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Evaluation of a Subsequent Deposition of Human Bodies in a Funerary Site in Sardinia (Italy) Using Entomological Evidence

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Abstract: Environmental elements, such as insects, plants, algae and microbes, may provide important information when reconstructing and interpreting past events. In archaeological contexts, the study of the insects associated with dead bodies can contribute to describe funerary practices. Funerary archaeoentomology is increasingly being utilized; however, there is a lack of application in ancient contexts, thousands of years old. During archaeological excavations carried out at the Filigosa archaeological site (Sardinia, Italy), a prehistoric grave cut named *Domus de Janas* was found. This type of grave is typical of the island and dates to the Recent Neolithic period. The sepulchral chamber containing 77 individuals (49 adults and 28 subadults) was investigated revealing the presence of some entomological fragments. The mineralized specimens found belonged to the immature stages of flies (Diptera) in the genera *Calliphora* and *Lucilia*, as well as beetles (Coleoptera) in the genus *Necrobia*. These species are typically associated with body decomposition. The analysis and interpretation of these findings led to the following conclusions based on archaeological hypotheses: (1) the cadavers were exposed for a period of time, allowing the arrival of the blow flies during the initial wave of colonization; (2) subsequent primary depositions occurred within the chamber, and (3) a geological change likely occurred shortly after the cessation of the tomb utilization leading to the presence of mud and water.

Keywords: funerary archaeoentomology; prehistoric grave; funerary practices; Calliphoridae; Domus de Jana

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1. Introduction

Insects represent the most abundant zoological group colonizing all terrestrial environments, and with few species have also adapted to marine habitats (e.g., bugs–Heteroptera: Gerridae, Hermatobatidae, Veliidae–and midge–Diptera: Chironomidae) [1–3]. It is not surprising that several species are often found associated with human goods [4], and some species are also found on human and animal remains, as part of the decomposer community [5]. In archaeology and in forensic science, the role of insects as a source of information is now recognized, and they are widely used to reconstruct events that occurred in "the past", including the "distant past" [6–9]. In forensic entomology, the insects collected from the cadaver and the crime scene are mainly used to estimate the minimum time since death (PMI min), which corresponds to the time of colonization of the body by the first colonizers, mainly belonging to the Diptera (flies) in the family Calliphoridae (blow or bottle flies), Muscidae (house flies) and Sarcophagidae (flesh flies) [10]. In this case, the time of development of the insects (eggs, larvae, puparia, adults) can be estimated because the rate of development, in the majority of insects, is temperature-dependent [11] and species-specific with some population differences well described for the blow fly *Chrysomya albiceps* [12]. In contrast, when the time since death is quite long and several communities of carrion-breeding insects have succeeded on the body, the estimation of the PMI is carried out considering the last community (wave of colonization) and the phenology of the species, particularly those belonging to the first colonizers [10]. The composition of the species capable of colonizing a body changes over time depending on the physical (mainly loss of water), chemical and biochemical (fermentation) transformations of the bodies. However, these communities are well defined, and the order of their appearance on the body is well understood, despite variations based on the geographical characteristic of the case. Additionally, the season and the body's exposure can significantly influence the pattern of colonization of a body.

First colonizers, mainly flies, as previously mentioned, require a significant amount of water for feeding, while the later colonizers, such as beetles in the family Dermestidae (Coleoptera) and clothes moths in the family Tineidae (Lepidoptera), are able to develop on dry tissues, feeding also on keratin. This very resistant protein makes up a significant portion of the skin and all the skin annexes, such as hair and nails. The insect families involved in the body colonization include the following: Calliphoridae, Sarcophagidae, Muscidae, Fanniidae, Piophilidae, Phoridae, Heleomyzidae, Stratiomyidae, Sphaeroceridae, Syrphidae, Milichidae (Diptera); Dermestidae, Cleridae, Histeridae, Staphylinidae, Ptinidae, Tenebrionidae, Nitidulidae (Coleoptera); Tineidae, Pyralidae (Lepidoptera); Formicidae, Vespidae (Hymenoptera) [13–22]. In addition, mites can also colonize the dry tissue of deceased bodies.

