

## INDUCTION OF RESISTANCE IN COMMON BEAN PLANTS "*Phaseolus vulgaris* L." USING DIFFERENT PLANT ELICITORS AGAINST SPIDER MITE "*Tetranychus urticae* KOCH" INFESTATION

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### ABSTRACT

The common bean plants "*Phaseolus vulgaris* L." is frequently attacked by the two spotted spider mite (TSSM) *Tetranychus urticae*, causing a several decrease in bean plant growth and yield. Therefore, for commercial production of bean in the field, controlling mite infestation is necessary. Foliar application of salicylic acid (SA) or methyl jasmonate (MeJA) on common bean plants before or after two spotted spider mite infestation proved to be effective in reducing infestations. In most concentrations these elicitors significantly improved common bean plant growth i.e. had a positive effect on plant height, number of branches, shoot dry weight and leaf area per plant and bean yield. SA at 100 mg/L had the strongest positive effect. Moreover, application of elicitors significantly altered leaflet anatomical characters i.e. increased thickness of leaflet blade, thickness of palisade and spongy parenchyma as well as thickness of midrib region of the leaflet and changed the dimension of vascular bundles, resulting in mite infestation had strongly decreased on these leaflets of new anatomical characters. We conclude that both elicitors, in particular, 100 mg/L SA could be used for controlling *T. urticae* infestation, to improve plant growth and to improve bean yield and its quality in the field.

**Keywords:** Salicylic, Methyl Jasmonate, Two spotted spider mite (TSSM), Bean, Leaf Anatomy.

### INTRODUCTION

Common bean (*Phaseolus vulgaris* L.) is one of the most popular vegetable crops and hence a fundamental source of proteins for human consumption. For example, in Egypt, common bean export reached about 24704 tones in 2006 (FAO, 2009). The *two spotted spider mite* (TSSM), *Tetranychus urticae* Koch (Acari: Tetranychidae) is considered a major pests on different agricultural crops including bean plants. Globally, around 1,200 species of spider mites are known to be pest on different crops (Zhang, 2003), but TSSM is the most polyphagous of all and has been reported on over 150 host plant species of economic value (Zhang, 2003; Wilkerson *et al.*, 2005). TSSM feeds by puncturing cells with its stylets and draining the contents, thereby producing a characteristic yellow specking of the leaf surface. This chlorotic damage reduces the plant's ability to build carbohydrates via photosynthesis which consequently results in reduction of the total yield of vegetable crops. Moreover, following two spotted spider mite infestation secondary infestation by pathogens often causes substantial