Available online on 15.01.2021 at http://jddtonline.info

Journal of Drug Delivery and Therapeutics

Open Access to Pharmaceutical and Medical Research

Open Access Full Text Article

Research Article

Antipyretic Activity of Hydroalcoholic Extract of Leaves of *Colocasia esculenta*

Kushwah Chandrakanta *, Singh Nitu, Goswami Raksha, Jain Nitesh

Oriental College of Pharmacy and Research , Oriental University, Sanwer Road, Opposite Revati Range, Jakhya, Indore (M.P.), India, 453555

Article Info:

Article History:
Received 13 Nov 2020;
Review Completed 23 Dec 2020
Accepted 30 Dec 2020;
Available online 15 Jan 2021

Cite this article as:
Kushwah C, Singh N, Goswami R, Jain N, Antipyretic Activity of Hydroalcoholic Extract of Leaves of *Colocasia esculenta*, Journal of Drug Delivery and Therapeutics. 2021; 11(1):65-67
DOI:http://dx.doi.org/10.22270/jddt.v11i1.4663

*Address for Correspondence:
Kushwah Chandrakanta, Oriental College of Pharmacy and Research, Oriental University, Sanwer Road, Opposite Revati Range, Jakhya, Indore (M.P.), India, 453555

Abstract

In this paper the antipyretic effect of the Hydroalcoholic extract of leaves of *Colocasia esculenta* against Brewer yeast induced pyrexia model in Wistar rats of either sex was investigated. *Colocasia esculenta* (Apiaceae) is a tropical perennial plant. It contain flavonoids, alkaloids, apigenin, anthocyanin, carbohydrates, fiber, minerals, protein, fat, calcium and iron, Fever induced in the animal (rats) by the injection 15%w/v of brewer's yeast suspension (10mg/kg according to body weight of rats) subcutaneously in the back below the nape of the neck. . After 18 hr. of Brewer's yeast injection and rise in rectal temperature was recorded. The temperature of animal was recorded at 0, 1, 2, 3 and 4hr after drug administration. Paracetamol (100 mg/kg p. o.) was used as standard drug. The group received Hydroalcoholic extract 200mg/kg and 400mg/kg showed significant decrease in rectal temperature respectively as compared with the group received standard drug. All the values are expressed as mean ± standard deviation and analysed for ANOVA. Differences between controls, standard ant test groups were considered significant at $P < 0.001$ levels. . The Hydroalcoholic extract of *Colocasia esculenta* leaves (200mg/kg and 400mg/kg) possesses dose dependent, significant antipyretic activity against Brewer yeast induced pyrexia.

Keywords: Antipyretic activity, ethanolic extract, *Colocasia esculenta,* Dunnet's t –test, ANOVA.

INTRODUCTION

The aim of the present context is to evaluate the antipyretic activity of the Hydroalcoholic (Water 30%+alcohol 70%) extract of leaves of *Colocasia esculenta* in brewer yeast induced pyrexia model in Wistar rat. *Colocasia esculenta* (Apiaceae) is a tropical perennial plant. The plant leaves are up to 20 to 150 cm and shape is like elephant ear. [1, 2, 3] *Colocasia esculenta* English name is taro and Hindi name is arvi .It is indigenous in New Zealand, and west to Indonesia. It is cultivated all over India. Plant used as vegetable. [4, 5] The plant is also used in cancer, autoimmune disorders, and heart disease. [6] Taro leaves are quite nutritious and low in calories, replacing higher calorie. Taro flower is used for soups and gruels, gravies and puddings. *Colocasia esculenta* requires moist condition. In the natural habitat. It is commonly found near water sources. It contain flavonoids, alkaloids, apigenin, auteolin, anthocyanin, carbohydrates, fiber, minerals, protein, fat, calcium and iron, starch, magnesium, cholesterol, zinc, sodium, potassium and vitamin A, vitamin C, vitamin E, vitamin K, energy, and pyridoxine (B_6), thiamine (B_1), copper, riboflavin (B_2), folates, niacin, pantothenic acid, manganese, selenium etc. [7] There was no report on the extensive antipyretic study of the *Colocasia esculenta* leaves of this plant species .To the best of my knowledge, this is the first time the leaves are screened for antipyretic study.

