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**Praveen Kumar Pandey**

Himalayan institute of  
Pharmacy and Research, Atak-  
farm, Rajawala, Dehradun,  
Uttarakhand, India

**Sahiba**

Himalayan institute of  
Pharmacy and Research, Atak-  
farm, Rajawala, Dehradun,  
Uttarakhand, India

**Amit Kumar joshi**

Himalayan institute of  
Pharmacy and Research, Atak-  
farm, Rajawala, Dehradun,  
Uttarakhand, India

**Dr. Divya juyal**

Himalayan institute of  
Pharmacy and Research, Atak-  
farm, Rajawala, Dehradun,  
Uttarakhand, India

## ***Castanea Sativa Mill- A review on its phytochemical and pharmacological profile***

**Praveen Kumar Pandey, Sahiba, Amit Kumar joshi, and Dr. Divya juyal**

### **Abstract**

*Castanea sativa mill* local name is sweet chestnut. The family is Fagaceae and sub- family is castaneoideae. They are plant used in Indian traditional medicines for inflammation and swelling, bacterial infections, Diarrhea and Cardiovascular. This weed has been known to possess antibacterial, anti-inflammatory, anti-cardiovascular and anti-bacterial activity. A wide range of chemical compound including eight phenolic compound, tannins, starch, free sugars, fiber, protein, lipids vitamins and minerals, Gallic acid and ellagic acid have been isolated from this plant. The aim of this review article was to summarize the information related to botany, photochemistry and pharmacological activity of the *castanea sativa mill* (sweet chestnut) plant.

**Keywords:** *Castanea sativa mill*, fagaceae, antioxidant activity, antibacterial activity

### **1. Introduction**

The Himalaya plant diversity plays pivotal role. They record of medicinal plant use in the Himalayas found in Rig-Veda. The Rig-Veda, Ayurveda describes the medicinal important of 1200 plant <sup>[1]</sup>. Ayurveda is believed to be subsequently last 5000 years in India. It is one of the most noted systems of medicine in the world. This system is based on the hypothesis that everything present in the universe has composed of five elements viz. space, air, energy, liquid, and solid. These elements present in the human body in combined from like Vata (space and air), pitta (energy and liquid) and kapha (liquid and solid). Vata, pitta and kapha toughter are called tridosha (three pillars of life) <sup>[2]</sup>.

#### **1.1 Plant Description**

*Castanea sativa mill* or (sweet Chestnut) is Fagaceae family, local to Europe and Asia Minor, and generally cultivate all through the clement world. *Castanea sativa mill* attains a Height of 20-35m (66-115ft) with a trunk often 2m (7) in diameter. The *Castanea mollissima*, *Castanea dentata*, *Castanea crenata* dispersed mainly in Japan, China, Korea, U.S, and South Europe <sup>[3]</sup>. The *Castanea sativa mill* is middling large tree may reach 30-35m. The bark is brown-greyish color. The often has net-shaped venations with deep furrows or fissures. Leaves are oblong 8-25cm long and 5-9cm broad. This tree species is monoecious, flowers develop in late June to July <sup>[4]</sup>. The sweet chestnut is warm – clement deciduous species that like a represent yearly temperature range between 8<sup>0</sup> and 15<sup>0</sup> and monthly mean temperature over 10 °C during 6 months. The genus needs a bare minimum rainfall that ranges between 600 and 800mm according to its distribution and interfaces with temperatures. The *Castanea sativa mill* history is old many regions in Asia and in a Europe have a centuries chestnut growing tradition but the establishment of modern orchards generally low-mid mountain hilly areas are preferred <sup>[4, 5]</sup>. *Castanea sativa mill* is the only natural species of the genus *Castanea* in Europe and Turkey <sup>[6]</sup>. the sweet chestnut was widely introduced in the temperate parts of the Indian subcontinent mainly in the lower and middle Himalayas. The sweet chestnuts are characterized by high level of starch and low levels of fat and proteins. There is increase evidence showing that the consumption of chestnut has become more important in human nutrition the health benefits. The *castanea sativa mill* provides the presence of many bioactive components <sup>[7]</sup>. the sweet chestnut have a very low fat content and consequently, can be processed by boiling, drying and stored at moderate temperatures without the problems of rancidity. The sweet chestnut can be cultivated in the mid to lower elevations of Himalayan region. The *Castanea sativa mill* (sweet chestnut) flowering takes place in the month of march- April <sup>[8]</sup>.

