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RESEARCH ARTICLE

Curing with Creepy Crawlies: A Phenomenological Approach to Beetle Pendants Used in Roman Magical and Medicinal Practice

Adam Parker

Department of Classical Studies, Open University, UK

adam.parker@open.ac.uk

Evidence for some ephemeral, Roman, ritual practices, particularly using organic materials, is lost to us. This paper will introduce a case study which has not been previously considered as a platform to explore the material relationships between invertebrates and their use in magical or medicinal practices. Through a combination of discussing the biology and zoogeography of the stag beetle *Lucanus cervus*, in combination with a phenomenological approach to the topic that considers the beetles as real, living creatures and situates them within a living and changing environment throughout, this paper raises questions about, and adds colour to, our understanding of the potential uses of stag beetles as pendants for such purposes in the Roman world. Experimental investigations using other beetle species were undertaken as part of this investigation to show that there are significant logistical issues which may have been encountered during the preparation of an insect for the purpose of personal adornment. The novel approach adopted in this paper is multidisciplinary, drawing on strands of biology, archaeoentomology, materiality, and sensory archaeologies, in addition to the experimental reconstructions.

Keywords: Phenomenology; Beetle; Coleoptera; Stag Beetle; Lucanus; Experimental; Roman Magic; Materiality; Archaeoentomology

Introduction

The *materia magica* and *materia medica* of the Roman world are, together, a vast corpus of material and literary evidence incorporating pendants, phylacteries, rings, gemstones, tools and instruments, and curse-tablets to name but a few. These may be apotropaic images or materials, or be objects which were considered to possess supernatural qualities either on their own or once combined with other apotropaic or mundane *materia*. Furthermore, the *materia* of magic and/or medicine could include biological components, such as whole or selective parts from plants, animals, or even people. This corpus may also be extended beyond the physical limitations of material culture to include insubstantial elements such as physical gestures, spoken words, smells, colours, and sounds (see Boschung and Bremmer 2015; Parker and McKie 2018). Roman magical practice had a particular interest in the exotic and the unusual (see Wilburn 2012: 15–18) which may be categorised in terms best described by Bronisław Malinowski (1935: 218–223) as the 'coefficient of weirdness'. In this capacity, there was clear evidence for a particular demand for non-local or difficult-to-acquire materials sourced alongside the mundane materials for the purposes of magical and/or medicinal rituals and practices; a clear duality between the two elements exists within the archaeological, documentary, and literary records for such practices.

One of the major issues facing the archaeological understanding of Roman magical practice and, in particular, the range of its material culture, is ephemerality. We know that evidence for some practices is lost, particularly where organic remains are concerned. For example, in the early third century AD soldiers removed flower garlands from the busts of emperors and re-used them as protective amulets against fever — a practice that is recorded in the *Historia Augusta* because the Emperor Caracalla executed soldiers in Raetia for having done so (*Hist. Aug.* 5.7.4). This contextual link between the flowers as *materia* and their non-consumptive,

behavioural/gestural use for this specific magico-medicinal purpose does not survive in the archaeological record. Even more robust materials may not be immune to this issue. In this group we might consider the case studies of jet and amber; both naturally occurring materials, both fossilised products (the former a type of coal, the latter tree resin), and both were transported hundreds and/or thousands of miles away from their sources as either raw or worked materials. Jet and amber were, for different reasons, considered to have magical and medicinal properties pertinent to women (Jet: Allason-Jones 1996: 15–17; Parker 2016: 107–110. Amber: Eckardt 2014: 105–109; Davis 2018). The ancient sources suggest a strong literary association with the idea of burning both materials and so, in combination with strong links to funerary practices, it is possible that many objects have been lost to archaeological inquiry because they were burnt on funeral pyres as part of their ritual use. Both jet and amber are easily flammable and leave no detectable chemical trace following incineration. Thus the naturally ephemeral nature of the material, in combination with transformational ritual processes, may have limited the amount of material available to the modern archaeologist. It is the issue of ephemerality with which this paper is concerned. Some recent studies have attempted to resolve this issue through fine-grained, contextual analyses: for example, Wilburn's reconstruction of the use of ostrich eggs in Berenike, Egypt (Wilburn 2015) and Garland's discussion on the 'doctor's' burial at Colchester (Garland 2018). These sorts of approaches are valuable, but in order to attain some ritual insight into ephemeral invertebrate remains, I will use a much broader multi-disciplinary approach which, whilst focussing on materiality, incorporates biological and zoogeographical information and considers the objects from a phenomenological and experimental position.

This paper will introduce a case study which has not been previously considered as an ephemeral ritual practice: the use of beetles in Roman magical and medicinal practices. Invertebrates, generally, are not often considered part of Roman material culture but in the case of the following this paper intends to not only highlight that potential function, but to consider the limitations and implications of natural biological processes on their use.

There are tantalising references in ancient sources to the use of a certain type of beetle as a pendant which was efficacious for its ability to remedy illness.[1] The most notable example is in Pliny the Elder's *Natural History* (11.34): 'The beetle, for instance…in one large kind we find horns of a remarkable length, two pronged at the extremities, and forming pincers, which the animal closes when it is its intention to bite. These beetles are suspended from the neck of infants by way of remedy against certain maladies.' A comparable reference is in a second or third century AD Greek text by Antoninus Liberalis. The text records a myth by Nicander in which a man called Cerambus is turned into a beetle: 'He can be seen on trunks and has hook-teeth, ever moving his jaws together. He is black, long and has hard wings like a great dung beetle.' (Antoninus Liberalis, *Met.* 22). The story of Cerambus concludes with the comment that the beetles are used as toys by young boys and that the head is removed to be worn as a pendant (Beavis 1988: 153; Sprecher-Uebersax 2008: 146). In both instances, it is with great likelihood that the beetle being described is the male European stag beetle *Lucanus cervus* (Sprecher-Uebersax 2008: 146; **Figure 1**).

