seeking means of recognition and communication with their own species, not only through spoken words but also through gestures, paintings, drawings, and sculptures to represent perceptions of the world. The world 'graffiti' (often used as 'graffiti') is a term derived from the Latin 'graphiti,' which means 'a mark or inscription made by scratching or scraping a wall' (Monserrat and Aguilar, 2007). In urban centers, the act of 'graffiti' involves the conscious or unconscious marking and documenting of events and situations over time (Gitahy, 1999). It is considered a democratic art form, as it occurs arbitrarily and without commitment to any spatial or ideological limitations (Gitahy, 1999). According to Silva-and-Silva (2011), graffiti is considered a graphic art, a visual communication that circulates messages through symbols and letters constructed from a symbolic repertoire that, according to the individual's will, can be common to society or restricted to small groups of individuals. It is a language intrinsic to urban audiences, characterized by direct interference with walls or surfaces through paintings or writings (Silva-and-Silva, 2015). Graffiti is considered



an art of ephemeral nature, as it may not be present for a long period of time (Gitahy, 1999).

Among the various themes that can be addressed through graffiti, such as social, political, economic, and cultural critiques (Gitahy, 1999), we can also highlight the presence of animals and other elements of nature, including insects. According to Hogue (1987), artists, in general, have a considerable fondness for insects. Humans have established relationships with insects in various distinct ways, and it is noticeable that artists can be inspired to depict insects in their works (Klein, 2007). Furthermore, as Klein (2007) points out, human-insect interactions are so widespread that insects often appear as central figures, even as symbols, within politics, science and technology, religion, mythology and folklore, literature, poetry, music, performing and visual arts, and recreation.

Due to being highly numerous, extremely diverse, colorful, and charismatic organisms for some people, artists who often do not ignore them in their representations have a far-reaching influence on the history of Art. While the practice of including real insects or their products in artistic expressions is widespread, it has been widely neglected or ignored (Klein, 2021). Cultural Entomology is the field responsible for studying the relationship between insects and culture (Hogue, 1980), and from the perspective of the influence of insects on art, Klein (2021) defines insect art as that which uses, portrays, or conceptually belongs to these animals. Thus, depicting how insects affect human culture can have relevant consequences for people's appreciation of them, as well as for the conservation of insects and other invertebrate groups (Klein, 2021). Furthermore, as Klein (2021) also points out, the study of insect art can enhance our understanding of our history and relationship with nature. After all, it is the connections we make with insects, whether artistic or not, that can help reduce our destructive tendencies towards the natural world and, consequently, towards ourselves.

### Graffiti in the city of Salvador

In Salvador, graffiti gained prominence in the 1980s. Artists like Miguel Cordeiro, Nildão, Renato da Silveira, Bel Borba, and Ray Vianna were the driving forces behind the popularity of street art in the city (Falcón and Garcia 2021). According to these authors, it was during that time that many young people realized that through graffiti, they could acquire a new form of expression and another way to communicate directly with the public on the streets. For them, due to the abundance of walls and the ease of



painting without discrimination or even violence, Salvador is considered a convenient city for producing graffiti murals. Nevertheless, in the second half of the 2000s, these authors consider that it was still not entirely clear how to differentiate graffiti from tagging in Salvador. However, according to Cruz and Costa (2008), both graffiti and tagging need to be fully assimilated as autonomous activities within the context of a society's issues.

According to Falcón and Garcia (2021), in 2005, the municipal government, through an initiative, successfully changed this scenario with the Salvador Graffita project. This project aimed to sensitize young people who were engaged in tagging in the city center and the outskirts through the medium of art. These young graffiti artists from Salvador were hired by the city government to paint pre-established themes on footbridges, walls, viaducts, etc., as indicated by the project. Consequently, the project drew the attention of the population to graffiti, perceived as an art form. The authors demonstrate that artists who were interviewed reported that a significant portion of the population began to appreciate their work, distinguishing it from tagging or acts of vandalism. Falcón and Garcia (2021) also show that another beneficial aspect of the project was a considerable increase in the number of artistic productions spread throughout the city. In addition to graffiti-covered walls, high-end store windows, facades, and even university courtyards began to be considered settings for graffiti. The authors also mention that, to further strengthen the movement, in 2011, the former President of Brazil, Dilma Rousseff, sanctioned a law that distinguishes graffiti from tagging. The law does not consider graffiti a crime as long as it is produced with the purpose of enhancing public or private property.

