BIOTECHNOLOGICAL POTENTIAL OF PHOSPHATE SOLUBILIZING BACTERIA ISOLATES OF HABANERO CHILI CROPS

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Key words: Inorganic phosphate, bacteria, organic acids

Introduction. Most agricultural soils contain large reserves of phosphorus and a considerable part comes from its accumulation as a consequence of regular applications of P fertilizers. Several microorganisms (bacteria, fungi) are able solubilize soil phosphorus. The principal mechanism for mineral phosphate solubilization is the production of organic acids, resulting in the acidification of the microbial cell and its surroundings (2).
The aim of our study was to isolate and evaluate the potential of phosphate solubilizing bacteria of crops of habanero chili.

Methods. The samples of soil were collected of habanero chili crops in the locality of Chiná, Campeche (Fig. 1a). The microorganisms were isolates by serial dilution in plates of Piskovskaya's Agar (PA) and PA modified (PAm). The strains were selected by appearance of a clear zone surrounding the colony and characterized by colonial morphology and cell. The phosphate-solubilizing capacity was confirmed by measurement of pH in the cultures of the strains that grew in tubes with Piskovskaya's Broth (PB) after 8 days at room temperature. Actually, it will be determined the rate of solubilization of calcium phosphate tribasic and the production of organic acids (lactate, acetate, propionate, pyruvate, malonate, maleate, tartarate, oxalate, succinate, fumarate) through of ion chromatography (1).

Results. Nineteen morphologically different phosphate-solubilizing bacteria strains based on halo formation in PA and PAm (Fig. 1b) were isolated from five samples of soil (Table 1). The initial pH of every culture was of 5.6 and after of 8 days in culture we observed acidification of media in all strains to exception of ITCB-09 (Table 1).

The appearance of clear zone in the PA and PAm cultures and change of pH confirmed the possible capacity of these strains of phosphate solubilize (2).


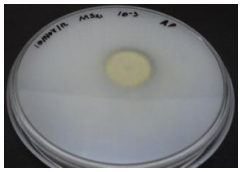

Fig. 1. A) Habanero chili crops. B) Phosphate solubilizing strain.

Table 1. Phosphate-solubilizing bacteria, isolated of habanero chili crops in the locality of Chiná, Campeche.

Strain	Cell wall	Cell morphology	pH 8 days
ITCB-09	-	Cocci	5.6
ITCB-10	-	Bacillus	5.1
ITCB-11	-	Bacillus	5.2
ITCB-12	-	Bacillus	4.7
ITCB-13	-	Bacillus	4.5
ITCB-17	-	Cocci	4.6
ITCB-18	-	Bacillus	4.7
ITCB-19	-	Bacillus	4.8
ITCB-20	-	Bacillus	4.8
ITCB-21	+	Bacillus	4.5
ITCB-22	-	Bacillus	4.6
ITCB-23	-	Bacillus	4.2
ITCB-24	-	Bacillus	4.3
ITCB-25	-	Bacillus	4.3
ITCB-26	-	Bacillus	4.4
ITCB-27	-	Bacillus	4.7
ITCB-28	-	Bacillus	4.9
ITCB-29	-	Bacillus	4.8
ITCB-30	-	Bacillus	4.5

Conclusions.

Taking into account that organic acids are chelating agents, it is likely that decrease in pH during growth of the strains is due to production of these acids. Therefore, the next work stage will be to detect, in culture media, these organic acids by using ion chromatography.

References

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