

Article Metadata and JATS



Jeffrey Beck



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Everybody knows what metadata is!

It is data about data!

Everybody knows what metadata is!

MTHFR methylenetetrahydrofolate reductase [*Homo sapiens* (human)]

Official Symbol: MTHFR provided by [HGNC](#)

Official Full Name: methylenetetrahydrofolate reductase provided by [HGNC](#)

Primary source: [HGNC:HGNC:7436](#)

See related: [Ensembl:ENSG00000177000](#) [MIM:607093](#)
[Vega:OTTHUMG0000002277](#)

Gene type: protein coding

RefSeq status: REVIEWED



Organism: [Homo sapiens](#)

Lineage: Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Primates; Haplorrhini; Catarrhini; Hominidae; Homo

Summary: The protein encoded by this ... deficiency.[provided by RefSeq, Oct 2009]

Expression: Ubiquitous expression in lung (RPKM 7.5), thyroid (RPKM 7.2) and 25 other tissues. [See more](#)

Orthologs: [mouse all](#)


buttercup.jpg



ipmc-dev11|-\$ identify -verbose buttercup.jpg
 Image: buttercup.jpg
 Format: JPEG (Joint Photographic Experts Group JFIF format)
 Class: DirectClass
 Geometry: 487x517+0+0
 Resolution: 72x72
 Print size: 6.76389x7.18056
 Units: PixelsPerInch
 Type: TrueColor
 Endianness: Undefined
 Colorspace: sRGB
 Depth: 8-bit
 Channel depth:
 red: 8-bit
 green: 8-bit
 blue: 8-bit

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buttercup.jpg



ipmc-dev11|-\$ identify -verbose buttercup.jpg
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 Channel depth:
 red: 8-bit
 green: 8-bit
 blue: 8-bit

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buttercup.jpg



Channel statistics:
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 max: 255 (1)
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 skewness: 0.217215
Green:
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 max: 255 (1)
 mean: 92.3975 (0.362343)
 standard deviation: 65.9452 (0.258609)
 kurtosis: -0.431805
 skewness: 0.732417
Blue:

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max: 255 (1)
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standard deviation: 58.3456 (0.228806)
kurtosis: 0.332941
skewness: 1.07552

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 standard deviation: 65.8206 (0.25812)
 kurtosis: 0.158924
 skewness: 0.814258

Rendering intent: Perceptual
Gamma: 0.454545
Chromaticity:

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red primary: (0.64,0.33)
green primary: (0.3,0.6)
blue primary: (0.15,0.06)
white point: (0.3127,0.329)

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Quality: 95
Orientation: TopLeft

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- exif:YResolution: 72/1


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- exif:Software: 3.1
- exif:WhiteBalance: 0
- exif:XResolution: 72/1
- exif:YResolution: 72/1

buttercup.jpg



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Profile-icc: 3144 bytes
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Version: ImageMagick 6.7.8-9 2016-06-16 Q16
<http://www.imagemagick.org>

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buttercup.jpg



Other Metadata
Photographer: Jeff Beck
Subject: Dog
Property: Mutt
Property: Puppy
Property: Brown

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Everybody knows what metadata is!

It is data about data!

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Everybody knows what metadata is!

It is any information about data!

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Everybody knows what metadata is!

But it can also be about things.


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Metadata

Name: Buttercup
Species: Dog (*Dogis doggis*)
Breed: Mut
Age: 8 ½ years
Color: Brown (with some gray)