Many other projects have been launched to mobilize and organize the graffiti scene in the city of Salvador. For instance, we can mention the "Projeto Cidadão," founded by the educator Antônio Jorge, and the crews formed in various neighborhoods of the city, such as Castelo Branco and Cajazeiras. Additionally, numerous graffiti artists began their studies at the School of Fine Arts of the Federal University of Bahia, giving rise to teams like the 071 Crew (Falcón and Garcia 2021).

### Perception of insects by residents of the city of Salvador

Regarding the categorization of animals by humans, ethnozoological classification systems are closely linked to how each particular culture thinks, feels, and acts in relation to the animals in their environment (Santos-Fita et al., 2011). Marques (2001) considers that ethnoentomology can be defined as the ethnozoological subfield



that studies the cognitive processes (thoughts and perceptions), emotional (affective-emotional reactions), and behavioral (attitudes) that mediate the relationships between human populations and insect species in the ecosystems where they live, as well as the resulting environmental impacts. According to Silva and Costa Neto (2004), following an academic definition, we can consider insects as animals of the phylum Arthropoda that have segmented bodies into head, thorax, and abdomen, and three pairs of legs.

However, research on ethnotaxonomy demonstrates that the term 'insect' is used as a classificatory category that includes organisms not systematically related to the Linnean class Insecta, such as mammals, reptiles, amphibians, mollusks, arachnids, among others (Costa Neto, 2003). Through the hypothesis of entomoprojective ambivalence proposed by Costa Neto (1999), humans tend to project feelings of harm, danger, irritability, repugnance, and contempt onto non-insect animals (including people), associating them with the culturally determined category 'insect.' However, for the study at hand, there were no misconceptions about the term 'insect,' as shown in Figure 1, panels in which users of the social media platform Instagram identified insects and submitted them for contribution to this study. This methodology is further explained in the 'Objectives and Methods' section.

### Objective and methods

The present study aims to document entomological artistic expressions through photographs of graffiti displayed in the city of Salvador, Bahia, Brazil (Fig. 2). In total, graffiti artworks were found in various locations throughout the city, including Rio Vermelho, Pituba, Cajazeiras, Alto das Pombas, Caminho de Areia, Cabula, Federação, São João do Cabrito, Itapuã, Ribeira, Solar do Unhão - MAM, Plataforma, Boca da Mata, Fazenda Grande do Retiro, Politeama, Castelo Branco, Largo do Campo Grande, Pituaçu, Graça, Amaralina, Horto Florestal, Calabetão, Monte Serrat, Dois de Julho, Largo das Sete Portas, Barroquinha, Av. Dom João VI, Brotas, Pelourinho, São Caetano, Barra, Águas Claras, Barbalho, Pernambués, and Santo Antônio além do Carmo. To collect these records, in addition to actively searching for graffiti panels in Salvador, we used the social media platform Instagram to gather data from December 2022 to February 2023. Subsequently, the depicted insects were identified to the lowest possible taxonomic group.



#### Results and discussion

In the city of Salvador, graffiti representing the following taxonomic groups belonging to Insecta were inventoried (Table 1): Coleoptera, Lepidoptera, Diptera, Hymenoptera, Hemiptera, and Odonata. The largest taxonomic group represented was Lepidoptera, found in 61 observed panels, followed by Hemiptera in 25 panels, Coleoptera in 11 panels, Hymenoptera in 10 panels, and Diptera and Odonata in two panels each, totaling 111 graffiti artworks featuring insects in the capital of Bahia. Panels representing two orders of insects simultaneously were also observed, such as Lepidoptera and Coleoptera, and Lepidoptera and Hymenoptera.

