

**The Anti-malarial and Biochemical Studies of *Microglossa pyrifolia*  
(Lam.) Ktze and *Trimeria grandifolia* (Hochst.) Warb from Lake  
Victoria Basin, Kenya**

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## ABSTRACT

Malaria continues to kill over a million people each year, with more than 90% of these cases found in sub-Saharan Africa. In this work, two plants used as traditional medicine in the Lake Victoria basin; *Microglossa pyrifolia* (Lam.) Ktze. (compositae) and *Trimeria grandifolia* (Hochst.) Warb. (Flacourtiaceae), were investigated for their anti-plasmodial and biochemical principles. On the anti-plasmodial assay, aerial parts of *M. pyrifolia* methanol extract had the highest anti-plasmodial activity against *P. falciparum* chloroquine sensitive, D6 strain ( $IC_{50}$   $1.59 \pm 0.07$   $\mu\text{g/ml}$ ) and chloroquine resistant, W2 strain ( $2.50 \pm 0.15$   $\mu\text{g/ml}$ ) strains. Similarly, the methanol extract of *T. grandifolia* showed activity ( $IC_{50}$   $17.16 \pm 0.03$   $\mu\text{g/ml}$ ) and ( $IC_{50}$   $19.21 \pm 2.18$   $\mu\text{g/ml}$ ) on D6 and W2 strains. All extracts subjected to cytotoxicity assay did not show any cytotoxic effect on Vero 199 cells ( $CC_{50} > 20$   $\mu\text{g/ml}$ ). Extracts of *M. pyrifolia* and *T. grandifolia* were subjected to bioassay-guided fractionation. Pure and semi-pure compounds obtained were also subjected to anti-plasmodial assay. Compound TGC 2 had activity on both D6 ( $IC_{50}$   $9.78 \pm 3.2$   $\mu\text{g/ml}$ ) and W2 ( $14.4 \pm 1.35$   $\mu\text{g/ml}$ ) strains. Compound MPC 3 also showed activity on CQ sensitive D6 strain ( $IC_{50}$   $11.12 \pm 2.31$   $\mu\text{g/ml}$ ). MPC 2 had a higher activity on CQ resistant strain W2 ( $IC_{50}$   $24.22 \pm 2.51$   $\mu\text{g/ml}$ ) compared to CQ sensitive strain D6 ( $IC_{50}$   $27.11 \pm 1.18$   $\mu\text{g/ml}$ ) although both activities were generally low according to KEMRI criteria. An interaction study was carried out using compound TGC 2 and chloroquine diphosphate. An additive interaction effect was observed with Fraction Inhibition Concentration [sum FIC ( $\geq 1$  -  $< 2$ )] Structure elucidation of *T. grandifolia* showed three compounds Idesin [6-hydroxy-2-(hydroxymethyl)phenyl  $\beta$ -D-glucopyranoside] TGC2 (**61**) of which is reported here for the

first time, Lupenone [Lup-20(29)-en-3-one] TG 4 (**62**) and  $\beta$ - sitosterol [TGP 33 (**63**)] and one compound Friedelanol [MP24 (**64**)] from *Microglossa pyrifolia*.