

# Antimicrobial Activity of Biosurfactants

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## Abstract

Biosurfactant has antibiological activities. Due to its low toxicity, biosurfactant can be applied to human health care products. Possessing the antibiological activities as well as the surfactant properties implies that biosurfactant can be widely used in the cosmetic industry. In this presentation, applications of biosurfactant have been reviewed including the antimicrobial activities of sophorolipid.

Sophorolipid, a biosurfactant produced from *Candida bombicola* ATCC 22214, showed antimicrobial activity against *Bacillus subtilis*, *Staphylococcus xylosum*, *Streptococcus mutans*, and *Propionibacterium acne* at 4, 1, 1, 0.5 ppm as MIC (minimum inhibitory concentration). Also 100 ppm of sophorolipid inhibited 50% of cell growth of plant pathogenic fungus, *B. cinera*. However, sophorolipid showed no effect on the *Escherichia coli*., indicating its selective antimicrobial activity depending on the cell wall structure. Treatment of *B. subtilis* with sophorolipid increased the leakage of intracellular enzyme, malate dehydrogenase, indicating the possible interaction of sophorolipid with cellular membrane. Between lactone-type and acid-type sophorolipid, the former showed higher antimicrobial activity.

Table 1. Release of intracellular enzyme with sophorolipid treatment.

Strain	Malate dehydrogenase activity (Unit/ml)	
	before treatment	after treatment
E. coli	83	99
B. subtilis	25	158

Table 2. Growth inhibition of *Propionibacterium acne* by sophorolipid (%).

	Sophorolipid	DSDM	PB	Sucrose monolaurate	Tween 80
50 ppm	100	96.1	21.7	8.63	1.6
300 ppm	100	100	91.8	98.9	0.5

DSDM; distearyl dimethyl ammonium chloride, PB; cocoamidopropyl betain, Tween 80; polyoxyethylene sorbitan monooleate

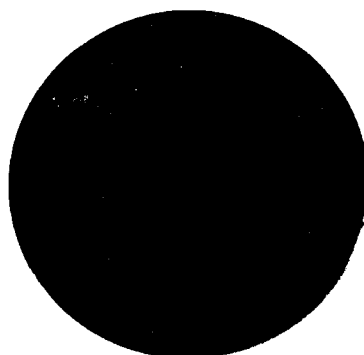


Fig. 3 Antifungal activities of *Bacillus*

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