

Sexual selection in females

Kavita Isvaran

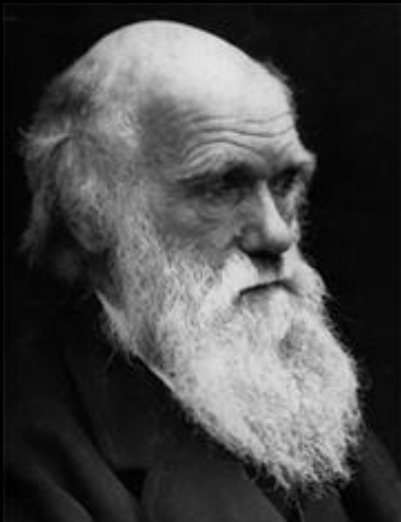
Centre for Ecological Sciences
Indian Institute of Science, Bangalore



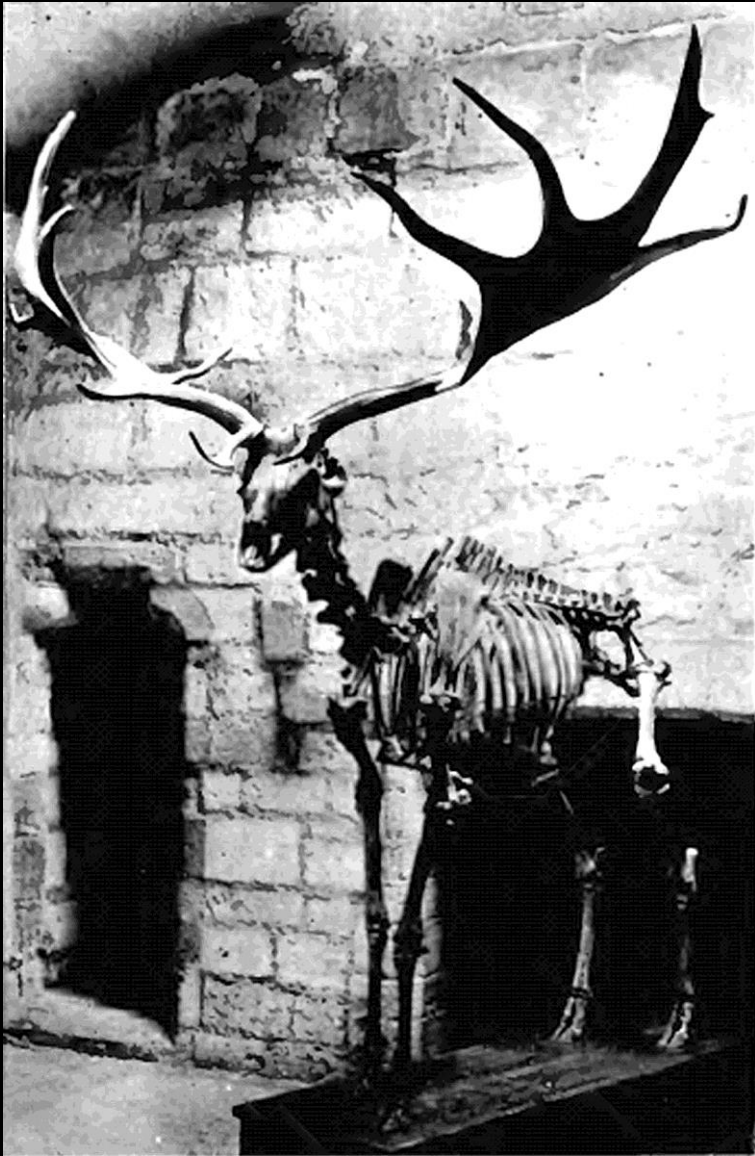
Elaborate characters may evolve as a result of

“the advantage which certain individuals have over other individuals of the same sex and species in exclusive relation to reproduction”

Darwin 1871. The Descent of Man, and Selection in relation to Sex



Historically - emphasis on male traits



Why?

THEORY

- Mate limitation:

FEMALES THE RARER SEX

Trivers 1972, Emlen & Oring 1977, Clutton-Brock & Vincent 1991, Jones et al. 2000, Kokko & Jennions 2003, Kokko et al. 2012, Bateman 1948, Arnold & Duvall 1994

Why?