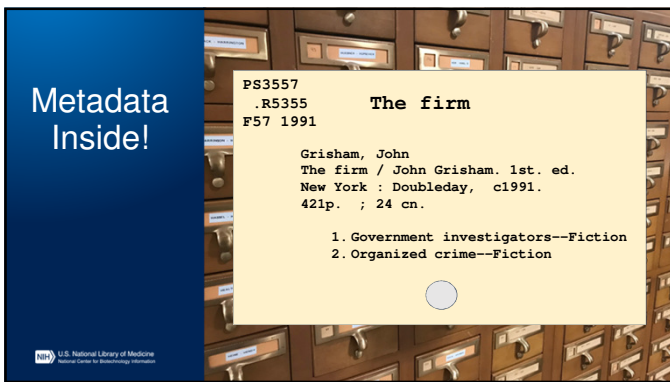
Buttercup

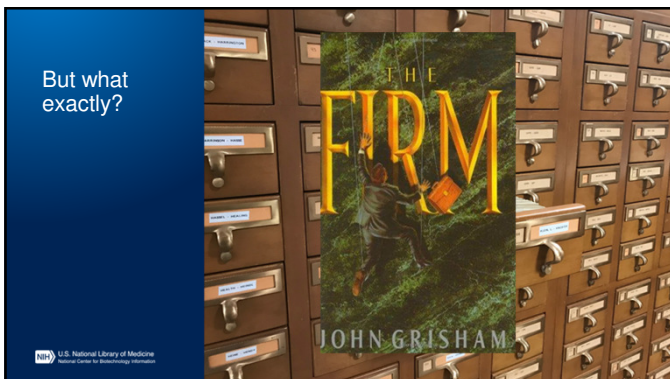


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But what exactly?
The Work?

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Work - "a distinct intellectual or artistic creation"

Detour to FRBR

Functional Requirements for Bibliographic Records by the IFLA.

Google "FRBR"

Section 3.2 "The Entities"

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Work - "a distinct intellectual or artistic creation"

Expression - "the intellectual or artistic realization of a work in the form of alpha-numeric, musical, or choreographic notation, sound, image, object, movement, etc., or any combination of such form"

Detour to FRBR

Functional Requirements for Bibliographic Records by the IFLA.

Google "FRBR"

Section 3.2 "The Entities"

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Work - "a distinct intellectual or artistic creation"

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Manifestation - "the physical embodiment of an expression of a work."

Detour to FRBR

Functional Requirements for Bibliographic Records by the IFLA.

Google "FRBR"

Section 3.2 "The Entities"

Work - "a distinct intellectual or artistic creation"

Expression - "the intellectual or artistic realization of a work in the form of alpha-numeric, musical, or choreographic notation, sound, image, object, movement, etc., or any combination of such form"

Manifestation - "the physical embodiment of an expression of a work."



Item - "a single exemplar of a *manifestation*"

Detour to FRBR

Functional Requirements for Bibliographic Records by the IFLA.

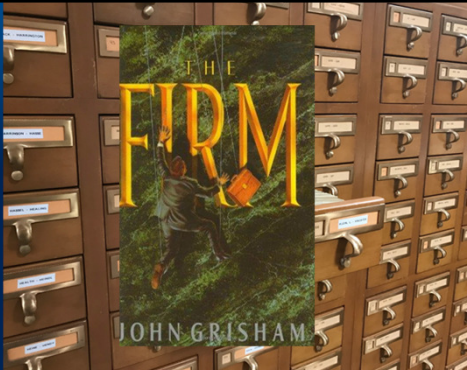

Google "FRBR"

Section 3.2 "The Entities"

But what exactly?

The Work?
The Expression?
The Manifestation?
The Item?

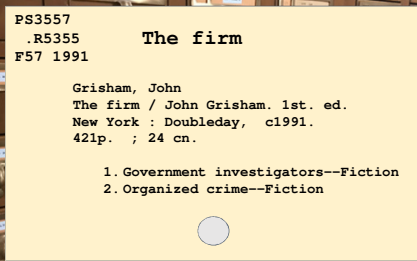
Identifying and Locating

PS3557
.R5355
F57 1991

The firm

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New York : Doubleday, c1991.
421p. ; 24 cm.

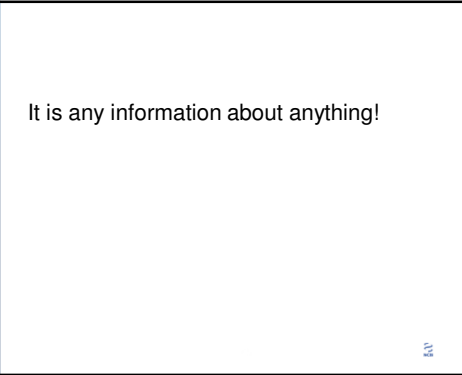
1. Government investigators--Fiction
2. Organized crime--Fiction



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Everybody knows what metadata is!

