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Case study

The ivy and the palm: Care and mourning for a child buried in 19th-century Madrid, Spain

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ABSTRACT

Objective: To evaluate indicators of care and symbolism in a mid-19th-century child burial.**Materials:** Mummified human remains, a medical bandage, remnants of plants and clothing.**Methods:** Dental radiography, scanning electron microscopy, botanical identification, clothing description, a review of funerary iconography.**Results:** A dental age between 5.5 and 6.5 years and a female sex were estimated. The bandage on the left arm contained a metal plate composed of copper and zinc, and an ivy leaf (genus *Hedera*). A palm branch (*Phoenix dactylifera*) was placed in the coffin, and the corpse was dressed in blue clothing.**Conclusions:** The bandage combines traditional knowledge (*Hedera* leaf) and contemporaneous recommendations from medical texts (metal plate) and represents a case of care of a child in mid-19th-century Madrid. The blue clothing and braided palm branch represent a Christian codified mourning for her death.**Significance:** Evaluating funerary objects alongside skeletal remains has provided insight into ways in which traditional medical treatment, alongside current religious symbolism was intertwined to provide care and to mourn for a 19th-century child.**Limitations:** Preservation concerns and time constraints due to reburial precluded a complete study of the remains, and the type of ivy leaf (fertile) limits identification at the species level.**Suggestions for further research:** A review of plant use in the funerary and paleopathological record during the Early Modern Period.

1. Introduction

The medical and symbolic use of plants by humans dates back millennia (Hardy, 2021; Morales et al., 2024; Nadel et al., 2013) and is probably related to our evolutionary history (Freyman et al., 2024; Weyrich et al., 2017). The study of ancient texts and iconography

(Bussmann and Sharon, 2006; Petrovska, 2012; Silva et al., 2014), of archaeological findings associated with funerary contexts (Ives, 2021; Masur et al., 2018; Preiss et al., 2005; Tereso and Vaz, 2024; Vaz et al., 2021), and of current societies through ethnobotanical research (Dafni et al., 2006; Lautenschläger et al., 2020), shed light on this complex relationship across human history. For instance, from written sources

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and findings in burials, there is sound knowledge regarding the use of plants for embalming (Corbineau et al., 2018). The medical use of plants is more difficult to study in funerary contexts due to preservation issues, and findings are usually associated with the gut content of mummified remains (Nystrom and Piombino-Masali, 2017; Oeggl et al., 2005). The medical use of plants has also been discussed within the recent framework of the bioarchaeology of care (Tilley, 2015; Tilley and Schrenk, 2017), providing insights beyond inferences from skeletal findings (Nystrom and Piombino-Masali, 2017; Zink et al., 2019). In funerary contexts, several plants have garnered diverse meaning across human societies. For example, in the Xiongnu burials from the Eurasian Steppes, millet has been found in funerary contexts as a symbol of rebirth and immortality (Korolyuk and Polosmak, 2010), while in the Mediterranean area, the blue lotus was associated to death and rebirth, originally in ancient Egypt and later in other areas (Jannot, 2009; McDonald, 2018).

In this study, we analyze the partially mummified remains of a girl recovered from a mid-19th-century burial from a Convent located in the historical downtown of the city of Madrid. Contained within the burial was a wooden coffin, clothing, and two plant specimens; one associated with medical treatment and one imbued with religious, funerary symbolism (Fig. 1).

2. Material and methods

An archaeological intervention took place in 2015 in the crypt of the church of the Convento de Las Trinitarias Descalzas, built in 1673 and currently open to visitors in Madrid. Children's burials were found within the crypt, containing a minimum of 400 children, and dated to the mid-19th century based on three burials with associated documents dated to 1843, 1848 and 1849 (García-Rubio and Etxeberria, 2018). Permission was granted by the religious authorities to carry out non-destructive analysis of selected bones and materials. From a