MATERIALS AND METHODS

Plant materials

Leaves of *Colocasia esculenta* were collected from local market of city, Indore Madhya Pradesh. *Colocasia esculenta* leaves were authenticated by "Dr. S N Dwivedi, Head of the department of botany, Janata PG Collage, A.P.S. University, Rewa"

Voucher specimen number: J/Bot./2020-0320

Figure 1: Leaves of *Colocasia esculenta*

Animals

Wister albino rats of either sex were selected for the study and weighing 100–150 g. The animals were housed individually in standard cages at room temperature 22±2°C and 50±5% relative humidity (12 h light/dark cycle). The animals were provided the standard feed and water *adlibtum*. The animals were deprived of food for 24 hours before experimentation, but had free access to drinking water. All experiments were performed in the morning. Experimental protocols were approved by our Institutional Ethical Committee which follows guidelines of CPCSEA (Committee for the Purpose of Control and Supervision of Experiments on Animals) and complies with international norms of Indian National Science Academy (INSA).

Chemicals

Chemicals used in the study and it were procured from Central drug house, Delhi. Brewer's yeast was purchased from (Loba Chem, Mumbai) and Paracetamol was obtained for (Central drug house, Delhi). Paracetamol tablet I.P, B. No, GS7L44, Manufacture by Cipla, were used as a standard drug.

Extraction

Leaves were collected from local market of city, Indore Madhya Pradesh. It was dried in shade. The dried leaves were powdered and powder drug weighed (50 g) and filled in Soxhlet apparatus for extraction. The powdered drug was extracted with Hydroalcoholic solvent (30%water + 70% alcohol) until drug was completely extracted.The percentage yield was calculated for extract after drying under vacuum. [8]

Antipyretic activity

The antipyretic activity of the given drug was determined. Divided the animal in four groups each group containing six animals (rats) of either sex were recruited for the study.

Brewer's yeast method

Four groups of six rats were formed. Group I was control groups received normal saline. Group II was standard group treated by Paracetamol (100mg/kg). Group III was test group-I treated rats received leaves extract of herbal drug (200mg/kg). Group IV was test control group-II treated rats received leaves extract of herbal drug (400 mg/kg). All the test drug were administered orally. Fever induced in the animal (rats) by the injection 15%w/v of brewer's yeast suspension (10mg/kg according to body weight of rats) subcutaneously in the back below the nape of the neck. The sight of injection was massaged in order to spread the suspensions beneath the skins. The room temperature was kept at 22-24°C. Immediately after yeast administration, food was withdrawn and rise in rectal temperature was recorded. The measurement was repeated after 30 minutes. The dose of the test compounds and standards drugs was given orally. The rectal temperature was recorded again after 0, 1, 2, 3and 4 hours. [9-16]

Statistical analysis

The study data were expressed as mean SEM. The study data of Antipyretic activity was analysed by one way analysis of variance (ANOVA). P value 0.001 was considered as statically significant.

RESULTS

Table 1: Effect of Antipyretic activity of Hydroalcoholic extract of *Colocasia esculenta* in Brewer's yeast method.

Groups	Treatment	Dose(mg/ kg)	Basal temperature ^{o}F	0 hours	1 hours	2 hours	3 hours	4 hours
I	Control group (normal saline	-	37.08	39.03± 0.155	39.13± 0.160	39.32± 0.184	39.18± 0.136	39.13± 0.150
II	Standard group (Paracetamol)	100 mg/kg	37.43	39.05± 0.107	38.84± 0.177**	38.38± 0.217***	38.18± 0.162***	37.94± 0.191***
III	Test group-I (*C.eculenta*)	200 mg/kg	37.23	39.97± 0.186	38.98± 0.320*	38.74± 0.169**	38.33± 0.179**	38.26± 0.018**
IV	Test group-II (*C.eculenta*)	400 mg/kg	37.30	39.08± 0.226	38.87± 0.212**	38.62± 0.162**	38.29± 0.155**	38.21± 0.175**

All values are mean ±SEM (n=6); *p< 0.05, ** p<0.01, ***p<0.001, when compared to control.

