

The tea plant, *Camellia sinensis* (L.) O. Kuntze is an important crop in the agriculturally based economy of Kenya. It ranks second to tourism as an earner of foreign exchange and provides a livelihood for more than a million people. There are a number of diseases affecting the tea plant but the most prevalent is armillaria root rot caused by the fungus *Armillaria mellea*.

Trichoderma species is an imperfecti fungi and is reported to be antagonistic against *Amillaria mellea* and *Mycena citricolor* fungus, the causative agents of armillaria root rot in tea and American leaf spot disease of coffee, respectively.

The first part of the study discusses the effects of the crude extracts and isolated compounds from *Trichoderma* species on the test organisms; *Paecilomyces variotii*, *Penicillium notatum*, *Nematospora corylii*, *Mucor miehei*, *Bacillus brevis*, *Bacillus subtilis*, *Enterobacter dissolvens*, *Sarcina lutea* and *Armillaria mellea*.

The crude culture broth extracts and pure compounds isolated from *Trichoderma harzianum*, *T longibrachiatum* and *T koningii* when cultured in media **M1** to **M6** were investigated individually for *in-vitro* antifungal and antibacterial activities by agar diffusion technique. Some of the culture broth extracts produced definite antifungal and antibacterial activities against most of the test organisms.

The results indicate that some extracts were fungicidal and antibacterial at concentrations upto 100 ug per 6 mm disks. *T koningii* showed the least activity against most of the test organisms especially against the yeast, *Nematospora corylii*.

The two compounds, 2-phenylethanol (1) and 2-(p-hydroxypheny) ethanol (tyrosol) (2) obtained from *T harzianum* were the most predominant metabolites and are being reported for the first time from *Trichoderma* species. The most active metabolite isolated from these strains was 6-n-pentyl-2H-pyran-2-one (3), which showed the highest antifungal and antibacterial activity and completely inhabited the growth of *Armillaria mellea* fungus when tested at a concentration of 200 ppm.

Compound 4 (sorbicillin) and compound 5 ergosterol were isolated from the mycelium of *T longibrachiatum*. Compound 4 exhibited moderate activity against the fungal test organism.

The second part of the study describes the extraction, isolation and structural elucidation of secondary metabolites from the roots of the plant, *Tephrosia aequilata* Baker.

Tephrosia (Leguminosae) is a large tropical and subtropical genus estimated to contain about three hundred species. The petroleum ether extract of the roots of *Tephrosia aequilata* was subjected to chromatographic separations. This led to the isolation of five flavonoids, which included two --hydroxychalcones, two --oxygenated chalcones and a pterocarpan. All four chalcones were prenylated.

The compounds demethypraecansone (30) and trans-praecansone A (33) are metabolites that are being reported for the first time from the plant, *Tephrosia aequilata*. The pterocarpan, 3, 4: 8, 9-

dimethylenedioxypterocarpan (31), the --oxygenated chalcone, cispraecansone A (32) and --hydroxychalcone, cis-praecansone B (34) isolated in the present study are new natural metabolites.

The pure compounds obtained from *T aequilata* were tested against gram-positive and gram-negative bacteria, fungus, yeast and *Plasmodium falciparum*. Demethylpraecansone B (30) exhibited moderate activity against gram-negative bacteria while *cis*-praecansone B (34) had moderate activity against gram-positive bacteria.