radiograph of the mandible (University Hospital La Paz, Madrid), age was estimated using dental maturation rates (AlQahtani et al., 2010). Osteological sex estimation was not attempted, but the sex was estimated based on the examination of the clothing. Carious lesions and alveolar bone resorption were recorded. Botanical identification was based on the assessment of the morphological features of the specimens (Castroviejo, 1986; Valcárcel, 2008; Valcárcel et al., 2003; Valcárcel and Vargas, 2010). Non-destructive energy dispersive spectroscopy (EDS) with a scanning electron microscope (SEM), was undertaken at the Service of Non-destructive Techniques (National Museum of Natural Sciences, Madrid) on a fragment of the metal plate found within the bandage. This technique allows qualitative and semi-quantitative analysis of the material (Goldstein et al., 2018). Two samples of the metal plate were analyzed through EDS, with four points selected for study; two located on the surface of the fragments, and two on surfaces resulting from breakage to the borders of the fragments.

3. Results

A dental age between 5.5 and 6.5 years was estimated. Carious lesions were observed on the crown of the four mandibular deciduous molars, with resorption of alveolar bone surrounding the left deciduous molars (Fig. 2). An oval defect on the mummified skin of the right arm, covered by the bandage, was interpreted as a pathological lesion (Fig. 3E).

A bandage was observed on the right arm (Fig. 3A). The removal of the bandage revealed that it was formed by four elements. The first was a strip of cloth around the arm (Fig. 3B). The second element consisted of two thicker pieces of gauze that contained the third element, a highly corroded metal plate (Fig. 3C). The fourth element was a plant leaf (Fig. 3D) in direct contact with the oval defect of the skin, interpreted as a pathological lesion (Fig. 3E).

In the four points selected for study (Fig. 4), the most abundant



Fig. 1. Burial. A: The wooden coffin in situ, before opening. B: The coffin without the lid, showing the partially mummified skeleton (observe face and hands), with blue clothing, shoes, and the presence of a palm leaf with its leaves braided, some of them with blue fabric bows, by the right side of the body. The bandage can be observed on the right arm.

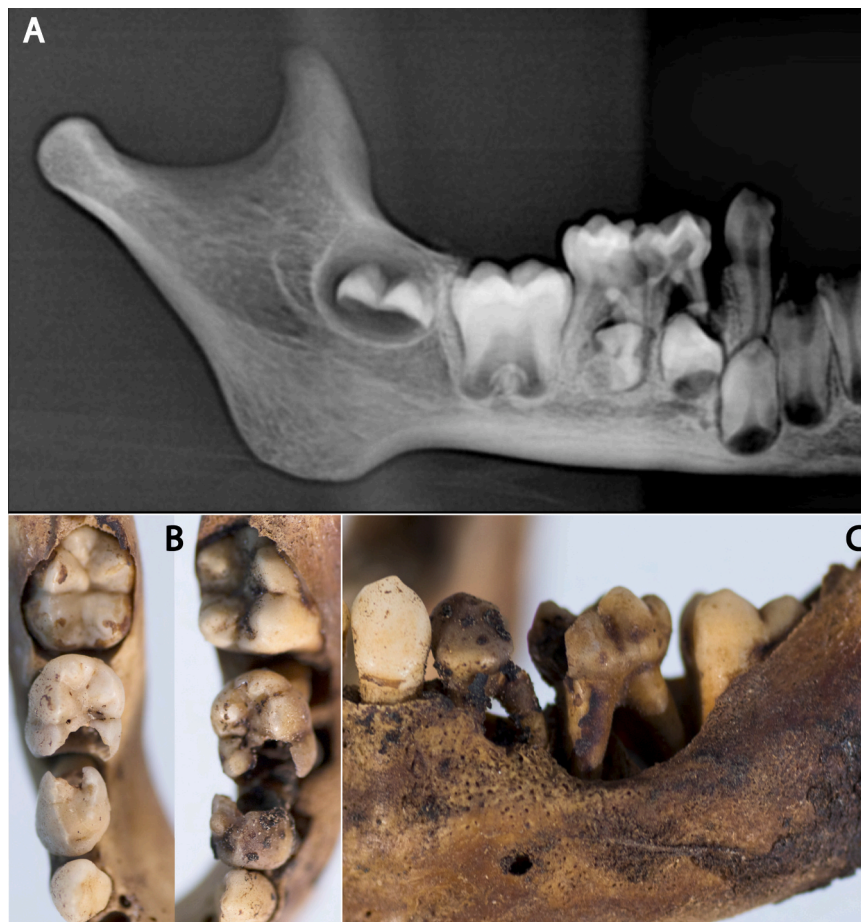


Fig. 2. Dental age and oral health. A: The Orthopantomography of the right half of the mandible for age estimation. B: Occlusal view of the left and right deciduous and first permanent molar with the carious lesions on the deciduous molars. C: Bone resorption at the level of the second left deciduous molar.

