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ORIGINAL RESEARCH ARTICLE

Phytochemical Investigation and Evaluation of Analgesic Activity of *Passiflora edulis* Linn Leaves Available in South Eastern Odisha

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ABSTRACT

The present study was an attempt to investigate the phytochemical constituents and to explore the analgesic activity of various extracts of *Passiflora edulis* leaves . *P. edulis* extracts were screened for phytochemical constituents and evaluated for the analgesic activities by tail immersion method in Swiss Albino mice.all the extracts were tested for analgesic activity at 200mg/kg concentration.and the standard drug in a dose of 50mg/kg body weight of mice. The analgesic activities were well comparable with the standard drug,aspirin. The n-butanol extract of *P. edulis* linn showed better analgesic activity in comparison with other extract and the standard drug. The data were verified as statistically significant by using one way ANOVA (analysis of variance) at 5% level of significance ($p<0.05$).

Key words: *Passiflora edulis*; analgesic activity; aspirin; tail immersion method.

INTRODUCTION

Analgesics are defined as the substances which decreases pain sensation by increasing pain threshold to external stimuli. Noxious pain stimuli can be developed by thermal, chemical and physical pressures.The literature survey reveals that there are no reports on the analgesic activity of the leaf extracts of *Passiflora edulis* species. This prompted the authors to undergo the present study.

The tribal areas of Sosahandi, Koraput (District) of Eastern Orissa, due to its unique varieties geographical and climatic factors has had a rich variety of medicinal plant . *Passiflora edulis Linn* (family: Passifloraceae) also known as passion flower is frecuntly distributed. And extensively used traditionally by the tribal people The purple passionfruit is native from southern Brazil. In India purple passion fruit is harvest in the Nilgiris in the south and in various parts of northern India. The passionfruit vine is a shallow-rooted, woody, perennial, climbing by means of tendrils. The alternate, evergreen leaves, deeply 3-lobed. A single, fragrant yellow colour flower, 2 to 3 in (5-7.5 cm) wide, is borne at each node on the new growth. Traditionally the fruit is used to treat asthma and cough and the juice is considered to be good to the heart [1]. It is used in homeopathic medicine for the treatment of insomnia, epilepsy, tetanus, muscle spasms and leaves presented anxiolytic activity [2] .Folklore claims to have several medicinal properties such as sedative, tranquillizer, diuretic , anti-spasmodic, anti-anxiety [3]. The plant survey also confirms the presence of anti-inflammatory activity, anti-asthmatic,neuropharmacological effects and anti-oxidant property [4] Chemical analysis of the fruit was also done which showed the presence of carbohydrates, ascorbic acid, carotene [5], vitamins,alkaloids, glycosides [6], saponins, tannins & triterpens.

Experimental

Collection of Plant Material

The leaves of *Passiflora edulis* were collected from the tribal belts of the Sosahandi forest of koraput district.The plant was identified, confirmed and authenticated by the V.D .College (Autonomous),Jeypore,Koraput.Odisha by Depat. of Botany Vide Voucher specimen no. (V.N. no - 1105). After authentification leaves were collected in bulk and washed under running tap water to remove adhering dirt. Then the stem barks were shade dried. The dried materials were made into coarse powder by grinding in mechanical grinder.

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Preparation of Extracts

The coarse powder was taken in Soxhlet apparatus and extracted successively with petroleum ether, chloroform, ethanol and n-butanol. The extraction was done for 72 hours. The marc of each extract was dried and used for extraction with successive solvent. The liquid extracts were concentrated separately under vacuum and resulting extracts were kept in desiccator until further [8,9].

Priliminary phytochemical investigation

The crude petroleum ether, chloroform, ethanolic and aqueous extracts were subjected to preliminary phytochemical analysis in order to detect the presence of various groups of phytoconstituents by carrying out the following chemical analysis [9,10].

Table 1: Phytochemical screening of *Passiflora edulis* leaf extract

Extracts	Phytochemicals							
	Alkaloids	Glycosides	Carbohydrates	Steroids	Tannin	Flavonoids	Oil&fats	Saponin
Chloroform	-	-	-	+	-	+	-	-
Ethanol	-	-	-	+	+	+	+	+
Pet . ether	-	-	-	-	-	-	-	-
Water	-	-	-	+	+	-	+	+

+ = Present and - = Absent

Animal care and handling

This was done as per the guidelines set by the Indian National Science Academy, New Delhi. 12-week old healthy Swiss albino mice (20-50gm) of either sex bred locally in the animal house of Jeypore College of Pharmacy were selected for the study. They were housed under controlled conditions with temperature of 23±2°C, humidity 50±5% and 10-14 hours of light and dark cycles, respectively. The animals were housed individually in polypropylene cages containing sterile paddy husk (procured locally) as bedding throughout the experiment and had free access to sterile food (animal chow procured from M/s Hindustan Lever Ltd.) and water *ad libitum*. Animals were caged and all operations on animals were done in an aseptic condition. The approvals for the research work was obtained by the Institutional Ethical Committee vide Regd. No. HPI/07/60/IAEC/0013 dated May 7, 2007.

