

Efficacy of Botanicals and Hot Water treatment on production of *Pleurotus florida*

Nitu Nayak; Reshmi Rani; Susmita Jha; Siddhi Datri; Ravi Jha; Prabhat Singh & Atul Singh

Department of plant pathology, Sam Higgin bottom Institute of Agriculture, Technology and Sciences (Formerly AAI-DU) Allahabad, India

Email: mailnayak2nitu@gmail.com

Abstract:

An experiment was conducted in Mushroom cropping room at department of plant protection SHIATS, Allahabad. Different botanical extracts that are Lantana camara, Azadirachta indica, Aloe vera, Saraca indica, Tagetes patula and hot water (60-80°C) were taken and substrate for mushroom remained soaked with those extracts for 24 hrs excluding control were taken to check the efficacy of botanicals and hot water on mushroom yield. Later the spawn bags were transferred to the mushroom cropping room where the temperature and relative humidity were maintained at 28-30°C and 80-95% respectively by the application of water in the cropping room and substrate twice a day. After continuous study result revealed that the substrate treated with hot water were having maximum mushroom yield in compare to treatment with botanicals and control.

Key words: Random complete block design; hot water treatment; botanical extract; substrate

Introduction: A **mushroom** (or toadstool) is the fleshy, spore-bearing fruiting body of a fungus, typically produced above ground on soil or on its food source (<https://en.wikipedia.org/wiki/Mushroom>).

Mushrooms have been cultivated since ancient times for their nutritional value and flavour especially in the far eastern countries. The protein found in mushrooms is less than in animals but much more than in most plants. They have low fat content, high fibre and all essential amino acids and with the exception of

iron, contain all important minerals too (Sadler, 2003). This low cost vegetable is not only packed with nutrients like vitamin D but also has properties to ward off cancer, HIV-1 AIDS and numerous other diseases (Beelman et al., 2003).

The **oyster mushroom**, is a common edible mushroom. It was first cultivated in Germany as a subsistence measure during World War I and is now grown commercially around the world for food. The oyster mushroom is one of the more commonly sought wild mushrooms, though it can also be cultivated on straw and other media. (https://en.wikipedia.org/wiki/Pleurotus_ostreatus)

The nutrition in oyster mushrooms is very high. The nutritional information for a 100 gram or 3.5 ounce serving of oyster mushrooms has only 33 calories and 0.4 grams of fat. These mushrooms also contain 6.4 grams of carbohydrate and 33 grams of protein per serving. The nutrients in mushrooms will vary if you serve it up in a lot of fat or with other accompaniments like bread or meat. Oyster mushrooms are also suitable additions to the diet of people with obesity, diabetes and high blood pressure. Extract from the pink oyster has shown to stop the proliferation of cancerous cells. Oyster mushrooms are also known to benefit people trying to quit tobacco products or even counter the Hepatitis C virus. (<http://www.diethealthclub.com/health-food/oyster-mushrooms.html>).

Lantana camara is a small perennial shrub which can grow to around 2m in height and forms dense thickets in a variety of environments. *L. camara* also excretes chemicals (allelopathy). Studies conducted in India have found that *Lantana* leaves can display antimicrobial, fungicidal and insecticidal properties.

(https://en.wikipedia.org/wiki/Lantana_camara)

Azadirachta indica Neem is the name of indigenous tree which is found to be very advantageous to the people. The inhibition of cholinesterase activity leads to the accumulation of acetylcholine at synapse, causing over stimulation and disruption of neurotransmission in both central and peripheral nervous system (Namba et al. 1971; Menzoni et al., 2004).

Aloe vera provides the beneficial natural phytochemicals and polysaccharides that are necessary for superior plant intelligence. Plant know what they want, and so they respond positively with a happier growth thanks to an enriched soil fertility. (<http://www.aloeverafertilizer.com>)

Saraca indica (family Caesalpinaceae) also known as *Saraca asoca* is one of the most ancient sacred plants widely distributed throughout the Indian subcontinent. Various medicinal uses of *Saraca indica* had been reported in Charaka Samhita (100 A.D.). Different parts of the plant exhibit a number pharmacological effects like antihyperglycemic, antipyretic, antibacterial, antihelmintic, activity, and so forth. (<http://www.hindawi.com/journals/omcl/2015/205360>)

Tagetes patula is a species in the daisy family (Asteraceae). The flower is an annual, occasionally reaching 0.5 m by 0.3 m. In some climates it flowers from July to October.

