



## Phytochemical, anti-inflammatory and anti-trypanosomal properties of *Anthocleista vogelii* Planch (Loganiaceae) stem bark



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### ABSTRACT

**Ethnopharmacological relevance:** *Anthocleista vogelii* Planch (Loganiaceae) is used in African Traditional Medicine for the treatment of pain and inflammatory disorders as well as sleeping sickness.

**Aim of the study:** To determine the *in vivo* anti-inflammatory and *in vitro* anti-trypanosomal activities of the extracts of *A. vogelii* stem bark and identify the phytochemical classes of the fractions responsible for the activities.

**Materials and methods:** The *in vivo* anti-inflammatory activity of the extracts was evaluated using the egg albumin-induced rat paw oedema model while the *in vitro* anti-trypanosomal activity was assessed on *Trypanosoma brucei brucei*. The *in vitro* cytotoxicity was assessed on HeLa (human cervix adenocarcinoma) cell line.

**Results:** The methanolic extract of *A. vogelii* stem bark, with 11.2% yield, gave LD<sub>50</sub> > 5000 mg/kg. The n-hexane fraction of the extract contains steroids, terpenes and fatty acids and yielded non-cytotoxic terpenoidal column fraction with anti-trypanosomal IC<sub>50</sub> of 3.0 µg/mL. The ethylacetate fraction at 100 mg/kg dose significantly ( $p < 0.05$ ) provoked 37.8, 62.5 and 69.7% inhibition of oedema induced by egg-albumin at the second, fourth and sixth hours respectively.

**Conclusion:** The study demonstrated that the anti-inflammatory and anti-trypanosomal activities of *A. vogelii* are probably due to non-cytotoxic terpenoids and validated the traditional use of *A. vogelii* in the treatment of inflammation and sleeping sickness.

### 1. Introduction

*Anthocleista vogelii* Planch (Loganiaceae) is a medicinal plant used extensively in Southern Nigeria for treating various diseases. It usually grows around the riverine or marshy areas of the tropical humid forest of West Africa (Irvine, 1961) and is commonly used in the management of pain (Adjahoun et al., 1996), inflammatory disorders (Dalziel, 1955) and sleeping sickness (Nwodo et al., 2015). Combinations of the stem or root bark and the leaves are used as anti-inflammatory and anti-diabetic agents (Sunday et al., 2016) and also in the treatment of wounds (Dalziel, 1955; Leeuwenberg, 1972). Combined extracts of *Ficus exasperate* and *A. vogelii* at different doses have been reported to

exhibit up to 91.7% chemosuppression of *Plasmodium berghei berghei* (Okon et al., 2014). The petroleum ether leaf extract has been reported to demonstrate good anti-plasmodial activity, which may be due to the constituent decussatin, stigmaterol, swertiaperennin and hexadecanoic acid (Alaribe et al., 2012). Antimicrobial compounds have been isolated from the stem bark of *A. vogelii* (Tene et al., 2008). Both the root and stem barks possess hypoglycemic activity in both normal and alloxan-induced diabetic animals (Abuh et al., 1990; Osadebe et al., 2014), supporting the traditional use of the plant in diabetes management (Sunday et al., 2016). The aqueous extract has been reported to exhibit good anti-nociceptive activity and very low toxicological profile (Mbiancha et al., 2013), and most plants with anti-nociceptive activity

**Abbreviations:** AV, *Anthocleista vogelii* crude extract; AVEF, *Anthocleista vogelii* ethylacetate fraction; AVHF, *Anthocleista vogelii* n-hexane fraction; AVMF, *Anthocleista vogelii* methanol fraction; AVMK, *Anthocleista vogelii* water marc (insoluble residue); AVWF, *Anthocleista vogelii* water fraction; DMEM, Dulbecco's Modified Eagle's Medium; DCM, Dichloromethane; DMSO, Dimethyl sulphoxide; EtOAc, Ethyl acetate; Em<sub>590</sub>, Emission at 590 nm; Exc<sub>560</sub>, Excitation at 560 nm; HeLa, human cervix adenocarcinoma cell line; IC<sub>50</sub>, 50% Inhibitory concentration; InterCEDD, International Center for Ethnomedicine and Drug Development; LD<sub>50</sub>, Lethal dose at 50% population; NSAIDs, Non-steroidal anti-inflammatory drugs; SD, standard deviation; TLC, Tin layer chromatography

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