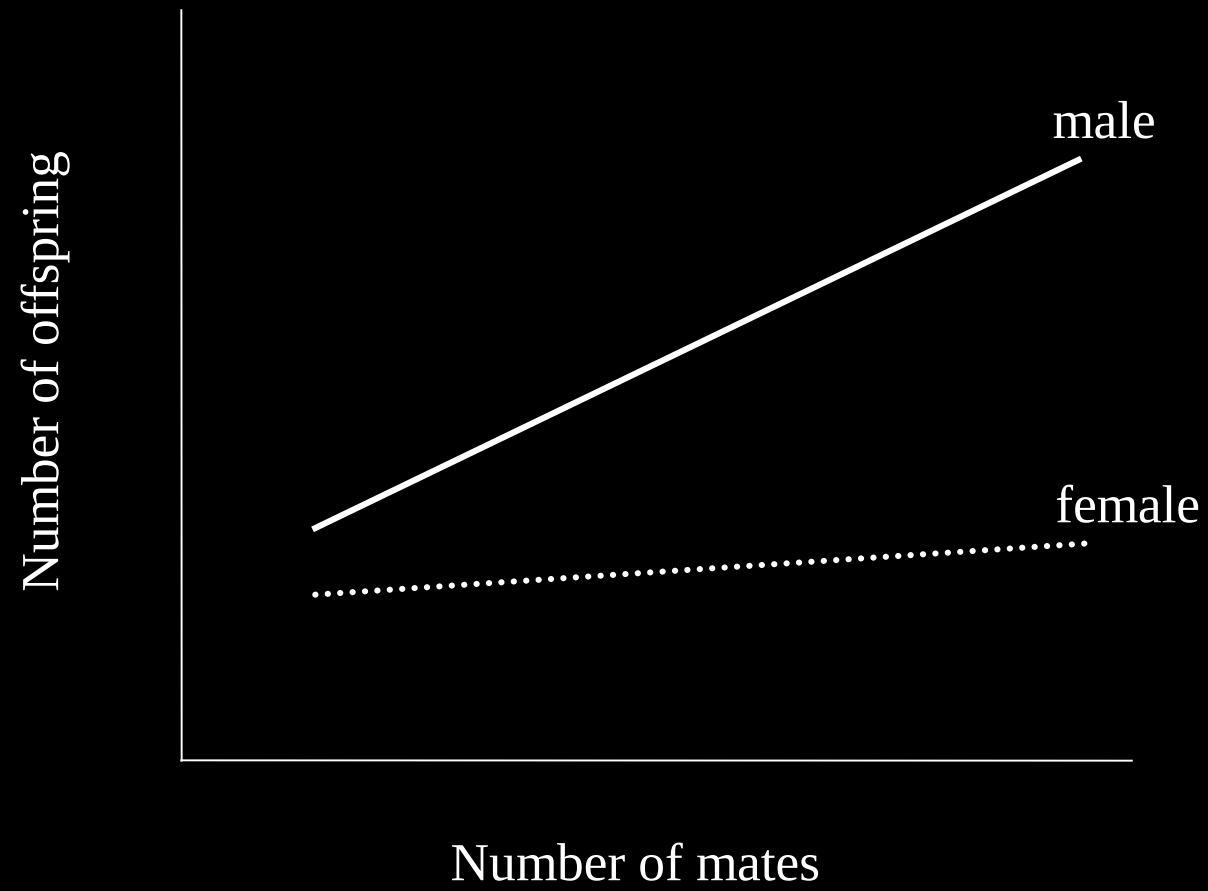
THEORY

- Mate limitation:

FEMALES THE RARER SEX

- Bateman gradient

Trivers 1972, Emlen & Oring 1977, Clutton-Brock & Vincent 1991, Jones et al. 2000, Kokko & Jennions 2003, Kokko et al. 2012, Bateman 1948, Arnold & Duvall 1994



Why?