element was copper (63.98–91.96 %), followed by zinc (from absent to 21.32 %), with chlorine as the third most abundant element (4.13–19 %) (Fig. 4). The proportion of copper to zinc, which ranged from 3 to 8 (Cu/Zn), could point to brass, although the proportion is larger than expected. The corrosion of the plate and the lack of further analysis precludes a final conclusion.

The leaf, in contact with the mummified skin of the right arm, was identified as a fertile ivy leaf (Fig. 5). Given the location of the burial in central Spain, four ivy species could have been used: *H. helix*, *H. hibernica*, *H. algeriensis*, *H. maroccana*. The leaf's morphology, appearing ovate in shape and as long as it is broad, allows us to discard the two non-native species (*H. algeriensis* and *H. maroccana*), as they have generally elliptic fertile leaves, sometimes ovate but always much longer than wide. Both *H. hibernica* and *H. helix* have fertile leaves like the one found in the bandage. Hence, the leaf morphology does not help distinguish between the two species. The characteristic that may have helped distinguish between the two species (leaf hairs) was not preserved. We thus consider taxonomic identification at the genus level.

A palm branch, with its leaves braided, some of them with blue fabric bows, was found placed by the right side of the body. The braided leaves do not have any botanical features that allow species identification. However, they most likely come from *Phoenix dactylifera*, or the date palm.

The clothing was consistent with the attire of Spanish women in the mid-19th century, suggesting this individual was a female. The clothing, a loose-fitting coat made of sky-blue silk, was in very poor condition, and seemed too big for the size of the body. The hem had been sewn with basting stitches (usually used provisionally to join a couple of pieces of fabric). The size of the dress (too large), and the type of sewing, seemed

to indicate that it was a reused garment, the length of which was adjusted to the height of the girl. The heeled shoes the girl was wearing appeared to be small, as they had the heel counter folded inwards so that the feet could fit inside.

4. Discussion

We interpret the presence of the metal plate within the bandage as a protective and supportive element for the pathological lesion and the leaf of ivy respectively, but since its main component was copper, we must consider its use as antiseptic. In coetaneous handbooks of bandages, shields (*escudos*) are mentioned; a metal or rubber plate for holding the pieces of a dressing, generally used in the cure of ulcers on the limbs (*Manual de Vendajes*, Ossorio-Gómez, 1877, p. 144). Preserving dressings (*apósitos preservativos*) (*Extracto de apósitos y Vendajes*, Juan Cuesta y Ckerner, 1868, p. 30–31), and preserving plates (*planchas preservativas*) (*Compendio del arte de los vendajes*, Gerdy, 1839, p. 54) are also mentioned, defined as metal or leather plates used as protective devices for ulcers. The thin metal plate found in the bandage, not in direct contact with the skin, but placed between two layers of gauze, would fit these uses. Current knowledge indicates that the local release of copper ions supports the Fenton reaction leading to the production of antibacterial hydroxyl radicals (Salah et al., 2021; Sandoval et al., 2022), but this antiseptic quality of copper has been recognized across human societies since ancient times, with its use recorded in medical texts and pharmacopoeias (Milanino, 2006).

In the paleopathological literature, there are four cases where copper-alloy plates have been documented and interpreted as part of a medical treatment (Hallbäck, 1976; Janssens, 1987; Knusel et al., 1995;



Fig. 3. Bandage. A: The bandage before examination, note that both hands were held in praying position with the fingers intertwined. B–E: Sequential removal of the parts of the bandage, showing the strip of fabric holding it to the arm (B), the metal plate (C), the ivy leaf (D) and the ulcer (E).

