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## In vitro antifungal activity and GC/MS profiling of ten selected Sudanese essential oils against *Madurella mycetomatis*, the causative agent of black-grain mycetoma

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*Madurella mycetomatis* is one of the most prevalent causative agents of black-grain eumycetoma. Infection caused by this fungus is notoriously difficult to treat due to absence of adequate therapy and frequently leads to surgical excision of the infected limb. Prolonged follow-up after surgery with currently available antifungals, however, might improve the clinical outcome [1]. Nevertheless, the increasing recurrence and resistance of these pathogenic organisms to existing antifungals warrant the development a reproducible *in vitro* assay for discovery of novel bioactive agents [2].

The new 96-well microplate's assay based on resazurin dye, which was developed by our group to assess the antifungal activity against *Madurella mycetomatis* [3] is presently applied to 10 essential oils. GC/MS analysis was carried out with an HP 5890 Series II gas chromatograph (FID) and the identification of the compounds was based on comparisons with published MS data and a computer library search.

*In vitro*, *M. mycetomatis* appears to be highly susceptible to essential oils, hence the MICs of the essential oils ranged between 0.625 – 2.5 mg/mL, while the standard antifungal, itraconazole exhibited MIC of 0.354 µM. More than 300 mono- and sesquiterpenes were identified and a correlation between the bioactivity and the identified compound has been hypothesised.

### References:

[1] van de Sande WWJ. Global Burden of Human Mycetoma: A systematic review and meta-analysis. PLoS Negl Trop Dis 2013; 7: e2550. doi:10.1371/journal.pntd.0002550.

[2] van Belkum A, Fahal AH, van de Sande WWJ. *In vitro* susceptibility of *Madurella mycetomatis* to posaconazole and terbinafine. Antimicrob Agents Chemother 2011; 55: 1771 – 1773

[3] Khalid SA. Development of microtiter plate-based method for the determination of the MIC of antimycetomal agents against *Madurella mycetomatis*. II ResNet NPND Workshop on Natural Products Against Neglected Diseases, Nov. 25 – 28th, 2014, Rio de Janeiro, Brazil.