

EvoThan: International Symposium on Comparative Evolutionary Thanatology

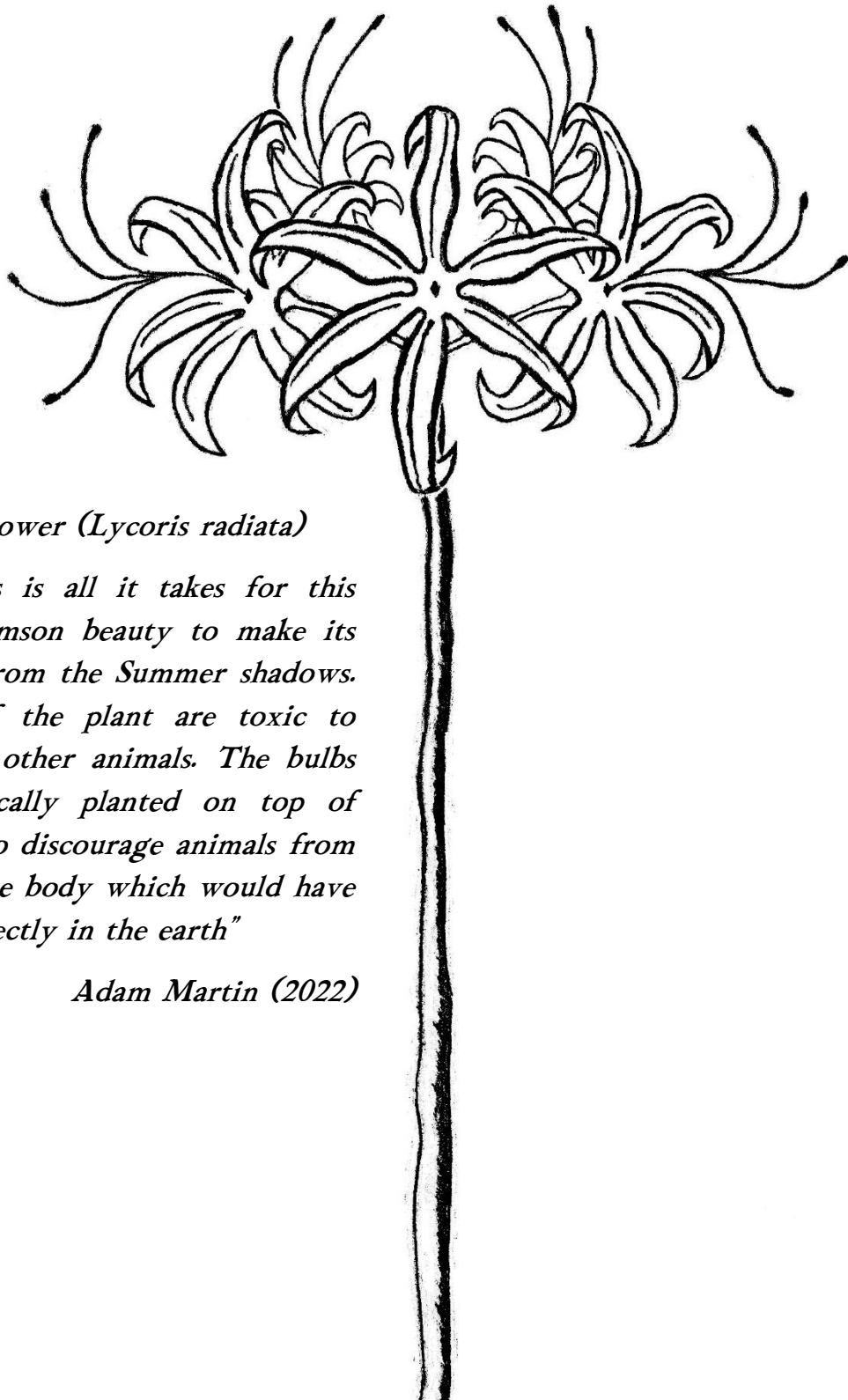
How do animals *understand* death?

Programme

June 20 & 21, 2024
Kyoto University



Introduction



Higanbana flower (Lycoris radiata)

"A few days is all it takes for this Japanese Crimson beauty to make its appearance from the Summer shadows. All parts of the plant are toxic to humans and other animals. The bulbs were historically planted on top of burial sites to discourage animals from disturbing the body which would have been laid directly in the earth"

Adam Martin (2022)

Welcome to the 2024 edition of the *International Symposium on Comparative Evolutionary Thanatology* (EvoThan) hosted by the *EvoThan Collective*. We are thrilled to announce our event, taking place in the serene setting of Kyoto, Japan, from Thursday, June 20th, to Friday, June 21st, 2024. Comparative thanatology is the interdisciplinary study of death-related behaviors and processes across different animal species, aiming to elucidate evolutionary, ecological, and social factors influencing animals' responses towards mortality. The EvoThan Symposium will be a gathering of experts, researchers, and enthusiasts dedicated to exploring and advancing our understanding of such animal reactions to death and dying.

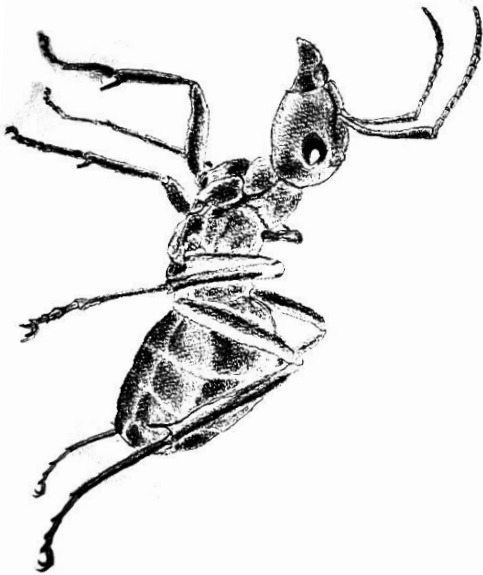
The *EvoThan Collective* is an international non-profit organization dedicated to advancing the scientific understanding of comparative evolutionary thanatology—the study of death-related behaviors across human and nonhuman animals. Welcoming researchers from diverse fields, including biology, ethology, anthropology, and comparative psychology, the *EvoThan Collective* emphasizes rigorous scientific methods to explore the nature and evolution of death-related phenomena. Through conferences, publications, and a commitment to the scientific method, it serves as a collaborative platform for interdisciplinary knowledge exchange in the evolving field of comparative evolutionary thanatology.

Recognizing the diverse needs of our global community, the *EvoThan Symposium* will be a hybrid event, ensuring accessibility for participants who are unable to join us in person. Join us to engage with eminent scholars and researchers involved in comparative thanatology, as they share groundbreaking insights and discoveries. Whether you're presenting your own research or participating in lively discussions, your contributions will shape the dialogue of this international gathering.

EvoThan Collective.

