

Effect of Ultrasound on Selected Plant Germination

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Abstract

The effect of ultrasound on plants has been shown by limited number of researchers. This article presents data on effect of ultrasound on seedlings of chickpea and fenugreek experimented in less favorable temperature ranging from 9.0-16.0 °C. The exposure was done in seedlings semi-buried in moist coco peat. The results indicated that 23% of chickpea (n=31) that had ultrasound exposure (30-55 kHz/ 5' for 2 consecutive days) had germination root length (>1.5cms) as compared to 14% in control (n=28). The effect in Fenugreek was the opposite that control seedlings had better growth than the exposed seedlings (30-55 kHz/ 5' for 2 consecutive days). The effect of ultrasound (30-55 kHz/ 30' one time) on germinating garlic indicated positive effect that weaker seedlings can benefit from the treatment. Hence to conclude, it could be stated that seeds with bigger bulk mass like chickpea, had positive effect whereas seeds with lower bulkmass like fenugreek had negative effect at treatment dose 5'/30-55 kHz and garlic had positive effect at 30' / 30-55kHz. Possibly it also reiterates the proven concept that longer exposure is beneficial than a shorter exposure.

Keywords: Ultrasound, Chick Pea, Fenugreek, Garlic, Plant Growth

Introduction

Ultrasound referring to inaudible sound >20 kHz has been used in medicine as well as in agriculture. Comparatively literature citing its use for augmenting plant growth is limited (1,2). The effect of ultrasound has been shown in many plants like pea, rice, chick pea (3,4,5) but mostly for aiding in *Agrobacterium* mediated transformation. Its direct effect on plant growth has been shown by few researchers who have shown it can influence organogenesis. Interestingly it has been shown that longer exposure could have beneficial effect than shorter exposure and plants follow complex nonlinear biological response (6).