EMPIRICAL EVIDENCE

Males have exaggerated traits

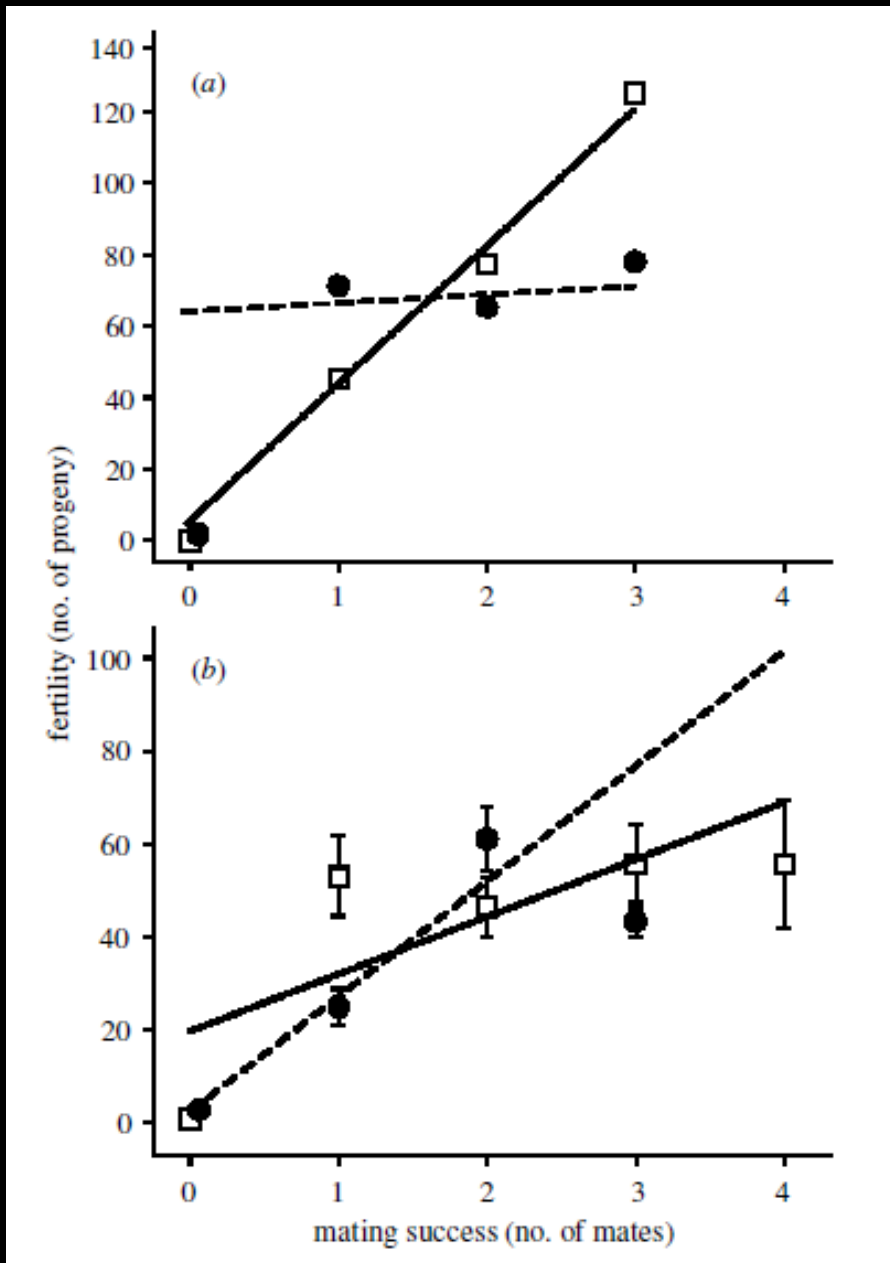


Is sexual selection then not an important evolutionary process
in females?

Sex role reversal



Bateman gradient steeper in females in pipefish



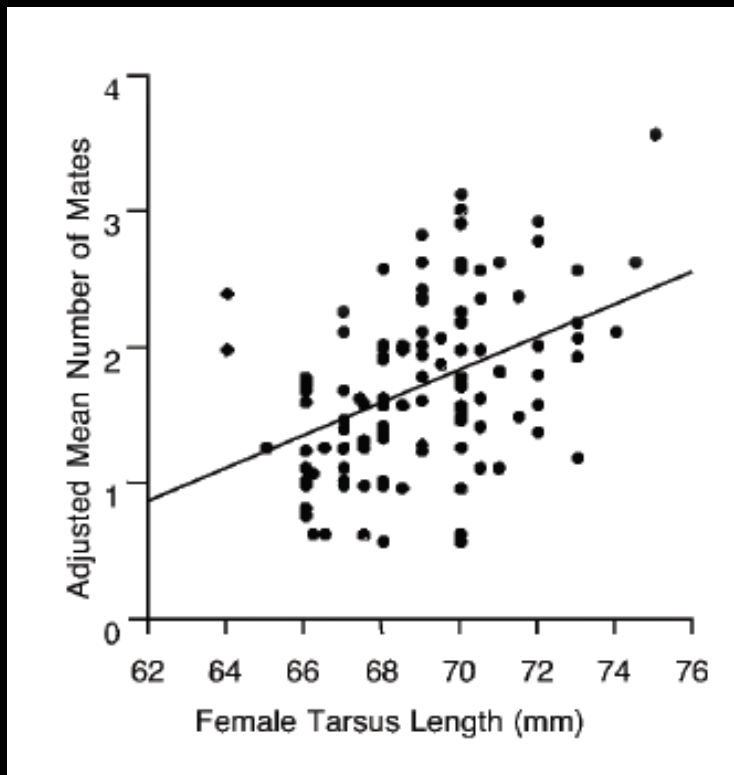
Drosophila melanogaster



Syngnathus typhle

Jones et al. 2000

Sexual selection on female body size in Bronze-winged jacana



Females 48% heavier and
have larger wing spurs

Emlen & Wregge 2004

Is sexual selection on females limited to rare cases of sex-role reversal?