Magical beetles

The primary sources above are key to the following discussion in this paper, but it is important to consider the wider use of beetles as *materia magica*.[2] There is scant evidence for beetles being used in ritual practices in the Roman world, with the obvious exception of the scarab. The scarab has a long association with Egyptian mythology where it was an important religious symbol. *Scarabeus sacer* (the sacred scarab) is associated with the god Ra because of the analogy of its dung-rolling behaviour and the movement of the sun across the sky (Remler 2010: 169–171). It is mentioned in various capacities as one of the *materia magica* of the *Papyri Grecae Magicae* (*PGM*) — the Greek Magical Papyri from Egypt. These documentary sources are a sort of do-it-yourself guide to magical practices, incorporating step by step guides to the performance of specific rituals. In the *PGM* the scarab was mentioned as a holy name or as Chryphis, the Scarab God (*PGM* VII.520; XII.101; XXXVI.170) and it was drawn as a symbol (*PGM* II. 64–183; XXXVI.181). Perhaps the most relevant example from the PGM is where a real, physical beetle was required for the purposes of the ritual (*PGM* IV.52–85). In this passage the practitioner was instructed to use hairs from a stallion to tie a knot around the waist of the living beetle in order to suspend it from a reed which was two cubits in length. An oil lamp was then lit beneath the suspended beetle. The purpose of the ritual was to, essentially, torture the beetle because it was acting as an avatar for an un-named supernatural being and that by doing so the user would be able to interact with this powerful character. The text continues to say that the beetle was eventually released, but only after the summoned entity provides the necessary 'answers' (presumably part of a divination rite). It is a single source, but it does provide an evidential basis for the ritualised and magical use of

Figure 1: The stag beetle *Lucanus cervus*, the eponymous example of the genus *Lucanus*. Male specimen, with the characteristic pincers, on the left and the smaller female on the right.
(Photo: Didier Descouens via Wikimedia Commons. Reproduced under CC BY SA International 4.0 License).

a beetle in the Roman world. Note that the explicit references to releasing the beetle and the use of other organic components would prevent these material elements from entering the archaeological record as a 'ritual group' of associated magical components.

As a side note to discussion of the PGM, the existence of a single, simple ritual remedy 'to keep bugs out of the house' (*PGM* VII: 149–54: 'Mix goat bile with water and sprinkle it') is of interest because, designed as a repellent, it is the antithesis to the idea of capturing invertebrates. Beyond the *PGM*, a scarab beetle is recommended as an amulet against quartan fever by Alexander of Tralles in which it is required to be caught alive, wrapped in red cloth, and tied around the neck (see Faraone 2018: 280). An un-named beetle is invoked as a substance at the start of an otherwise fragmentary second – third century spell in the *Supplementum Magicum* (*SM* 78, col.ii; see Daniel and Maltomini 1990).

Perhaps the most commonly encountered use of the scarab beetle in the Roman Empire more broadly was its use on gemstones. Magical gemstones were a common feature of this period and may be defined as precious stones, 1–3 cm in size, which are inscribed with divine names and mythological images (usually in Greek), usually on both sides and not in retrograde (Nagy 2015: 206ff). The Campbell-Bonner magical gems database lists over 190 examples which include an icon of a scarab.[3] As a case in point, a haematite intaglio from Welwyn (Hertfordshire) depicts an image of Isis and Bes surrounded by additional figures — namely a lioness, a uterine symbol, a seven-toothed key, an ouroboros and a thirty-letter Greek word on one side, and a scarab, a second uterine symbol and additional Greek lettering in the form of *voces magicae* on the reverse (RIB 2423.1; Frere and Tomlin 1992 Figure 23).

The major difference between the sources noted above and the real invertebrates is that whilst invertebrates do occasionally survive in the archaeological record, there is no secure material evidence that they were used as pendants (or amulets) in the Roman world. That statement needs qualifying: there is no secure evidence for them having been physically adapted for the purposes of suspension or encasement in such a way to allow them to be used as objects of personal adornment. It remains a possibility that the classical texts were not actually recording a contemporary Roman practice, or have neglected to recall a specific geographic or temporal range in which it originally occurred. Perhaps it never happened at all? Or happened so infrequently as to be invisible in the archaeological record? Be that as it may, if there is a possibility that Pliny the Elder and Antonius Liberalis were recording a *bona fide* human activity in the early imperial period,

our understanding of this practice is severely stunted. There is a clear risk here of over-interpreting literary accounts for magical practice which do not have a clear material basis, a warning given by Houlbook and Armitage (2015: 7–9). Assuming that the questions above are legitimate, the possibility remains that the practice occurred in the Roman world. Many alternative questions arise from this possibility: How were the beetles physically acquired? What biological or environmental processes might affect this? How are the adapted pendants suspended on the body? How long did they last? How did they interact with the wearer, their clothes, or the physical environment? The organic nature of beetles, even when adapted for use as personal adornment by humans, is important as the main factor in their ephemerality. These creatures were not only ephemeral to modern archaeological practices, but also to the contemporary Roman individuals interacting with them.

It is the intention of this paper to explore these questions from multiple angles: biological, material, phenomenological, and experimental. Given the difficulties with approaching ephemeral concerns, speculation will be carefully used as an analytical device in combination with a broadly phenomenological and experimental approach to the subject. Phenomenology is a methodological approach to archaeology orientated around the central idea of 'being in the world' (Moran 2000: 4–6; Tilley 2004: 1f); of human agents situating themselves in a real world environment and engaging with this as a primary research tool. Sensory experiences are a key interpretative method in the application of phenomenology to archaeological enquiry (Tilley 1994) and, although these experiences are subjective, in the case of investing an ephemeral practice its value lays in helping to establish pertinent research questions.

This approach allows for this exploration of possible human-beetle interactions in the Roman period to go beyond the empirical limitations of the archaeological record because it engages with experimental reconstruction and re-use as well as modern comparative practices. My particular application of the phenomenological philosophy will incorporate tactile, experimental investigations of organic beetle remains in order to move beyond ancient and modern literary descriptions and into real-world applications and implications of handling organics. To the best of my knowledge, this multidisciplinary approach to the use of these insects as *materia magica* is novel and unique within the current literature.

This approach is, by its nature, essentially humanist (in as much as I will be investigating *human*-beetle interactions, rather than the interactions of beetles themselves) and, at least in part, essentialist as far as the behaviour and biology of certain beetle species is concerned. Nevertheless, I intend for this approach to be an original contribution to the study of ephemeral Roman magical and medicinal practices, phenomenological approaches to the natural world, and archaeoentomology.

Stag Beetles — Biology and zoogeography

The term for beetle used by Pliny is *scarabaeus* which he uses as a general term for a range of Coleoptera (Beavis 1988: 157). In modern entomological terminology this term more specifically relates to the Coleopteran superfamily Scarabaeoidea which consists of over 35,000 species worldwide (Ratcliffe 2002: 1), including those of the family Lucanidae, itself containing the genus *Lucanus* and its several species. Naturally, Pliny was not considering quite this many individual beetles in his broad entomological discussions within *Natural History*, but establishing the differences in ancient and modern nomenclature is important. Antoninus Liberalis used the word Κεράμβυξ (Cerambux) for the human character in the story. This may be a point of some confusion with modern biological literature as the phrase may have inspired the etymological root for the beetle family *Cerambycidae*, the 'long-horn beetles'. *L. cervus* is Europe's largest, native, terrestrial beetle and is particularly well-known in the modern world — the identification of this species with the two ancient descriptions rests on the description of both as being large and having some manner of hooked horn or tooth. Whilst this association is not absolute, it offers a plausible case study from which to start. The biological issues flagged in the following as being important for the acquisition of beetles may (perhaps) be generalised to other beetle species, genera, or families if they were also adapted for similar uses in the Roman world.

