



Original Paper

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## The synergistic neurotoxins of palmyrah (*Borassus flabellifer* L.) flour

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### ABSTRACT

Palmyrah (*Borassus flabellifer* L.) is consumed in various forms in different parts of Sri Lanka. Although a neurotoxic syndrome had been described in rats it is being consumed by humans. However, the chemical nature of the neurotoxin is unknown. Thus the objective of the present study was to determine the neurotoxic principle using palmyrah seed shoot and bioactivity directed separations. Two primary amines were isolated. These were not toxic individually but toxic when given together showing synergism. Studies of the amines by <sup>1</sup>H NMR and <sup>13</sup>C-NMR showed a steroidal aglycone (spirostane) linked to a carbohydrate moiety containing three  $\alpha$ -rhamnosyl residues and a  $\beta$ -pyranosyl residue. Comparison with known spectral data showed that the  $\beta$ -pyranosyl is likely to be a  $\beta$ -glucosaminosyl which is probably in position 6 of glucose in one compound and most likely to be in the position 3 of glucose in the other. Synergism appears to be at two levels (i.e. at the absorption level) where the high content of neutral saponins present appears to be needed to facilitate absorption of the cationic toxin and at the point of action. The synergistic mechanism of the toxic amines remains to be explained.

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**Keywords:** Palmyrah, neurotoxin, spirostane, saponins, primary amine, synergism.

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