It is any information about anything!

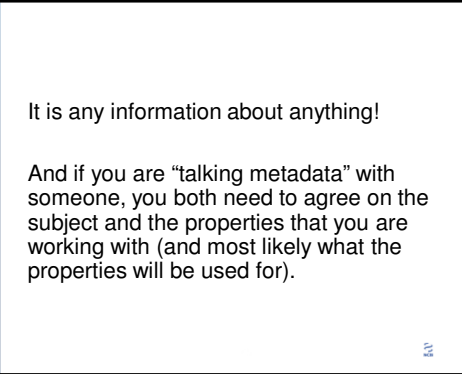


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Everybody knows what metadata is!

It is any information about anything!

And if you are “talking metadata” with someone, you both need to agree on the subject and the properties that you are working with (and most likely what the properties will be used for).



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OPEN ACCESS [Freely available online](#)

Bee Threat Elicits Alarm Call in African Elephants

Lucy E. King^{1,2,3*}, Joseph Soltis^{3*}, Iain Douglas-Hamilton^{1*}, Anne Savage⁴, Fritz Vollrath^{3,5}

¹ Animal Behaviour Research Group, Department of Zoology, University of Oxford, Oxford, United Kingdom, ² Education and Science, Disney's Animal Kingdom, Bay Lake, Florida, United States of America, ³ Bee and the Elephant, Nairobi, Kenya

Abstract

Unlike the smaller and more vulnerable mammals, African elephants have relatively few predators that threaten their survival. The sound of disturbed African honeybees (*Apis mellifera scutellata*) causes African elephants candidate offspring to retreat and produce warning vocalizations that lead other elephants to join the flight. In our first experiment, audio playback of bee sounds induced elephants to retreat and elicited more head-shaking and flailing, reactive behaviors that may prevent bee stings, compared to white noise control playbacks. Most importantly, elephants produced distinctive "rumble" vocalizations in response to bee sounds. These rumbles exhibited an upward shift in the second formant location, which implies active vocal tract modulation, compared to rumbles made in response to white noise playbacks. In a second experiment, audio playback of these rumbles produced in response to bee elicited increased headshaking, and further and faster retreat behavior in other elephants, compared to control rumble playbacks with lower second formant frequencies. These responses to the bee rumble stimuli occurred in the absence of any bees or bee sounds. This suggests that these elephant rumbles may function as referential signals, in which a formant frequency shift alerts nearby elephants about an external threat. In this case, the threat of bees.

Chosen King LE, Soltis J, Douglas-Hamilton I, Savage A, Vollrath F (2010) Bee Threat Elicits Alarm Call in African Elephants. PLoS ONE 5(4): e10346. doi:10.1371/journal.pone.0103466

Editor: Anne Hildebrand, University of Sussex, United Kingdom

Received: March 5, 2010; **Accepted:** March 24, 2010; **Published:** April 26, 2010

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Funding: DFG/DFG, and Bielefeld University Grants Disney Worldwide Conservation Fund Save the Elephants. The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

Competing Interests: Save the Elephants has received funding from the Disney Worldwide Conservation Fund (DWCF), which helps support all our world-wide research and on-site projects, working with local and regional nongovernmental organizations to conserve elephants, and restore, conserve, and Disney's Office of Corporate Outreach. The DWCF ensures that 100 percent of the funds are directed to DWCF nonprofit organizations to support worldwide conservation. The DWCF has supported the work of researchers working with Save the Elephants, and the U.S. nonprofit Wildlife Conservation Network, for many years to help engage communities in land-use and wildlife conservation. Joseph Soltis' research is funded independently of the DWCF. None of the authors have any competing financial interests. All authors have read and approved the final manuscript. The DWCF does not support open access to its content. PLoS ONE is a peer-reviewed journal published by the American Psychological Association. The DWCF does not support open access to its content. PLoS ONE is a peer-reviewed journal published by the American Psychological Association.