Whilst the beetle described by the ancient authors is argued to represent *Lucanus cervus*, it is worth clarifying that there are, in fact, four other species of the genus *Lucanus* present in modern Europe which are morphologically very similar to *L. cervus*: *L. (Pseudolucanus) barbarossa; L. tetraodon; L. ibericus; L. pontbrianti* (Harvey et al. 2011: 24). Whilst the differences are clear in modern biological terms, all five of these candidates fit the broad description supplied by Pliny. Thus we are not just looking at a single stag beetle in the Roman Empire, but five stag beetles. I argue that it is incredibly unlikely that the slight external morphological differences within the genus were known, or even noticed, in the ancient world. The important implication of having multiple stag beetles is that, at least in modern terms, the distribution of

these individual species are geographically restricted (**Figure 2**): *L. cervus* has the largest range from Spain and Britain in the west to central Russia in the east and from Scandinavia to the northern Mediterranean zone; *L. Barbarossa* is found in Spain, Portugal, and Morocco; *L. tetraodon* has a range focussed on southern Italy and the Albanian and Greek coasts; *L. ibericus* occurs in Albania, Greece, Turkey, Ukraine, Russia, the Caucasus and the Middle East; *L. pontbrianti* has the most restricted range, based in the south of France and parts of Spain. For the purposes of biological clarity here, it should be highlighted that the morphological variations in these species are the results of long-term evolutionary changes and could not have developed within the past 2,000 years — thus these stag beetles are the stag beetles of the Roman world, though the nuances of their distributed ranges may have changed throughout this period. However, to highlight links between modern biological knowledge and the archaeological record we may flag, as a case in point, that the pre-Roman presence of *L. cervus* at the north western edge of its European range in Britain is established from excavations of Sweet Track, an early Neolithic (c. 4000–2900 BC) trackway in Somerset (Buckland and Buckland 2006). None of the other species of *Lucanus* have yet been found from archaeological investigations in Britain (Buckland and Buckland 2006) so, in this instance, the archaeological existence of the species is mirrored by the modern presence in this province.

This is, however, not the place to enter into a wide-range geographical study about the distribution of Lucanid species in modern and ancient European contexts. Britain offers a viable case study to investigate this single species further. The presence of *L. cervus* has been noted from Roman sites in Britain: in a late Iron age or early Roman context at Farmoor (Oxfordshire), in a fourth century AD context at Kirkham (Lancashire), and in a fourth century AD well context from a villa at Empingham (Rutland) (Buckland and Buckland 2006; **Figure 3**). Whilst three data points is not significant for a distribution survey, the three Roman examples in Britain have a general correlation with the modern distribution. The identification of *Lucanus cervus* within archaeological investigations depends on the beetle interacting with the urban landscapes made by humans; their archaeological presence in an entirely natural landscape is more likely to go unnoticed because archaeological investigations (at least historically) inevitably favour the urban and built environments where evidence of human activities may be uncovered and analysed. It is thus worth noting that the intrinsic biases of an excavation methodology may affect our understanding of the ancient distribution of this species.

Assuming a similarity in distribution patterns; with it covering the largest geographic area, *Lucanus cervus* was, inevitably the most common of the species. In all cases, no matter the *Lucanus* species encountered, it is clear that the ancient authors were discussing the males. All members of the genus *Lucanus* are sexually

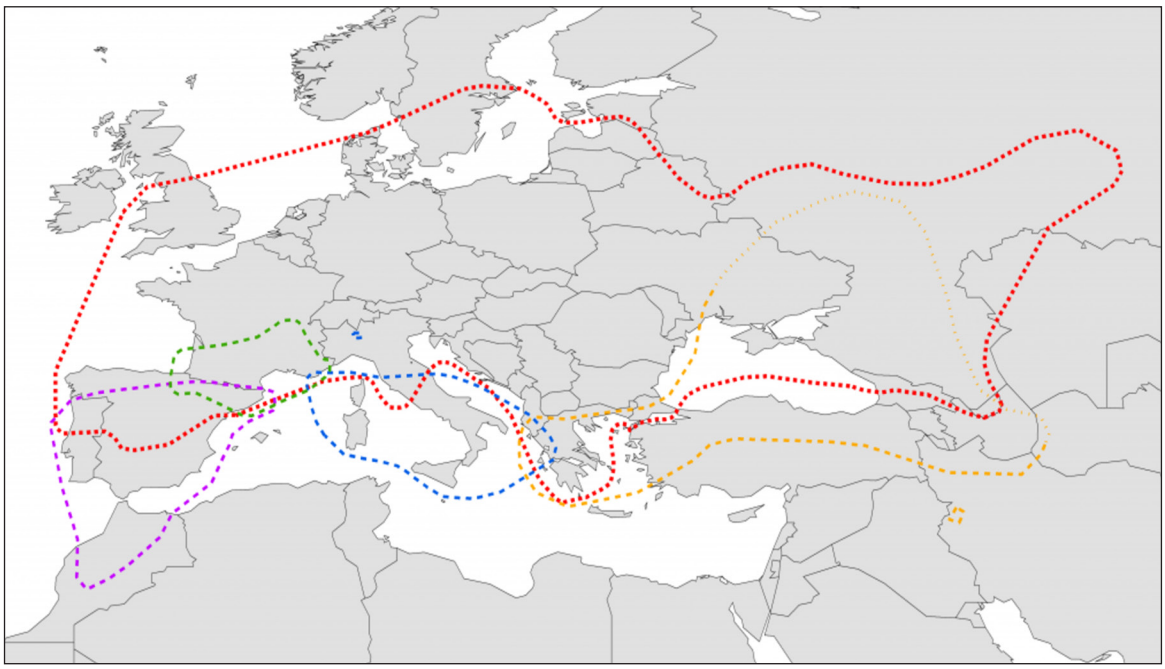

Figure 2: Modern range of *Lucanus* species in Europe. Red: *L. cervus*; Purple: *L. (P.) barbarossa*; Green: *L. pontbrianti*; Blue: *L. tetraodon*; Orange: *L. ibericus*). (Copyright European Stag Beetle Monitoring Network, reproduced with permission.)

