

Aplotaxene, a possible allelochemical of thistle (*Carduus* sp)

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In a search for allelochemicals from *Carduus nutans* and the closely related invasive species *C. acanthoides*, bioassay-guided fractionation of roots and leaves of each species were conducted. Dichloromethane extracts of the roots of both species contained a phytotoxin [aplotaxene, (Z,Z,Z)-heptadeca-1,8,11,14-tetraene] with sufficient total activity to potentially act as an allelochemical. Aplotaxene made up 0.44% of the weight of greenhouse grown *C. acanthoides* roots and was not found in leaves of either species. It inhibited growth of lettuce in soil. The compound caused cellular leakage of cucumber cotyledon discs in darkness and light at similar concentrations. Soil in which *C. acanthoides* had grown contained aplotaxene at a lower concentration than necessary for biological activity in our short-term soil bioassays, but these levels might have activity over longer periods of time and might be an underestimate of concentrations in undisturbed and/or rhizosphere soil.

Ficus species are used in African traditional medicine in the treatment of a wide variety of ailments and diseases such as convulsive disorder, wound healing, gonorrhoea, tuberculosis, diabetes, diarrhoeal infections, dysentery, malaria and HIV. The aim of this study was to isolate the phytochemical constituents in the plant and test them for their antibacterial activity. The fruits, leaves and stem bark were extracted with organic solvents and the compounds in the extracts separated and purified by column chromatography before being identified by NMR spectroscopy and by comparison of the NMR data against values reported in the literature. The antibacterial activity of the pure compounds and extracts were tested using the disk diffusion method. Three triterpenes and three flavonoids: lupeol acetate (1); cycloart-23-ene-3, 25-diol (2); β -sitosterol (3); 5,7,4'-trihydroxyflavan-3-ol (4); epicatechin (5); and isovitexin (6) were isolated in this study. Antimicrobial activity was observed at 8 mg mL⁻¹ for *Staphylococcus aureus* ATCC 29213 with four of the six isolated compounds, with no activity being observed at 1 – 4 mg mL⁻¹ against *Escherichia coli* ATCC 25922, *E. coli* ATCC 35218 and *S. aureus* ATCC 43300. Epicatechin (5) was found to decrease adhesion of *E. coli* ATCC 25922 and *S. aureus* ATCC 29213. Decreased adhesion of *S. aureus* ATCC 29213 was also observed with 5,7,4'-trihydroxyflavan-3-ol (4) and isovitexin (6). The results of this study provide baseline information on *F. sansibarica*'s potential validity in the treatment of infections associated with Gram-positive microorganisms.