Citation: King LE, Soltis J, Douglas-Hamilton I, Savage A, Vollrath F (2010) Bee Threat Elicits Alarm Call in African Elephants. PLoS ONE 5(4): e10346. doi:10.1371/journal.pone.0103466

Keywords: African elephants, honeybees, vocalizations, communication, social behavior, conservation

Introduction

Mammalian calls can reflect the internal states of animals, such as fear, but also may refer to external objects or events, such as the presence of predators [1]. For example, among social mammals including social separation or encounters with strangers can result in calls of increased emotional intensity as observed in rhesus monkeys, *Macaca mulatta* [2], and tamarins, *Leontideus rosalia* [3], baboons, *Papio cynocephalus senegalensis* [4], guinea pigs, *Cavia porcellus* [5], and tree shrews, *Tupaia glanis* [6]. Typical acoustic responses to potentially threatening challenges include changes in tempo-based features (e.g. call rate and duration) and source features (e.g. increased and more variable frequency and amplitude). Filter features related to vocal tract modulation are less commonly associated with arousal, but have been observed in baboons [1].

In addition to expressing internal state, mammalian vocalizations are also known to refer to external objects or events (i.e., referential signaling) [1]. In many cases, mammalian alarm calls vary acoustically according to specific predator species or class of predator (e.g., aerial versus terrestrial). Playback experiments with avian, *Nucifraga cygnetus* [7], and vervet monkeys, *Chlorocebus* [8], *arctifans* [9], show that listeners react to alarm calls as if they were in the presence of an actual predator. This suggests that the acoustic structure of alarm calls can be related to specific external events, which in turn can be acted upon in adaptive ways by listeners. The complexity and variation of the acoustic cues can be seen in examples taken from three species of *Genypterus*, in which vervet monkeys *C. arctifans* separate their alarm calls for leopard and eagle through the location of dominant frequency [9]. Campbell's monkeys *C. amplifans* separate them by call duration, fundamental frequency and dominant frequency location [9], while Diana monkeys *C. diana* separate them by call rate, duration, fundamental frequency and dominant frequency location [10,11,12]. Alarm alarm calls are not always predator specific, however. For example, yellow-billed mannikin, *Mniotilta flaviventris*, alarm calls are similar across a range of predators but do increase in rate with level of perceived risk [13].

Unlike the smaller and more vulnerable mammals, African elephants have relatively few predators that threaten their survival in the wild. In Kenya's Amboseli National Park, however, defensible and intense behavior in elephants was observed in the presence of Maasai lions [14], who have been known to kill elephants. African elephants react similarly to sound playback of

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1

April 2010 | Volume 5 | Issue 4 | e10346

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April 2010 | Volume 5 | Issue 4 | e10346


JATS is a NISO standard that defines XML elements and attributes and models for describing Journal Articles.

Another Detour

JATS XML

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1



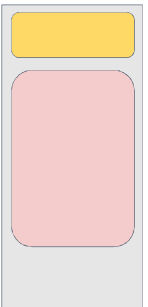
Beginning

Like any good story

An article represented in JATS XML has 3 parts.

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Beginning

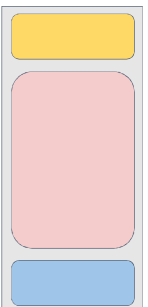
Middle

Like any good story

An article represented in JATS XML has 3 parts.

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AV



Beginning

Middle

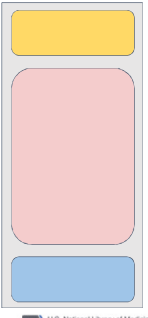
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Like any good story

An article represented in JATS XML has 3 parts.

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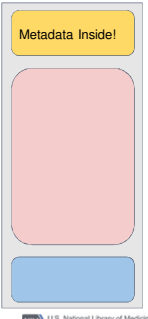
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Like any good story

An article represented in JATS XML has 3 parts.

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147



Metadata Inside!

