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 ± 0.07 µg/ml) and chloroquine resistant, W2 strain (2.50 ± 0.15 µg/ml) strains. Similarly, the methanol extract of T. grandifolia showed activity (IC$_{50}$ 17.16 ± 0.03 µg/ml) and (IC$_{50}$ 19.21 ± 2.18 µg/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 µg/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 ± 3.2 µg/ml) and W2 (14.4 ± 1.35 µg/ml) strains. Compound MPC 3 also showed activity on CQ sensitive D6 strain (IC$_{50}$ 11.12 ± 2.31 µg/ml). MPC 2 had a higher activity on CQ resistant strain W2 (IC$_{50}$ 24.22 ± 2.51 µg/ml) compared to CQ sensitive strain D6 (IC$_{50}$ 27.11 ± 1.18 µg/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 (≥1 - <2)] Structure elucidation of T. grandifolia showed three compounds Idesin [6-hydroxy-2-(hydroxymethyl)phenyl β-D-glucopyranoside] TGC2 (61) of which is reported here for the
first time, Lupenone [Lup-20(29)-en-3-one] TG 4 (62) and β-sitosterol [TGP 33 (63)] and one compound Friedelanol [MP24 (64)] from *Microglossa pyrifolia*. 