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**The Thesis Submitted for the Degree of M.Sc (in the field of  
Horticulture Science)**

**Application of *Ganoderma lucidum* spent  
substrate mushroom for greenhouse tomato  
transplantation Newton under hydroponic  
conditions**

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### Abstract

In Iran, a significant amount of spent mushroom compost is produced annually from the culture industry of medicinal and edible mushrooms. and thousands tons of these wastes are burned or discarded every year. Which causes environmental pollution. one of the suitable ways to exploit these wastes is to use them as a raw material for soilless culture substrate to produce tomato seedlings. today, the use of soilless substrates for seedling production is very widespread in the country. this research was conducted in a completely randomized design with 4 replications in the greenhouse of the Faculty of Agriculture, Zabol University in 1399. Experimental treatments include 12 types of substrates including: spent compost of *Ganoderma lucidum* + cocopeat (40 to 60), spent compost of *Ganoderma lucidum* + cocopeat (60 to 40), spent compost of *Ganoderma lucidum* + cocopeat + perlite (70, 20, 10), spent compost of *Ganoderma lucidum* + cocopeat + perlite (50, 40, 10), spent compost of *Ganoderma lucidum* + Palmpeat + perlite (70, 20, 10), spent compost of *Ganoderma lucidum* + Palmpeat + perlite (50, 40, 10), Palmpeat + perlite (75 to 25), spent compost of *Ganoderma lucidum* + vermicompost + Palmpeat (60, 10, 30), spent compost of *Ganoderma lucidum* + vermicompost + Palmpeat (30, 10, 60), spent compost of *Ganoderma lucidum* + vermicompost (50 to 50), spent compost of *Ganoderma lucidum* + vermicompost (70 to 30), cocopeat + perlite (75 to 25) control. the purpose of this study was to investigate the possibility of replacing the spent mushroom compost to produce *Ganoderma lucidum* with expensive imported substrate, along with common compounds in the hydroponic culture system for the production of Newton greenhouse tomato seedlings. the results of this study showed that the highest amount of root wet weight (21.87 g), root dry weight (3.24 g), shoot fresh weight (32.42 g), shoot dry weight (4.83 g), number Leaves (8), seedling height (25.59 cm), stem diameter (4.79 mm), chlorophyll a (0.457 mg / g), chlorophyll b (0.255 mg / g), total chlorophyll (0.713 mg / g) and carotenoids (0.236 mg / g) were recorded in the spent compost bed of *Ganoderma lucidum* + cocopeat + perlite (50,40,10). the highest shoot to root ratio (3.431) in the substrate (cocopeat + perlite (75 to 25) and the highest amount of total soluble carbohydrates (18.5 mg / g fresh weight) in the spent compost of *Ganoderma lucidum* + Palm pit + Perlite (70, 20, 10) were measured. according to the results of this study, the use of *Ganoderma lucidum* spent compost in a suitable and desirable volume ratio improves the qualitative and quantitative characteristics of tomato seedlings produced in the greenhouse. Therefore, the use of this organic compost in soilless cultivation systems is recommended.

Keywords: Cocopeat, *Ganoderma lucidum*, Organic waste, Perlite, Spent substrate mushroom