Lepidoptera (butterflies and moths) were the taxonomic group with the most graffiti representations in Salvador (N=61). This group comprises the second-largest order among insects, second only to Coleoptera (beetles), and there are cataloged more than 170,000 species of Lepidoptera worldwide (Zhang et al., 2011), covering almost all biogeographic regions and also exhibiting a wide diversity of habitats. According to the Taxonomic Catalog of the Fauna of Brazil (CTFB), approximately 84,500 species of insects are recorded in the country. Of these, 15% correspond to Lepidoptera, with approximately 3,500 species of butterflies and 9,300 species of moths. In the graffiti representations, 49 are butterflies and two are moths, not reflecting the real proportion of butterfly and moth species recorded in Brazil. This fact demonstrates the high popularity that butterflies have compared to moths among the general public.

Regarding the group of Lepidoptera, we were able to observe different forms of representations in relation to the positioning of the wings. Many butterflies were depicted in a flying position (N=48), as seen in some examples in Figure 3. With wings positioned vertically over the body, eight butterflies were observed, as in some panels in Figure 4A-C. Additionally, five butterflies were portrayed in a non-natural way, meaning that the forewings and hindwings are illustrated at a right angle to the body axis, which is analogous to the position in which dried specimens are stored after entomological mounting protocols for preservation in collections, unlike how they are observed in nature (Figure 4D-F). The two moths are depicted resting with their wings held horizontally over the body, as they are commonly seen and recognized by people (Figure 5A, B).

Most of the butterflies in the graffiti representations are associated with plants, reflecting the guild of nectar-feeding butterflies that feed on nectar and include the



majority of butterfly groups (Uehara-Prado et al., 2007) (Figure 3D and Figure 4A). Among the depicted Lepidoptera, only three panels correspond to the larval or caterpillar stage (Figure 2D and Figure 5C, E), two of them even identified by realistic representations of their main characteristics. Both (Figure 2D and Figure 5E) are of a *Papilio* sp. (Lepidoptera: Papilionidae). In Figure 5E, we can observe the osmeterium, a retractable gland projected through a transverse groove or slit in the pronotum (Salgado-Neto, 2010). In Figure 2D, we can see the commonly known "snake caterpillar"; these relatively large false "eyes" are indeed a defense strategy, as these structures mimic a snake, thus deterring potential predators (Hossie and Sherratt, 2014)). Figure 5D also deserves attention, where we can observe a butterfly emerging from the pupa. Butterflies are commonly known for the process of metamorphosis they undergo; they are holometabolous insects, having four stages of development (egg, larva, pupa, and adult).

Hemiptera was the second taxonomic group with the most graffiti representations in the city of Salvador (N=25). All the panels featuring Hemiptera were created by the artist Odé Frasão ("Feik"), who uses insects, always very colorful and creative, as a focus of his art. This explains the relatively high number of representations compared to other orders depicted in graffiti in Salvador. Although the Hemiptera are not represented faithfully to reality, it is possible to observe distinctive characteristics defining the order, such as the piercing-sucking mouthparts and the hemelytron (Figure 6). Most of the graffiti seems to depict leafhoppers, which can be very colorful, and that's how the artist portrays them.

