Abstract:

The work described in this thesis details the isolation and structure elucidation of secondary metabolites from endophytic fungi and the plant *Prismatomeris tetrandra*, and synthesis of (+)-ochromycinone.

From the three endophytic fungi 22 secondary metabolites were identified, of which 10 were new. The new structures were determined by spectroscopic analysis, notably 2D NMR techniques. The known metabolites were identified by comparison of their spectral data with those published in the literature. These secondary metabolites belong to diverse structural groups and most of the tested metabolites were found to be antimicrobial. Some of them exhibited prominent antimicrobial activities, which merit further pharmacological evaluation. This proved the enormous biosynthetic potential of the endophytic fungi, especially in the production of antimicrobial metabolites.

A new cytotoxic iridoid **PT-1,** isolated from a plant, is also reported.

The absolute configuration of **6744-5** was determined by the 'Exciton Chirality Method' from its dibenzoate derivative **6744-5b**. The absolute configuration of **6744-6** was determined by comparison with that of **6744-5**.

In the thesis a very short, simple, and highly enantiospecific (seven steps, 99% ee) synthesis of (+)-ochromycinone is also reported. In contrast to the known procedures, the commercially available and cheap enatiomerically pure (*R*)-(+)-3-methylcyclohexanone (99% ee) was used as starting material. Key steps are the regioselective Diels-Alder reaction and the photooxidation. A large dependency of the specific optical rotation on the concentration of (+)-ochromycinone in $CHCl_3$ was observed for the first time for angucyclinones.

The current study could be a good source of reference in the scientific world due to its novel findings, especially the data for a total of 45 compounds, of which 27 are new including natural products and derivatives thereof and intermediates of the synthetic steps.