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Meta-analysis of the origin of bimaturation in orangutan males

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Introduction

- There are two types of orangutans that diverged 2.7- 5 million years ago, *Pongo pygmaeus* (Borneo) and *Pongo abell* (Sumatra).
- Orangutan exists in a semi-solitary society where they forage and roam alone.
- Females tend to stay in their home range while males are the ones who disperse away to find new territory.
- Adult males exhibit bimaturation where they express one of the two morphological characters.
- Subordinate males or “unflanged”, they reach maturity around 14 years old but they do not develop secondary sexual characteristics, and that makes them have female facial morphology.
- Dominant “flanged” males develop irreversible secondary sexual characteristics such as cheek pads (flanges), laryngeal sac (throat sac) and longer hair. [3]
- The presence of flanged dominant males usually suppresses the maturation of unflanged conspecifics males.
- This still remains an understudied characteristics, and that is why this project was undertaken.

What contributes to the development of Flanges in male orangs?

Materials and Methods

- This is a meta-analysis of five published studies that specifically looked into:
 - Hormonal sampling Androgen and GC.
 - Fecal sample collection.
 - DNA analysis.
 - Testosterone levels between flanged and unflanged males.

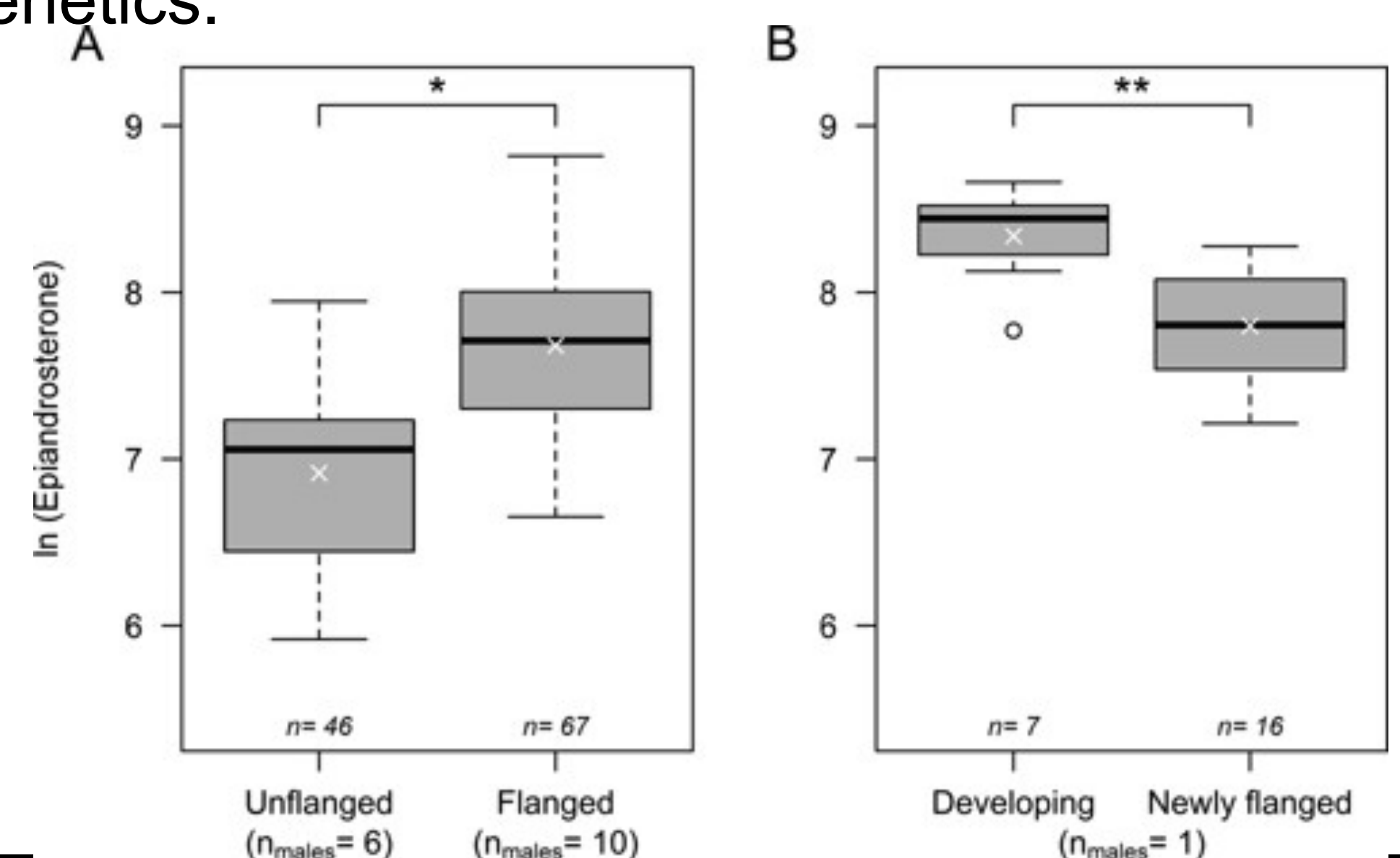


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2. Emery Thompson, Melissa et al. "Low Testosterone Correlates with Delayed Development in Male Orangutans." Ed. Tobias Deschner. *PLoS ONE* 7.10 (2012): e47282. Web. 17 Apr. 2017.
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Results

- The development of unflanged to flanged males still unclear. However, reviewed studies illustrated that male androgen levels increase usually in response to reproductive competition and mating seasons or when fertile females are present.[2]
- Higher ranking males (dominant) exhibit an increase in testosterone levels than lower ranking males.[2]
- Flanges do not show a sign of inheritance, and they might be due to the environmental change more than genetics.



Discussion

- The goal of this meta-analysis was to understand the morphological differences in orangutan males.
- Bimaturism is unique to this type of primates.
- The developments can be due to hormonal change, inheritance from a dominant flanged male, or it can be due to environment.

Conclusion

- Social Stress alone is not enough to arrest secondary sexual characteristics.
- GC and androgen levels were significantly higher in flanged males.[2]
- Elevation androgen levels is linked to male-male competition and flanged male dominance. [2]
- Further studies need to be done in order for us to fully understand the development of secondary sexual characteristics in orangutans.

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