The order Coleoptera is the most diverse and one of the most successful among insects, representing approximately 40% of the described organisms in Hexapoda (Triplehorn and Jonnson, 2011; Zhang et al., 2011). There are over 390,000 species cataloged worldwide (Gullan and Cranston, 2017), and this order is found in nearly all biogeographic regions, except Antarctica, inhabiting a wide range of habitats (Triplehorn and Jonnson, 2011). Beetles are diverse both taxonomically and in terms of morphology and size, varying greatly in length (Ferreira Jr et al., 2014). According to Monné and Costa (2022), there are more than 34,670 species of beetles cataloged for Brazil, distributed across over 4,825 genera. Despite being the most diverse group among insects, Coleoptera was the third taxonomic group with the most graffiti representations in the city of Salvador (N=11). The famous and commonly known ladybugs (Coccinellidae) were observed in seven panels, including those where multiple orders were depicted, specifically Coleoptera and Lepidoptera (Figure 7). Other taxonomic



groups were also observed, such as Lucanidae (Figure 7B) and Scarabaeidae (Figure 7A, E). It's worth noting the graffiti depicting a child wearing a Pharaoh's turban handling a scarab beetle (Scarabaeidae) (Figure 7E). Scarab beetles were considered amulets in Ancient Egypt, something widely popularized and used by various social classes throughout the history of this civilization (Scarabs, 2001).

Hymenoptera was the fourth taxonomic group with the most graffiti representations in the city of Salvador (N=10). Of these, eight panels featured bees, which have had a relationship with humans since ancient times, as evidenced by cave paintings, ancient scriptures, and even their use as decorations on the clothing of kings and queens (Valoto and Rondo, 2007). Bees are insects that are quite popular and charismatic in the perception of the general population. In Figure 8B, C, G, we can see bees of the genus *Apis* Linnaeus, 1758 (Apidae), which are commonly known and represented in various cultural aspects. Figure 8E also stands out because it depicts a bee and a message below it alluding to the disappearance of these insects and how it will negatively impact the human population, thus highlighting the utmost importance of conserving this group. The other two panels featured ants (Figure 8F, H). Such insects are present in numerous cultural aspects, such as myths, legends, magical and religious practices. They are also used as sources of food and medicine and are involved in educational activities in the field of education (Costa Neto, 2002).

The order Diptera comprises one of the largest groups of insects in the world, and its representatives (flies and mosquitoes) are abundant in both the number of individuals and species, with a significant portion of the species having a cosmopolitan distribution (Brito, 2008). In total, two panels depicting Diptera were observed in the city of Salvador. One panel represents a fly (Figure 9A), and the other represents a mosquito (Figure 9B).

The order Odonata currently comprises approximately 6,000 described species (Trueman, 2007). These organisms are commonly known by various names such as dragonflies, damselflies, and others (Brasil et al., 2019). Dragonflies can be quite colorful and are notable to the general public for their beauty, charisma, and behavior. They are also considered significant symbols in legends and cultures worldwide, as noted by Lenko et al. (1996). Two panels depicting dragonflies were observed (Figure 9C, D).

In general, we were able to observe graffiti artworks depicting insects in various levels of detail, ranging from simpler representations (Figure 3D; Figure 4C, F; Figure 5C; Figure 7A; Figure 8E; and Figure 9D) to more elaborate ones (Figure 1A, C, D;



Figure 5B, E; Figure 7B; and Figure 8B, C, G). This is consistent with the study conducted by Monserrat and Aguillar (2007) on arthropods in Iberian graffiti. Graffiti featuring insects were found on walls of bars, restaurants, gyms, schools, and even on boats. We observed graffiti panels where the depicted insects were portrayed in a less realistic manner, as seen in Figure 7D, while others were approached in a more detailed and realistic way, as represented in Figure 1A. Consequently, it is possible to classify the taxonomic groups to which they belong (Table 1).

Despite insects evoking a feeling of disgust in a significant portion of the general population (Ruppert and Barnes, 1996), butterflies and moths (Lepidoptera) can be considered an exception compared to other less popular and charismatic insect groups. In the work of Da-Silva and Silva (2019), the supremacy of lepidopterans was also observed, as they were well represented in artistic works in Beco do Batman, a famous street in São Paulo, São Paulo, Brazil

#### **Conclusions**

According to Da-Silva and Silva (2019), emphasizing representations of animals present in urban art, in this case, specifically insects, symbolizes an opportunity to raise awareness among the general public about environmental preservation and to popularize this significant group of invertebrates on our planet. We can consider the presence of insects through graffiti panels in the city of Salvador as both symbolic and representative. These artworks can be found in various neighborhoods of the capital of Bahia and encompass the key taxonomic groups of the class.

