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# Microstructures Produced by Hadrosaur Bones from Alaska and Wyoming

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# Research + Scholarship SYMPOSIUM



## **Microstructures Produced by Hadrosaur Bones from Alaska and Wyoming**

Since 2005 when Dr. Mary Schweitzer made the first discovery, microstructures with the appearance of “osteocytes” and “blood vessels” have been recovered from fossils of various localities, dating back as far as the Triassic. The majority of these finds have come from dense, cortical bone but recently have been discovered in cancellous bone. Since her initial discovery, Schweitzer has done a lot of work to verify that these microstructures are not biofilms, but instead are original organic tissue. This project was looking to get similar results to Schweitzer’s research and to find a simple test method for the initial discovery of soft tissue using easily available supplies. Fragments of “float” Edmontosaurus bones were collected from Eastern Wyoming and “in-situ” hadrosaur bones collected from Alaska. Two different techniques were used, the first method implemented daily changes of a 0.5 M solution of EDTA and the second was a solution of 2M HCl; both are known techniques for demineralizing modern bone. Using the solution of HCl, the bones were subjected to daily solution changes until completely demineralized. The sediment left over was then used to make covered slides, which were then analyzed and photographed with a petrographic scope. This analysis revealed certain microstructures of several types that had been freed from the bone. Comparing the microstructures with previous work done by other researchers indicates that these structures have the morphological appearance of original soft tissue blood vessels and osteocytes. In every HCl sample, the material from Wyoming produced highly fragmented sections of these “blood vessels”, while the Alaska material produced larger, abundant “blood vessels” and in addition, rarer “osteocytes”. These samples were of cancellous bone and ossified tendon. The EDTA samples have yet to produce any original organic structures. Further stain tests will be performed for verification of the organic nature of the structures. The ease in finding these microstructures using basic supplies and in weathered bones seems to indicate the possibility of original organic preservation in fossil bones may be quite prevalent, possibly even the norm.