Milanino, 2006). In two of these examples, the content of copper in the plates was higher than in the present case, 99 % in the Swedish case (Hallbäck, 1976), and an average of 93.69 % in the plate from York (Knusel et al., 1995). As discussed by these authors in the context of medical knowledge contemporaneous to their cases, the use of copper plates could have had an additional medical purpose beyond a mechanical use. Olive-Busom et al. (2021) also suggest that the copper detected in the borders of a lesion diagnosed as otitis media in a Medieval Islamic skeleton, could be caused by the application of copper acetate, a treatment mentioned in Medieval Islamic treatises to treat inflammation, clean wounds and aid cicatrization, although these authors do not deny that the green staining could be due to artifacts in the burial (shroud pin, earring). The metal plate, not in direct contact with the skin, was probably used as mechanical support for the ivy leaf, although the choice of a material mainly composed of copper could have been also motivated by its antiseptic properties.

Ivy leaf is a plant with an ancient record of medical use, cited in *De Materia Medica* by Dioscorides, who stated that “its leaves, boiled with wine, are applied as a poultice for any ulcer” (Gabaudan and Bracero, 2015), and recommended by Avicenna for skin infections in his *Canon of Medicine* (Mahdizadeh et al., 2015). But in the paleopathological literature, there is only one report of the medical use of ivy leaves. Giuffra and colleagues (Giuffra et al., 2008) studied the mummified body of the Renaissance noblewoman Mary of Aragon (1503–1568), which found ivy leaves placed inside a pocket of a bandage that covered an ulcerous lesion potentially resulting from tertiary syphilis. These authors report that the use of ivy was included as a remedy for the treatment of skin

conditions in most European pharmacopoeias and medical books from the 15th to the 16th centuries. Our review of the pharmacopoeias published in Spain between 1739 and 1884 revealed the use of fresh leaves of *Hedera* in four out of ten texts consulted, the oldest from 1803 (*Pharmacopoea Hispana*), and the most recent from 1884 (*Farmacopea Española*). The use of ivy leaves has persisted in several European regions well into the 20th century. In the seminal work published in Spain in 1961 titled *Plantas Medicinales. El Dioscórides renovado*, it is stated that “To heal sores, you can use the decoction of the leaves, which are prepared by boiling one ounce of them, freshly picked, in one liter of water. After washing, the sore or ulcer is covered with one or two ivy leaves that were used to prepare the decoction and covered with gauze and the necessary bandages” (Font Quer, 1961). Recent ethnobotanical work with older adults in Spain (Alarcon et al., 2015; Menendez-Baceta et al., 2014; Pardo de Santayana et al., 2014), and in other European countries (De Natale and Pollio, 2007; Neves et al., 2009; Shannon et al., 2017), have reported the frequent use of ivy leaves to treat skin conditions (open sores, ulcers, wounds). While historical medical remedies might not have scientifically tested effects, there is evidence that *Hedera* species do have some antibacterial properties, probably dependent on the release of phytochemicals, particularly saponins, interacting with lipids and water (Cioaca et al., 1978). From a wider perspective, ivy has symbolic meaning in seminal books in Spanish literature, such as Don Quixote (Pardo-de-Santayana et al., 2006), or in famous paintings like the Triumph of Bacchus (or the drunken), by Velázquez (Ca. 1628), following ancient mythological traditions.

