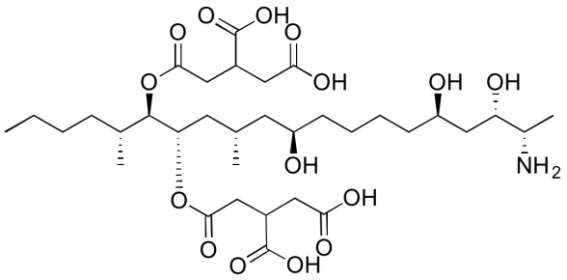
prehrambeno biotehnološki fakultet

Sveučilište u Zagrebu

Primjena otpada riblje industrije u uklanjanju mikotoksina FB_1

dr.sc. Iva Čanak



Zaklada Hrvatske akademije znanosti i umjetnosti

projekt „Uklanjanje mikotoksina otpadom riblje industrije „

prof.dr.sc. Ksenija Markov
prof.dr.sc. Jadranka Frece
dr.sc. Željko Jakopović
dr.sc. Deni Kostelac

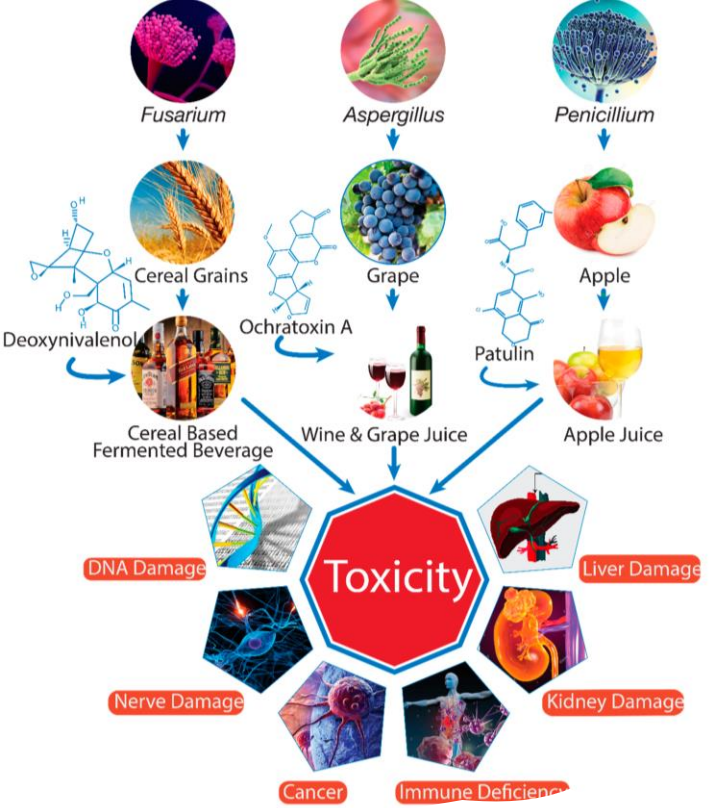
Mikotoksini

- Sekundarni produkti metabolizma nekih plijesni (*Aspergillus*, *Penicillium* itd.)
- Sinteza tijekom rasta na supstratima biljnog i životinjskog podrijetla
- Česti onečišćivači hrane; uzročnici značajne štete u gospodarstvu; uzročnici različitih bolesti
- Velik problem za ljude i životinje u brojim zemljama svijeta

- Prema procjeni FAO-a, 25 % hrane koja se proizvodi u svijetu kontaminirano je mikotoksinima

Aflatoxins	• *Aspergillus flavus* • *Aspergillus parasiticus* • *Aspergillus aflatoxiformans*
Ochratoxin A	• *Aspergillus carbonarius* • *Aspergillus westerdijkiae* • *Aspergillus ochraceus* • *Aspergillus steynii*
Fumonisins	• *Aspergillus niger* • *Fusarium oxysporum* • *Fusarium verticillioides* • *Fusarium proliferatum*
Zearalenone	• *Fusarium graminearum* • *Fusarium culmorum* • *Fusarium crookwellense*
Deoxynivalenol	• *Fusarium graminearum* • *Fusarium culmorum*

Kępińska-Pacelik, J., & Biel, W. (2021). Alimentary risk of mycotoxins for humans and animals. Toxins, 13(11), 822.



