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## Antimicrobial property of peach leaves

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**Abstract**

The *Prunus persica* L. Batsch (family Rosaceae) is a deciduous tree. Leaves and the bark of the Peach tree have been used by traditional herbalists to treat gastric and stomach irritations and abdominal tenderness, irritation or congestion. The Peach leaf extracts are also rich in purified glucans, which may protect against environmental toxins. Antimicrobial activity is being considered to be an important and inevitable property especially for cellulosic fabrics used in direct contact with human body. Antimicrobial textiles can improve functionality of textiles articles, especially garments, worn close to the skin. The plant extract containing active substances can be used effectively to make the textiles microbial resistance and to safeguard the fabric from damage by synthetic antimicrobial agents also. The effect of peach leaves extract treatment was tested on samples. Therefore, research on environment friendly antimicrobial agents based on natural products for textile application is gaining worldwide interest.

**Keywords:** Antimicrobial property, microbes, *Prunus persica*, textiles

**1. Introduction**

The *Prunus persica* L. Batsch is a deciduous tree with lanceolate tapering leaves and pink flowers. In 19<sup>th</sup> century, cultivation of Peaches took place in India. Peach is the widely popular and delicious fruit, native to China, from where it spread to rest of the world and grown throughout the warm temperate regions. Peach is a temperate fruit rich in proteins, sugar, minerals and vitamins. Peach fruit have a broad range of nutrients vital for the healthy functioning of the body. It has a wealth of essential nutrients and antioxidants which are valuable in pregnancy and helps in strengthening the immune system.

Peach leaves were used by traditional herbalists for healing sores and wounds, treatment of coughs, bronchitis and abdominal disorders. Tea made from Peach leaves is good kidney cleanser. In *Ayurveda*, juice of Peach leaves is used for the treatment of worms. The bark and leaves of the Peach tree have been used to treat gastric and stomach irritations and abdominal tenderness and congestion. The extract is found to be useful for chronic diarrhoea, dysentery, and chronic hepatitis. Peach tree parts have reported for its useful medicinal properties like antioxidant anti-acetyl cholinesterase, anti-inflammatory, hypermenorrhoea, dysmenorrhoea, leiomyoma, infertility, anti-tumour promoter and anti-oketsu syndrome (stagnation of blood circulations), anthelmintic, laxative, sedative, antimalarial, anticoagulant, antifungal, and anti-allergic (Anonymous, 2015) [1]. The Peach leaf extract is rich in purified a-glucans, which may protect against environmental toxins and microbes.

Chemical and heavy metal finished fabric provide good antimicrobial activity but their applicability is limited due to the factors like toxicity and non-biodegradability. Due to the relatively lower incidence of adverse reactions of herbal agents in comparison with synthetic agents, herbal agents can be exploited as an attractive eco-friendly alternative for textile applications. As regard to the effect of herbal finish on physical properties of the fabric, it is reviewed from literature that use of these finishes improves some physical properties of the fabrics. Herbal treated fabric showed the better property to non-wettability, resistance to abrasion and microbial resistance (Hooda, 2012) [4].

Most of the consumers are very conscious about our hygiene and cleanliness. Therefore, the demand of antimicrobial treated fabric is increasing. Climatic changes and increasing pollutants in the environment also necessitate the antimicrobial treated clothes to protect the body. Hence, there is a great demand for antimicrobial treatment based on non-toxic and eco-friendly bioactive compounds.

Natural herbal products can be useful for antimicrobial treatments since there is a tremendous source of plant with antimicrobial composition to be effective in bringing out herbal antimicrobial treatments on textile. These herbal substances can also be used as renewable sources at household levels.

Although certain natural antimicrobial agents are available, Natural herbal products such as Peach tree extracts treatment can be used for anti-microbial finishes since there is a tremendous source of medical plants with anti-microbial composition to be effective in bringing out herbal textiles.

Peach leaves extract has anti-microbial activity against various micro-organisms. Peach leaves is used to provide anti-bacterial effects when it is applied on bandages, surgical masks, gowns, apparel, nappies, and tampons and so on. The present study was conducted to check the antimicrobial property of peach leaves for microbial resistance with following specific objective:

- Determination of antimicrobial property of Peach leaves

## 2. Materials and Methods

Two types of materials namely cotton woven fabric and leaves of Peach tree were procured.

The cotton fabric in grey state exhibiting light to medium weight was selected for the study and the fabric was procured

from Shop no. 19, Teliyan Pull Market, Hisar. To ensure complete wetting and uniform absorbency of the extract, pre-treatment was given to the fabric i.e. desizing and scouring. Green leaves of Peach tree (*Shaan-E-Punjab*) were collected, washed, shade dried and grinded to make into a fine powder. Extract was prepared by cold aqueous maceration. Peach leaves extract was analysed for yield percentage and antibacterial property at different concentrations. Extraction of Peach leaves was done at two different time periods. The yield percentage of 24 hrs. was found to be higher than that of 12 hrs. 5mg/ml concentration exhibited strong zone of inhibition. Therefore, 24 hrs. time period and 5mg/ml concentration was continued for application of treatment on desized and scoured cotton woven fabric by exhaust method.