The oval opening of the skin immediately underneath the ivy leaf

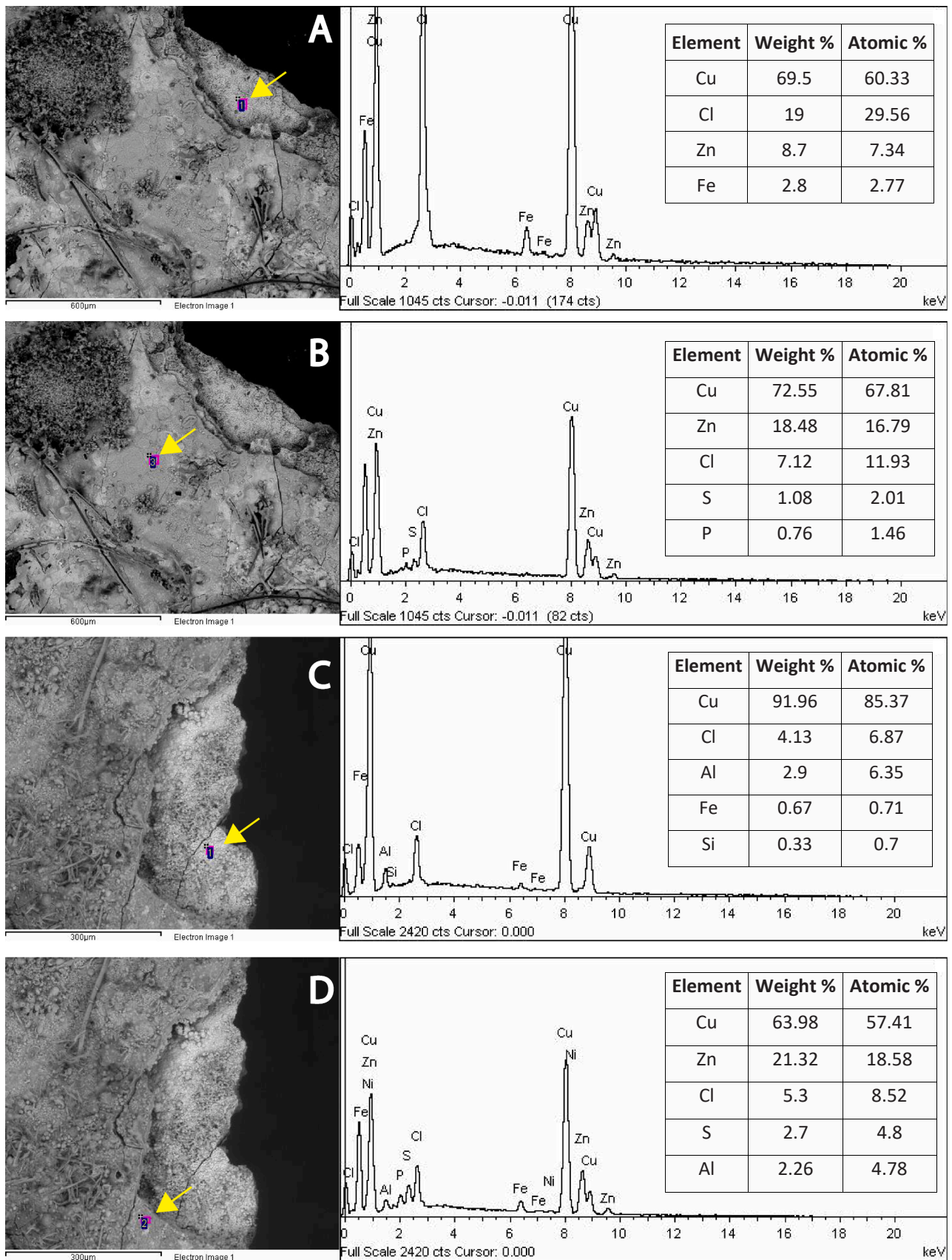


Fig. 4. Metal plate analysis. Images from the SEM at the four locations chosen for EDS analysis (yellow arrows A–D), and the respective results on the right.