Primarne mikotoksikoze

Sekundarne mikotoksikoze- *carry over* effekt

re serije dodatka prehrani Lectranal

Izvor: Licencirane fotografije / Autor: Milsing

Državni inspektorat Republike Hrvatske izvijestio je da se povlače dodatni proizvodi Lectranal, a riječ je o svim serijama s valjanim rokom Lectranal kaps a 60 kom, Lectranal acute kaps a 30 kom, Lectranal acute a 20 kaps, priopćila je u petak Hrvatska agencija za poljoprivredu i hranu.

Proizvođač Milsing d.o.o. iz Velike Gorice odlučio je povući sve serije spomenutih proizvoda s valjanim rokom koje nisu obuhvaćene prijašnjim povlačenjem kako bi se osigurala maksimalna sigurnost, dodaje se u priopćenju

Proizvodi koji su bili obuhvaćeni prijašnjim povl
mikotoksina – okratoksina A u sirovini korišten
u skladu s europskom uredbom o utvrđivanju c
hrani te utvrđivanju postupaka u području sigu

Gospodarstvo

Iz trgovine povučena i izvjesna organska heljda! Zbog aflatoksin mikotoksina!

1 min read

9 mjeseci ago Franc Mihić

Proizvod nije u skladu s Uredbom (EZ) br. 1881/2006 od 19. prosinca 2006. o kontaminanata u hrani.

NASLOVNICA | VIJESTI | SPORT | SHOWBIZ | LIFESTYLE | TEMATSKI PRILOZI | PODCAST | KOLUMNE | TISKANO | DIGITALNO

VIJESTI Giti više od pola milijuna eura Borrell: "EU želi izbjeći ovisnost o Kini kao što je bilo s ruskim plinom" Putin ra

HRVATSKA

S tržišta povučene Naturine sušene smokve. Pronađene povećane količine aflatoksin mikotoksina

Naslovnica » Novosti » S tržišta se povlači sok od jabuke: razlog opoziva mikotoksin-patulin

S tržišta se povlači sok od jabuke: razlog opoziva mikotoksin-patulin

Mirjana Bošković Smrekar 27 lis 2022 Novosti Komentari isključeni

Subjekt u poslovanju s hranom u postupku samokontrole otkrio je da je u soku od jabuke povećan sadržaj mikotoksina-patulina zbog čega su ga povukli s tržišta.

OBAVEZNO PROVJERITE / Povlači se BIO kašica za djecu. ima povećane količine mikotoksina-okratoksina A

