

13th INTERNATIONAL
CONGRESS
OF THE SERBIAN SOCIETY
OF TOXICOLOGY



1st TOXSEE
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Present and Future of toxicology: Challenges and opportunities



10 - 12 May, 2023 Belgrade

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ABSTRACT
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IZAZOVI I MOGUĆNOSTI UPOTREBE PAPAVER SOMNIFERUM L. U PREHRAMBENOJ INDUSTRIJI I TOKSIKOLOGIJI

TOXICOLOGICAL
RISK ASSESSMENT

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Papaver somniferum L. je biljka opijumskog maka koja se konzumira kao hrana. Veliki broj sorti maka se koristi za proizvodnju farmaceutskih alkaloida opijuma i za proizvodnju semena za ishranu. Seme je bogato linoleinskom i oleinskom kiselinom- mononezasićenom masnom kiselinom, koja pomaže u snižavanju nivoa LDL (Low Density Lipoprotein - lipoproteina male gustine) u krvi i povećanje nivoa HDL (High Density Lipoprotein - lipoproteina velike gustine), što je veoma značajno za zdravlje kardiovaskularnog sistema. Seme ne sadrži opijate, ali može biti kontaminirano njima tokom berbe, jer njegov lateks sadrži brojne alkaloidne (morfijum, tebain, kodein, papaverin, noskapin).

Opijumski alkaloidi i njihovi polusintetski i sintetski derivati (heroin), oksimorfon, oksikodon, hidroksikodon, dihidrokodein) imaju značaj u toksikologiji i farmaciji, kao opioidni analgetici i sredstva zloupotrebe. Analgetički efekat se postiže dejstvom agonista preventivno na μ -receptore, dok κ i δ -receptori uglavnom smanjuju aktivnost puteva koji prenose informacije o bolu do centralnog nervnog sistema. Trovanja opioidnim analgeticima su posledica predoziranja heroinom i drugim opioidima. Konzumiranje većih količina prehrambenih proizvoda koji sadrže mak često može dati pozitivne rezultate testa na droge u urinu, što predstavlja izazove u razlikovanju uzimanja semena maka kao hrane od davanja opijata.



Izloženost tebainu konzumiranjem hrane koja sadrži mak može predstavljati zdravstveni rizik. Maksimalno dozvoljena koncentracija kodeina (MAC) u urinu je 300 ng/mL. Prag upotrebe hrane koji sa sigurnošću ne bi doveo do pozitivnih testova na lekove trenutno nije dostupan.

KLJUČNE REČI: proizvodnje hrane, zdravlje, koncentracije opijumskih alkaloida, opijati maka, toksičnost

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CHALLENGES AND POSSIBILITIES OF USING PAPAVER SOMNIFERUM L. IN THE FOOD INDUSTRY AND TOXICOLOGY

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Papaver somniferum L. is the opium poppy plant consumed as food. There are a large number of poppy varieties that are used to obtain opium alkaloids for pharmaceutical purposes and to produce seeds for use as food. Poppy seeds are rich in linoleic and oleic acid, a monounsaturated fatty acid that helps lower LDL (low density lipoprotein) levels in the blood and increases HDL (high density lipoprotein) levels, which are very important for cardiovascular health. Poppy seeds do not contain opiates, but can be contaminated with them when harvested, as the poppy latex contains numerous alkaloids (morphine, thebaine, codeine, papaverine, and noscapine).

Opium alkaloids and their semisynthetic and synthetic derivatives (heroin, oxymorphone, oxycodone, hydrocodone, dihydrocodeine) are of multiple importance in toxicology and pharmacy as opioid analgesics and abuse agents. The analgesic effect is achieved by the action of agonists primarily on μ -receptors, while κ - and δ -receptors mainly reduce the activity of pathways that transmit pain information to the central nervous system. Poisoning with opioid analgesics is usually the result of an overdose of heroin, methadone, and other opioids. Consumption of large amounts of poppy-containing foods often results in positive urine test results, which can make it difficult to distinguish between poppy as food and opioid use.



Exposure to thebaine through consumption of poppy-containing foods could pose a health risk. MAC-The Maximum Allowable Concentration of codeine in urine is 300 ng/mL. A threshold for food consumption that would not be certain to result in positive drug tests is not currently available.

KEYWORDS: food production, health, opium alkaloids, poppy opiates, toxicity

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