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## Studies on Phyllody in *Parthenium Hysterophorus* and Host Range of Phytoplasmas Within Important Crops Cultivated in Ethiopia

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### Abstract

*Parthenium hysterophorus* is an annual weed that, due to its competitiveness and adaptability to different climatic and soil conditions, is widely spread in Australia, South Asia and parts of East Africa. It was introduced to Ethiopia in the 1980ies and became the major invasive weed in both arable and grazing lands. In Ethiopia a disease caused by phytoplasmas was commonly observed in *Parthenium* (up to 75 % field incidence). Diseased plants are characterised by excessive branching, reduced plant height and leaf size, and modification of floral structures into leaf-like structures that lead to sterility.

More than 700 plant diseases are associated with phytoplasmas. Phyllody symptoms caused by phytoplasmas were already found on different crops, e.g. sunn hemp, lupin, field pie, soybean and cowpea. This suggests that *Parthenium* phyllody also affects a wide range of legume species in Ethiopia. In order to test whether infected *Parthenium* plants can serve as a reservoir from which the pathogen could be transmitted to other plants, samples of important crops showing phyllody symptoms, such as faba bean, chick pea, lentil and grass pea as well as groundnut and sesame, were collected on locations in Ethiopia that were heavily affected by *Parthenium*.

DNA from these plants is going to be extracted and the phytoplasmas detected by polymerase chain reaction (PCR). The PCR-amplified DNA fragments will be further characterised applying Restriction Fragment Length Polymorphism (RFLP). Amplified fragments will be sequenced and phytoplasmas will be identified by comparison with sequences stored in databases. So far, the type of phytoplasmas found in *Parthenium* — which shows the closest relationship of rDNA-sequence fragments to the species „*Candidatus Phytoplasma aurantifolia*“ — was also detectable on sesame, groundnut and faba bean. These infected plants exhibited severe malformations of inflorescences which resulted in reduced yields.

**Keywords:** Ethiopia, *parthenium hysterophorus*, phyllody, phytoplasmas