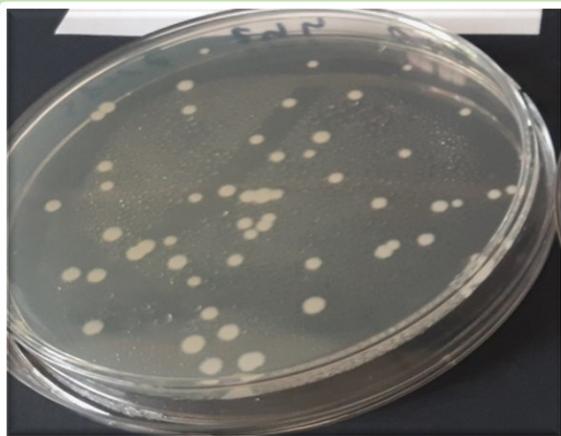
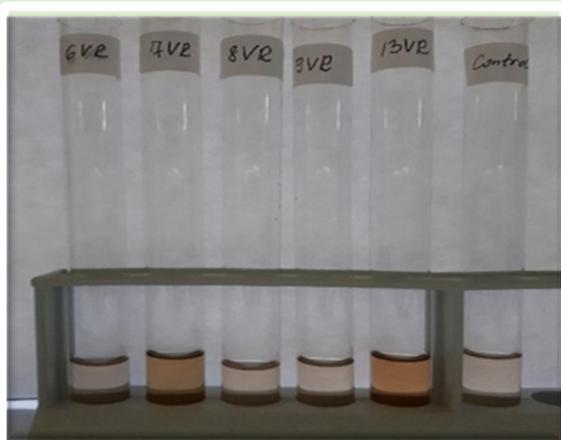


IN VITRO INVESTIGATION ABILITY TO PRODUCTION INDOLE ACETIC ACID BY FIVE *BACILLUS* STRAINS

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Abstract

In these study we investigated the ability of five *Bacillus* strains to produce indole acetic acid (IAA). These strains have well known plant growth promoting activity (PGP). IAA is refers to plant hormones auxins. Auxins are responsible for cell elongation, cell division, root and shoot growth, flowers and fruit development in plants.

During the batch fermentation process of studied strains were detected the cell forming unit (CFU/ml) of strains, pH at the media and assimilation of carbon source by each strain. The highest IAA production were measured to *B. thuringiensis* 13VR with 8, 38 $\mu\text{g/ml}$ followed by *B. cereus* 7VR (7.35 $\mu\text{g/ml}$) and *B. subtilis* 8VR (3.47 $\mu\text{g/ml}$). Assimilation of glucose started after 8 hour at the beginning of fermentation process and most of which is exhausted up to 24 hours of fermentation process. At the beginning of fermentation process pH ate the media was at 5.5, as to the end of fermentation process decreased. At the end of fermentation process was measured the lowest 4.5 pH of the media at strain *B. pumilus* 9VR .

Keywords: *Bacillus*, PGP activity, indole acetic acid (IAA), plant growth promoting activity (PGP)

Results and Discussion

Maximal colony forming unit per ml of bacterial strains were detected between 16 h and 20 hour of starting of cultivation process. After that the number of bacterial cell decreasing until 216 hour (Fig.1).