The aforementioned taxa refer to carrion-breeding or to predators of those species. It is also important to note that additional species living in the environment surrounding the body may be collected during scene inspections, such as phytophagous insects, spiders, millipedes and woodlice. Their presence is not directly related to the body; however, they can provide valuable environmental information, such as indicating a potential body transfer from a primary to a secondary crime scene [10]. Some authors define these species as opportunistic or occasional [23,24], but these words do not recognize the informative value of these elements. It is worth citation that forensic entomology is applied not only to cases referring to homicide or the abandonment of humans, but it is also applied to animals (wild, livestock and pets) in cases of violence, abuse, abandonment, negligence, poaching and illegal trade [25–27].

In recent years, there has been a significant increase in studying the entomological fauna associated with human and animal remains in archaeological contexts in Europe and South America [28–32]. These studies cover a temporal frame of over 3000 years and provide a more detailed understanding of funerary practices. Knowledge of the biology of the taxa found in situ provides information on burial procedures and on the period of the year when they took place [6,7,33–39]. As forensic entomology, funerary archaeoentomology has also been applied to non-human cases, such as a llama in an archaeological Peruvian site [7] and to an Egyptian dog colonized by carrion breeding insects and also by ectoparasites (ticks and the louse fly) [40].

Furthermore, the detection of "museophagous" species in osteological, anthropological and in mummy collections allows for the planning of an effective conservation strategy [41] to stop and avoid any process of biodeterioration of the collections.

The study and the interpretation of the insects from archaeofunerary contexts, defined as funerary archaeoentomology by the French scientist Jean-Bernard Huchet [42], shares the same approach, protocols and methodologies used in forensic entomology but without any legal mandate. For instance, funerary archaeoentomology is part of a more extended discipline: archaeoentomology that is defined as the study of insects found in archaeological sites [43]. The skepticism of using insects from past contexts has been bypassed only when some studies have proven that insects did not undergo significant speciation during the Quaternary period allowing for evaluations based on comparisons with modern specimens/species [34–46]. In addition to the funerary, there are many different topics of research in archaeoentomology: insect biogeography, environmental ecology, food trade and public health are just some examples [44]. It is worth mentioning that the comparison between a past biome and the present-day biome might allow for the detection of changes in the composition of the fauna [47] also in the pre-Anthropocene, as is well demonstrated in some studies performed on African samples [48].

Despite an increasing number of archaeological studies, including entomology, alongside commonly used disciplines, such as archaeozoology and archaeobotany, to enhance the reconstruction past events, insects are still under-investigated in ancient contexts, especially when they are thousands of years old. This lack of attention can be attributed to (1) the poor preservation of entomological evidence, (2) the techniques typically used to isolate archaeological elements from excavated material (e.g.,: the use of sieves with too large mesh) and (3) the limited knowledge and familiarity of archeologists with insect remains. The "non collection" of insect and more generally of arthropod remains from archaeological contexts is a waste of potential information that in an independent way can support or disprove archaeological hypotheses.

This paper serves as noteworthy example of applying the entomological approach to a thousand-year-old archaeo-funerary context focusing on the hypotheses clearly expressed by the archaeologists and anthropologists working on the material collected from the site. The excavation of human remains in 1965 from a "prehistoric" grave, known as *Domus de Janas*, at the Filigosa archaeological site near Macomer (Sardinia, Italy) (Figure 1) holds significant archaeological importance due to the age of the remains dating back to the Chalcolithic period, around the early 3rd millennium BC, making it unique in Sardinia.

Despite the good preservation of the bones, several questions regarding funerary practices in this culture remain open and require a multidisciplinary approach for answers.

The aim of this paper is to address the following archaeological hypotheses/questions by using information derived from insect fragments found in association with human bones, in order to understand the burial practices of this ancient Sardinian culture and to provide better insights into ongoing anthropological and geo-taphonomical research on the Filigosa archaeological material:

(1) Were the bodies exposed before their final burial in the inner sepulchral chamber of the tomb?
(2) Was the chamber used for an extended period with subsequent primary depositions?
(3) At the time of the excavation, 1965, the remains were found immersed in water and mud. Was this the original "environmental condition" of the chamber?

Figure 1. Location of the city Macomer city (Sardinia, Italy) (40°15′51″ N 8°46′30.22″ E). (© 2007−2018 d-maps.com).

Geographical, Historical and Archaeological Context

The town of Macomer, located in the mid-west of Sardinia (Italy), approximately 30 km from the coast (40°15′51″ N 8°46′30″ E, 563 m a.s.l.) (Figure 1) has Punic origins. In the 3rd century BC, the city was conquered by Romans that took advantage of its strategic position in the center of the Island.