June, 2024

Speakers



"The {anthill} passage leading downward from the opening is not all straight or easy for any other creature to traverse; it passes through turns and twists with branching tunnels and connecting galleries and terminates in three hollow cavities. One of these is their common dwelling-place, another a storeroom for provisions, while in the third they deposit the dying."

Plutarch (46-74 CE)



Susan Carey

Emerita Professor Susan Carey's work at Harvard University has focused on the development of concepts in children and adults. Her research explores the initial representational repertoire, developmental changes, and learning mechanisms underlying shifts in conceptual understanding. Of particular interest are her groundbreaking studies on children's acquisition of the concept of death. Recognized with numerous awards, Prof. Carey has had a significant impact in the fields of developmental psychology and cognition.



Barbara J. King

Emerita Professor Barbara J. King of William & Mary's Anthropology Department is now a full-time science writer and public speaker. She has written 7 books on animals' lives, including *How Animals Grieve*, and numerous magazine essays. Her TED talk on love and grief in the animal kingdom has been viewed over 3.5 million times. Prof. Barbara King's website is www.barbarajking.com



James R. Anderson

Emeritus Professor James Anderson at Kyoto University, is internationally recognized for his research on wild and captive primates, particularly in the realms of primate cognition and mirror self-recognition. His substantial contributions to the field endure, highlighted by his editorial roles in esteemed journals. Notably, he has edited two special journal editions on comparative thanatology and thrice-organized the Kyoto Workshop on Evolutionary Thanatology, showcasing his authority in the research of primate cognition and its implications for the understanding of comparative evolutionary thanatology.



Alecia Carter

Prof. Alecia Carter is a Lecturer in Evolutionary Anthropology at the Department of Anthropology, University College London, UK, focuses her research on how primates, particularly baboons, respond to the deaths of others, offering insights into the evolution of cognition and emotion. Her extensive study at the Tsaobis Baboon Project in Namibia has revealed intriguing behaviors, such as baboon mothers carrying and grooming the corpses of their infants, shedding light on the evolutionary origins of grief and death awareness.



Takahisa Miyatake

Prof. Takahisa Miyatake, a distinguished researcher at Okayama University, is a leading expert in insect behavior with over 170 publications. With years of dedicated and extensive research on the evolutionary aspects of death-feigning behavior in insects, his work provides valuable insights into the emergence of anti-predator strategies, emphasizing the trade-offs individuals face between enhancing survival prospects and limiting opportunities for feeding and reproduction.



Teresa Iglesias

Dr. Teresa Iglesias serves as the team leader for cephalopod support at the Okinawa Institute of Science and Technology. Her research centers on behavior, ecology, and neuroscience, with a specific emphasis on the investigation of sleep behavior in cephalopods. Previously, Dr. Iglesias conducted an experimental study on thanatological responses in western scrub jays, which raised intriguing questions about the social and emotional dimensions of these mobbing interactions, shedding light on the complex behaviors exhibited by scrub jays when faced with both dead conspecifics and heterospecifics



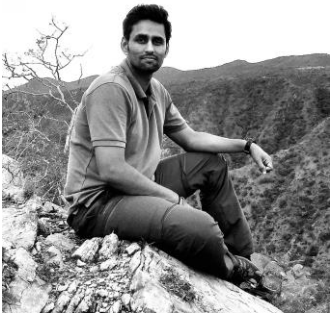
Antonio Osuna-Mascaró

Dr. Antonio Osuna-Mascaró is an animal cognition researcher with a diverse academic background that include paleontology and tool use in wild chimpanzees. Currently based at the Goffin Lab, Messerli Research Institute, Vetmeduni, his work focuses on unraveling the cognitive and tool-using abilities of Goffin's cockatoos. Among these is his latest research to assess their understanding of irreversibility in relation to the concept of death.



André Gonçalves

Dr. André Gonçalves, a post-doctoral researcher at the Center for the Evolutionary Origins of Human Behavior (formerly Primate Research Institute) at Kyoto University, is deeply engaged in investigating the comparative thanatology of primates and other non-human animals through experimental methods. His research primarily focuses on exploring how chimpanzees perceive and process death and death-related stimuli. Utilizing techniques such as touchscreen tasks and eye-tracking technology, he aims to uncover the intricacies of chimpanzee cognition in this domain.



Nachiketha Sharma

Dr. Nachiketha Sharma, a postdoctoral fellow at the Kyoto University Institute for Advanced Study, is deeply interested in understanding Asian elephants from a holistic perspective. His research mainly focuses on ecology, acoustic communication, physical cognition, and thanatology of Asian elephants both in wild and captive conditions.



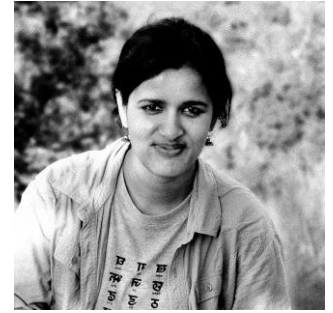
Leanne Proops

Dr. Leanne Proops is an Associate Professor in the Centre for Comparative and Evolutionary Psychology, University of Portsmouth, UK. She studies the socio-cognitive abilities of domestic equids (horses, donkeys and mules) and is fascinated by the field of evolutionary thanatology. Her current projects include an exploration of domestic horse and feral donkey responses to the carcasses and bones of their species..



Qian Sun

Dr. Qian “Karen” Sun is an Assistant Professor in the Department of Entomology at Louisiana State University. Her research centers on the chemical and behavioral ecology of social insects, with a primary emphasis on termites. Her earlier investigations have delved into the behavioral responses of termites to dead conspecifics and the mechanisms of death recognition. Additionally, she has contributed to the field with two review papers on corpse management in social insects. She remains interested in the intriguing research topic of evolutionary thanatology.



