



Isolation and characterisation of larvicidal compounds from *Commiphora Merkeri* Engl. exudate against *Aedes aegypti* and *Anopheles gambiae*

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Introduction

Mosquito control methods have been targeting adult stage of the life cycle mainly by using synthetic insecticides in the form of indoor residual spraying (IRS), long lasting insecticide treated nets (LLINs), insect repellent and deterrents [1,2]. However, an application of insecticides to mosquito at their larvae and pupae stage is favorable due to restricted movements of mosquito at these stages. Plants are essential sources of phytochemicals, some of which show insecticidal properties.

Objectives

The current study was to isolate and evaluate larvicidal compounds from *Commiphora merkeri* exudate against *Aedes aegypti* L. and *Anopheles gambiae* S.S

Methods

Plant material
↓
Extraction and concentration
↓
Evaluation for larvicidal activity
↓
Isolation of compounds
↓
Larvicidal activity of compounds



Results

The exudate exhibited larvicidal activity with LC₅₀ of 34.59 and 41.07 µg/mL against *Ae. aegypti* and *An. gambiae* larvae, respectively.

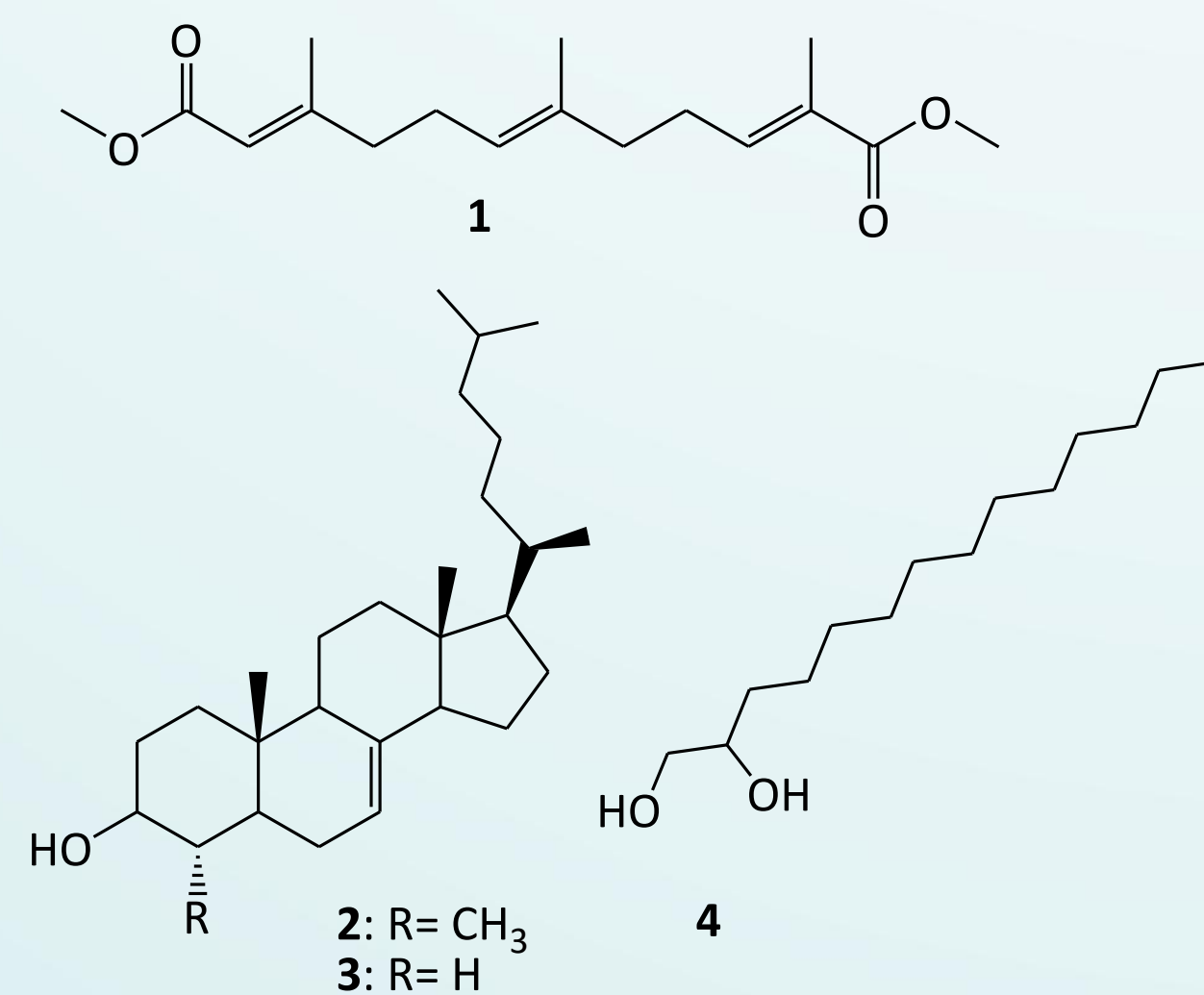


Figure 1: Compounds isolated from *C. merkeri* exudate

Chromatographic separation of exudate led to isolation of Four compounds, (2E,6E,10E)-1,12-dimethoxyl-2,6,10-farnesen-1,12-dione (**1**), 4α-methylcholest-7-en-3β-ol (**2**), cholest-7-en-3β-ol (**3**) and tetradecane-1,2-diol (**4**). Sterols, **2** and **3** exhibited activity with LC₅₀ values of 263.52, 377.67 µg/mL and 224.16, 264.42 µg/mL against *Ae. aegypti* and *An. gambiae* larvae, respectively. Compounds, **1** and **4** had weak activity (LC₅₀ > 1000 µg/mL).

In addition, there were no statistically significant differences (≥ 95%) in the mortalities exhibited by compounds **2** and **3**. This study suggests that the exudate of *C. merkeri* could be potential for control of mosquito larvae.

Table 1: Mosquito larvicidal activity of exudate and isolated compounds

Sample/Compound	LC ₅₀ (95% CI) µg/mL		
	<i>Ae. aegypti</i>	<i>An. Gambiae</i>	<i>Cx. quinquefasciatus</i>
After 24 h of exposure			
Exudate	34.59 (30.04-39.82)	41.07 (31.83-53.01)	36.54 (27.89-47.88)
1	>1000	>1000	>1000
2	>1000	>1000	>1000
3	>1000	>1000	>1000
4	>1000	>1000	>1000
After 48 h of exposure			
Exudate	26.51 (26.00-27.03)	37.87 (30.44-47.12)	31.56 (24.35-40.89)
1	>1000	>1000	>1000
2	224.16 (180.43-278.49)	263.52(214.66-323.51)	224.16 (180.43-278.49)
3	264.42 (210.75-331.75)	377.67(292.40-487.82)	264.42 (210.75-331.75)
4	>1000	>1000	>1000

Conclusions

The *C. merkeri* exudate could be useful for managing populations of *An. gambiae*, *Ae. aegypti* and *Cx. quinquefasciatus*.

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