Increasing evidence for widespread sexual selection in females



1. LEK-MATING SYSTEM in blackbuck antelope





A typical female visit to a lek

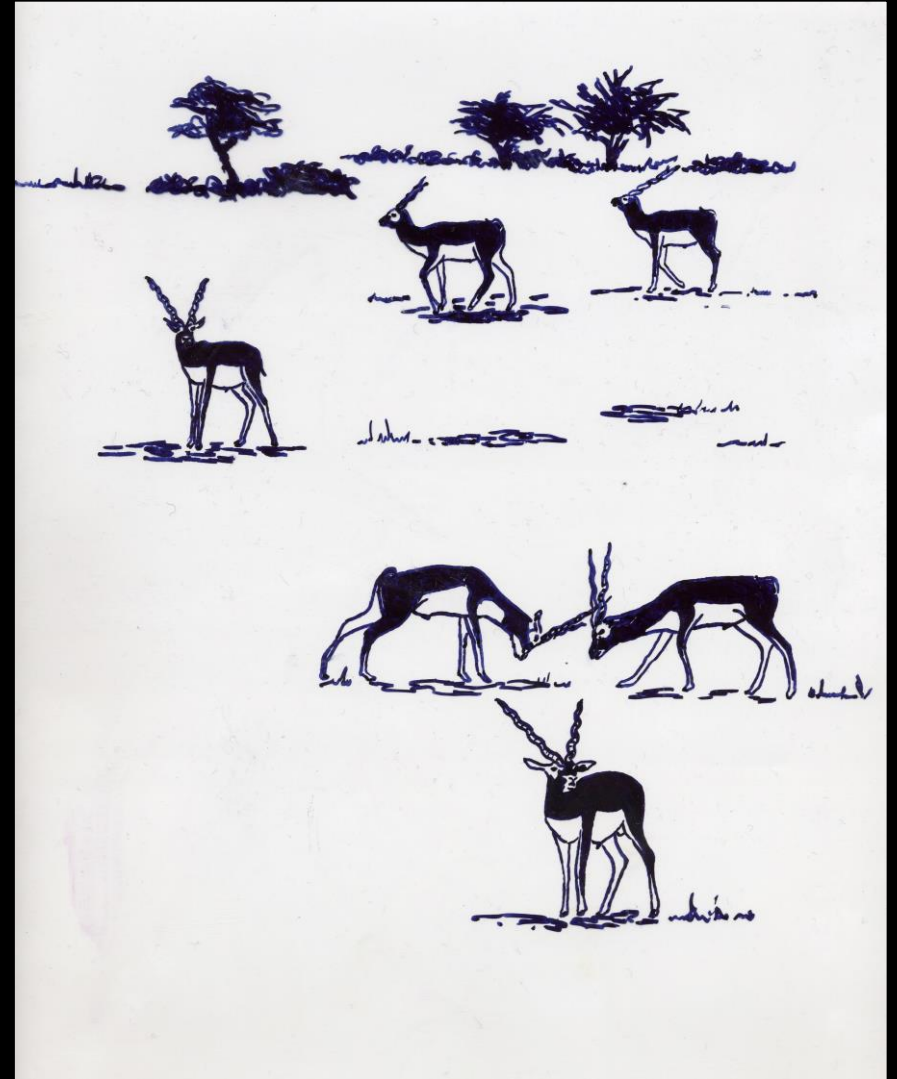
Enters lek

Visits one or more males

Courtship with one or more males

Mates with one male

Leaves lek



Mating patterns on leks - controversial