Izvor: dm

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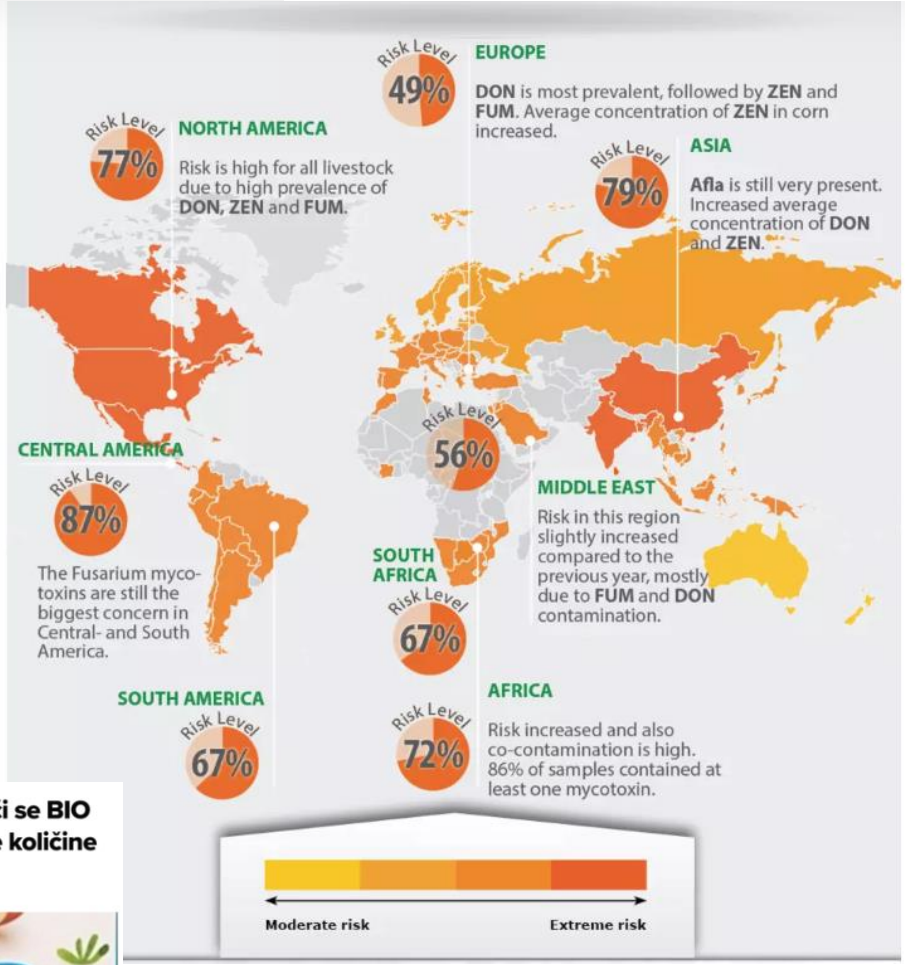

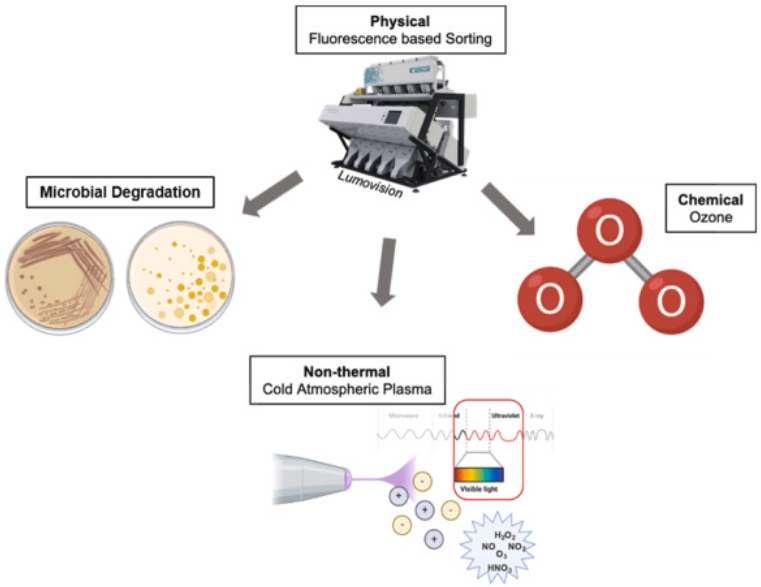

DOI: 10.5937/FFR1802087B

UDK 582.28:615.918:661.183

Review article

IN VITRO REMOVING OF MYCOTOXINS BY USING DIFFERENT INORGANIC ADSORBENTS AND ORGANIC WASTE MATERIALS FROM SERBIA

Aleksandra S. Bočarov Stančić*[1], Zorica R. Lopičić[2], Marija I. Bodroža Solarov[3], Slavica Ž. Stanković[4], Snežana M. Janković[1], Jelena V. Milojković[2], Jelena A. Krulj[3]