Sanjeeta Sharma Pokharel

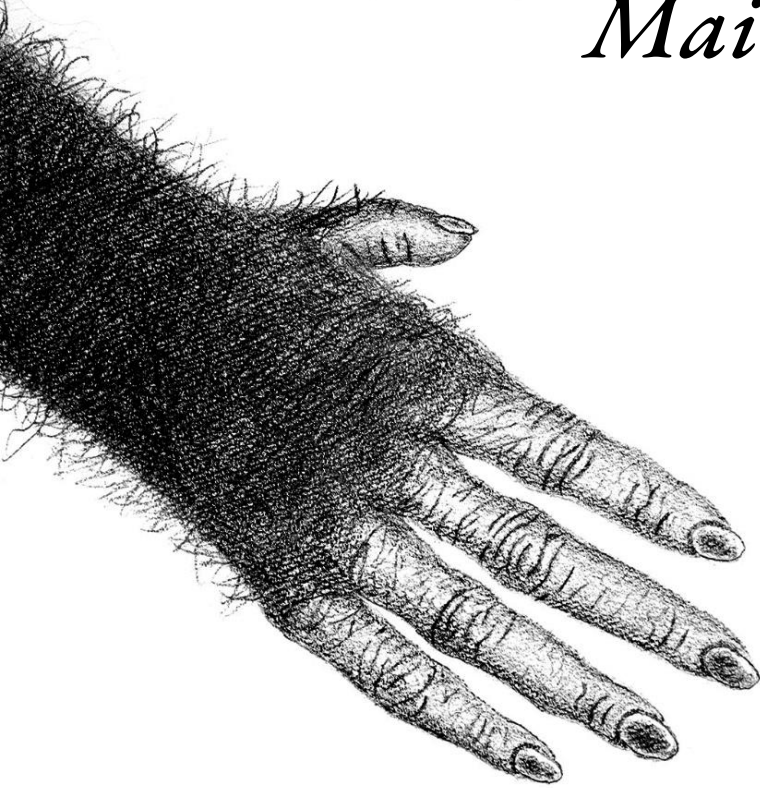
Dr. Sanjeeta Sharma Pokharel is an elephant biologist who has been exploring the physiological adaptive mechanisms concerning ecological and human-induced challenges in free-ranging and captive Asian elephants. Her primary research interests revolve around understanding physiological and behavioural interplays in animals. A part of her elephant research also focuses on comparative thanatological studies in Asian elephants. She is a member of the IUCN Asian Elephant Specialist Group and currently works as a JSPS postdoctoral fellow at Asian and African Area Studies (ASAFAS), Kyoto University.



Claudia Stephan

Dr. Claudia Stephan is a lecturer and researcher at the Department of Biology at the Friedrich-Alexander University Erlangen-Nürnberg, Germany. Her research primarily focuses on the evolution and the development of vocal communication and cognition in forest guenons. Dr. Stephan recently added topics on the behaviour and underlying cognitive capacities in forest elephants and gorillas in their natural habitats to her research portfolio. She is particularly interested in how highly social species respond to deceased conspecifics and what kind of (contextual) information is inferred during such encounters.

Abstracts: Main Talks



"After the death of the female, which took place early in the morning, the remaining one made many attempts to rouse her, and when he found this to be impossible his rage and grief were painful to witness. (...) the ordinary yell of rage which he set up at first, finally changed to a cry (...) uttered somewhat under the breath, and with a plaintive sound like a moan"

Arthur E. Brown (1879)

Animal Grief: Perspectives from Anthropology and ActivismBarbara J. King¹,¹William & Mary, U.S.A.

Within evolutionary thanatology, the field of animal-grief studies has grown immensely in the last 15 years. It sits at a fascinating intersection. Among the media and the animal-loving public there emerges at times a readiness to embrace a romanticized view of other-than-human grief. At the opposite pole, some scientists cling to hard-core skepticism, wielding the belief that any claims for the expression of animal grief amount to unwarranted anthropomorphism. Meanwhile, scholars of animal grief grapple with how to define and recognize grief in ways that do not measure expressions of animal emotion only against a human standard. This work has illuminated the scope and contours of what I believe to be a genuine and profoundly felt grief in individuals from a variety of mammalian, avian, and perhaps other, species. Based on my own understandings of animal grief through an anthropological lens, I explore this situation. Then I ask: Can, and should, this increasing knowledge play a role in animal activism? To what situations in the wild and in captivity might such knowledge be effectively applied? Would doing so only reinscribe an unwanted speciesist hierarchy? Or might knowing who in the animal kingdom grieves and how their grief unfolds help us be better and do better for animals, who too often pay the price of human exceptionalism?

Are non-human animals likely to have a concept of death?Susan Carey^{1,2}¹Harvard University, ²New York University

My first goal is to explicate what the question of whether animals have a concept of death comes to. Its answer depends upon what we mean by “having a concept” and what target concept of death we have in mind. I will characterize the human religious concept of death and the human biological concept of death and will argue that it is unlikely that any animal has either of these. Animals and prelinguistic infants undoubtedly have mental representations with abstract conceptual content, called systems of core cognition or core knowledge in the developmental cognitive science literature. Examples include representations of number (systems of representations with numeral content that are precursors to mathematical knowledge), representations of intentional and causal agency (a system of representation with agent at its core with content that overlaps and is the precursor to intuitive psychology), and representations of physical knowledge (a system of representations with the concept object at its core that represents physical interactions among objects). These systems of core cognitive are evolutionarily ancient and are attested early in human infancy in every culture studied. In support of my argument, I will illustrate the evidence for core cognition of agency, and the lack of evidence for a biological concept alive in infancy. And I will sketch the evidence that the construction of an intuitive vitalist biology, the first conceptual system that includes a biological concept of death in childhood, requires conceptual change. I will endorse the suggestion made in some of the abstracts for the present symposium that the animal concept of death attested in comparative evolutionary thanatology is cessation of agency. I will pose the question of what precursors to a biological concept of death the representation of cessation of agency might be shown to include.

Suicide is Panless: Why Chimpanzees Never Kill Themselves

James Anderson¹

¹Graduate School of Letters, Kyoto University, Japan

Chimpanzees in the wild are known to die from various causes, including disease, predation, intra-specific aggression, hunting by humans, and accidents. The literature contains many reports of such deaths. But despite the many thousands of hours during which chimpanzees have been observed both in the wild and in captivity, no cases of suicide have ever been witnessed, nor any convincing evidence for deliberate self-killing found. In fact, the same applies to all nonhuman primates and, I would argue to all nonhuman species. By contrast, suicide is estimated to account for around one million human deaths worldwide each year; it is considered the leading cause of violent death. To understand why suicide appears to occur only in humans, we need to consider comparative and developmental aspects of death awareness, as well as cognitive processes that arise from self-awareness, such as self-conscious emotions, mental time travel, and the ability to imagine alternative future outcomes.

Live or Lifeless? How Chimpanzees Perceive "Death-stimuli"

André Gonçalves¹

¹Center for the Evolutionary Origins of Human Behavior, Kyoto University, Japan

Humans and many non-human animals divide their world into agents and non-agents. Agents usually have clear morphological/biomechanical features associated with animacy used to categorize them as such. According to the animate monitoring hypothesis, animate entities attract more attention than inanimates due to their potential role as predators or prey in ancestral human environments. Studies show that humans quickly detect both upright lions and impalas in comparison to their reclining counterparts. Detecting animacy is a problem many animals face, expected to be widespread in Nature. The perception of dead animals poses an interesting question since they share both animate and inanimate attributes. Visual-defining features of death include inertia, injury, and decay. Using a two-competing stimuli task with eye-tracking, we measured chimpanzees' attention toward images depicting both live and dead animals in realistic backgrounds to explore if they exhibited preferential-looking patterns towards live versus death-related stimuli. In experiment1, the stimuli consisted of image-pairs of live and dead animals. Experiment2 had image-pairs of dead and live infant-carrying behavior in non-human primates. Lastly, experiment 3 consisted of image-pairs of sleeping and dead mammals. Our results suggest a similar animacy bias towards upright live animals versus dead reclining animals in experiment1; the chimpanzees detected live animals quicker and looked at them significantly longer. Experiment2 showed this bias carried through infant primates; chimpanzees looked longer at live primate infants in comparison to dead ones. Finally, in experiment3, there was no such difference in latency or looking durations; sleeping and dead animals were perceived similarly in this experiment. The results suggest that indeed chimpanzees show an animacy bias towards life-like stimuli; however, while we remain agnostic as to whether chimpanzees distinguish sleeping from dead animals in experimental settings, our sleeping-dead stimuli may be too perceptually similar for such detection in this task. Other experimental methods involving active choice might reveal such a categorization is within their grasp.

