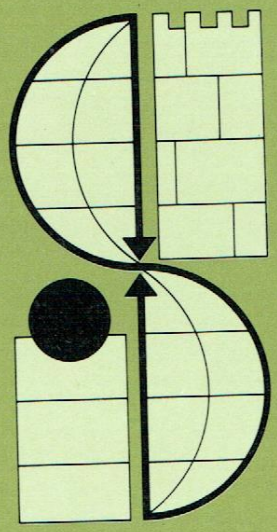

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PROGRAM AND ABSTRACTS

EFFECT OF pH ON PLANT GROWTH REGULATORS PRODUCTION BY ECTOMYCORRHIZAL FUNGI

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Seven isolates of ectomycorrhiza forming fungi were used in our studies. The fungi were grown in the Lamb's medium at 26°C, at pH 4.0, 5.8 and 7.0.
All the fungi studied produced auxin-like substances in tryptophan containing media. This production was affected by pH. More of auxins were detected at pH 5.8 and 7.0 than at pH 4.0. Among the auxin-like substances IAA was mainly produced.
Only one fungal isolate produced auxin-like substances in media of pH 5.8 without tryptophan.
Gibberellin-like substances were produced by 4 of 7 isolates studied. The production of these substances was inhibited at pH 7.0. In the post culture media of Cenococcum graniforme and Hebeloma crustuliniforme GA_3-acetate was detected by gas chromatography.
Cytokinin-like substances were produced by six fungal isolates grown at pH 5.8 and 7.0. No correlation was found between production of biomass and cytokinin-like substances synthesis. Among the cytokinin-like substances produced 2iP riboside and zeatin riboside were detected.

GROWTH AND SPREAD OF VAM FUNGI HYPHAE EXTERNAL TO PLANT ROOTS

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Vesicular-arbuscular mycorrhizal (VAM) fungi live in close contact with host plants by abundantly forming fungal structures (arbuscules, vesicules, hyphae) among and within the root cells, while the external mycelium of the symbiotic fungi spreads out from the roots to colonize the soil.
A system for indirectly monitoring the spread of VAM fungi hyphae was developed. Cuvette sections, confined on both sides by polyamide nets of 80um mesh size restrict root growth but allow passage of fungal hyphae. The mycorrhizal colonization of receiver plants separated from inoculated spreader plants by root-free cuvette sections is periodically examined to indirectly assess the spread of external hyphae through natural or amended soil or substrates. The first cuvette in the sequence is planted with a spreader plant which has been preinoculated with a mycorrhizal fungus. Adjacent to the spreader cuvette is the root free compartment through which hyphae must pass if colonization of non-inoculated seedlings in the receiver cuvette is to occur.
The growth of hyphae through the root-free cuvette from spreader to receiver varies greately depending on the substrate or soil amendment added to that intermediate cuvette. The cuvette system also may be used to monitor the ability of mycorrhizal fungi to spread through natural, non-sterilized soil sections (monoliths) cut in the field. Past studies using the cuvetttes have given results which are easily reproduced and interpreted, given uniform soil samples or substrates, and controlled temperature and moisture.

PHYTOTOXIC MICROORGANISMS AND THEIR IMPACT ON THE ALLELOPATHIC PHENOMENON IN THE NEGEV DESERT OF ISRAEL

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Very few annual plants are found near shrubs of Artemisia herba-alba on north facing slopes in the region of Sde Boker, in the Negev desert. It had been suggested that this allelopathic phenomenon is derived from volatile essential oils emanating from the plant. However, it was stressed that additional unknown factors were also involved. In our present work, we examined the possible role of phytotoxic microorganisms. A quantitative bioassay, using lettuce seeds (Lactuca sativa), for detection of phytotoxic activity of microorganisms, was developed. It has been shown that in winter, when annuals germinate and establish, phytotoxic intensity of bacterial and actinomycete isolates from "Artemisia" and "Control" sites was similar in the top soil layer (0-1 cm) where most seeds reside. However, densities of phytotoxic actinomycetes and phytotoxic bacteria were 1.5 and 10 times higher near shrubs of A. herba-alba compared with control sites. Specific phytotoxicity was calculated by multiplication of phytotoxic intensity and density of microorganisms. Combined specific phytotoxicity of actinomycetes and bacteria showed, in the winter, a specific phytotoxicity 5.8 times higher at "Artemisia" compared with "Control" sites. In addition, tests with essential oils from A. herba-alba showed a combined allelopathic effect with phytotoxic bacteria. At present, response of the annuals which are found in the investigated area, to phytotoxic microorganisms is being compared with that of lettuce seedlings.

CHARACTERIZATION OF Tn5 INDUCED R.meliloti MUTANTS WITH DECREASED NODULATION COMPETITIVENESS

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To isolate R.meliloti mutants affected in nodulation competitiveness, Tn5 induced Km-r colonies of strain CXM1-105 were used for mixed inoculation of alfalfa together with a reporter Fix^- strain CXM1-48 in ratio 1:10. Alfalfa plants (Medicago varia, cv. Zaikevicha) were grown on nitrogen-free medium in tubes with vermiculite. Due to its high competitiveness, strain CXM1-105 in the mixed inoculation provided the same shoot mass as in the monoinoculation. Among 123 Km-r colonies tested one colony, T107, failed to increase shoot mass in the mixed inoculation together with CXM1-48. Since in the monoinoculation the mutant T107 exhibited the same effectiveness as the parent strain, the former was considered to be a $Comp^-$ mutant. By transduction, Tn5 and $Comp^-$ mutation were mapped together. Earlier by Tn5 mutagenesis another $Comp^-$ mutant, T37, was generated in strain CXM1-105. In addition to $Comp^-$ phenotype, this mutant showed delayed nodulation. Mutant T107 in contrast to T37 had no influence on nodulation. Similarly to T37, Tn5 insertion in T107 by conjugation with deletion mutant ZB121 was localised in megaplasmid-1. It should be noted that only a part of alfalfa plants inoculated by $Comp^-$ mutant together with CXM1-48, showed Fix^+ phenotype, whereas mixed inoculation with CXM1-105 resulted in 100% Fix^+ plants. This was valid for two different alfalfa cultivars. Thus, in mixed inoculation on cv. Zaikevicha T37 induced 7.7% Fix^+ plants, T107 - 69.7%, while on cv. Uzgenskaya T37 induced 6.3%, T107 - 43.3%. In the greenhouse conditions the mutants were $Comp^-$ as well.