It is highly likely that there are more graffiti artworks featuring insects in Salvador that were not covered in this study. The city's vast territorial expanse, including less accessible areas, poses challenges to conducting a comprehensive inventory of this kind, coupled with the ephemeral nature of these artworks, as previously mentioned.

Even though some graffiti pieces have been portrayed in a less realistic and more artistic manner, it underscores the importance of recognizing this group of organisms that surrounds us, whether to advance science and art or to popularize biodiversity and conservation efforts (Da-Silva and Silva 2019).



### Table:

Table 1. Number of graffiti artworks depicting various groups of Insecta observed in the city of Salvador, Bahia, Brazil.

- 45	
Insecta (6)	
Lepidoptera (61)	
Nymphalidae (2)	
Dannaus sp. (11)	
Morpho sp. (4)	
Papilionidae (1)	
Heraclides sp. (1)	
Papilio sp. (2)	
Coleoptera (11)	
Scarabaeidae (2)	
Scarabaeus sp. (1)	
Lucanidae (1)	
Lucanus sp. (1)	
Coccinellidae (7)	
Hemiptera (25)	
Hymenoptera (10)	
Apidae (3)	
Apis sp.	
Diptera (2)	
Odonata (2)	



### Figures:

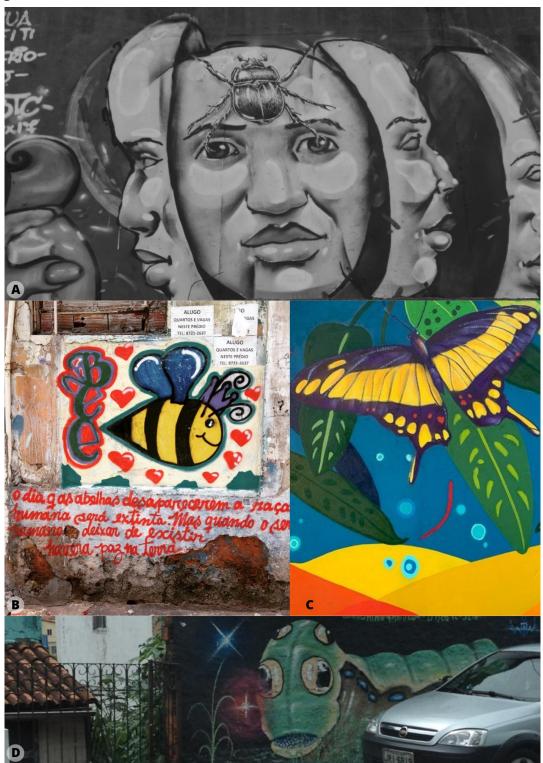


Figure 1. Perception of insects by residents of the city of Salvador. A – Author: Geovane Correa; B - Unknown author; C – Author: Eder Muniz; D - Unknown author.



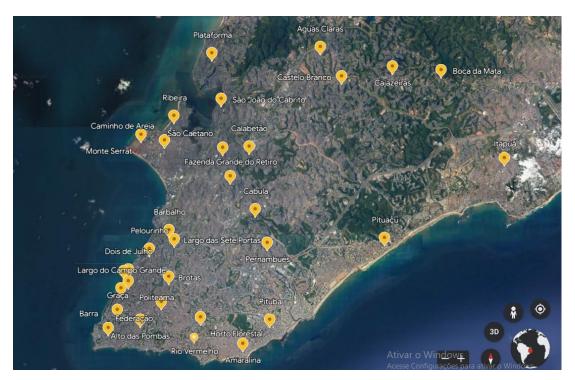


Figure 2. Map of the Salvador region, Bahia, Brazil. Yellow dots represent the locations where graffiti artworks depicting insects were found. Photo: Google Earth.