*Prospective Studies of Primates' Responses to Death*Alecia Carter¹¹University College London, U.K.

The field of evolutionary comparative thanatology is growing rapidly. Despite recent interest in this relatively new field of research, there have been few systematic, prospective data. In this talk, I will discuss prospective observational and experimental research from my lab that queries non-human primates' responses to the deaths of others from captive to free-ranging and wild settings. I aim to provide insight into the breadth and ubiquity of primates' responses to death, their motivations for interacting with the dead, and evidence for whether they grieve when bereaved.

*Equid Responses to Bones and Carcasses*Leanne Proops¹¹University of Portsmouth, U.K.

Myths of elephant graveyards, supported by field experiments and observations, suggest that some non-human animals may be attracted to the bones and carcasses of conspecifics long after they have died (Goldenberg & Wittemyer, 2020; McComb et al., 2006). However, recent eye tracking studies with chimpanzees indicate that attraction to the skeletons of conspecifics might reflect a generalized and highly adaptive drive to affiliative with members of the same species rather than a specific desire to re-visit dead group members (Gonçalves et al., 2022). In short, the mechanisms underlying such behaviour remain unclear. In this talk, I will introduce two ongoing projects that explore domestic horses' responses to skulls and bones and wild donkeys' responses to conspecific carcasses and matched control areas. Equids are an ideal taxonomic group in which to study this form of mortuary behaviour given that they develop lasting social bonds and can react strongly to the death of social partners (Dickinson & Hoffmann, 2016). In our domestic horse study, across three experiments we presented subjects with arrays of 1) a horse skull, cattle skull and pig skull; 2) a horse skull, horse leg bone and a wooden log; and 3) a horse skull and plastic 3D model of a horse skull, with half the skulls presented frontally and half laterally. Our preliminary findings provide insights into the preferences and discriminative abilities of horses and the role of olfactory versus visual cues in these responses. Since 2022, in our second study we have positioned video camera traps near ten wild donkey (burro) carcasses found in the region of Bill Williams River, Arizona, USA. Field notes suggest these carcasses become important local landmarks where individuals may socialise and establish territorial boundaries. Alongside these cameras, we recorded nearby comparable locations, relocated carcass sites, and scent marking posts. From these data we will be able to calculate visitation rates to determine if carcasses are preferentially visited and compare detailed activity budgets for donkeys observed at each site to provide insights into the function of these visits. These are the first systematic studies of responses to bones and carcasses in equids and will help to elucidate the proximate mechanisms and evolutionary origins of these mortuary behaviours. We also hope that the establishment of these controlled field studies can provide a blueprint for future studies across species.

Full author list: Leanne Proops¹, Teresa Romero¹, Kate Lewis¹ and Erick Lundgren²

Affiliations: ¹Centre for Comparative and Evolutionary Psychology, University of Portsmouth, UK; ²Department of Biology, Aarhus University, Denmark

Dead Calf Carrying in Asian Elephants

Sanjeeta Sharma Pokharel¹

¹Asian and African Area Studies, Kyoto University, Japan

Understanding how animals respond to death is gaining traction among ethologists and conservation biologists. Thanatological responses of highly cognitive and behaviourally flexible species, the Asian elephants, were reported based on opportunistic field observations and publicly available videos*. Similar to African elephants, Asian elephants showed a range of behaviours, including exploration, visitation, guarding, epimeletic responses and vocalization in reactions to dying and dead conspecifics. Notably, adult female elephants were observed carrying dead calves, a behaviour rarely observed in elephants. The condition of dead calves and the mode of carrying raises questions whether elephants truly understand the state of the calves. The fact that adult females carried dead calves for extended periods, despite the potential hindrance to their basic survival activities, such as foraging and movement, hints at associated maternal instincts and suggests two possibilities either (i) their failure to comprehend the state of ‘death’ and hence, carrying the ‘unresponsive’ calves or (ii) the existence of grief-like behaviours in elephants. Further comprehensive studies, including physiological assessments of surviving individuals, are warranted to better understand these phenomena and to advance the field of comparative thanatology.

**References: Sharma, N., Pokharel, S.S., Kobshima, S. and Sukumar, R., 2020. Behavioural responses of free-ranging Asian elephants (Elephas maximus) towards dying and dead conspecifics. Primates, 61, pp.129-138. Pokharel, S.S., Sharma, N. and Sukumar, R., 2022. Viewing the rare through public lenses: insights into dead calf carrying and other thanatological responses in Asian elephants using YouTube videos. Royal Society open science, 9(5), p.211740.*

Sexual dimorphisms in behavioural responses to a poached conspecific in wild forest elephants (Loxodonta cyclotis)

Claudia Stephan¹

¹Friedrich-Alexander University, Germany

The increased attention towards deceased conspecifics in various social animal species seems to be one of the most intriguing conundrums in animal behavior. The factors that might explain the observed behavioral variation amongst individuals and contextual information that could impact on the latter remain widely nebulous. Here we analyse forest elephants’ (*Loxodonta cyclotis*) responses to a poached adult male conspecific, using remote camera trapping and individual identification during a period of eight months. After completely avoiding the carcass site for over a week, general interest was high across all age classes. However, females and males substantially differed in behavioral responses. Males consistently stayed longer around the remains, showed signs of increased arousal by physically interacting with the bones and the surrounding vegetation, and bonding behavior. Females, in contrast, were more passively explorative and preferred to visit the site without their dependent offspring, suggesting that they associated increased risk with the dead body. Our findings suggest that while females balance potential inclusive fitness risks from visiting the carcass against gathering social information, males are mainly driven by the urge to assess information that might affect their own position in male dominance hierarchies. Forest elephants seem to infer contextual information associated with death and to adapt their behavioral responses accordingly. Results reported here highlight the necessity to take intrinsic and extrinsic factors into account when investigating behavioral plasticity towards dead conspecifics. Furthermore, our findings inform adaptive management strategies with regards to forest elephant conservation efforts.