### **Correspondence**

**Praveen Kumar Pandey**

Himalayan institute of  
Pharmacy and Research, Atak-  
farm, Rajawala, Dehradun,  
Uttarakhand, India

### 1.2 Phytochemical constituent

the isolated from the bark of castanea sativa mill eight phenolic compound (Castalin, Castalagin, Vescalagin, Kurigalin, 5-O- Galloylhamamelase, (3, 5 Dimethoxy- 4-Hydroxyphenol) - 1- O -  $\beta$  - D -(6 - O - Galloyl) Glucose, Chestanin and Acutissimin A [9]. The catanea sativa mill leaves contains in tannins and phenolic compounds. Gallo Tannins-  $\beta$ -Penta-O-Galloyl -D-Glucopyranose. Ellagic Tannins - two C-C coupled Galloyl Ester. Condensed Tannins (proantho cyanides) - Polymer of Flavan -3. The castanea fruits contain starch, free sugars, fiber, protein, lipids vitamins and minerals, as well as other bioactive non-nutrients such as poly phenolics. The high amount of starch responsible for the significant contents of crude energy and

low contents of crude protein and fiber contents the highest amount values of non-essential amino acid in present in castanea sativa mill. The total phenolic contents were more significantly affected by the processing stage factors the Gallic acid content was more affected by the processing stage. The cultivar factors had more of an effect on the ellagic acid contents. The free sugar contents, which were more influenced by the processing stage in both harvests. Significant levels of lutein, lulein esters,  $\gamma$ - tocopherol, vitamin c, for ascorbic and dehydroascorbic acid, respectively were also found in castanea sativa mill [10].

### 1.3 pharmacological activity

S. No.	Author	Activity	Part used	year
1	Avsar C. <i>et al.</i>	Anti-microbial and antioxidant activity [11]	Pollen grains	2016
2	Jukic H. <i>et al.</i>	Antioxidant and antibacterial activity [12]	Fruit	2014
3	Barros L. <i>et al.</i>	Antioxidant activity [13]	Flower	2014
4	Chiarini A. <i>et al.</i>	Cardiovascular activity [14]	Bark	2013
5	Zivkovic Z. <i>et al.</i>	antimicrobial activity [15]	Leave and Bark	2010
6	Neri L. <i>et al.</i>	antioxidant activity [16]	Fruit	2009
7	Basile A. <i>et al.</i>	Antibacterial and allelopathic activity [17]	leaves	2000

### Pharmacological activity

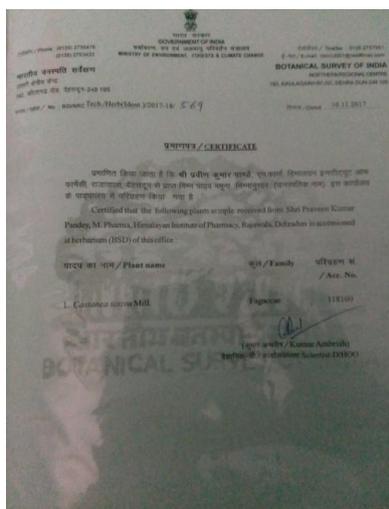
**Antioxidant activity-** the *in vitro* antioxidant activity assays were perform. The lyophilized infusions and decoctions were dissolved in water. The final solution was diluted to different concentration to be DPPH radical - scavenging activity was evaluated using an ELX800 micro plate reader. The calculated as a percentage of DPPH discolourations after that 1 hour of inculation with the antioxidant extract [13].

**Anti-microbial activity-** the disc- diffusion method was used as a screening test for antibacterial activity. The filter paper discs (6 mm in diameter) implemented with sample solution was placed on Mueller Hinton agar plates. The primary separation medium, 2-3 colony of the investigated microorganism were taken with a flamed loop, and then incubated at 37 °C [15]. The suspension for both inoculations was prepared from the broth culture. 1ml of suspension homogenized with 9 ml of melt Mueller Hinton poured into

Petri dishes. Extract diluted in 30% ethanol, the after incubation zone diameters in 0.1mm accuracy and effect was calculated as a mean of triplicate tested. The activity of tested extracts against bacteria [15].

