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# Anti-measles virus activity of 4-hydroxy-3-methoxy benzaldehyde (Vanillin) isolated from *Xylopia aethiopica* (Dunal) A. rich

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ABSTRACT

*Xylopia aethiopica is* a plant used ethnomedicinally for the treatment of several infections in Nigeria. This study was carried out to isolate the active compound(s) in *Xylopia aethiopica* and evaluate their anti-measles virus activity. The Dichloromethane (DCM) fraction of *Xylopia aethiopica* was fractionated using chromatographic techniques, which led to the isolation of a compound characterized using spectroscopic techniques, FT-IR, 1D and 2D NMR in addition to in vitro anti-measles evaluation in adsorption and post-infection inhibition assays. The isolated compound characterized as 4-Hydroxy-3-methoxy benzaldehyde (Vanillin) was active on measles virus and has minimum nontoxic dose of 10 µg with cytotoxic and inhibitory activity of $CC_{50}$ = 84.18 µg/mL, $IC_{50}$ = 0.71 µg/mL and selectivity index (SI) = 118.56 ($r^2$ = 0.979) and interfered with viral attachment and fusion. This is the first report of the isolation of Vanillin from *Xylopia aethiopica* leaf and its high antiviral activity shows it could be developed further into a promising antiviral lead compound.



## Introduction

Measles virus (MV), a member of the genus *Morbillivirus* in the family *Paramyxoviridae*, is the etiological agent of measles. MV is an enveloped virus with a non-segmented, negative- sense, single-stranded RNA genome. It is transmitted via aerosol droplets and causes a common, acute infectious disease characterized by fever, cough, corrhyza, conjunctivitis and a generalized maculopapular rash [1] . In spite of the availability of a safe and effective live vaccine, measles is still responsible for 4% of deaths in children younger than five years of age world-wide [2] and approximately 145,700 children under age five died from measles in 2013 [3]. Despite the potential of existing vaccine to control, eliminate and eradicate this disease, novel

*Abbreviations:* COSY, COrelation SpectroscopY; HSQC, Heteronuclear Single Quantum Coherence; FT-IR, Fourier Transform Infra Red; $TCID_{50}$, 50% Tissue culture Infectious Dose; HMBC, Heteronuclear Multiple Bond Correlation; DEPT, Distortionless Enhancment by Polarization Transfer.

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