ABSTRACT: Aflatoxin B_1 (AFB_1), ochratoxin A (OTA), zearalenone (ZON), deoxynivalenol (DON) and T-2 toxin are the most extensively studied toxic fungal metabolites. Once mycotoxins enter the food/feed production chain keeping their toxic characteristics, it is very difficult to remove or eliminate them. One of promising methods to reduce mycotoxins in contaminated food/feedstuffs is the use of mycotoxin binders. This paper presents the results of *in vitro* investigations of mineral mycotoxin binders (bentonite - BEN, diatomite – DIA and zeolite - ZEO), and organic mycotoxin binders - agricultural waste materials (*Myriophillium spicatum*, peach and sour cherry pits). Chemical compositions of the adsorbents have showed that they do not consist of elements toxic to the animals. Inorganic adsorbents (BEN, DIA and ZEO) tested *in vitro* were better binders of AFB1 (94.97% - 96.90%), while the biosorbents were more efficient in adsorption of OTA (19.98% - 66.66%), ZON (33.33% - 75.00%) and T-2 toxin (16.67% - 50.00%). Inorganic adsorbents and organic waste materials expressed similar binding capacity for DON *in vitro*, with the exception of *M. spicatum* that did not at all adsorb this type B trichothecene. Our results indicate that feed contamination with different types of mycotoxins might be diminished by a product that combines different inorganic and organic adsorbents with diverse mycotoxin binding properties.

Key words: *mineral adsorbents, biosorbents, mycotoxins, in vitro binding*

Research Article

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(wileyonlinelibrary.com) DOI 10.1002/jsfa.9343

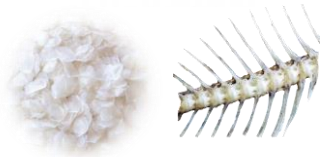
Comparative efficacy of agricultural by-products in sequestering mycotoxins

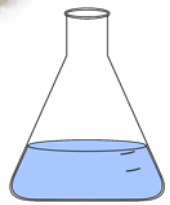
Donato Greco, Vito D'Ascanio, Elisa Santovito, Antonio F Logrieco and Giuseppina Avantaggiato*

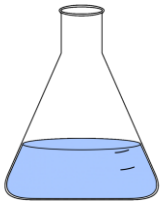
Table 1. AFB_1, ZEA, OTA, FB_1, and DON adsorption by selected agricultural by-products tested at different pH values (7 and 3) and at 1 mg mL^{-1} dosage towards a multi-mycotoxin solution containing 1 µg mL^{-1} of each toxin. Values are means of triplicate experiments

		Mycotoxin adsorption (%)									
		AFB_1		ZEA		OTA		FB_1		DON	
	Agricultural by-product	pH 7	pH 3	pH 7	pH 3	pH 7	pH 3	pH 7	pH 3	pH 7	pH 3
1	Pea seed	0	1	7	25	0	26	0	0	0	0
2	Pea seed-pod	0	3	5	18	0	3	1	0	2	0
7	Green bean	2	3	16	25	0	8	2	31	3	1
8	Cranberry beans	3	4	14	13	2	7	0	21	0	0
9	Cranberry beans (seed pod)	3	0	19	16	0	0	7	27	0	3
21	Lentil	0	4	8	22	0	18	12	4	1	1
22	Haricot bean	0	2	4	13	0	9	0	12	1	0
23	Cicerchia[a]	0	2	0	8	0	17	11	17	1	0
26	Chickpea	0	1	14	14	0	4	0	0	1	5
25	Broad bean	0	3	7	14	1	17	3	0	0	5
4	Onion leaf	4	5	15	26	0	16	4	11	1	2
5	Onion bulb	4	1	0	7	0	1	4	6	1	1
6	Cauliflower leaf	6	4	8	16	1	0	2	25	16	0
10	*Brassica rapa* stem and leaf	3	0	9	7	0	0	0	0	0	7
11	Broccoli stalk	3	1	9	10	0	0	14	29	0	4
12	Celery stalk	4	4	11	12	0	0	9	49	2	2
13	Fennel bulb	1	3	4	12	0	0	5	35	0	0
15	Potato tuber skin	3	5	0	7	0	1	24	30	1	3
35	Tomato fruit skin	4	8	18	35	1	21	11	0	3	0
3	Asparagus stem	11	14	27	33	0	29	0	0	0	0
37	Wheat straw	21	18	23	30	0	12	6	0	2	0
24	Broad bean (dry skins)	25	25	8	13	1	17	3	58	4	0
27	Olive tree branches	30	21	39	39	0	15	2	0	4	3
28	Olive tree leaves	29	13	60	58	0	30	0	0	1	6
29	Almond shell	38	40	26	24	0	15	3	40	1	0
36	Almond hull	45	48	21	31	3	38	9	7	3	0
14	Artichoke bud	51	31	62	31	0	4	9	18	2	0
16	Artichoke stalk	47	19	54	20	0	0	10	15	0	8
17	Artichoke leaf veins	39	13	44	15	0	0	9	34	1	13
18	Artichoke heart	46	12	74	19	0	7	18	49	1	6
19	Artichoke involucral bract	39	8	53	17	0	0	19	48	0	0
20	Artichoke leaf blades	37	17	62	44	0	15	18	7	2	18
30	Primitivo grape pomace	58	60	29	31	4	29	2	37	1	0
31	Sangiovese grape pomace	65	66	31	35	6	33	17	11	0	0
32	Malvasia grape pomace	58	53	27	25	6	18	19	4	0	0
33	Greco di Tufo grape pomace	51	50	27	30	5	19	15	19	1	0
34	Aglianico grape pomace	58	52	30	31	5	28	11	18	6	0