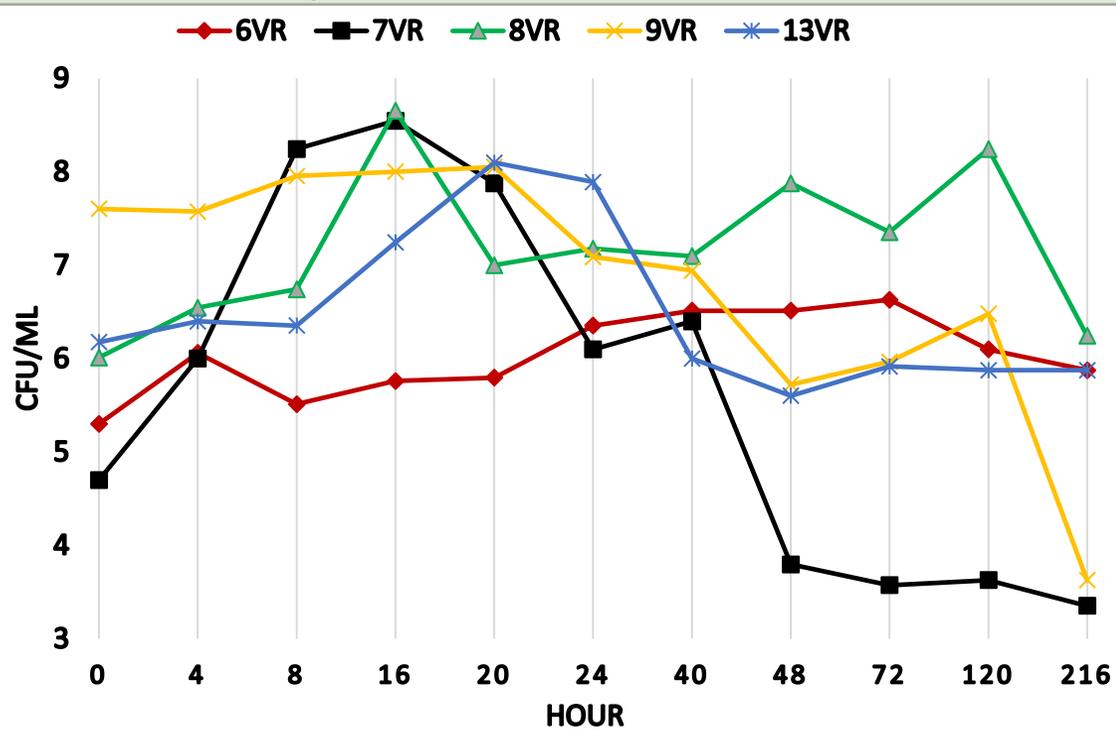


Fig. 1: The dynamics of the growth at five *Bacillus* strains were reports as cfu/ml.

During the batch fermentation process *Bacillus* strains assimilation 8 mg/ml glucose as the until 24 hour. After that consumption of carbon source by strains reduced to the end of fermentation process (fig. 2).

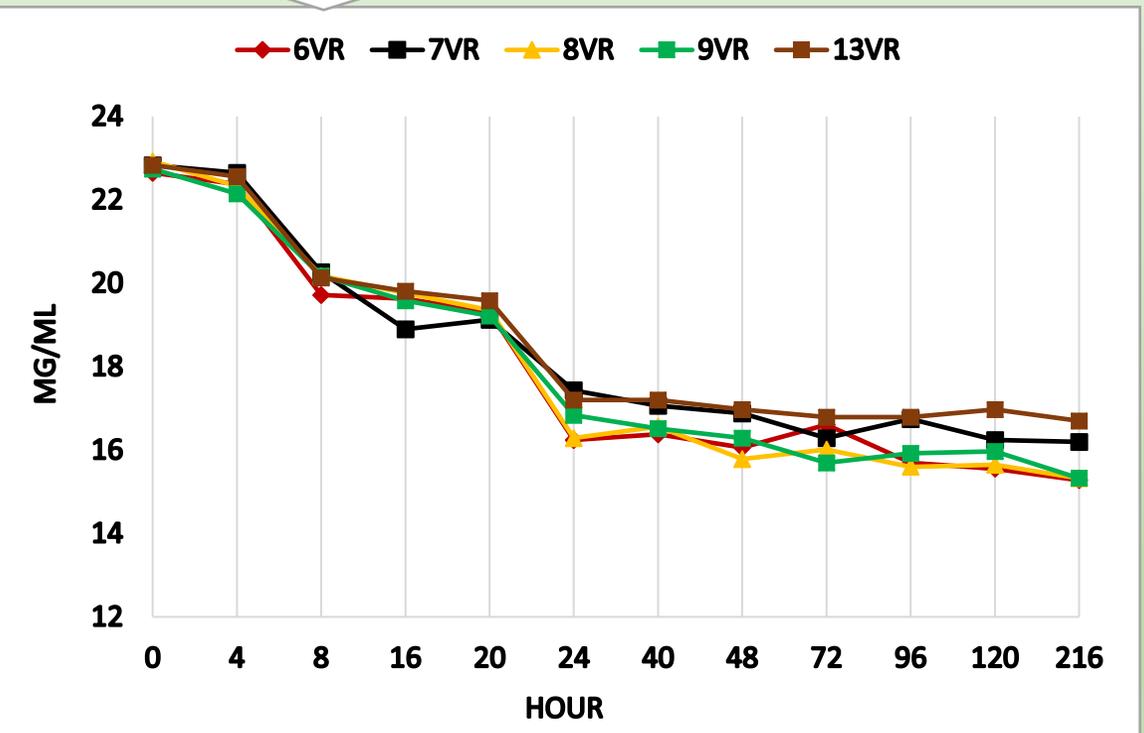


Fig.2: The dynamic of assimilation at carbon source during the batch fermentation process by five *Bacillus* strains.