During archaeological excavations that began in 1965, a mass grave containing several skeletonized human remains was discovered in the archaeological area of Filigosa. The remains were found in a sepulchral chamber of a *Domus de Janas*, a prehistoric grave cut typically found in Sardinia, dating back to the Recent Neolithic (~4th millennium BC, [49]). Original pictures of the excavation and the map of this site are reported in Rodriguez et al. [50]. The subsequent Ozieri culture, which developed during the Final Neolithic, represents the first Sardinian culture with a regional diffusion, characterized by uniform rituals and ceramic traditions throughout the Island. The Filigosa archaeological site is the first necropolis where a specific Eneolithic culture, known as Filigosa culture, was first identified, dating back around 2900 BC (Figure 2).

The chamber investigated here contained a minimum number of 80 individuals (47 adults and 33 subadults) carbon-dated (C_{14} data) between 2900 and 2700 years BC [50,51]. The burial context appeared intact, with the bones submerged in a water–mud sediment. These waterlogged conditions allowed for the preservation of the remains which, once cleaned and examined, exhibited mineralized growth attached to the surface. Additionally, common-use objects, such as a small wood jar, were recovered from the excavation [52–54].

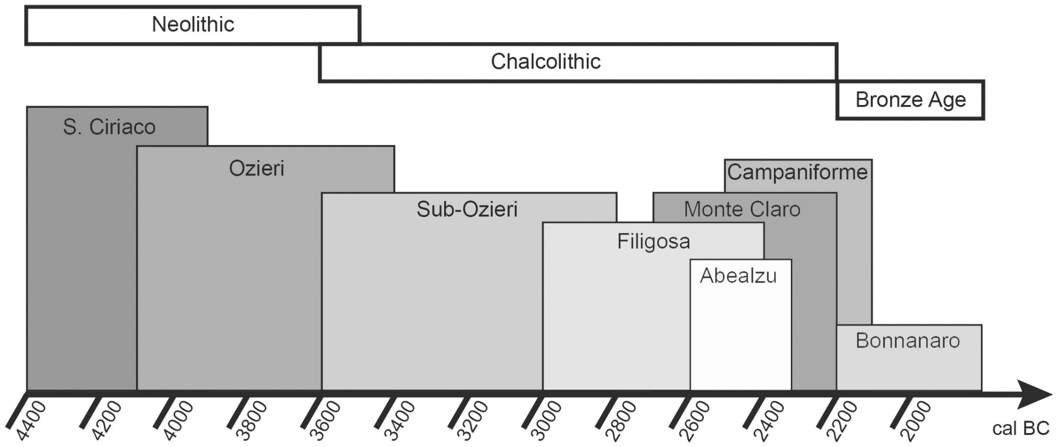

Figure 2. Temporal representation of the different Sardinian cultures (data from Melis and Piras, 2010 [51]).

2. Materials and Methods

In 2018, during a detailed examination of the human remains, most of which exhibited a dark coloration and bluish spots, the presence of several non-human elements was revealed on (Figure 3A) and inside (Figure 3B,C) the bones [51].

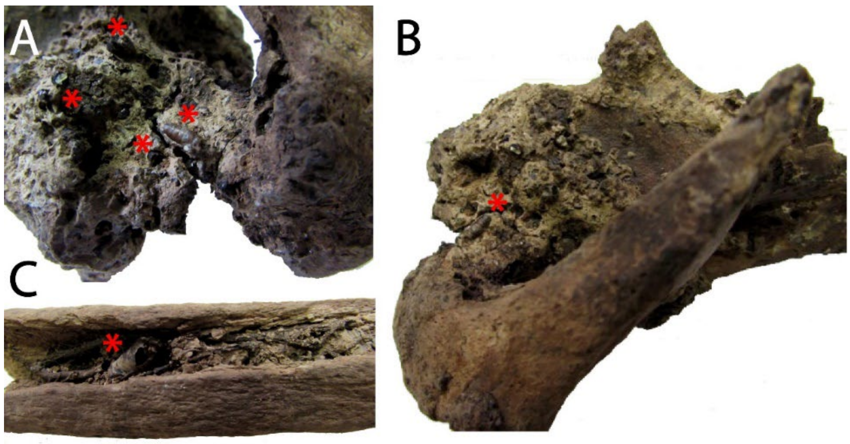

Figure 3. Diptera puparia nested into human bones from the mass grave in Macomer. (**A**,**B**) The inorganic mineral matrix covering the surface of the bones can be observed along with the nested Diptera puparia (red *). (**C**) An empty puparium is clearly visible and included within the cavity of the bones, which are clearly visible.

