

## Effect of Phytohormones on the Development and Nutraceutical Characteristics of the Fruit *Capsicum annum*

**Authors :** Rossy G. Olan Villegas, Gerardo Acosta Garcia, Aurea Bernardino Nicanor, Leopoldo Gonzalez Cruz, Humberto Ramirez Medina

**Abstract :** *Capsicum annum* is a crop of agricultural and economic importance in Mexico and other countries. The fruit (pepper) contains bioactive components such as carotenoids, phenolic compounds and capsaicinoids that improve health. However, pepper cultivation is affected by biotic and abiotic factors that decrease yield. Some phytohormones like gibberellins and auxins induce the formation and development of fruit in several plants. In this study, we evaluated the effect of the exogenous application of phytohormones like gibberellic acid and indolbutyric acid on fruit development of jalapeno pepper plants, the protein profile of plant tissues, the accumulation of bioactive compounds and antioxidant activity in the pericarp and seeds. For that, plants were sprinkled with these phytohormones. The fruit collection for the control, indolbutyric acid and gibberellic acid treatments was 7 peppers per plant; however, for the treatment that combines indolbutyric acid and gibberellic acid, a fruit with the shortest length ( $1.52 \pm 1.00$  cm) and weight ( $0.41 \pm 1.0$  g) was collected compared to fruits of plants grown under other treatments. The length ( $4,179 \pm 0,130$  cm) and weight of the fruit ( $8,949 \pm 0.583$  g) increased in plants treated with indolbutyric acid, but these characteristics decreased with the application of GA3 (length of  $3,349 \pm 0.127$  cm and a weight  $4,429 \pm 0.144$  g). The content of carotenes and phenolic compounds increased in plants treated with GA3 ( $1,733 \pm 0.092$  and  $1,449 \pm 0.009$  mg / g, respectively) or indolbutyric acid ( $1,164 \pm 0.042$  and  $0.970 \pm 0.003$  mg / g). However, this effect was not observed in plants treated with both phytohormones ( $0.238 \pm 0.021$  and  $0.218 \pm 0.004$  mg / g). Capsaicin content was higher in all treatments; but it was more noticeable in plants treated with both phytohormones, the value being  $0.913 \pm 0.001$  mg / g (three times greater in amount). The antioxidant activity was measured by 3 different assays, 2,2-diphenyl-1-picrylhydrazyl (DPPH), antioxidant power of ferric reduction (FRAP) and 2,2'-Azinobis-3-ethyl-benzothiazoline-6-sulfonic acid (ABTS) to find the minimum inhibitory concentration of the reducing radical (IC50 and EC50). Significant differences were observed from the application of the phytohormone, being the fruits treated with gibberellins, which had a greater accumulation of bioactive compounds. Our results suggest that the application of phytohormones modifies the development of fruit and its content of bioactive compounds.

**Keywords :** auxins, capsaicinoids, carotenoids, gibberellins

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