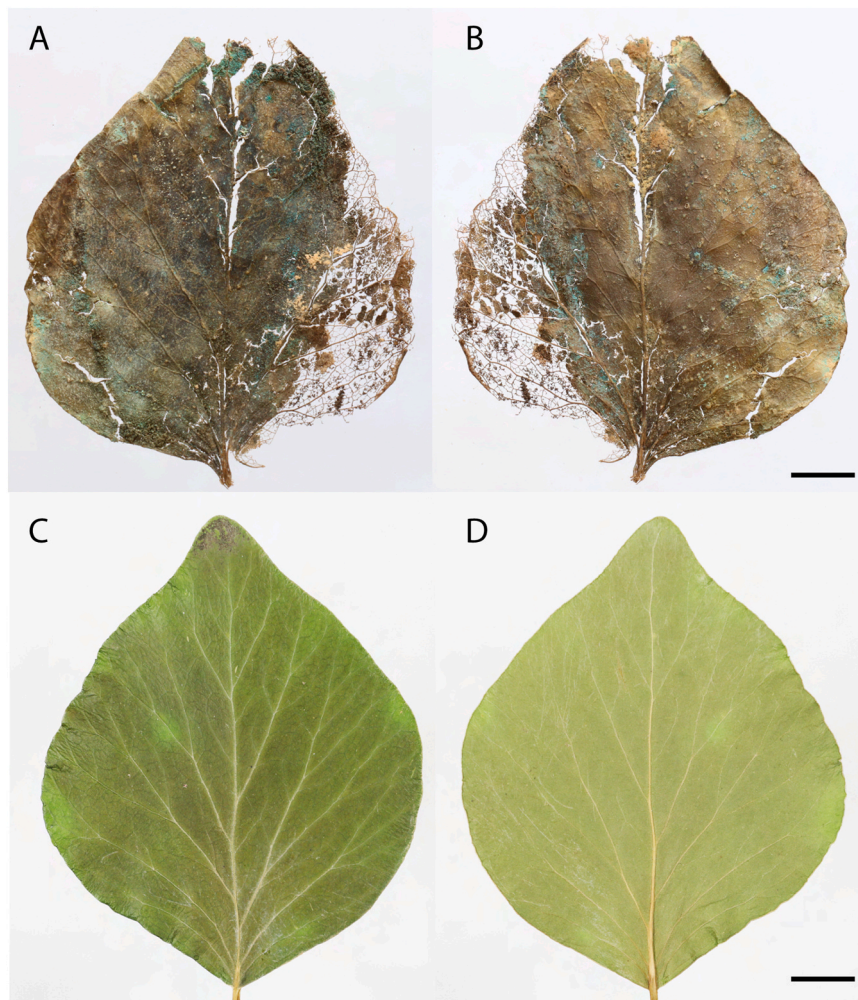


Fig. 5. *Hedera* leaf. The leaf recovered from the bandage in abaxial (A) and adaxial (B) views, and the same views from a collected and half-dried leaf of an ivy plant from the streets of Madrid (C, D).

was interpreted as a pathological lesion. It could be a dermatologic manifestation of one of the frequent infectious diseases in Spain during the 19th century (tuberculosis, diphtheria or syphilis) (Navarro et al., 2002), although it could also be an acute bacteremia following osteitis or osteomyelitis, a condition with rapid, high mortality in children before the antibiotic era (Dennison, 1951). No sign of a fracture or any other pathological condition was observed in the exposed part of the humerus, and the diagnosis could not proceed further due to time constraints, programmed reburial, and the decision not to alter dramatically the disposition of the body. The poor oral health of the child, alongside the disease causing the lesion under the bandage, and even other comorbidities, may have contributed to a poor health status (Sadiq et al., 2021), resulting in the death of the child. From the bioarchaeology of care perspective, as applied to children (Oxenham and Willis, 2017), this is a clear example of medical care provided during the last part of the dependent childhood stage (Bogin, 2020).

The archaeological evidence suggests that the children buried in the crypt of Las Trinitarias are a cross-section of the inhabitants of the neighborhood, with an admixture of different social classes, but the lack of identification of this child hampers further inquiries into the interpretation of this treatment in mid-19th-century Madrid. The bandage combines an ancient tradition (ivy leaf), with recommendations from contemporaneous medical texts (metal plate), and it was administered during a period when medical sciences in Spain were recovering from a period of political and scientific delay (Martykánová and Núñez-García, 2022; Piñero, 1992; Rodríguez Ocaña and Perdiguero, 2006). In this

period of incipient professionalization, medical attention was provided by private, municipal and mixed pious foundations, as well as by royal hospitals, with religious establishments continuing to play a significant role (Martykánová and Núñez-García, 2022). This case could be associated with any of these possibilities.