Entomological tweezers and paintbrushes were used to gently extract the entomological remains after soaking the bones overnight in warm water (40 °C). The samples, interspersed within the residual mud sediments, were stored in 70% EtOH (VWR, PA, USA) until further examinations. A double wash in EtOH 70% was performed, and the specimens were air-dried at room temperature for microscopic observations.

Morphological analysis was conducted using the Keyence VHX-2000/VH-Z250 digital microscope equipped with a Keyence VH-Z250R and VHZ20R lens and VHX-2000 Ver. 2.2.3.2 software (Keyence, Japan). When possible, the identification was carried out by comparing with the laboratory puparia collection and using specific Diptera identification keys [10,55,56].

The peculiarity of the samples requires particular attention for the identification. In fact, in old contexts, Diptera puparia represent the majority of the entomological findings. Puparia are barrel-like structures formed from the cuticle of the third instar larva where only few diagnostic characters are detectable. In addition, while it is common for puparia to retain the same characters as the larval stage [56,57], physical modifications, such as contraction during pupariation, may occur, resulting in a partial loss of definition and in the deformation of some features [58]. Moreover, elements, such as oral sclerites, are not always present among the remains of empty puparia, and the spiracle slits can be not completely visible. Molecular analyses of DNA cannot be performed on puparia of an archaeological origin due to the initial paucity of DNA molecules on/in the chitinous matrix and because of the DNA-degradation process. A PCR inhibitor can also affect the possibility of amplification when, despite all of the abovementioned issues, a very small amount of DNA is extracted. At the moment, information is not available about the possibility of identifying puparia of archaeological origin using the cuticular hydrocarbons: an approach that deserves particular attention [59–62]

For all of these reasons, a long experience in morphological identification of immature flies and the availability of a complete reference collection are fundamental for the study of such material.

3. Results

The majority of the entomological remains (around 20 specimens), identified as Diptera puparia, both hatched and closed, were found nested inside the bone's "marrow cavity" (Figure 3C). Other specimens (around 10 specimens) were found in the bones' cavities adhered to mud and soil sediments (Figure 3A,B).

Almost all the findings were identified as mold/cast mineralized puparia at non-definable phases of development [58], with the cuticle complete or patched and still attached to the mineral component. The segmentation of the puparia content was still recognizable in some specimens (Figure 4).

Among the best-preserved puparia, an observation at a higher magnification revealed a compact and fibrous structure of the mineral casts, as well as the striped pattern of the dorsal side of the puparium (Figure 5).

The examination of the entomological assemblage also revealed some specimens near the completion of the metamorphosis, indicated by the presence of a well-developed trichosity preserved on the dorsal surface of the specimens (Figure 5).

In most cases, the morphological characters used for the species identification were missing due to the taphonomic transformation of the immatures into mineral fossils. However, in a few cases, the posterior spiracles were well preserved allowing for the identification of the puparia as belonging to species in the family Calliphoridae (Diptera) (Figure 5). The size and the oval shape of some specimens resembled the features of species in the genus *Lucilia* Robineau-Desvoidy, 1830 [56]. In contrast, the smaller size and rounded shape of the posterior spiracles belonging to specimens in Figure 5E showed a close similarity with *Calliphora vicina* Robineau-Desvoidy, 1863. Furthermore, in the latter, the posterior spiracles are located at a 45-degrees angle, rather than being orthogonal as in *Calliphora vomitoria* (Linnaeus, 1758).

In addition to the dipteran remains, two elytra of beetles of the genus *Necrobia* Olivier, 1795 (Figure 6) (Coleoptera: Cleridae) were recognized. The pattern of the punctuation and the peculiar shape of the distal part of the elytra suggested that they belong to *Necrobia rufipes* Degeer, 1775.