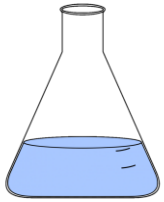
Metode



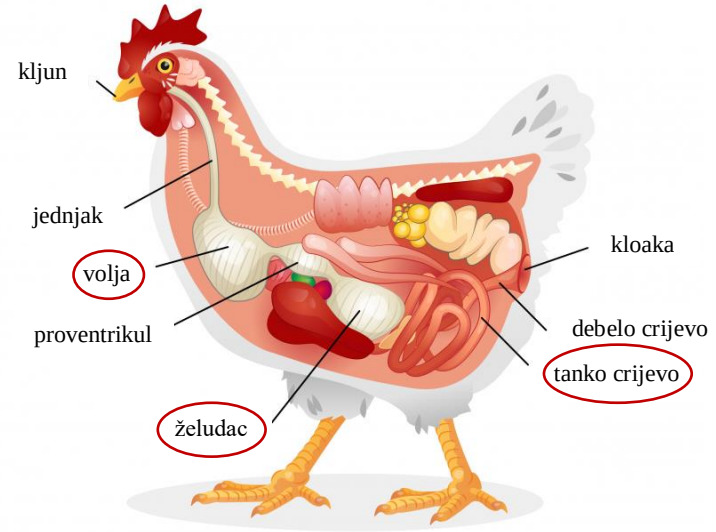


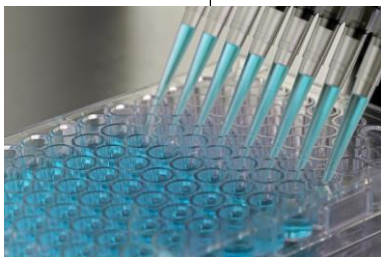


fosfatni pufer pH7



citratni pufer pH3





Rezultati

Tablica 1. Postotak vezanja FB1 u fosfatnom i citratnom puferu kostima brancina

	% vezanja	
Vrijeme (h)	Fosfatni pufer pH 7	Citratni pufer pH 3
0	63,95	84,05
2	75,1	61,1
4	96,55	69,25
24	56,1	66,1

Tablica 2. Postotak vezanja FB1 u fosfatnom i citratnom puferu kostima orade

	% vezanja	
Vrijeme (h)	Fosfatni pufer pH 7	Citratni pufer pH 3
0	53,3	94,55
2	44,5	93,1
4	80,6	86,4
24	93,7	87,75

Tablica 3. Postotak vezanja FB_1 u fosfatnom i citratnom puferu ljuskama

	% vezanja	
Vrijeme (h)	Fosfatni pufer pH 7	Citratni pufer pH 3
0	95,7	82,8
2	96,7	73,35
4	94,65	86,35
24	94	82,9

Tablica 4. Postotak vezanja FB_1 u simuliranim uvjetima GIT-a peradi

	% vezanja		
Adsorbens	Volja	Želudac	Tanko crijevo
Kosti brancina	21,51	20,43	22,58
Kosti orade	31,18	0	0
Ljuske	2,15	38,71	27,96

Hvala na pažnji!