E2-16: Investigations on *Piper longum grown* in Sri Lanka

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Piper longum (S. Thippili) is a perennial herb of the Family Piperaceae and is known as long pepper. The plant grows in Sri Lanka, India, Malaysia and Philippines, A number of types of *P. longum* are known. It is widely used in Ayurvedic medicine and is reported to possess stimulant, carminative, analgesic and antiinflammatory properties and is used in the treatment of diseases of the respiratory tract.

Piperine is the principal component of the berries and several other alkaloids have been reported. Reported compound in the volatile oil of the berries are: n-hexadecane, n-heptadecane, n-octadecane, n-nonadecane, n-eicosane, n-neneicosane, thujene, terpinolene, zingiberine, p-cymene, p-methoxy acetophenone, dihydrocarvol and phenyl ethyl alcohol

P. longum is imported by Sri Lanka for use in Ayurvedic medicine. Therefore studies on systematic cultivation, chemical and microbiological investigations of *P.longum* have been undertaken.

The samples of *P.longum* plant materials for the studies were collected from the experimental plots of CISIR and also from the CRI farm at Walpita.

The piperine contents in different parts of *P.longum* were determined by extracting powdered plant materials (0.5 g) with ethanol for 3 h. The extract was made up to 100ml. 1ml of this was purified using a sep-pak cartridge and the solution made up to 10 ml. The HPLC analysis was carried out at 335 using Bondapak C-18 column and methanol - water (3:2) solvent system. The volatile oil obtained by the water distillation of the powdered berries for 5 h was studied by Gas Liquid Chromatography.

The antibacterial activities of the *P.longum* berry oils were studied against *Staphylococcus aureus* (NCTC 6571), *Escherichia coli* (NCTC 10418) and *Pseudomonas aeruginosa* (NCTC 10662) by Plate and Well method using gentamicin as the standard antibiotic. The plates were incubated and the inhibition zones were determined. The minimum inhibitory concentrations of the oils against these organisms were also determined.

The antifungal studies of the oils were conducted using. *Alternaria* sp *Collectotrichum* sp.and *Fusarium oxysporum*. The potato dextrose agar plates were incubated till the growth of the fungus reached a diameter of 2 cm. Then the filter paper discs containing the oils were placed on the plates and incubation zones were determined.

The piperine contents of the roots, stems, leaves and matured barries were found to be 0.89, 0.164, 0.01 and 2 % respectively. The piperine contents in 1,2,3 and 4-month old berries were 0.53, 1.46, 0.89 and 0.73 % respectively. The water distillation of the berries yielded 0.98 % oil. From this oil 19 components, several of which were previously unreported in this oil were identified by employing GC-MS data.

The antibacterial studies indicated that the oil was active against *S.aureus* and *E. coli*. The minimum inhibitory concentrations of the oils against *S.aureus* was about 42 mg/ml and against *E. coli* was about 83 mg/ml. The oils did not show any activity against any of the fungi.

The results indicate that the highest content of essential oil is present in the berries of *Piper longum* followed by the roots. These are the parts of the plant that are commonly used in ayurvedic medicine. The maturity studies indicated that the highest piperine content was at the age of 2 months. The volatile oil was found to be active against *S. aureus* and *E. coli* but it did not show any antifungal activity.