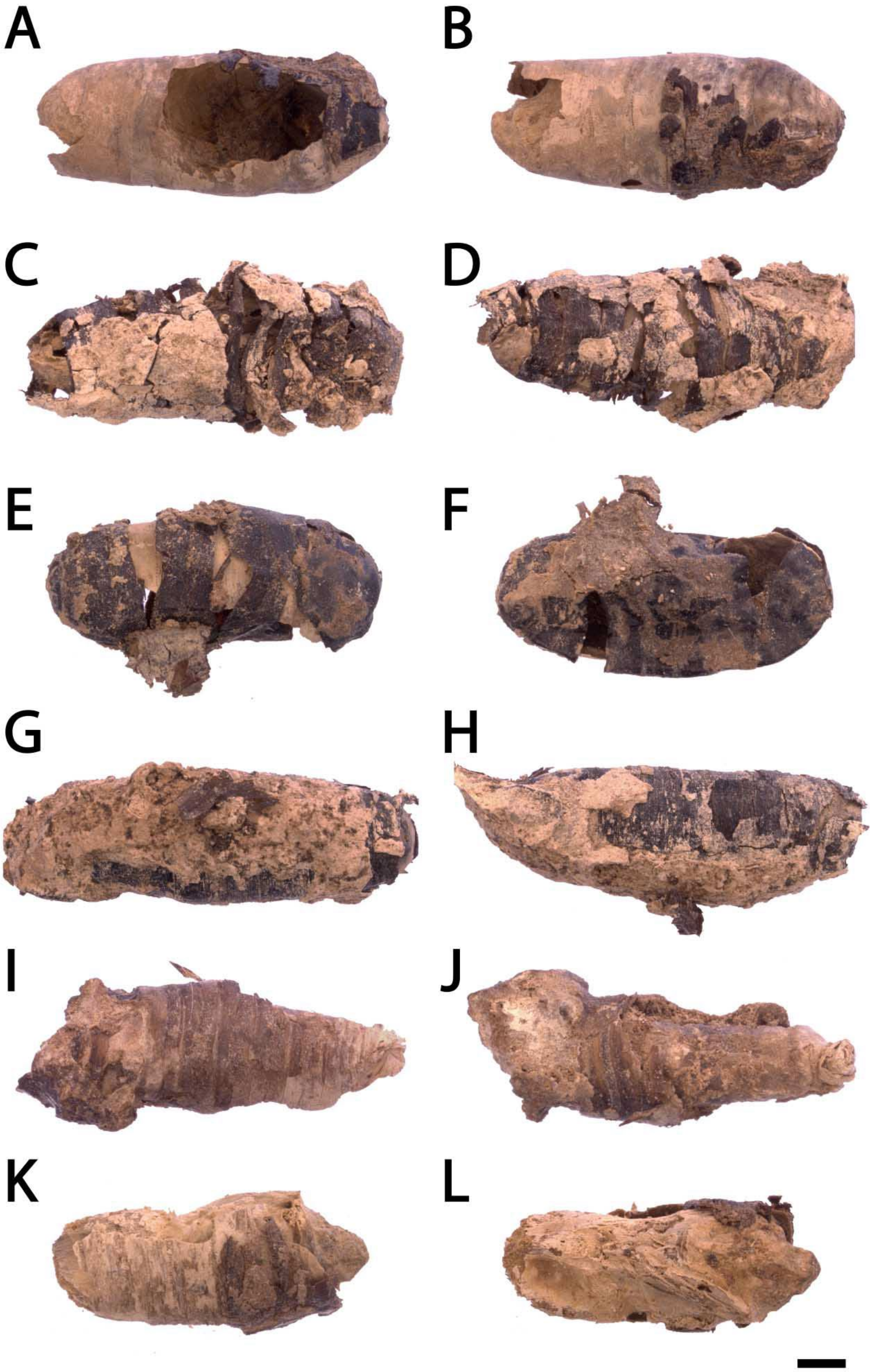

Figure 4. Mold/cast mineralized puparia extracted from human bones. Different levels of preservation are shown. The organic cuticle was patched and still attached to the mineral component (**A**,**B**,**I**–**L**) or complete (**C**–**H**). Scale bar: 1 mm.

