

Bioassay-guided purification of germination stimulants produced by sesame

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Abstract: Root parasitic weeds, a serious problem in agriculture, severely reduce yield of several economically important crops in tropical and semi-tropical areas of the eastern hemisphere and the Mediterranean region. Among the parasitic angiosperms, witchweeds (*Striga* spp.) and broomrapes (*Orobanche* spp.), Orobanchaceae, are the most devastating as they cause severe reductions in yields of many important crops. The seeds of these weeds may remain dormant in soil for many years until germination is stimulated by a chemical signal exuded by roots of host and some non-host plants. Sesame, a major crop in *Striga* endemic areas, root exudates collected from hydroponically grown plants, induced 60 and 50% germination of *S. hermonthica* and *O. minor* seeds, respectively. The germination activity of the crude root exudates on *S. hermonthica* seed was comparable to that of the synthetic germination stimulant GR24 at 0.1 ppm. A bioassay guided column and high-performance liquid chromatography (HPLC) confirmed the stimulatory activity of the root exudates on *S. hermonthica* and *O. minor* seed germination. Further analysis using HPLC connected to tandem mass spectrometry (LC/MS/MS) showed that the active fraction from sesame has a mass spectrum different from those of the natural strigolactones (strigol, sorgolactone, orobanchol, and alectrol) and is probably not a strigolactone.

Keywords: sesame, *Striga hermonthica*, *Orobanche minor*, germination stimulants, strigolactones