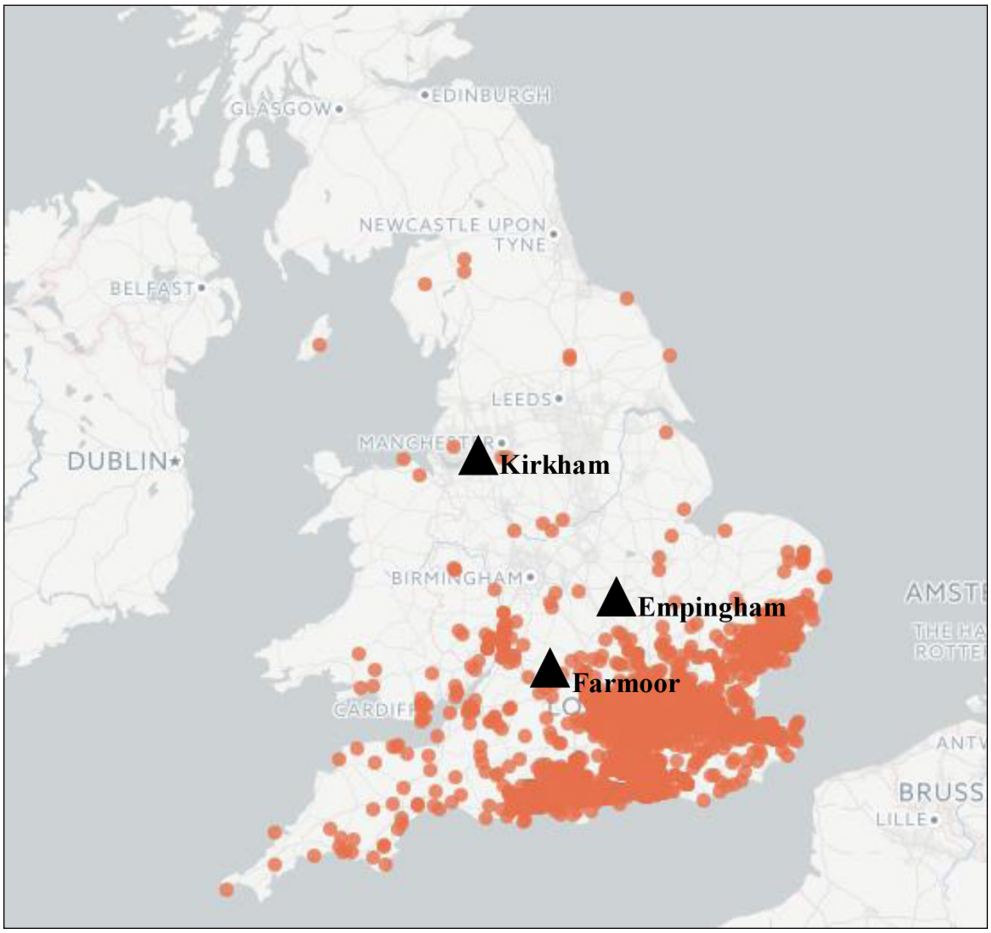

Figure 3: Distribution map of modern records of the stag beetle *Lucanus cervus* in Britain (orange dots) and records from secure Roman contexts (black triangles). (Adapted from original base map OpenStreetMaps, modern layer copyright CartoDB, Available at https://species.nbnatlas.org/species/NBNSYS0000011448).

dimorphic — there are prominent physical differences between males and females (**Figure 1**). It is the males which bear the prominent pincers, two-pronged at the distal end. These appendages are, however, not used for biting but for fighting and for representing strong sexual characteristics to the opposite sex. In both sexes, the head and pronotum are black and the elytra (wing cases) a dark red-brown in colour. There is significant natural variation in the size of the adult beetles, with males ranging from 35–92 mm and females 35–45 mm in length (the beetles, like all insects which undergo complete metamorphosis, do not grow once they reach their adult stage). A recent study has demonstrated that the average size for the beetle sexes is 51.2 mm and 37.2 mm respectively (Harvey and Gange 2006: 222). Variation in the physical size of the adult beetle has significant implications for how these insects may be interacted with, visually or physically (**Figure 4**).

Understanding the lifecycle of the species is important for this study. There is no evidence to suggest that these insects were farmed or managed in any way in the ancient world, leaving foraging/hunting of specimens as the only viable method of acquiring the raw materials. We may speculate that 'finished' pendants may be transported or traded elsewhere, or moved around the Empire around the necks of their owners, but any human interaction with a beetle pendant is entirely dependent upon natural biological processes to supply them.

We may draw on modern biological investigations to flesh out the lifecycle of the beetle — to place it 'in the world' as the phenomenological approach suggests. The lifecycle of *L. cervus* may be as long as 3–6 years, the vast majority of this involving the larval and pupal stage of the beetle (Harvey and Gange et al. 2011: 27). Adults may be seen between May and August, living only for a few weeks (Chinery 2012: 262). After mating, females lay 30–90 eggs near rotting wood. These eggs hatch after 3 weeks (Fremlin 2016). The hatched larvae live underground in the wood, which is consumed as their primary food source. The larvae will undergo several instar stages (moults) over a period of several years before pupating in late summer

Figure 4: Natural size comparison between two adult male *Lucanus cervus* in a collection, showing clear relative differences in maximum size (Author's photo 2018).

(Harvey et al. 2011: 27). The pupal stage overwinters before emergence of the new adults begins in May of each year, with the males initially emerging up to a week before the females at the start of the season (Rink and Sinsch 2011: 17). Most male specimens are dead before July, but females may survive into August (Rink and Sinsch 2011: 17). The adult stage of the stag beetle is thus particularly short, the majority of its lifecycle duration is undertaken as a larva. The larvae are hidden from view, in rotting wood and/or underground, but are the key to the total numbers of surviving adults.

Finding the raw materials

In order to adapt a beetle into a pendant, there is a dependency upon accessing the 'raw materials' at some point in the supply chain. Adult stag beetles are, relatively, small creatures (despite being large for European beetles). If stationary at ground level or in the tree canopy, opportunistic discovery of these insects may be difficult for a human observer. That said, if they were actively being sought as living or dead specimens, a broad understanding of their lifecycle by a human agent would inform access to these.