The Curious Case of Elephant Burials

Nachiketha Sharma¹

¹Institute for Advanced Study, Kyoto University, Japan

Elephants are known to display a wide range of thanatological behaviors from physical interactions, visiting the carcass and even to carrying the dead. They show deep interest in the remains of dead conspecifics that may even extend to conspecific skeletons. Of these thanatological interactions, ‘burial’ is one of the most intriguing and very rarely documented behaviour in elephants. Wild African savanna elephants (*Loxodonta africana*) have been, on occasion, observed to partially cover dead conspecifics with branches, leaves or soil. Some anecdotal reports suggest this species of elephants have buried dead/sleeping humans or even other animals. As with dead calf carrying (a behavior observed in two elephant species), a recent study claimed that wild Asian elephants (*Elephas maximus*) also engage in burial behaviors similarly to their African counterparts; they seem to drag the carcass of calves for burying ‘upside down’ position in ditches. In this talk, I will present a brief overview of how and why non-human animals bury their dead and through my own observations, I will discuss the circumstantial evidence to explore the intentionality behind the burial behaviours of elephants.

The Thanatosis of Beetles

Takahisa Miyatake¹

¹Okayama University, Japan

Thanatosis (or death feigning) is widely observed in animals including mammals, birds, reptiles, fishes, and invertebrates. Ever since Charles Darwin and Jean-Henri Fabre have shown interest in thanatosis, its adaptive significance has not yet been proven with sufficient data. Therefore, I examined the conditions under which thanatosis occurs using the weevil (*Cylas formicarius*), at first. The weevil feigns death in a state of extreme rigidity with a characteristic posture that can be discriminated from dead specimens, indicating the weevil shows consciously feigning dead. Second, a trade-off between flight ability and duration of thanatosis has been examined using the seed beetle (*Callosobruchus chinensis*) in lab and field. Third, strains artificially selected for shorter (S-strains) and longer (L-strains) duration of thanatosis to measure its inheritance and correlated responses using the red flour beetle (*Tribolium castaneum*). In the field, S-strain type is the majority and L-strain type is the minority in this beetle species. When cohabiting with a predatory jumping spider, L-strain beetle was significantly less eaten than S-strain. However, L-strains were at a disadvantage in breeding because of their lack of movement. This is because they have not met their sexual partners. Beetles derived from S-strains showed higher expression of dopamine in their brain and higher activity than these derived from L-strain beetles. When the L-strain beetles were placed on a treadmill to measure locomotor ability, abnormalities in gait were also found. The duration of thanatosis was shortened by dopamine supplementation. Transcriptome analysis showed that L-strain beetles had higher expression of dopamine-related genes in the tyrosine metabolism system and greater variation in human Parkinson's disease-related genes compared to S-strains. Although I am aware that my talk is somewhat different from what you may think of thanatology, insects are clearly consciously performing death feigning. It would be interesting, in my opinion, to know if predators can distinguish between a dead prey and an individual feigning death as a future work.

From cannibalism to burial: corpse management in termite societies

Qian "Karen" Sun¹

¹Louisiana State University, U.S.A.

Social insects, such as termites, ants, and bees, frequently face the death of colony members as a consequence of living in large groups. While dead conspecific individuals are commonly avoided by non-social insects, social insects employ various corpse management strategies, including removal, burial, and cannibalism. The behavioral response depends on the nature of the corpse as well as the feeding and nesting ecology of the species. The eastern subterranean termite, *Reticulitermes flavipes*, is a wood-feeding species living in the soil with thousands to millions of individuals in a colony. In this species, workers cannibalize freshly dead colony members and bury them when corpses are highly decomposed. This behavioral alteration is modulated by postmortem changes in the chemical profile of the corpse. Immediately after death, the corpse releases a blend of volatiles, 3-octanone and 3-octanol, which attract workers to retrieve and consume it. The early death cues enable the colony to recycle nutrients before decomposition occurs. With longer postmortem time, early death cues diminish, and the accumulation of late death cues (fatty acids, phenol, and indole) indicates corpse decomposition and elicits burial behavior. Among the fatty acids, oleic acid is a shared death cue among diverse arthropods, which typically triggers avoidance in non-social species but corpse management in social species. In *R. flavipes*, the dynamic change from novel early death cues to conserved late death cues balances nutritional benefits and pathogenic risks. This postmortem chemical communication highlights unique adaptations in termites to their ecological and social niche.

Death as an indicator of risk in the Scrub Jay

Teresa Iglesias¹

¹Okinawa Science Institute, Japan

Abstract: Navigating the risk of injury or death is a fact of life for all organisms and exposure to danger can be managed by assessing and attending to cues of elevated risk. One of the most salient cues of risk is a dead conspecific. I will discuss how the sight of a dead conspecific induces alarm calling and risk-reducing behavior in a corvid, the western scrub-jay, *Aphelocoma californica*. Discovery of a dead conspecific elicits vocalizations that are effective at attracting conspecifics, which then also vocalize, thereby resulting in a cacophonous aggregation. However, is this reaction simply a surprised response to novel objects that suddenly appear nearby? How does it compare to seeing a predator? Do they have to recognize the dead individual? Are they responding to the smell of the conspecific carcass? What about dead heterospecifics? I will describe a series of experiments that answer these questions. By exploring the cues that are necessary and sufficient to elicit these cacophonous aggregations and the subsequent behavioral modification that reduces their exposure to these areas, we can begin to understand one component of the western scrub-jays' response to their dead.

