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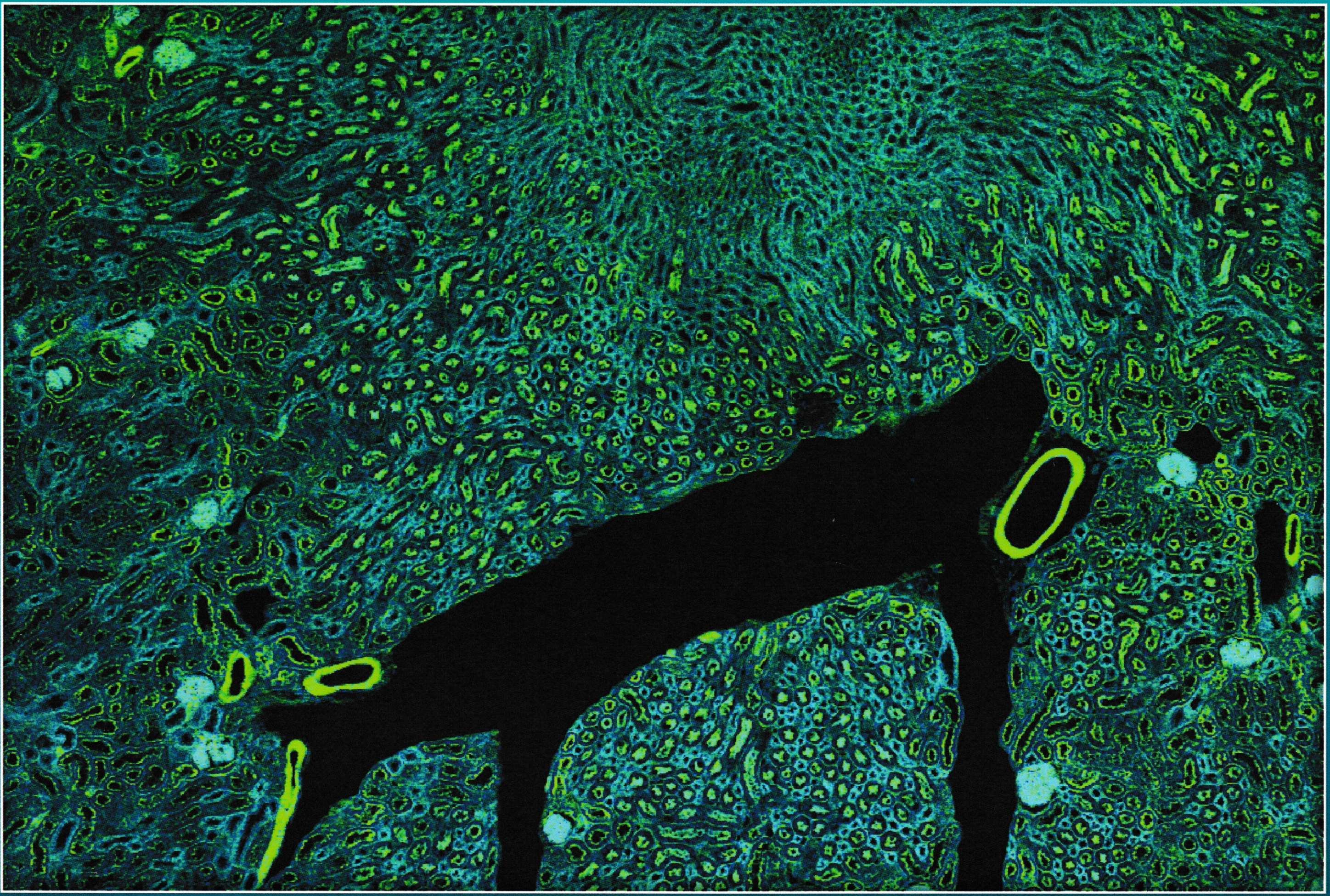

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CHARACTERIZATION OF NEMATODE POPULATIONS WITHIN HADROSAUR BONES AT HELL CREEK, MONTANA USA.