Environmental or predatory pressures on the population of larvae will have a direct effect on populations of adult beetles in up to three years from the initial date of this effect, because of the long larval stage of the beetle's development. The emergence of adult beetles would be negatively affected in the medium-term in a specific locality where, we might speculate, the number of ideal rotting log habitats is reduced from one year to the next (via human agency through ground clearing, or natural processes such as flooding or fire). Adult beetles have been shown to disperse up to 1 km from their emergence sites in a single flight (Rink and Sinsch 2011: 20) so whilst mass-migrations are not a feasibility, movement away from known habitats or into previously unrecognised habitats are — so the places within a landscape that the beetles may be found could change year-on-year. In opposition to the idea of habitat clearance it was, conversely, possible that woodland areas were protected or curated for several purposes. Myriad reasons were possible, but economic (e.g. woodland provided resources beneficial to human agents) and ritual concerns spring to mind. Concerning the latter, think of the importance of the sacred-grove in the pre-Roman religious and ritual landscape and the adaptation and continuation of several of these sites, such as Uley, Hayling Island, and Thetford, into the Roman period (Mattingly 2006: 62). We may speculate wildly that the biological fauna of these protected natural sites became significant or, indeed, associated with the practices, people, or beliefs incorporated into the same spaces. The same is true for all manner of invertebrates but, in the context of stag beetles and their large physical presence, audibly noisy flights, and flash-in-the-pan adult lifecycles, a connection between

their annual emergence at spatially important woodland areas and the practices described by the ancient writers is worth considering.

The beetles are most conspicuous whilst in flight because of the incidental noise made by their beating wings. Males spend more time in flight than females and at heights of up to 3 m (Harvey et al. 2011: 11). Females fly at a height of 1–2 m from the ground (Harvey et al. 2011: 5) and both are thus within the direct visual range of a human observer. It has been shown that males emerging earlier in the season are typically larger than those emerging later (Hardersen et al. 2011: 465).

Physical capture at ground level was certainly possible. In fact, the observance or capture of multiple live specimens at a single time is feasible, if only due to the presence of multiple males attempting to mate with a single female. Up to four males have been observed trying to mate with a single female (Fremlin n.d.); this represents a considerable group of beetles in a single locale and a viable resource for their collection.

The biological issues around attaining the raw materials only applies for live specimens. Many carcasses of beetles are used in modern biological research because they are much easier to find than live beetles. The adult beetles are predated by a number of larger creatures, particularly magpies which are attracted to the large males in flight. When magpies kill and eat stag beetles they generally focus on the fleshy abdomen and leave the harder head, thorax and wing cases intact (Harvey and Gange 2006: 224). At least one modern biological note records that magpies annually congregate around known emergence sites in order to predate the newly emerged adults (Fremlin et al. 2012). One implication of the consumption of *Lucanus* beetles by members of the Corvidae is that the opportunistic collection of dead beetles by humans was a viable option for acquiring these body parts; especially the head or wings if these are the parts discarded by birds. Mass consumption of beetles at a single site, of the type suggested above, would also provide a considerable resource of carcasses and birds or predators in certain spaces could be secondary indicators of the presence of the beetles. The biological information is a little unclear, but it is possible that the larger specimens of male *L. cervus* may suffer additional predation pressures, meaning that the carcasses left over from the killed and consumed beetles *may* be slightly larger on average than those taken from a general sample of live specimens (Hardersen et al. 2011: 466).

The modern biological interactions between the beetles and birds are certainly of interest. Whilst there is clearly a strong folkloric connection to magpies in the modern world, this is not exactly true of the ancient world. There is an ancient mythological story recording the transformation of the Pierides sisters into magpies following their failed competition against the Muses (Ovid, *Met.* 5.300) which, at least coincidentally (or, perhaps, tenuously), links the birds to the beetles in the ancient world though the metamorphosis of Cerambus described above. Pliny provided one of the key connections between stag beetles and pendants, but his comments on magpies allude only to their propensity for stealing gold and silver (Pliny, *Nat. Hist.* 10.41), their ability to talk (*Nat. Hist.* 10.59), and that they lay nine eggs (*Nat. Hist.*10.79) – perhaps itself an allusion to the nine Pierides sisters transformed into the birds.

Experimental reconstruction

In an application of the phenomenological philosophy, handling real beetle body parts offers a viable methodology for highlighting the logistical challenges of working with these ephemeral organics as material culture. Other archaeological studies, more broadly, have utilised an experimental approach to attempt to understand the construction and use of ritual objects for which we have little or no literary record to draw upon. Particularly relevant here is the work by Whitmore (2017) which aimed to reconstruct the movement of a phallic pendant whilst worn around the neck: the study filmed an adult male participant undertaking different activities whilst wearing a replica copper alloy phallus (with a variety of suspension media) and concluded that, despite its frequent movement away from the body, the pendant returned most frequently to a default resting position in which the phallus pointed outwards and away from the body. McKie (2016: 98ff) experimented with the reconstruction of writing lead curse tablets and established that curses could be inscribed using only the body for support, holding the lead in one hand, and that the fresh writing on the tablets was much brighter than the background materials. Casting the net more widely and the multi-scalar analysis and experimental reconstruction of antler frontlet from the Mesolithic site of Star Carr argued convincingly for establishing a manufacturing sequence whilst raising new questions about the precise form that the resulting headdress took when worn in a shamanic context (Little et al. 2016). What these three studies intend to demonstrate is that an experimental approach, using comparable analogues to the materials used in ancient or prehistoric ritual practices, can lead to new insights and further avenues of investigation.

Given the declining numbers of *Lucanus cervus* in Britain and Europe, its classification as 'Near Threatened' on the International Union for Conversation and Nature Red List (IUCN 2017) and the associated legal, ethical and logistical issues of live capture for experimental purposes, an alternative was sourced in order to undertake some simple experimental investigations pertinent to this subject. One beetle species is widely available for the purposes of jewellery making and elytra (wing casings) of this Buprestid beetle, *Sternocera aequisignata,* were sourced by the author for the purposes of experimentation. *S. aequisignata* is a Southern Asian species of wood-boring beetle (Integrated Taxonomic Information System 2017), which is widely consumed by people in Thailand (Hanboonsong 2010: 175) and is likely to have been entirely unknown to the Roman world. Whilst there are not taxonomic similarities between *S. aequisignata* and the *Lucanus* beetles discussed by Pliny, they are appropriate substitutes for the simple reasons that they are both beetles of a broadly similar size — their external body parts are all made from chitin; this is important for the discussion of adaption for suspension. *S. aequisignata* does not have a formalised common name, but the adult beetles are a bright iridescent green (**Figure 5**) and naturally live for only 1–3 weeks (Hawkeswood and Sommung 2016); the total life cycle from egg to adult takes over 2 years (Hawkeswood and Sommung 2016) and the same environmental pressures on larval growth mentioned above for *L. cervus* is also prevalent in *S. aequisignata,* resulting in variably sized adults. The wings are not a direct analogue for the head of a stag beetle, but these investigations served to establish the feasibility of suspending beetle body parts, the potential for modifying them by hand, and to identify key features that may not have been otherwise recognised as relevant to the construction of an insect pendant.