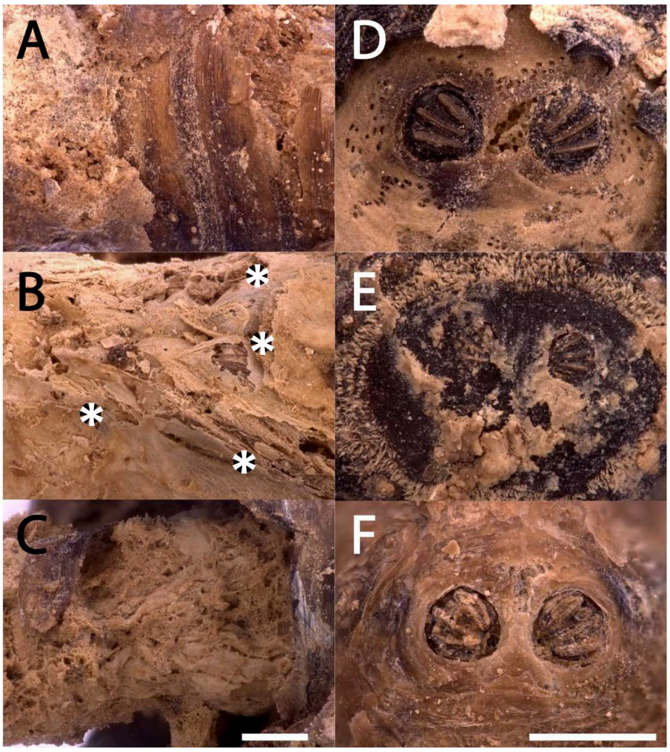

Figure 5. Details of mineralized puparia. (**A**) Striped pattern of the dorsal side of the puparium, (**B**,**C**) compact and fibrous structure of the mineral casts and (**B**) microtrichosity of the dorsal. (**D**–**F**) Calliphoridae posterior spiracles. Scale bars: 500 µm.

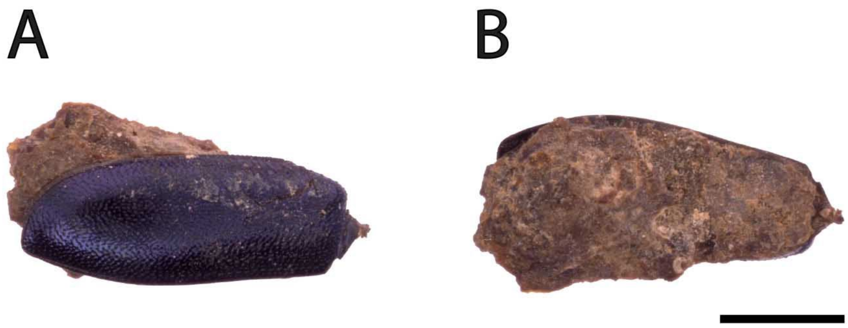

Figure 6. *Necrobia rufipes*, single elytron. (**A**) Dorsal view, (**B**) ventral view. Scale bar: 1 mm.

4. Discussion

The detailed examination of the bones, collected in 1965, allow for the identification of exogenous elements, partially mineralized, identified as insects, mainly Diptera puparia. Unfortunately, the original sediments of the tomb were not available for further research, and the condition of the tomb had been completely perturbated not allowing for a new in situ investigation. However, the type and the quality of the findings allow for an interpretation of the context starting from the archaeological data and from the archaeological and anthropological hypotheses.

Diptera puparia were found to be both adhered to the surface of intact bones through the formation of mineral growth and within the cavities of some of the bones showing post mortem fractures. Consequently, the presence of these necrophagous flies is not linked to the decomposition of the corpses to which the bones belong. Instead, it is associated with the decomposition of other bodies subsequently placed. It is also worth mentioning that the Calliphorinae larvae (genera *Lucilia* and *Calliphora*) at the end of the III instars (known as post-feeding or migratory or wandering stage) usually move away from the body in which they develop feeding on the soft tissue during the "fresh stade" to pupate in a sheltered place to avoid predation and potential bacterial infections [63]. This confirms the hypothesis of subsequent depositions. While the burial site was continuously used, only carbon dating or other archaeological findings could indicate its duration.

The identification of flies within the Calliphoridae family, well known as the first colonizers of a cadaver in exposed environments [10], indicates that the cadavers were exposed long enough for the flies to lay eggs and developed on them, as evidenced by the presence of hatched puparia. In particular, despite some records of *C. vicina* from hypogean contexts, species in the genus *Lucilia* have not been reported from this type of environment. Instead, they are typically found on exposed bodies in sunny and shadow areas [64,65]. In Sardinia, in addition to these two taxa, other species of blow flies belonging to the first colonization waves of exposed bodies have been reported and cited also from archaeo-funerary contexts: *Calliphora vomitoria* (Linnaeus, 1758), *Protophormia terraenovae* (Robineau-Desvoidy, 1830) and *Phormia regina* (Meigen, 1826) [35,66]. It is worth mentioning that *Phormia regina* seems to be extinct in Sardinia, whereas it is quite common at the beginning of the summer in the continental Italian regions and in the rest of Europe [35]. The extinction of this species could be due to transformations of the environment, to changes in the interaction of humans and livestock sharing, in the past, the same places or to the competition with other species.

