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ANTIPYRETIC ACTIVITY OF METHANOLIC EXTRACT OF LEAVES OF *QUISQUALIS INDICA* LINN.


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ABSTRACT

The antipyretic effect of the methanolic extract of leaves of *Quisqualis indica* Linn. against brewer yeast induced pyrexia model in wistar rats of both sexes was investigated. Pyrexia was induced by subcutaneously injecting 20% w/v brewer's yeast suspension (10 ml/kg) into the animals' dorsum region. Twelve hours after the injection, the rectal temperature of each rat was measured .The temperature was measured at 0, 1, 2, 3 and 4hr after drug administration. Aspirin (150 mg/kg p. o.) was used as standard drug. The group received methanolic extract 100mg/kg and 200mg/kg showed significant decrease in rectal temperature from 38.40± 0.075 to 37.44 ± 0.0638 and 38.99 ± 0.140 to 37.49 ± 0.038 respectively as compared with the group received standard drug . All the values are expressed as mean ± standard deviation and analyzed for ANOVA and post hoc Dunnet's t-test. Differences between groups were considered significant at $P < 0.01$ levels. . The statistically processed results support the conclusion, that the methanolic extract of *Quisqualis indica* (Linn.) leaves (100mg/kg and 200mg/kg) possesses dose dependent, significant antipyretic activity against brewer yeast induced pyrexia.

Key Words: *Quisqualis indica ,* Antipyretic ,Subcutaneous , Dunnet' s t –test, Anova ,Aspirin.

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INTRODUCTION

The aim of the present context is to evaluate the antipyretic activity of the methanolic extract of leaves of *Quisqualis indica* Linn in brewer yeast induced pyrexia model in wistar rat.

Quisqualis indica Linn. (Combreteceae) is a strong climber, ligneous vine that can reach from 2.5 meters to up to 8 meters. It is commonly known as Rangoon creeper. It is indigenous in Africa, Indo Malaysian region and cultivated all over India. Flower numerous, pendent, 7.5cm long , 3.8cm wide. At first they

are white in color then they become deep red [1]. In Philippines the fruit is used as a vermifuge. The plant is also used as a cough cure. In Amboina the leaves are given in a compound decoction for flatulent distension of abdomen. In India the leaves are given in a compound decoction for flatulent distension of abdomen, seeds are given with honey as an electuary for the expulsion of entozoa in children .In China seed are used as vermifuge , In Indo-china region seeds are used as anthelmintic and for rickets of children .In Thailand seeds used as anthelmintic;. In Bangladesh seeds are used for diarrhea, fever, boils, ulcers and helminthiasis[2]. Leaves contains Rutin, trigonelline ,L-proline ,L-aspargine , and Quisqualic acid whearase flower gum contains Pelargonidin-3-glucoside .Seed Oil contains Linoleic, Oleic ,Palmitic ,Stearic,and Arachidic acids. Ellagitannins, quisqualin A and quisqualin B is present in fruits of this plant[3] and flower contains linalool oxides (furanoid and pyranoid), 2,2,6-trimethyl-6-vinyl-3-oxo-tetrahydropyran, (E,E)-alpha-farnesene, (Z)-3-hexenyl benzoate and benzyl benzoate[4].Four Diphhenyl propanoids were isolated from stem bark of *Quisqualis indica* [5].

There was no report on the extensive antipyretic study of the leaves of this plant species. To the best of my knowledge, this is the first time the leaf was screened for antipyretic study.

MATERIAL AND METHOD

Plant Material

The mature green leaves of *Quisqualis indica* Linn were collected in the morning locally from Jaipur District, Rajasthan ,India, in the month of August 2009. The plant was identified and authenticated by the Botanist, from the Department of Botany, University of Rajasthan, Jaipur, India. A voucher specimen (RUBL20663) is deposited in the Department of Botany, University of Rajasthan.. After authentification fresh leaves were collected in bulk, dried under shade and pulverized in a grinder. The coarse powder was used for further studies.

Animals

Thirty six Wistar rats of both sexes, weighing 150 – 200 g were used for the study. The animals were kept in polypropylene cages in a room maintained under controlled atmospheric conditions. The animals were fed with standard diet (Hindustan liver, Mumbai, India) and had free access to clean drinking water. Pharmacological study was approved by Animal Ethical Committee of School of Pharmacy; Suresh Gyan Vihar University, with CPCSEA Reg no. 1234/a/.08/CPCSEA.

Chemicals

Chemicals used in the study were procured from Central drug house, Delhi. Brewer's yeast was purchased from (Loba Chem, Mumbai) and Aspirin was obtained for (Central drug house, Delhi).