- Male-male interactions and male harassment of females



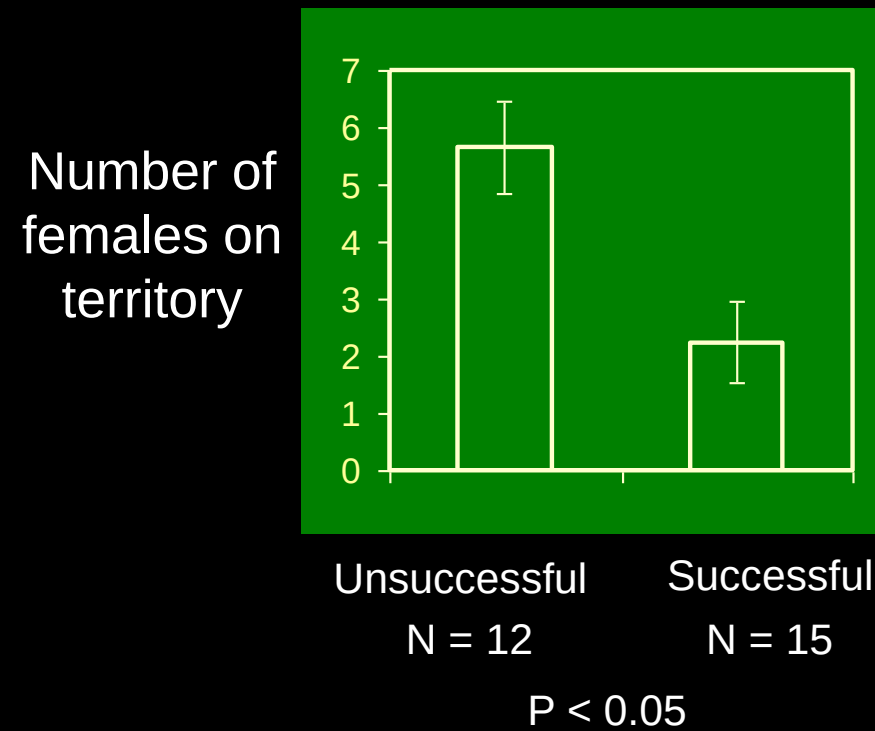
Mating patterns on leks - controversial

- Female mating preferences

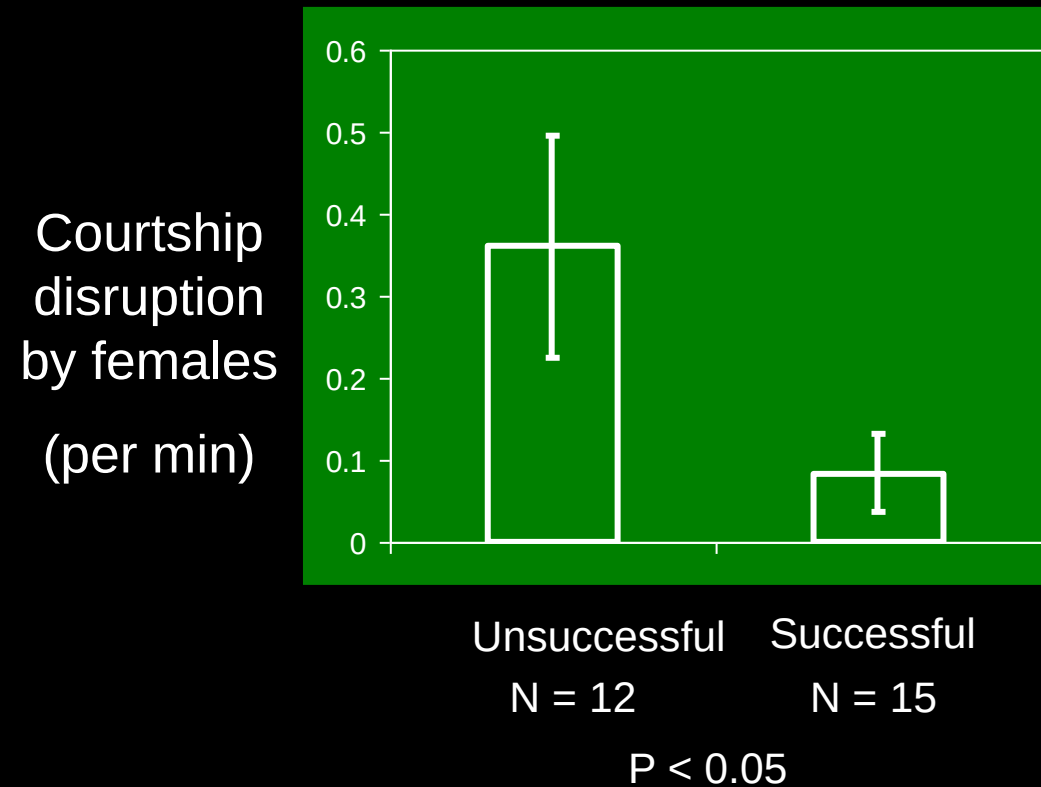




Probability of successful mating decreases with female aggression



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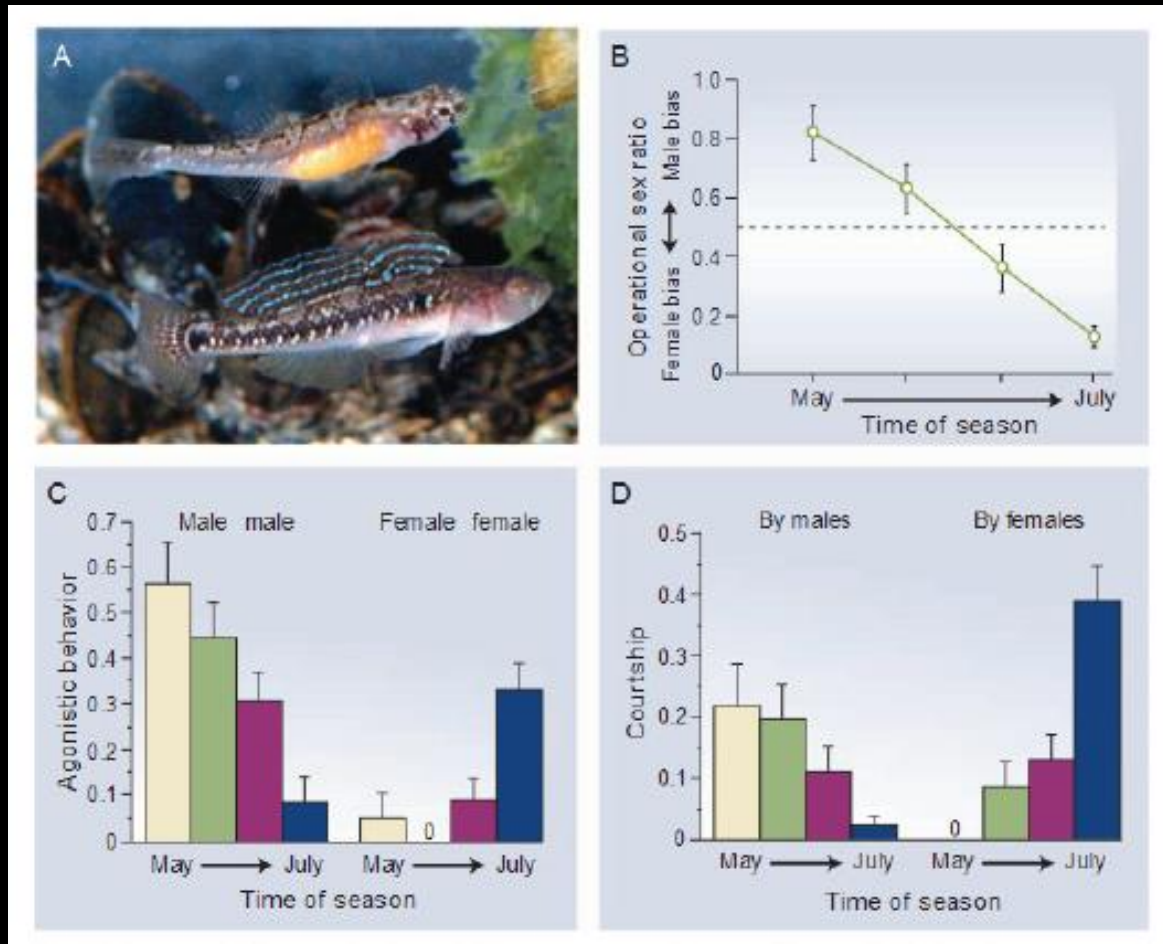


