Sexual dimorphism in the forelimb myology of the snow leopard (Panthera uncia)

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Introduction

Materials and Methods

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Specimen:

A 21-year-old male snow leopard (*Panthera uncia*, studbook number 2012) that died of natural causes at the Santa Barbara Zoo (SBZ) was donated last summer to Midwestern University's team for anatomical study purposes. The research of the male specimen was preceded in summer 2019 by that of a female snow leopard, who was 16 years old at the time of death. The research of

Results

1 - Despite the larger body mass of our *P. uncia* male specimen (39 kg versus 36 kg), most of the forelimb muscle weights of the male were comparable to the female, indicating that the male forelimb muscles were relatively smaller compared to overall body size.

2 - In the male, *m. rhomboideus pars cervicalis* was stouter, more robust than *m. rhomboideus pars thoracis*, and had an expanded origin comparatively, comparatively to the female whose *m.rhomboideus pars capitis* was much more robust than normally seen among felids. Please see figures 3 and 4 below.

Figure 3: Male - left dorsolateral view m. rhomboideus pictured, deomonstrating the difference from the female. Numbers pictured; 11 = m. rhomboideus cervicis, 12 = m. rhomboideus thoracis, 105 = m. rhomboideus capitis

Results

5 - *M. biceps brachii* was a broad fusiform muscle occupying most of the cranial aspect of the brachium superficially. In both limbs of the female and the left limb of the male a bifurcation of the tendon of insertion was noted. In the female, the tendons of *m. cleidobrachialis* and *m. brachialis* travel between the split. In the male on the left, the medial bifurcation had three muscles fusing together with it, *m. cleidobrachialis + m. pectoralis superficialis* and all aspects of *m. brachialis* appear to connect to the medial bifurcation and insert with it onto the proximal medial ulna. However, in the males right limb, there was no bifurcation noted and very minimal tendinous fiber connection to the tendon of insertion for *m. brachialis* and *m. cleidobrachialis + m. pectoralis superficialis*. Please see figures 16 - 19.

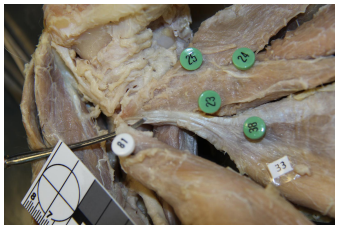

Figure 16: Male - left cranial view of antebrachium depicting m. biceps brachii bifurcation (probe) and the muscles joining the medial bifurcation. Numbers pictured; 23 = m. brachialis medial belly,

Discussion

There are a few non-mutually exclusive reasons for the morphological differences between these specimens: sexual dimorphism, health differences, and individual variation. Based on the differences observed between the two specimens and the relatively larger size of the male compared to the female, we interpret the differences in *mm. rhomboideus* and *m. triceps brachii* (results 2 and 3) as resulting from sexual dimorphism due to the larger body size of the male. Previously, studies of other big cats have shown that shoulder muscles and other muscles that support the trunk via the forelimb, have the most consistent positive allometry (without accounting for phylogeny) indicating the robustness of the muscle scales positively with

Acknowledgements and References

I would like to thank the Santa Barbra Zoo for graciously allowing us this opportunity to conduct research with a male snow leopard specimen, the ARCIVES of Midwestern University for handing and caring for the specimen and the Boehringer Ingelheim Veterinary Scholars Program, for supporitng me as a student. I also want to give a big thank you to my mentors Dr. Heather Smith and Dr. Beth Townsend for their aid and direction during this project. I have learned a great deal from their teaching and mentorship.