**Application of antifungal agents as paclitaxel boosters in** ***Alternaria alternata* isolate MSh *Taxus* strain in submerged fermentation**

Nayereh Sharifi-Ghahfarokhi 1, Mohsen Mobini-Dehkordi 1\*, Sadegh Farhadian 2

1 Genetics Department, Faculty of Science, Shahrekord University

2 Biology Department, Faculty of Science, Shahrekord University

Corresponding author Email: [mobini-m@sku.ac.ir](mailto:mobini-m@sku.ac.ir)

**‌ Statement of Problem:** Despite the fact that paclitaxel is a natural, effective anticancer agent approved by the FDA and included in the WHO's essential medicines list (EML), it is not widely available due to uneconomical and unsustainable industrial production based on low-growth and low-yielding *Taxus* trees. The fact is that endophytic paclitaxel-producing fungi will be a cheap and environmentally benign way to scale up industrial production through production enhancements.

**Research Purpose:** Increasing paclitaxel production in an endophytic fungus, *Alternaria alternata* isolate MSh *Taxus* strain isolated from *Taxus baccata*, by employing antifungal agents as fungal envelop destabilizers to leak paclitaxel end products from the cell and reduce feed-back inhibition for paclitaxel production.

**Research Method:** Antifungal agents such as clotrimazole and cinnamon methanol extract were added to 5-day-old cultures of *Alternaria alternata* isolate MSh Taxus strain in submerged fermentation using modified YPD media and incubated for 5 days at standard conditions. The amounts of paclitaxel produced were then determined using an HPLC instrument.

**Results and Conclusion:** Cinnamon extract at a concentration of 15 mg/ml raised paclitaxel production from 715.46 mg/l to 1944.78 mg/l, whereas clotrimazole at a concentration of 2µg/ml boosted paclitaxel production from 759.40 mg/l to 1012.09 mg/l. Therefore, treating fungal culture with cinnamon extract will pave the way for microbial industrial production.

**Keywords:** Paclitaxel, Endophytic fungi, Antifungal agent, Natural product.