Identification of new proteins from the matrix of sclerites from the alcyonarian, Lobophytum crassum

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The organic matrix of sclerites of the alcyonarian coral, Lobophytum crassum, was studied to investigate its molecular characteristics and functional properties. The shape of the sclerites was identified using scanning electron microscopy. The soluble organic matrix comprised 0.03% of the sclerite weight. The SDS-PAGE analysis of the preparation showed four protein bands with apparent molecular weights of 37, 48, 67 and 102 kDa. The 67 and 102-kDa proteins appeared to be calcium binding proteins, detected as radioactive bands by 45Ca autoradiography. The 67-kDa protein appears to be glycosylated. The N-terminal amino acid sequence of the 67-kDa was determined; 7 of 20 residues were acidic. A database search for homologous proteins did not give a clear indication of the function of the 67-kDa protein. The isolated organic matrix possesses carbonic anhydrase activity which functions in calcium carbonate crystal formation, indicating that organic matrix is not only structural protein but also a catalyst. An interpretation of these results is that the sclerite of alcyonarian corals has a proteinaceous organic matrix related to the calcification process.