ACUTE ORAL TOXICITY TEST OF *QUERCUS INFECTORIA* G. OLIVIER EXTRACT IN RATS

Tuanta Sematong[1], Sirinan Thubthimthed[1], Sareeya Reungpathanapong[1], Sarunya Laovitthayanggoon[1] and Chuleratana Banchonglikitkul[1]

[1]*Pharmaceutical and Natural Products Department, Thailand Institute of Scientific and Technological Research (TISTR) Pathumthani 12120, Thailand.*

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INTRODUCTION

Quercus infectoria G. Olivier, common name known as Ben ka nee (Thai) and belonging to the Fagaceae family. It is indigenous to Turkey, Iran, Iraq, Kurdistan, Cyprus, East Aegean Islands, Greece, Lebanon and Syria. The tree is occasionally cultivated for production of tanning bark and for dye production of the wood. The main constituents found in the galls of *Q. infectoria* are tannin (50-70%) and small amount of free gallic acid and ellagic acid. This plant is very useful in various parts.

The seed can be thoroughly washed in running water to remove the bitter tannins and cooked, or it can be dried, ground into powder and used as a thickening in stews etc. The nut gall extract or powder is also used as herbal drink or tea health purposes. Due to is very useful plant, that needs to find out more potentials and safety information. Thus, the objective of this study is to determine the safety of 95% ethanolic extract of *Q. infectoria* in rats.

Figure 1 *Quercus infectoria* G. Olivier : Ben ka nee

MATERIAL AND METHOD

Animals Male (250 ± 20 g) and Female (230 ± 20 g) Wistar rats were obtained from National Laboratory Animal Centre, Mahidol University, Salaya, Nakornpathom. They were kept in cages with sterilized wood shavings as bedding at 24 ± 2°C in 12 h light/dark cycle and feed with standard diets and tap water *ad libitum*. All rats were acclimatized for 7 days prior to the experiments.

Method Acute oral toxicity test was carried out following the "Guideline No. 423: Acute oral toxicity-Acute toxic class method of the OECD Guidelines for Testing of Chemicals (7)". In brief, animals were divided into five groups and each group contains five rats of both sexes. Group 1 was served as negative control which was received 0.5% CMC or distill water in equivolume to the test group. Group 2-4 were served as treatment groups which were received the extract at dose of 2,000, 7,500 and 15,000 mg/kg, respectively. The rats were fasted for 16 hrs prior to dosing the test sample while drinking water was available *ad libitum*, and foods were withheld for further 3-4 hrs. Any toxic signs were immediately observed at ½, 1 and 3 hrs. The special care should be considered to animals that obviously showed toxic signs during the first 4 hrs after dosing and observed once daily thereafter for 14 days. Body weight was

recorded weekly and at the end of the test. All survivors were euthanized by CO_2 asphyxiation and then performed necropsy finding. The mean of body weight gain of the animals in the test groups was calculated in comparison to the rats of the control group using Student's *t*-Test ($p \leq 0.05$).

RESULTS AND DISCUSSION

As shown in Table 1 and 2. All groups of treated rats (2,000, 7,500 and 15,000) did not show any toxic sings through the observation period. But the number of dead rats was found at dose 7,500 and 15,000 mg/kg b.w. The body weight gain of the rats showed no difference from the control group. Necropsy findings exhibited normal appearance and no macroscopic pathological lesions of visceral organ. Thus, LD_{50} (lethal dose) was estimated at 9,700 mg/kg.

Table 1 Summary of mortality rate and gross pathology of control and treated rats

Treatment/Dose	[a]Mortality rate			Gross Pathology
	Male	Female	Total	
Control group 0.5% CMC equivolume to the treatment group	0/5	0/5	0/10	Normal
Treatment group "Ben ka nee extract 2,000 mg/kg bw."	0/5	0/5	0/10	Normal
Treatment group "Ben ka nee extract 7,500 mg/kg bw."	1/5	1/5	2/10	Normal
Treatment group "Ben ka nee extract 15,000 mg/kg bw."	3/5	5/5	8/10	Normal

[a] Number of dead rats/number of rats tested

Table 2 Means of body weight gain of the control and treated rats were recorded during experimentation and at termination

Sex	Treatment/Dose	*Mean of body weight gain (g)	
		Day 8	Day 15
Male	**Control group** 0.5% CMC	46.40 ± 2.25	91.00 ± 2.42
	Treatment group "Ben ka nee extract 2,000 mg/kg bw."	*58.20 ± 2.93	*79.80 ± 2.22
	Treatment group "Ben ka nee extract 7,500 mg/kg bw."	36.00 ± 11.11	83.25 ± 12.46
	Treatment group "Ben ka nee extract 15,000 mg/kg b.w."	52.00 ± 13.00	68.50 ± 11.50
Female	**Control group** 0.5% CMC	18.00 ± 2.16	32.60 ± 2.40
	Treatment group "Ben ka nee extract 2,000 mg/kg bw."	19.20 ± 1.82	30.20 ± 3.48
	Treatment group "Ben ka nee extract 7,500 mg/kg b.w."	*30.75 ± 1.97	*44.25 ± 2.46
	"Ben ka nee extract 15,000 mg/kg b.w."	NC	NC

* Data shown in the table are mean ± SEM

NC = Not calculated (dead findings within 24-48h after treating with extracts)

CONCLUSION

The LD_{50} of 95% ethanolic extract of *Ben ka nee* in rats is 9,700 mg/kg body weight. Therefore, this study indicated that Ben ka nee extract seem to be safe in use as material source for herbal products development. However, the repeated dose toxicity evaluation of the extract is still necessary in further study.

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