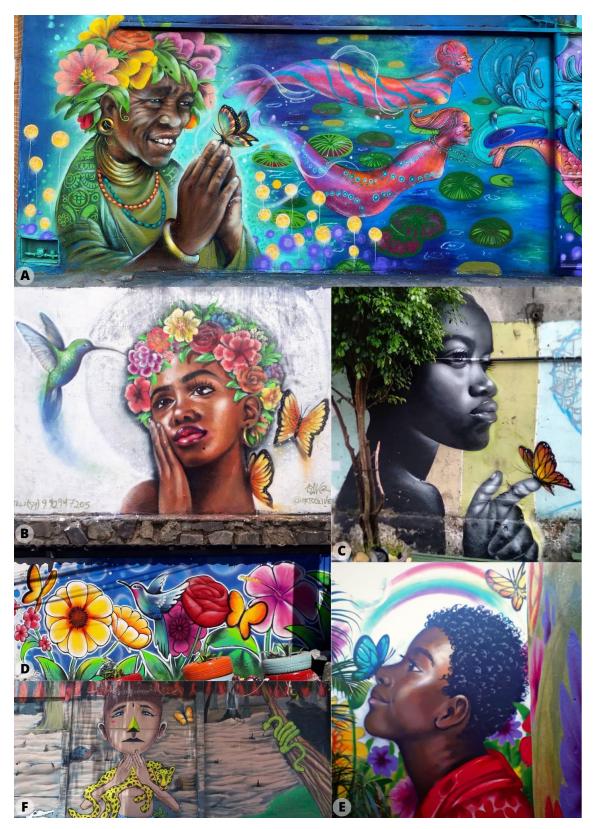


Figure 3. Butterflies (Lepidoptera) depicted in a flying position. A-E - Author: Oliver Dorea; F - Author: Danilo Scanf.

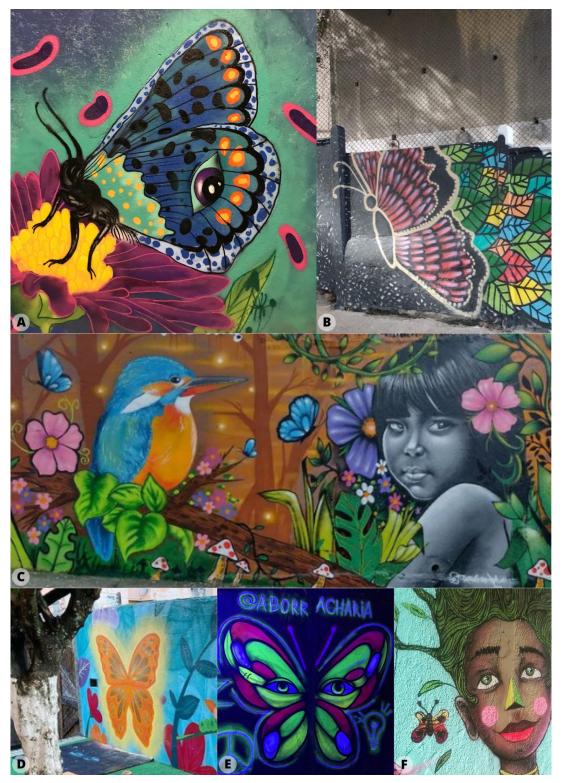


Figure 4. Butterflies (Lepidoptera) with wings positioned vertically over the body. A-B - Unknown author; C – Author: Gringoo Gogrin Gogrin; D - Unknown author; E – Author: Fael Primeiro; and F – Author: Danilo scanf.



Figure 5. A, B - Moths (Lepidoptera) depicted. C, E - Caterpillars (Lepidoptera) depicted. A-B – Author: Eder Muniz; C-E - Unknown author.



Figure 6. Hemipterans (Hemiptera) depicted. A-F – Author: Odé Frasão.