The palm branch is a polysemic motif with a complex iconographic history, present in ancient Mesopotamia and Egypt, in the Roman and Greek worlds, and whose current symbolism in Christian religious art began during the Middle Ages (de Bustamante, 1980; Ferguson and Ferguson, 1961; Kefalidou et al., 2009; Lacalle, 2017; López Terrada, 2005). From Roman and Greek representation of triumph and victory in athletics and war, and in Christianity, the palm branch acquired several interrelated meanings. The Latin name adopted by Linnaeus for the palm tree in his 1753 *Species Plantarum* was *Phoenix*, merged the sacred Egyptian phoenix bird rising from the ashes that he identified as the date-palm in his 1735 *Systema Naturae* (Linnaeus, 2024: 30) with well-established Christian meanings relating to the Virgin, martyrs and resurrection (Quattrocchi, 2017; Van den Broek, 1972). In Christianity, the palm branch represents the victory of martyrs over death, and it is present in numerous paintings like the 17th century famous series of paintings of female saints by Francisco de Zurbarán (Delenda, 2010). The palm branch is also central to the Virgin dormition and assumption, as described in the apocryphal texts (Shoemaker, 2002). Across Spain during the Palm Sunday marking, at the beginning of the Easter Week, palm branches are carried during religious processions, and afterwards the branches are exposed on the balconies throughout the year (García,

2017). Palm branches with white leaves and bows from the *Palmeral de Elche* (Palm Grove of Elche, southeastern Spain), have been used for centuries for religious purposes (Nixon, 1951; Ramos Folqués, 1970), and the palm branch found in the burial probably comes from this place. This child's burial is similar to the funeral portraits of nuns in Spanish and Spanish-American catholic convents, where palm branches are frequently depicted alongside the body of the deceased (Alarcón, 2008; Córdova, 2017; Sanz and Hernández, 1997).

Regarding the blue color of the clothing and braids, they might hold Christian religious meaning. Since the 11th century onwards, the blue color was associated with the cult of the Virgin, as it can be observed in a multitude of religious paintings, becoming a moral, spiritual color within Christianity (Pastoureau, 2023). Interestingly, the palm and blue color are present on the famous panel, *The Death of the Virgin* by Mantegna (Ca. 1462), on display at the Museo del Prado, two blocks away from the Convento de Las Trinitarias,¹ since 1829, a few years before the burial of the children in the crypt.

5. Conclusion

In this study we evaluate a mid-19th-century burial of an approximately six-year-old girl from the crypt of the Convento de las Trinitarias in Madrid, with a bandage applied to her right arm. The bandage consisted of layers of gauze, a copper and zinc metal plate, and a fertile leaf of *Hedera* in contact with the skin. The bandage combines traditional knowledge related to skin conditions (*Hedera* leaf) with contemporaneous recommendations from medical texts (gauze, metal plate), representing an example of medical care for a child. The presence of a palm branch and the blue clothing suggest a Christian codified mourning for her death, alluding to representations of martyrs and the dormition of the Virgin in classical religious paintings. From a broader anthropological perspective, this burial is a 19th century urban example of the ancient and complex relationship between plants and human culture. The intertwining of medical knowledge and symbolism, noted by the presence of ivy, representing the effort to maintain life, and the palm, representing the hope of a new life, exemplifies the fear and hope that epitomizes human nature.

CRedit authorship contribution statement

Ríos Luis: Writing – review & editing, Writing – original draft, Visualization, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Almudena García-Rubio:** Writing – review & editing, Project administration, Investigation, Funding acquisition. **Berta Martínez:** Writing – review & editing, Methodology, Investigation, Conceptualization. **Mercedes González:** Writing – review & editing, Formal analysis. **Francisco Etxeberria:** Writing – review & editing, Project administration, Funding acquisition, Formal analysis. **Virginia Valcárcel Núñez:** Writing – review & editing, Writing – original draft, Visualization, Methodology, Investigation, Formal analysis. **María Paz de Miguel Ibañez:** Writing – review & editing, Formal analysis.

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¹ <https://www.museodelprado.es/coleccion/obra-de-arte/el-transito-de-la-virgen/6ebfe544-41dd-44ac-a217-d7ba24fc0d48>.

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