

## Synthetic surfactants are replaced with environmentally friendly biosurfactants

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**Background and Aims:** Surfactants are surface active agents, which were used in cosmetic preparations for many reasons. A biosurfactant is a biologically produced surfactant. Variety of bacteria have been described that are abundant source of useful bioactive secondary metabolite such as biosurfactants due to their unique biochemical properties which resulting from their complex structure. The most common of glycolipid biosurfactants are rhamnolipids and sophrolipids which they generally composed of hydrophilic head group and lipophilic tails. The hydrophilicity lipophilicity balance (HLB) of them is 22-24.

**Methods:** *Pseudomonas aeruginosa* strain MR01, gram negative bacteria, have been reported to excrete a mixture of biosurfactants with glycolipid structure. The composition of medium for biosurfactant production was as follows (g/l): soybean oil 40.4, NaNO<sub>3</sub> 3.0, MgSO<sub>4</sub>.7H<sub>2</sub>O 0.25, KH<sub>2</sub>PO<sub>4</sub> 0.25 and yeast extract 1.0 seed culture were prepared using a nutrient broth medium by overnight incubation in rotary shaker at 20 rpm and 30°C. Over production of rhamnolipids achieve by growth limitation conditions. Restrained conditions of nitrogen and multivalent ions are necessary. Carbon sources as glycerol, glucose, n\_alkanes and triglycerides contained in e.g. vegetable oils are suitable for production.

**Results:** In recent years increasing global environmental awareness has lead to much more interest in biosurfactants compared to their chemical counterparts. It is due to unique properties of biosurfactants including biodegradability, low toxicity, mid production cost and environmental acceptability, lower critical micelle concentration (CMC), higher temperature, pH and salinity. From a biotechnology perspective, the production of biosurfactants is important owing to their vast applications in food, cosmetics, pharmaceutical, agricultural, petrochemical industries, bioremediation and microbial enhanced oil recovery.

**Conclusions:** Biosurfactants can be served as green alternatives in a variety of cosmetic application. They show many promising characteristic for cosmetic applications.

**Keywords:** Biosurfactants; Cosmetic; Rhamnolipids; *Pseudomonas aeruginosa*