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Mechanisms of antihyperuricemic effect of *Phyllanthus niruri* and its lignan constituents.

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Abstract

ETHNOPHARMACOLOGICAL RELEVANCE: *Phyllanthus niruri* Linn. (Euphorbiaceae) is used as folk medicine in South America to treat excess uric acid. Our initial study showed that the methanol extract of *Phyllanthus niruri* and its lignans were able to reverse the plasma uric acid of hyperuricemic animals.

AIM OF THE STUDY: The study was undertaken to investigate the mechanisms of antihyperuricemic effect of *Phyllanthus niruri* and its lignan constituents.

MATERIAL AND METHODS: The mechanisms were investigated using xanthine oxidase assay and uricosuric studies in potassium oxonate- and uric acid-induced hyperuricemic rats.

RESULTS: *Phyllanthus niruri* methanol extract exhibited in vitro xanthine oxidase inhibition with an IC₅₀ of 39.39 microg/mL and a moderate in vivo xanthine oxidase inhibitory activity. However, the lignans display poor xanthine oxidase inhibition in vitro and a relatively weak in vivo inhibitory activity at 10mg/kg. On the other hand, intraperitoneal treatment with *Phyllanthus niruri* methanol extract showed 1.69 folds increase in urinary uric acid excretion when compared to the hyperuricemic control animals. Likewise, the lignans, phyllanthin, hypophyllanthin and phylltetralin exhibited up to 2.51 and 11.0 folds higher in urinary uric acid excretion and clearance, respectively. The co-administration of pyrazinamide with phyllanthin exhibited a significant suppression of phyllanthin's uricosuric activity resembling that of pyrazinamide with benzbromarone.

CONCLUSIONS: The present study showed that the antihyperuricemic effect of *Phyllanthus niruri* methanol extract may be mainly due to its uricosuric action and partly through xanthine oxidase inhibition, whereas the antihyperuricemic effect of the lignans was attributed to their uricosuric action.