At the same time, the absence of fly species belonging to other families suggests that the bodies were buried soon after the colonization by blowflies. However, the lack of fragments of taxa typical of burial in confined space, such as Phoridae and *Hydrotaea* spp. (Muscidae), is challenging to explain and could be related to peculiar environmental conditions, such as submersion or running waters through the tombs, after the first colonization of the blowflies. The lists of the species collected from bodies buried in crypts, natural and artificial underground spaces and coffins in Europe [35,37,39,55] indicate that the most abundant taxon in these environments is the genus *Hydrotaea* Robineau-Desvoidy 1830, which was also reported by Smith [10] as the first colonizer of buried bodies in a forensic context. This genus has a cosmopolitan distribution, and in Europe, eight species have been reported from human and animal cadavers despite the most common species from archaeological contexts being *Hydrotaea capensis* (Wiedemann, 1818) [55]. This species does not appear on the Checklist for the Italian fauna for Sardinia (https://www.faunaitalia.it/checklist/ accessed on 5 January 2025), but it has been reported in an archaeo-funerary context in Northern Sardinia on two partially mummified bodies [35]. Also, Phoridae, in the genera *Megaselia* Rondani, 1856, *Diplonevra* Lioy, 1864 *Triphleba* Rondani, 1856 and *Conicera* Meigen, 1830, known as coffin flies, are quite common in buried bodies and also already reported from archaeo-funerary contexts in crypts [39]. The very small size of their puparia (1–2 mm) can affect their "survival" on the bones. Their small size is also one of the causes of their underestimation in archaeological contexts. As the common name of this insect, coffin flies reveal their attitude to colonize a buried body, where, in some cases they are the only colonizers of the cadaver.

In addition to blowflies, the elytron of a single specimen of *N. rufipes* (Cleridae), usually associated with human bodies during the late stages of decomposition, was found. However, the survival of a single elytron is an indicator of the presence of a large original population of this species. *Necrobia rufipes* feeds on exposed dried human/animal remains and can be predator of fly larvae, but it has also been reported from dried food, and it is commonly known as the red-legged ham beetle or as the copra beetle. This species is rarely found on cadavers buried at depths greater than 30 cm [67]; however, it is common in cadavers from crypts and catacombs especially in dry conditions where is it usually present in large numbers [68,69]. This species has been also reported from Egyptian mummies and erroneously described as a new species *Necrobia mumiarum* by Hope in 1834 [68]. Also, for beetles, the absence of any other species able to feed on bones, such as the species in the genera *Dermestes* Linnaeus, 1758, *Anthrenus* Geoffroy, 1762 and *Attagenus* Latreille, 1802 (Dermestidae), known as larder beetles for the first and as carpet beetles for the others, is challenging to explain and could be related to peculiar environmental conditions or to the "washing away" effect of the water accumulated in the funerary chamber. Also, in this case, the absence of the original sediment does not allow for a specific search of fragments of these taxa.

On the other hand, the preservation state of the puparia is a key factor in better describing the taphonomy of the grave. The "nesting" of the findings within the inorganic mineral covering the human bones, as well as the mineralization of the puparia, undoubtedly occurred as a tertiary event (following burials and subsequent depositions) after the colonization by blowflies. This likely occurred when a new geochemical condition emerged. Such an environmental condition was likely induced by the organic decomposed matter, an increase in water in the grave and the specific chemical composition of the rocks, favoring the mineralization process, and, on the other site, the formation of Vivianite, as reported by Rodriguez and coworkers [51].

Special attention must be paid to the mineralization of the organic matter composing the fly pupae. Puparium is the barrel-like case inside of which the metamorphose occurs from larva to adult; pupa is the metamorphosing stage. Even though the external feature of a puparium does not change during the time, except for the initial darkening, inside, the following phases can be detected: pre-pupa, pupa, pharate–the complete adult before the emergence. The majority of the analyzed puparia were in a state of semi-mineralization, a phenomenon of inside-out mineralization (infilling) that occurred leaving the puparia cuticle intact (mold/cast specimens), whereas only a few were in a state of full mineralization. These two kinds of mineralized specimens were also found by McCobb and co-workers investigating arthropod remains recovered from a 16th century deposit in York [70]. The mineralization of arthropods remains common in archaeological deposits, especially in urban contexts with the majority of the records originating from archaeological excavations in the UK [70–73] but also from Georgia, Jamaica and Kenya contexts [74–76]. Although the mineralization affected mainly organisms within the phylum Arthropoda, botanical remains, such as cereal grains [73], apple seeds [77] and other fruits and seeds [68], were also found to be affected by the same phenomenon. In addition, interesting observations about the mineralization process in Lepidoptera immatures have been made on Bombycoidea fossils [78], leading to important conclusions that can also be applied to Diptera, especially in terms of the approach to analyzing mineralized insects and interpreting their abundance or scarcity in an archaeological context.

