Aqueous Extract of *Capparis Deciduas* in Acute Toxicity Effects of the Rat by Use of Toothache Reliever Activity

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Summary

The present study designed to evaluate the toothache reliever activity of aqueous extracted Acute toxicity effects of *capparis decidua* extract (3.5%) Commonly used in India in treatment of respiratory illnesses in order to evaluate the acute toxicity using conventional methods .The result of the oral acute toxicity study revealed no death with doses up to 3200 mg/kg body weight. However, the rats showed signs of depression and inappetence. Using the intraperitoneal route, the rats showed dose-dependent signs of toxicity ranging from inappetence, depression, unsteady gait, tremors, and respiratory distress to death. The I/P LD50 was 1400 mg/kg body weight. No gross changes were observed in the organs of rats that died following extract administration. Histopathological lesions were also not observed in all the organs except the lungs, which showed congestion, oedema and bronchitis.

These result suggested that the aqueous extract of a capparis deciduas to be used with some degree of safety especially by toothache reliever by oral rout

Key words: Acute toxicity, rat, capparis deciduas

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Introduction

Increase the demand of natural product of has influsedthe direction taken by many study in pharmacology and toxicology since the largest part of extensive research in medical field or remedies no study concerning their safety action can be clamed to cure toothache which in many cases becomes fatal.

Once the efficacy of a new phytomedicine is proven, an evaluation of its security in laboratory animals and through other experimental models should follow. Scientific reasons for the realization of toxicological studies are that many countries' legislation demands that a given phytomedicine must receive authorization for commercialization and prescription so as to constitute a medicine. The duration of the Acute toxicity effects studies depends on the application duration of the phytomedicine in human beings. The primary objective of toxicity evaluation studies is to assess the safety of the compound intended for clinical use by establishing

Acute, sub-chronic and chronic effect and reproductive toxicity **(1, 4)**. In addition animal and cell testing for mutagen city and carcinogenicity as well organ system toxicity are indispensables before human test can begin **(2).** These assays allow the detection of toxic effects, the understanding of toxic mechanisms and the definition of conditions in which these effects are produced. Thus, phytomedicines which are to be used only on determined occasions demand short studies, while those used continuously have to be submitted also to clinical studies.At the moment, phytotherapy exists principally on the Informal market, representing a serious threat to public health, since the vegetal drugs are commercialized without any phytosanitary control in regard to their identity or purity. Better and more control in this pharmaceutical area is necessary, as the phytomedicines represent an alternative economically more viable to the population of India and also for reasons of a revival of historical knowledge. It is in this context that the present study proposes to water extract of capparis deciduas plant a phytomedicine widely used by the Indian population. It is usually administered in the form of liquid water extract *capparis deciduas* plant to toothache reliever activity in the form of compresses to areas affected toothache pain reliever.

The aim of the present study was to evaluate Acute toxicity effects data of the phytomedicine capparis deciduas plant in rats in order to increase the confidence in extrapolating safety to humans, particularly with references to its use as a herbal medicine

Methods

Collection of plant material

The fresh of *capparis deciduas plant* were collected in the month of June 2007 near funde takali village

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Extraction of plant material drug

capparis deciduas plant were shed dried and reduced to coarse powder using pastel and mortar. The powdered material (1000 g) was macerated overnight with purified water at room temperature. The maceration was repeated twice. The filtered extracts were combined and evaporated under reduced pressure (yield 3.5%w/w). The phytochemical test of the crude extract showed the presence of active compounds of plats e.g. thiamin

Animals

Albino rats of both sexes weighing between 135 – 235 g body weights obtained from were kept under standard environmental conditions (25±2º C; 12/12 h light/dark cycle). They were housed in cages and fed with standard diet For experimentation, the animals were deprived of food overnight. All experiments were in accordance with the guidelines for Care and Use of Laboratory Animals.

Table 1. Toxicity signs observed in rats that received single dose (i.p.) of the *capparis deciduas plant* extract.

Dose (mg/kg Body weight)	Signs of toxicity					
	Inappetence	Depression	Unsteady gait	Tremor	Resp.distress	Death
800	+	+	+	-	-	-
1200	+	+	+	-	-	+
1600	+	+	+	+	+	+
2000	+	+	+	+	+	+
2400	+	+	+	-	+	+
2800	+	+	+	-	+	+
3200	+	+	+	-	+	+

+ = Present, - = Absent.

Table 2. Percentage mortality in rats given the *capparis deciduas* plant extract (i.p) at different doses.

Group	No. of Animals	Dose (mg/kg)	No. of death	% Mortality
1	15	800	0	0
2	10	1200	8	53.3
3	10	1600	10	76.6
4	10	2000	12	80.0
5	10	2400	14	93.3
6	10	2800	15	100
7	10	3200	15	100

Experimental procedure

Albino rats of both sexes were divided into eight groups of five rats each and were given graded doses (800, 1200, 1600, 2000, 2400, 2800 and 3200 mg/kg body weight) of the extract by gastric tube. The rats were observed for signs of toxicity and death over a period of 72 h as described by Lorke (1983). The eighth group received single oral dose of 2 ml normal saline through the same route.In another experiment, yeti rats were randomly divided into 8 groups of 10 rats each. The first 7 groups were given graded doses (800, 1200, 1600, 2000, 2400, 2800 and 3200 mg/kg body weight) of the extract by intraperitonal route while the last group received 2 ml of normal saline by the same route. The animals were then observed for 24 h for toxicity signs and death. The LD50 of the extract was calculated using the arithmetic method of Karber as modified by Aliu and Nwude (1982).

