

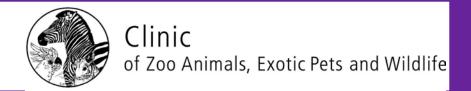
# Science business

### Marcus Clauss

Clinic for Zoo Animals, Exotic Pets and Wildlife, Vetsuisse Faculty, University of Zurich, Switzerland

Prague 2019









#### Clinic for Zoo Animals, Exotic Pets and Wildlife

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Former Staff

#### Teaching

University Curriculum

University-Electives

Teaching at other institutions

Invited Lectures

J.-M. Hatt

#### M. Clauss

E-Learning

Research

Open Positions

Links

Impressum

Publications & Reports

#### **Lectures: Marcus Clauss**

2004 Boskos Seminar Pretoria

2008 ESVCN (Talk)

2009 ISRP Clermont-Ferrand (Plenary)

2009 BEW Zürich (Plenary)

2009 EAZWV Beekse Bergen (Talk)

2010 EAZWV Madrid (Talk)

2011 Institute of Anthropology Zurich (Seminar)

2011 ESVCN Zaragoza (Plenary)

2011 NESCent (Talk)

2011 SVBT Fortbildung

2011 Zoologische Gesellschaft Zürich (Plenary)

2012 Basie (Seminar)

2012 Sciene+Barbecue Zurich (Plenary)

2012 Bio 122

→ Tannins and herbivores (PDF, 3768 KB)

↓ Digestive physiology of sulds (PDF, 1355 KB)

Evolutionary adaptations of ruminants (PDF, 6064 KB)

Adaptations of desert animals (PDF, 4236 KB).

Herd management (PDF, 4689 KB)

Stress in captive solitary species (PDF, 1911 KB)

◆ Digestive physiology of primates (PDF, 4057 KB)

Comparative fibre digestion (PDF, 10430 KB)

Diet abrasiveness and teeth (PDF, 7065 KB)

SALES CONTRACTOR OF STREET

→ Fütterung von Reptilien (PDF, 7745 KB)

◆ The indomitable moose (PDF, 12051 KB)

↓ Dinosaur reconstructions (PDF, 13144 KB)

Why birds fly and dinosaurs died out (PDF, 3052 KB)

Introduction general physiology (PDF, 2912 KB)

Introduction digestive physiology (PDF, 16024 KB)



•Selfish reasons I

Public reasons



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  - Publications are a prerogative for many career steps (PhD, Diplomate, Certified specialist) and very generally for a career in academia (but not necessarily for cool jobs).

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# 'publish or perish!'



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- Publications are a cornerstone of evaluations and of the reputation of a scientist or an institution; publications are therefore important for your own reputation, and you can make others your friends by publishing with/for them.
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### Selfish reasons II

•be known (and remembered) ...



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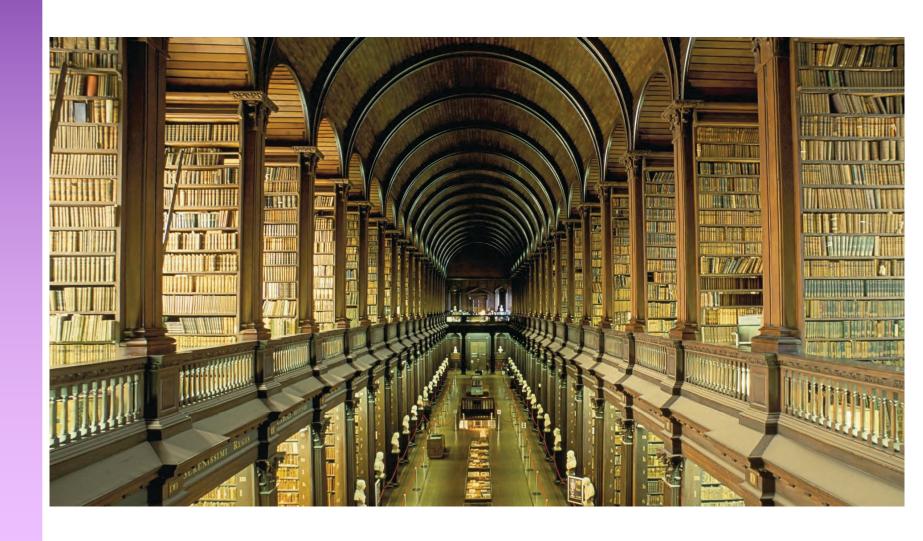
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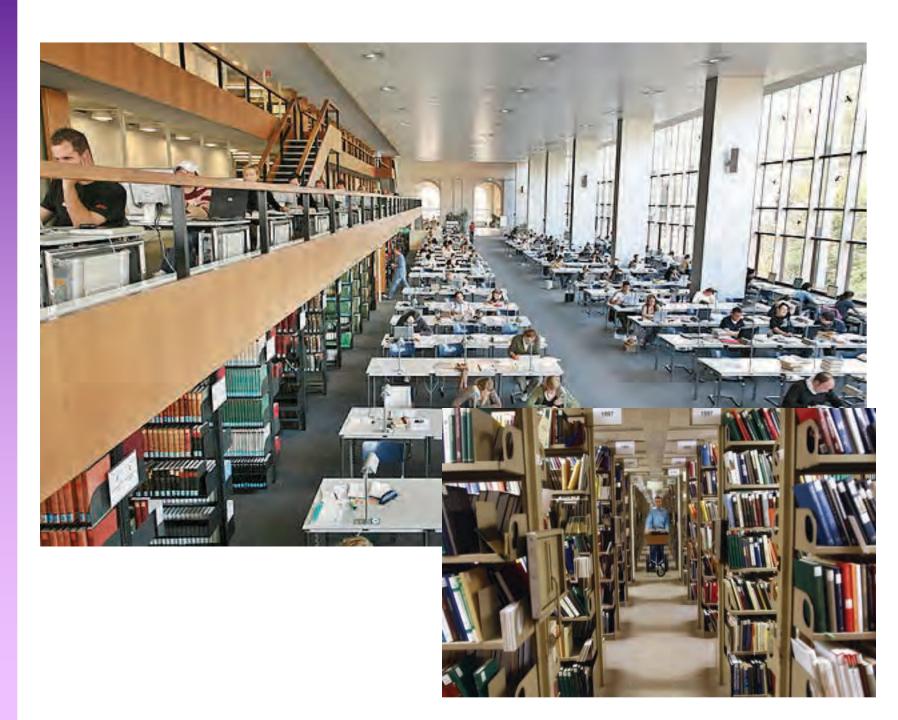
•be known (and remembered) ... be famous ... be human



# 'Cathedrals of knowledge'









# Referencing



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is it chaotic or well-ordered and consistent?



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Clauss M, Hummel J (2005) The digestive performance of mammalian herbivores: why bia may not be that much better. Mammal Review 35:174-187 Clauss M, Steuer P, Erlinghagen-Lückerath K, Kaandorp J, Fritz J, Südekum K-H, Hummel J (2015) Faecal particle size: Digestive physiology meets herbivore diversity. Comparative Biochemistry and Physiology A 179,182-191. HUMMEL, J., CLAUSS, M., ZIMMERMANN, W., JOHANSON, K., NORGAARD, C. & PFEFFER, E. 2005: Fluid and Particle Retention in Captive Okapi (Okapia johnstoni). Comp. Biochem. Physiol. A 140, 436-44. Hummel, J.; Suedekum, K. H.; Streich, W.J.; Clauss, M. 2006. Forage fermentation patterns and their implications for herbivore ingesta retention times. Functional Ecology 20(4), 989-1002.



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Giraffes in zoos often die from malnutrition (Clauss et al. 2001).

According to Clauss et al. (2001), giraffes in zoos often die from malnutrition.

Clauss et al. (2001) showed that some zoo giraffes consume amounts of food lower than expected based on extrapolations from other herbivores and from free-ranging giraffes, and speculated that this might be a cause for low body reserves and death associated with depleted adipose tissue stores often observed in this species in captivity.



The basal metabolic rate of sauropod dinosaurs changed during ontogeny (Sander & Clauss 2008).

It has been speculated that the basal metabolic rate of sauropod dinosaurs might have changed during ontogeny (Sander & Clauss 2008).



Browsing ruminants have only protozoa of the subfamily Entodiniinae in their rumen (Clauss & Lechner-Doll 2001).

Entodiniinae are mostly the only protozoa subfamily that is found in the rumen of browsing ruminants (reviewed by Clauss & Lechner-Doll 2001).



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Epidemiological studies on the transmission of bovine spongiforme encephalopathy (BSE) – some remarks from a biometrical point of view

Susanne Dahms

Zusammenfassung: Anhand einer Fall-Kontroll-Studie zur Übertragung der Bovinen Spongiformen Encephalopathie (BSE) werden biometrische Aspekte der Planung und Auswertung solcher epidemiologischer Studien diskutiert. Bei dem Beispiel handelt es sich um eine retrospektive Untersuchung der Hypothese, daß BSE-Fälle als Kälber durch Fleisch- und Knochenmehl enthaltende Kraftfuttermittel infiziert worden sind. Dazu wurde als Studientyp eine Fall-Kontroll-Studie gewählt, deren Studiendesign und Datenerhebung zunächst vorgestellt werden. Zur Auswertung der Studie wurden rohe und mit Hilfe logistischer Regressionen adjustierte Odds-Ratios für den Risikofaktor "Fleisch- und Knochenmehl" geschätzt. Diese Auswertungsstrategie wird hier diskutiert und der gewählte Regressionsansatz mit einem alternativen Ansatz verglichen. Dabei zeigt sich, daß bei der Auswahl der Studienherden Probleme aufgetreten sind, die zu einem unausgewogenen Verhältnis von Kontroll- zu Fallherden geführt haben. Dieses Mißverhältnis und die unterschiedliche Datenqualität bei Fällen und Kontrollen erschweren die Interpretation der Studienergebnisse.

Schlüsselwörter: Biometrie, Epidemiologie, Fall-Kontroll-Studie, Bovine Spongiforme Encephalitis (BSE) Summary: This contribution discusses biometrical aspects of the design and analysis of epidemiological case-control studies. The study chosen as an example was undertaken to investigate the transmission of bovine spongiform encephalopathy (BSE) to calves and the role of the inclusion of meat and bonemeal in proprietary feedstuffs. The hypothesis was examined by means of a case-control study which is summarized with emphasis on its study design and the collection of data. The analysis included the estimation of raw oddsratios for the inclusion of meat and bonemeal in proprietary feedstuffs for calves as well as adjusted odds-ratios using logistic regression. This strategy is discussed and the chosen regression model is compared with an alternative one. Results show that problems occurred when recruiting herds for the study leading to uneven proportions of cases and controls. Because of these misproportions and due to different data quality for cases and controls the interpretation of the study results is difficult.

Key words: biometry, epidemiology, case control studies, bovine spongiforme encephalopathy (BSE)

#### Einleitung

Die Erforschung der Herkunft und Übertragung der Bovinen Spongiformen Encephalopathie – oder kurz BSE – stellt ein Problem mit vielfältigen Teilaspekten dar, die in unterschiedliche Gebiete der Veterinärmedizin fallen. Eine Aufgabe der Epiderniologie kann darin gesehen werden, das Erscheinungsbild der Krankheit insgesamt zu erfassen, um daraus Fragestellungen und Hypothesen für weiterführende, speziellere Studien abzuleiten. Dazu gehört aber auch, die einzelnen Forschungsergebnisse und die verschiedenen Erklärungsansätze dann wieder zusammenzuführen und kritisch zu prüfen, wie sie zueinander und zur Gesamterscheinung der Krankheit passen.

Die Arbeit eines Epidemiologen ist damit nicht primär auf die individuelle Erkrankung gerichtet, sondern auf das Geschehen in einer Population und die Randbedingungen, unter denen es zu beobachten ist. Daher gehören statistisches Denken und biometrische Methoden zum unverzichtbaren Handwerkszeug der Epidemiologie. Es erfordert allerdings eine sorgfältige Studienplanung, einen sachgerechten Umgang mit statistischen Methoden und eine Abstimmung auf die zu bearbeitende Fragestellung, damit epidemiologische Studien interpretierbare Ergebnisse liefern können.

Mit diesem Beitrag soll am Beispiel der BSE ein Eindruck davon vermittelt werden, wie sich die zu untersuchende Frage-

stellung auf die Planung epidemiologischer Studien auswirken kann, welche Probleme bei der Durchführung auftreten können und was dann bei der Interpretation der Ergebnisse zu beachten ist. Dazu soll zunächst kurz auf die beschreibenden epidemiologischen Untersuchungen der ersten BSE-Fälle eingegangen werden. Den Schwerpunkt wird dann eine Fall-Kontroll-Studie zu einer spezifischen Übertragungshypothese des BSE-Erregers bilden.

Nachdem Mitte der achtziger Jahre in Großbritannien die ersten BSE-Erkrankungen aufgefällen waren, führte ihre zunehmende Verbreitung bald zu umfangreichen epidemiologischen Untersüchungen, die ihre Herkunft klären sollten: Im Juni 1987 wurde mit einer deskriptiven Studie aller bis dahin in Großbritannien aufgetretenen BSE-Fälle begonnen, deren Ergebnisse 1988 von Wilesmith et al., (1988) veröffentlicht wurden.

Das Ziel dieser Studie war einmal, das klinische Bild und die Pathologie der BSIPErkrankung genauer zu beschreiben. Vor allem ging es aber auch darum, anhand der bekannten Fälle die epidemiologischen Merkmale der BSE herauszuarbeiten, das heißt zu klären, wo, wann, unter welchen Umständen und bei welcher Art von Tieren die Krankheit auftritt, um anhand dieser Merkmale mögliche ätiologische Arbeitshypothesen zu entwikkeln. Die Datenerhebung konzentrierte sich daher auf BSE-betroffene Tiere bzw. Herden. Zur ihrer Charakterisierung wurde



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Die Arbeit eines Epidemiologen ist damit nicht primär auf dit in dividuelle Erkrankung gerichtet, sondern auf das Gescheht in einer Population und die Randbedingungen, unter denen ezu beobachten ist. Daher gehören statistisches Denken und bio metrische Methoden zum unverzichtbaren Handwerkszeug de Epidemiologie. Es erfordert allerdings eine sorgfällige Studien planung, einen sachgerechten Umgang mit statistischen Methoden und eine Abstimmung auf die zu bearbeitende Fragestellung, damit epidemiologische Studien interpretierbare Ergebnisse liefern können.

Mit diesem Beitrag soll am Beispiel der BSE ein Eindruck davon vermittelt werden, wie sich die zu untersuchende Frage-

Summary: This contribution discusses biometrical aspects of the design and analysis of epidemiological case-control studies. The study chosen as an example was undertaken to investigate the transmission of bovine spongiform encephalopathy (BSE) to calves and the role of the inclusion of meat and bonemeal in proprietary feedstuffs. The hypothesis was examined by means of a case-control study which is summarized with emphasis on its study design and the collection of data. The analysis included the estimation of raw oddsratios for the inclusion of meat and bonemeal in proprietary feedstuffs for calves as well as adjusted odds-ratios using logistic regression. This strategy is discussed and the chosen regression model is compared with an alternative one. Results show that problems occurred when recruiting herds for the study leading to uneven proportions of cases and controls. Because of these misproportions and due to different data quality for cases and controls the interpretation of the study results is difficult.

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Institut für Biometrie und Informationsverarbeitung Fachbereich Veterinärmedizin, Freie Universität Berlin

#### Epidemiologische Studien zur Übertragung der Bovinen Spongiformen Encephalopathie (BSE) – Anmerkungen aus biometrischer Sicht

Epidemiological studies on the transmission of bovine spongiforme encephalopathy (BSE) – some remarks from a biometrical point of view

Susanne Dahms

Eine Untersuchung der Produktionsverfahren in 46 Tierkörperbeseitigungsanlagen in Großbritannien (Wilesmith et al., 1991) ergab, daß seit Anfang der 80er Jahre vermehrt Umstellungen der Produktionstechnologie vorgenommen worden sind, die unzureichende Erhitzungstemperaturen und -zeiten zur Folge haben können. Außerdem wurde weitgehend die Fett-Extraktion mit organischen Lösungmitteln aufgegeben. Damit könnten Bedingungen geschaffen worden sein, die den Scrapielungen zeitlich mit dem geschätzten Beginn der BSE-Exposition zusammenfallen, erhärtet sich damit die Fleisch- und Knochenmehl-Hypothese weiter.

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#### **Papers and Articles**

### Bovine spongiform encephalopathy: epidemiological studies on the origin

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Veterinary Récord (1991) 128, 199-203

The results of further epidemiological studies of bovine spongiform encephalopathy (BSE) support the previous findings that the onset of exposure of the cattle population to a scrapic-like agent, sufficient to result in clinical disease, occurred in 1981/82. The onset of this exposure was related to the cessation, in all but two rendering plants, of the hydrocarbon solvent extraction of fat from meat and bone meal. A further possible explanation, related to the geographical variation in the reprocessing of greaves to produce meat and bone meal, was identified for the geographical variation in the incidence of BSE.

FOLLOWING the identification of the novel neurological disease of domestic cattle, bovine spongiform encephalopathy (BSE), in Great Britain in November 1986 (Wells and others 1987) an epidemiological study of the disease was begun in June 1987. The initial findings of this study were consistent with exposure of cattle sufficient to cause clinical disease, commencing in 1981/82, to a scrapie-like agent via cattle feedstuffs containing ruminant derived protein in the form of meat and bone meal (Wilesmith and others 1988). Meat and bone meal is a by-product of the rendering of animal carcases and waste animal material principally from abattoirs, a process which was, from very early times until the 1920s, used to prod mainly tallow (MMC 1985). Meat and bone meal has been inc porated into cattle feedstuffs as a source of animal protein several decades. The initial epidemiological studies of BSE a identified changes in the rendering processes which were p sibly significant in explaining why cattle became exposed t scrapie-like agent. One of the objectives of the continuing e demiological studies was to investigate further the possible r sons for this exposure. To this end, the changes in the render process were investigated in detail by means of a survey rendering plants in production in Great Britain.

This paper describes the results of this survey together we the results of the epidemiological studies to investigate. The the time of onset of effective exposure of cattle.

#### Materials and methods

Case definition and collection of data

The methods of case definition and collection of data affected cases were those described previously (Wilesmith a others 1988).

Survey of past and present processes used in the rendering pla

A survey of all rendering plants in Great Britain producing products destined for animal feedstuffs was conducted during

September and October 1988. The survey involved visits to all plants in operation at this time by veterinary officers to obtain data on the following: the toinnage of raw material currently processed, together with the species composition and the type of material; whether greaves, the product of the initial rendering process, are or have been purchased and, if so, the details of the further processing employed; the changes in the composition and type of material processed since 1980; the type of process currently used, its date of installation and the changes in the type of process during the history of the plant; the details of the process in use including the particle size of raw material entering the process, the maximum temperature applied and the time/temperature combinations of the process; the output of each plant in terms of the tonnage of greaves, meat and bone meal and tallow since 1980 and the purchasers of the products.

The maximum temperatures achieved by the material in the processes were determined from the temperature monitoring equipment in the plants and checked by means of remote sensing infrared thermometers directed at the material, and, or, thermocouple probes inserted into the material.

Additional information on the processes employed, and changes, in rendering plants which had ceased production before the survey was also obtained to assess the representativeness of the results of the survey.

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herds are shown in Fig 1.

Survey of rendering processes

The survey of rendering plants revealed that, at some time in 1988, there were 46 plants in operation in Great Britain producing tallow and greaves and in many cases further processing

J. W. Wilesmith, BVSc, MRCVS, J. B. M. Ryan, BEd, MIBIol, Epidemiology Unit, Central Veterinary Laboratory, New Haw, Weybridge, Surrey KT15 3NB

M. J. Atkinson, BVMS, DVSM, MRCVS, MAFF, Regional Office, Woodthorne, Wolverhampton WV6 8TQ



#### Papers and Articles

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Mit diesem Beitrag soll am Beispiel der BS

The Veterinary Record, March 2, 1991

### Papers and Articles

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Although it has been repeatedly suggested that a change in the processing protocols at rendering plants was responsible for the onset of the British BSE epidemic (e.g. Dahms 1997), the original source usually cited for this claim (Wilesmith et al. 1991) does not substantiate it.



## **Marine Mammal Science**





### Notes

MARINE MAMMAL SCIENCE, 33(1): 386-388 (January 2017)

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DOI: 10.1111/mms.12364

The blue whale brain misrepresented by an alcohol dehydrated brain of 3,636 grams

SAM H. RIDGWAY<sup>1</sup> AND KAITLIN R. VAN ALSTYNE, National Marine Mammal Foundation, 2240 Shelter Island Drive, Suite 200, San Diego, California 92106, U.S.A.

We recently noticed an outlier in the available data on blue whale brain mass in the supplemental data of a recent paper (Montgomery et al. 2013). The authors listed a brain mass of 3,636 g as the only representative of the blue whale species as a whole. In several papers, the blue whale is represented by only this one brain (von Bonin 1937, Jerison 1978, Glezer 2002, Hof et al. 2005, Manger 2006, Marino et al. 2006, Marino 2009, Montgomery et al. 2013, Gersenowies-Rodriguez 2014). After discovering a large discrepancy between the 3,636 g value and blue whale brain mass data (Table 1) that we had extracted from the literature, we conducted an investigation to determine the source of this outlier blue whale value.