### 2. Material or methods

Local survey and identification leaves and bark of *Castanea sativa Mill* (sweet chestnut) was collected from Nainital, Utrakhand, India. The plant was identified and authenticated by, Senior Scientist a National botanical survey of India, Northern Regional Center, 192, Kaulagarh Road, Dehradun - 248195. set of the sample was deposited in the herbarium of botanical survey of India. A voucher /No. BSI/NRC tech/herb (ident)/2017-18/569 is deposited in the herbarium. The identify of *Castanea sativa mill* (sweet chestnut), the information was collected to local people of several areas. The identification of plant species and the use of indigenous medicinal plant.



### 3. Conclusion and discussion

Although the plant grown in debris heap and in waste places, the plant is used as an important medicinal science a long period of time In view of the wide-ranging medicinal value of

castanea sativa mill plant as described in ayurvedic literature, different parts of the plant such as com, seeds, leaves, fruits and bark resin used to cure various ailments such as antioxidant, antibacterial. these are study concluded that

castanea sativa mill can be valuable plant especially for treatment diarrhea, heart failure, bacterial infection and anti-inflammation. The plant can be thus considered as a shows potential source for the synthesis and development of new molecules.

17. Basile A, Giordano S, Ferrara L. Antibacterial and allelopathic activity of extract from castanea sativa leaves. *Research fitoterapia*. 2000; 71:110-116

#### 4. Reference

1. Gaire PB, Subedi Lalita. medicinal plant diversity and their pharmacological aspects of Nepal Himalayas. *Pharmacognosy journal*. 2011; 3(25).
2. Kokate CK, Purohit AP, Gokhale SB. *Pharmacognosy*, 43<sup>rd</sup> edition nirali prakashan, 2009, 1-5.
3. Ashwar AB, Hmid H. physicochemical, rheological and antioxidant properties of sweet chestnut as affect by pan and microwave roasting; *journal of advance research*. 2017; 8:399-405.
4. Conedera M, Tinner W, Krebs P. *Castanea sativa* in Europe: distribution, habitat, usage and threats, *europear: atlas of forest tree species*, 2016, 78-79
5. Dono Daria. cerutti. K alessandra. *Castanea: department of Agriculture, forestry and food sciences (DISAFA)*. 2014, 2284-4813.
6. Tug NG, Kurt L. An ecological and syntaxonomical overview of castanea sativa and a new association in turkey: *Journal of Environmental Biology*, 2010, 81-86.
7. Muzaffar S, Maqbool K. physico-chemical characterization of sweet chestnut (*castanea sativa* mill) starch grown in temperate climate of Kashmir, India: *Acta alimentaria*. 2016; 45(2):258-267.
8. Rana CJ, Verma DV. Genetic resources of temperate minor fruits: National bureau of plant genetic resources, 2011, 110-012.
9. Mill isabelle, lampire Olivier. Polyphenols isolated from the bark of castanea sativa mill. Chemical structures and auto association, Elsevier science ltd. 1998; 49(2):623-631.
10. Rosa santos, cardosa Ferreira. Chestnut (*castanea sativa* mill) fruit compositions and quality. POCI- programa operacional ciencia inovacao, 2010, 1-176.
11. Avsar C, Ozler H, Civek S. phenolic composition, antimicrobial and antioxidant activity of castanea sativa mill. Pollen grain fro black sea region of turkey *international food research journal*. 2016; 23(4):1711-1716
12. Jukic H, trutic N. antioxidant and antibacterial properties of castanea sativa mill catkins extracts. *International society for horticultural science*, 2014.
13. Caroch M, Barros L, Bento A. castanea sativa mill. Flower amongst the most powerful antioxidant matrices: A phytochemical approach in decoction and infusion; hindavi publishing corporation biomed research international. 2014; (7):232956
14. Chiarini A, Miccuco M. sweet chestnut, bark extract cardiovascular activity and mycytes protection against oxidative damage, *Research oxidative medicine and cellular longevity*, 2013, (3).
15. Zivkovic Z. scavenging capacity of superoxide radical and screening of antimicrobial activity of castanea sativa mill extracts, *research Czech. J food SCI. b*. 2010; 28(1):61-68.
16. Neri L, Dimitri G. chemical composition and antioxidant activity of cured chestnut from three sweet chestnut ecotypes from Italy; *research journal of food composition and analysis*. 2009; 23(1):23-29.