

Kratek opis usposabljanja mladega raziskovalca (*Short description of the Young Researcher's training*)

1. Raziskovalna organizacija (*Research organisation*):

Univerza v Ljubljani, Biotehniška fakulteta

2. Ime, priimek in elektronski naslov mentorja (*Mentor's name, surname and email*):

Tomaž Polak; tomaz.polak@bf.uni-lj.si

3. Šifra in naziv raziskovalnega področja (*Research field*):

4.02.04 Predelava animalnih surovin

4. Kratek opis usposabljanja mladega raziskovalca (*Short description of the Young Researcher's training*):

Navedite tudi morebitne druge zahteve, vezane na usposabljanje mladega raziskovalca (npr. znanje tujih jezikov, izkušnje z laboratorijskim delom, potrebne licence za usposabljanje...).

slo:

Mikotoksini so strupeni sekundarni metaboliti plesni in v svetu predstavljajo resno nevarnost v preskrbi s hrano. Zaradi možne naravne okužbe žitnih zrn, ki se uporabljajo v proizvodnji krme in živil, obstaja velika verjetnost vstopa mikotoksinov v prehransko verigo človeka. Področje dela naše programske skupine obsega tako živila animalnega kot rastlinskega izvora. V predlagani študiji se bomo posvetili problemu določanja in preprečevanja mikotoksinov v sušenih mesninah.

Sušene mesnine

Podatki iz literature kažejo, da lahko živila živalskega izvora, kot so meso in mesni izdelki, prispevajo k vnosu mikotoksinov v človeški organizem. Do neposrednega prenosa pride preko predelave mesa domačih živali, izpostavljenih kontaminiranim krmilom in krmnim mešanicam (carry over effect), preko uporabe mešanic začimb ali z neposredno kontaminacijo končnih izdelkov s plesnimi, ki pod določenimi pogoji proizvajajo mikotoksine. Študije so pokazale tudi, da so plesni rodov *Penicillium* in *Aspergillus*, izolirane iz površine mesnih izdelkov – fermentiranih klobas in pršuta, pod določenimi pogoji izdelave, kot so temperatura, vrednost aw, poškodbe ovitkov, prisotnost ali odsotnost kože (šunke) ali razpok in skladiščenje, sposobne proizvodnje omenjenih mikotoksinov.

V študiji na mesninah bi ugotavljali možnosti za zmanjšanje kontaminacije mesnih izdelkov z AFB in OTA. Pripravili bi izolate mikotoksinov in jih dodali v nadev za suhe salame (I), analizirali vsebnost omenjenih mikotoksinov po fermentaciji in s tem ovrednotili vpliv procesiranja na pojavnost mikotoksinov. Inokulirali bi tudi površino (ovitek) salame s starterskimi kulturami plesni, ki ne proizvajajo mikotoksinov (II), in s tem ovrednotili možno inhibicijo tvorbe mikotoksinov. Predvidevamo, (I) da bo na vsebnost mikotoksinov v nadevu suhih klobas (z izolati) vplivala tehnologija izdelave oz. dodatek starterskih kultur za fermentacijo sušenih mesnin in (II) da lahko z inokulacijo površine salam s plesnimi, ki ne proizvajajo mikotoksinov, zaustavimo ali inhibiramo rast tistih rodov, ki tvorijo mikotoksine.

Rezultati bodo pomagali realno oceniti vpliv naknadne kontaminacije mesnin z mikotoksini plesni (v obliki izolata) na vsebnost AFB in OTA v končnem fermentiranem izdelku. Prav tako bomo ocenili primernost nekaterih tehnoloških postopkov (fermentacija) za zmanjšanje kontaminiranih surovin (mesa in drobovine) z AFB in OTA.

V okviru usposabljanja je predvideno tudi sodelovanje z drugimi inštitucijami, ki se s podobno problematiko ukvarjajo, zato je obvezno znanje angleškega jezika ter zaželeno znanje hrvaškega jezika (obisk Veterinarskega inštituta v Zagrebu).

Kandidat(ka) mora imeti zaključeno 2. stopnjo Bolonjskega študija Biotehniških oz. naravoslovnih smeri. Usposabljanje bo potekalo večinoma v laboratoriju.

eng:

Mycotoxins are toxic secondary metabolites from moulds and they represent a serious threat to food security worldwide. Due to possible natural infection of cereal grains used in production of animal feed and human food, there is a high probability of mycotoxins entering the human food chain. The scope of the studies of our project group includes food of both animal and vegetable origins. Here, we will focus on problem determination and prevention of mycotoxins in fermented meat products.

Fermented and cured dry meat products

Data from the literature show that food of animal origin, such as meat and meat products, contributes to intake of mycotoxins in the human organism. Direct transfer occurs through processing of meat from domestic animals exposed to contaminated feed and compound feed (carry-over effect), through mixtures of spices used, or by direct contamination of the finished products with moulds that produce mycotoxins. Studies have shown that mould genera *Penicillium* and *Aspergillus* isolated from the surface of meat products (e.g., fermented sausages, smoked ham) can form these mycotoxins under certain conditions of production and storage, such as temperature, water activity (aw), damaged packaging, and presence or absence of skin (ham) or cracks.

The study of meat products will include assessment of options for reducing contamination by aflatoxin B (AFB) and ochratoxin A (OTA). (I) Mycotoxin-producing mould isolates will be prepared and added to the stuffing of salami, with analysis of content of mycotoxins in the meat and fat, and before and after fermentation, to determine the effects of processing on occurrence of mycotoxins. (II) The surface (the casing) of salami will also be inoculated with starter cultures of moulds that do not produce mycotoxins, to determine possible inhibition of mycotoxin production. We assume for (I) that mycotoxin content in the stuffing of dried sausages (with added isolates) will be affected by the manufacturing technology/ addition of starter cultures for fermentation of the cured dry meat, and for (II) that with inoculation of the surface of salami with moulds that do not produce mycotoxins, this will stop or inhibit growth of species of moulds that form mycotoxins.

The effects on subsequent contamination of meat with mould mycotoxins (added as isolates) on the contents of AFB and OTA in the final fermented product will be determined. The suitability of certain technological processes (e.g., fermentation) for reduction of contamination of raw materials (e.g., meat, offal) with AFB and OTA will also be investigated.

The training also includes cooperation with other institutions that deal with similar issues, so that knowledge of English is obligatory and knowledge of the Croatian language desirable (visit

of the Veterinary Institute in Zagreb).

The candidate must have completed the 2nd stage of the Bologna studies in Biotechnical or Chemistry sciences. The training takes place mainly in the laboratory.