

**A STUDY OF THE ORGANIC MATRIX OF CUTTLEBONE: MOLECULAR WEIGHTS,  
CHARACTERIZED INFRARED SPECTRUM AND AMINO ACID COMPOSITION**

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Abstract: Organic matrix of the shell of *Sepia esculenta*, the cuttlebone, was extracted by 10% acetic acid and double distilled water. It was analyzed using SDS-Polyacrylamide electrophoresis (SDS-PAGE), Fourier Transform Infrared spectrum (FT-IR) and the technique of analysis of amino acid composition. SDS-PAGE electrophoresis showed the number of bands of acid soluble matrix was lower than that of the aqueous soluble matrix, but the former protein concentration was higher than the latter. This may be attributed to two factors: The loss of the proteins of low molecular range weight in the process of dialyzing, and the poor resolution resulting from some very thick and broad bands. The FT-IR spectrum showed amide, amine, and carboxylic acid groups in the organic matrix of the cuttlebone, with high sugar/protein ratio and strong sugar bands. Moreover, the  $\text{HCO}_3^-$  groups could be at the organic mineral interface. The results of amino acid analyses indicated a high content of aspartic acid (Asp) and glutamic acid (Glu) in both the soluble and the insoluble matrix, the sum of them respectively occupied close to 23% and 19%. Glycine (Gly) and Serine (Ser) were also present in a relatively high concentration. The total of Asp and Glu was obviously more than that of Ser and Gly in the soluble matrix, however, with the opposite in insoluble matrix. These data imply that acidic amino acids play an important role in the calcification of cuttlebone.