Using a modern steel awl, a series of holes were pushed through the wings. Several of the pierced examples were strung directly onto leather and metal wires; these suspension loops latterly tied to larger necklaces both singly and in multiples (**Figure 5**). These experimental investigations suggest several important implications which are relevant for the idea that beetles may be adapted into objects of personal adornment by people in the Roman world. Firstly, and most obviously, that variable mounting methods are plausible. The only locality where piercing for suspension was either impossible or inappropriate was at the edge of the wing where the natural flex of the elytron caused fracturing of this edge. A wing with a failed piercing largely retained its structural integrity.

Secondly, that the method and position of piercing affects durability. Wings are convex, as are the heads of stag beetles. Piercing against this natural curve proved more suitable than with it, i.e. from the interior outwards. Piercing or bending from the interior curve outwards provided a much more brittle surface to work with than from the exterior inwards. Piercing is possible via both sharp and narrowly blunted instruments, both achieving greater success with a rotary rather than directly piercing motion.

Thirdly, that the natural lightweight material is strongly affected by environmental conditions. The average stag beetle weighs in the 10s of grams and the head on its own weighs single figures of the same. The wings used here are even less. The implications are that, whilst worn as a pendant, physical human activity or the effect of external environmental factors (such as wind) strongly affects the position of the pendant. The adapted pendant wings moved in all directions, often turning around or bouncing on their suspension

Figure 5: Left: Natural size and colour variation in *Sternocera aequisignata* elytra. Right: Two pierced elytra suspended via leather and metal suspension loops (Author's photo 2018).

loops. No matter the physical arrangement of invertebrate parts on a pendant, there are strong implications for methods of securing these in place or weighing them down. If only a part of the total insect mass is utilised (i.e. head only) its suspension is difficult as, speaking generally, pendants require a pendular weight or structural shape to ensure a resting position on the body.

Fourthly, that disembodied beetle body parts are brittle and liable to impact damage when interacting with other solid surfaces. Combining the brittle surfaces of insect parts with other heavy, free-moving objects (other pendants, for example) impacts upon the long-term durability of the finished pendant. The chitinous material is, however, waterproof, cleanable and largely stable.

The classical sources mentioned above suggest that the heads of Stag beetles were disembodied and worn as pendants. Different mounting methods may apply for heads rather than for whole beetles or the wing parts, as attempted here. Perhaps most revealing, is the fever amulet mentioned by Alexander of Thralles in the above in which the beetle was encased in textile before being worn around the neck. In this instance the beetle was not modified in any way that could be visible in the archaeological record. The importance of the other *materia* (the red cloth) and its use on the body (worn around the neck) in this example are certainly of interest. As a comparable method of discussing the use of heads suspended on their own, metal casings can be used to mount animal remains in the modern world as part of the *charivari* chain of traditional *Lederhosen* dress; modern examples encasing stag beetle heads are known (Sprecher-Uebersax 2008: 146) and in this capacity we might, speculatively, consider the same use during the Roman period. These fully encasing mounts utilise a large amount of metal to physically support the projecting pincers and often provide a brace between them. Whilst an excellent modern comparison, they are designed to be used as part of the amulet chains — physically jostling with other dismembered animal parts and liable to physical damage without these accoutrements. The same was not necessarily true of ancient examples. A number of alternative mounting arrangements are possible for stag beetle heads which would render them still visible, including a single central perforation through the centre, non-invasive suspension via ties to the horns, or the addition of an integral suspension block at the back or underside which itself contains a suspension loop (**Figure 6**).

Discussion

The above discussion has sought to outline the lifecycle and necessary zoogeography of this particular beetle species with the aim of identifying key features which may have affected the acquisition, construction, and use of a beetle-pendant in the Roman world. Natural biological issues undoubtedly affected the availability of stag beetles and, indeed, of all beetles. Modern biological research has shown that the range of the stag beetles is broad, covering most of mainland Europe and going beyond its boundaries and, with the exception of most of North Africa, encompassed most of the Roman Empire at its largest extent.

Stag beetles were present in the Roman world — this is a certainty. The potential ways in which people interacted with beetles is where complications arise. To paraphrase Adrian Chadwick (2015: 52), there is no material signature by which either prosaic practices or more arcane rites can be identified. Does this then mean that the heads of stag beetles cannot be considered as part of the *materia magica* or the *materia medica*? Invoking the old aphorism 'absence of evidence is not evidence of absence' at least provides room for the speculative linking, in this case, of biological processes and human interactions. The spectrum of the interactions between people and beetles or insects, more broadly, is great. Insects inhabit almost every

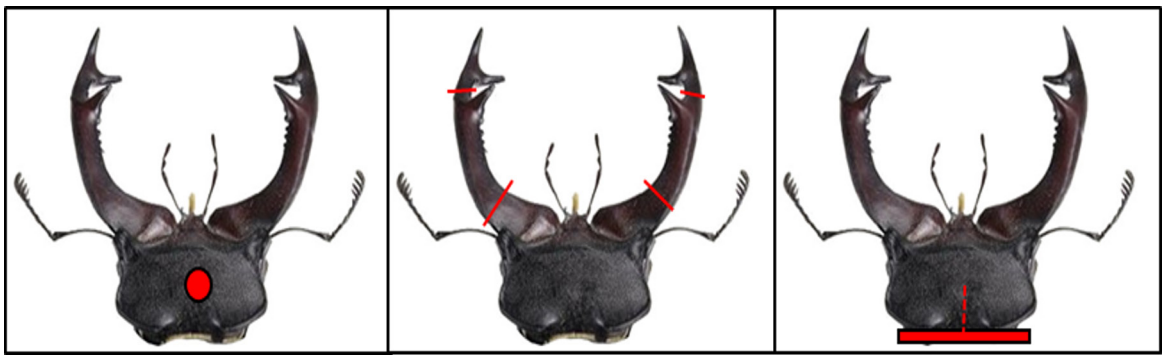

Figure 6: Speculative mounting arrangments for disembodied Stag Beetle heads shown in red. Left: Single, central suspension. Centre: Ties to mandibles. Right: Integral suspension block at back or underside. Adapted from Figure 1.

known habitat outside of the polar regions and the deep sea (Chinery 2012: 3) and in the long and short scheme of things, did so before, during, and after humans occupied the same places. Thus at a conceptual level, interactions between the people of the Roman world and stag beetles were inevitable and, inevitably, greater than just wearing them as pendants. The scope of these interactions extends across time and space within the Roman world, and includes verbal or literary descriptions or discussions about the beetles, visual familiarity with the insect, and physical interactions with them — all either as the primary participant, or through secondary sources.

