Poster Session 2 – Pharmacology

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Acute toxicity testing of polymeric binder for use in extended release tablets

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The oral route is the most convenient method of drug administration for systematic effect. The basic objective in dosage form design with many drugs is to optimize its delivery. In this reference, the extended release tablets are widely used to achieve prolonged therapeutic effect by continuously releasing medication over an extended period of time after administration of a single dose. Many polymeric excipients are designed so as to achieve extended release profile for many drugs. However for use of such materials in-vivo toxicological assessments are necessary for further developments (Lagunin et al 2003). This study reports the acute toxicity testing of poly(vinyl acetate-*co*-maleic anhydride), VAMA, prepared by precipitation polymerization (Raval et al 1997) (Table 1). The acute toxicity of the VAMA copolymer was evaluated in male (n = 24) and female (n = 24) Sprague-Dawley rats. The rats were acclimatized to the laboratory conditions one week before the study and the health status was examined by a veterinarian before the start of the study. Rats of both sexes were divided into four groups according to dosage pattern (Table 2). The VAMA copolymer was weighed on the day of initiation and a suspension was made in freshly prepared 0.32% agar before dosing. The rats were administered the polymeric binder as single oral dose on the day of initiation of study. The rats were observed for changes in body weight, food consumption, clinical signs and gross necroscopy. There was no effect on body weight or food consumption, no major clinical signs were observed during the study period and no abnormalities were detected on necroscopy. Because no evidence of any toxicity was observed at any dose level, it is concluded that dosage of VAMA copolymer up to, and inclusive of, 80 mg kg^{-1} were well tolerated by the Sprague-Dawley rats.

Table 1 Characterization of VAMA

Feed composition (mol) VA:MA	0.25:0.25
Copolymer composition (mol) VA:MA	0.27:0.11
Yield (g)	35.0
Acid value (mg KOH/g)	394.0
Softening point (°C)	165.0
Molecular weight	1056.0
Bulk density (g mL^{-1})	0.327

Table 2 Acute toxicity study schedule

Group (n = 6/group)	Control	Low dose	Mid dose	High dose
Dose (mg kg^{-1})	0.0	4.00	400.00	800.00

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In-vitro lens protective and antimicrobial activity of *Butea frondosa*

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Butea frondosa has been used traditionally as a topical formulation in the treatment of eye diseases and disorders (Mengi & Deshpande 1995). Cataract has been the major eye disorder afflicting mankind since ancient times. Cataract results from the opacity of lens, one of the major causes of which is lens protein denaturation. In this investigation, the lens protective action against oxidative stress, and antimicrobial activity against *Staphylococcus aureus* and *Pseudomonas aeruginosa*, causative agents of majority of infective eye conditions, has been determined. *Butea frondosa* was collected, authenticated, air dried and extracted with water in a soxhlet apparatus. The lens protective action of *Butea frondosa* was determined by culturing freshly excised goat lenses in a Tyrode medium containing H_2O_2 (0.5 mM) and *Butea frondosa* aqueous extract (0–0.25 mg). Lenses were evaluated firstly for their ability to transmit light by measuring the time taken for the lenses to become opaque (t_{op}) and secondly, for lens glutathione (GSH) levels (Varma & Devamanoharan 1995). Glutathione levels were determined by incubating lenses for 3 h with H_2O_2 (0.5 mM), homogenizing, centrifuging and treating the supernatant with DTNB (Ellman's reagent), and measuring the absorbance at λmax of 410 nm. Antimicrobial activity was determined by making serial dilutions of the extract in double strength nutrient broth, and inoculating the tubes with 1×10^6 viable cells from a 24-h broth culture of *Staphylococcus aureus(MCTC 737)* and *Pseudomonas aeruginosa(MCTC 1688)*. The minimum concentration of the extract inhibiting the growth of microorganism was taken as minimal inhibitory concentration (MIC). The results indicate that *Butea frondosa* root extracts afford significant concentration-dependent in-vitro lens protection against peroxide-induced damage (Table 1). The antimicrobial activity of *Butea frondosa* against *Staphylococcus aureus* and *Pseudomonas aeruginosa* indicates its usefulness in the treatment of eye disorders (Table 2).

Table 1 In-vitro lens protective activity of *Butea frondosa* root extract

Incubation conditions		t_{op}* (h)	GSH* (μmol g^{-1})
Extract (mg)	H_2O_2 (0.5 mM)		
0	0	20.0 ± 0.6	8.0 ± 0.2
0	0.5	9.0 ± 0.4	2.1 ± 0.3
0.05	0.5	13.0 ± 0.2	4.5 ± 0.5
0.10	0.5	18.0 ± 0.3	6.0 ± 0.7
0.15	0.5	22.0 ± 0.5	8.1 ± 0.4
0.20	0.5	26.0 ± 0.1	8.4 ± 0.3
0.25	0.5	28.0 ± 0.3	8.6 ± 0.1

Values are mean ± s.e.m. (n = 3).

Table 2 Antimicrobial activity of *Butea frondosa* root extract

Microorganism	MIC (μg mL^{-1})
Staphylococcus aureus (MCTC 737)	10.0
Pseudomonas aeruginosa (MCTC 1688)	12.5

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