Antipyretic Activity of Hydroalcoholic Extract of Leaves of Colocasia esculenta

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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, autolein, 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 (B6), thiamine (B1), copper, riboflavin (B2), 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 ad libitum. 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 LP, 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 Soshlet 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 (100 mg/kg). Group III was test group-I treated rats received leaves extract of herbal drug (200 mg/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 (10 mg/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, 3 and 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 °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 (Ceculenta)                      | 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 (Ceculenta)                     | 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 200 mg/kg and 400 mg/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.
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