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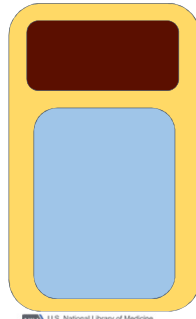
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Metadata Inside!

Identifying and Locating metadata are kept in the <front>

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147



Journal Metadata
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Article Metadata
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Expanding <front>

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147

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OPEN ACCESS Freely available online

Bee Threat Elicits Alarm Call in African Elephants

Lucy E. King^{1,2,3*}, Joseph Soltis⁴, Iain Douglas-Hamilton^{1,2}, Anne Savage¹, Fritz Vollrath^{1,3}

1 School of Behavioural Biology, Department of Zoology, University of Oxford, Oxford, United Kingdom, 2 Education and Science, Disney's Animal Kingdom, Bay Lake, Florida, United States of America, 3 Save the Elephants, Nairobi, Kenya

Abstract
Unlike the smaller and more vulnerable mammals, African elephants have relatively few predators that threaten their survival. The sound of disturbed African honeybees *Apis mellifera scutellata* causes African elephants *Loxodonta africana* to retreat and produce warning vocalizations that lead other elephants to join the flight. In our first experiment, audio playbacks of bee sounds induced elephants to retreat and elicited more head-shaking and dusting, reactive behaviors that may prevent bee stings, compared to white noise control playbacks. More importantly, elephants produced distinctive "rumble" vocalizations in response to bee sounds. These rumbles exhibited an upward shift in the second formant location, which implies active vocal tract modulation, compared to rumbles made in response to white noise playbacks. In a second experiment, audio playbacks of these rumbles produced in response to bees elicited increased headshaking, and further and faster retreat behavior in other elephants, compared to control rumble playbacks with lower second formant frequencies. These responses to the bee rumble stimuli occurred in the absence of any bees or bee sounds. This suggests that these elephant rumbles may function as referential signals, in which a formant frequency shift alerts nearby elephants about an external threat. In this case, the threat of bees.

Citation: King LE, Soltis J, Douglas-Hamilton I, Savage A, Vollrath F (2013) Bee Threat Elicits Alarm Call in African Elephants. PLoS ONE 8(5): e63846. doi:10.1371/journal.pone.0073286

Editor: Karen McComb, University of Sussex, United Kingdom

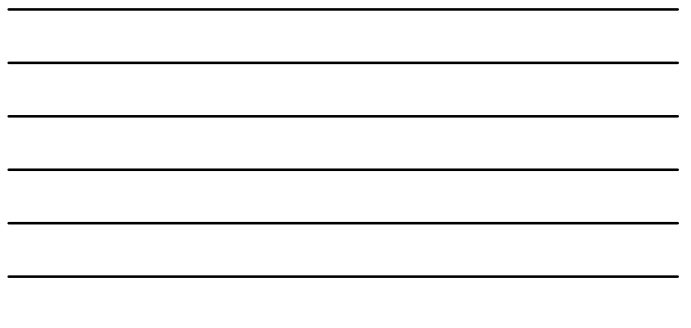
Received: March 1, 2013; **Accepted:** March 20, 2013; **Published:** April 26, 2013

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Funding: ESRC/NERC, Save the Elephants Grant, Disney Worldwide Conservation Fund, Save the Elephants. The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

Competing Interests: Save the Elephants has received funding from The Disney Worldwide Conservation Fund (DWCF), which helps scientists all over the world understand the role of elephants, working with qualified and respected scientific organizations on community conservation, education, science and environmental projects. The Disney Worldwide Conservation Fund is supported by Guest contributions, merchandise initiatives, special guest programs, and Disney's Office of Corporate Partnerships. The DWCF ensures that 10% percent of the funds are directed to U.S. DWCF nonprofit organizations to support worldwide conservation. The DWCF has supported the work of researchers working with Save the Elephants, via the U.S. nonprofit Wildlife Conservation Network, for many years. Iain Douglas-Hamilton is a member of the Scientific Advisory Board of Save the Elephants. Joseph Soltis' research is funded by independent grants of the DWCF. Save the Elephants is the formal program administrator of Disney's Animal Kingdom's Call Conservation Program. The DWCF does not support research, data or any Call Conservation Program. DWCF is not involved in the conception, direction, implementation, analysis, interpretation or publication of this research.