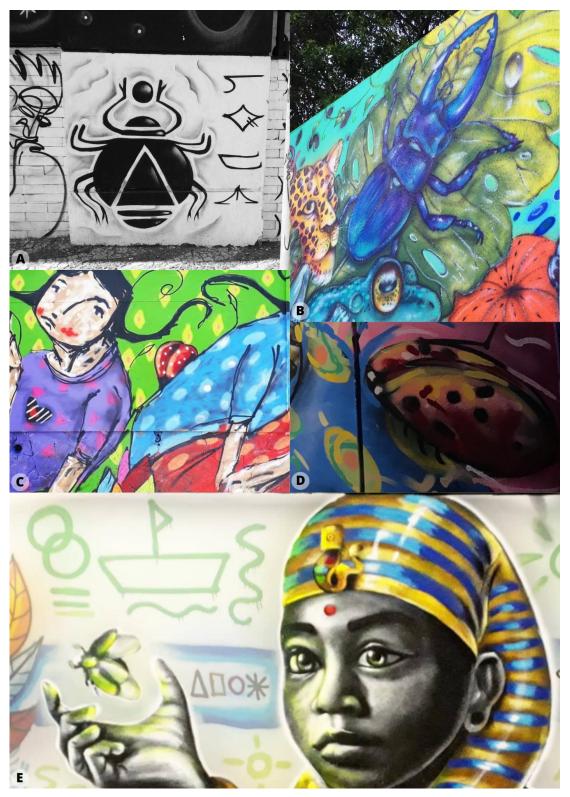


Figure 7. Beetles (Coleoptera) depicted. A – Author: Fael Primeiro; B – Author: Eder Muniz; C-D – Author: Limpo Rocha; E – Author: Oliver Dorea.

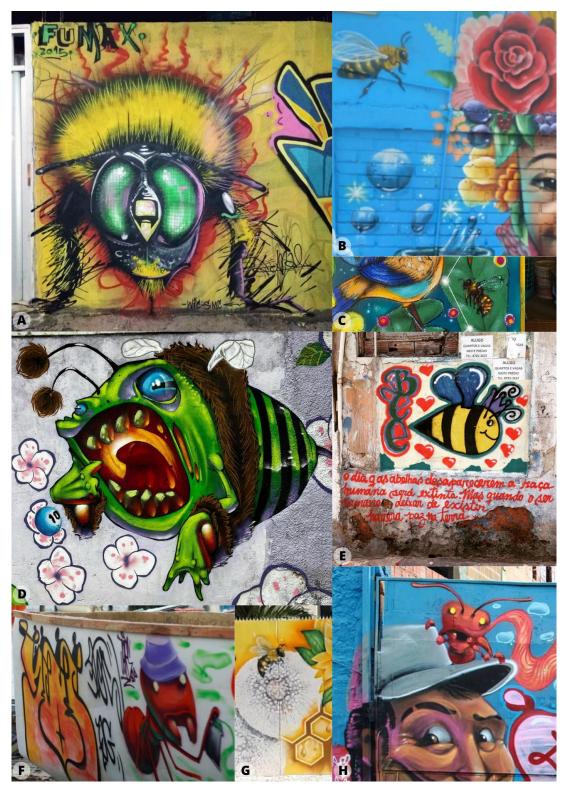


Figure 8. Bees and ants (Hymenoptera) depicted. A – Author: Fumax dos Anjos; B – Author: Oliver Dorea; C – Author: Eder Muniz; D – Author: Bigod O Sapo; E - Unknown author; F – Author: Joks Johnes Alves Leite; G – Author: Oliver Dorea; and H – Author: Joks Johnes Alves Leite.

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Figure 9. A, B – Flies (Diptera) depicted. C, D - Dragonflies (Odonata) depicted. A-B – Author: Fumax dos Anjos; C – Author: Tiana Lago; D – Author: Limpo Rocha.

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