

In this thesis Raman spectroscopy is evaluated as a tool of identification and discrimination of carotenoids from microbial biomass. Microorganisms, halophilic or nonhalophilic, belong to Cyanobacteria, Proteobacteria, Chlorophyta, Rhodophyta and to others. Biomass was cultivated under laboratory conditions and yielded varied colours. Raman spectra were recorded successfully from lyophilized biomass by excitation wavelength 514.5 nm (dispersive Raman microspectrometer) and 1064 nm (FT Raman spectrometer). Results were compared with Raman spectroscopic data from pigment extracts. Spectra of carotenoids are characterized by the main Raman bands ν_1 , ν_2 and ν_3 due to C=C stretching, C-C stretching and C-CH₃ deformation. HPLC/UV-VIS allows effective pigment separation from extracts and detection of separated pigments by UV-VIS analyzer. Assessment of Raman analysis and its potential to detect microbial carotenoids are discussed. Sarcinaxantin is an unusual carotenoid identified together with more common β - carotene. Raman spectroscopic results obtained on carotenoids recorded from colonies which accumulated more than one carotenoid need to be interpreted carefully.