Material and Method

The study was conducted during the period Sep- Nov 2014 at the laboratory of department

of plant pathology at SHIATS, Allahabad. Hot water and different plants were taken to evaluate the efficacy. Plants taken were *Lantana camara*, *Tagetes spp*, *Azadirachta indica*, *Saraca indica* and *Aloe vera*.

Plant extracts

The extracts were prepared from leaves of selected plants. The leaves were thoroughly washed and then sun dried for two days and were grinded by the means of mixture to make it powder form.

Hot water treatment

In this process 2kg chopped paddy straw was boiled in plant pathology laboratory, SHIATS. It has been boiled for 3hrs at 60-80°C. Afterward it was left to cool and after cooling spawning was done.

Control

No any treatment has been applied to control substrate.

Collection of spawn

Sorghum bicolor was used as a spawn substrate which was purchased from SHIATS, Allahabad. Inoculation of substrate was made with spawn of *Pleurotus spp florida@10g/0.5kg* per w/w basis under aseptic condition.

Substrate preparation and treatments

Seven month stored paddy straw was selected as a substrate for the cultivation of *Pleurotus florida*. Paddy was chopped into 1-2cm long pieces and

were soaked for 20hrs with different plant extracts and hot water separately. Seven different treatments were prepared after inoculation that is *Lantana camara* (T₁), *Tagetes patula* (T₂), *Azadirachta indica* (T₃), *Saraca indica* (T₄), *Aloe vera* (T₅), Hot water treatment (T₆) and control (T₇). The treatments were arranged in random complete block design pattern. Later the bags were transferred

to the mushroom cropping room where the temperature was maintained at 28-30°C.

and spraying the substrate bags with water twice a day in morning and evening.

The relative humidity inside the cropping room kept as high as 80-95% by watering the floor

Comparative study on yield of mushroom in different flushes

	LANTANA(T1)			MARI GOLD(T2)			NEEM(T3)			ASHOKA(T4)			ALOEVERA(T5)			HOTWATER(T6)			CONTROL(T7)								
	flush1	flush2	flush3	flush1	flush2	flush3	flush1	flush2	flush3	flush1	flush2	flush3	flush1	flush2	flush3	flush1	flush2	flush3	flush1	flush2	flush3						
total	3.7g	4	3.26	total	4.03	3.01	3.05	total	9.51	6.14	7.24	total	4.18	3	3.2	total	5.67	3.14	3.92	total	12	11.1	14	total	0	0	0



fig1: fruiting in lantana



fig2: fruiting in Tagetes



fig3: fruiting in Azadirachta



fig 4: fruiting in Saraca



fig 5: fruiting in Aloe vera



fig 6: fruiting in hot water treatment bag



fig 7: no fruiting in check bag

Yield of oyster mushroom

There were significant effects of the substrate treatment with plant extracts and hot water on the yield of oyster mushroom. The fruit of oyster mushroom was harvested in three flushes. Different treatments yield respectively, *Lantana camara* (T1) yields 3.7g, 4g and 3.26g, *Tegetes patula* (T2) yields 4.03g, 3.01g and 3.05g, *Azadirachta indica* (T3) yields 9.51g, 7.14g and 7.24g, *Saraca indica* (T4) yields 4.18g, 3g and 3.2g, *Aloe vera* (T5) yields 5.67g, 3.14g and 3.92g, hot water treatment(T6) yields 12g, 11.1g and 14g in three flushes, and control(T7) was infected by *Rhizoctonia spp* hence no yield was received .

Result and discussion

Finally the result revealed that mushroom yield was maximum in hot water treatment in compare to plant extract treatment and control. Hence, hot water treatment is economical and efficient for farmer to use rather than to use others.

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