

## Polycyclic aromatic hydrocarbons in Sri Lankan made tea and their extractability into the tea infusion

Tea industry makes a vital contribution to the economy of the country. Foreign exchange earned from tea was U.S \$ 620 million in 2000. Quality of Sri Lankan tea is a key factor which enables Sri Lanka to be competitive in the international market and therefore maintaining the quality of Sri Lankan tea is vital to the sustainability of the tea industry. There is a continued worldwide concern in PAHs in the food and environment due to their carcinogenic properties. Improper or inefficient dryers used in tea processing resulted in teas with smoky taint. Smoke is always associated with PAHs, and therefore, smoky teas could contain PAHs.

The reverse-phase HPLC method was used, to determine the levels of nine PAHs (Anthracene[An], Phenanthrene[Ph], Fluoranthene[Fl], Pyrene[Py], Benz(a)anthracene[B(a)A], Chrysene[Ch], Benzo(k)fluoranthene[B(k)F], Benzo(a)pyrene [B(a)P] and Dibenz(a,h)anthracene [DB(a,h)A]) in smokey, clean (no smoke taint) and control (steam was used in the dryer to dry the tea) tea samples. The PAH levels in the tea infusion were also determined.

The smokey tea samples contain all the nine PAH's tested. However both clean and control tea samples did not contain carcinogenic B(a)P and DB(a,h)A. The tea samples with smoky character contained significantly higher concentrations of PAHs than that of control and clean tea samples thereby indicating improper or inefficient drying conditions which led to the generation of smoke which may be the cause for the contamination of tea with PAHs. There was no significant difference in PAHs levels between control and clean tea samples for all the PAHs except Benzo(a)pyrene. Control tea samples contained higher levels of B(a)P than clean tea samples. Out of nine PAHs tested, the concentrations of Phenanthrene, Fluoranthene and Pyrene were the highest (>100 ppb) in smoky tea samples. The levels of carcinogenic PAHs such as, Benzo(a)pyrene, Benz(a)anthracene, Benzo(k)fluoranthene and Dibenz(a,h)anthracene were found to be low even in smoky samples (7-23 ppb). These concentrations of carcinogenic PAHs were well below the concentrations set by Swiss authority (limit set by Switzerland is 50 ppb for Benzo(a)pyrene). Six PAH compounds out of nine were detected in the tea infusion and their concentrations were well below the recommended level. Most of the carcinogenic PAH's such as B(k)F, B(a)P and DB(a,h)A were not detected in tea liquor.