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We began our reversed chronological tracking of the 3,636 g blue whale brain with Montgomery et al. 2013, who cited Manger (2006). From Manger, the trail led to Jerison (1978), Gihr and Pilleri (1969), von Bonin (1937), and on to Warncke (1908) and Wilson (1933), who credited the original source: Guldberg (1885, p. 128). Also, Gihr and Pilleri (1969) cited the 3,636 g brain as well as a 6,700 g brain as two separate specimens, crediting von Bonin (1937) as the source for the former and Guldberg (1885) as the source for the latter. After consulting a German speaking colleague, we are confident in our understanding of the methods that Guldberg (1885) spelled out in his original German publication.





### Flawed citation practices facilitate the unsubstantiated perception of a global trend toward increased jellyfish blooms

Marina Sanz-Martín<sup>1,2</sup>\*, Kylie A. Pitt<sup>3</sup>, Robert H. Condon<sup>4</sup>, Cathy H. Lucas<sup>5</sup>, Charles Novaes de Santana<sup>6</sup> and Carlos M. Duarte<sup>7</sup>

Analyses showed that 48.9% of publications misinterpreted the conclusions of cited sources, with a bias towards claiming jellyfish populations are increasing, with a single review having the most influence on the network. Collectively, these disparities resulted in a network based on unsubstantiated statements

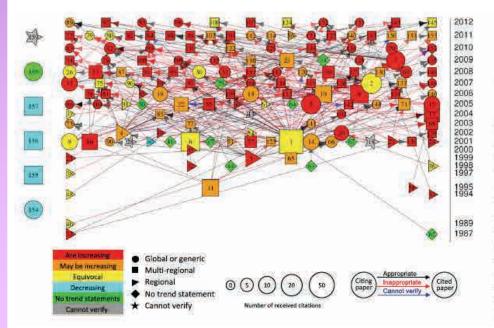
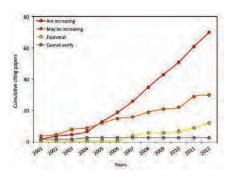


Figure 1 Chronological network of citation threads regarding jellyfish population trends. Nodes represent papers, their size and their numerical label represent the frequency at which they have been cited by other papers in the network, their shape represents the spatial category and their colours/shades represent the affirmation degree stated in support of jellyfish trends. Arrows represent the appropriateness assessment of the citations. Data set available in Sanz-Martín et al. (2016),









Citation: Visscher DR, Merrill EH (2018) Functional connectivity in ruminants: A generalized state-dependent modelling approach. PLoS ONE 13(6): e0199671. https://doi.org/10.1371/journal.pone.0199671

RESEARCH ARTICLE

Functional connectivity in ruminants: A generalized state-dependent modelling approach

Darcy R. Visscher1\*, Evelyn H. Merrill2

the inactivity of rumination associated with rapid gut fill resulted in reduced predation risk.

We assumed

that individuals used inactivity to reduce predation risk within patches because it has been reported in field studies [96]. When inactivity, such as when ruminant lie down to ruminate, reduces predation risk,

 Banks P, Norrdahl K, Korpimaki E. Nonlinearity in the predation risk of prey mobility. Proceedings of the Royal Society of London Series B-Biological Sciences. 2000; 267(1453):1621–1625. <a href="https://doi.org/10.1098/rspb.2000.1187">https://doi.org/10.1098/rspb.2000.1187</a>





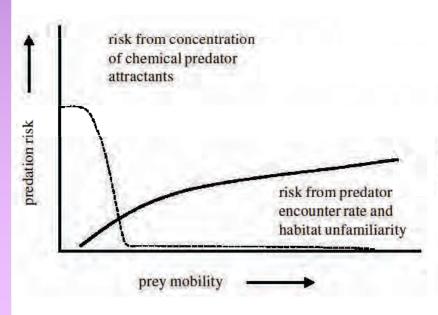
### Nonlinearity in the predation risk of prey mobility

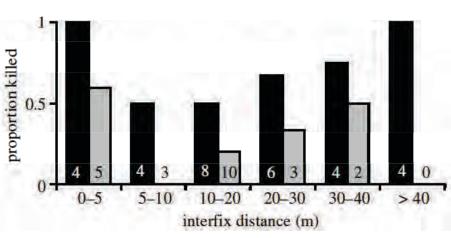
### Peter B. Banks\*, Kai Norrdahl and Erkki Korpimäki

Department of Biology, Section of Ecology, University of Turku, FIN-20014, Finland

Odorous waste products such as urine and faeces are unavoidable for most animals and are widely exploited by predators and their prey. Consequently, waste accumulations can be risky and prey which increase their mobility in order to disperse and dilute their waste should avoid a high predation risk until this benefit is balanced by the increasing risks of random predator encounter. This hypothesis was tested for voles (*Microtus* spp.) in Finland which are vulnerable to predation due to the scent and ultraviolet attractiveness of their urine. The mortality and mobility of radio-collared voles showed a U-shaped relationship, regardless of vole sex, species or population cycle phase. The low risks for prey making intermediate movements suggest that predation risk can exert strong selective pressures on prey such that they have little respite from the risk of being killed.

Proc. R. Soc. Lond. B (2000) 267, 1621-1625









### Life cycle period and activity of prey influence their susceptibility to predators

A. Molinari-Jobin, P. Molinari, A. Loison, J.-M. Gaillard and U. Breitenmoser

ECOGRAPHY 27: 323-329, 2004





We found more chamois predated when feeding, whereas roe deer were predated mainly when ruminating.

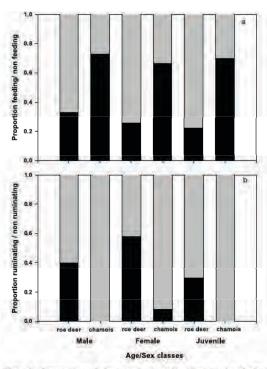


Fig. 3. Comparison between the activity that rendered the different roe deer and chamois age/sex classes vulnerable to lynx predation. (a) Feeding (n roe deer = 34, n chamois = 26). (b) Ruminating (n roe deer = 59, n chamois = 1).



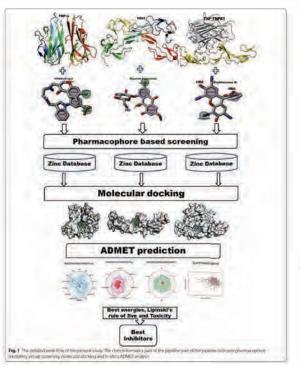
#### RESEARCH

#### **Open Access**

## Identification of novel inhibitors for TNFα, TNFR1 and TNFα-TNFR1 complex using pharmacophore-based approaches



Madhu Sudhana Saddala and Hu Huang



interest. Docking was performed using the AutoDock in PyRx Virtual Screening tool [28, 29]. The hit molecules

28. Schwarm A, Ortmann S, Wolf C, Streich WJ, Clauss M. More efficient mastication allows increasing intake without compromising digestibility or necessitating a larger gut: comparative feeding trials in banteng (Bos javanicus) and pygmy hippopotamus (Hexaprotodon liberiensis). Comp Biochem Physiol A. 2009;152(4):504–12.







Experience and knowledge in a topic



Experience and knowledge in a topic (new) idea



Experience and knowledge in a topic (new) idea
Literature research



Experience and knowledge in a topic (new) idea
Literature research
Formulation of a question/hypothesis



Experience and knowledge in a topic (new) idea
Literature research
Formulation of a question/hypothesis
Design a study



Experience and knowledge in a topic (new) idea
Literature research
Formulation of a question/hypothesis
Design a study
Apply for funding

Forschungskredit der Universität Zürich 2009

Research funding of the University of Zurich

Attachment 1

Research plan

Title: Comparative analysis of tooth wear in free-ranging and captive ungulates

Summary

Tooth wear is often suggested as an important factor limiting the life expectancy of freeranging wildlife. As a poor dental health in captive animals is frequently reported in the zoo literature (Martin Jurando et al. 2008), one would expect tooth health to be a limiting factor of



Experience and knowledge in a topic
(new) idea
Literature research
Formulation of a question/hypothesis
Design a study
Apply for funding
Evaluation of the application by "peers"



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Experience and knowledge in a topic
(new) idea
Literature research
Formulation of a question/hypothesis
Design a study
Apply for funding
Evaluation of the application by "peers"
Do the study: finances, material
personnel
```



```
Experience and knowledge in a topic
(new) idea
Literature research
Formulation of a question/hypothesis
Design a study
Apply for funding
       Evaluation of the application by "peers"
Do the study: finances, material
              personnel
       create starting conditions
```



```
Experience and knowledge in a topic
(new) idea
Literature research
Formulation of a question/hypothesis
Design a study
Apply for funding
       Evaluation of the application by "peers"
Do the study: finances, material
              personnel
       create starting conditions
       experimental stage: generation of samples
```



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Experience and knowledge in a topic (new) idea
Literature research
Formulation of a question/hypothesis
Design a study
Apply for funding
```

Evaluation of the application by "peers"

Do the study: finances, material

personnel

create starting conditions

experimental stage: generation of samples

lab stage: analysis of samples



Experience and knowledge in a topic (new) idea

(new) idea

Literature research

Formulation of a question/hypothesis

Design a study

Apply for funding

Evaluation of the application by "peers"

