

**BOOK OF ABSTRACTS**  
**THE 2<sup>ND</sup> BALKANS - CHINA**  
**MINI-SYMPOSIUM ON NATURAL**  
**PRODUCTS AND DRUG DISCOVERY**



МИНИСТАРСТВО ПРОСВЕТЕ,  
НАУКЕ И ТЕХНОЛОШКОГ РАЗВОЈА



**11-13 April, 2019**  
**Belgrade, Serbia**

**Institute for Biological Research "Siniša Stanković",  
University of Belgrade, Belgrade, Serbia**

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CIP- Каталогизација у публикацији – Народна библиотека Србије

615.322.015.11(048)

**BALKANS-China Mini-symposium on Natural Products and Drug Discovery (2 ; 2019 ; Beograd)**

Book of abstracts / The 2nd Balkans-China Mini-symposium on Natural Products and Drug Discovery, 11-13 April, 2019 Belgrade, Serbia ; [organizer] Institute for Biological Research "Siniša Stanković", University of Belgrade ; [co-organizers Government of the Republic of Serbia [and] Ministry of Education, Science and Technological Development, Republic of Serbia [and] Shanghai Institute of Materia Medica (SIMM), Chinese Academy of Science (CAS), China] ; editor Marina Soković. - Belgrade : Institute for Biological Research "Siniša Stanković", University of Belgrade, 2019 (Belgrade : Swa tim). - 59 str. ; 21 cm  
Tiraž 90. - Bibliografija uz pojedine apstrakte. - Registar.

ISBN 978-86-80335-10-0

а) Лековите биљке -- Дејство -- Апстракти

COBISS.SR-ID 275279628

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Institute for Biological Research "Siniša Stanković",  
University of Belgrade, Belgrade, Serbia

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Government of the Republic of Serbia, under the  
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## Publisher

Institute for Biological Research "Siniša Stanković", University of Belgrade, Belgrade, Serbia

## Editor

Marina Soković

## Graphic design

Marija G. Gray

## Printed by

Swa tim, Belgrade

## Print run

90

## Year of publication

2019

## ISBN

978-86-80335-10-0

## Edible and medicinal fungi inhibit enzymes linked to diabetes type-2 therapy

Dejan Stojković, Marija Smiljković, Jovana Petrović, Marina Kostić, Ana Ćirić, Jasmina Glamočlija, Marina Soković

University of Belgrade, Department of Plant Physiology, Institute for Biological Research "Siniša Stanković", Bulevar Despota Stefana 142, 11000 Belgrade, Serbia

*Diabetes mellitus* is a chronic disorder of metabolism followed by abnormal rise in plasma glucose levels, as a consequence of unequilibrated insulin production and/or insensitivity to the effect of this hormone in signal transduction of cellular receptors. One of the effective strategies for diabetes type-2 management is the inhibition of complex polysaccharide hydrolysis by pancreatic  $\alpha$ -amylase and absorption limitation of glucose by inhibiting intestinal  $\alpha$ -glucosidase enzyme.

*Agaricus blazei* Murrill, *Coprinus comatus* (O.F.Müll.) Pers., *Cordyceps militaris* (L.) Fr., *Inonotus obliquus* (Ach. ex Pers.) Pilát, *Morchella conica* Pers. and *Phellinus linteus* Berk. & M.A. Curtis were investigated for their antidiabetic properties. *In vitro* assays on  $\alpha$ -amylase and  $\alpha$ -glucosidase enzyme inhibition were performed with methanolic extracts of the selected mushrooms. Furthermore, we calculated the necessary daily intake of mushroom extracts and dry mushroom powders based on the equivalent doses of therapeutic drug acarbose given to diabetic patients per day.

Our comparative study on enzyme inhibition showed that the most promising potential is ascribed to *I. obliquus* extract, while no inhibition of  $\alpha$ -amylase was recorded with *M. conica* and *C. militaris* methanolic extract at the tested concentration. The lowest daily intake of mushroom powder was suggested for *I. obliquus* with the dose of  $3 \times 1.148$  g/day, while the highest was predicted for *P. linteus*  $3 \times 2.215$  g/day.

Although majority of previous studies showed *in vivo* antidiabetic potential of water and polysaccharidic mushroom extracts by different experimental approaches, our study is the first highlighting *in vitro* antidiabetic potential by inhibition of  $\alpha$ -amylase and  $\alpha$ -glucosidase with methanolic extracts; which makes the investigated species more promising for the diabetes type-2 treatment by another additional and different mechanism of action.

**Keywords:** Diabetes mellitus,  $\alpha$ -Amylase,  $\alpha$ -Glucosidase, Mushroom, Edible and medicinal.

**Acknowledgment:** The authors thank to Serbian Ministry of Education, Science and Technological Development for the financial support (grant number 173032).