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Samples taken from the partially permineralized bone and ossified tendons of the hadrosaurid dinosaur, *Edmontosaurus annectens,* (and other Cretaceous dinosaurs) found at the Hell Creek Formation (Montana and eastern Wyoming,) and the Maastrichtian Hell Creek Formation in South Dakota have yielded stunningly preserved soft tissue structures including osteocytes and blood vessels [1, 2, 3, 4], collagenous matrix [1, 4] and nerves [5]. However, endogenous soft tissue structures are not the only microscopic finds being reported. Evidence of microorganisms including nematodes, fungi (or the evidence thereof) and helminth eggs have been found in vessel canals, gut remains, and coprolites from multiple hadrosaurid dinosaur specimens [6, 7, 8]. The discovery of microscopic organism communities in dinosaur remains is rare and provides important records of relationships between soft-bodied invertebrates and the remains of dinosaur bone and gut material. Many studies reporting helminths associated with extinct animal remains including two of the hadrosaurid reports cited here, argue that these microorganisms were endemic parasitic infestations and were preserved at death. However, some studies suggest that these helminth populations may instead be from opportunistic extant worms living in and gaining nutrients from the preserved remains [6]. In the present study, we present an analysis of populations observed in *E. annectens* from Hell Creek, MT, and provide evidence that these nematodes are opportunistic extant fungivores rather than parasites. Nematode adult and juvenile population counts were analyzed under brightfield from 40um ground sections of *E. annectens* scapula and jaw (Figure 1). The orientation of the worms suggests this population was feeding on fungus growing on decaying soft tissues (or possibly residual tissue) within bone canals at the time of collection and emplacement in fixative. To characterize live nematode populations in bones and in soil surrounding bones in Montana, a field adapted Baermann funnel technique allowed us to collect, identify, and analyze worm populations. One living fungivorous nematode was extracted from a triceratops bone shard (Figure 2). Resulting species identification and population dynamics were compared with the nematode populations observed in the E. annectens bone sections.

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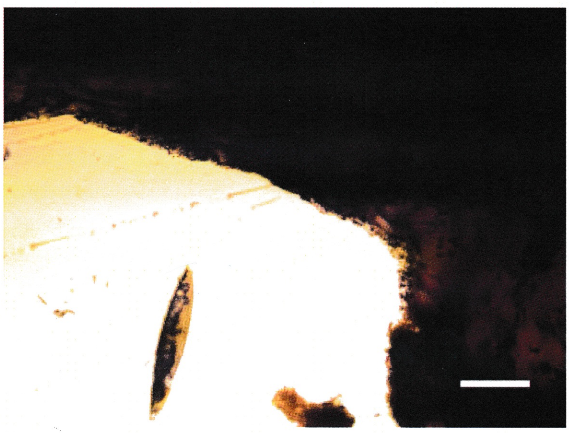

Figure 1: Nematode in blood canal, *Edmontosaurus* jaw, Glendive, MT. Scale bar =100µm.

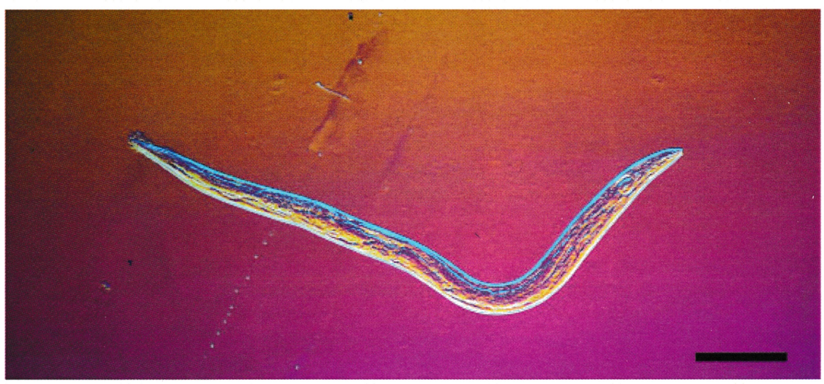

Figure 2: Living fungivorous nematode, extracted from Triceratops buried shard, Glendive, MT, scale bar = 90 µm.