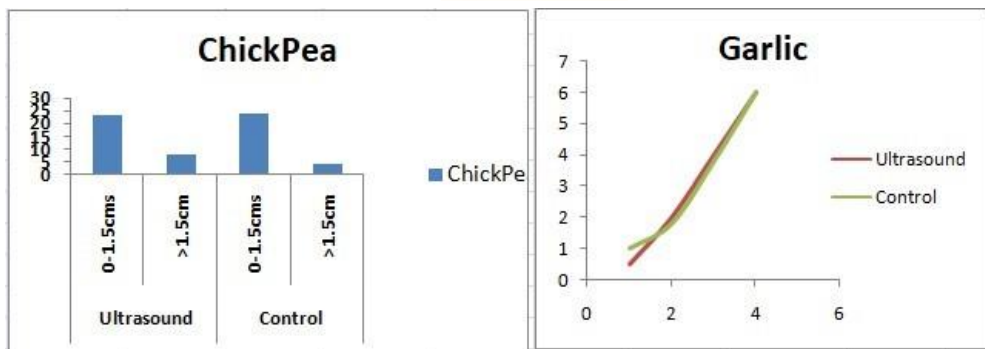
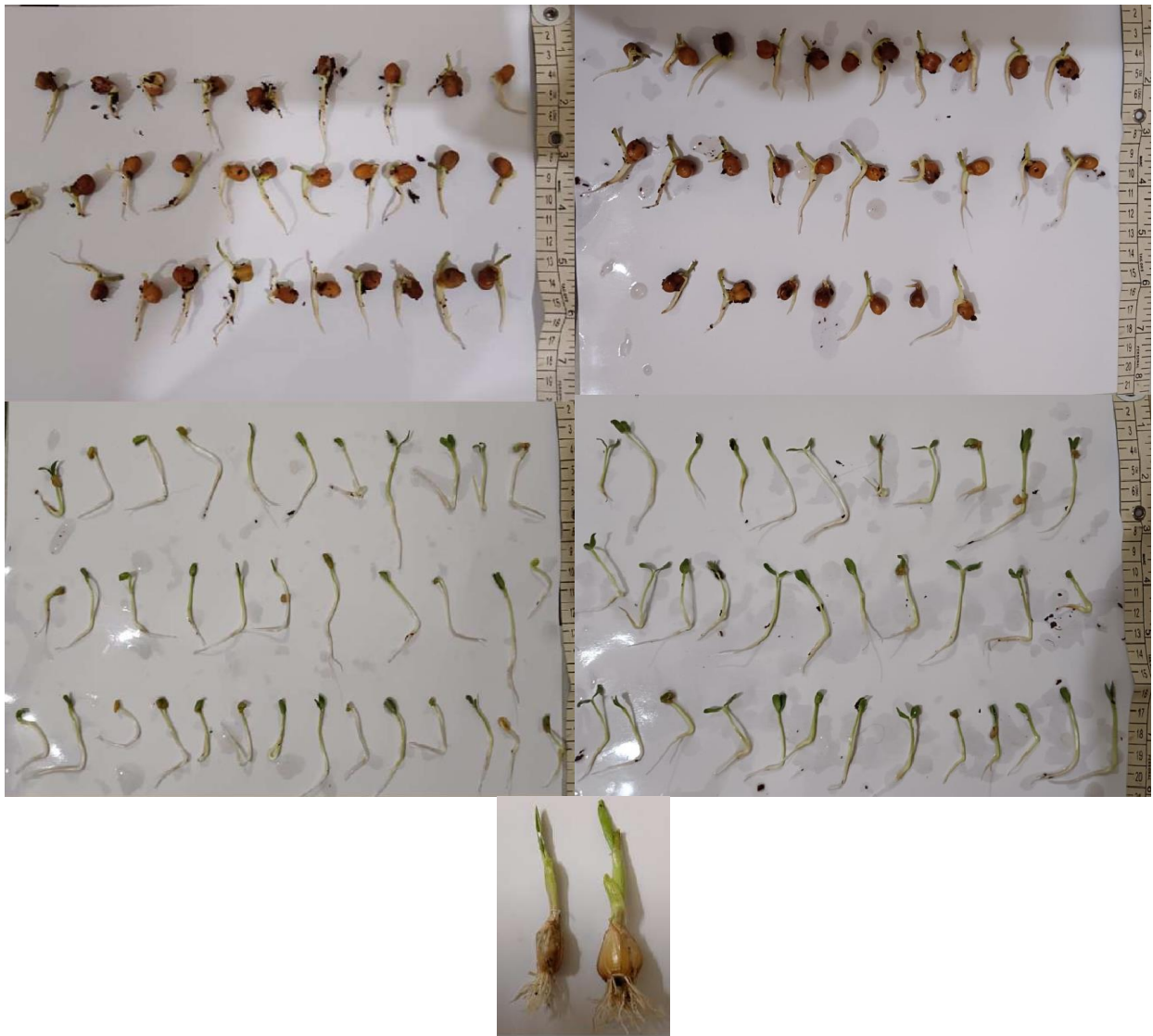
Methodology

Ultrasound home appliance (30-55kHz) used for small mammal replant (rats, bats) was used to expose

selected plant seedlings semi buried in moist coco peat. 5' for 2 days in 48hrs soaked Chick Pea and Fenugreek from top and 30' in germinating Garlic (<1cm) in side angle. The seedlings were let to grow for 10days in less favorable temperature of 9.0-16.0 °C.

Results

Ultrasound exposed Control



Discussion & Conclusion

In literature, the use of ultrasound for plant growth has been documented for augmenting transformation (3,4,5) with *Agrobacterium* and also less cited for its direct effect on plants (1,2). Hence adding knowledge to this less explored field could be beneficial. Our results indicated that seeds with bigger biomass like Chick Pea had beneficial effect and seeds with lower biomass like fenugreek had less beneficial effect. Garlic did have beneficial effect. One reason could be the bulk seed mass or the other reason could be the proven concept of non-linear biological response

(6) with longer exposure having beneficial effect and shorter duration having harmful effects.

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