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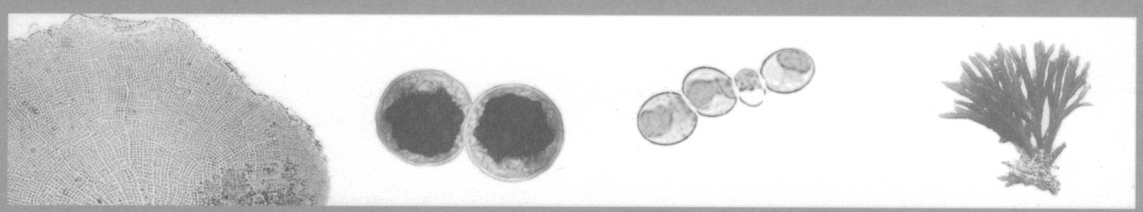
Program & Abstracts



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259. MICROALGAL GROWTH AND METABOLIC PERFORMANCE IN BIPHASIC BIOREACTORS

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One of current research trends encompassing production of specific metabolites by microorganisms is integration of cell culturing and purification processes. This procedure offers the advantages of cell retention within the bioreactor, rapid product removal from the cell-containing phase, and a cell-free partially purified effluent. Such extractive bio-production system may be obtained by mixing two immiscible liquid phases: the production of the desired metabolite takes place in one phase (aqueous medium, with microalgae), whereas the metabolite produced (e.g. fatty acids) is concentrated into the other phase (organic solvent). Despite their immiscibility, the phases are continuously in close contact due to efficient mixing inside the bioreactor. As most organic solvents are toxic to microalgae, a preliminary step in the design of feasible biphasic reactor systems is screening of organic solvents for biocompatibility with the microalga under study.

In this research effort, three microalgal species (viz. *Pavlova lutheri*, *Nannochloropsis* sp. and *Scenedesmis pleiomorphus*) were cultivated in biphasic systems containing 8 organic solvents characterized by different log P values (hexane, toluene, octane, decane, tetradecane, hexadecane, bis - 2 ethylhexyl phthalate and dodecane). The biocompatibility of these solvents and their influence on the fatty acid profile of each microalgae were assessed via cell counting, morphological observation by microscopy and lipid analysis.