Do the study: finances, material

personnel

create starting conditions

experimental stage: generation of samples

lab stage: analysis of samples

incl. all that can happen (and also go wrong) at these stages



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Experience and knowledge in a topic
(new) idea
Literature research
Formulation of a question/hypothesis
Design a study
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       Evaluation of the application by "peers"
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       experimental stage: generation of samples
       lab stage: analysis of samples
       computer stage: data evaluation (graphics, statistics)
```



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```



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Equine Veterinary Journal Pege 2 of 31 COMPARATIVE ANALYSES OF TOOTH WEAR IN FREE-RANGING AND CAPTIVE WILD EQUIDS 3 Summary Reasons for performing study. Captive breeding programmes have played a trucial role in the conservation of threatened equid species. Grazing runniants and thinoceros in captivity have significantly less abrasiondominated tooth wear than their free-ranging conspecifics, with potential negative consequences for their health. However, a similar study on wild equids in captivity is II mussing. 12 Objectives: The aim of this study was to establish if different tooth wear patterns are exhibited by freeranging and captive equids 16 Methods Dental casts of maxillary cheek teeth of 228 museum specimens of seven wild equid species were analysed using the extended mesowear method. Although teeth showing specific abnormalines were not scored, the presence of focal overgrowths (hooks) of the rostral P2 was recorded. 22 23-

The results of this study indicate that captive Equits forus procuralskii, E. grovyt, E. homionus, E. quagga bookmi and E. sobra hartmannae have significantly less-abrasion dominated tooth wear on their premolars than their free-ranging conspecifics (p < 0.001). Fewer differences were exhibited between populations in the molars, and no significant differences were exhibited in the posterior cusp of the M2 between populations, except in a small sample of E. kinng. Captive equids exhibited more homogeneous wear along the tooth row whereas free-ranging equids exhibited a tooth wear gradient, with more abrasion on premolars than molars. There were significantly more rostral books on the P2 in the captive than the free-ranging population (p=0.03).

\*\*Conclusions and potential relevance\*\*

\*\*Overall\*\*, captive equids did experience less abrasion-dominated tooth wear than their free-ranging conspecifics; but the differences in tooth wear were less pronounced than those between captive and free-ranging wild ruminant and chinoceros species. These results

Equine Veterinary Journal

indicate that feeding regimes for captive equids deviate less from natural diets than those for

captive ruminants and rhinoceros, but that factors leading to hook formation, in particular

feeding height, should receive special attention.

Page 3 of 31

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## Don't pull punches in peer review

Reviewers volunteer their time to judge the validity of a paper as a favour to the scientific community, not to the authors.

Asking referees to keep their criticism positive could exacerbate the overall shortage of researchers willing to review manuscripts, particularly if they feel uncomfortable about reining in negative comments.

Rohit Goswami



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> Comparative analyses of tooth wear in free-

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#### Comparative analyses of tooth wear in free-ranging and captive m wild equids

A TAYLORY, B. W. H. MOLLERY, C. SOWITZER



III E SCHUIZ-KORMAS\*\*\*

Troop Zoological Secrety; and Wristo Zoo Regions, IV.

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#### Summary

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#### Introduction

Darly's breading programmes have object universities pole in the conservation of threatment equals [1]. Proposition with latter Passes for an of marchid was classified as actived to transid on the EATA fled Law from the 1960s and 1996 had through capther branding and renarcolaries programmes were has a harmatering apparature sear of reset 500 [1-2]. Successful resmontaction programmes dispared on the breath and wabity of the paptive good allow I believe to appearant grades around professions are impactly exported [3-3]. The entopolicymus of an impaler party was a donestic scoon is milifiertable and relates recognize and lower chowing movements suspend by feeding an concentrate legal [8,7]. While trained timesatic horses can have their booth chart relatively mustly by writer rierians or sagare shorters, both frestment of teeth to captive with coulds to make proble has come (8) Purthamont, local; was pattern of righters; and white intercess (Sectlethers areas), threewarefunctly between him-surgery and matter agents may with capther specimens as leasting any frontly have abreauts dominated theft were (9,10). Captive grants may imput a det of been structured than the has writing compartion because of citratic difference than duty resembled for exchange bed petraneing techniques and lecrossers feeding by given in zoon (1) increasing a study investmenting the local history achibited by captive wild aquitive well remove.

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The are in the study was to quantity the front seast changed in ins-morey and rapton wild equids, sarry the admined measurer crathed as therefored by taken [15,17], in order to combot whether different wear patterns are sub-bitted in captivity than both world, in parallel to studies on rempany and discounts (9,10), we hypothesised that buttle equition of dispersion less absolve dominant to the war than the beautigramments.

#### Materials and methods

#### Material

Duran between probability investrial services of Daywelloc from 22. mological vacuums. In limit, 127 (non-strong and 106 captive spectrums front apecia were studied there \$1 and \$21. Only specimens with faces: ungineers whoched for responser eating Conservely even or damaged tenth were as disched. The systems of Treaten (14) and Noyal (17) were used for electifying specific tooth. Marilley tooth raws, excluding the permanent second, chest and leasth promoter (10s-116, 205-206) and the treit, arcord and third male (1009-111), 2009-211) leave analysed. From grangements at hooks of the castral 10%, 206 and coulde [7]. Tell 5.5 mm) with recorded.



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Equipm Votor many Journal 155N 0425-1644 DOI: 10.1111/ovi.12408

#### Comparative analyses of tooth wear in free-ranging and captive wild equids

L.A. TAYLOR!!, D. W. H. MÜLLER!!, C. SCHWITZER!, T. M. KAISER!, J. C. CASTELL!, M. CLAUSS! and E SCHULZ-KORNAS\*\*\*

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#### Summary

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Study design. Cross sections share of messors spacement, come of to the control yard cartive counts.

Methoda: Senter carts of moverny cross batts of 278 messors specimens (172 from two ranging and 106 from captive native were analysisd using the extension reserved method. Attribught sent maying specific statumations were not storage, the presence of time as any owner. Detaks of the foural promoters, (05, 206) was recorded

Results Captivili quies farus proporties à grown à horizona, à usuage électric surfit poère harbonnes tons less auradors des communares that promises than time if to carrying conspection Field 001, Hower differences, were whitehold advisory populations in the molers. No differences were exhause in the design of the motion (LLC, 2) it browses people done, except in a small sample of Evering, Dip the would switched more homogeneous. wear along the both raw who rup this region register exhibited a both wear dipolars. With more absenting in commolars bear moles. There were more resural Accides on the promotions (ACE, XCE) in the copying than the free-ranging population (Fig. 8.62).

Conclusions: Captive equits dividepenence lies abegins dominated about west than this tree treating compacting that the collections is both weat were assignificated than those browners captive and treatment with runtical and reviewers species. This indicates that heading regimes for captive works polytic session returns such that their this space is interest, and rendered all this factors taken to now harmater in carried leading haight, chough receive special attention.

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#### Introduction

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The lam of this study was in quantity the foots wear observed in the ranging and custive wild cycles, using the submitted mesowaer mitthed as developed by Kalser (16 T/L in order to estudiesh window different was patterns are wrented in captwity tion in the wild. Importion with studies on contracts and thirocores (9,10), we by politicisted that captive equies would experience was annexis dominated forethwise than basis free remains consequence.

#### Materials and methods

Durital cases were produced of museum appropriate of Figure san. For 21 Publication of the second in total, 122 have ranging and 106 capture speciment From 7 species were studied (Supplementary litters 7 and 3). Only specimen with known criple were swinced for mesower scoring Despenyory worth or contrapped based worst exchanged. The systems of Triscon-US) and Hoya (19) were used for identifying specific tests). Magillary troots town including the permanent excent, that and lound promise USS-108, 205-208) and the Pris. second and third moler (189-11). 109-21 II wire analysed Foca everyrowiths or feeds of the reseal fide 706, and coulds) [11, 71] 5-3 mm/were recorded.



### How new knowledge is made public

#### Present at a conference:

secure funding for conference

Write an "Abstract"

Submit

Evaluation by conference committee (peers)

Design a presentation (Power-Point)

Present (oral/poster) at conference

others perceive the presentation/ read the abstract

#### Produce a manuscript

cooperation with co-authors

internal corrections (e.g. by boss, supervisor)

Choice of a publication outlet

Submission of manuscript

Evaluation by peers

Revision of manuscript

Manuscript is accepted

Correction of page proofs

Manuscript is printed

Others read the manuscript



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Manuscript is accepted

Correction of page proofs

Manuscript is printed

Others read the manuscript

Discussion
Media appearance
Repetition

Inclusion into Textbooks



# How scientists are evaluated ...



### 'Impact Factor'

IF = mathematical parameter (calculated!)

The average number of times a publication of the journal in question is cited in the first two years following the publication year (i.e. today's IF refers to publications three years old).

The more prestigious a journal = the more it is read = the more its articles are cited = the more prestigious it is



### Impact Factors

2006 - 2018

CA-A Cancer Journal for Clinicians	50	187
Science	31	37
Nature	29	40
The Veterinary Record	1.06	1.74
Journal of Zoo and Wildlife Medicine	0.36	0.59
Schweizer Archiv für Tierheilkunde	0.32	0.59



### 'h-Factor'

HF = mathematical parameter (calculated!)

The number of publications of a researcher which have been cited as least as often as this number.

Example: 7 publications, one is cited 5 times, one is cited 2 times, the other ones are cited once or not at all => HF=2

HF of Noble Price winners 30-70

HF should increase with age and has to be corrected for age if different people are compared.

Note that the HF can never go down even if you don't work any more.

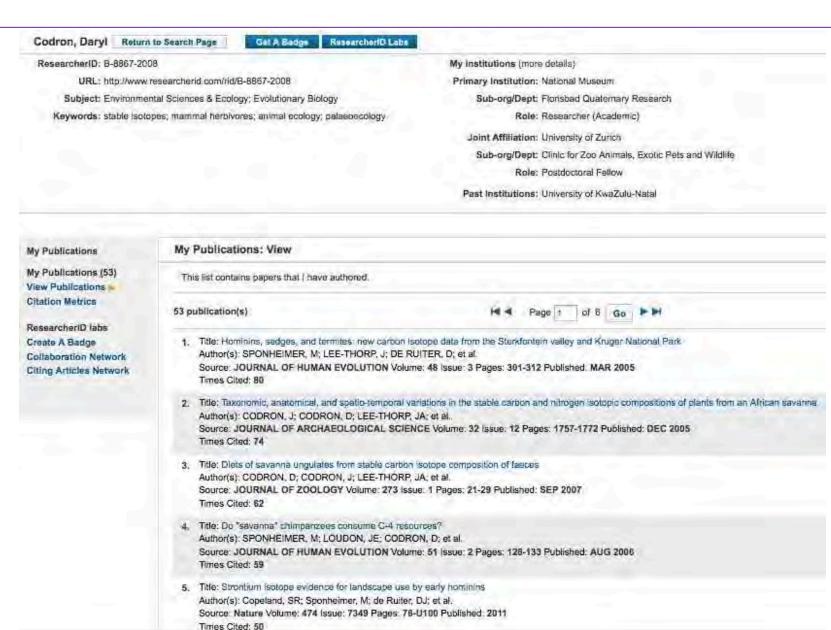


By any kind of success in the "peer-review-process",

- successful grant applications
- "peer-reviewed" publications and their citations

(- awards)







Codron, Daryl

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ResearcheriD Labs

ResearcherID: B-8867-2008

URL: http://www.researcherid.com/rid/B-8867-2008

Subject: Environmental Sciences & Ecology; Evolutionary Biology

Keywords; stable isotopes; mammal herbivores; animal ecology; palaeoecology

My Institutions (more details)

Primary Institution: National Museum

Sub-org/Dept: Florisbad Quaternary Research

Role: Researcher (Academic)

Joint Affiliation: University of Zurich

Sub-org/Dept: Clinic for Zoo Animals, Exotic Pets and Wildlife

Role: Postdoctoral Fellow

Past Institutions: University of KwaZulu-Natal

#### My Publications

My Publications (53) View Publications Citation Metrics

ResearcherID labs
Create A Badge
Collaboration Network
Citing Articles Network

#### My Publications: Citation Metrics

This graph shows the number of times the articles on the publication list have been cited in each of the last 20 years.

Note: Only articles from Web of Science Core Collection with citation data are included in the calculations. More information about these data.

#### Citation Distribution by year



Total Articles in Publication List: 53

Articles With Citation Data 51

Sum of the Times Cited: 1009

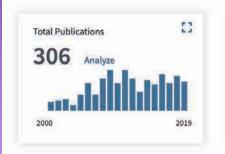
Average Citations per Article: 19.78

h-index: 20

Last Updated: 09/25/2015 06:17

GMT

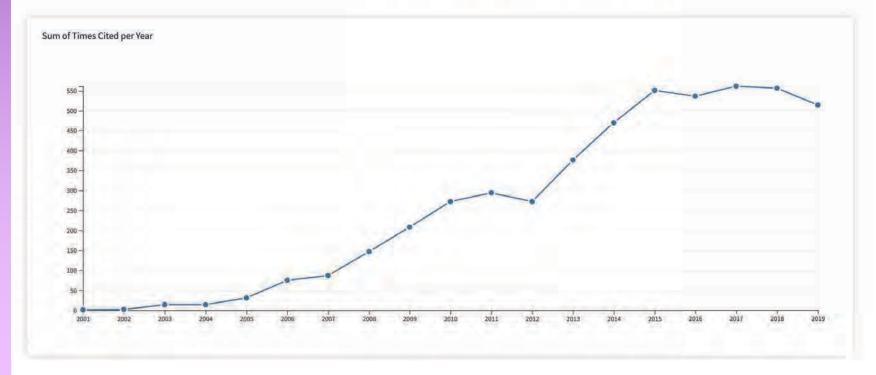






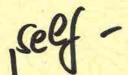














### Comparative Biochemistry and Physiology - A Molecular and Integrative Physiology Top Cited Article 2008 - 2010

Awarded to:

Schwarm, A., Ortmann, S., Wolf, C., Jürgen Streich, W., Clauss, M.

For the paper entitled:

"Excretion patterns of fluid and different sized particle passage markers in banteng (Bos javanicus) and pygmy hippopotamus (Hexaprotodon liberiensis): Two functionally different foregut fermenters"

This paper was published in:

Comparative Biochemistry and Physiology - A Molecular and Integrative Physiology, Volume 150, Issue 1, 2008

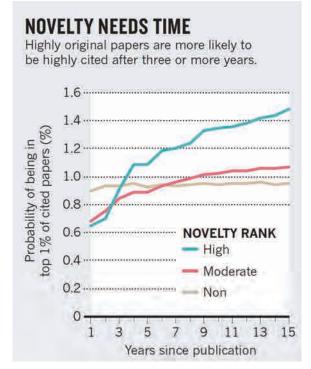
Judy Bai Publisher - Life Sciences Elsevier, Beijing, China



# Blinkered by bibliometrics

Science panels still rely on poor proxies to judge quality and impact. That results in risk-averse research, say Paula Stephan, Reinhilde Veugelers and Jian Wang.

27 APRIL 2017 | VOL 544 | NATURE | 411





The number of peer-reviewed pubications (as such or in combination with a weighting for impact factor or h-factor) is currently the most important evaluation criterium in academia.

Acquiring grant money is the second most important criterium – or the most important one in some places!

Other potential criteria revolve around media presence or the influence on 'policy making'.

This is something one has to know, even if one need not welcome it.

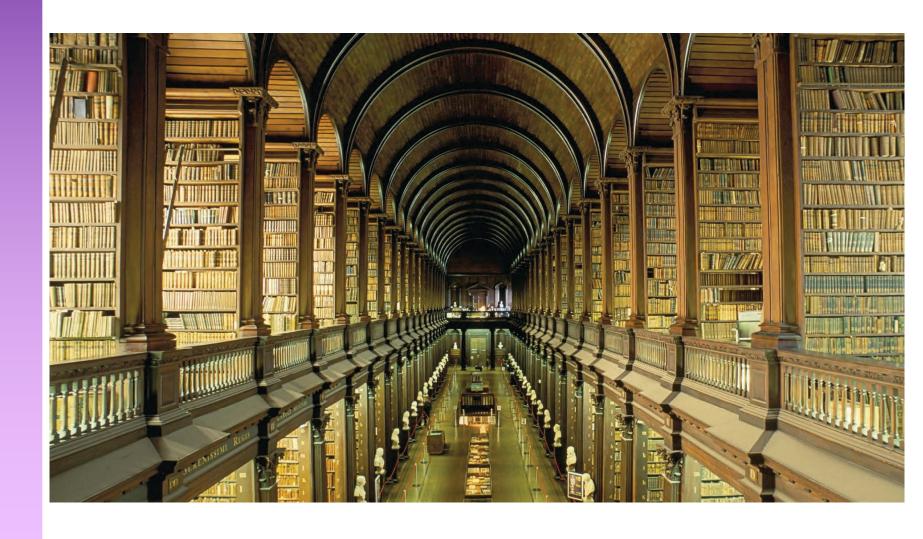


# ... and what really counts





## 'Cathedrals of knowledge'





Do others read, use, build on, deal with your publications?



Do others read, use, build on, deal with your publications?

Do you have a vision, or do you 'just' work on some tiny detail?



Do others read, use, build on, deal with your publications?

Do you have a vision, or do you 'just' work on some tiny detail?

Do you do research in an elegant, cool, beautiful, simple way?



# Elegance

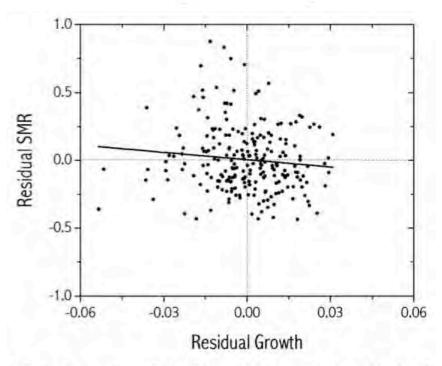


### Basing a story on data

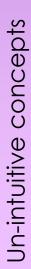
### A high standard metabolic rate constrains juvenile growth

Anthony C. Steyermark\*

Zoology 105 (2002): 147-151



**Fig.1.** A negative relationship exists between the residuals of growth and standard metabolic rate (SMR; P = 0.04; R = 0.13), indicating a tradeoff in energy expenditure. Growth was measured from hatching to approximately six months of age, and growth rate was calculated as change in body mass per day. Oxygen consumption of each individual was measured immediately after growth measurements ended, and was used to calculate SMR.



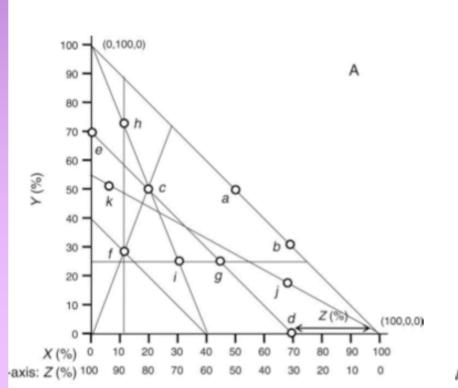


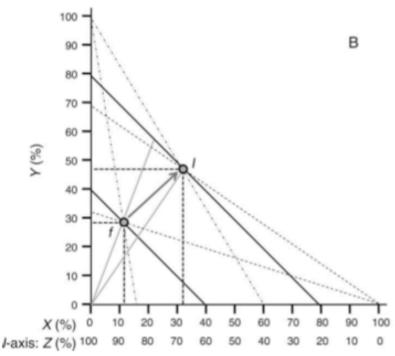
### Basing a story on concept

### Toward a quantitative nutritional ecology: the right-angled mixture triangle

DAVID RAUBENHEIMER

Ecological Monographs, 81(3), 2011, pp. 407-427







### **Functional Ecology**



Functional Ecology 2014, 28, 1059-1060

doi: 10.1111/1365-2435.12301

#### **FE SPOTLIGHT**

Do we ditch digestive physiology in explaining the classic relationship between herbivore body size diet and diet quality?

Clare McArthur\*

(among other measures) as a diagnostic tool, they test an elegant set of predictions arising from hypotheses associ-



### Functional Ecology

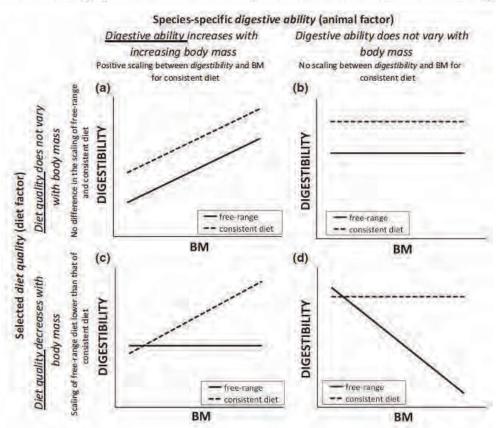


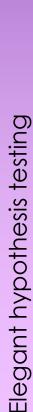
Functional Ecology 2014, 28, 1127-1134

doi: 10.1111/1365-2435.12275

# Does body mass convey a digestive advantage for large herbivores?

Patrick Steuer<sup>1</sup>, Karl-Heinz Südekum<sup>1</sup>, Thomas Tütken<sup>2,†</sup>, Dennis W. H. Müller<sup>3,4</sup>, Jacques Kaandorp<sup>5</sup>, Martin Bucher<sup>6</sup>, Marcus Clauss<sup>3</sup> and Jürgen Hummel\*.<sup>1,7</sup>







### Functional Ecology

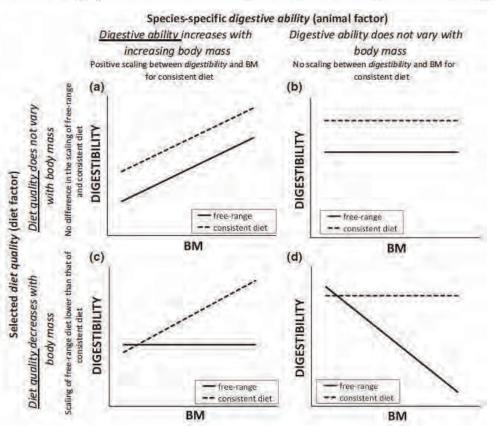


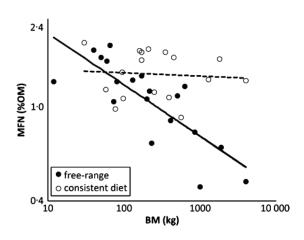
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Do others read, use, build on, deal with your publications?

Do you have a vision, or do you 'just' work on some tiny detail?

Do you do research in an elegant, cool, beautiful, simple way?

Do those who learnt from you think and speak highly of you?



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Do you have a vision, or do you 'just' work on some tiny detail?

Do you do research in an elegant, cool, beautiful, simple way?

Do those who learnt from you think and speak highly of you? Do you have a reputation of integrity?



# Integrity



# Integrity

authorship



Mammal Rev. 2004, Volume 34, No. 3, 241-245. Printed in Great Britain.

The potential interplay of posture, digestive anatomy, density of ingesta and gravity in mammalian herbivores: why sloths do not rest upside down

MARCUS CLAUSS



Mammal Rev. 2004, Volume 34, No. 3, 241-245. Printed in Great Britain.

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Mammal Rev. 2005, Volume 35, No. 2, 174-187. Printed in Great Britain.

The digestive performance of mammalian herbivores: why big may not be that much better

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British Journal of Nutrition (2016), 116, 763–773

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doi:10.1017/S0007114516002701

Influence of ruminal methane on digesta retention and digestive physiology in non-lactating dairy cattle

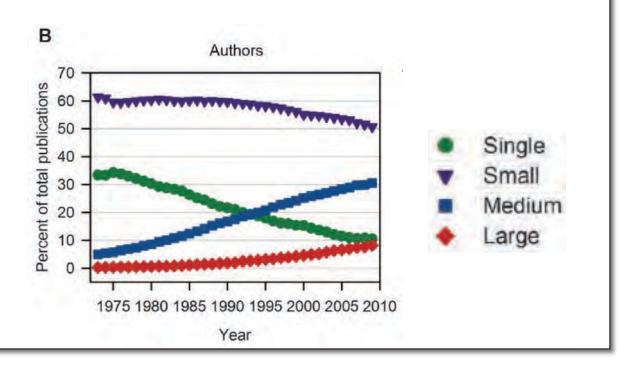
Marie T. Dittmann<sup>1,2,3</sup>, Kirsty J. Hammond<sup>3</sup>†, Paul Kirton<sup>3</sup>, David J. Humphries<sup>3</sup>, Les A. Crompton<sup>3</sup>, Sylvia Ortmann<sup>4</sup>, Tom H. Misselbrook<sup>5</sup>, Karl-Heinz Südekum<sup>6</sup>, Angela Schwarm<sup>2</sup>, Michael Kreuzer<sup>2</sup>, Christopher K. Reynolds<sup>3</sup> and Marcus Clauss<sup>1</sup>\*

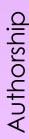


#### SCIENTIFIC PUBLISHING

## Multinational teams and diseconomies of scale in collaborative research

David Hsiehchen, \*\* Magdalena Espinoza, \*\* Antony Hsieh\*\*







PRL 103, 092001 (2009)

PHYSICAL REVIEW LETTERS

week ending 28 AUGUST 2009

PRL 103, 092001 (2009)

PHYSICAL REVIEW LETTERS

week ending 8 AUGUST 2009

#### **Observation of Single Top-Quark Production**

V. M. Abazov, 36 B. Abbott, 74 M. Abolins, 64 B. S. Acharva, 29 M. Adams, 50 T. Adams, 48 E. Aguilo, 6 M. Ahsan, 58 G. D. Alexeev, 36 G. Alkhazov, 40 A. Alton, 64.\* G. Alverson, 62 G. A. Alves, 2 L. S. Ancu, 35 T. Andeen, 52 M. S. Anzelc, 52 M. Aoki, <sup>49</sup> Y. Arnoud, <sup>14</sup> M. Arov, <sup>59</sup> M. Arthaud, <sup>18</sup> A. Askew, <sup>48</sup>: B. Asham, <sup>41</sup> O. Asham, <sup>41</sup> C. Avila, <sup>8</sup> J. BackusMayes, <sup>81</sup> F. Badaud, <sup>13</sup> L. Bagby, <sup>49</sup> B. Baldin, <sup>49</sup> D. V. Bandurin, <sup>58</sup> P. Banerjee, <sup>29</sup> S. Banerjee, <sup>29</sup> E. Barberis, <sup>62</sup> A.-F. Barfuss, 15 P. Bargassa, 79 P. Baringer, 57 J. Barreto, 2 J. F. Bartlett, 49 U. Bassler, 18 D. Bauer, 43 S. Beale, 6 A. Bean, 57 M. Begalli, M. Begel, C. Belanger-Champagne, L. Bellantoni, A. Bellavance, J. A. Benitez, A. Benitez, S. B. Beri, L. Bellavance, Bellavance, L. Bellavance, A. Benitez, L. Bellavance, A. Benitez, S. B. Beri, A. Benitez, S. B. Beri, L. Bellavance, A. Benitez, S. B. Beri, L. Benitez, S. B. Benitez, G. Bernardi, <sup>17</sup> R. Bernhard, <sup>23</sup> I. Bertram, <sup>42</sup> M. Besançon, <sup>18</sup> R. Beuselinck, <sup>43</sup> V. A. Bezzubov, <sup>39</sup> P. C. Bhat, <sup>49</sup> V. Bhatnagar, <sup>27</sup> G. Blazey, <sup>51</sup> S. Blessing, <sup>48</sup> K. Bloom, <sup>66</sup> A. Boehnlein, <sup>49</sup> D. Boline, <sup>61</sup> T. A. Bolton, <sup>58</sup> E. E. Boos, <sup>38</sup> G. Borissov, <sup>42</sup> T. Bose, <sup>76</sup> A. Brandt, <sup>77</sup> R. Brock, <sup>64</sup> G. Brooijmans, <sup>69</sup> A. Bross, <sup>49</sup> D. Brown, <sup>19</sup> X. B. Bu, <sup>7</sup> N. J. Buchanan, <sup>48</sup> D. Buchholz, 52 M. Buehler, 80 V. Buescher, 22 V. Bunichev, 38 S. Burdin, 42.‡ T. H. Burnett, 81 C. P. Buszello, 43 P. Calfayan, 25 B. Calpas, <sup>15</sup> S. Calvet, <sup>16</sup> J. Cammin, <sup>70</sup> M. A. Carrasco-Lizarraga, <sup>33</sup> E. Carrera, <sup>48</sup> W. Carvalho, <sup>3</sup> B. C. K. Casey, <sup>45</sup> H. Castilla-Valdez, 33 S. Chakrabarti, 71 D. Chakraborty, 51 K. M. Chan, 54 A. Chandra, 47 E. Cheu, 45 D. K. Cho, 61 S. Choi, 32 B. Choudhary, 28 L. Christofek, 76 T. Christoudias, 43 S. Cihangir, 49 D. Claes, 66 J. Clutter, 57 Y. Coadou, 6,8 M. Cooke, 49 W. E. Cooper, <sup>49</sup> M. Corcoran, <sup>79</sup> F. Couderc, <sup>18</sup> M.-C. Cousinou, <sup>15</sup> S. Crépé-Renaudin, <sup>14</sup> V. Cuplov, <sup>58</sup> D. Cutts, <sup>76</sup> M. Ćwiok, 30 A. Das, 45 G. Davies, 43 K. De, 77 S. J. de Jong, 35 E. De La Cruz-Burelo, 33 K. DeVaughan, 66 F. Déliot, 18 M. Demarteau, <sup>49</sup> R. Demina, <sup>70</sup> D. Denisov, <sup>49</sup> S. P. Denisov, <sup>39</sup> S. Desai, <sup>49</sup> H. T. Diehl, <sup>49</sup> M. Diesburg, <sup>49</sup> A. Dominguez, <sup>66</sup> T. Dorland, <sup>81</sup> A. Dubey, <sup>28</sup> L. V. Dudko, <sup>38</sup> L. Duflot, <sup>16</sup> D. Duggan, <sup>48</sup> A. Duperrin, <sup>15</sup> S. Dutt, <sup>27</sup> A. Dyshkant, <sup>51</sup> M. Eads, <sup>66</sup> D. Edmunds, <sup>64</sup> J. Ellison, <sup>47</sup> V. D. Elvira, <sup>49</sup> Y. Enari, <sup>70</sup> S. Eno, <sup>60</sup> P. Ermolov, <sup>38</sup> M. Escalier, <sup>15</sup> H. Evans, <sup>53</sup> A. Evdokimov, <sup>72</sup> V. N. Evdokimov, <sup>39</sup> A. V. Ferapontov, <sup>58</sup> T. Ferbel, <sup>61,70</sup> F. Fiedler, <sup>24</sup> F. Filthaut, <sup>35</sup> W. Fisher, <sup>49</sup> H. E. Fisk, <sup>49</sup> M. Fortner, <sup>51</sup> H. Fox, <sup>42</sup> S. Fu, <sup>49</sup> S. Fuess, <sup>49</sup> T. Gadfort, <sup>69</sup> C. F. Galea, <sup>35</sup> A. Garcia-Bellido, <sup>70</sup> V. Gavrilov, <sup>37</sup> P. Gay, <sup>13</sup> W. Geist, W. Geng, 15.64 C. E. Gerber, 50 Y. Gershtein, 48.7 D. Gillberg, 6 G. Ginther, 70 B. Gómez, 8 A. Goussiou, 8 J. P. D. Grannis, 7 S. Greder, 19 H. Greenlee, 49 Z. D. Greenwood, 59 E. M. Gregores, 4 G. Grenier, 20 Ph. Gris, 13 J.-F. Grivaz, 16 A. Grohsjean, <sup>25</sup> S. Grünendahl, <sup>49</sup> M. W. Grünewald, <sup>30</sup> F. Guo, <sup>71</sup> J. Guo, <sup>71</sup> G. Gutierrez, <sup>49</sup> P. Gutierrez, <sup>74</sup> A. Haas, <sup>69</sup> N. J. Hadley, OP. Haefner, S. Hagopian, J. Haley, II. Hall, AR. E. Hall, L. Han, K. Harder, AR. Harder J. M. Hauptman, <sup>56</sup> J. Hays, <sup>43</sup> T. Hebbeker, <sup>21</sup> D. Hedin, <sup>51</sup> J. G. Hegeman, <sup>34</sup> A. P. Heinson, <sup>47</sup> U. Heintz, <sup>61</sup> C. Hensel, <sup>22,||</sup> K. Herner, <sup>63</sup> G. Hesketh, <sup>62</sup> M. D. Hildreth, <sup>54</sup> R. Hirosky, <sup>80</sup> T. Hoang, <sup>48</sup> J. D. Hobbs, <sup>71</sup> B. Hoeneisen, <sup>12</sup> M. Hohlfeld, <sup>22</sup> S. Hossain, 74 P. Houben, 34 Y. Hu, 71 Z. Hubacek, 10 N. Huske, 17 V. Hynek, 10 I. Iashvili, 68 R. Illingworth, 49 A. S. Ito, 49 S. Jabeen, 61 M. Jaffré, 16 S. Jain, 74 K. Jakobs, 23 D. Jamin, 15 C. Jarvis, 60 R. Jesik, 43 K. Johns, 45 C. Johnson, 69 M. 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# IOD IN RHINOS—NUTRITION GROUP REPORT: REPORT FROM THE NUTRITION WORKING GROUP OF THE INTERNATIONAL WORKSHOP ON IRON OVERLOAD DISORDER IN BROWSING RHINOCEROS (FEBRUARY 2011)

Marcus Clauss, Ph.D., D.V.M., Ellen Dierenfeld, Ph.D., M.S., Jesse Goff, D.V.M., Ph.D., Kirk Klasing, Ph.D., Liz Koutsos, Ph.D., M.S., Shana Lavin, Ph.D., M.S., Shannon Livingston, M.S., Brian Nielson, Ph.D., Michael Schlegel, Ph.D., P.A.S., Kathleen Sullivan, M.S., Eduardo Valdes, Ph.D., and Ann Ward, M.S.





ORIGINAL RESEARCH

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Within-Population Isotopic Niche Variability in Savanna Mammals: Disparity between Carnivores and Herbivores

Daryl Codron 1,2\*, Jacqueline Codron 3, Matt Sponheimer 4 and Marcus Clauss 5



Molecular Ecology (1998) 7, 519-531

# Speciation and phylogeography of Hawaiian terrestrial arthropods

G. K. RODERICK and R. G. GILLESPIE

Order of

authorship was determined by proximity to tenure decisions.





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Forest fragmentation affects early successional patterns on shifting cultivation fields near Indian Church, Belize

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All authors contributed equally to this paper so the order of authorship was determined by rock, paper, scissors.



### AGGREGATION OF PREDATORS AND INSECT PARASITES AND ITS EFFECT ON STABILITY

BY M. P. HASSELL AND R. M. MAY\*

Journal of Animal Ecology, Vol. 43, No. 2 (Jun., 1974), pp. 567-594

\* The order of authorship was determined from a twenty-five-game croquet series held at Imperial College Field Station during summer 1973.



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The Fleeting Gleam of Praise: Cognitive Processes Underlying Behavioral Reactions to Self-Relevant Feedback

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Order of authorship was determined by a flip of what William B. Swann, Jr., claimed was a fair coin.



Equal contributions and credit given to authors in critical care medicine journals during a 10-yr period\*

Crit Care Med 2012 Vol. 40, No. 3

Fei Wang, MD, PhD; Lu Tang, PhD; Lulong Bo, MD, PhD; Jinbao Li, MD, PhD; Xiaoming Deng, MD, PhD

Table 1. Number of original research articles with authors given equal credit and annual prevalence

Year	American Journal of Respiratory and Critical Care Medicine	Critical Care Medicine	Intensive Care Medicine	Critical Care	
2001	0/519 (0%)	4/314 (1.3%)	0/237 (0%)	0/25 (0%)	
2002	2/382 (<1%)	2/338 (<1%)	0/230 (0%)	0/28 (0%)	
2003	6/365 (1.6%)	1/372 (<1%)	2/288 (<1%)	0/49 (0%)	
2004	13/303 (4.3%)	4/319 (1.3%)	3/252 (1.2%)	0/65 (0%)	
2005	20/364 (5.5%)	10/338 (3.0%)	3/197 (1.5%)	0/111 (0%)	
2006	31/325 (9.5%)	11/360 (3.1%)	2/211 (<1%)	2/179 (1.1%)	
2007	31/300 (10.3%)	19/321 (5.9%)	8/228 (3.5%)	3/133 (2.2%)	
2008	43/309 (13.9%)	15/380 (3.9%)	7/222 (3.2%)	10/174 (5.7%)	
2009	39/263 (14.8%)	19/375 (5.1%)	6/225 (2.7%)	19/210 (9.0%)	
2010	55/277 (19.9%)	27/255 (10.6%)	11/206 (5.3%)	28/240 (11.7%)	
Total	240/3407 (7.0%)	112/3372 (3.3%)	42/2296 (1.8%)	62/1214 (5.1%)	
Trenda	z = -14.23, p < .0001	z = -7.68, p < .0001	z = -5.24, p < .0001	z = -6.55, p < .000	



## Equal contributions and credit given to authors in critical care medicine journals during a 10-yr period\*

Crit Care Med 2012 Vol. 40, No. 3

Fei Wang, MD, PhD; Lu Tang, PhD; Lulong Bo, MD, PhD; Jinbao Li, MD, PhD; Xiaoming Deng, MD, PhD

Table 2. Number of original research articles with authors given equal credit categorized by byline position

Byline Position of Authors Receiving Equal Credit	American Journal of Respiratory and Critical Care Medicine (n = 240)	Critical Care Medicine (n = 112)	Intensive Care Medicine (n = 42)	Critical Care (n = 62)	Total (n = 456)
First two authors	180 (75.0%)	90 (80.4%)	30 (71.4%)	44 (71.0%)	344 (75.4%)
First three or more authors	10 (4.2%)	5 (4.5%)	2 (4.8%)	3 (4.8%)	20 (4.4%)
Last two or more authors	18 (7.5%)	9 (8.0%)	3 (7.1%)	4 (6.5%)	34 (7.5%)
First and last authors	1 (<1%)	0	3 (7.1%)	3 (4.8%)	7 (1.5%)
First two and last two authors	17 (7.1%)	2 (1.8%)	2 (4.8%)	2 (3.2%)	23 (5.0%)
First two (or more) and last authors	4 (1.2%)	1 (<1%)	0	2 (3,2%)	7 (1.5%)
First and last two authors	0	1 (<1%)	0	0	1 (<1%)
First and third authors	0	1 (<1%)	0	2 (3.2%)	3 (< 1%)
Middle authors only	8 (3.3%)	0	0	1 (1.6%)	9 (2.0%)
All authors	0	0	2 (4.8%)	0	2 (<1%)
Others	2 (<1%)	3(2.7%)	0	1 (1.6%)	6 (1.3%)



# Primary oligodendrocyte death does not elicit anti-CNS immunity

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# Representation of Geometric Borders in the Entorhinal Cortex

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SCIENCE VOL 322 19 DECEMBER 2008

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# Thermal physiology of Amazonian lizards (Reptilia: Squamata)

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# Vocal complexity and sociality in spotted paca (*Cuniculus paca*)

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# Integrity

language