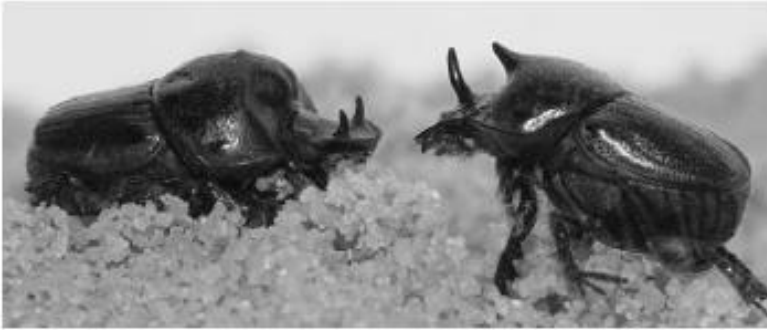
Females compete aggressively for preferred males in topi



Bro-jorgensen 2007

Who competes and who chooses? Sex roles flexible





- Weapons and ornaments
- Fierce competition
- Indicators of quality
- Correlation between trait and offspring survival/quality

Surely Sexual Selection?

Sexual Selection re-defined

Competition for mates ~~BREEDING OPPORTUNITIES~~

“..a broader definition of sexual selection as a process operating through intrasexual competition for reproductive opportunities, providing a conceptual framework that is capable of incorporating the processes leading to the evolution of secondary sexual characters in both sexes”

