



PhD Project

Project Details	
Project Title	Atmosphere Cold Plasma Application for Decontamination of Fungi and Mycotoxins in Agro Produce
Project Summary	<p>Spices are imported worldwide mainly from developing countries with tropical and/or subtropical climate. In spite of potential health benefits, spices are often susceptible to toxigenic microfungi growth and thus potential mycotoxin development. Mycotoxins, one of the most serious of natural origin, are produced by toxigenic microfungi, mostly by <i>Aspergillus</i>, <i>Penicillium</i>, and <i>Fusarium</i> and to a certain extent <i>Alternaria</i> genus as their secondary metabolites. Worldwide, spices are rather overlooked in terms of mycotoxin regulations, which usually only cover aflatoxins (AFs) and ochratoxin A (OTA). The common methods employed to remove mycotoxins includes physical, and chemical, enzymatic and microbial decontamination methods. Unfortunately, these methods can be inaccurate, unreliable, laborious, time consuming, and not suitable for inline measurement. It is worthwhile noting that the traditional mycotoxin degradation methods can take long processing time for effective mycotoxin reduction, hence not energy efficient and expensive. Even though several methods have been proposed to degrade mycotoxins in foods, the food industry continues to seek a rapid and effective technology. Therefore, the aim of this proposal is design and development of an atmosphere cold plasma based non thermal technology for the decontamination of fungi and mycotoxins of major spices harnessing their safety and quality attributes.</p>

PhD Supervisors			
Role	Faculty	Academic Unit in IITD	Email ID
Supervisor 1	Jatindra K Sahu	CRDT	jksahu@iitd.ac.in
Supervisor 2	Satyananda Kar	CES	satyananda.kar@ces.iitd.ac.in

Project requirements (Student qualifications, experience required, etc)
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- PG in Biotechnology/Chemistry/Biochemical Engineering/Chemical Engineering/Food Process Engineering/Food Science & Technology
- Other requirements like MTech/MSc (GATE/NET) as per IIT Delhi admission process

Source of funding (IRD/FITT Project details, if any)

No funding is available with faculty members to support the fellowship of the student.

The student should have his/her own fellowship (CSIR/DST/ICAR/UGC, any other) (5 years) to continue PhD work.

Role of Faculty Members involved:

1. Satyananda KAR:

Design and development of an atmosphere cold plasma system with different frequencies, evaluation of techno-economical aspect of the system and scale up.

2. Jatindra K SAHU:

Assessment of Atmosphere cold plasma system on decontamination of fungi and mycotoxins of major spices.

Atmosphere cold plasma induced mathematical modelling and simulation on inactivation kinetics of fungi and mycotoxins of spices.

Atmosphere cold plasma included volatile and colour change understanding, predictive modelling and simulation of spices.