



Deutscher Tropentag, October 9-11, 2002, Witzenhausen
“Challenges to Organic Farming and Sustainable Land Use
in the Tropics and Subtropics”

**Ability of Watery Extracts of Composted Organic Waste from
Urban Households to Control Airborne Plant Pathogens**

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Abstract

The effect of compost applications on plant health has mainly been investigated regarding soil borne diseases. The few investigations on the effectiveness of shoot treatments with watery compost extracts showed that leaf pathogens were effectively controlled and that different mechanisms seemed to be involved. Additionally to systemically acquired induced resistance, some other antagonistic mechanisms of the microorganisms present in compost extracts were observed, including production of antibiotics, concurrence for nutrients or parasitism. In the present investigation, the effectiveness of watery extracts from composts that were produced from organic household waste in West Africa, was examined using the pathosystem tomato and *Alternaria solani*.

Applications of watery compost extracts successfully suppressed infection of *A. solani* on tomato. Different factors were checked for their impact on the effectiveness of the extracts and the density of microorganisms present in the extracts. Temperature and frequency of stirring significantly influenced the density of microorganisms and the effectiveness against *A. solani*. Daily stirring of the compost-water mixture during the extraction period (3 days) increased the density of microorganisms sevenfold and disease incidence was reduced by 27% as compared to the treatment with only one initial stirring. The incubation of the compost-water mixture at 20°C increased the number of microorganisms in the extract tenfold as compared to mixtures incubated at 30 and 35°C. The extract incubated at 20°C reduced incidence of *A. solani* by 66% as compared to the control, whereas the other variants were less effective.

The formulation substances cellulose, alginate and xanthan were added to the extracts to increase their effectiveness against the pathogens. The extract enriched with xanthan reduced disease incidence on tomato by 23% as compared to the extract without formulation substances.

Storage duration of the composts after their preparation significantly influenced the density of microorganisms present in the extracts and their effectiveness against *A. solani* on tomato. Those composts that were stored for a shorter period showed a higher number of microorganisms in the extract and a higher effectiveness of the extracts.