```
\dots but no information exists on x \dots
```

... but x has not been studied so far ...



```
... but no information exists on x ...
```

... but x has not been studied so far ...

The most likely explanation for the fact that something has not been studied yet is that it is not very interesting.



```
... but no information exists on x ...
```

... but x has not been studied so far ...

The most likely explanation for the fact that something has not been studied yet is that it is not very interesting.

Find another reason to justify your work!



```
... xx is an endangered species ...
... therefore we need information on its blood cell biology ...
```



```
... xx is an endangered species ...
```

... therefore we need information on its blood cell biology ...

If you really want to protect something, spend money to buy habitat and fences ... not to hire scientists.



```
... xx is an endangered species ...
```

... therefore we need information on its blood cell biology ...

If you really want to protect something, spend money to buy habitat and fences ... not to hire scientists.

# Find another reason to justify your work!





#### Counting the books while the library burns: why conservation monitoring programs need a plan for action

David B Lindenmayer", Maxine P Piggott', and Brendan A Wintle<sup>2</sup>

Conservation monitoring programs are critical for identifying many elements of species ecology and for detecting changes in populations. However, without articulating how monitoring information will trigger relevant
conservation actions, programs that monitor species until they become extinct are at odds with the primary goal
of conservation: avoiding biodiversity loss. Here, we outline cases in which species were monitored until they suffered local, regional, or global extinction in the absence of a preplanned intervention program, and contend that
conservation monitoring programs should be embedded within a management plan and characterized by vital
attributes to ensure their effectiveness. These attributes include: (1) explicit articulation of how monitoring information will inform conservation actions, (2) transparent specification of trigger points within monitoring programs at which strategic interventions will be implemented, and (3) rigorous quantification of the ability to
achieve early detection of change.

Front East Empore 2013; 11(10): 549-555, doi:10.1890/120220 [published online 11 Nov 2013]

The continuing loss of biodiversity is a serious global problem (Batchart et al. 2010). Of the 63 837 species assessed worldwide using the International Union for Conservation of Nature (IUCN) Red List criteria, 865 are extinct or extinct in the wild and 19 817 are listed as critically endangered, endangered, or vulnerable to extinction (IUCN 2012). Since the start of the 21st century alone, at least 10 species of vertebrates are known to have gone extinct, although this is likely to be a substantial underestimate. The only way to know whether populations of a species are declining is by monitoring them, thus

#### In a nutshell:

- Monitoring is a critical part of effective species conservation, but mony species are being monitored until they go extinct
- Management inservention should be triggered when it becomes apparent that a monitored species is in decline
- Meat conservation manituring programs lack preplanted interventions and a clear statement about how the information derived from manituring will help to conserve the species
- Conservation increating programs and management plans should identify trigger points for prospecified management interventions

Fenner School of Environmens and Sossery, Assoralam Research Council Center of Excellence for Environmental Decisions; and National Environmental Research Program, The Assoration National University, Camberns, Assoration (dated Indemnsyst) and calls as: "School of Bosony; Assoration Research Council Course of Escellence for Environmental Decisions; and National Environmental Research Program, University of Melbourne, Melbourne, Australia making monitoring an essential conservation activity.

There are a variety of reasons to monitor biodiversity, including learning about a species' ecology and population biology, reporting on the state of biodivenity, and estimating the state of (or detecting changes in) populations so that appropriate actions can be taken (Yoccor et al. 2001). However, when a monitoring program is funded under the specific objective of conserving a species that has been identified as imperiled, it would seem reasonable to expect that the monitoring would, at the very least, aim to detect population changes that trigger specific and timely conservation actions, and/or clarify aspects of the species' ecology or population biology that are most immediately relevant to improving the effectiveness of conservation actions. Unfortunately, conservation monitoring programs commonly (1) track the state of a population without any plan for what will be done if a given change is observed or (2) collect information on the species' ecology or population biology that has no immediate relevance to decisions about the most appropriate course of action to prevent extinction. The end result may be that the decline and extinction of species is accurately recorded without any effective attempts at mitigation.

Monitoring a species until it becomes extinct is clearly not a conservation policy that would ever be earnestly proposed. Yet the conservation literature contains many examples of threatened or endangered species being monitored until they went locally, regionally, or globally extinct (WebTable 1). This unfortunate phenomenon may become more frequent in the future, given both the large number of imperiled species globally (IUCN 2012) and the prevalence of poorly designed and implemented biodivensity monitoring programs (Nichols and Williams 2006; Lindenmayer and Likens 2010) that lack a sound



#### Use of positive and negative words in scientific PubMed abstracts between 1974 and 2014: retrospective analysis

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Christiaan H Vinkers assistant professor<sup>1</sup>, Joeri K Tijdink psychiatrist<sup>2</sup>, Willem M Otte assistant professor<sup>3 4</sup>

#### Box 1: Words used in PubMed search queries and Google books search engine

#### Positive words

Amazing, assuring, astonishing, bright, creative, encouraging, enormous, excellent, favourable, groundbreaking, hopeful, innovative, inspiring, inventive, novel, phenomenal, prominent, promising, reassuring, remarkable, robust, spectacular, supportive, unique, unprecedented

#### Negative words

Detrimental, disappointing, disconcerting, discouraging, disheartening, disturbing, frustrating, futile, hopeless, impossible, inadequate, ineffective, insignificant, insufficient, irrelevant, mediocre, pessimistic, substandard, unacceptable, unpromising, unsatisfactory, unsatisfying, useless, weak, worrisome

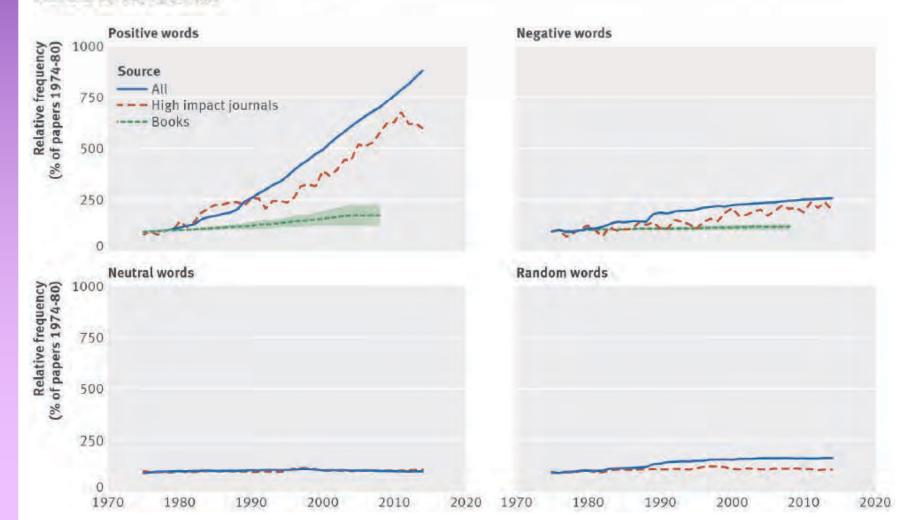
#### Neutral words

Animal, blood, bone, brain, condition, design, disease, experiment, human, intervention, kidney, liver, man, men, muscle, patient, prospective, rodent, significant, skin, skull, treatment, vessel, woman, women

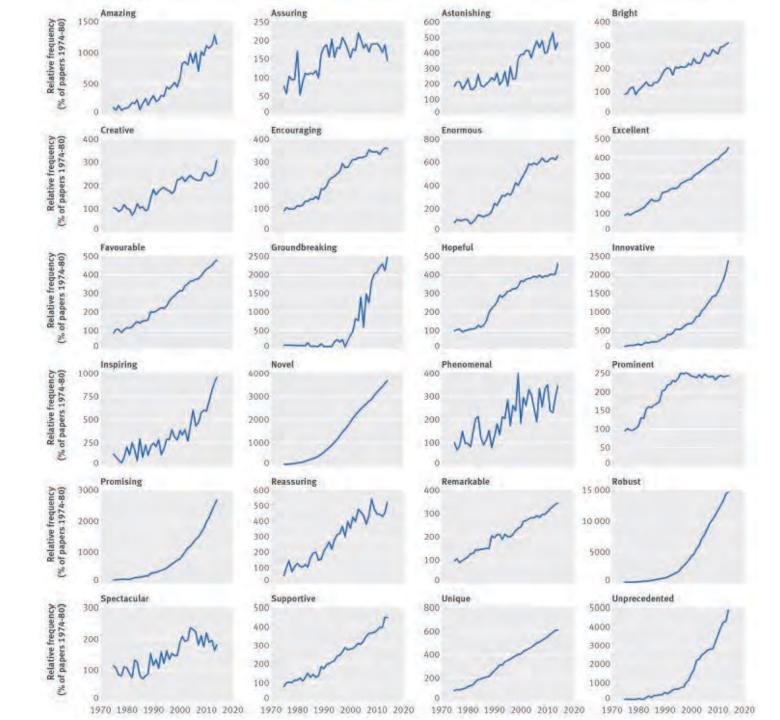


#### Use of positive and negative words in scientific PubMed abstracts between 1974 and 2014: retrospective analysis

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## Integrity

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Citation: Yamaguchi MS, Ganz HH, Cho AW, Zaw TH, Jospin G, McCartney MM, et al. (2019)
Bacteria isolated from Bengal cat (*Felis catus* × *Prionallurus bengalensis*) anal sac secretions produce volatile compounds potentially associated with animal signaling, PLoS ONE 14(9): e0216846. https://doi.org/10.1371/journal.pone.0216846

RESEARCH ARTICLE

Bacteria isolated from Bengal cat (Felis catus × Prionailurus bengalensis) anal sac secretions produce volatile compounds potentially associated with animal signaling

Mei S. Yamaguchi<sup>1</sup>, Holly H. Ganz<sub>0</sub><sup>2</sup>, Adrienne W. Cho<sup>2</sup>, Thant H. Zaw<sup>2</sup>, Guillaume Jospin<sup>2</sup>, Mitchell M. McCartney<sup>1</sup>, Cristina E. Davis<sup>1</sup>, Jonathan A. Eisen<sub>0</sub><sup>2,3,4</sup>\* David A. Coil<sup>2</sup>







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#### RESEARCH ARTICLE

Bacteria isolated from Bengal cat (Felis catus × Prionailurus bengalensis) anal sac secretions produce volatile compounds potentially associated with animal signaling

Mei S. Yamaguchi<sup>1</sup>, Holly H. Ganzo<sup>2</sup>, Adrienne W. Cho<sup>2</sup>, Thant H. Zaw<sup>2</sup>, Guillaume Jospin<sup>2</sup>, Mitchell M. McCartney<sup>1</sup>, Cristina E. Davis<sup>1</sup>, Jonathan A. Eiseno<sup>2,3,4</sup>\*, David A. Coil<sup>2</sup>

We show that the bacterial community in the anal sac consists primarily of only a few abundant taxa and that isolates of these taxa produce numerous volatiles that are found in the combined anal sac volatile profile. Several of these volatiles are found in anal sac secretions from other carnivorans, and are also associated with known bacterial biosynthesis pathways. This is consistent with the fermentation hypothesis and the possibility that the anal sac is maintained at least in part to house bacteria that produce volatiles for the host.



# Integrity

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Research Article

#### Field Data on the Little Known and Endangered Lepilemur mittermeieri

Leslie Wilmetta, Christoph Schwitzer, Roseline C Beudels-Jamar, Gontran Sonet, Pierre Devillers and Cédric Vermeulen

'University of Liège - Gembloux Agro-Bio Tech, BIOSE Department, Forest Management Resources ixis, Belgium, Passage des Déportés, 2, 8,5030 — Gembloux, Balaium

Conservation Biology Unit, OD Nature, Royal Belgian Institute of Natural Sciences, Brussets, Belgium, Rule Vautier, 29 1000 Bruxelles, Belgium 'Bristol Zoological Society, d'o Bristol Zoo Gardens, Clifton, Bristol, BSS 3HA (UK)

\*Joint Experimental Molecular Unit (JEMU), OD Taxonomy & Phylogeny, Royal Belgian Institute of Natural Sciences, 29 Rue Vaulier, B-1000 Brussels, Balgium

#### Abstract

Lepilemur millermeieri is a very little known sportive lemur of the Ampasindava peninsula of Madagascar. presently regarded as endangered. On the basis of genetic material only, obtained from three individuals collected at the same locality. No observation confidently allocated to the species has been reported since. The objectives of our research were to verify that the sportive lemurs found in forests of the Ampasindava peninsula beyond the type-locality of Lepilemur mittermeleri belonged to the same species as the type, to provide morphological and behavioural data for populations confidently attributed to L. mittermeleri and to obtain for these populations preliminary evaluations of density variations within the peninsula. Our surveys were undertaken in March and April 2014 in remnant forest patches of the western part of the Ampasindaya peninsula. Linear transects by night and punctual observations by day were conducted. A total of 54 animals were seen along nine transects situated in four forest patches, two at low attitude and two at high attitude. All animals examined and photographed appeared similar, and the impression was gained that a single taxon was involved. Genetic material collected from one dead specimen proved identical to the type of L. mittermeier which confirmed the identity of the populations we observed. It thus appears that L. mittermeleri is indeed the only sportive lemur present on the peninsula and that it occurs in several forest remnants. We endeavoured to get evaluations of the density and abundance of the species in the four forest patches we studied. We used KAIs (Kilometric Abundance Indices) to evaluate and compare relative densities, and Buckland's distance sampling method to evaluate absolute densities. The latter suggested a density of 1.9 animals/ ha, a result that must, however, be taken with caution.

Keywords: Lepilemur mittermeieri; Ampasindava peninsula; Madagascar; Distance sampling; Endangered species

#### Introduction

Sportive lemurs (genus Lepilemur) are medium-sized, mostly folivorous, forest-dwelling, mostly nocturnal primates, confined, like the rest of the infraorder Lemuriformis, to Madagascar [1,2]. They are placed by most recent authors in the monotypic family Lepilemuridae [3,4]. As a genus, the sportive lemurs are widely distributed, in discrete populations, in low- and mid-altitude evergreen and deciduous forests of Madagascar [5-8]. The diversity of the genus has only recently been fully appreciated [4]. Until the 1970's all populations were included in two or one species. Between 1977 and the 1990's seven species were recognised. Groves [3] recognised eight species. Recent genetic and cytogenetic studies have identified 26 species, with more likely to be discovered [4]. The cryptic character of the now-recognised species, the long ignorance of their identity and the fact that many of them have only been characterised through genetic analyses mean that very few eco-ethological data can be specifically attributed to most of them. Thus, by 2013, data on behaviour and ecology were only available for six of the 26 species [4]. The genus is very homogenous: species are morphologically similar and are not sexually dimorphic. The reproductive cycle of individual species and the social behaviour of individuals are poorly known but some sportive lemurs, at least, show a seasonal reproductive cycle and individuals appear to be mostly solitary [5,8-11].

Concern for the conservation status of sportive lemurs had long been expressed, in spite of their supposed large range and occasional local abundance, because of fragmented distribution and severe threats to many isolated populations, risk factors which increase with the current intensification of deforestation and habitat degradation [12-14]. The new understanding of the diversity of the genus has considerably increased this concern as most species are now known to have very small, shrinking and fragmenting ranges and, probably for some of them, small total populations [4]. A 2012 assessment evaluates 5 species as critically endangered, 17 as endangered, 4 as vulnerable: Effective conservation actions are thus urgently needed to preserve viable populations of each species. To define and guide these actions, a minimum understanding of the limits of the area of distribution, of the habitat requirements, of the behaviour and population size of the target species are required.

Our fieldwork addresses one of the least-known, endangered, species, Lepilemur mittermeieri. L. mittermeieri was described from the Ampasindava peninsula on the basis of tissue samples from three specimens for which karyotype and mitochondrial cytochrome b DNA sequences were obtained [1]. At the time of description no indication of presence of the taxon outside of the type locality was known. No morphological description, and no eco-ethological data accompany the description. Mittermeir et al. [6] provided somewhat more information on Lepilemur mittermeieri. They suggested that the species was limited

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Predatory publishing

Predatory publishing



#### Research Article

#### Field Data on the Little Known and Endangered Lepilen

Leslie Wilmet's, Christoph Schwitzer', Roseline C Beudels-Jamar', Gontran Sonet', Pierre Devillers' and

'University of Liège - Gembloux Agro-Bio Tech, BIOSE Départment, Forest Management Resources axis. Belgium, Passage de

Conservation Biology Unit, OD Nature, Royal Beigian Institute of Natural Sciences, Brussets, Beigium, Ruin Vautier, 29 1000 Br Bristol Zoological Society, c/o Bristol Zoo Gardens, Clifton, Bristol, BS8 3HA (UK)

"Joint Experimental Molecular Unit (JEMU), OD Taxonomy & Phylogeny, Royal Belgian Institute of Natural Sciences, 29 Rue Va

#### Abstract

Lepilemur mittermeieri is a very little known sportive lemur of the Ampasindava penins presently regarded as endangered. On the basis of genetic material only, obtained from three at the same locality. No observation confidently allocated to the species has been reported s of our research were to verify that the sportive lemurs found in forests of the Ampasinday the type-locality of Lepilemur mittermeieri belonged to the same species as the type, to proand behavioural data for populations confidently attributed to L. mittermeleri and to obtain for preliminary evaluations of density variations within the peninsula. Our surveys were undertake 2014 in remnant forest patches of the western part of the Ampasindaya peninsula. Linear tra punctual observations by day were conducted. A total of 54 animals were seen along nine trans forest patches, two at low altitude and two at high altitude. All animals examined and photograph and the impression was gained that a single taxon was involved. Genetic material collected from proved identical to the type of L. mittermeieri which confirmed the identity of the populations is appears that L. mittermeleri is indeed the only sportive lemur present on the peninsula and that forest remnants. We endeavoured to get evaluations of the density and abundance of the spec patches we studied. We used KAIs (Kilometric Abundance Indices) to evaluate and compare re Buckland's distance sampling method to evaluate absolute densities. The latter suggested a deha, a result that must, however, be taken with caution.

Keywords: Lepilemur mittermeieri; Ampasindava peninsula; Madagascar; Distance sampling; Endangered species

#### Introduction

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Received August 06, 2015; Accepted 24. 2015

Citation: Wilmel L. Schwitzer C, Beud (2015) Field Data on the Little Known rimatol 4: 130 doi:10 4172/2167-650

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#### Field Data on the Little Known and Endangered Lepilemur mittermeieri\*

Leslie Wilmet<sup>1,2</sup>, Christoph Schwitzer<sup>3</sup>, Roseline C. Beudels-Jamar<sup>2</sup>, Gontran Sonet<sup>4</sup>, Pierre Devillers<sup>2</sup> and Cédric Vermeulen<sup>1</sup>

<sup>1</sup>University of Liège – Gembloux Agro-Bio Tech, Département BIOSE, Forest Management Resources Axis, Gembloux, Belgium <sup>2</sup>Conservation Biology Unit, OD Nature, Royal Belgian Institute of Natural Sciences, Brussels, Belgium <sup>3</sup>Bristol Zoological Society, c/o Bristol Zoo Gardens, Clifton, Bristol, UK