Histopathological study
All the rats that died during the study period were subjected to postmortem examination within six hour of death and tissue samples (liver, kidney, intestine and testicles) were obtained and fixed in 10% neutral buffered formalin and used for histopathological slide preparation as described by Drury and Wallington (1976). Slides of lesions were observed using X40 objective and results

Results Discussion

Acute Toxicity

Table I summarises the data of oral acute toxicity of the: *capparis deciduas* extract indicate that there was no mortality in any of the groups As far as the clinical exams are concerned, no indices of toxicity were observed, However, the treated animals showed signs of depression and inappetance In the intraperitoneal toxicity testing, the rats showed dose-dependent signs of toxicity (Table 1), with death occurring in groups that received 1200, 1600, 2000, and 2400 mg/kg within 14 h of extract administration while all the animals treated with 3200 mg/kg group died within 8 h. The mortality rates and calculated LD50 are presented in Tables 2 and 3, respectively.Gross and histopathological lesions observed in some organs or rats that died from various groups as a result of extract administration are shown on Tables 4 and 5.There were no gross lesions in all organs examined except the lungs that were congested. Similarly, dosedependent histopathologcal changes such as congestion, oedema and bronchitis were observed in the lungs.Rats treated orally with the aqueous leaf extract of *capparis deciduas* did not show any mortality and this could indicate wide safety margin following oral administration. According to the toxicity scale of Hodge and Sterner, any compound with an oral LD50 of between 500 – 500 mg/kg should be considered practically non toxic (CCHOS,1999). This could be attributed to the fact that orally administered drugs and compounds do undergo some events that potentially decrease the amount reaching systemic circulation for pharmacological effects (Brander et al., 1991). The manifestation of depression and inappetance observed in the rats may however be link to some chemical constituents present in the extract such as tannins (Hotellier and Delaveau, 1975; Nwafor et al.,1995). Alldredge (1993) attributed reduce feed intake in animals fed tannin containing diets to strong astringent property of tannins and induction of internal malaise in mammals, which may contribute to reduce feed intake. The result of the intraperitoneal acute toxicity study showed that LD50 of the extract is 1400 mg/kg, indicating that the extract is of low toxicity. Clarke and Clarke (1977) reported that any substance with an i/p LD50
Of above 1000 mg/kg should be regarded as safe.

Table 3. Determination of intraperitoneal LD50 of plant the extract of *capparis deciduas* in rats.

Group	Dose	Dose diff. (DD)	Dead	Mean dead (MD)	Dose diff x mean dead
1	8 0 0	400	0		
2	1200	400	8	4	800
3	1600	400	10	8.5	1800
4	2000	400	12	10.5	2200
5	2400	400	14	12	2400
6	2800	400	15	14.5	2600
7	3200	400	15	15	2800

LD50 = Least dose that killed all animals - (DD x MD)/(No. Animals/grp0
LD50 = 2800 – 9800/7
LD50 = 2800 – 1400
LD50 = 1400 mg/kg (i.p.)

Table 4. Gross changes observed in rats treated (i.p.) with varying doses of plant extract of *capparis deciduas.*

Dose (mg/kg)	Observed changes				
	Lungs	Liver	Kidney	Intestine	Testicles
800	-	-	-	-	-
1200	Mild congestion	Mild congestion	Mild congestion	Mild congestion	Mild congestion
1600	Mild congestion	Mild congestion	Mild congestion	Mild congestion	Mild congestion
2000	Severe	Congestion	Mild congestion	Mild congestion	Mild congestion
2400	Severe congestion	Mild congestion	Mild congestion	Mild congestion	Mild congestion
2800	Severe congestion	Mild congestion	Mild congestion	Mild congestion	Mild congestion
3200	Severe congestion	Mild congestion	Mild congestion	Mild congestion	Mild congestion

Table 5. Histopathological changes observed in various organs of dead rats treated with single dose (i.p.) of plant extract of *capparis deciduas.*

Dose (mg/kg)	**Observed changes**				
	Lungs	**Liver**	**Kidney**	**Intestine**	**Testicles**
800	**-**	**-**	**-**	**-**	**-**
1200	**Congestion, Oedema, bronchitis**	**-**	**-**	**-**	**-**
1600	**As in 1200**	**-**	**-**	**-**	**-**
2000	**As in 1200**	**-**	**-**	**-**	**-**
2400	**As in 1200**	**-**	**-**	**-**	**-**
2800	**As in 1200**	**-**	**-**	**-**	**-**
3200	**As in 1200**	**-**	**-**	**-**	**-**

- = No lesion observed.

The dose dependent toxic manifestations observed following i/p administration may be due to the effect of one or more of the chemical constituents present in the extract, where the concentration increases with administration of higher doses. This might have affected morbidity and mortality observed in the study. The absence of gross and histopathological lesions in the liver, kidney, intestines and testicles further buttress the level of safety of the extract on these organs except the lungs where extensive lesions were observed as the dose increases. It is therefore concluded that the high LD50 obtained following i/p administration of the extract and lack of mortality when orally administered may be an indication that the aqueous leaf extract of *capparis deciduas* could be used with some degree of safety especially when consumed by oral route.

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