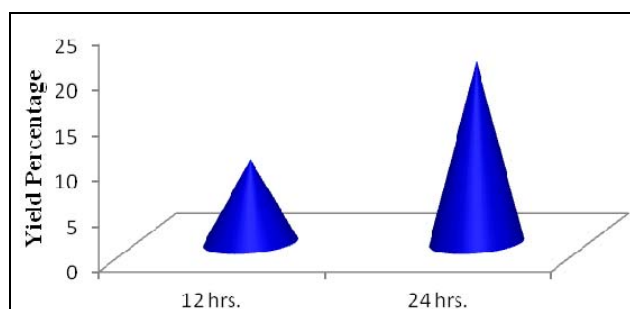
## 3. Results and Discussion

### 3.1 Determination of yield percentage of Peach leaves extract

Yield percentage was calculated in terms of air dried powder weight of the plant material as indicated in Table 1 & Fig. 1. The yield of the aqueous extract obtained for 12 hrs. was 9.20 (%) and for 24 hrs. was 20.11(%). It was evident that in case of 24 hrs. better yield percentage was obtained. Accordingly, the extraction time of 24 hrs. was selected for research.

**Table 1:** Determination of yield percentage of Peach leaves extract at different time periods

Plant source	Method of extraction	Time period (hrs.)	Weight of the air dry powder (g)	Weight of the extract (g)	Yield Percentage (%)
Peach leaves	Maceration	12	100	9.20	9.20
		24	100	20.11	20.11



**Fig. 1:** Determination of yield percentage of Peach leaves extract at different time periods

### 3.2 Antibacterial property of Peach leaves extract at different concentrations

Antibacterial property of Peach leaves extract at different concentrations was tested by using agar well diffusion method against growth of cellulose degrading bacteria i.e. *Bacillus spp.* The concentrations were 1mg/ml, 3mg/ml and 5mg/ml. The results were obtained in terms of zone of inhibition and interpreted as no inhibition, weak, moderate and strong.

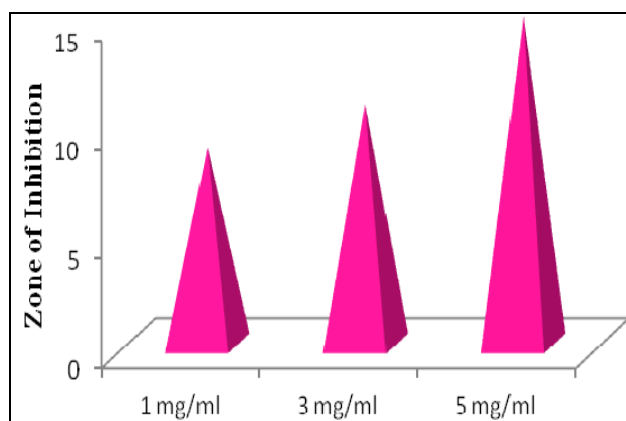
The data revealed that sterilized distilled aqueous kept as control had no inhibition. The concentrations 1mg/ml and 3mg/ml exhibited moderate zones of inhibition i.e. 9mm and 11mm respectively while 5mg/ml concentration had a strong zone of inhibition i.e. 15mm against *Bacillus spp.*

Thus, with an increase in the concentration of Peach leaves extract, its zone of inhibition indicating antibacterial property was also increased.

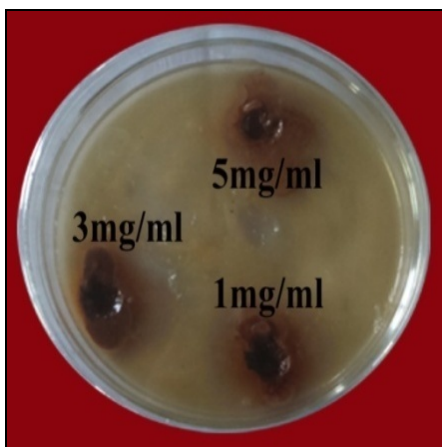
**Table 2:** Antibacterial property of Peach leaves extract at different concentrations

Peach Leaves Extract Concentrations	1mg/MI	3mg/MI	5mg/MI
Zone of inhibition* (mm)	9	11	15
Control (sterilized distilled aqueous)	No Inhibition		

\*No activity (-mm), weak (<6mm), moderate (7-12mm) and strong activity (>12mm) (Dey *et al.*, 2010) [2]



**Fig. 2:** Antibacterial property of Peach leaves extract at different concentrations



**Plate 1:** Zone of inhibition of Peach leaves extract at different concentrations

The results highlighted that maceration conducted for two different time periods i.e. 12 hrs. and 24 hrs. gave 9.20 (%) and 20.11(%) yield respectively. The increase in yield percent with an increase of time may be due to more phytochemical extraction or due to increase in keeping time. The results are similar to the results obtained by Ahmad (2010) <sup>[6]</sup> who reported increase in mass yield percent of *Syzygium cumini* (L.) extract with increased length of extraction period. Wasif and Ruble (2007) <sup>[5]</sup> also reported that increase in concentration showed better zone of inhibition to bacterial presence as compared to lower concentration. Gupta (2016) <sup>[3]</sup> also revealed that the activity of the treated samples increases with the increased in extract concentration.

#### 4. Conclusion

Serviceability of the textiles is the first requisite for consumers. The antimicrobial property of textiles is being considered to be an important and inevitable parameter for their serviceability. The antimicrobial treatments are given to textile materials for two purposes as to protect the wearer and the cotton fabric itself. Peach leaves extract on cotton fabrics is an effective treatment for bacterial resistance. It was found that an increase in the concentration of Peach leaves extract, its zone of inhibition indicating antibacterial activity was also increased.

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