# Evaluation of Anti-sickling Activities of three *Cissus species;* Cissus populnea, *Cissus Arguta Hook.f. and Cissus quadrangularis L.*

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## Abstract:

Sickle cell disease (SCD) is an inherited genetic disease that affects people globally, with the highest prevalence in the sub-Saharan African region. Medicinal plants are useful in managing sickle cell crises associated with morbidities. The *Cissus* family Vitaceae species have been reported to manage sickle cell disease in folklore medicine. Hence, this study aimed to evaluate the antisickling properties of three *Cissus* species in Nigeria.

The leaves and stems of *Cissus polpulnea*, *Cissus arguta, and Cissus quadrangularis* were collected, authenticated, dried, pulverized, extracted, and concentrated *in vacuo.* Antisickling assays followed standard protocols of reversal and inhibition of sickling at 45mins and the samples were also screened for Phytochemicals

The Phytochemical screening showed the presence of secondary metabolites except saponins, which were absent in *C. quadrangularis* leaf.

*C. polpunea* leaf and stem extracts (2 mg/ml) both showed inhibited sickling at 59.6% and reversed at 56.98%. At 4mg/ml, the percent inhibition was 38.02% and 58.6% respectively and both extracts showed no activity for the reversal of sickling.

*C. arguta* leaf and stem extracts (2 mg/ml) showed inhibition at 80.02% and 83.48%, and reversal at 86.98% and 83.48% respectively comparable to the standard Para hydroxybenzoic acid (PABA). At 4

mg/ml, the percent inhibition was 85.64% and 40.11%, and reversal was observed at 63.83% and 40.11% respectively.

*Cissus quadrangularis* leaf and stem extracts (2mg/ml) showed inhibition at 60.66% and 66.51% and reversal at 23.17% and 59.21%. At 4 mg/ml, the extracts showed inhibition of 59.26% and 79.54% and reversal at 45.41% and 43.53%.

The *Cissus arguta* showed significant inhibitory and reversal antisickling activities at all concentrations tested and thus, provided scientific validation for the medicinal use of the plant in Nigeria. The bioactive compounds present could be templates for antisickling drug discovery and development.

**Keywords:**

Anti-sickling, Sickle cell disease, *Cissus arguta*, *Cissus quadrangularis.*