Antonius Liberalis provided one method of physical interaction — that beetles were used as toys — which may have allowed the beetle to remain alive throughout the specific interaction and, conceivably, have been released afterwards: an interaction for which any evidence will remain ephemeral. Despite the paucity of literary and archaeological evidence for the scale of these interactions we are provided with one main piece of information in the two ancient sources — stag beetle heads worn as pendants.

The question of 'why?' is also complicated, but arguably a more peripheral consideration to those raised here. Pliny, at least, offers a vague functional interpretation of the pendant as a curative amulet. Answering whether the source of the illness or cure was magical or medicinal is anachronistic; the two concepts were intimately intertwined in the Roman world (Cruse 2011: 52, 54–55; Draycott 2012: 76–80) and differentiation at this point is based on semantics. Value may be sought in accepting that it was a 'healing practice', irrespective of the mechanism by which this healing occurred. Whilst I clearly follow this argument, as a line of enquiry if nothing else, it is certainly worth noting a caveat that, in cases where the modern understanding of ancient use is speculatively 'ritual', that this need not necessarily be the case. Undoubtedly, it was physically possible to produce or wear a pendant made from an insect and to not consider, or imbue, it to have a supernatural and/or ritual purpose. The above comments on the potential difficulties of acquiring beetles to be used as pendants still stand, regardless of the ultimate function of the finished object. I argue that the importance of 'exoticness' would also still apply, be it for the aesthetic, medical, or supernatural implications. Given the ancient literary references to such things serving a curative, ritualised purpose, this is certainly worth the consideration it is given here.

The act of removing a beetle's head, modifying it in any way, or the spaces or occasions in which it was used could all have had ritual elements involved if they were not themselves already regarded as rituals (e.g. Merrifield 1987: 6). Specific gestures and movements were important parts of (magical) rituals. In discussing the creation and deposition of curse-tablets, McKie (2016: 21) argues that certain postures requiring movement of the whole body, whether deliberate or not, were an integral part of the process. With this in mind, removing the head of a stag beetle required the use of the fingers, hands, and arms and may be achieved manually by gripping the head and body separately and pulling or twisting, or mechanically by the use of a knife or another sharpened object. In either case, the beetle needs to be supported and, if it was still alive at the time of its beheading, at least partially restrained. The experience of handling a live beetle and a dead one is very different; a live beetle is incredibly mobile. Restraining a live beetle by hand or with the use or aid of other equipment was and is entirely possible, though the co-operation of the insect was unlikely. A stag beetle may try to fly or walk away, to use its pincers or mouth parts as leverage, or a combination of these strategies in attempting to free itself from any physical constraint. The restraint of beetles in the hand is a feature of another modern practice — the creation of *maquech*, live-beetle brooches, in modern day Mexico. These offer an excellent case study for the adaption of a living beetle to a form of personal adornment. The *maquech* are live beetles of the species *Zoperus chilensis* (commonly known as 'Ironclad beetles') and are large, flightless and relatively long-lived beetles in their adult form. The beetles are held in one hand by jewellers whilst jewels and decorations are adhered to the upper parts of their head, pronotum, and elytra before a chain is tied or affixed to the body — this chain may be attached to a pin or fastening upon the wearer's body providing a tether for a living, mobile insect on their clothes (Romero-Kantún and Sánchez-Galván 2014; Miss-Domínguez et al. 2017; **Figure 7**). The beetles are actively hunted by *maquecheros* — people who are familiar with their habitats, lifecycle, behaviour, and associated host plants (Romero-Kantún and Sánchez-Galván 2014: 9); a practice purportedly dating back to the Maya in Mexico's pre-colonial past (Miss-Domínguez et al. 2017). There are modern, circumstantial reports of the adult beetles, with jewels, living for several months in a domestic setting due to the hardiness and slow life-cycle of the insect (Jaggard 2015). Clearly there are no direct comparisons, either in the biology of the beetle or the temporal, cultural and geographic range of the practice but its existence is pertinent to the possibility of the Roman exploitation of *L. cervus*.

Given the existence of live stag beetles only between the months of May and August (May to July for the male beetles), any ritual acts associated with the beetles must have occurred during summer if live beetles

Figure 7: A Mexican *maquech* – a beetle (*Zoperus chilensis*) decorated with jewels and chained in order to be worn upon the body as 'living jewellery'.
(Photo: Hungarian Natural History Museum, Via Europeana. Reproduced under CC BY NC ND License).

were required — the references in the *PGM* and by Alexander of Thralles in the introduction suggest two of many possible ritual acts, one requiring the suspension of a live beetle over a flame and the other requiring it to be wrapped (and presumably left) in red textile. Storage and preservation of dead beetle parts, either in an unaltered state or suspended for personal adornment would have allowed year-round access to these materials. If we can speculate that there was an industry, however miniscule, related to the acquisition, adaption or sale of the beetles, this again must have had its peak in the early months of summer. The short window of opportunity for seeing such beetles and the requisite environmental factors in ensuring that they were, in fact, visible at a specific place may have made them particularly elusive or possessed of an exotic quality. Given the link to seasonality and to summer, perhaps such pendants were temporary or disposable? Perhaps their use was limited to specific times, places, or social functions? Perhaps they were used only once, or for a single, specific, ritual function related to seasonal changes? These issues could impact upon the ephemerality of these beetle pendants, both for contemporary users and for modern archaeological inquirers.

Whilst live beetles may be released or otherwise escape alive, dismembered stag beetles that have been victims of predation, often missing abdomens and limbs, wings and wing-cases are still capable of movement and mobility for a short time whilst in this terminal state (Fremlin 2014; Arno Thomaes pers. comm.). When discussing the role of the human cadaver in archaeology Nilsson Stutz (2008: 22–23) discusses the transformative nature of death and the fundamental changes in biological processes from those of growth to decay. The idea is morbid, but can be transferred to this case study to speculate that the post-predated beetles exist at a liminal point between life and death, on the cusp of transformation from living creature to raw material suitable for modification into a pendant. The materiality of death is particularly relevant here (Fahlander and Oestigaard 2008: 3–5). This transitional quality may have proven of interest to ancient collectors of the beetles. If only considered in purely pragmatic terms, the insect is possessed of incredible physical strength and endurance. These qualities are, potentially, some of those which sympathetic magic (see Graf 1997: 205ff) may try to replicate or install upon a human user, particularly if they are considered as part of a 'healing practice'. Indeed, this idea that the physical attributes of animals can be given to or reflected in or by people by such supernatural means is well discussed in modern discourse (Wilburn 2012: 155–160).

