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# Phytochemical investigation of Striga asiatica

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# Phytochemical investigation of *Striga asiatica*

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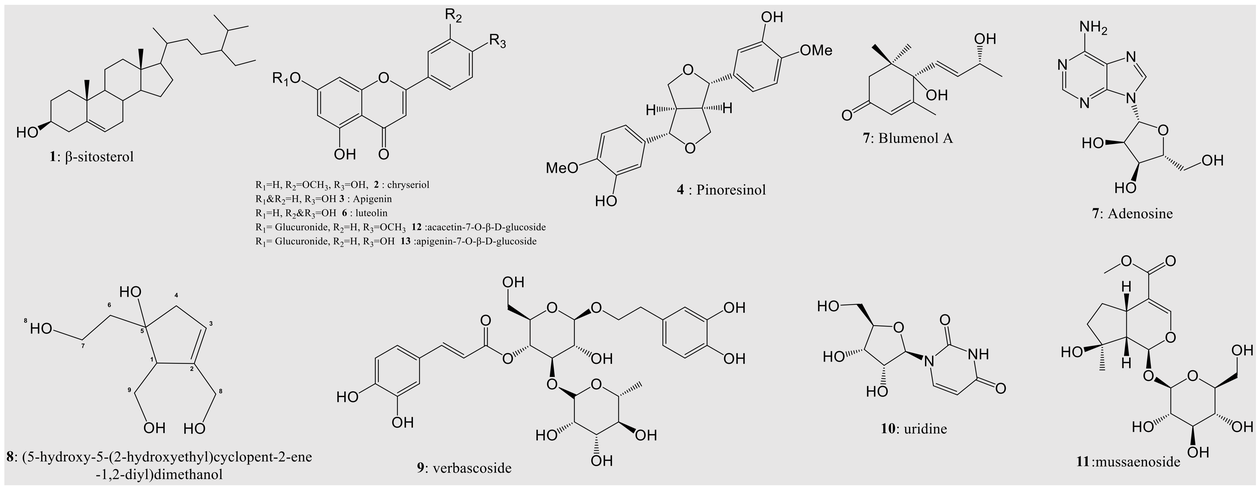
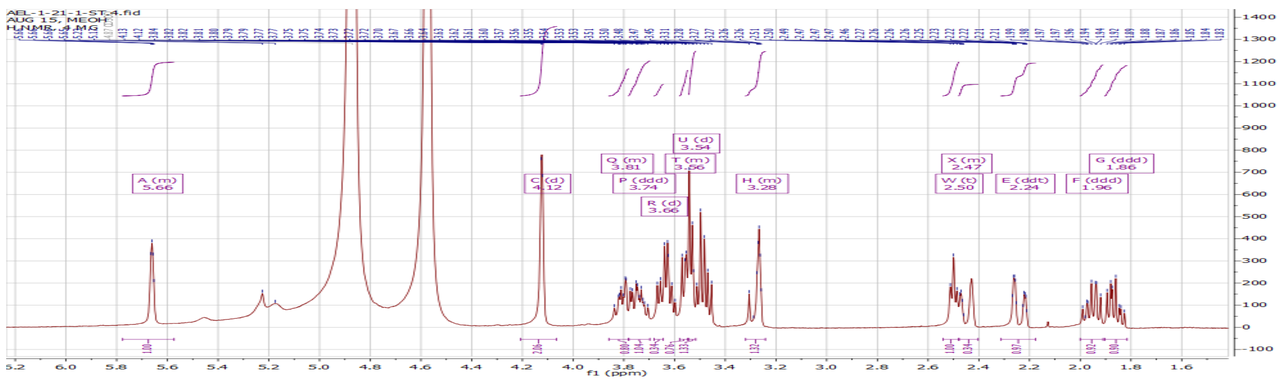
## Introduction