<sup>4</sup>Joint Experimental Molecular Unit (JEMU), OD Taxonomy & Phylogeny, Royal Belgian Institute of Natural Sciences, Brussels, Belgium

Abstract: Lepilemur mittermeieri is a very little known sportive lemur of the Ampasindava peninsula of Madagascar, presently regarded as Endangered. It was described in 2006 by Rabarivola et al. on the basis of genetic material only, obtained from three individuals collected at the same locality. No observation confidently allocated to the species has been reported since. The objectives of our research were to verify that the sportive lemurs found in forests of the Ampasindava peninsula beyond the type locality of Lepilemur mittermeieri belonged to the same species as the type, to provide morphological and behavioral data for populations confidently attributed to L. mittermeieri and to obtain for these populations preliminary evaluations of density variations within the peninsula. Our surveys were undertaken in March and April 2014 in remnant forest patches of the western part of the Ampasindava peninsula. Linear transects by night and punctual observations by day were conducted. A total of 54 animals were seen along nine transects situated in four forest patches, two at low altitude and two at high altitude. All animals examined and photographed appeared similar, and the impression was gained that a single taxon was involved. Genetic material collected from one dead specimen proved identical to the type of L. mittermeieri which confirmed the identity of the populations we observed. It thus appears that L. mittermeieri is indeed the only sportive lemur present on the peninsula and that it occurs in several forest remnants. We endeavored to get evaluations of the density and abundance of the species in the four forest patches we studied. We used KAIs (Kilometric Abundance Indices) to evaluate and compare relative densities, and Buckland's distance sampling method to evaluate absolute densities. The latter suggested a density of 1.9 animals/ha, a result that must, however, be taken with caution.

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#### Introduction

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<sup>\*</sup> Previously published in J. Primatol. 2015, 4:2. http://dx.doi.org/10.4172/2167-6801.1000130.



# The Rewards of Predatory Publications at a Small Business School

## DEREK PYNE

This study is the first to compare the rewards of publishing in predatory journals with the rewards of publishing in traditional journals. It finds that the majority of faculty with research responsibilities at a small Canadian business school have publications in predatory journals. In terms of financial compensation, these publications produce greater rewards than many non-predatory journal publications. Publications in predatory journals are also positively correlated with receiving internal research awards. By improving the understanding of the incentives to publish in predatory journals, this research aims to contribute to a better-informed debate on policies dealing with predatory journals.

Journal of Scholarly Publishing April 2017 doi: 10.3138/jsp.48.3.137



# Integrity

admitting you were wrong



- I

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## Mammalian Biology

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#### Original Investigation

Impact of anthropogenic disturbance on the density and activity pattern of deer evaluated with respect to spatial scale-dependence



Naoki Agetsuma-\*\*, Ryosuke Koda b. Riyou Tsujino c. Yoshimi Agetsuma-Yanagiha.

- \* Wakayama Experimental Forest, Hokkatdo University, Japan
- Beseurch Institute of Environment, Agriculture and Picheries, Osaka Prefecture, Japan
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- 4 Htrai 141-1, Kozagawa, Wakayuma 649-4561, Japan

#### ARTICLE INFO

Article litetory: Received 20 December 2012 Accepted 24 May 2013 by Lica Corlatti Available online 21 June 2013

Reywords: Cervus nippon yakushimae Activity Denssity Land use Spatial scale

#### ABSTRACT

Anthropogenic disturbance modifies various ecological of wildlife. The magnitude of the effects will change depending on spatial scale. The ration, the effective spatial scale at which for wildlife ca the disturbance has the greatest on wild populations wust be determined. This study examined the influence of anthropogenic di pance on two ecological traits (population density and daily activity pattern) of deer. We quantified use (broad-leaved forest, mixed coniferous/broadleaved forest, natural grassland, s h, forestry area, and agricultural land), hunting risk. ne vegeta and densities of feral domestic do keys. The effects of land use were analyzed at various spatial scales a fure (generalized mixed model) was used to examine significant variables logical traits at each spatial scale. Combinations of selected variables differed with ecologic scales. The spatial scale of the best model was defined as the most effective spatial s there ogical trait. Deer density was affected positively by areas of natural grass histly, and negatively by areas of forestry, mixed forest and agricultural land a flectiv tial scale. For the daily activity pattern, larger areas of agricultural land, natura and higher hunting risk reduced diurnal and induced nocturnal activity. ale explaining population density was smaller than that of daily activity that agricultural land, forestry areas and hunting risk affected deer ecology as anti gnic disturbance. However, each disturbance factor modified different ecological traits or cological traits at different spatial scales. Detecting the appropriate spatial scales at which turbance should be managed is essential for wildlife conservation. © 2013 Deutsche Gesellschaft für Säugetierkunde. Published by Elsevier GmbH. All rights reserved.

#### Introduction

wildlife populations Anthropogeni worldwide (B ers their ecology in various ways. I 2. Hockin et al., 1992; Blom et al., 200 seving, 2012), activity pattern (e.g., Kilpat Presley et al., 2009), habitat use (e.g., Coulon et 2008; Fletcher and Hutto, 2008; Hockin et al., polis et al., 2008) and other ecological traits 1992; Markovchi fil change depending on the type and magnitude of disturbance, Identical disturbance may affect different ecological traits of wildlife (Gill et al., 2001; Kilgo et al., 1998). The influences of anthropogenic disturbance on wildlife ecology are complex, and can have both negative and positive effects on species (e.g., Fletcher and Hutto, 2008; Markovchick-Nicholis et al., 2008).

Habitat transformation is a major disturbing factor for wild populations, altering numbers of individuals through modifications of resource availability and shelter sites. Such a disturbance may favor some wildlife species. For example, the density of raccoms (Procyon lotor) has increased in urban and suburban areas (Riley et al., 1998) following considerable habitat modifications. Furthermore, the abundances of some fruit bats (Phyllostomidae) are greater in farmland or secondary forests than in primary forests (Willig et al., 2007). However, habitat transformation often induces negative impacts on wild populations. The density of the Japanese monkey (Macaca fuscata) decreases in areas with coniferous plantations (Hill et al., 1994) and ungulates tend to avoid exposed areas without shelter sites (Mysterud and Ostive, 1999).

Hunting and control measures also alter population density, activity pattern and habitat use of wildlife. White-tailed deer (Odocolleus virginiana) show significant shifts of core-area use and daily activity pattern between the prehunt and hunt period

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 E-moil address: agentiam above holosolus as pp (N. Agetsuma).

Mammalian Bidley 79 (2014) 44-31

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# Mammalian Biology

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#### Retraction Notice

Retraction notice to "Impact of anthropogenic disturbance on the density and activity pattern of deer evaluated with respect to spatial scale-dependency" [Mamm. Biol. 79 (1) (2014) 44-51]



Naoki Agetsuma<sup>a</sup>, Ryosuke Koda<sup>b</sup>, Riyou Tsujino<sup>c</sup>, Yoshimi Agetsuma-Yanagihara<sup>d</sup>

- \* Wakayama Experimental Forest, Hokkaido University, Japan
- b Research Institute of Environment, Agriculture and Fisheries, Osaka Prefecture, Japan
- <sup>c</sup> Center for Natural Environment Education, Nara University of Education, Japan
- 4 Hirai 343-1, Kozagawa, Wakayama 649-4563, Japan

This article has been retracted: please see Elsevier Policy on Article Withdrawal (http://www.elsevier.com/locate/withdrawalpolicy).

This article was retracted at the request of the authors Naoki Agetsuma, Ryosuke Koda, Riyou Tsujino and Yoshimi Agetsuma-Yanagihara. The authors are sorry to report that they found a bug in statistical software "R" used in their article published in Mammalian Biology. They would like to withdraw the paper.

The authors found a bug of the "dredge" function in "MuMIn" package of statistical software "R" (R Development Core Team, 2012) they used. The "dredge" function generates all possible mathematical models such as generalized linear model (GLM) and generalized linear mixed model (GLMM) using all combination of variables, and supports model selection procedures by AIC. The "R" prepares several GLMM functions such as "glmmML", "Imer" and "glmmadmb", and manual of the "MuMIn" package shows the "dredge" function can be applicable for all these GLMM functions (Barton K. 2013), Then, they used "glmmadmb" and "dredge" for their analyses.

However, when the authors made further analyses of the same data set using "glmmadmb" and "dredge" functions recently, they found a discrepancy of statistic results of "dredge" with other functions ("summary" and "model.sel"). The "dredge" seems not to take account of "mixed effect" of the models and it seems to generate results of GLM (i.e. "glm.nb" function). This bug of software has not been ever reported as far as the authors know and may occur only between "glmmadmb" and "dredge". The "dredge" might work properly in "glmmML" and "Imer".

The authors found that their data in the paper were analyzed by GLM not GLMM accidentally. Authors re-analyzed the same data set using GLMM ("glmmadmb") and "model.sel" function and they got different results from the published ones.

(Odocoileus virginiana) show significant shifts of core-area use and daily activity pattern between the prehunt and hunt period

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Correcting oneself

Corresponding author, Tel.: +81.735.77.0321; fax: +81.735.77.0301. E-mail address: agreement belond a actin (N. Agetsuma).

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- \* Wakayama Experimental Forest, Hokkaido University, Japan
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This article has been retracted; please see Elsevier Policy on Article Withdrawal (http://www.elsevier.com/locate/withdrawalpolicy). Procuke Koda, Riyou Tsujino and Yoshimi Agetsuma-Yanagihara. the authors are sorry to report that they found a bug in statistical software "R" used in their ticle published in Mammalian Biology. They would like to withuraw the paper.

The authors found a bug of the "dredge" function in "MuMIn" package of statistical software "R" (R Development Core Team, 2012) they used. The "dredge" function generates all possible mathematical models such as generalized linear model (GLM) and generalized linear mixed model (GLMM) using all combination of variables, and supports model selection procedures by AIC. The "R" prepares several GLMM functions such as "glmmML", "Imer" and "glmmadmb", and manual of the "MuMIn" package shows the "dredge" function can be applicable for all these GLMM functions (Barton K. 2013), Then, they used "glmmadmb" and "dredge" for their analyses.

However, when the authors made further analyses of the same data set using "glmmadmb" and "dredge" functions recently, they found a discrepancy of statistic results of "dredge" with other functions ("summary" and "model.sel"). The "dredge" seems not to take account of "mixed effect" of the models and it seems to generate results of GLM (i.e. "glm.nb" function). This bug of software has not been ever reported as far as the authors know and may occur only between "glmmadmb" and "dredge". The "dredge" might work properly in "glmmML" and "Imer".

The authors found that their data in the paper were analyzed by GLM not GLMM accidentally. Authors re-analyzed the same data set using GLMM ("glmmadmb") and "model.sel" function and they got different results from the published ones.

(Odocoileus virginiana) show significant shifts of core-area use and daily activity pattern between the prehunt and hunt period

1616-5047/\$ - see front matter © 2013 Deutsche Gesellschaft für Säugetierkunde. Published by Elsevier GribH. All rights reserved. tro-U de dat ord 10 1016/Liverniste 2017 et ort

Corresponding author, Tel.: +81.735.77.0321; fax: +81.735.77.0301. E-mail address: agreement belond a actin (N. Agetsuma).



# Integrity

the grey zone between truth and lie





RESEARCH ARTICLE

# The Evolution of Stomach Acidity and Its Relevance to the Human Microbiome

DeAnna E. Beasley<sup>1\*</sup>, Amanda M. Koltz<sup>2</sup>, Joanna E. Lambert<sup>3</sup>, Noah Fierer<sup>4,5</sup>, Rob R. Dunn<sup>1</sup>

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**Competing Interests:** The authors have declared that no competing interests exist.

#### Abstract

Gastric acidity is likely a key factor shaping the diversity and composition of microbial communities found in the vertebrate gut. We conducted a systematic review to test the hypothesis that a key role of the vertebrate stomach is to maintain the gut microbial community by filtering out novel microbial taxa before they pass into the intestines. We propose that species feeding either on carrion or on organisms that are close phylogenetic relatives should require the most restrictive filter (measured as high stomach acidity) as protection from foreign microbes. Conversely, species feeding on a lower trophic level or on food that is distantly related to them (e.g. herbivores) should require the least restrictive filter, as the risk of pathogen exposure is lower. Comparisons of stomach acidity across trophic groups in mammal and bird taxa show that scavengers and carnivores have significantly higher stomach acidities compared to herbivores or carnivores feeding on phylogenetically distant prey such as insects or fish. In addition, we find when stomach acidity varies within species either naturally (with age) or in treatments such as bariatric surgery, the effects on gut bacterial pathogens and communities are in line with our hypothesis that the stomach acts as an ecological filter. Together these results highlight the importance of including measurements of gastric pH when investigating gut microbial dynamics within and across species.

#### Introduction

Often, vertebrate stomach evolution is discussed in the context of the stomach's role in chemically breaking down food and, specifically, denaturing proteins via pepsinogen and HCl [1]. The stomach clearly serves these purposes. However in light of our growing understanding of microbial symbionts' role in human health, it is interesting to reassess the stomach's additional role as an important barrier against pathogen entry into the gastrointestinal tract [2–3]. Here we consider the ecology of bird and mammal stomachs and, in the same light, medical





RESEARCH ARTICLE

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- 1 Department of Biological Sciences, North Carolina State University, Raleigh, North Carolina, United States of America, 2 Department of Biology, Duke University, Durham, North Carolina, United States of America,
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- \* debeasl2@ncsu.edu



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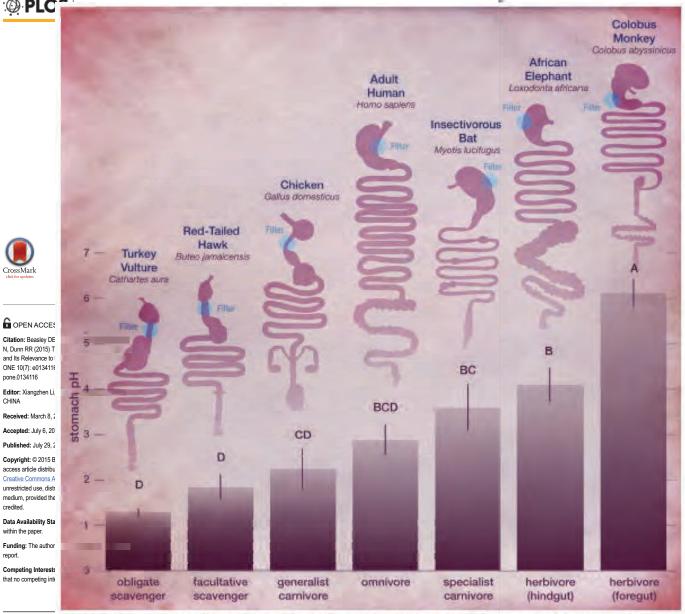
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PLOS ONE | DOI Fig 1. Comparison of stomach pH (mean ± S.E.) across trophic groups with gastrointestinal tracts of representative birds and mammals. Different letters above error bars represent statistically significant differences (P < 0.05) using ANOVA and Tukey-Kramer post-hoc test. Obligate scavengers (1.3 ± 0.08), facultative scavengers (1.8 ± 0.27), generalist camivore (2.2 ± 0.44), ormivore (2.9 ± 0.33), specialist camivore (3.6 ± 0.51), hindgut herbivore

(4.1 ± 0.38) and foregut herbivore (6.1 ± 0.31).

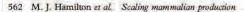


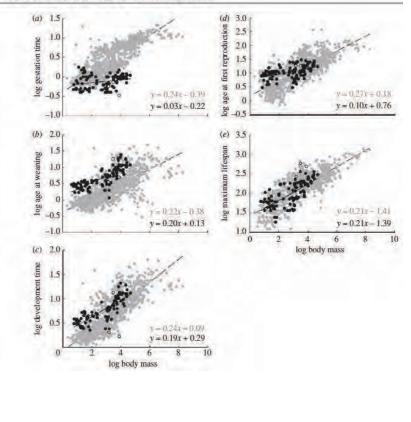


Proc. R. Soc. B (2011) 278, 560-560 doi:10.1098/rspb.2010.1056 Published online 25 August 2010

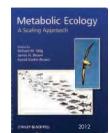
# Universal scaling of production rates across mammalian lineages

Marcus J. Hamilton<sup>1,2,3,#</sup>, Ana D. Davidson<sup>1,4</sup>, Richard M. Sibly<sup>5</sup> and James H. Brown<sup>1,3</sup>







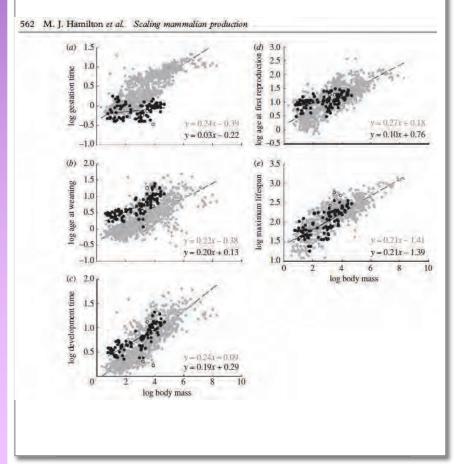


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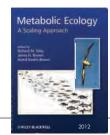
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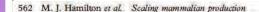
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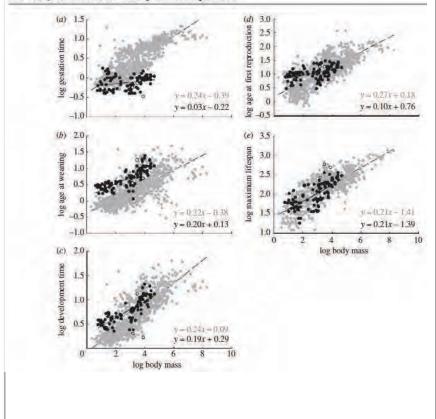
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## Chapter 5

# LIFE HISTORY

Richard M. Sibly

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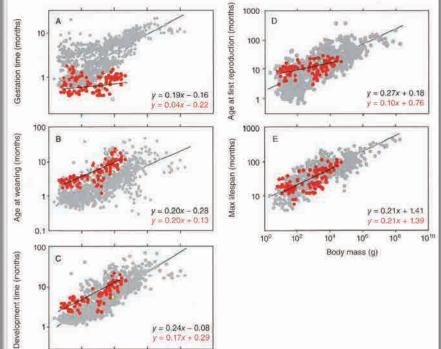
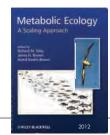


Figure 5.4 The timings of major life-history events in marsupials, shown in red, placentals, shown in gray, and three monotremes (open circles). Times are measured in months. (A) Gestation time; (B) age at wearing; (C) development time; (D) age at first reproduction; (E) maximum lifespan. (From Hamilton et al. 2011.)





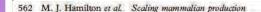
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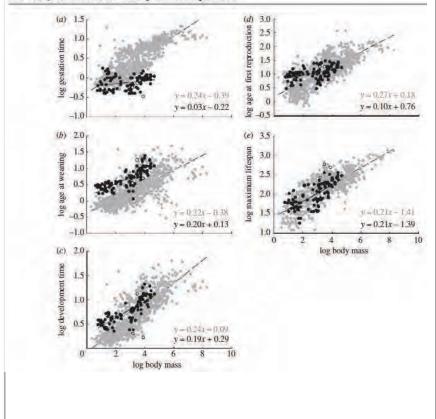
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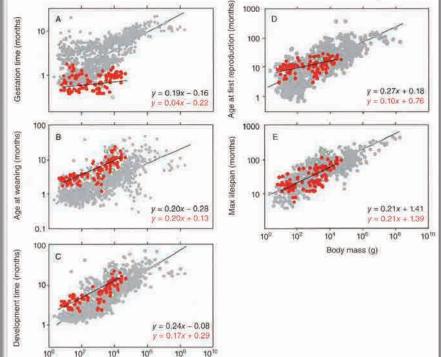
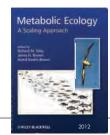


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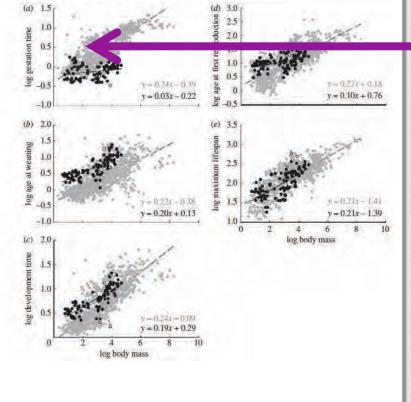


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562 M. J. Hamilton et al. Scaling mammalian production



## Chapter 5

## LIFE HISTORY

Richard M. Sibly

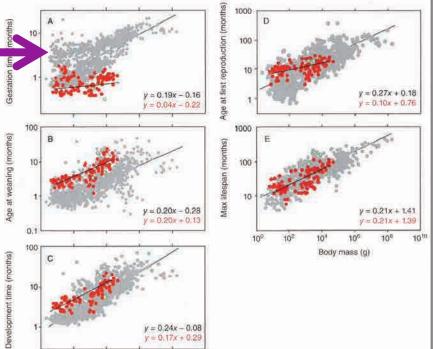


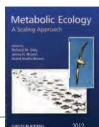
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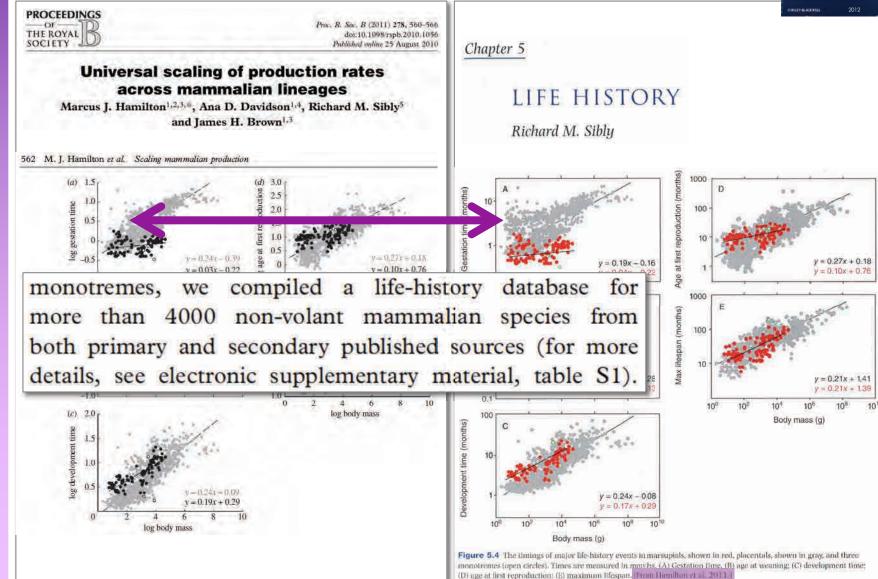
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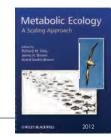






