27/8/2020
Tulkarm

An-Najah National University

Plant production and protection

Graduation Project

Growing Oyster Mushroom *Pleurotus ostreatus* on Different Substrates

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Introduction:

- Oyster mushrooms are a type of fleshy edible fungi and having excellent flavor and taste.
- They are one of the most widely consumed mushrooms in the world, especially in south east Asia, India, Europe and Africa (Mandeel Q, Al-Laith A, Mohamed S, 2005).
- It is the third largest commercially produced mushroom in the world. (Obodai M, Cleland-Okine J, Vowotor K, 2003)
- China produces 85% of all oyster mushrooms all over the world (Chang S-T,1999) .
- They get their name from their oyster-shaped cap and very short (or completely absent) stem.
- They come in several other colors including yellow and pink!

Introduction:

Scientific classification

Scientific name	Pleurotus ostreatus
Kingdom:	Fungi
Phylum:	Basidiomycota
Class:	Agaricomycetes
Order:	Agaricales
Family:	Tricholomataceae

Oyster mushroom parts:

- **The cap.**

- **The gills.**

- **The stem.**

Mushroom's Nutritional Contents:

water	85-95%
protein	3%
carbohydrates	4%
fats	0.1%
minerals and vitamins	1%

(Z.A. Shah , Et Al, 2004)

- Cholesterol free
- Low sodium
- Low calorie
- Fat free

- Mushrooms are useful against diabetes, ulcer and lungs diseases.

(Z.A. Shah , Et Al, 2004)

- Have medicinal properties like anticancerous, anticholesteral, antitumorous.

Why is the Oyster mushroom Pleurotus spp. ?

1. Shorter growth time.
2. Ease of planting and no additional equipment required.
3. The substrate used for their cultivation requires only pasteurization.
4. Used medias are cheap raw materials and giving high yield.
5. P. ostreatus demands few environmental controls.
6. Fruiting bodies are not often attacked by diseases and pests.
7. It can be cultivated in a simple and cheap way (Sánchez C. ,2010).

Mushroom medias:

The Oyster mushroom Pleurotus ostreatus is characterized by its rapid growth on argo-wastes such as wheat straw, Wheat Bran, sesame meal, Coconut, wood shavings and wheat hay.

In this project we highlighted on 3 substrates:

	wheat straw Unit on DM	**wood shavings** Unit on DM	**Wheat hay** Unit on DM
lignin	11-22.9 %	31.15%	11-22.9 %
Cellulose	33.7-40 %	32.09%	33.7-40 %
water holding capacity	low	high	high

(T.S.Khan, Et Al, 2012)
(F.Cotana, Et Al, 2013)

Objective:

The objective of the project is to investigate the cultivation of Oyster mushroom on different agricultural substrates.

Materials and tools:

- 10% chlorine
- White and Black nylon bags
- Mushroom Spawns
- Lime (الشيد)
- Wheat hay (10kg)
- Wood shavings (10kg)
- Wheat straw (10kg)
- Sprinklers
- Hygrometer










Procedure:

- Room cleaning and sterilization.

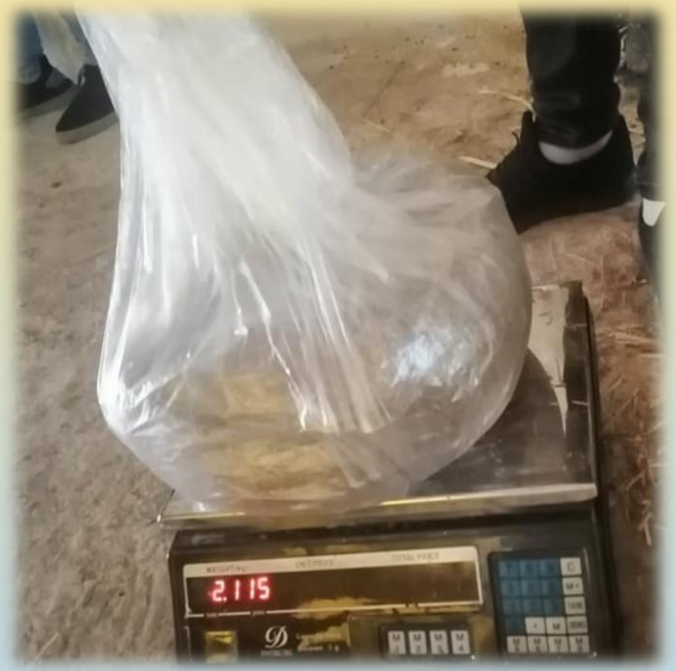
- Boil the agricultural media (straw, hay, and shavings) for (2-3) hours.