The understanding of irreversible non-functionality in Goffin's cockatoos

Antonio J. Osuna- Mascaró¹

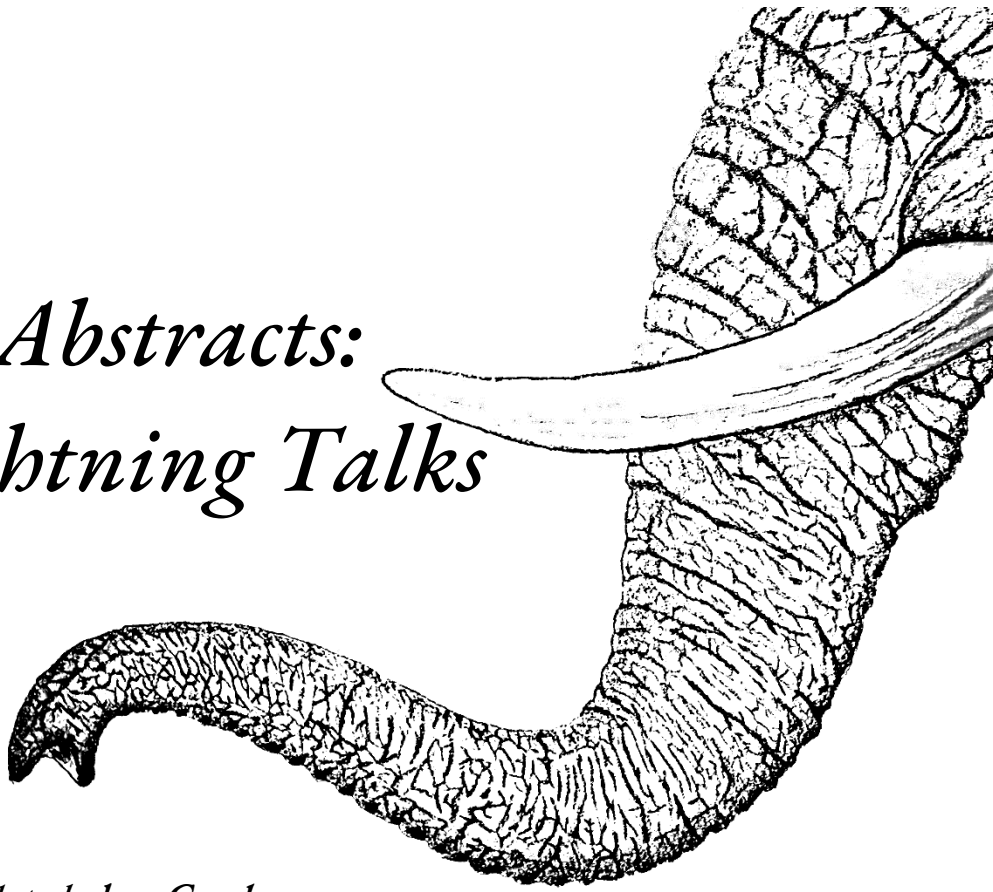
¹University of Vienna, Austria

While recognizing when something has permanently ceased to function is of profound importance for human technology and social behavior, it remains unexplored in non-human animals. This study investigates the ability of Goffin's cockatoos (*Cacatua goffiniana*) to develop an understanding of irreversible non-functionality by using a touchscreen interface. These parrots were able to learn to categorize interactive elements as irreversibly non-functional after associating them with a particular event, learning to generalize a rule by acquiring the necessary understanding of it. The Goffin's cockatoo has shown remarkable tool use and tool making skills in the past, making it an ideal model to study the perception of functionality in non-human animals. Nevertheless, the understanding of irreversible non-functionality has broader implications, as it is also a proposed prerequisite for the development of a minimal concept of death.

Full author list: Antonio J. Osuna-Mascaró¹, Eleonora Rovegno^{1,2}, Remco Folkertsma¹, Susana Monsó^{2,4}, Alice M.I. Auersperg¹

Affiliations: 1Comparative Cognition, Messerli Research Institute, University of Veterinary Medicine Vienna, Medical University Vienna, University of Vienna, Veterinaerplatz 1, 1210 Vienna, Austria; 2Department of Life Sciences and Biotechnology, University of Ferrara, via Borsari 46, 44121 Ferrara, Italy; 3 Department of Logic, History and Philosophy of Science, UNED (Universidad Nacional de Educación a Distancia), Paseo Senda del Rey 7, 28040 Madrid, Spain; 4 Unit of Ethics and Human-Animal Studies, Messerli Research Institute, University of Veterinary Medicine Vienna, Medical University Vienna, University of Vienna, Veterinaerplatz 1, 1210 Vienna, Austria

Abstracts: Lightning Talks



"Histories of Ethiopia, unpolluted by Greek fripperies, record that if an elephant sees another elephant lying dead, it will scoop up some dirt with its trunk and sprinkle it on the corpse, as if it were conducting a sacred ritual of some sort, failing to do so would be sacrilege, once it has done its duty, the elephant is free to move on."

Claudius Aelianus (175-255 CE)

A Concept of Death in Genus Pan: Implications for Human EvolutionKatherine H. McLean¹¹University of Auckland, New Zealand

An understanding of what death and dying entail is termed a concept of death (CoD), and the human CoD is often viewed as one of the characteristics that distinguishes our species. In this research, I identified an analogous understanding of death and dying in our closest living relatives—genus Pan. Linguistic frameworks designed for studying the CoD in human children look for evidence of understanding of several facets of death. I adapted these frameworks for the non-verbal Pan species, systematically analysing written and video recordings of chimpanzee and bonobo behaviours surrounding death within these new behavioural frameworks. I identified compelling evidence for the comprehension of several aspects of death, and thus for the presence of a human-like CoD in chimpanzees and bonobos. This has implications for our own evolutionary story and raises questions about what makes humans ‘human’.

A case of maternal cannibalism in Macaca fuscataYu Kaigaishi¹¹Institute for Advanced Study, Kyoto University, Japan

How primate mothers interact with their dead infants has attracted much attention from primatologists. In particular, the care given to infant corpses has been well documented. In contrast, instances of maternal cannibalism, another striking response to dead infants, are rarely observed and the factors contributing to this phenomenon remain unclear among primates. Here, I report a new case of stillbirth and subsequent maternal cannibalism which occurred in a free-ranging group of Japanese macaques (*Macaca fuscata*). In the observed case, a multiparous female gave a stillbirth in winter, 2022. The newborn appeared premature due to the lack of hair and unformed limbs, and the unseasonal birth. Initially, the mother cared for the newborn by licking and holding the body, but she suddenly began consuming the entire corpse, except for the parts around the head. This is the first case of maternal cannibalism by a multiparous mother of free-ranging Japanese macaque. We compared this case with those previously reported in Old World monkeys, and discussed the possible link between stillbirth, maternal care and cannibalization towards deceased infants. In order to understand how primates comprehend the concept of “death” and how their maternal relationships have evolved, it would be important to focus not only on maternal care toward dead infants but also cannibalism that could occur at the end of the caregiving.

Response of Irrawaddy dolphins to a dead conspecificAmy Jones^{1,2}¹Environmental Research Institute, UK. ²Marine Conservation, Cambodia

Cetacean behavior has long attracted scientific attention as humans endeavor to discover what makes these mammals so emotive and engaging. To date, much of this research has focussed on abundant and widely distributed cetacean species such as bottlenose dolphins (*Tursiops truncatus*) and humpback whales (*Megaptera novaeangliae*). As an endangered and often evasive species, research regarding Irrawaddy dolphin (*Orcaella brevirostris*) behavior is limited. This study uses data collected by The Cambodian Marine Mammal Conservation Project, to investigate the behavioral responses of Irrawaddy dolphins towards a dead conspecific. During a routine boat survey of Cambodia's Kep Archipelago, the carcass of an adult female Irrawaddy dolphin was recovered and attached to the stern of the research vessel and promptly towed to the research island for further examination. During this survey, there was a four-fold increase in the number of

Irrawaddy dolphin groups observed compared to the seasonal average (post-monsoon), in addition to an atypically positive response towards the research vessel and an atypical increase in the number of behavioral events observed. These behavioral variations were believed to be in response to the towed dead conspecific. The authors propose future dedicated research to assess the complexity of wild Irrawaddy dolphin behavior, cognition, and awareness to robustly exemplify the species' apparent sentience and intelligence.