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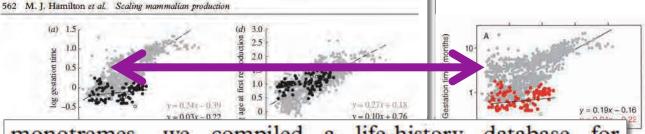




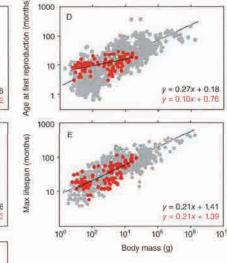
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## LIFE HISTORY

Richard M. Sibly



life-history compiled database for monotremes, more than 4000 non-volant mammalian species from both primary and secondary published sources (for more details, see electronic supplementary material, table S1).



#### Supplementary material 2

- Supplementary Table 1. Data were compiled from the following sources:
- a. Cardillo M, et al. 2004 Human population density and extinction risk in the world's carnivores PLoS Biology Vol. 2, No. 7, e197 doi:10.1371/journal.pbio.0020197
- b. Ceballos G Ehrlich PR (2002) Mammal Populations Losses and the Extinction Crisis. Science 296:904 907.
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- 14 Jones KE, Purvis A, Gittleman JL (2003) Biological Correlates of Extinction Risk in Bats. Am Nat 161:601-614.

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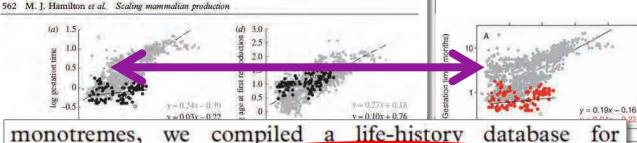
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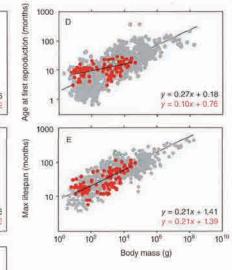
Chapter 5

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# Integrity

teamplay



# ETORPHINE-KETAMINE-MEDETOMIDINE TOTAL INTRAVENOUS ANESTHESIA IN WILD IMPALA (AEPYCEROS MELAMPUS) OF 120-MINUTE DURATION

Gareth E. Zeiler, B.V.Sc. (Hons), M.Med.Vet. (Anaesthesiology), George F. Stegmann, M.Med.Vet. (Anaesthesiology), Dipl. E.C.V.A.A., Geoffrey Fosgate, D.V.M., Ph.D., Dipl. A.C.V.P.M., Roxanne K. Buck, B.Sc., B.V.Sc., Sabine B. R. Kästner, Prof.Dr.Med.Vet., M.Vet.Sci., Dipl. E.C.V.A.A., Maya Kummrow, Dr.Med.Vet., D.V.Sc., Dipl. A.C.Z.M., Dipl. E.C.Z.M., Christina Gerlach, Med.Vet., and Leith C. R. Meyer, B.V.Sc., Ph.D.

Abstract: There is a growing necessity to perform long-term anesthesia in wildlife, especially antelope. The costs and logistics of transporting wildlife to veterinary practices make surgical intervention a high-stakes operation. Thus there is a need for a field-ready total intravenous anesthesia (TIVA) infusion to maintain anesthesia in antelope. This study explored the feasibility of an etorphine-ketamine-medetomidine TIVA for field anesthesia. Ten wild-caught, adult impala (Aepyceros melampus) were enrolled in the study. Impala were immobilized with a standardized combination of etorphine (2 mg) and medetomidine (2.2 mg), which equated to a median (interquartile range [IQR]) etorphine and medetomidine dose of 50.1 (46.2-50.3) and 55.1 (50.8-55.4) µg/ kg, respectively. Recumbency was attained in a median (IQR) time of 13.9 (12.0-16.5) min. Respiratory gas tensions, spirometry, and arterial blood gas were analyzed over a 120-min infusion. Once instrumented, the TIVA was infused as follows: etorphine at a variable rate initiated at 40 ug/kg per hour (adjusted according to intermittent deep-pain testing); ketamine and medetomidine at a fixed rate of 1.5 mg/kg per hour and 5 ug/kg per hour, respectively. The etorphine had an erratic titration to clinical effect in four impala. Arterial blood pressure and respiratory and heart rates were all within normal physiological ranges. However, arterial blood gas analysis revealed severe hypoxemia, hypercapnia, and acidosis, Oxygenation and ventilation indices were calculated and highlighted possible co-etiologies to the suspected etorphine-induced respiratory depression as the cause of the blood gas derangements. Impala recovered in the boma post atipamezole (13 mg) and naltrexone (42 mg) antagonism of medetomidine and etorphine, respectively. The etorphine-ketamine-medetomidine TIVA protocol for impala may be sufficient for field procedures of up to 120-min duration. However, hypoxemia and hypercapnia are of paramount concern and thus oxygen supplementation should be considered mandatory. Other TIVA combinations may be superior and warrant further investigation.

Key words: Aepyceros melampus, etorphine, impala, ketamine, medetomidine, TIVA.

#### INTRODUCTION

Etorphine immobilization in impala (*Aepyceros melampus*) has been studied since the 1960s.<sup>1,7</sup> Despite decades of use in impala, etorphine immobilization has only been described and no reports are available mentioning its use for the long-term maintenance of surgical anesthesia. The lack of its incorporation into anesthetic maintenance protocols is perhaps because of pronounced

From the Department of Companion Animal Clinical Studies (Zeiler, Stegmann, Buck), the Department of Production Animal Studies (Fosgate), and Department of Paraclinical Studies (Meyer), Faculty of Veterinary Science, University of Pretoria, Private Bag X04, Onderstepoort, 0110, South Africa; Small Animal Clinic, University of Veterinary Medicine Hannover, Foundation, Bünteweg 9, 30559 Hannover, Germany (Kästner, Gerlach); and Zoo Wuppertal, Hubertusallee 30, 42117 Wuppertal, Germany (Kummrow); Correspondence should be directed to Dr. Zeiler (gareth.zeiler@up.ac.za).

dose-related respiratory depression. 6.23.24 In order to decrease the dose of etorphine and thus its undesirable characteristics, it can be used in a combination with other drugs with known analgesic and anesthetic sparing effects, such as a low dose of ketamine (a cyclohexamine dissociative anesthetic) or medetomidine (an alpha<sub>2</sub>-adrenoceptor agonist) to achieve surgical anesthesia. 16

In South Africa, because of the importance of antelope for conservation and the value of these animals in zoo and private wildlife collections, veterinary intervention is often required. 5-22 These animals, in particular impala, are prone to injury and are often presented to veterinarians for surgical intervention. Long-duration transport to veterinary facilities, field equipment, manpower limitations, and high cost make surgery on wildlife a challenge. A reliable field anesthetic protocol that does not require the logistical challenges of inhalation agents may make surgical interventions more accessible to antelope situated in remote



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# Propofol—medetomidine—ketamine total intravenous anaesthesia in thiafentanil—medetomidine-immobilized impala (Aepyceros melampus)

Roxanne K Buck\*, Leith RC Meyer†, George F Stegmann\*, Sabine BR Kästner‡, Maya Kummrow§, Christina Gerlach‡, Geoffrey T Fosgate¶ & Gareth E Zeiler\*

\*Department of Companion Animal Studies, Faculty of Veterinary Science, University of Pretoria, Pretoria, South Africa †Department of Paraclinical Science, Faculty of Veterinary Science, University of Pretoria, Pretoria, South Africa ‡Small Animal Clinic, University of Veterinary Medicine Hannover, Hannover, Germany §Zoo Wuppertal, Wuppertal, Germany

Department of Production Animal Science, Faculty of Veterinary Science, University of Pretoria, Pretoria, South Africa

Correspondence: Roxanne K Buck, Department of Companion Animal Clinical Studies, Faculty of Veterinary Science, University of Pretoria, Private Bag X04, Onderstepoort, Pretoria 0110, South Africa, Email: roxanne.buck@up.ac.za

#### **Abstract**

**Objective** To characterize a propofol—medetomidine-ketamine total intravenous anaesthetic in impala (*Aepyceros melampus*).

Study design Prospective clinical study.

Animals Ten adult female impala.

Materials and methods Impala were immobilized at 1253 m above sea level with 2.0 mg thiafentanil and 2.2 mg medetomidine via projectile darts. Propofol was given to effect (0.5 mg kg<sup>-1</sup> boluses) to allow endotracheal intubation, following which oxygen was supplemented at 2 L minute<sup>-1</sup>. Anaesthesia was maintained with a constant-rate infusion of medetomidine and ketamine at 5 ug kg<sup>-1</sup> hour<sup>-1</sup> and 1.5 mg kg<sup>-1</sup> hour<sup>-1</sup>, respectively, and propofol to effect (initially 0.2 mg kgminute<sup>-1</sup>) for 120 minutes. The propofol infusion was titrated according to reaction to nociceptive stimuli every 15 minutes. Cardiopulmonary parameters were monitored continuously and arterial blood gas samples were analysed intermittently. After 120 minutes' maintenance, the thiafentanil and medetomidine were antagonized using naltrexone (10:1 thiafentanil) and atipamezole (5:1 medetomidine), respectively.

Results All impala were successfully immobilized. The median dose [interquartile range (IQR)] of propofol required for intubation was 2.7 (1.9–3.3) mg kg<sup>-1</sup>. The propofol—medetomidine—ketamine combination abolished voluntary movement and

ensured anaesthesia for the 120 minute period. Propofol titration showed a generally downward trend. Median (IQR) heart rate [57 (53–61) beats minute<sup>-1</sup>], respiratory rate [10 (9–12) breaths minute<sup>-1</sup>] and mean arterial blood pressure [101 (98–106) mmHg] were well maintained. Arterial blood gas analysis indicated hypoxaemia, hypercapnia and acidaemia. Butorphanol (0.12 mg kg<sup>-1</sup>) was an essential rescue drug to counteract thiafentanil-induced respiratory depression. All impala regurgitated frequently during the maintenance period. Recovery was calm and rapid in all animals. Median (IQR) time to standing from antagonist administration was 4.4 (3.2–5.6) minutes.

Conclusions and clinical relevance A propofol—medetomidine—ketamine combination could provide adequate anaesthesia for invasive procedures in impala. The propofol infusion should begin at 0.2 mg kg<sup>-1</sup> minute<sup>-1</sup> and be titrated to clinical effect. Oxygen supplementation and airway protection with a cuffed endotracheal tube are essential.

**Keywords** Aepyceros melampus, impala, ketamine, medetomidine, propofol, total intravenous anaesthetic.

#### Introduction

Historically, wild ruminants are chemically immobilized for capture followed by prompt drug antagonism



ETORPI INTRAV MELAM

Gareth E. Z (Anesthesio Buck, B.Sc. Kummrow, I Leith C. R.

Abstract: costs and lo operation. T anesthesia in anesthesia. immobilized median (inter kg, respectiv tensions, spir was infused intermittent hour, respect and respirate revealed seve highlighted p blood gas de antagonism o for impala m are of paran combination Key words:

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Teamplay

Journal of Zoo and Wildlife Medicine 48(1): 62–71, 2017 Copyright 2017 by American Association of Zoo Veterinarians

CONTINUOUS INTRAVENOUS INFUSION ANESTHESIA WITH MEDETOMIDINE, KETAMINE, AND MIDAZOLAM AFTER INDUCTION WITH A COMBINATION OF ETORPHINE, MEDETOMIDINE, AND MIDAZOLAM OR WITH MEDETOMIDINE, KETAMINE, AND BUTORPHANOL IN IMPALA (AEPYCEROS MELAMPUS)

Christina A. Gerlach, Dr. Med.Vet., Maya S. Kummrow, Dr.Med.Vet, D.V.Sc., Dipl. A.C.Z.M., Dipl. E.C.Z.M. (Z.H.M.), Leith C. Meyer, B.V.Sc., Ph.D., Gareth E. Zeiler, B.V.Sc., M.Med.Vet., Dipl. E.C.V.A.A., George F. Stegmann, M.Med.Vet., Dipl. E.C.V.A.A., Roxanne K. Buck, B.V.Sc., Geoffrey T. Fosgate, D.V.M., Ph.D., Dipl. A.C.V.P.M., and Sabine B. Kästner, Prof.Dr.Med.Vet., M.Vet.Sci., Dipl. E.C.V.A.A.

Abstract: In order to develop a long-term anesthesia for flighty antelope species in field situations, two different protocols for induction and maintenance with an intravenous infusion were evaluated in wild-caught impala (Aepyceros melampus). Ten adult female impala were induced with two induction protocols: one consisted of 0.2 mg/kg medetomidine, 4 mg/kg ketamine, and 0.15 mg/kg butorphanol (MKB) and one consisted of 0.375 mg/kg etorphine, 0.2 mg/kg medetomidine, and 0.2 mg/kg midazolam (EMM). In both treatments, anesthesia was maintained with a continuous intravenous infusion (CII) at an initial dose rate of 1.2 μg/kg per hr medetomidine, 2.4 mg/kg per hr ketaminen and 36 ug/kg per hr midazolam. Partial reversal was achieved with naltrexone (2:1 mg butorphanol; 20:1 mg etorphine) and atipamezole (5:1 mg medetomidine). Evaluation of anesthesia included respiratory rate, heart rate, rectal temperature, arterial blood pressure, oxygen saturation, end tidal carbon dioxide tension, and tidal volume at 5-min intervals, palpebral reflex and response to painful stimuli at 15min intervals, and arterial blood gases at 30-min intervals. Plasma cortisol concentration was determined after induction and before reversal. Duration and quality of induction and recovery were evaluated. EMM caused a faster induction of 9.5 ± 2.9 min compared to 11.0 ± 6.4 min in MKB. Recovery was also quicker in EMM (EMM: 6.3 ± 5.4 min; MKB: 9.8 ± 6.0 min). However, EMM also produced more cardiopulmonary side effects, including hypoxemia and hypercapnia, and calculated oxygenation indices (PaCO<sub>2</sub>-PETCO<sub>3</sub>) were worse than in MKB. One animal died after induction with EMM. The CII provided surgical anesthesia in 7 of 10 animals in MKB and in 9 of 9 animals in EMM for 120 min. In conclusion, the MKB induction protocol had advantages for prolonged anesthesia in impala with significantly less cardiopulmonary depression compared to EMM. The comparably decreased anesthetic depth could easily be adjusted by an increase of the CII.

Key words: Aepyceros melampus, CII, impala, ketamine, medetomidine, midazolam.

#### INTRODUCTION

Short-term anesthesia is commonly performed in antelope species in the field. Quick inductions

From the Small Animal Clinic, University of Veterinary Medicine Hanover, Foundation, Bünteweg 9, 30559 Hannover, Germany (Gerlach, Kästner); the Zoo Wuppertal, Hubertusallee 30, 42117 Wuppertal, Germany (Kummrow); the Department of Paraclinical Studies (Meyer) and Department of Companion Animal Clinical Studies (Zeiler, Stegmann, Buck); and the Department of Production Animal Studies (Fosgate), Faculty of Veterinary Science, University of Pretoria, Private Bag X04, Onderstepoort, 0110, South Africa. Present address (Gerlach): Silleruper Strasse 1, 24969 Grossenwiehe, Germany. Correspondence should be directed to Dr. Gerlach (christina.hogrebe@gmx.net).

are crucial to prevent exhaustion, hyperthermia,<sup>23</sup> and trauma in nervous species, and several combinations of potent opioids and a2-adrenoceptor agonists (\alpha2-agonists) or tranquilizers have been established.21 Potent opioids have the advantage of a quick induction but often cause poor respiration and muscle rigidity,21,24,25 rendering them unsuitable for prolonged procedures. Impala (Aepyceros melampus) appear particularly susceptible to etorphine-induced respiratory depression.24,25 which has been successfully addressed with administration of the mixed agonistantagonist opioid butorphanol in other species. 16,27 Immobilization of impala with a combination of ketamine and relatively high doses of medetomidine was described to achieve reliable respiration and muscle relaxation; however, levels



CONTINUOUS INTRAVENOUS INFUSION ANESTHESIA WITH MEDETOMIDINE, KETAMINE, AND MIDAZOLAM AFTER INDUCTION WITH A COMBINATION OF ETORPHINE,

Veterinary Anaesthosia and Analgesia 2017, 44, 991-1006 MEDETOMIDINE, http://dx.doi.org/10.1016/j.vaa.2017.04.005

REVIEW ARTICLE

Chemical capture of impala (Aepyceros melampus): A review of factors contributing to morbidity and mortality

Gareth F. Zeiler & Leith CR Meyer

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CAPTIVE MANAGEMENT OF WILD IMPALA (AEPYCEROS MELAMPUS) DURING INTENSIVE IMMOBILIZATION AND GENERAL ANESTHESIA STUDY TRIALS

Gareth E. Zeiler, M.Med.Vet. (Anaesthesiology), Dipl. E.C.V.A.A., Dipl. A.C.V.A.A., and Leith C.R. Meyer, B.V.Sc., Ph.D.

manuscript preparation without informing the

included respiratory rate, heart rate, rectal temperator the red collaborators carbon dioxide tension, and tidal volume at 5-min interest the red collaborators

Journal of the South African Veterinary Association ISSN: (Online) 2224-9435, (Print) 1019-9128

Comparison of thiafentanil-medetomidine to etorphine-medetomidine immobilisation of impalas (Aepyceros melampus)

Authors Gareth L. Zeiler10 Leith C.R. Meyer @

Impalas (Aepiceros melampus) are increasingly valuable in the South African wildlife industry, and there is a greater need to chemically immobilise them, ideally with minimal risk. This

Zeller and Meyer BMC Vetermary Research (2017) 13:246 DOI 10 1186/s12917-017-1163-8

**BMC Veterinary Research** 

RESEARCH ARTICL

Blood acid-base status in impala (Aepyceros melampus) immobilised and maintained under total intravenous anaesthesia using two different drug protocols

Gareth E. Zeiler and Leith C. R. Meyer



# Integrity

beyond the grey zone



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The authors appreciate the consideration of this unique manuscript. The objectives of the research included evaluation of nutrient digestibility and fecal scores of four commercially available raw meat carnivore diets in a small felid model species. African wildcat (Folis silvostris hybrog). The diet treatments evaluated included a 100% raw pork based diet (Carnivore) Essentials). Pork has not traditionally been utilized as a viable raw meat option for zoo carnivores; however, advances in swine management have eliminated many concerns and pork is a timely and novel meat option for the 200 industry. The park diet was compared to three commonly fed carmivore diets (Nebraska Brand Premium Feline, Nebraska Brand Special Beef. Feline and Triple A Brand). In addition, common microbial screens were conducted on all tested. diets and standard methods of caloric density (metabolizable energy) were compared. We believe these data are exceptionally valuable for veterinarians and nutritionists because they provide information regarding the value of additional options when managing diets of carnivores. In addition, to the authors' knowledge, this is the first study to compare metabolizable energy calculated using both the NRC equations and standard Modified Anwater values applied to carnivore diets. The data demonstrate the differences and possible underestimation of ME for zoological carnivore diets. Veterinarians managing carnivores would benefit from these data because they will provide insight into obesity and body condition concerns of managed felids and other carnivores consuming raw meat diets

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# Influence of pork and pork by-products on macronutrient and energy digestibility and palatability in large exotic felids

C. J. Iske,\* C. L. Morris,\*†1 and K. L. Kappen†

\*Department of Animal Sciences, Iowa State University, Ames 50011; and †Omaha's Henry Doorly Zoo & Aquarium, Omaha, NE 68107

