



# JOURNAL OF BIODIVERSITY AND CONSERVATION

Short Communication

## *Flacourtia jangomas* and browning activity

Rakhee Dimri<sup>1</sup> and Sanjeet Kumar<sup>2\*</sup><sup>1</sup>Department of Botany, VSKC Government PG College, Dakpathar, Dehradun, India<sup>2</sup>Biodiversity and Conservation Lab., Ambika Prasad Research Foundation, Odisha, India\*Correspondence Author's email-Id: [sanjeet.biotech@gmail.com](mailto:sanjeet.biotech@gmail.com)

---

### ARTICLE INFO

---

#### Article History

Received: 10 December 2020

Received in revised form: 15 December 2020

Accepted: 28 December 2020

*Keywords:* *Flacourtia jangomas*, Polyphenol compounds, Antioxidants, Nutraceutical, Reducing activity

---

### ABSTRACT

*Flacourtia jangomas* is an important nutraceutical plant belongs to the family Flacourtiaceae. This plant is having many nutritional as well as medicinal values. It is having good antioxidant properties. The authors observed different stages of browning in *F. jangomas* to check the reducing activity of phenolic compounds. The study highlights that the reducing activity of the fruit increases with time and the ripen fruits are seen to be reduced faster than the unripe ones.

### INTRODUCTION

Every cell undergoes oxidation and reduction processes of chemicals. These processes cause the production of free radicals within the cells. Free radicals are very unstable molecules that are produced as a byproduct of biological functions including oxygen consumption and inflammatory activities. They disrupt regular bodily processes by oxidising biomolecules including lipids, proteins, and DNA, which can lead to a

number of disorders. Reactive oxygen species (ROS), also known as oxygen-centered free radicals, such as H<sub>2</sub>O<sub>2</sub> and O, can combine with some transition metal ions to produce the hydroxyl radical (•OH), a highly reactive oxidising species. Cells and tissues sustain significant damage when ROS undergoes oxidation. Plant tissues have many enzymes that detoxify LP products (glutathione Stransferases, phospholipid-hydroperoxide glutathione peroxidase, and

ascorbate peroxidase), scavenge ROS (peroxidases, and glutathione peroxidase), and protect cells under such stress situations (ascorbate, glutathione, phenolic compounds and tocopherols). Exogenous antioxidant intake can aid the body's efficient scavenging of free radicals. Furthermore, several studies have demonstrated a correlation between an increase in dietary natural phenolics and a decreased risk of coronary heart disease, a lower death rate from cancer, and a higher life expectancy (Rahman et al. 2012; Kumar et al. 2013; Kumar et al. 2017a; Kumar et al. 2017b; Kumar and Jena 2017). Additionally, several health-related features of these polyphenolic chemicals, including antioxidant, anticancer, antiviral, and anti-inflammatory activity, have been demonstrated to be helpful. On the other hand, rising interest in naturally occurring antioxidants that exist in plants as secondary metabolites has been sparked by worries

about the safety of routinely used synthetic antioxidants (Dubey et al. 2013; Sasi et al. 2018). The present study, therefore aimed in order to gauge the quantity of natural antioxidants contained in *Flacourtia jangomonas* fruits and to evaluate the browning activity in its unripe and ripe stages.

#### MATERIALS AND METHODS

The authors had visited Sundargarh, Odisha for the conservation and biodiversity documentation in 2020. The fruits and other plants of *F. jangomas* were collected for the further study purposes. For the study of browning activity, four different stages of fruits are taken, those are the most ripen fruit, a little ripen fruit, a little unripe fruit and the most unripe fruit. Then the fruits are cut transversally, kept under open air to get in contact with the environmental oxygen and to complete the browning reaction.



**Figure 1:** Browning activity of *F. jangomas*

## RESULTS

The ripe fruits show more browning reaction as compared to the unripe fruits. The ripe fruit took 4 minutes to get the colour change whereas the unripe fruit took 45 minutes to get that same change of colour. The idea behind it is that fruits turn brown because of a reaction between polyphenolic chemicals and ambient oxygen. The *Flacourtia jangomas* Fruits' Reducing Activity may be a useful indicator of the plant's potential antioxidant activity. Fruits of *F. jangomas* can be employed as a potent antioxidant source and supplement as nutraceuticals since their reducing activity is pretty good.