DISCUSSION

Table 1 shows data related to the effect of Hydroalcoholic extract of leaves of *Colocasia esculenta* on yeast-induced pyrexia at different time intervals. Yeast induced fever is called pathogenic fever. Its etiology includes production of prostaglandins, which set the thermoregulatory center at a lower temperature .The present results show that Hydroalcoholic extract of Colocasia esculenta leaves possesses a significant antipyretic effect in yeast-provoked elevation of body temperature in rats and its effect is comparable to that of paracetamol (standard drug). So inhibition of prostaglandin synthesis could be the possible mechanism of antipyretic action as that of Paracetamol.[17]

CONCLUSION

In the present pharmacological evaluation the Hydroalcoholic extract of leaves of *Colocasia esculenta*. Plant was investigated for the antipyretic activity against Brewer's yeast induced pyrexia in rats. At the end of our study, a strong conclusion can be drawn that, the Hydroalcoholic extract of the plant at a dose level of 200mg/kg and 400mg /kg exhibited competent, potent and comparable results. It promotes *Colocasia esculenta* plant as a promising antipyretic plant species, seeking vast multidimensional future research work up to the molecular level to establish new up-to-date scientific data about this plant species and to elucidate its exact mechanism of antipyretic effect.

REFERENCES

1. Sudhakar P, Thenmozhi V, Srivignesh S, Dhanalakshmi M, Pharmacognostic and pharmacological review on *Colocasia esculenta* (L.) schott, Journal of Pharmacognosy and Photochemistry, 2020; 4
2. Al-Kaf AG, Al-Deen AMT, ALhaidari SAA, Al-Hadi FAA, Methanolic and aqueous extracts of *Colocasia esculenta*, were screened for the presence of phytochemical constituents and tested the antimicrobial and antioxidant activity, Universal Journal of Pharmaceutical Research, 2019; 30
3. Nakharekar VG, Berde CV, Secondary metabolites and nutritional value profiling of *Colocasia esculenta*, World journal of pharmaceutical science, 2016; 709-710
4. Amit K, Bidyut M, Phytochemical analysis and Antioxidant activity of *Colocasia esculenta*, International Journal of Chemical and Molecular Engineering, 2019; 20
5. Kubde MS, Khadabadi SS, Farooqui IA, Deore SL, In-vitro anthelmintic activity of *Colocasia esculenta*, Research Library, 2010; 83
6. Manisha K, Sachin P, Navin S, Neuropharmacological activity of hydroalcoholic extract *Colocasia esculenta*, Pharmaceutical Biology, 2010; 1207
7. Md. Reyad-ul F, Md. Saiful Islam A, Md. Munirul I T, Kazi Md. M, , Pharmacological and Phytochemicals of Medicinal Plants of *Colocasia esculenta*, American Journal of Clinical and Experimental Medicine, 2015; 9
8. Subedi NK, Abdur Rahman SM, Akbar MA, Analgesic and Antipyretic Activities of Methanol Extract and Its Fraction from the Root of *Schoenoplectus grossus* Evidence-Based complementary and alternative medicine, 2016; 16-17
9. Fadey O, Adewunmi CO, Antipyretic activity, analgesic, anti-inflammatory activity of derivatives of salicylic acid and anthranilic acid in animal (rats), African Journal of Biotechnology 2004; 427-431
10. Janakiram A, Glara AF, Evalution of antipyretic activity of "Anjavaerathichooranam" in yeast induced pyrexia, International Journal of Medicine and Health Research, 2018; 104-106
11. Bhattacharya A, Behra R, Agrawal D, Sahu PK, Kumar S, Mishra SS, Antipyretic effect of ethanolic extract of *Moringa oleifera* leaves on albino rats, 2014; 74-78
12. Vasundra Devi P.A, Divya Priya S, Antipyretic potential of Ethanol and Aqueous Extract of Root of *Asparagus racemosus* in Yeast induced Pyrexa, Asian Journal And Clinical Research, 2013; 1-4
13. Tayyaba A, Muhammad RK, Bushra M, Antipyretic, anti-inflammatory and analgesic activity of *Acacia hydaspica* R. Parker and its phytochemical analysis, BMC Complementary Medicine and Therapies, 2015; 1-5
14. Pise HN, Jadhav SS, Evaluation of analgesic and antipyretic activity of *Nigella sativa*: an experimental study, National Journal of Physiology, Pharmacy and Pharmacology, 2016; 291
15. Pumima A, Kofi BC, Anti-inflammatory, analgesic and antipyretic activities of *Mimusops elengi* Linn, Indian Journal of Pharmaceutical Sciencess, 2010; 548-550
16. Emdad H, Subhash C, In-vivo antipyretic activity and Phytochemical screening of the Methanol Extract of *Bombax Malabaricum* family is Bombacaceae, Tropical Journal of Pharmaceutical Research, 2014; 56-57
17. Goodman L.S. and Gilman AG. The Pharmacological Basis of Therapeutics. 19th Edn., McGraw-Hill, New York 1996, P 959-975