ABSTRACT: Two experiments were conducted to evaluate digestibility and palatability of a new commercial pork-based raw diet for zoo-managed felids. Currently 2 protein sources (beef or horse) comprise the majority of commercial raw meat diet formulations for exotic carnivores in zoological institutions. Pork-based diets have traditionally not been widely utilized and thus nutrient digestibility of pork has not been adequately evaluated in exotic carnivores. The objectives of this study were 1) to determine if a pork-based diet had similar apparent total tract macronutrient digestibility and fecal scores as standard zoo carnivore diets formulated with either horse or beef, in large exotic felids and 2) evaluate palatability of pork for use in zoos. Ten exotic felids were used including cheetahs (Acinonyx jubatus; n = 3), jaguars (Panthera onca; n = 3), leopards (Panthera pardus; n = 2), puma (Puma concolor; n = 1), and Bengal tiger (Panthera tigris tigris; n = 1) 1). Dietary treatments consisted of 4 raw meat diets: 1 horse-based (Horse), 2 beef-based (B1, B2), and 1 pork-based diet (Pork). Fecal scores also were evaluated (1 = hard to 5 = watery/liquid). This randomized crossover design study consisted of 4 periods, each 10

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Key words: exotic felids, fecal scores, nutrient digestibility, palatability, pork, raw diet

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J. Anim. Sci. 2016.94:3738–3745 doi:10.2527/jas2016-0414

#### INTRODUCTION

In zoological institutions, carnivores are typically fed raw meat diets manufactured with beef or horsemeat as primary protein sources. Although research studies addressing health benefits of raw meat diets in felids are lacking, several studies have documented greater digestibility of macronutrients in felid species

<sup>&</sup>lt;sup>1</sup>Corresponding author: clmorris@iastate.edu Received February 25, 2016.
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d for treatment adaptation followed by 4 d of sample collection. Dry matter and crude protein apparent digestibility values were greater (P < 0.05) in felids fed Pork (88.0 and 95.7%) compared with felids fed Horse (83.6 and 92.7%) and B2 (85.6 and 93.1%). Apparent organic matter digestibility was greater (P < 0.05) in felids fed Pork (90.8%) than felids fed Horse (88.5%). Apparent fat digestibility values were high across all treatments but were greater (P < 0.05) in felids fed Pork (98.5%) compared with felids fed B1 (95.5%) or B2 (96.5%). Gross energy digestibility values were greater in felids fed Pork (92.4%) compared with B1 (90.2%). Average fecal scores were 2.30, 2.94, 3.42, and 3.54 for Horse, Pork, B1 and B2, respectively; and were different (P < 0.05) between treatments with exception of B1 and B2 that did not differ. Felids approached the pork diet first in 65.6% of observations and tasted the pork diet first in 71.9% of observations, compared with a beef-based raw diet. Based on results, the evaluated pork-based diet had similar apparent total tract macronutrient digestibility and palatability compared with standard zoo carnivore formulations. In conclusion, pork-based diets could be included among dietary options for large zoo felids.

Key words: exotic felids, fecal scores, nutrient digestibility, palatability, pork, raw diet

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J. Anim. Sci. 2016.94:3738–3745 doi:10.2527/jas2016-0414

#### INTRODUCTION

In zoological institutions, carnivores are typically fed raw meat diets manufactured with beef or horsemeat as primary protein sources. Although research studies addressing health benefits of raw meat diets in felids are lacking, several studies have documented greater digestibility of macronutrients in felid species

<sup>&</sup>lt;sup>1</sup>Corresponding author: clmorris@iastate.edu Received February 25, 2016. Accepted June 2, 2016.



Journal of Zoo and Wildfall Medicino Appendix Association of Zoo Vetermanium 531765 White Oak Rd Fales, FE 32097 USA

### Dear Editors:

Please find enclosed a manuscript entitled: "In macromurient and energy digestibility and paltybica) and microbial population evaluation in exclusive consideration of publication as an ar

The authors appreciate the consideration of the research included evaluation of nutrieur digest available raw meat carnivore diets in a small fi hybroa). The diet treatments evaluated include: Essentials). Pork has not traditionally been un camivores; however, advances in swine mana a timely and novel meat option for the 200 ind commonly fed carnivore diets (Nebraska Bran Feline and Triple A Brand). In addition, comp diets and standard methods of caloric density believe these data are exceptionally valuable for provide information regarding the value of adcarnivores. In addition, to the authors' knowle metabolizable energy calculated using both th values applied to camiyore diets. The data de underestimation of ME for zoological carnivo benefit from these data because they will provi concerns of managed felids and other carnivor

# Influence of pork and pork by-products on macronutrient and energy digestibility and palatability in large exotic felids

C. J. Iske,\* C. L. Morris,\*†1 and K. L. Kappen†

\*Department of Animal Sciences, Iowa State University, Ames 50011; and †Omaha's Henry Doorly Zoo & Aquarium, Omaha, NE 68107

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# Calculations for ME using modified Atwater factors and the NRC equation predicted 4.6, 4.5, 4.7, and 4.9

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and palatability compared with standard zoo carnivore formulations. In conclusion, pork-based diets could be included among dietary options for large zoo felids.

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<sup>1</sup>Corresponding author: clmorris@iastate.edu Received February 25, 2016. Accepted June 2, 2016.

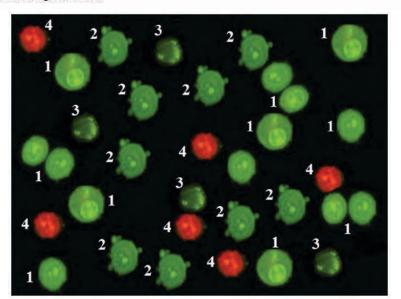


# SCIENTIFIC REPORTS

## OPEN

Received: 01 October 2015 Accepted: 23 March 2016 Published: 13 April 2016 Novel piperazine core compound induces death in human liver cancer cells: possible pharmacological properties

Nima Samie<sup>1</sup>, Sekaran Muniandy<sup>2</sup>, M. S. Kanthimathi<sup>2,3</sup>, Batoul Sadat Haerian<sup>1</sup> & Raja Elina Raja Azudin<sup>4</sup>





# Integrity

bullshit





RESEARCH ARTICLE

# Biomechanical Characteristics of Hand Coordination in Grasping Activities of Daily Living

Ming-Jin Liu<sup>1</sup>, Cai-Hua Xiong<sup>1</sup>\*, Le Xiong<sup>2</sup>, Xiao-Lin Huang<sup>3</sup>

- 1 Institute of Rehabilitation and Medical Robotics, State Key Lab of Digital Manufacturing Equipment and Technology, Huazhong University of Science and Technology, Wuhan, Hubei 430074, China, 2 Foisie School of Business, Worcester Polytechnic Institute, Worcester, MA 01609–2280, United States of America, 3 Tongji Hospital, Tongji Medical College of Huazhong University of Science and Technology, Wuhan, Hubei 430030, China
- \* chxiong@hust.edu.cn



#### G OPEN ACCESS

Citation: Liu M-J, Xiong C-H, Xiong L, Huang X-L (2016) Biomechanical Characteristics of Hand Coordination in Grasping Activities of Daily Living. PLoS ONE 11(1): e0146193. doi:10.1371/journal. pone.0146193

Editor: Renzhi Han, Ohio State University Medical Center, UNITED STATES

Received: October 28, 2015

Accepted: December 14, 2015

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Data Availability Statement: Data are available from the Dryad Digital Repository: http://dx.doi.org/10.5061/dryad.gg8g5.

Funding: This work was partly supported by the National Basic Research Program of China (973 Program, Grant No. 2011CB013301), and National Natural Science Foundation of China (Grant No. 51335004).

Competing Interests: The authors have declared that no competing interests exist.

#### Abstract

Hand coordination can allow humans to have dexterous control with many degrees of freedom to perform various tasks in daily living. An important contributing factor to this important ability is the complex biomechanical architecture of the human hand. However, drawing a clear functional link between biomechanical architecture and hand coordination is challenging. It is not understood which biomechanical characteristics are responsible for hand coordination and what specific effect each biomechanical characteristic has. To explore this link, we first inspected the characteristics of hand coordination during daily tasks through a stati<mark>stical analys</mark>is of the kine<mark>mati</mark>c data, which were collected from thirty right-handed subjects during a multitude of grasping tasks. Then, the functional link between biomechanical architecture and hand coordination was drawn by establishing the clear corresponding causality between the tendinous connective characteristics of the human hand and the coordinated characteristics during daily grasping activities. The explicit functional link indicates that the biomechanical characteristic of tendinous connective architecture between muscles and articulations is the proper design by the Creator to perform a multitude of daily tasks in a comfortable way. The clear link between the structure and the function of the human hand also suggests that the design of a multifunctional robotic hand should be able to better imitate such basic architecture.

#### Introduction

The human hand is an amazing instrument that can perform a multitude of functions, such as the power grasp and precision grasp of a vast array of objects. The excellent behaviors of the human hand are enabled by a highly complex structure, with 19 articulations, 31 muscles and more than 25 degrees of freedom (DOF) [1]. While the abundant functions are favorable, this





RESEARCH ARTICLE

## Biomechanical Characteristics of Hand Coordination in Grasping Activities of Daily Living

Ming-Jin Liu<sup>1</sup>, Cai-Hua Xiong<sup>1</sup>\*, Le Xiong<sup>2</sup>, Xiao-Lin Huang<sup>3</sup>

- 1 Institute of Rehabilitation and Medical Robotics, State Key Lab of Digital Manufacturing Equipment and Technology, Huazhong University of Science and Technology, Wuhan, Hubei 430074, China, 2 Foisie School of Business, Worcester Polytechnic Institute, Worcester, MA 01609–2280, United States of America, 3 Tongji Hospital, Tongji Medical College of Huazhong University of Science and Technology, Wuhan, Hubei 430030, China
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Introduction

Program, Grant No. 2011CB013301), and Nation Natural Science Foundation of China (Grant No.

The human hand is an amazing instrument that can perform a multitude of functions, such as

structure to perform numerous tasks. Hand coordination should indicate the mystery of the Creator's invention.





RETRACTION

### Retraction: Biomechanical Characteristics of Hand Coordination in Grasping Activities of Daily Living

The PLOS ONE Staff

Following publication, readers raised concerns about language in the article that makes references to a 'Creator', and about the overall rationale and findings of the study.

Upon receiving these concerns, the *PLOS ONE* editors have carried out an evaluation of the manuscript and the pre-publication process, and they sought further advice on the work from experts in the editorial board. This evaluation confirmed concerns with the scientific rationale, presentation and language, which were not adequately addressed during peer review.

Consequently, the *PLOS ONE* editors consider that the work cannot be relied upon and retract this publication.

The editors apologize to readers for the inappropriate language in the article and the errors during the evaluation process.

### Reference

 Liu M-J, Xiong C-H, Xiong L, Huang X-L (2016) Biomechanical Characteristics of Hand Coordination in Grasping Activities of Daily Living. PLoS ONE 11(1): e0146193. doi: 10.1371/journal.pone.0146193 PMID: 26730579



# The New England Journal of Medicine

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Volume 304

JANUARY 15, 1981

Number 3

# DECREASED MYOCARDIAL TAURINE LEVELS AND HYPERTAURINURIA IN A KINDRED WITH MITRAL-VALVE PROLAPSE AND CONGESTIVE CARDIOMYOPATHY

JOHN R. DARSEE, M.D., AND STEVEN B. HEYMSFIELD, M.D.

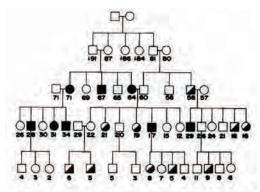


Figure 1. Pedigree of a Kindred with a Marked Incidence of Congestive Cardiomyopathy and Mitral-Valve Prolapse.

Fitty-two members are represented (female members are indicated by circles, and males by squares). In the second through fifth generations, 46 consanguineous and four non-consanguineous members are shown; the three consanguineous members who died before the start of the investigation are denoted by arrows, and the age of each member is given below each symbol.

Members with congestive cardiomyopathy are represented by solid symbols, and those with mitral-valve prolapse by half-solid symbols.



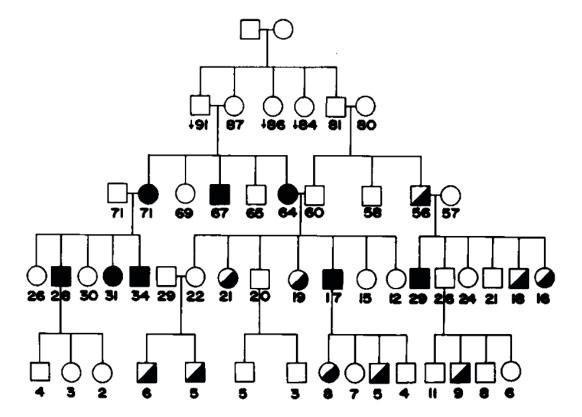


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Lindsay & Boyle, Cogent Social Sciences (2017), 3: 1330439 https://doi.org/10.1080/23311886.2017.1330439







Received: 17 April 2017 Accepted: 11 May 2017

\*Corresponding author: Jamie Lindsay, SEISRG – Southeast Independent Social Research Group, 512 N. Central Avenue, Knoxville, TN 37917, USA E-mail: jlind.seisrg@gmail.com

Reviewing editor: Jamie Halsall, University of Huddersfield, UK

### SOCIOLOGY | RESEARCH ARTICLE

### The conceptual penis as a social construct

Jamie Lindsay1\* and Peter Boyle1

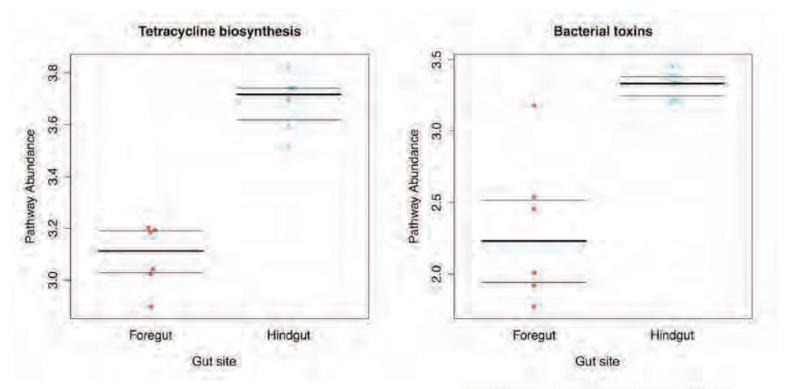
Abstract: Anatomical penises may exist, but as pre-operative transgendered women also have anatomical penises, the penis vis-à-vis maleness is an incoherent construct. We argue that the conceptual penis is better understood not as an anatomical organ but as a social construct isomorphic to performative toxic masculinity. Through detailed poststructuralist discursive criticism and the example of climate change, this paper will challenge the prevailing and damaging social trope that penises are best understood as the male sexual organ and reassign it a more fitting role as a type of masculine performance.

Subjects: Gender Studies - Soc Sci; Postmodernism of Cultural Theory; Feminism



# Bacterial community structure and function distinguish gut sites in captive red-shanked doucs (Pygathrix nemaeus) ••

Jonathan B. Clayton<sup>1,2,3,4</sup> | Robin R. Shields-Cutler<sup>4,5</sup> | Susan L. Hoops<sup>4</sup> |
Gabriel A. Al-Ghalith<sup>6</sup> | John C. M. Sha<sup>7</sup> | Timothy J. Johnson<sup>3,8,9</sup> | Dan Knights<sup>1,3,4</sup>



In the foregut, tetracycline

and bacterial toxins were also increased, which likely indicates microbes are more competitive among each other in this gut site.



# But what does really count?

Do others read, use, build on, deal with your publications?

Do you have a vision, or do you 'just' work on some tiny detail?

Do those who learnt from you think and speak highly of you? Do you have a reputation of integrity?



# But what does really count?

Do others read, use, build on, deal with your publications?

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Do those who learnt from you think and speak highly of you? Do you have a reputation of integrity?

Are you happy?



# But what does really count?

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Do you have a vision, or do you 'just' work on some tiny detail?

Do those who learnt from you think and speak highly of you? Do you have a reputation of integrity?

Are you happy?

Would the child you were be proud of the adult you are?



# Integrity

getting used to lying

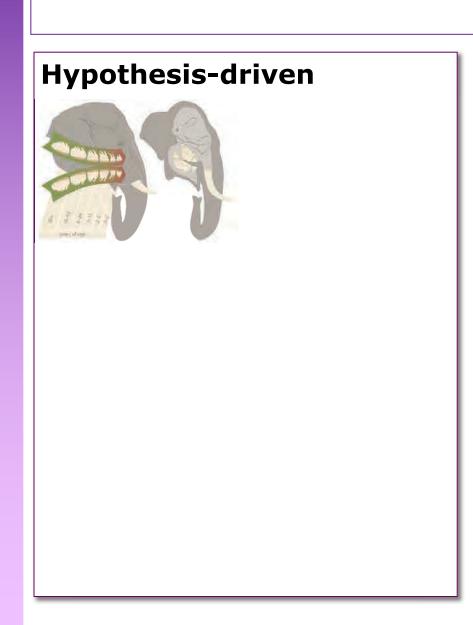




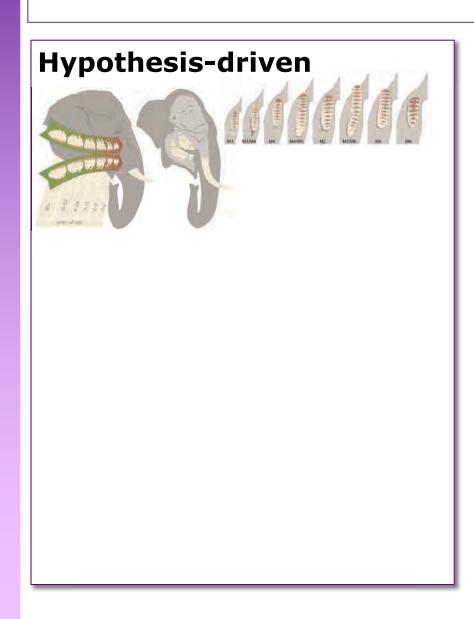


# **Hypothesis-driven**

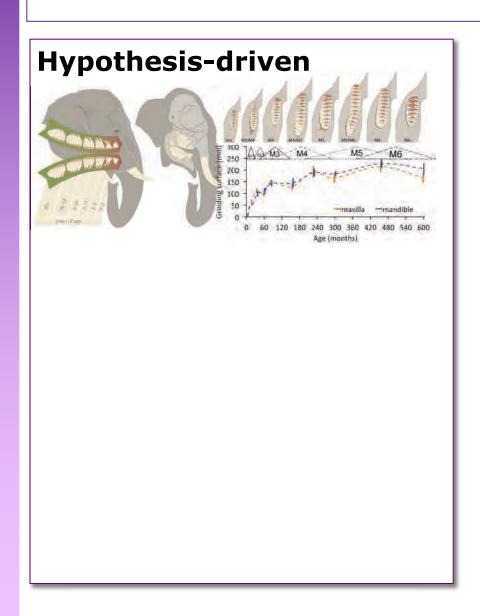




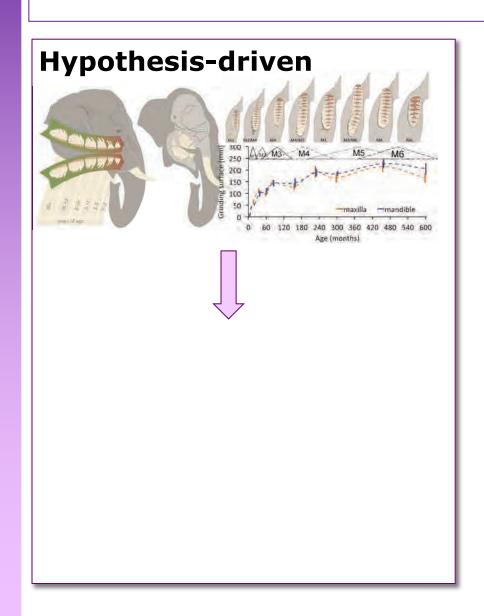




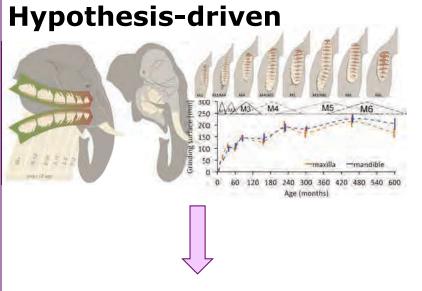






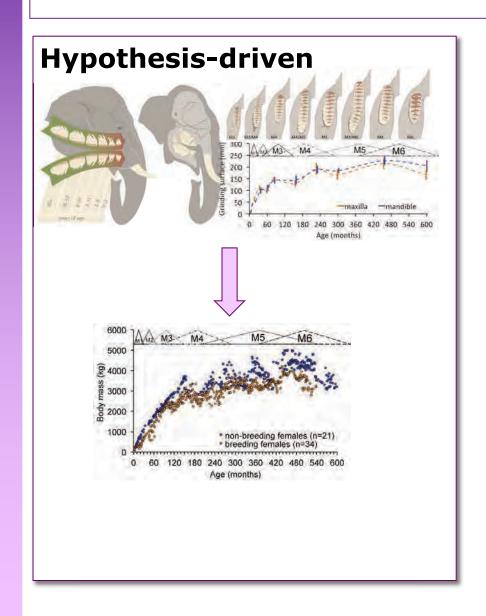




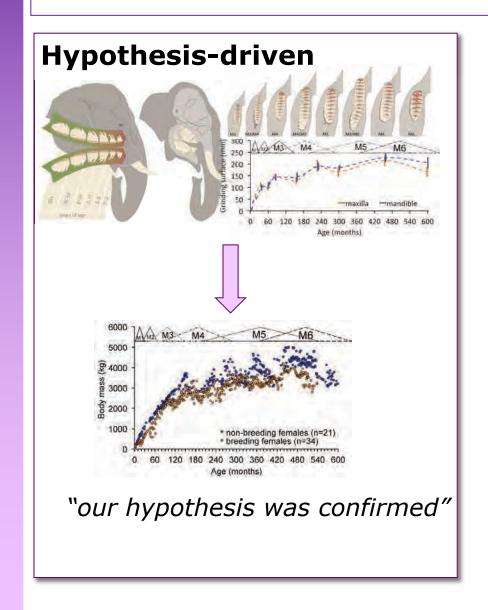


"to test our hypothesis, we collected body mass data from zoo elephants"

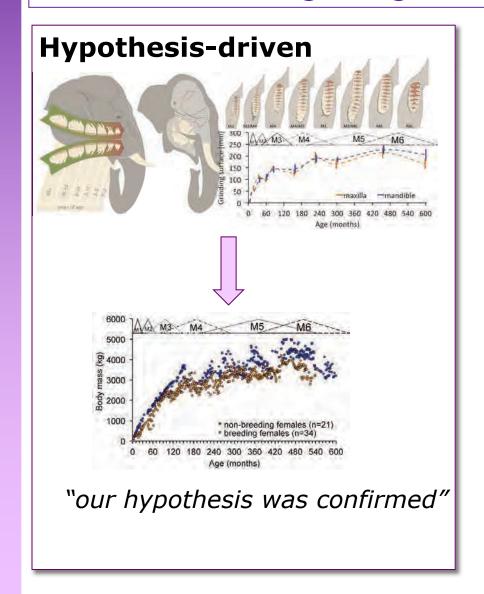




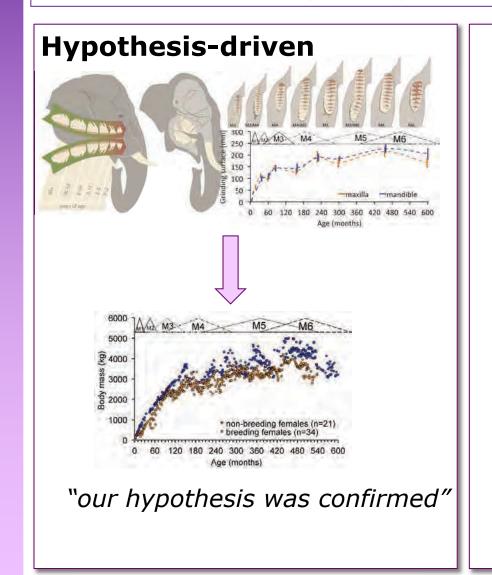




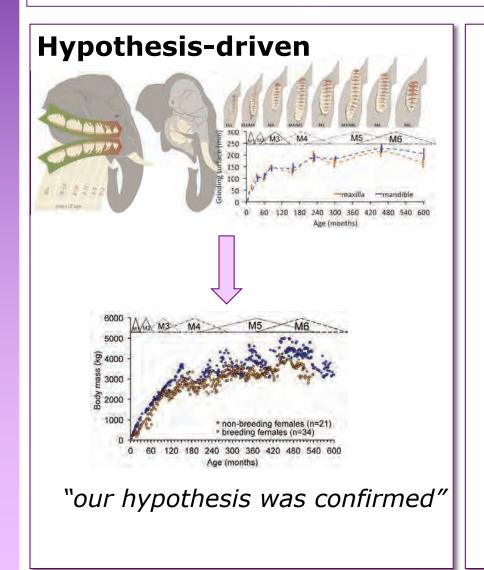






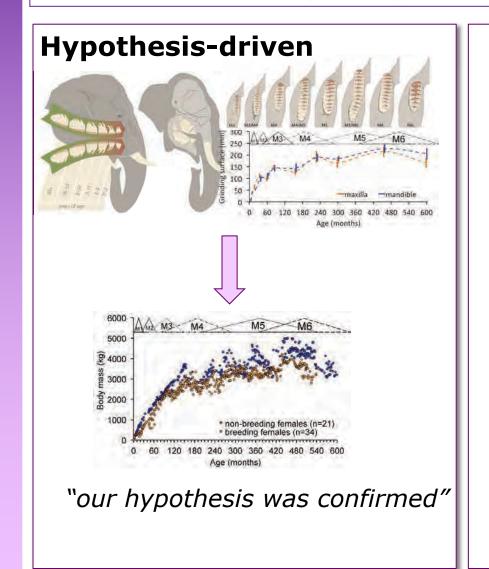


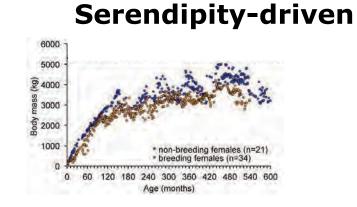




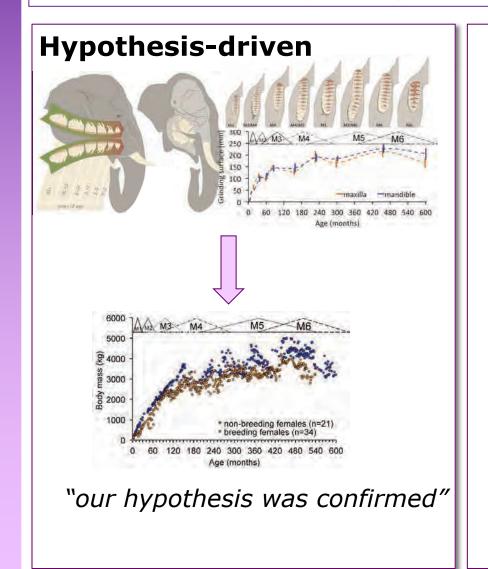
### **Serendipity-driven**

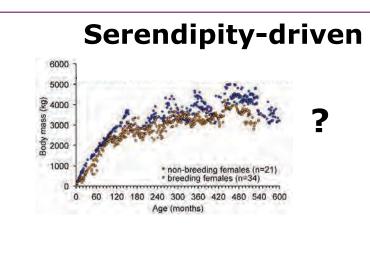




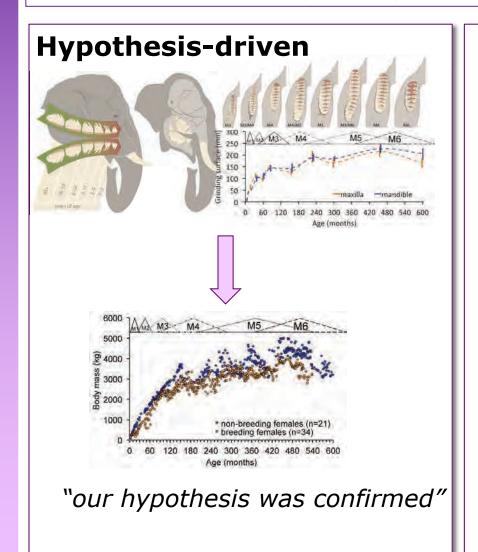


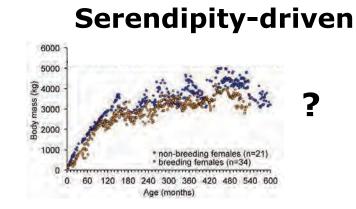








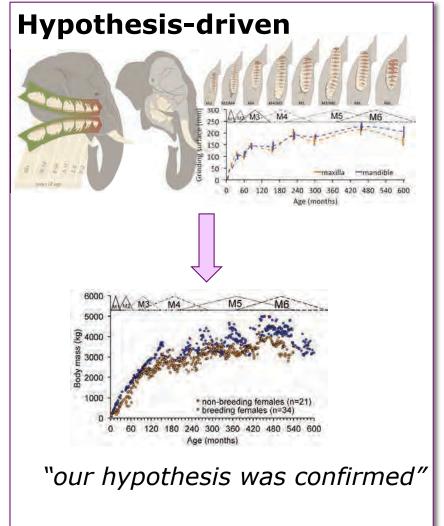


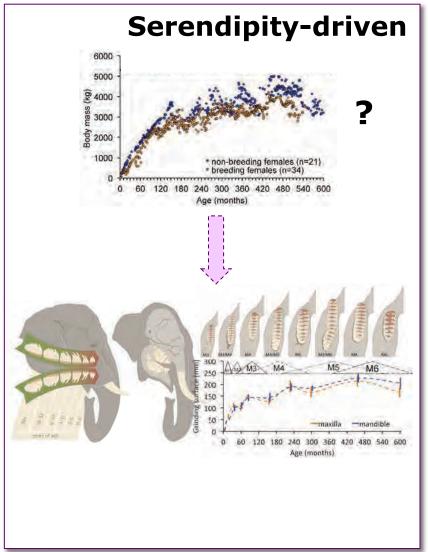


"I know a good thing when I see it"

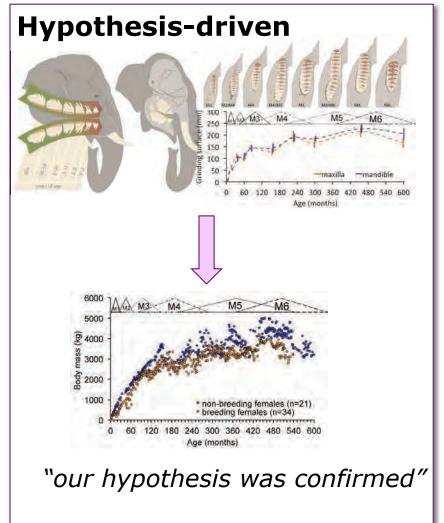
Patty Larkin, 'Angels running'

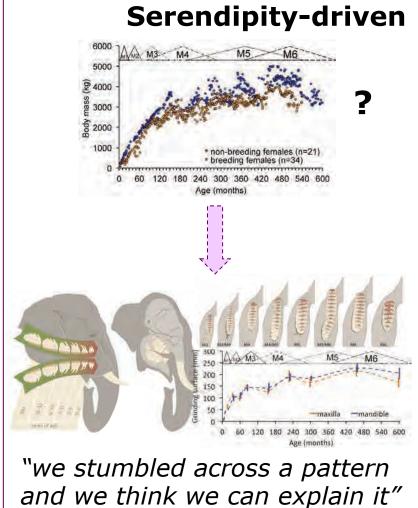














# The greatest story ever planned?

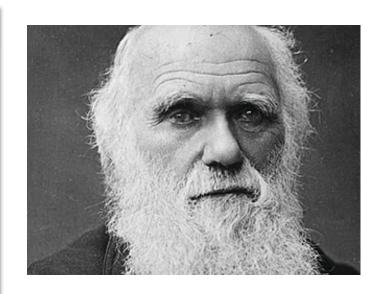
### Darwin's diary:

### 1. Hypothesis

Species originate by selection acting on the variability of phenotypes so that only certain ones can reproduce/so that certain ones can reproduce more efficiently.

### 2. Research plan

Travel around the world and find model systems to test hypothesis.

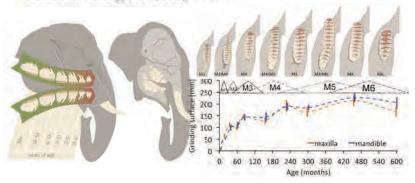


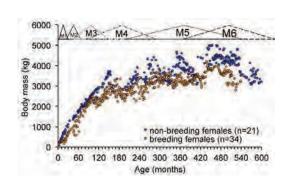


Elephant body mass cyclicity suggests effect of molar progression on chewing efficiency

Christian Schiffmanna, b, Jean-Michel Hatta, Stefan Hobye, d, Daryl Codrone, f, Marcus Claussa, \*

Mammalian Biology xxx (2018) xxx-xxx





mass data. These data revealed a pattern corresponding to the considerations on molar progression above (which we had collated after identifying the pattern; this study therefore did not test a hypothesis, but reports a serendipitous result).



What kind of behaviour are we promoting when we (fanatically) promote 'hypothesis-driven research'?

What kind of scientists are we selecting for?



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Funding only 'hypothesis-driven research' means you do not fund, by definition, the generation of new ideas



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Funding only 'hypothesis-driven research' means you do not fund, by definition, the generation of new ideas – *only (if you are lucky) their testing*.



But the more interesting aspect is:

If you teach (= set incentives to the effect that) people (to) lie about hypothesis generation,



But the more interesting aspect is:

If you teach (= set incentives to the effect that) people (to) lie about hypothesis generation, how do you teach that lying should not expand to data manipulation?



# find your place





Ambition/effort <=> "love" for a topic ?



Ambition/effort <=> "love" for a topic ? Read! Read! Read!

(also: literature check for a certain clinical case)



Ambition/effort <=> "love" for a topic ? Read! Read! Read!

(also: literature check for a certain clinical case)

Find your own questions