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Bee Alarm Call in Elephants

unfamiliar conspecifics [13]. Little research has been conducted on elephant vocalizations in response to specific threats, although observations of elephants "braying" or "trumpeting" in response to the presence of lions is well known [16]. More recently, research has demonstrated that African elephants actively avoid contact with African honey bees – with implications for the management of both species [17,18]. First was the discovery that Kenyan elephants avoid feeding on trees with beehives [19]. Subsequently, a playback study demonstrated that elephants retreat when hearing the sounds of disturbed bees [20].

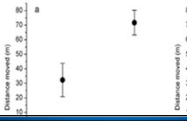
In order to investigate this apparent natural threat to elephants further, we recorded the vocalizations of elephants in response to playbacks of disturbed bee sounds, using an array of microphones capable of recording low frequency elephant calls. In a second playback experiment, we played the recorded "rouble" vocalizations to moving elephants in order to examine their potential function. We played natural and experimentally modified bee response calls, in order to isolate and explore the effect of a specific acoustic feature on the response of listeners, namely, the location of the second formant. Such formant location skills are

due to modulations of the vocal tract [21]. Thus we were able to explore how an acoustically distinctive elephant vocal produced in the presence of bees may function as an alarm call.

Results

Honeybee playbacks

Confirming previous observations [20], elephants moved away in response to the playbacks of bee sounds. We performed 13 bee sound and 13 white noise playback trials to elephant families, consisting of a 2-min pre-stimulus phase, a 6-min stimulus phase (either noise or bee sounds), and a final 2-min post-stimulus phase. In 14 out of 13 bee trials (93%), families had moved away, compared to 0 of 13 white noise control trials (0%). Elephants moved away significantly further in response to bee sound playbacks (7.62 m \pm 2.16 SE) than to white noise playbacks (2.2 m \pm 2.16 SE, Mann-Whitney U test, $n=13$, $n=13$, $U=13$, $p=0.012$ Figure 1a). Additionally, using 300 seconds as a ceiling for families that did not move, elephants moved faster during bee sound playbacks (mean latency 61 sec \pm 21.1;



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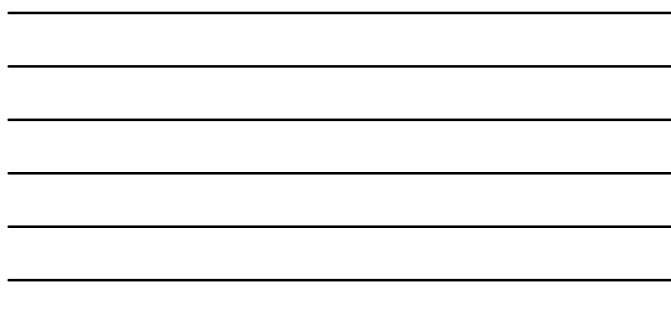


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Bee Threat Elicits Alarm Call in African Elephants

Lucy E. King^{1,2,3*}, Joseph Soltis¹, Iain Douglas-Hamilton¹, Anne Savage¹, Fritz Vollrath^{1,3}

Abstract
 Unlike the smaller and more vulnerable mammals, African elephants have relatively few predators that threaten their survival. The sound of disturbed African honeybees *Apis mellifera scutellata* causes African elephants (*Loxodonta africana*) to retreat and produce warning vocalizations that lead other elephants to join the flight. In our first experiment, audio playbacks of bee sounds induced elephants to retreat and elicited more head-shaking and dusting, reactive behaviors that may prevent bee stings, compared to white noise control playbacks. More importantly, elephants produced distinctive “rumble” vocalizations in response to bee sounds. These rumbles exhibited an upward shift in the second formant location, which implies active vocal tract modulation, compared to rumbles made in response to white noise playbacks. In a second experiment, audio playbacks of these rumbles produced in response to bees elicited increased headshaking, and further and faster retreat behavior in other elephants, compared to control rumble playbacks with lower second formant frequencies. These responses to the bee rumble stimuli occurred in the absence of any bees or bee sounds. This suggests that these elephant rumbles may function as referential signals, in which a formant frequency shift alerts nearby elephants about an external threat. In this case, the threat of bees.

