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# Studies on Transmission of the Phyllody of *Parthenium* by Cuscuta S*p. a*nd Different Insect-vectors in Regard to Cultivated Plants

Thomas Henniger[1], Martina Bandte[2], Christian Ulrichs[3], Taye Tessema[4], Susanne von Bargen[5], Carmen Büttner[6]

[1]*Humboldt Universität Zu Berlin, Institute for Horticultural Sciences, Phytomedicine, Germany*
[2]*Humboldt-Universität zu Berlin, Institute for Horticultural Sciences, Germany*
[3]*Humboldt-Universität zu Berlin, Institute for Horticultural Science, Urban Horticulture, Germany*
[4]*Humboldt-Universität zu Berlin, Institute for Horticultural Sciences, Section Phytomedicine, Germany*
[5]*Humboldt-University Berlin, Institute for Horticultural Sciences, Germany*
[6]*Humboldt-Universität zu Berlin, Institute for Horticultural Sciences, Section Phytomedicine, Germany*

**Abstract**

*Parthenium hysterophorus* L. is an annual herb of the *Asteraceae* family, originating from the tropical America. It has become an invasive weed in tropical regions worldwide and is known in Ethiopia since 1980 from the region around Dire Dawa. Since then it has spread in the middle-high regions of the Ethiopian highland. Phyllody is an important disease of P. hysterophorus, which induces plant stunting and reduces seed production. It's causal agent is thought to be a phytoplasmose and seems to be transferred by insect-vectors like leafhoppers. Aims of the study are to identify natural vectors and to investigate transmissibility and hostrange of this plant pathogen in Ethiopia.

Symptomatic plants of P. hysterophorus, collected in Ethiopia along roads in the surroundings from Debre Zeit and Nazreth at an altitude of about 1500 m, were used for transmission studies of the phytoplasmas to cultivated plants. Leafhoppers within the family Cicadellidae of a mass rearing established in Ambo as well as seedlings of Cuscuta campestris, which are suitable for the transmission of phytoplasmas, were used as experimental vectors. Furthermore, aphids and leafhoppers within the family Tettigometridae were collected from phyllody-infected P. hysterophorus plants around Debre Zeit and Nazreth with an exhaustor and transferred separately in 70 % ethanol.

In opposite to previous studies by Taye et al. Cuscuta campestris was successfully established on healthy as well as on diseased plants of P. hysterophorus. Haustorias predominantly developed at the leaves and leaf-stalks. Especially young and small plants were particular susceptible. Concluding, a method was established to determine the hostrange of the pathogen of the phyllody-disease. The technical course of the transmission studies with leafhoppers was successful, but no characteristic phyllody symptoms at P. hysterophorus were induced after transmission experiments with Cuscuta campestris and leafhoppers within the family Cicadellidae until now.

Collected insects were tested by a phytoplasma specific polymerase chain reaction (PCR). Therefor the primer-pair P1/P7 was applied to amplify an 1800bp rDNA fragment. Gel electrophoresis of PCR reactions, obtained from isolated DNA from different leafhoppers within the family Tettigometrida, revealed products between 1500bp and 2000bp. These results will be confirmed by RFLP-analysis.

**Contact Address:** Thomas Henniger, Humboldt Universität Zu Berlin, Institute for Horticultural Sciences, Phytomedicine, Lentzeallee 55/57, 14195 Berlin, Germany, e-mail: phytomedizin@agrar.hu-berlin.de

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