

## Anti-parasitic activity and cytotoxicity of selected medicinal plants from Kenya.

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### Abstract

Indigenous rural communities in the tropics manage parasitic diseases, like malaria and leishmaniasis, using herbal drugs. The efficacy, dosage, safety and active principles of most of the herbal preparations are not known. Extracts from 6 selected plant species, used as medicinal plants by indigenous local communities in Kenya, were screened for in vitro anti-plasmodial and anti-leishmanial activity, against 2 laboratory-adapted *Plasmodium falciparum* isolates (D6, CQ-sensitive and W2, CQ-resistant) and *Leishmania major* (IDU/KE/83=NLB-144 strain), respectively. The methanol extract of *Suregada zanzibariensis* leaves exhibited good anti-plasmodial activity (IC<sub>50</sub>) 4.66±/0.22 and 1.82±/0.07 microg/ml for D6 and W2, respectively). Similarly, the methanol extracts of *Albizia coriaria* (IC<sub>50</sub>) 37.83±/2.11 microg/ml for D6 and *Aspergillus racemosus* (32.63±/2.68 and 33.95±/2.05 microg/ml for D6 and W2, respectively) had moderate anti-plasmodial activity. *Acacia tortilis* (IC<sub>50</sub>) 85.73±/3.36 microg/ml for W2 and *Albizia coriaria* (IC<sub>50</sub>) 71.17±/3.58 microg/ml for W2) methanol extracts and *Aloe nyeriensis* var *kedongensis* (IC<sub>50</sub>) 87.70±/2.98 and 67.84±/2.12 microg/ml for D6 and W2, respectively) water extract exhibited mild anti-plasmodial activity. The rest of the extracts did not exhibit any anti-plasmodial activity. Although the leishmanicidal activity of extracts were lower than for pentosam (80%), reasonable activity was observed for *Aloe nyeriensis* methanol (68.4±/6.3%), *Albizia coriaria* water (66.7±/5.0%), *Maytenus putterlickoides* methanol (60.0±/6.23%), *Asparagus racemosus* methanol and water (58.3±/8.22 and 56.8±/6.58%, respectively), *Aloe nyeriensis* water (53.3±/5.1%) and *Acacia tortilis* water (52.9±/6.55%) extracts at 1000 microg/ml. *Leishmania major* infected macrophages treated with methanol extracts of *Suregada zanzibariensis* and *Aloe nyeriensis* var *kedongensis* and pentosam had infection rates of 28±/2.11, 30±/1.22 and 40±/3.69%, respectively at 1000 microg/ml, indicating better anti-leishmanial activity for the extracts. The methanol extract of *Albizia coriaria* (44.0±/3.69%) and aqueous extracts of *Asparagus racemosus* (42±/3.84%) and *Acacia tortilis* (44±/5.59%) had similar activity to pentosam. Multiplication indices for *Leishmania major* amastigotes treated with methanol extracts of *Albizia coriaria*, *Suregada zanzibariensis* and *Aloe nyeriensis* var *kedongensis*, aqueous extract of *Acacia tortilis* and pentosam were 28.5±/1.43, 29.4±/2.15, 31.1±/2.22, 35.9±/3.49 and 44.0±/3.27%, respectively, at 1000 microg/ml, confirming better anti-leishmanial activity for the extracts. Aqueous extracts of *Aloe nyeriensis* (46.7±/3.28%) and *Albizia coriaria* (47.5±/3.21%) had similar activity level to pentosam. The plant extracts have better inhibitory activity while pentosam has better leishmanicidal activity. All extracts exhibited very low cytotoxicity (CC<sub>50</sub>) > 500 microg/ml) against human embryonic lung fibroblast (HELFL) cells. The investigations demonstrated the efficacy and safety of some extracts of plants that are used by rural indigenous communities for the treatment of parasitic diseases.