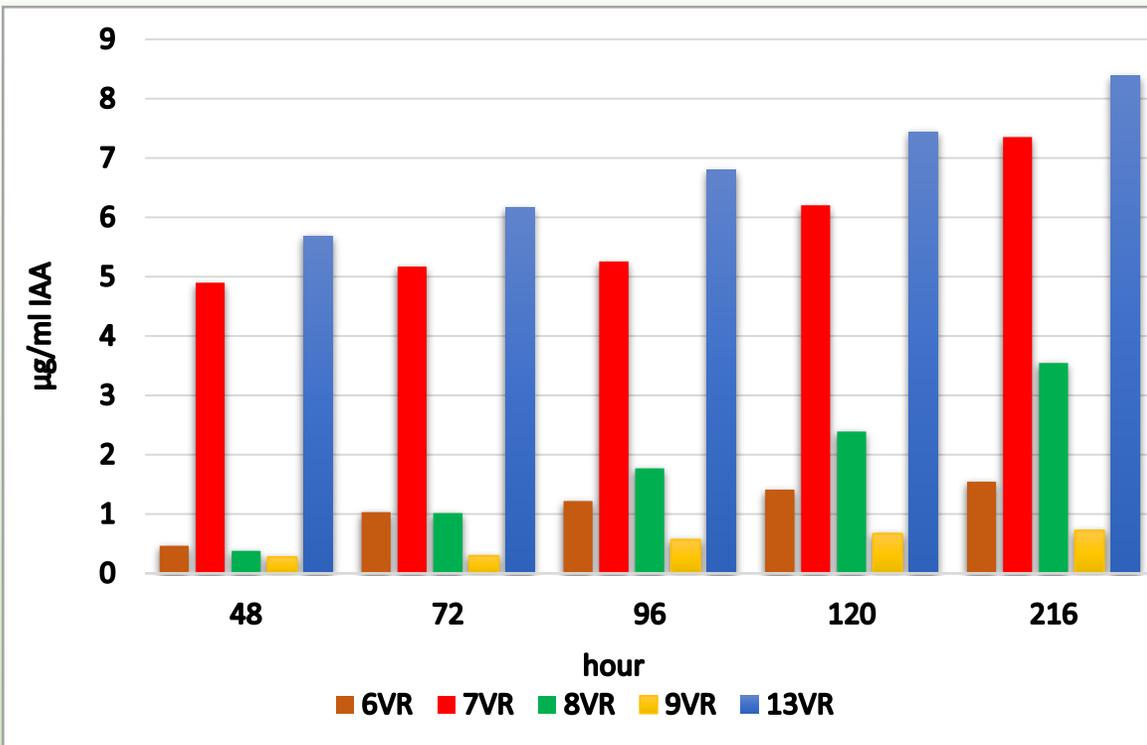


Fig. 3: IAA production during the batch fermentation process by five *Bacillus* strains.

The largest amount of IAA production (8.38 µg/ml) was detected at *Bacillus thuringiensis* 13 VR. *Bacillus subtilis* 6VR and *Bacillus pumilus* 9VR are weak producer to IAA (Fig.3).

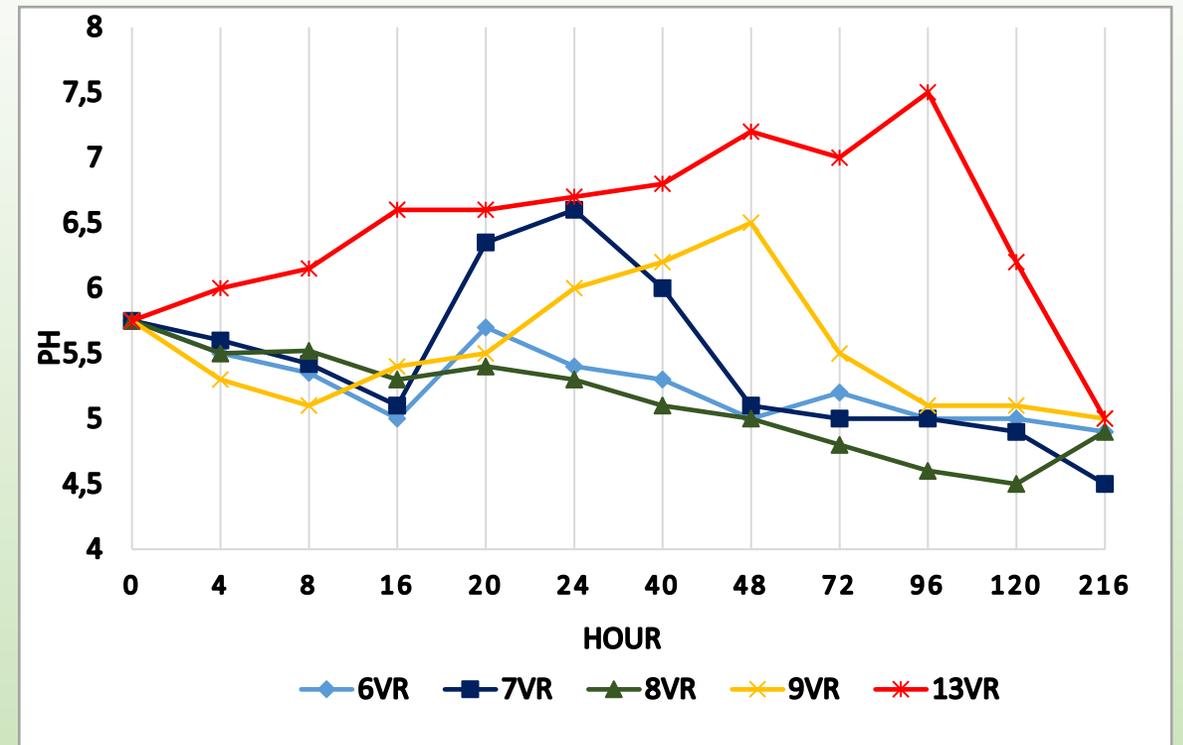


Fig. 4: pH at the 14' media during the fermentation process.

Started pH to the media at the beginning of fermentation process of all studied strains is 5.75. During the fermentation, it is found that with the absorption of glucose in the medium, lead to lower pH at the media (fig.4).

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