Social Selection

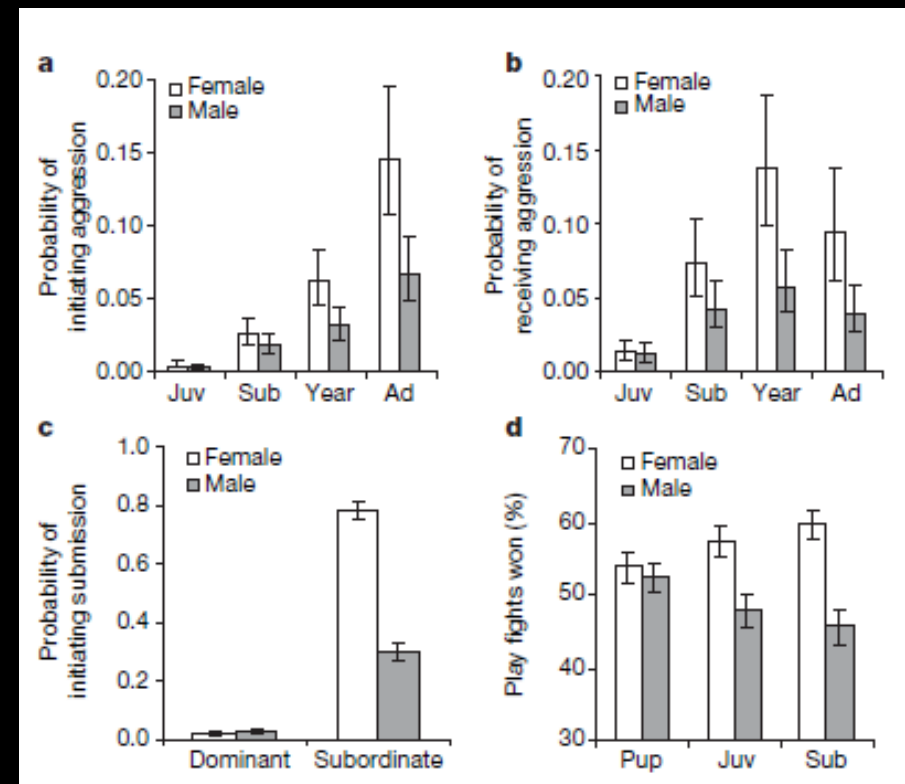
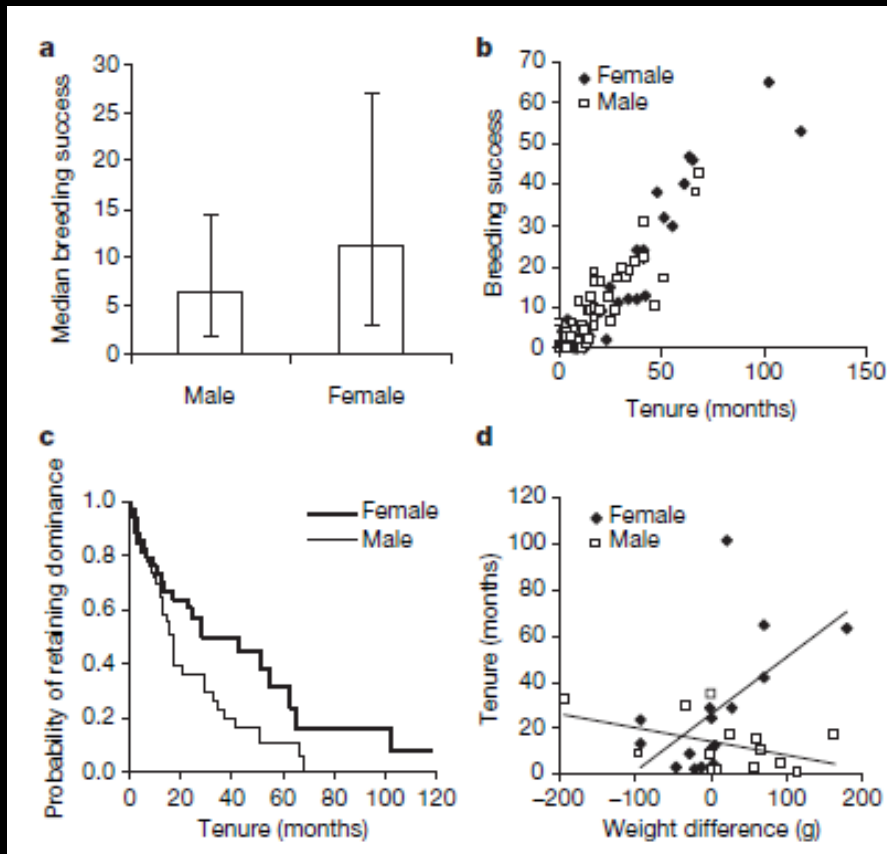
“differential reproductive success (ultimately, differential gene replication) due to differential success in social competition, whatever the resource at stake”

“competition in which an individual must win in contests or comparisons with conspecific rivals in order to gain access to some resource, including (under sexual selection) mates’.

West-Eberhardt 1983, Tobias et al. 2012, Clutton-Brock 2009,
Stockley & Bro-Jorgensen 2011

Female-female competition

Best studied in eusocial and cooperative breeding animal societies
e.g., Meerkat *Suricata suricatta*



2. Signalling and Aggression in female rock lizards



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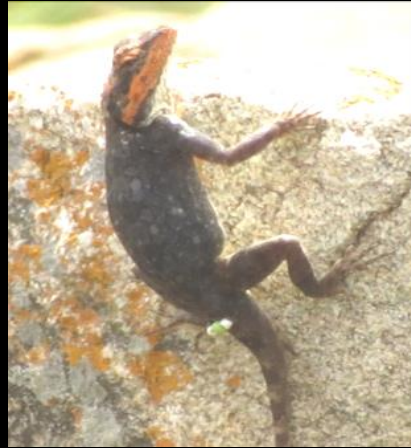


