

## EMERGING THREATS BY NOVEL CONTAMINANTS TO ORGANICALLY GROWN TEA AND SPICES

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The recent updates of quality standards of organic crop produce exerted a greater challenge to Sri Lankan producers and exporters to be fitting with market requirement of EU and US. This study aimed to (a) distinguish novel contaminants under recent standards, (b) assess the rates and quantities of novel contaminants present, and (c) Identify the root causes for the presence of novel contaminants in the organic tea and spices exported by the Bio Food Pvt (Ltd). Chemicals namely; Anthraquinone, Biphenyl, Phthalimide, PAH, Chlorate & Perchlorate, MOSH/POSH, and Ethylene oxide were identified as novel contaminant by reviewing the recent certification standards of organic tea and spices. The detailed chemical analysis reports of organic tea and spices exported by the Bio Food Pvt (Ltd) During 2018 to 2021 were studied for the presence of contaminants. The frequency and trends of occurrence and concentration of identified chemical were explored. In 2018 and 2019, Phthalimide and Anthraquinone were detected in higher frequencies compared to other possible contaminants, while the frequency of occurrence of Anthraquinone was high in 2020 & 2021. In contrast, Phthalimide was detected in a lower frequency in 2021. Chlorate and PAHs were also recorded at high concentrations in random occurrence in pepper during the last three years. Phthalimide and Anthraquinone were frequently detected in tea in the year 2018 & 2019, on the contrary Anthraquinone was the high frequently detected contaminant in tea in 2020 & 2021. Anthraquinone is released to the environment via seed dressing, seed treatments, and pesticides, while Pesticides such as Captan, Folpet and Captafol contain Phthalimide. Processing steps of tea and spices showed tendencies of increasing PAHs. Anthraquinone and Phthalimide were the most common contaminants that caused the rejection of exports, hence rigorous scrutiny on agronomy, processing, and storage is essential in maintaining current quality standards.

**Keywords:** Anthraquinone, Organic tea, Organic pepper, Quality standards, Phthalimid