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Studies on Phyllody in *Parthenium hysterophorus* and Host Range of Phytoplasma 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 characterized 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. In order to test whether *Parthenium* plants harbours phytoplasmas, which may also infect important agricultural crops in Ethiopia, weeds and cultivated plants showing phyllody symptoms, such as faba bean, chick pea, lentil and grass pea as well as groundnut and sesame, were collected on different locations. Phytoplasma infection of plants was assessed by polymerase chain reaction (PCR) and further characterisation by Restriction Fragment Length Polymorphism (RFLP) analysis of PCR products. Amplified fragments were sequenced allowing species identification of the pathogens. Sequence comparisons of rDNA sequences revealed that phytoplasmas detected in *Parthenium* plants were also present in sesame, groundnut and faba bean. They all belong to the species “*Candidatus Phytoplasma aurantifolia*” which suggests that *Parthenium* represents a pathogen reservoir for the phytoplasmas affecting agricultural crops in Ethiopia.

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