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Male signalling



Female signalling







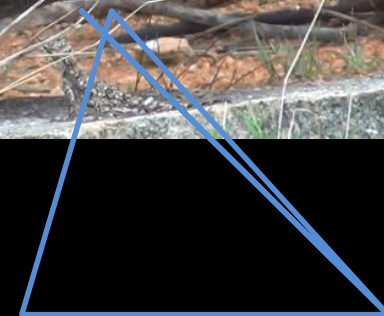
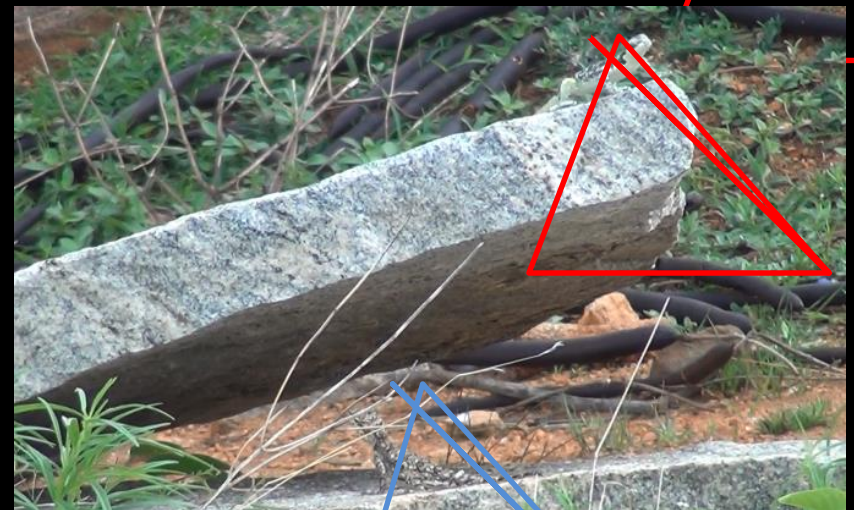
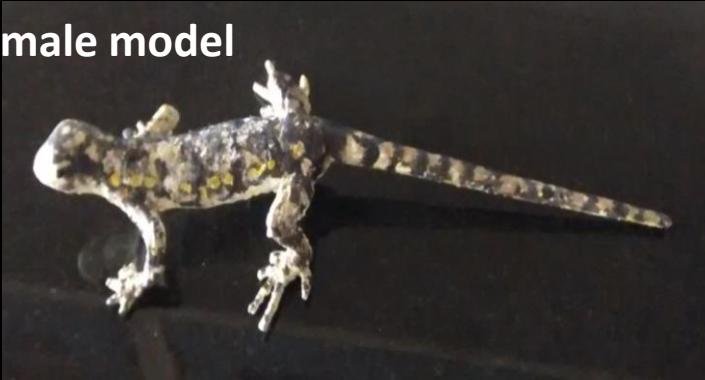
Signalling and aggression in females

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Conspicuous signals and aggression expected to be rare, and sensitive to the level of threat

Field experiments

Female model

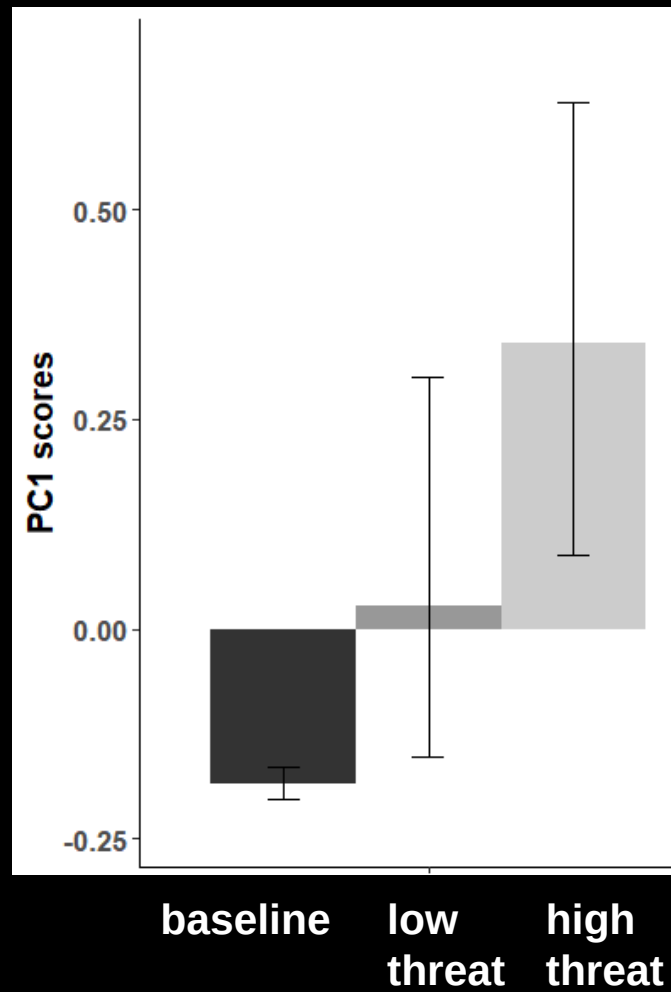




Aggression substantially increases with threat

Signalling sensitive to threat

Female signalling



Comparing communication and competition strategies

- How do females and males use the available behavioural and visual signal repertoire?
- Why?



Sexual selection in females: where do we stand?

- Increasing evidence for widespread reproductive competition

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- Increasing evidence for widespread reproductive competition
- Secondary sexual characters in females can be influenced by competition for mates but perhaps more strongly influenced by competition for breeding opportunities or resources affecting offspring survival and reproductive value
- Traits evolving under sexual/social selection in females may differ strikingly from those in males
- Evolutionary causes and consequences of female reproductive competition require a broader framework

ACKNOWLEDGEMENTS

Shreekant Deodhar

Devica Ranade

P. Somnath

Suhel Quader

Jane Brockmann

Colette St. Mary

Colin Chapman

Yadvendradev Jhala

Mel Sunkuist

Indian Institute of Science

Ministry of Environment and Forests

Norwegian Embassy

Department of Biotechnology

Animal Behavior Society

Sigma Xi

American Society for Mammalogists

Nature Conservation Foundation

Rishi Valley School

University of Florida

Wildlife Institute of India

Forest Department, Gujarat

Thank you.