

***Thymus fontanesii* Bois and Reut Essential Oils use as biopesticide against *Fusarium oxysporum* f.sp. *albedinis* Date Palm *Phoenix dactylifera* Parasite**

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Introduction & Objectives:

Date palm is an essential plant in Saharan regions oasis ecosystem, which is strongly damaged by fungal diseases essentially the Bayud due to *Fusarium oxysporum* f.sp. *albedinis* a serious threat to the date palm (Abass, 2013). Use of chemical biopesticides to fight although they are effective, are dangerous for man and the environment due to their toxicity. Use of essential oils as biopesticide offers an alternative in biological control. *Thymus* is a genus that covers a wide range of biological activities, namely antiseptic, antibacterial, antifungal (Faleiro *et al.*, 2003). *Thymus fontanesii* species antifungal activity is carried out in this investigation.

Methodology (Material and methods):

Leaves of thymus were used for essential oils extraction by hydro distillation. Inhibition test on radial mycelial growth (IR) *Fusarium oxysporum* f. sp. *albedinis* (Foa) is conducted at a range of essential oil concentration (1000, 400, 200, 100, 50, 33.3 and 20 ppm). Mycelial growth was measured daily until this mycelium in control reach dish edge. The inhibition rate (IR) of each is calculated as reported by Hmouni *et al.* (1996). Thyme essential oils bioassay on date palm infected by *Fusarium oxysporum* f. sp. *albedinis* is undertaken on date palms (*Phoenix dactylifera*) leaves collected in natura. Fusariosis evolution is followed and evaluated on explants inoculated with and without treatment and compared to a control (without inoculation).

Results and Discussion:

Thyme essential oil Inhibitory effect on *Fusarium oxysporum* f.sp. *albedinis* mycelial growth: fungus growth is entirely inhibited from 100 ppm suggesting that the *Thymus fontanesii* essential oils minimum inhibitory concentration (MIC) on *Fusarium oxysporum* f.sp. *albedinis* growth is equivalent to 100 ppm.

Thyme essential oil application effect on the of the disease incidence evolution (DI) on leaves: Disease incidence was significantly lower in leaves inoculated and then treated (35%) compared to the untreated leaves (56.66%). Suggesting that the application of the essential oil of thyme is effective to reduce the progression of the disease.

Conclusion:

Thymus fontanesii essential oils reveal an antifungal effect on *Fusarium oxysporum* f.sp. *albedinis* *in vitro* where mycelial growth decreased significantly with oils concentrations increase in and total growth inhibition observed from 100 ppm. In the same way, disease severity of the treated leaves with the *Thymus fontanesii* EO is significantly lower than that observed in non-treated. These results suggest the possibility of exploiting *Thymus fontanesii* EO for their antifungal properties against the Bayud agent.

Keywords: Antifungal activity, Bayud, *in vitro*, *in vivo*, disease.

References

1. Abass MH, (2013). Microbial contaminants of date palm (*Phoenix dactylifera* L.) in Iraqi tissue culture laboratories. Emir J Food Agric, 875-882.
2. Faleiro ML, et al. (2003). Antimicrobial activity of essential oils isolated from Portuguese endemic species of *Thymus*. Letters Appl Microbiol, 36: 35-40.
3. Hmouni A, MR Hajlaoui & A Mlaiki, (1996). Résistance de *Botrytis cinerea* aux benzimidazoles et aux dicarboximides dans les cultures abritées de tomate en Tunisie. EPPO Bulletin, 26(3-4): 697-705.

