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Food processing technologies on food alkaloids and food allergenics: Bioactive and toxicological aspects

Alkaloids are a class of naturally occurring chemical compounds that mostly contain biologically important amine structures and include some related compounds in plants and animal foods. Alkaloids show greatly diverse matrix and origins as well as pharmacological and/or nutraceutical action that often demonstrate a marked physiological action. The only thing that unites all these natural compounds under the term 'alkaloids' (alkali-like) is the nitrogen atom that is present in all of them. They are known to be adrenergics, antibiotics, poisons, stimulants, diuretics, astringents, anti-inflammatory, anti-hypertensives, anti-mydriatics, analgesics, anti-gout, expectorant, emetic, anti-spasmodic and many others. Food alkaloids can be take part in chemistry, food industrial applications, food supplement and medical drug fortifier. Chemical alkaloid taxonomy in plants and animal foods, originating from protein and aminoacids like this xanthinealkaloids, phenolic based alkaloids, originating from plant cell cultures, pseudoalkaloids, ergot alkaloids and tropane alkaloids in plants and cereals, glycoalkaloids in potatoes, their properties, nutraceutical and pharmaceutical effects. It has been carried out methylxanthine alkaloids including caffeine, theobromine and theophylline in most consumed non-alcoholic beverages such as tea, coffee, cocoa majorly and chocolate and herbal teas as less. Phenolic alkaloids containing piperidine alkaloid from black pepper with pyridine structure and sanguinarine, narceine alkaloids from pomegranate fruits with isoquinoline based structure are also important compounds. Alkaloids are usually derivatives of aminoacids, many have a bitter taste and are found as secondary metabolites in plants (including potatoes glycoalkaloids as solanine, solanidine and their derivatives and tomato glycoalkaloids as tomatine), animals (such as shellfish neurotoxic alkaloids and marine alkaloids; saxitoxin and its analogs), and fungi alkaloids. Many plant and marine based alkaloids are poisonous at dose over, but some are used medicinally as analgesics (pain relievers) or anesthetic, particulary morphine and codeine; some as vinblastine are used to treating certain cancer types. Taxol is an anti-cancer (antineoplastic or cytotoxic) chemotherapy drug and taxol is classified as a plant alkaloid, a taxane and an antimicrotubule agent. As others, phenethylamine alkaloid ephedrine is also used as stimulant, decongestant and appetite suppressant in diet processed foods and nutraceuticals. A specific alkaloids in foods can alter after food processing. In this point; toxicity, carcinogenic, toxigenic structure and cancer formation should be dealed. Food sensitivity is an adverse reaction to a food which other people can safely eat, and includes food allergies, food intolerances, microbial toxications, and chemical sensitivities, whereas food allergy is an abnormal response to a food triggered by body's immune system. Foodborne allergic reactions can sometimes cause serious illness and death. Food allergy is a reaction of the body's immune system to a certain food or beverage. In this context, food allergy is a very specific reaction involving the immune system of the body. At this point, distinguishing food allergy from other food sensitivities is the most important. Whereas food allergies are rare, food intolerances, which are the other

classification of food sensitivities, are more prevalent. Several specific foods are responsible for the majority of food allergies, even though any food can stimulate an immune response in allergic individuals. It is known that peanuts are the leading cause of severe allergic reactions, followed by shellfish, fish, tree nuts, and eggs. Peanuts, tree nuts including almonds, brazil nuts, cashews, hazelnuts (filberts), macadamia nuts, pecans, pine nuts (pignolias), pistachio nuts, walnuts, sesame seeds, milk, eggs, fish including shellfish and crustaceans, soy, glüten, fava beans, garlic and onion, mustard are some of the most known allergic foods. HHP processing improved the reducing of allergenic structure and allergenicity of some foods. Recently, limited studies have been performed on HHP effects on the structure of known allergens and the elimination of allergen compounds in foods. Further studies are needed for some allergenic proteins in various food matrices.

Biography

Tokuşoğlu has completed her PhD at Ege University Engineering Faculty, Dept of Food Engineering at 2001. She is currently working as Associate Professor Dr faculty member in Celal Bayar University Engineering Faculty Department of Food Engineering. Tokuşoğlu performed a visiting scholar at the Food Science and Nutrition Department /University of Florida, Gainesville-Florida-USA during 1999-2000 and as visiting professor at the School of Food Science, Washington State University, Pullman, Washington,USA during April-May 2010. She has published many papers in peer reviewed journals and serving as an editorial board member of selected journals. Tokuşoğlu published the scientific edited three international books entitled Fruit and Cereal Bioactives: Chemistry, Sources and Applications and entitled Improved Food Quality with Novel Food Processing by CRC Press, Taylor & Francis,USA Publisher,as third book Food By-Product Based Functional Food Powders by CRC Press,too; Dr Tokusoglu also published three national books entitled Cacao and Chocolate Science and Technology, Special Fruit Olive: Chemistry, Quality and Technology and third one as Frying Oils Science and Technology. She organized and/or administered as Conference Chair and Group Chair of Food and Nutrition at many conferences and congress in different continental countries as majorly in USA, Canada, Europe and Asia Pasific.