PHYTOCHEMICAL ANALYSIS AND IN-VITRO EFFECTS OF ETHANOLIC TAMARINDUS INDICA SEED EXTRACT ON SNAKE VENOM

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Introduction: Snakebite has been categorised as a ‘neglected tropical disease’ by WHO in 2009 and it affects mainly the poorer countries like Africa and Asia. The standard treatment for snake envenomation is the anti-snake venom medication which can be very expensive, not readily available and specific against a snake species. This study was conducted to screen the phytochemical compounds of Tamarindus indica seed extract (TSE) and its in-vitro effects on snake venom of three snake species; namely Daboia russelli, Naja kaouthia and Ophiophagus hannah.

Materials and method: Ethanolic Soxhlet extract of TSE was used. Phytochemical screening analysing for saponins, alkaloids, flavanoids, anthraquinone derivatives, arthaquinone glycosides, phenolic compounds, tannins, terpenoids, sterol and volatile oils were carried out. In-vitro enzymatic inhibition study on venom enzymes namely phospholipase A2 (PLA2), proteinase and phosphomonoesterase (PME) were studied by measuring the absorbance using the spectrophotometer. There were two main groups; Group 1: venom only; and Group 2: venom with TSE. The mean triplicate determination of venom enzyme activity post-exposure to TSE from Group 2 was taken and analysed against 100% venom enzyme activity from Group 1.

Results: Phytochemical screening showed that the TSE has (+++) phenolics and (+++) hydrolysable tannins. TSE significantly reduced all venom enzymatic activities i.e. PLA2, proteinase and PME from the three snake species at 925 nm, 280 nm and 400 nm, respectively. SDS-PAGE experiment showed the disruption of venom protein bands from all three snake species when venom was exposed to 4.76 µg TSE.

Conclusion: Ethanolic TSE contains mainly phenolics and hydrolysable tannins which can reduce the snake venom enzymatic activities. This is possibly due to the formation of tannin-protein complex rendering the venom less potent.