

Strigolactones, Signals for Friends and Enemies

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The strigolactones are signaling molecules that are used by the root parasitic broomrapes (*Orobancha* spp) and witchweeds (*Striga* spp) as well as the symbiotic arbuscular mycorrhizal (AM) fungi to detect the presence of their plant host. The requirements for such signaling molecules are that these compounds should be specifically indicative of the presence of a plant host. We are elucidating the biosynthetic origin of the strigolactones in several host plants of AM fungi as well as parasitic plants. This led to the discovery that the strigolactones are derived from the carotenoids - and should therefore be called apocarotenoids and not sesquiterpene lactones - and as such are quite “plant-specific”. Considering the dual signaling role of the strigolactones it is interesting that there is an interaction between AM fungi and parasitic plants through the host plant, resulting in reduced parasitism by *Striga hermonthica* on sorghum and maize that are colonized by AM fungi. We will discuss the evidence that this interaction is mediated through the production of strigolactones. Also the further elucidation of the strigolactone biosynthetic pathway, initially focusing on the first dedicated step that is probably catalyzed by a carotenoid cleavage dioxygenase will be discussed. We are cloning genes from the pathway to make transgenic plants with altered strigolactone biosynthesis. These plants will be a great tool to study the importance of these signaling molecules for the interaction of plants with friends as well as enemies.