```
Ambition/effort <=> "love" for a topic ? Read! Read! Read!
```

(also: literature check for a certain clinical case)

Find your own questions

=> Read (lit. research) - look for an answer!



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Ambition/effort <=> "love" for a topic ? Read! Read! Read!
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(also: literature check for a certain clinical case)

Find your own questions

=> Read (lit. research) - look for an answer!

If there is no answer or if it does not satisfy:

=> you have your topic



```
Ambition/effort <=> "love" for a topic ? Read! Read! Read!
```

(also: literature check for a certain clinical case)

Find your own questions

=> Read (lit. research) - look for an answer!

If there is no answer or if it does not satisfy:

=> you have your topic

'I did not chose the music, it chose me'

C. Eastwood, Honkytonk Man

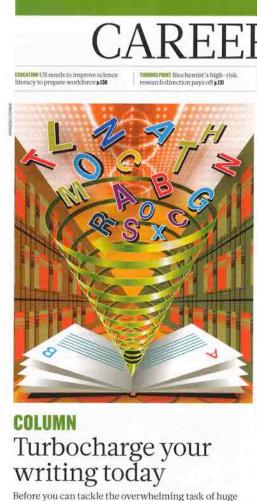


Write.



Write.

Write before you are ready.



writing projects, you must first put aside some widely held myths, say Maria Gardiner and Hugh Kearns.

NATURE JEES For the latest career listings and advice www.naturoious.com

A s a graduate student, you might find yourself well on the way with your education and 'ABD' (all but dissertation). Day after day, you tell yourself that you really, really intend to start writing your paper. After all, you've collected all the data, analysed them many times and entered them into tables.

But then you start thinking that maybe you need just a few more data. Perhaps, too, you should try a different analysis technique. And what if the tables you used aren't the right ones, or need to be formatted differently?

Many of the thousands of researchers we have worked with are constantly being tripped up by finicky, niggling details that keep them from writing up their research. Every day, they mean to start, but every day, something gets in their way or seems more important and this can go on for years. Some very common obstacles get in the way of high-quality, high-quantity scholarly writing, but powerful, evidence-based techniques can help researchers to overcome repetitive and unhelpful habits and get moving (see 'How to get out of a dissertation-writing rut').

### WRITING MYTHS

The biggest impediments to scholarly writing are long-held myths that seem to get passed down through the academic ranks like precious but unhelpful ancient wisdom. The first is the Readiness Myth - "I should write when I feel ready, and I don't feel ready yet". The secret to high output is that you have to write before you feel ready, because you might never reach that point. Researchers read endlessly and conduct countless experiments in the belief that it will eventually make them feel ready to write - we call these habits readitis and experimentitis. But ironically, all that reading and experimenting often makes them less likely to write, and more confused. So the first way to speed up your writing is to stop waiting, stop reading and experimenting, and start writing. You won't feel ready, but you have to do it anyway.

This brings us to the second myth, the Clarity Myth — I should get it all clear in my head first, and then write it down". This isn't how writing works in practice. You have probably had the experience in which you were sure about how a paper would go until you started to write it. Then you discovered that there were inconsistencies, or it didn't flow well or the links didn't make sense. This tells you that it wasn't all that coherent in your head, after all. In fact, writing clarifies your thinking. Writing is not recording - you don't just take 👂

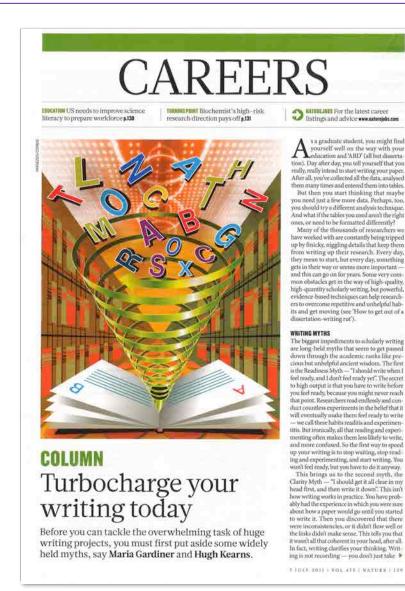
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Write.

Write before you are ready.

But please only write if you want to say something, not because you want to have a career.





# 'publish and perish!'



Always remember: most people who are really happy in this world are so without having published a thing.



Science is not about control.

Is is about cultivating a perpetual condition of wonder in the face of something that forever grows one step richer and subtler than our latest theory about it.

It is about reverence, not mastery.

Richard Powers (1991) The gold bug variations. William Morrow & Co, New York