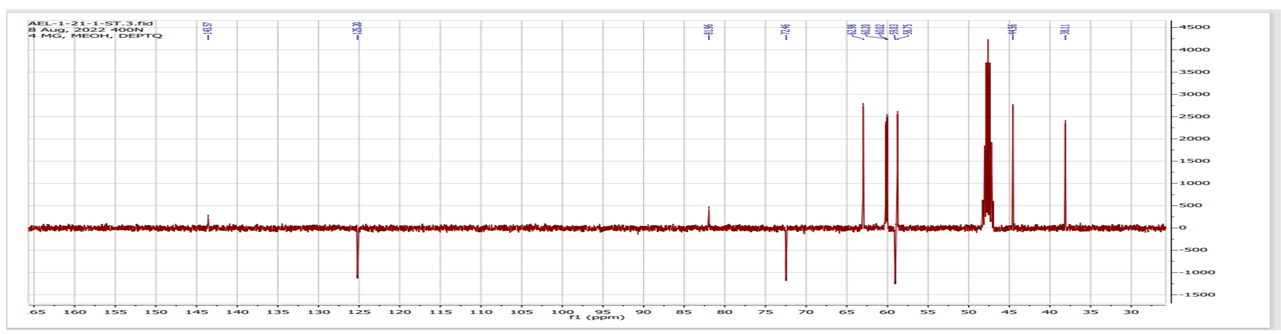
- *Striga asiatica* (Scrophulariaceae) is the most widespread *Striga* species,which has a geographic range spanning from South Africa to East Africa and from the Arabian Peninsula to Far East Asia.
- It is a hemiparasite and its main food sources are sorghum and millet in India and Pakistan, maize in Cambodia, China, and Thailand, Vietnam, Malaysia, Indonesia, and mainly rice in the Philippines.
- In sub-Saharan Africa, it is regarded as one of the most significant biotic constraints for subsistence agriculture known as witchweed in China, which has been used as a treatment for hepatitis and irritability in infants.
- Previous phytochemical investigation of *S. asiatica* whole plant reported in isolation of apigenin, acacetin, chrysoeriol, 5-hydroxy-7, 4` -dimethoxyflavone, 5,7-dihydroxy, 3`,4`-dimethoxyflavone, and 5-hydroxy-7,3`,4` -trimethoxy flavone, two caffeic acid sugar esters, verbascoside and isoverbascoside, as well as one norsesquiterpene, blumenol A from the whole plant.
- This study deals with the isolation and characterization of various phytochemical constituents from different fractions of the methanolic extract of *S. asiatica* aerial parts.




## Isolated compounds from *S. asiatica*




## $^1$H NMR Spectrum of 8



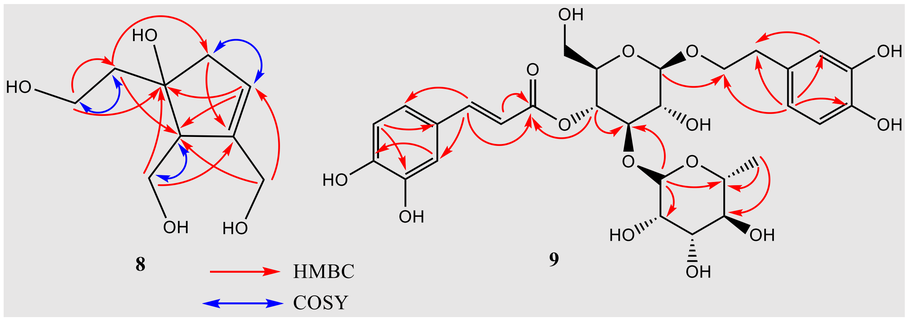

## DEPTQ spectrum of 8

## Material and Method

- *Striga asiatica* was collected in Hombolo, Dodoma region, Central Zone, Tanzania, parasitic on sorghum in April 2014, identity and confirmed by the Herbarium of University of Dar es Salaam, Tanzania staff members.
- The powdered air-dried aerial parts 150 g were extracted by maceration with 90% MeOH at room temperature. The solvent-free extract (23.5 g) was successively fractionated with petroleum ether, ethyl acetate and *n*-butanol.
- To obtain pure phytochemicals from different fractions, various chromatographic procedures including column chromatography over normal/reversed silica gel and Sephadex LH-20, as well as, preparative TLC were employed.
- NMR and mass spectra were recorded for purified compounds.

## Results and Discussion

- Thirteen compound were isolated from different fractions of the methanolic extract of *S. asiatica* aerial parts.
- Structure elucidation of isolated compounds were accomplished by 1D and 2D NMR, optical rotation, and ESIMS spectral data analysis.
- Compounds **8** was found to be previously undescribed and identified as (5-hydroxy-5-(2-hydroxyethyl)cyclopent-2-ene-1,2-diyl)dimethanol.
- Compounds **4**, (pinoresinol) & **11** (mussaenoside) are for the first time to be reported from Striga genus.




**Key HMBC correlations of compounds 8-9.**

## NMR of compound 8

$^1$H NMR (400 MHz, Methanol-$d_4$) δ 5.66 (m, 1H, H-3), 4.12 (d, *J* = 2.0 Hz, 2H, H-8), 3.81 (m, 1H, H-7a), 3.74 (ddd, *J* = 13.7, 9.9, 5.7 Hz, 1H, H-7b), 3.66 (d, *J* = 4.9 Hz, 1H, H-9a), 3.54 (d, *J* = 4.7 Hz, 1H, H-9b), 2.50 (t, *J* = 5.2 Hz, 1H, H-1), 2.46(m, 1H, H-4a), 2.24 (ddt, *J* = 16.6, 2.9, 1.5 Hz, 1H, H-4b), 1.96 (ddd, *J* = 14.4, 8.1, 6.5 Hz, 1H, H-6a), 1.86 (ddd, *J* = 13.7, 7.9, 5.7 Hz, 1H, H-6b).

$^{13}$C NMR (100 MHz, MeOD) δ 144.9 (C-2), 126.6 (C-3), 83.3 (C-5), 61.6 (C-9), 61.4 (C-8), 60.4 (C-1), 60.1 (C-7), 45.9 (C-4), 39.5 (C-6).

## Acknowledgements

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