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J Ethnopharmacol. 2011 Jan 27;133(2):647-53. Epub 2010 Oct 29.

Evaluation of the genotoxicity of *Orthosiphon stamineus* aqueous extract.

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Abstract

AIM OF THE STUDY: *Orthosiphon stamineus*, Benth, also known as Misai Kucing in Malaysia and Java tea in Indonesia, is traditionally used in Southeastern Asia to treat kidney dysfunctions, diabetes, gout and several other illnesses. Recent studies of **Orthosiphon stamineus** pharmacological profile have revealed antioxidant properties and other potentially useful biological activities thereby lending some scientific support to its use in folk medicine. So far the genotoxicity of **Orthosiphon stamineus** extracts has not been evaluated. In this study the genotoxic potential of **Orthosiphon stamineus** aqueous extract was investigated by the Salmonella/microsome mutation assay and the mouse bone marrow micronucleus test.

MATERIALS AND METHODS: Chemical composition of **Orthosiphon stamineus** aqueous extract was analyzed by High Performance Liquid Chromatography-Diode Array Detector (HPLC-DAD). The Salmonella/microsome assay (TA97a, TA98, TA100 and TA1535; plate incorporation method) was performed in the presence or in the absence of extrinsic metabolic activation (S9 mixture). In the mouse micronucleus assay, **Orthosiphon stamineus** extract was administered by gavage (0, 500, 2000 and 4000 mg/kg body weight/day for 3 days) to male and female Swiss Webster mice (N=6 per dose per sex) and bone marrow cells were harvested 24 h after the last dose. Ethoxy-resorufin-O-dealkylase (EROD) and benzyloxy-resorufin-O-dealkylase (BROD) activities were determined in mouse liver microsomes.

RESULTS: The chemical analysis revealed that the **Orthosiphon stamineus** extract contained flavonoids (sinensetin, eupatorin), caffeic acid, and rosmarinic acid (44.00±1.879 µg/mg), the latter seemed to be one of its major constituent. Tested at doses up to 5000 µg/plate, the **Orthosiphon stamineus** extract was not toxic to Salmonella tester strains and did not increase the number of revertant colonies over the background incidence. In the mouse bone marrow assay, the extract did not alter the polychromatic:normochromatic erythrocytes (PCE:NCE) ratio, nor did it increase the incidence of micronucleated polychromatic erythrocytes (MNPEs). No overt toxicity and no change of CYP1A (EROD) and 2B9/10 (BROD) activities were noted.

CONCLUSIONS: Based on the aforementioned findings, it is concluded that the use of **Orthosiphon stamineus** in the traditional medicine poses no genotoxic risk.

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PMID: 21044879 [PubMed - indexed for MEDLINE]

Publication Types, MeSH Terms, Substances

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