Reaction to Dead Conspecific by European Magpies

Olha Brezghunova¹

¹H.S. Skovoroda Kharkiv National Pedagogical University, Ukraine

European magpies (*Pica pica*) have been observed to respond to dead conspecific by forming an aggregation. During the study of the behavior (2000-2020) and ecology (2002-2009) of the species in Kharkiv region, Ukraine, it was only once when such behavior was registered (March of 2003, Siverskyi Donets floodplain). The "funeral gathering" was formed near an adult magpie that was just-killed by a Goshawk (*Accipiter gentilis*). The Goshawk was no longer near the dead individual and neither the gathering. The birds were clamoring (sounds of such intensity, a cacophony, were not observed in typical gatherings formed when a predator appears), which attracted more and more individuals (from 10 to 15 birds were present simultaneously). The birds approached the dead magpie at a distance of up to 30 cm (without touching it). I discuss different social interactions and responds to dead conspecific among corvids. Some reaction to dead conspecific is known for *Pica* sp., *Corvus* sp., *Pyrrhocorax* sp. Presumably it is a signal to other individuals of the potential danger.

Do People Believe that Nonhuman Animals Grieve?

Heather King¹

¹Rice University, U.S.A.

Do animals grieve? What evidence would convince you they do? Animals' 'non-human' experience of death and their (in)ability to grieve are frequently represented in the long list of powers which humans have denied to animals. Despite this, the nature of animal grief remains elusive, with people increasingly willing to attribute emotion, sociality, and indeed, grief, to at least some animals. Regardless of the lack of consensus, our beliefs about whether animals can comprehend death is a central facet of how we think about animal minds—and critically, how we conceive of the differences between humans and animals. We take this as our critical starting point, and ask to what extent the capacity of animals to grieve is supported by survey responses. In this lightning talk, I will present the qualitative data gathered from our 2022 survey 'Do Animals Grieve?', led by PI Dr Leanne Proops, in which we collected data from 275 UK-based participants. Our survey queried participants on various topics related to animal cognition, with a specific focus on various animals' understanding and experience of death. One common theme in the responses was the discussion of animal emotion as evidence to suggest animal grief. Such emotionality in animals was then invoked to justify both why, and why not, animals ought to be able to explore the body of close companions after death, with justifications on either side involving a wish to protect, or refrain from harming, the animal's emotional well-being. My talk will summarize the qualitative portion of our survey results, identifying common trends, discussing anecdotal reports, and analyzing respondent's storytelling practices.

Exploring Japanese children's knowledge of deathAoi Miyagawa¹¹Kyoto University, Japan

Human adults understand death to be the irreversible cessation of bodily functions and mental activity. At what age is this understanding formed? Researchers have reported that understanding of death develops by the age of 7 years and reaches the same level of understanding as adults around the age of 10-12 years (Speece and Brent, 1984, 2007; Slaughter, 2005). However, it has been suggested that understanding of human death may be influenced by a person's cultural background (Brent et al, 1996). The present study addressed possible cultural influences by comparing Japanese children's understanding of death with that of Western children. It also examined the influence of personal experiences on understanding of death, by asking parents about their children's previous exposure to death.

Responses to the corpse observed in wild stump-tailed macaques in ThailandAru Toyoda^{1,2,3,4}¹Japan Society for the Promotion of Science, ²Japan Monkey Centre, National Primate Research Center of Thailand, Wildlife Research Center of Kyoto University

Necrophilic behavior (attempted copulation with corpses) is rarely documented in nonhuman primates, especially in wild populations. This presentation shows the first recorded case of necrophilic behavior in wild stump-tailed macaques in Thailand. Six groups totaling over 460 individuals, were identified and habituated for observation. The corpse of an adult female, identified as TNG- F11, was discovered and observed directly and via camera trap for three days. Although the cause of death remained undetermined, no significant physical injuries were observed. During the three-day observation period, three different males attempted to copulate with the corpse. Notably, these males included not only those from the deceased female's group but also from different groups. These observations suggest that certain cues emitted by the corpse, along with its nonresistant/passive state, may have triggered these behaviors in the males. Given the rarity of necrophilic behavior reports in non-human primates, our findings offer new insights into such behaviors and contribute to the broader understanding of comparative thanatology. In this presentation, we report not only the details of these necrophilic behaviors, but also newly observed cases and previously observed cases of reactions to corpses, including previous cases of carrying dead infants.

Full author list: Aru Toyoda 1,2,3,4, André Gonçalves 5, Tamaki Marubashi 6, Suchinda Malaivijitnond 3,7, and Ikki Matsuda 4,8,9,10

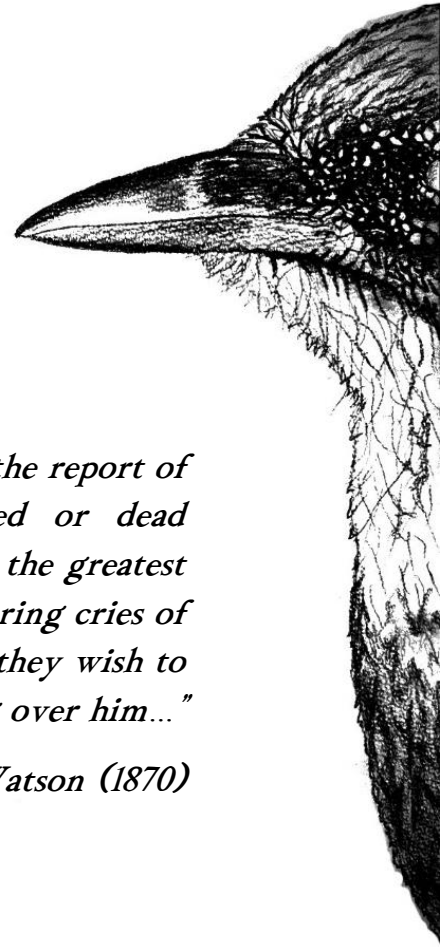
¹Japan Society for the Promotion of Science ²The Japan Monkey Centre, Inuyama, Aichi 484-0081 Japan ³National Primate Research Center of Thailand ⁴Wildlife Research Center of Kyoto University ⁵Section of Cognitive Neuroscience, Center for the Evolutionary Origins of Human Behavior, Kyoto University ⁶Musashi University ⁷Department of Biology, Faculty of Science, Chulalongkorn University ⁸Chubu Institute for Advanced Studies, Chubu University ⁹Chubu University Academy of Emerging Sciences ¹⁰Institute for Tropical Biology and Conservation, Universiti Malaysia Sabah***Chimpanzee behavioural reactions to putrescine, a chemical cue of death***Hanling Yeow^{1,2}¹Max Planck Institute for Evolutionary Anthropology, Germany, ²Kyoto University, Japan

Studying animal reactions to dead and dying conspecifics can inform us how much they understand and are aware of death. In chimpanzees, dead infant carrying is a puzzling behaviour because decaying corpses may carry the risk of disease transmission. In this study, putrescine, an unpleasant-smelling chemical produced when bodies decay, was presented to chimpanzees along with the dead body of a bird, and their reactions were recorded. Chimpanzees avoided putrescine but not the dead bird, suggesting that they do not show aversion towards corpses by themselves, but may show aversion towards chemical cues of decay. Dead infant carrying may be a naturally occurring behaviour in the early stages after death, when cues of disease are not yet present. However, cases of prolonged dead infant carrying behaviour occur despite the aversion to cues of potential infection from the decaying corpses, and further research will be required to understand why this happens.

