

EXAMINATION OF CLAW RETRACTION IN A RELATIVELY COMPLETE SPECIMEN OF MESOCYON

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Introduction

Mesocyon temnodon is an Oligocene canid species that lived in localities such as South Dakota, North Dakota, Wyoming, Colorado, and Nebraska approximately 35.4 million years ago. While the specifics of its evolutionary relationships and phylogenetic position are unclear, it is a member of the early Canid subfamily *Hesperocyoninae*. It has been suggested that these primitive dogs may have some anatomical similarities to felids, especially in post-cranial skeleton. One of these possible similarities is the ability to retract the claws.

Materials and Methods

The purpose of this study was to evaluate claws from a relatively complete *Mesocyon temnodon* specimen from North Dakota (NDGS 64) in order to determine the plausibility of claw retraction. The materials used for this process were the NDGS 64 specimen and specimens of modern Felids and Canids. This test was conducted by examining three lines of evidence: the morphology of the middle phalanx, depth of arc in the distal phalanx, and the sites of attachment for the extensor and flexor muscles.

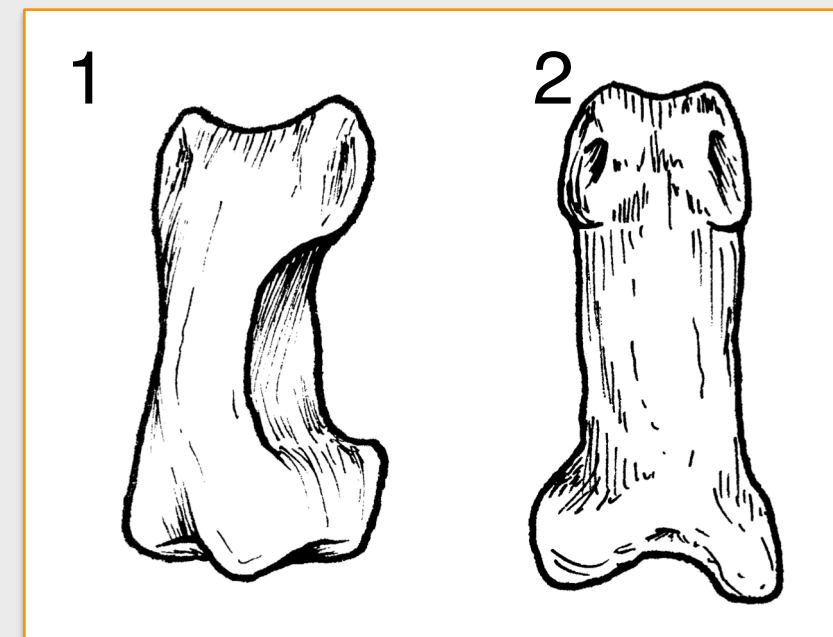


Fig. 1 Line drawings of middle phalanx from a specimen capable of claw retraction and (Fig. 2) a sample from NDGS 64



Fig. 3 Line drawing of a sample claw from NDGS 64 specimen

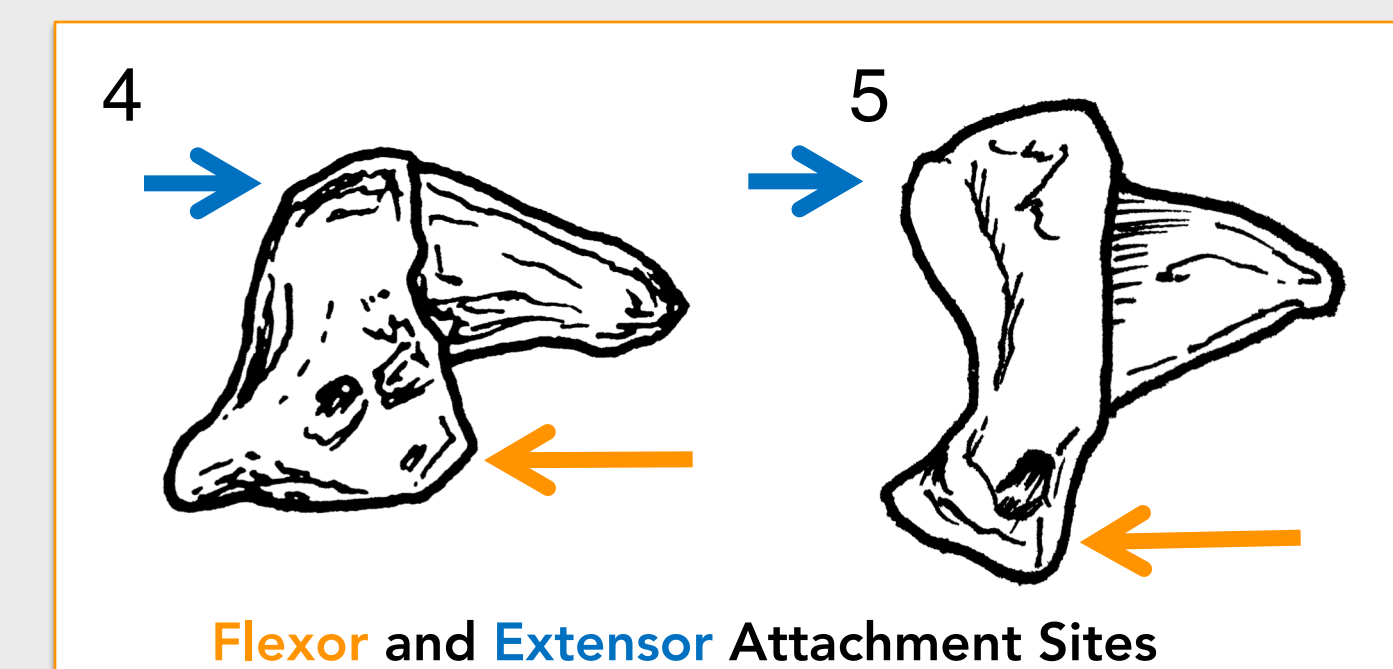


Fig. 4 Line drawings of a modern Canid and (Fig. 5) Felid Claw

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Results

In specimens capable of claw retraction, the middle phalanx is asymmetrical in shape due to a curvature on the lateral side of the phalanx. In specimens incapable of claw retraction, the middle phalanx is symmetrical. Our NDGS 64 sample shows us that the middle phalanx is symmetrical in shape.

In addition to this, specimens capable of claw retraction have a deeper curvature in the arc of the claw whereas non-retractable claws do not. However, this is less evident when the keratin sheaths are absent. There is still a slight curvature seen in our NDGS 64 sample. Compared to our modern specimens, our sample from NDGS 64 does not have a deep curvature in the arc.

Retractable claws have differing attachment sites for the extensor and flexor muscles compared to non-retractable claws. NDGS 64 shows greater similarity to the structural composition of the non-retractable claw than the retractable one.

Conclusions

After examining the three lines of evidence to identify the NDGS 64 claw as retractable or non-retractable, it was recognized that our sample failed to represent all three lines of evidence. It was concluded that the claw was non-retractable.

Future Directions

The continuation of this research involves investigating other post-cranial similarities to Felid species, such as the presence of an epicondylar fossa in NDGS 64.