## DISCUSSION

Sinha et al. (2018) examined using the DPPH method, the antioxidant potential of the ripe fruits of *Flacourtia jangomas* (Lour.) Raeus. and found out that the ethanol-aqueous extract's ability to scavenge free radicals was assessed, as was its ability to reduce power. Total antioxidant activity was assessed using the phospho-molybdenum method. The results were also concentration dependent as the ripe fruits have better antioxidant potential than the unripe fruits. Seal (2014) studied that a very good number of phenolics are present in the benzene, chloroform, and acetone extract of *F. jangomas*, and these substances also exhibit excellent radical scavenging abilities. These wild edible plants might be

used as antioxidant additions or nutritional supplements because the plant extracts are harmless and the use of synthetic antioxidants has been restricted due to their toxicity. Talukder et al. (2012) concluded that free radicals are dangerous because they can take part in unnecessary side reactions because of their chain reaction capabilities, which can lead to cellular damage, food blemishing, etc. The effects of free radicals can lead to life-threatening illnesses like cancer, stroke, and diabetes. Antioxidants are those chemicals that, by eliminating free radical intermediates, can stop these chain reactions.

## CONCLUSION

The therapeutic effects of plants are due to the presence of a variety of bioactive phytochemicals, which may explain why they have historically been used to treat a variety of diseases. An effort has been made in this page to gather and combine information on the ethnomedicinal, phytochemical, and pharmacological aspects of *F. jangomas*, a little studied plant. The crude extracts and chemicals obtained from *F. jangomas* have lately attracted a lot of interest for phytochemical and pharmacological investigations. To create better, safer, and more affordable medications, extensive study is needed to understand the specific mechanism of therapeutic action which will help society

enter the field of complementary and alternative medicine.

## ACKNOWLEDGEMENT

The authors are thankful to Forest and Environment Department, Govt. of Odisha and Ambika Prasad Research Foundation, Bhubaneswar for providing help and support.

## REFERENCES

- Dubey, N., Pandey, V.N. and Tewari, S.K., 2013. Antioxidant potential and phytochemical composition of unripe fruits of *Flacourtia jangomas* (Lour.) Raeusch. Medicinal Plants-International Journal of Phytomedicines and Related Industries. 5(3): 164-167.
- Kumar S and Jena PK. (2017). Tools from Biodiversity: Wild Nutraceutical Plants. Ed: James N Furze et al.: Identifying Frontier Research Integrating Mathematic Approaches to Diverse Systems / Sustainability. Springer, Switzerland. DOI: 10.1007/978-3-319-43901-3-9.
- Kumar S, Behera SP and Jena PK. (2013). Validation of tribal claims on *Dioscorea pentaphylla* through phytochemical screening and evaluation of antibacterial activity. Plant Science Research. 35: 55-61.
- Kumar S, Das G, Shin HS and Patra JK. (2017a). *Dioscorea* spp. (a wild edible tuber): A study on its ethnopharmacological potential and traditional use by the tribal people of Similipal Biosphere Reserve, India. Frontiers in Pharamcology. 8:52: doi:10.3389/fphar.2017.0052.
- Kumar S, Mahanti P, Rath SK and Patra JK. (2017c). Qualitative phytochemical analysis and antibacterial activity of *Dioscorea alata* L.: a nutraceutical tuber crops of rural Odisha. J Alt Med Res. 3(1): 122-122.
- Rahman, M., Habib, R., Hasan, R., Islam, A.T. and Khan, I.N., 2012. Comparative antioxidant potential of different extracts of *Flacourtia jangomas* Lour fruits. Asian Journal of Pharmaceutical and Clinical Research. 5(1): 73-75.
- Sasi, S., Anjum, N. and Tripathi, Y.C., 2018. Ethnomedicinal, phytochemical and pharmacological aspects of *Flacourtia jangomas*: a review. International Journal of Pharmacy and Pharmaceutical Sciences. 9-15.
- Seal, Tapan., 2014. Antioxidant activities of some wild vegetables of North-Eastern region in India and effect of solvent extraction system. Int. J. Pharm. Pharm. Sci. 6(5): 315-319.
- Sinha, D., Srivastava, A.K., Prabhuj, S.K. and Srivastava, G.K., 2018.

Antioxidant potential of the ripe fruits of *Flacourtia jangomas* (Lour.) Raeus. *Medicinal Plants-International Journal of Phytomedicines and Related Industries*. 10(1): 81-83.

Talukder, C., Saha, S., Adhikari, S., Mondal, H.K., Islam, M.K. and

Anisuzzman, M., 2012. Evaluation of antioxidant, analgesic and antidiarrhoeal activity of *Flacourtia jangomas* (Lour.) Raeusch. leaves. *Pharmacologyonline*. 3: 20-28.