Schedule

"Instead of being scared away by the report of the gun, leaving their wounded or dead companion to his fate, they show the greatest anxiety or sympathy for him, uttering cries of distress, and plainly proving that they wish to render him assistance by hovering over him..."

John Selby Watson (1870)



20th Thursday

The thumb and the trunk:

Experimental and observational insights into non-human primates and elephants' death awareness

09:00 - 09:15 – INTRO & REGISTRATION

Keynote Talk:

09:20 - The Child's Construction of a Concept of Death
Susan Carey, Harvard University*

10:05 - 12:05 - SESSION 1: Perceptive Primates

Chair: André Gonçalves

10:05 - *Suicide is Panless:*

Why Chimpanzees Never Kill Themselves

James Anderson, Kyoto University

10:45 - *Prospective Studies of Primates' Responses to Death*

Alecia Carter, University College London

11:25 - *How Chimpanzees Perceive Death-stimuli*

André Gonçalves, Kyoto University

12:05 - 13:30: Lunch Break

13:30 - 14:25 - SESSION 2: Lightning Talks I*

Chair: Sarv Dashti

14:30 - 16:50 - SESSION 3: Elusive Elephants-Equids

Chair: Alecia Carter

14:30 - *Equid Responses to Bones and Carcasses*

Leanne Proops, University of Portsmouth

15:10 - *Dead Calf Carrying in Asian Elephants*

Sanjeeta S. Pokharel, Kyoto University

15:50 - *Sexual Dimorphisms in Behavioural Responses to a*

Poached Conspecific in Wild Forest Elephants

Claudia Stephan, Friedrich-Alexander University*

16:20 - *The Curious Case of Elephant Burials*

Nachiketha Sharma, Kyoto University

21st Friday

Silent antenna, rustling feather:

Lessons from the lab to the field, from insect thanatosis to avian thanatology

09:00 - 09:15 – INTRO & REGISTRATION

Keynote Talk:

09:20 - *Animal Grief:*

Perspectives from Anthropology and Activism

Barbara J. King, William & Mary*

10:05 - 11:25 - SESSION 4: Imperative Invertebrates

Chair: Sanjeeta Pokharel

10:05 - *The Thanatosis of Beetles*

Takahisa Miyatake, Okayama University

10:45 - *From Cannibalism to Burial:*

Corpse Management in Termite Societies

Qian Sun, Louisiana St. University*

11:25 - 12:25 - SESSION 5: Lightning Talks II*

Chair: Nahoko Tokuyama

12:25 - 13:30: Lunch Break

13:30 - 14:30 - SESSION 6: Brilliant Birds

Chair: Nachiketha Sharma

13:30 - *Death as an Indicator of Risk in the Scrub Jay*

Teresa Iglesias, Okinawa Inst. Sci. Tech.

14:10 - *The Understanding of Irreversible Non-*

functionality in Goffin's Cockatoos

Antonio Osuna-Mascaró, Vetmeduni*

14:50 - 16:20 - WORKSHOP

14:50 - *What Could Future Thanatology Look Like?*

Alecia Carter, University College London

*Online Talks

20th Thursday

Lightning Talks I

13:30-14:18

13:30 - *A case of maternal cannibalism in Macaca fuscata*

Yu Kagaishi, Kyoto University

13:42 - *Responses to the corpse observed in Wild Stump-tailed macaques in Thailand*

Aru Toyoda, Japan Monkey Centre

13:54 - *Reaction to dead conspecific by European Magpies*

Olha Brezghunova, H.S. Skovoroda Kharkiv National Pedagogical University*

14:06 - *Response of Irrawaddy dolphins to a dead conspecific*

Amy Jones, Environmental Research Institute*

21th Friday

Lightning Talks II

11:25-12:23

11:25 - *Do People Believe that Nonhuman Animals Grieve?*

Heather King, Rice University*

11:47 - *A Concept of Death in Genus Pan: Implications for Human Evolution*

Katherine H McLean, University of Auckland*

11:59 - *Exploring Japanese children's knowledge of death*

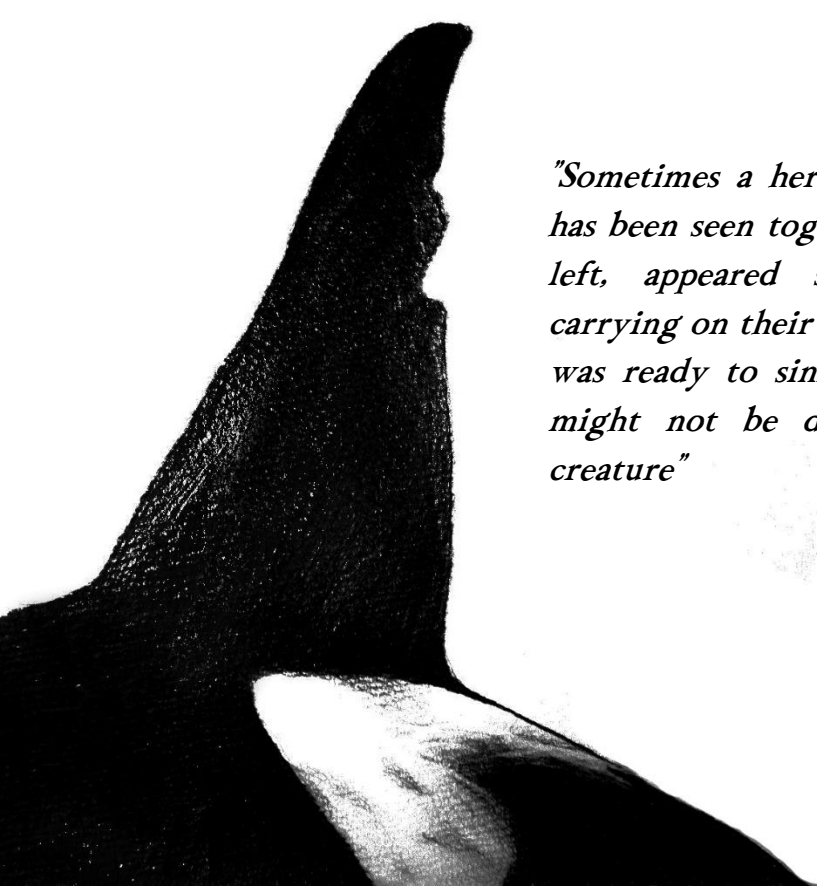
Aoi Miyagawa, Kyoto University

12:11 - *Chimpanzee behavioural reactions to putrescine, a chemical cue of death*

Hanling Yeow, Max Planck Institute for Evolutionary Anthropology

*Online Talks

Affiliated Institutions



"Sometimes a herd of large and small dolphins has been seen together, and two of these having left, appeared soon after, supporting and carrying on their back a small dead dolphin, that was ready to sink, as if in pity for it, that it might not be devoured by any other wild creature"

Aristotle (384-322 BCE)

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