
Departmental Seminar

Seminar Title	: Return Seminar: An investigation of the impact of atmospheric cold plasma treatment on the extraction of curcumin and the analysis of phytochemicals, antioxidants, physical and morphological characteristics of turmeric (<i>Curcuma longa</i> L.) powder
Speaker	: Jawaharlal Nehru Garimella
Supervisor	: 2910
Venue	: CH-306
Date and Time	: 11 Nov 2024 (17.10)
Abstract	: Turmeric powder (<i>Curcuma longa</i> L.), a member of the Zingiberaceae family is a natural antioxidant found in tropical climates like China and India, is extracted using various processes, including conventional and contemporary technologies. Curcuminoids, consisting of curcumin, bisdemethoxycurcumin, and demethoxycurcumin, are essential for scavenging reactive oxygen species. Researchers are exploring combinations of extraction procedures and pre-treatments for better curcumin recovery. Cold plasma (CP) is an emerging non-thermal food processing technique. Multi-pin atmospheric CP-assisted extraction is a powerful yet underexplored technique that efficiently leaches bioactive compounds from the interior to the exterior surface using ionized gas. In the present study, different applied voltages (10, 20, and 30 kV) and exposure periods (10, 20, and 30 min) were used to treat TP with CP. CP's effects on curcumin extraction and preservation of vital bioactives were the main focus, as well as assessing morphological and physical characteristics of the CP treated TP. At 30 kV for 10 min, the curcumin content peaked, yielding 46.49 mg/g of TP. Significantly ($p < 0.05$), total phenols increased from 163.91 to 360.78 mg GAE/g DW. This was accompanied by an astounding 16% increase in total flavonoids and a 26% increase in antioxidants compared to the control. Additionally, micrographs showed that the treated powder had cell lysis. The surface color characteristics and thermal properties of TP have shown improvement with the application of CP.