- Drying and cooling of agricultural medias.

- Mixing spawns with the media in a certain percentage (each 10kg of media must be mixed with one jar of Mushroom Spawns). (10:1).

- Weigh 10 kg from each medium, then divide it into 5 sections, and weigh every 2 kg in a bag.

- Putting mixtures in white bags and then covering them with black bags.



- Sealing the bags, tying them with ropes and suspending them in the sterile room for a certain period.

- After a period of inspection, fungal growths began to appear, and the black bags were removed.

- Installing a sprinkler system after 25 days from planting in order to maintain humidity, and provide the place with the necessary equipment to measure humidity and temperature and put insect traps.

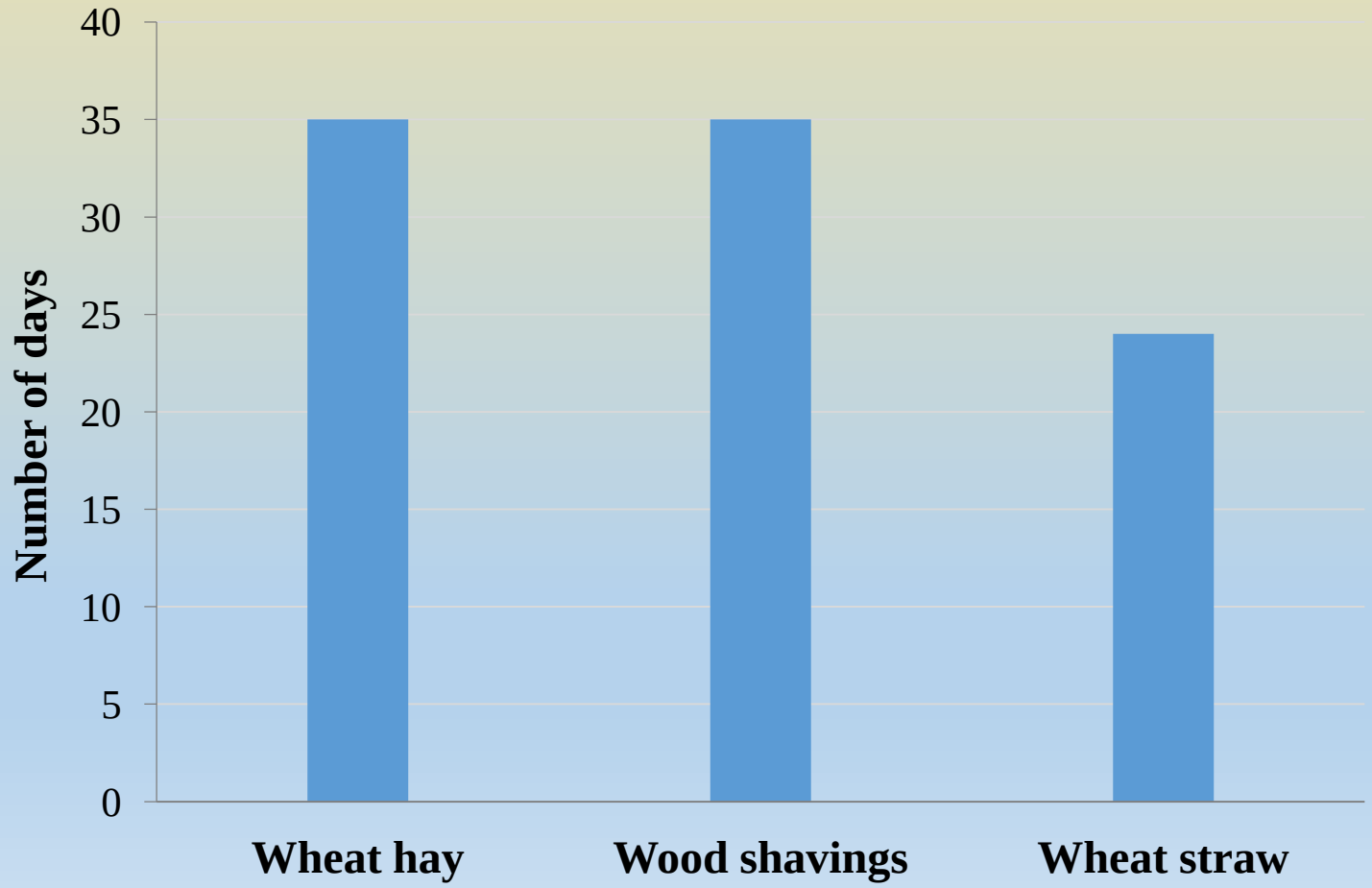
- Laying a net over the roof of the room to protect it from direct sunlight

- As the fungal growths became more visible and enlarged, we made holes in the white bags after 49 days from planting using sterile tools to allow the fungus growth to exit.