Regarding the latter point, it is important to remember that the insects collected from an archaeological context—specifically, an archaeo-funerary context—do not represent the entire entomological fauna present when the bodies were buried or during their decomposition process. Differences in species vagility, predation and physical and chemical resistance and differences in the taphonomical processes can affect taxa and developmental stages differently. For example, in Diptera, puparia are the most commonly represented specimens in archaeological cases, whereas adult flies are rarely found. In contrast, in Coleoptera, fragments of adults are the most common findings, and in Lepidoptera, cocoons often represent the only record of this taxon. In addition, the list of species associated with an archaeological context allows, as is already performed for mollusks and vertebrates investigated under the umbrella of archaeozoology, for a compilation of entomological lists of past biodiversity. This is fundamental for further analyses of species spread—including invasive and alien species—environmental changes, and the potential spread of diseases for which insects can be vectors or mechanical carriers.

5. Conclusions

Despite a paucity in terms of the number of specimens and species, the entomological assemblage collected from the *Domus de Janas* of the archaeological area of Filigosa in Sardinia allows for a discussion of the archaeological hypothesis and to draw the following conclusions about the funerary practices of people of the prehistoric/protohistoric culture of Filigosa.

(1) The finding of insects typical of the colonization of an exposed body indicates that the cadaver had been exposed for a period of time allowing for the arrival of the blow flies of the first wave of colonization (genera *Calliphora* and *Lucilia*). The exposure of the body before its burial inside the mortuary chamber would also occur in the funerary bed discovered at the entrance of the tomb, a space in continuity with the external environment that allows for blow fly searching activity, especially for the flies in the genus *Calliphora*. Indeed, flies of this genus are also able to colonize bodies in the first meters of a natural and artificial cavity where light and temperature are limited and anyway lower compared to the external environment [79–81].

(2) The presence of insects inside the fractured bones is clear evidence of the contamination of those human remains by insects colonizing a different decomposing cadaver (or more than one), likely laying in proximity. This, in association with the large number of human individuals found in the tomb, supports the hypothesis of subsequent primary depositions. This is supported not only because of the insects of the first wave of colonization, when the body is still in a fresh decomposition stage, but also because of the finding of some dried/mineralized skin associated with the bones.

(3) Even though flies can be found in wet environments and are able to colonize floating bodies, species in the genus *Necrobia* are described from dry environments, which is not consistent with the condition found by the archaeologist in 1965 during the excavation. A geological change must have occurred shortly after the end of the utilization of the tomb causing the infiltration of water inside the tomb.

We cannot exclude it as the cause of the end of its utilization as a sepulchral area. Further independent analyses would indeed be helpful to clarify this hypothesis, which is already partially supported by the state of preservation of the bones and the growth of specific minerals, as well as by the mineralization of the puparia. This is a very unique case of puparia mineralization in funerary contexts that has been, however, reported in urban archaeology from pits and wells of different ages, where the waterlogged environment facilitates this phenomenon. The interesting mineralization of insects in funerary contexts has also been reported in the presence of metals, particularly iron and bronze. In fact, the presence of metal accessories deposited in contact with the deceased, such as swords, decorative elements and belt plates, can contribute to the mineralization of the organic structures [82].

Despite the detection and collection of insect fragments from the bones allowing us to infer the funerary practices that occurred in this Domus de Jana, it is clear that the appropriate collection and storage of the original sediments would enable a more complete definition of the entomofauna. This necessitates, at least for the future, sampling an adequate number (minimum five litters for small sites, e.g., a single burial) of sediments for entomological and botanical analyses, which may independently support or refute the archaeological hypotheses. It is also worth mentioning that the volume sampling of an archaeological site should depend on its characteristics (extension, depth, stratigraphic complexity, etc.) and on the objectives of the project.

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