Standrad Drug used

Group of experimental model (200mg/kg). Aspirin was used as the standard drug in tail immersion model in a dose of 50mg/kg body weight of mice were tested in one dose in each *Passiflora edulis* leaf extract

Analgesic activity

The tail immersion method was used to evaluate the central mechanism of analgesic activity. Here, the painful reactions in animals were produced by thermal stimulus, i.e. by dipping the tip of the tail in hot water. Swiss albino mice were divided into six groups of six animals each. The animals were fasted for 16 hours with *water libitum*. Group-I animals were treated with solvent control, which received the normal saline water through oral route. Group-II animals were treated with reference control, which received aspirin (50mg/kg). Group-III to VI animals were treated with 200mg/kg of various leaf extract of *P. edulis* ,After administration of the above drugs, the basal reaction time was measured in a regular interval of 15 minutes, by immersing the tail tips of the mice (last 12cm) in hot water heated at temperature of 55±1°C. The actual flick response of mice, i.e. time taken in seconds to withdraw its tail tip from hot water source was calculated and the results were compared with that of the control group.

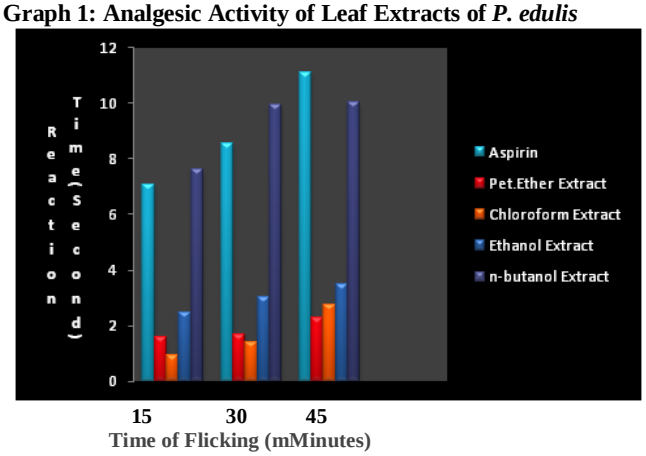
Table 2: Analgesic Activity of Leaf Extracts of *P. edulis*

Treatment Dose(mg/kg)		Tail Flick Latency (sec) (X ± SEM		
		15	30	45
Vehicle	---	0.07±0.13	0.09±0.22	0.08±0.014
Aspirin	50	7.08±0.17	8.57±0.26	11.13±0.17
Pet.ether extract	200	1.60±0.23	1.67±0.28	2.27±0.09
Chloroform extract	200	0.93±0.33	1.42±0.37	2.73±0.39
Ethanol extract	200	2.49±0.41	3.03±0.32	3.47±0.71
n-butanol extract	200	7.64±0.43	9.93±0.31	47.01±0.25

Statistical analysis

The data on biological studies were reported as mean±SD (n=6). For determining the statistical significance, standard error mean and ANOVA at 5% level of significance was employed. The 'p' values < 0.05 were considered significant.

Graph 1: Analgesic Activity of Leaf Extracts of *P. edulis*



RESULTS AND DISCUSSION

The analgesic activity showed that n-butanol extract of *Passiflora edulis* leaf was of

considerable importance and justified its use in pain as suggested in folklore medicines. By employing one-way ANOVA, all data were found to be statistically significant at 5% level of significance ($p < 0.05$).

CONCLUSION

Analgesic effect against thermal noxious stimuli may be elicited through opioid receptors or through modulation of several neurotransmitters involved in relevant phenomena. The extent of analgesic activity shown by crude extracts were less than that of the standard drug aspirin except the n-butanol extract of *P. edulis* linn;but were manifold more than that of the solvent control group, which justified its analgesic activity. Thus, it could be concluded that the *P. edulis* plant has analgesic activity and better results are obtained from the ethanolic extract of *P. edulis* linn. However, further study is needed to identify the chemical constituents present in the extract of this herb that elicits analgesic activity.

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