- Monitoring for results.

Results:

Fig 1: Number of days for first mycelial growth



Wheat straw

Wheat hay

Wood shavings

After 76 days from planting

Results:

Table 1: The effect of different substrates on mycelial growth **after 76 days**:

Treatment	Germination %
Wood shaving	**93.5^{a}**
Wheat hay	**60.3^{b}**
Wheat straw	**24.5^{c}**

Means that do not share a letter are significantly different.

Fig 2: The effect of different substrates on mycelial growth rate

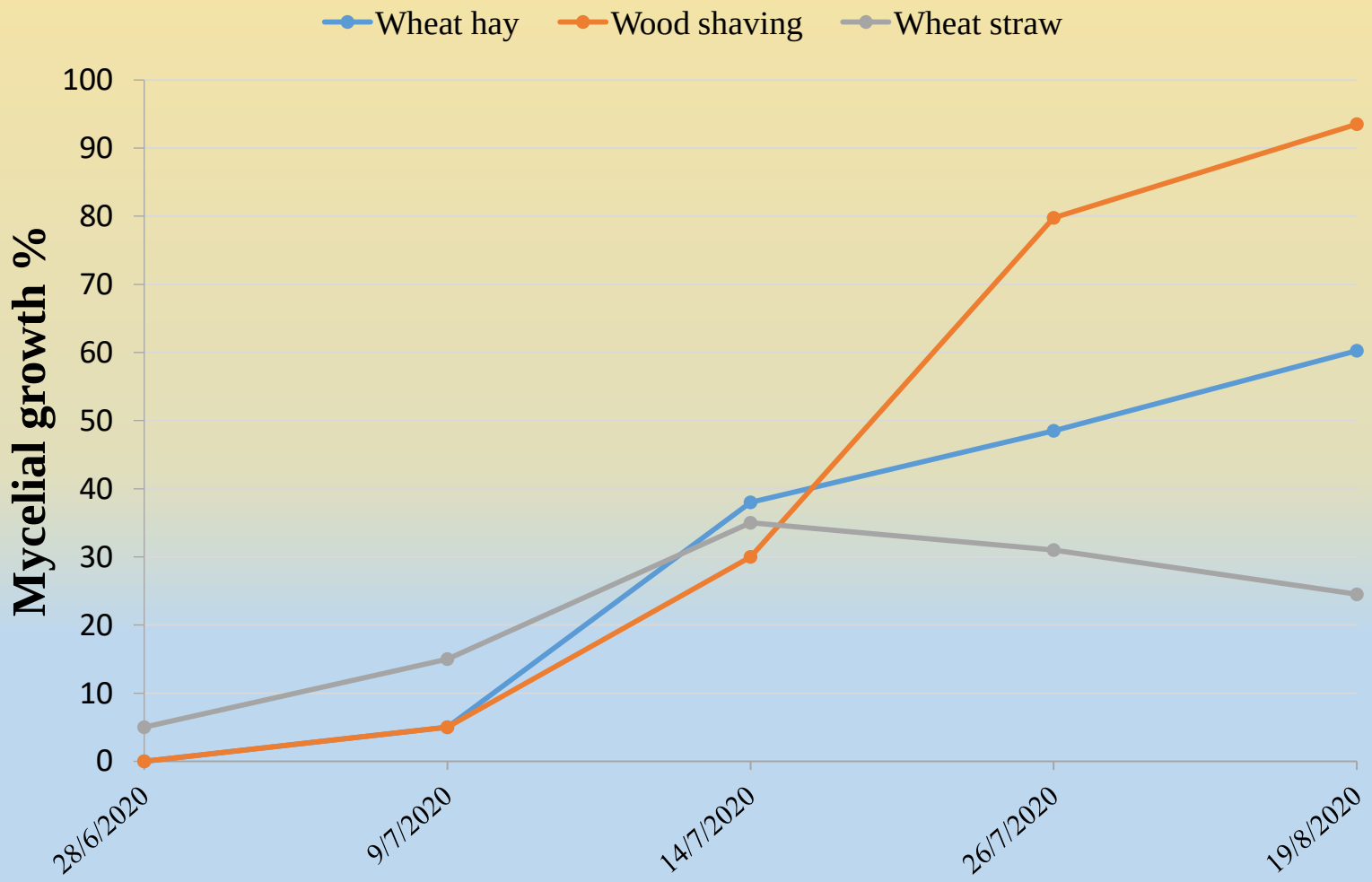
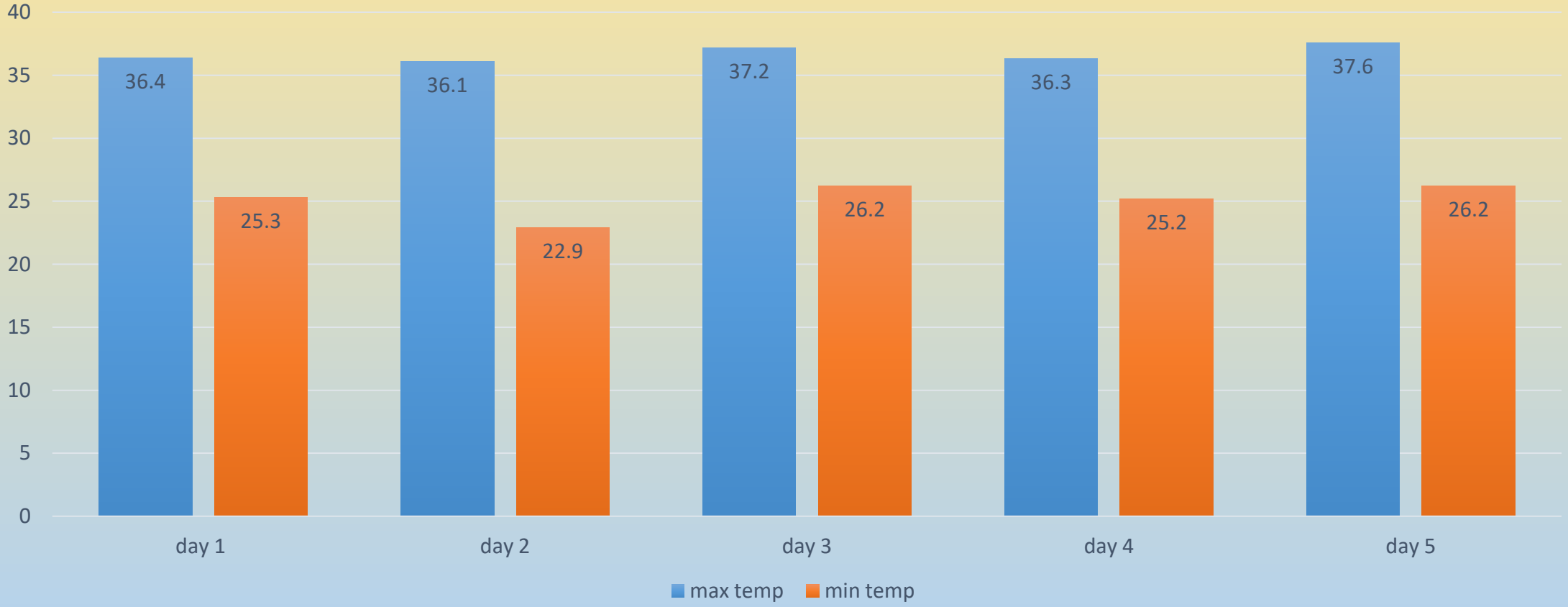


Fig 3: Max and Min temp's of five random days



The highest temperature value of all days was 37.6° on 19/8/2020, and the lowest temperature value of all days was 22.9° on 3/7/2020.
The average temperature value of all days was 30.25°.

Recommendations:

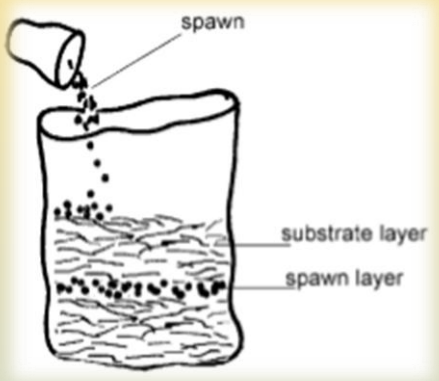
1. Wood shaving is a promising substrate for Oyster mushroom production.

2. Using wheat straw will promote early production.

3. Wheat straw, must be cut into small pieces before boiling.

Recommendations:

5. In wheat straw, it is not allowed to mix when adding spawns, but rather should be added in layers to get the best result.



6. We do not recommend planting mushrooms during this period (in summer) unless we provide controlled conditions.

7. We need to complete this experience to see the effect of different medias on production, in terms of quantity and quality.

References:

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