Competing Interests: Some of the authors have received funding from The Disney Worldwide Conservation Fund (DWCF), which helps scientists all over the world study the natural world. Funding with qualified and required nonprofit organizations on community conservation, education, science and environmental justice. The Disney Worldwide Conservation Fund is supported by Guest contributions, noncharitable initiatives, special grant programs, and Disney's Office of Corporate Outreach. The DWCF ensures that 75% percent of the funds are directed to U.S. 501(c)(3) nonprofit organizations to support worldwide conservation. The DWCF has supported the work of researchers working with Save the Elephants, via the U.S. nonprofit Wildlife Conservation Network, for many years in Kenya and Tanzania and supporting ground rangers. Animal research in Tanzania is funded by grants from the DWCF and the Wildlife Conservation Network. The DWCF also supports research on the elephant family of the African Program Administration at Disney's Animal Kingdom Theme Park in Florida. The DWCF does not support research, data collection, or any field conservation program. DWCF is not involved in the conception, design, implementation, analysis, interpretation or publication of this research.

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Competing Interests: Some of the authors have received funding from The Disney Worldwide Conservation Fund (DWCF), which helps scientists all over the world study the natural world. Funding with qualified and required nonprofit organizations on community conservation, education, science and environmental justice. The Disney Worldwide Conservation Fund is supported by Guest contributions, noncharitable initiatives, special grant programs, and Disney's Office of Corporate Outreach. The DWCF ensures that 75% percent of the funds are directed to U.S. 501(c)(3) nonprofit organizations to support worldwide conservation. The DWCF has supported the work of researchers working with Save the Elephants, via the U.S. nonprofit Wildlife Conservation Network, for many years in Kenya and Tanzania and supporting ground rangers. Animal research in Tanzania is funded by grants from the DWCF and the Wildlife Conservation Network. The DWCF also supports research on the elephant family of the African Program Administration at Disney's Animal Kingdom Theme Park in Florida. The DWCF does not support research, data collection, or any field conservation program. DWCF is not involved in the conception, design, implementation, analysis, interpretation or publication of this research.

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panels with Aerocrine, AstraZeneca, Boehringer Ingelheim, GSK and Novartis.
He has received sponsorship to attend international scientific meetings from
GSK and AstraZeneca, and has received funding for research projects from
GSK. He is a member of the British Thoracic Society (BTS)/Scottish
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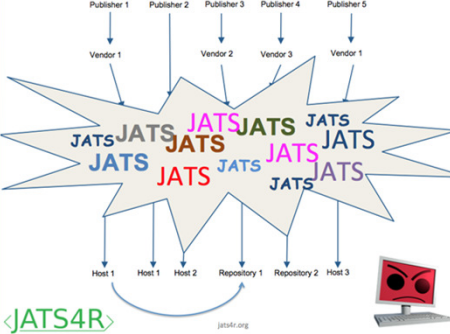


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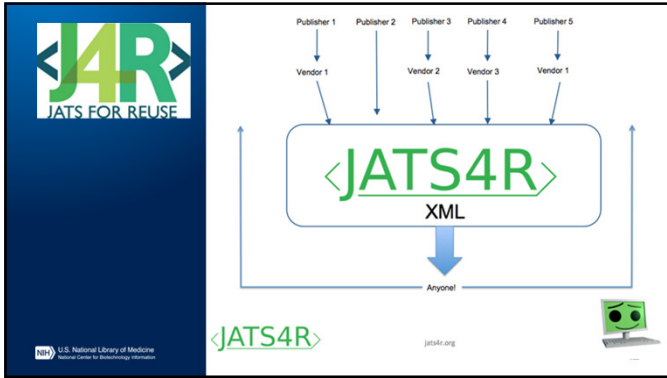
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