Extraction of plant material and preparation of Test Dose[6, 7,8]

About 500 gm of dry powder was taken in a closed bottle and it was deffatted with Petroleum ether . The deffating was continued for 7-8 days with occasional shaking. The Petroleum ether extract was filtered. The marc left after Petroleum ether deffating was taken out and dried under shade to get a dry mass, then extracted with Methanol by using cold maceration extraction . The extraction was continued for 7-8 days with occasional shaking. The methanolic extract was filtered ,concentrated under reduced pressure to a semisolid mass and was made free from solvent. For in vivo studies, the concentrated methanolic extract of *Quisqualis indica* (MEQI) was administered orally after suspending in normal saline. The freshly prepared solution of MEQI was used in each experiment.100mg/kg

and 200 mg/kg per ml test doses were selected on the basis oral acute toxicity study in mice The dose limits were selected on the basis of previously performed oral acute toxicity studies in mice, in accordance with the OECD guidelines.

Acute toxicity studies:

In the acute toxicity test carried out in mice we take six doses and 10 mice in each dose of methanolic extract i.e. 500, 1000, 1500, 2000 mg/kg body weight. All groups of test drug showed neither any toxic effect nor any lethal effect in the dose range of 500 to 2000 mg/kg body weight. . So we had taken a minimum and maximum dose 100mg/kg and 200 mg/kg of body weight for methanolic extract for further screenings.

Antipyretic activity study[9,10,11,12]

Twenty four Wistar rats of both sexes, weighing 150 – 200 g were used for the study. The animals were kept in polypropylene cages in a room maintained under controlled atmospheric conditions. The animals were fed with standard diet (Hindustan liver, Mumbai, India) and had free access to clean drinking water. Antipyretic activity was measured by Brewer's induced pyrexia model in rats. Rats were fasted overnight with water ad lib before the experiments. Pyrexia was induced by subcutaneously injecting 20% w/v brewer's yeast suspension (10 ml/kg) into the animals' dorsum region. Twelve hours after the injection, the rectal temperature of each rat was measured using a digital thermometer (Sato Keiryoki Mfg. Co., Ltd., Japan). Only rats that showed an increase in temperature of at least 0.7℃ were used for the experiments. Animals were divided in to 4 groups, each containing six animals. Group I served as control (received distilled water), Group II received the standard drug (received Aspirin 150mg/kg) .Group III received methanolic extract (100mg/kg) Group IV received methanolic extract (200mg/kg) The temperature was measured at 0, 1, 2, 3 and 4hr after drug administration. Aspirin (150 mg/kg p. o.) was used as standard drug.

Statistical analysis

All the values are expressed as mean ± standard deviation and analyzed for ANOVA and post hoc Dunnet's t-test. Differences between groups were considered significant at $P < 0.01$ levels. The statistical analysis was carried out using Graph pad Instat 3.0 software.

RESULT AND DISCUSSION

The results were presented in Table 1. (Change in body temperature ;Time in hour) The group received methanolic extract 100mg/kg showed significant decrease in rectal temperature from 38.40± 0.075 to 37.44 ± 0.0638 and and the group received methanolic extract 200mg/kg showed significant decrease in rectal temperature from 38.99 ± 0.140 to 37.49 ± 0.038 respectively as compared with the group received standard drug .And both the dose were found significant to the level of $p<0.01$, when compared with that of standard and control group.

CONCLUSION

In the present pharmacological evaluation the leaf extract (methanolic) of *Quisqualis indica* Linn. plant was extensively investigated for its antipyretic activity against Brewer's yeast induced pyrexia model in rats. At the end of our study, a strong conclusion can be drawn that, the methanolic extract of Quisqualis indica possess Antipyretic activity more or less depending on the dose levels. The methanolic extract of the plant at a dose level of 100mg/kg and 200mg /kg exhibited competent, potent and comparable results promoting Quisqualis indica Linn. 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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TABLES AND FIGURES:

Table 1 Effect of the methanolic extract of Quisqualis indica leaves on yeast-induced pyrexia in rats

Group	*Dose (mg/kg) b. w.*	*Rectal temp. before yeast injection*	*Rectal temp. after drug administration*				
			0h	1h	2h	3h	4h
Control	-	37.08 ± 0.043	39.02 ± 0.041	39.52 ± 0.062	39.79 ± 0.035	39.60 ± 0.033	39.41 ± 0.045
Standard**	150	37.89 ± 0.134	38.92 ± 0.195	38.36 ± 0.106	37.69 ± 0.141	37.33 ± 0.092	37.37 ± 0.058
MEQI**	100	37.69 ± 0.108	38.40 ± 0.075	38.08 ± 0.222	37.51 ± 0.114	37.38 ± 0.078	37.44 ± 0.0638
MEQI**	200	37.78 ± 0.186	38.99 ± 0.140	37.90 ± 0.149	37.42 ± 0.057	37.26 ± 0.056	37.49 ± 0.038

** Extremely significant (P<0.01), * Significant (p< 0.05), ns- Not significant (P> 0.05)

Figure1: Effect of the Methanolic extract of Quisqualis indica leaves on yeast-induced pyrexia in rats