It should be noted that other invertebrates may be used as viable amulets. Pliny, in particular, mentioned several in chapter thirty of book thirty of the Natural History — remedies for fevers. The wasp translated as *pseudosphex* is listed as a cure for fever, if worn as amulet after having being caught with the left hand or if it is the first wasp seen in a year (Pliny, *Nat. Hist:* 30.30). The *sphex* refers to a group of solitary wasps,

rather than the more familiar social wasps, and are of the order Hymenoptera in the families Eumenidae, Pompilidae, Sphecidae (Beavis 1988: 187). These three broad families are more commonly known as the Mason Wasps, Spider-hunting Wasps, and Digger Wasps respectively. Unlike the accessibility and relative ease of discovery associated with the very common Dung Beetles, finding and catching a solitary wasp might be an altogether more complicated challenge; specialist knowledge about where and when such a creature may be found would be vital in tracking one down. We might speculate about the importance exoticism might play in the capture and suspension of a solitary wasp, particularly if such a thing was not native to the area or province in which it is being displayed — acquiring and utilising the exotic and unusual is an important part of the ritual process of magic (Wilburn 2012: 17f).

Caterpillars and slugs are also mentioned in Pliny, but only in very general terms and in relation only to the ritual processes which are required of them: caterpillars are to be enclosed in a pieces of linen and tied three times whilst repeating the cause of the operation at each knot; slugs may be wrapped in skin (it is not recorded whose skin) or the heads of four are cut off with a reed.

A further invertebrate remedy for fever in Pliny (*Nat. Hist.* 30.30) is the web of the 'spider called "lycos"' applied with the creature itself to the temples in a compress with resin and wax. The spider family Lycosidae is a pan-European species consisting of 81 species commonly known as the wolf spiders which can be found in domestic settings (Roberts 1995: 209). A spider wrapped in cloth and attached to the arm as a cure for fever is also suggested by Alexander of Tralles (Faraone 2018: 280, no. 3). In the fourth — fifth centuries Marcellus of Bordeaux suggested that a mouse-spider[4] that had died on its web could be enclosed in clay, linen or parchment and traced around swollen tonsils to relieve the pain (see Faraone 2018: 278, no. 25).

The general problem with directly associating any invertebrates with real ritual processes visible in the archaeological record is the ephemeral nature of their survival in the ground. Assuming such practices occurred at all in the real world, soft bodied invertebrates (caterpillars and slugs for example) simply will not survive the intervening time between Roman deposition and modern excavation. Invertebrate remains which survive are the hard exoskeletal parts – immediately then we encounter a problem in survival and information retrieval. In order to be able to attribute any physical invertebrate remains to a specific ritual practice this would require the *in situ* survival of all or part of this process (to find the head of the stag beetle or the caterpillar wrapped in linen) in a dateable context. The recovery of insect fauna in general archaeological terms is reasonably based on selective environmental sampling and is not always part of the post-excavation analyses of a site. Bridging the gap between the discussion of invertebrate remains as material culture in classical text and the secure attribution of these practices to Roman Britain remains a purely theoretical concept and is likely to remain such.

Conclusions

This paper has raised questions about the potential uses of stag beetles as pendants for magical/medicinal purposes in the Roman world and attempted to add some colour to this somewhat opaque subject. Given the ephemeral nature of the materials and the scant literary sources available, contextual analyses are not yet an approach one can take to this subject. The discussion of the biology of this beetle species provides an insight into some issues and strategies which may have been encountered in sourcing the raw material; namely that the short temporal window in which the beetles are prevalent prevented year-round access, and that the nuances of their behaviour, lifecycle and natural environment required a basic understanding of some of these facts if the beetle could have been actively sought out.

As much as possible I have considered the stag beetles as real, living creatures within a living and changing environment, though the necessities of my approach have required the use of broad brush strokes to illustrate certain aspects of biology, behaviour, and how humans may have encountered them. Experimental investigations of other beetle species have shown that there are significant logistical issues which may have been encountered during the preparation of an insect for the purpose of personal adornment. Inevitably, the vast majority of all *Lucanus* species (and probably all invertebrates) exist and have existed without being subjected to any contact by humans, but the relationships between those that did are certainly of interest. Following Tilley (2004: 219f) this work is open to new interpretations, because other observations or reinterpretations of the same biological conditions or human-beetle interactions are, inevitably, possible. The material evidence remains elusive, but it is hoped that future archaeological investigations, in combination with an awareness of this possibility that such pendants existed, may shed additional light on this one element of Roman magical or medicinal practice which has been lost to us.

Abbreviations

PGM *Papyri Grecae Magicae* – Betz, H.S. (ed.) 1992. *The Greek Magical Papyri in Translation (including the Demotic Spells).* 2nd Edition. Chicago and London: The University of Chicago Press.

RIB Roman Inscriptions of Britain – Frere, S.S. and Tomlin, R.S.O. (eds) 1992. *The Roman Inscriptions of Britain, Volume II, Fascicule 4.* Stroud: Allan Sutton Publishing.

Notes

[1] For a holistic overview of references to other coleoptera and, indeed, other insects and invertebrates in Classical Antiquity see Beavis 1988.

[2] The term *materia magica* is a reference to the English translation of the *Papyri Graecae Magicae* (*PGM*) in which the phrase 'magical materials' is included in the text of the spells to refer to an explicitly un-named group of 'ingredients' for a ritual, presumed to be known by the author and reader (*PGM* I. 99; IV. 2663). In the glossary, the term is described as referring to the 'magical substance such as hair, thread from clothing, etc., which is often necessary to make sympathetic magic effective' (Betz 1992, 336).

[3] Campbell-Bonner Magical Gems Database http://www2.szepmuveszeti.hu/talismans/visitatori_salutem (Last accessed 28 February 2019).

[4] Probably the genus *Scotophaeus* which have silky grey hairs on the abdomen and share the name 'mouse spider' (Roberts 1995: 108–109).

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Competing Interests

The author has no competing interests to declare.

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