STUDY OF THE C/N RATIO AND DIFFERENT SOURCES OF NITROGEN FOR BIOSURFACTANT PRODUCTION BY *BURKHOLDERIA SP.* WITH CARBON SOURCE IMMISCIBLE

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Introduction. The surfactants are amphiphilic substances with hydrophobic and hydrophilic structure. Because of this, have the ability to increase the solubility of hydrophobic organic compounds and to reduce the surface tension between two immiscible phases. The trouble of chemical surfactants is that they become toxic to the environment, water and soil, and also difficult to degrade (1).

In recent years there has been investigated microorganisms able to synthesize these compounds, known as biosurfactants; being produced by microbial metabolism, are easily degradable and have low toxicity. Despite these benefits, its production has been constrained by the costs of the raw materials used and by the low yields obtained (1).

The aim of this study is to evaluate the culture conditions (based on the C/N and using different nitrogen sources) that improve biosurfactants productivity by *Burkholderia sp*. with immiscible carbon source.

Methods. Three nitrogen sources were used (ammonium nitrate, sodium nitrate and ammonium sulfate) at different C/N ratios (5/1, 10/1 and 20/1), using corn oil as carbon source for *Burkholderia sp*. (2). Flasks of 50 mL (with mineral medium, corn oil and *Burkholderia sp*. by Mera, 2011) were taken randomly by triplicate up within 36 hours. Biomass was determined (optical density) and surface tension (with a tensiometer, Cole Parmer model tensiomat mark 21 with a platinum-iridium ring); the rhamnolipids quantification was done by the indirect method of orcinol (3).

Results. In the kinetics can be observed that when nitrogen decreases, the biomass and surface tension also have the same behavior, but rhamnolipids production increase. With the three nitrogen sources, the ratio C/N=20 was the best for the production of rhamnolipids (Table 1). The order in nitrogen source for reached the best rhamnolipids production was: sodium nitrate (Figure 1), ammonium nitrate and ammonium sulfate.

Table 1. Dates obtained with the nitrogen sources (C/N=20)

Nitrogen source	Production biomass (g/L)	Production rhamnolipids (g/L)	Decrease surface tension (din/cm)
Sodium nitrate	0.2295	0.0891	36.8
Ammonium nitrate	0.1769	0.0814	40
Ammonium sulfate	0.1550	0.0752	41.3

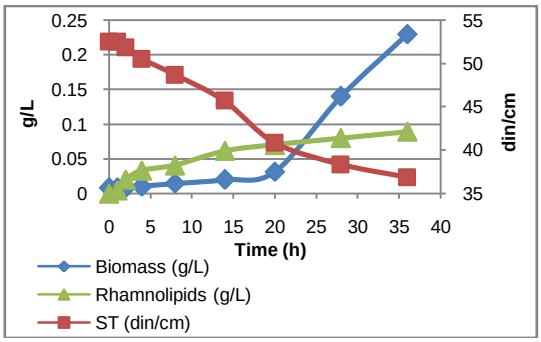

Fig.1 Determination of biomass, decrease of surface tension and rhamnolipids quantification with sodium nitrate C/N=20.

Conclusions. With the three sources of nitrogen (sodium nitrate, ammonium nitrate and ammonium sulfate) was possible to produce rhamnolipids. Nevertheless sodium nitrate with the ratio C/N=20 was best source of nitrogen for the production of this, reducing the surface tension up to 36 dynes/cm.

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