Movem Magazin

Država: Srbija

Doseg:

Strana: 62

Površina: 1.693 cm^2

07.12.2023
četvrtak

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PČELE ČUVAJU SVE(T)

BEES PROTECT THE WORLD (AND EVERYTHING IN IT)

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Pčele. Čudesna bića stvorena da pokreću čitav svet - sve nas! Možda o pčelama ne razmišljamo često na taj način, ali pored svega što o njima znamo, one su pokretači čak i ekonomskog razvoja!

Važne su za poljoprivredu, za uzgajanje voća i povrća, oprašuju biljke koje se koriste u ishrani stoke, pa je njihova uloga izuzetno važna i u stočarstvu. Na ovo se nadovezuje i prehrambena industrija, proizvodnja sokova, alkoholnih i bezalkoholnih pića, a onda i industrije mesa i mleka. Pčelinji vosak nezamenljiv je u industriji čelika, u optičkoj industriji, proizvodnji boja od voska, čije se značajne količine koriste se i u industriji kože, drveta i različitog papira. Industrija tekstila, verovali ili ne, takođe zavisi od pčela, jer one su ključne u oprašivanju pamuka i lana, koji su najčešće korišćeni prirodni materijali za proizvodnju tekstila. **Farmaceutska i kozmetička industrija često koriste med i pčelinji vosak kao bazu svojih proizvoda, a pčele, to svi znamo, proizvode i med - korisnu i lekovitu namirnicu korišćenu još i pre antičkog doba.**

Reklo bi se da od pčela zavisi opstanak gotovo svih ekosistema - opstanak sveta kakav poznajemo. Pčele su danas, kao i mnoge druge životinjske vrste, ugroženije nego ranije, a do toga je dovelo mnoštvo faktora. U svetu, pa i u Srbiji, je promena životnog stila jedan od njih. Sve manje živimo na selu i imamo mnogo manje livada koje su bile izvor najboljeg nektara i najkvalitetnijeg livadskog meda. Ovaj med je, pored kvaliteta za potrošače, bio od esencijalnog značaja i za zdravlje samih pčela. Livade su ili zarasle ili zamenjene jednoličnom monokulturom, a deficit kvalitetne hrane neminovno vodi i do problema sa zdravljem pčela. Ne smemo zaboraviti ni negativan efekat opšte hemizacije životne sredine (pesticidi u urbanim i poljoprivrednim područjima), zagađenje, globalne klimatske promene, čak i patogene koji se menjaju, postaju virulentniji, pojavljuju se novi... Imajući sve ovo na umu, moramo uraditi sve što je u našoj moći da pčele što više zaštitimo.

Upravo zato je Waste2ProtectBees projekat pokrenut - da bi podržao opstanak pčela i poboljšao njihovu ishranu. Ovaj projekat spojio je medonosne pčele i otpad iz industrije hrane, koji će pokušati da nusproizvode nastale tokom proizvodnje vina i pečuraka, iskoristi za dobijanje ekstrakata bogatih vrlo korisnim jedinjenjima za prihranu pčela.

Projekat Waste2ProtectBees osmislio je tim koji vodi **doc. dr Uroš Glavinić**, poučen dugogodišnjim naučnim radom prof. dr Zorana Stanimirovića na Fakultetu veterinarske medicine, koji se bavi istraživanjem pčela, njihove biologije, ponašanja i patologije već decenijama. Waste2ProtectBees podržao je Fond za nauku Republike Srbije, a realizuje se u saradnji sa Fakultetom za fizičku hemiju i Institutom za šumarstvo.

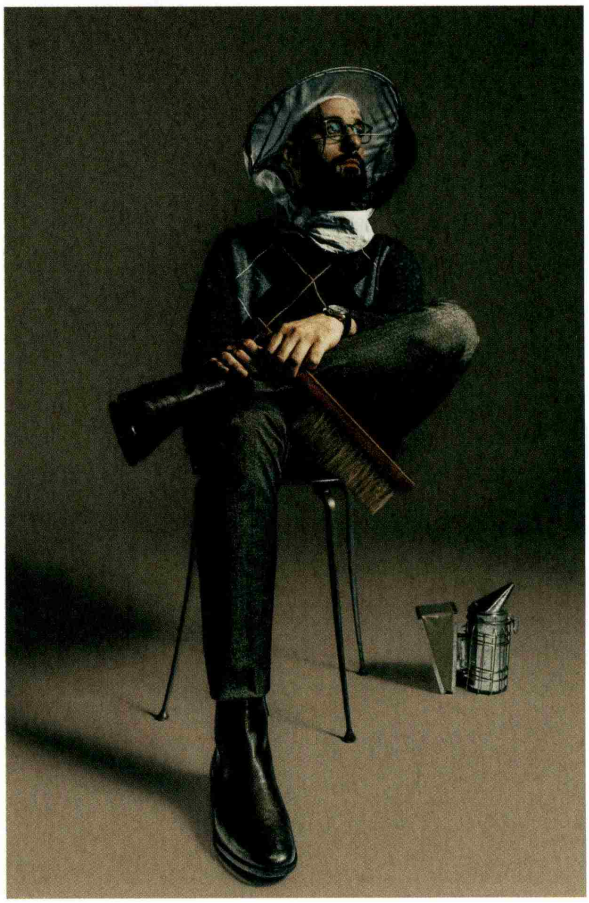
PČELINJI VOSAK NEZAMENLJIV JE U INDUSTRIJI ČELIKA, U OPTIČKOJ INDUSTRIJI, PROIZVODNJI BOJA OD VOSKA.

BEESWAX IS IRREPLACEABLE IN THE STEEL INDUSTRY, OPTICAL INDUSTRY, WAX-BASED PAINT PRODUCTION.

Bees. Miraculous beings created to sustain the entire world - all of us! Perhaps we don't often think about bees in that way, but beyond what we already know about them, they are drivers even of economic development!

They are crucial for agriculture, fruit and vegetable cultivation, pollinating plants used in livestock feed, making their role extremely important in animal husbandry. This extends to the food industry, juice production, alcoholic and non-alcoholic beverages, and then to the meat and dairy industries. Beeswax is irreplaceable in the steel industry, optical industry, wax-based paint production, significant quantities of which are also used in the leather, wood, and various paper industries. The textile industry, believe it or not, also depends on bees, as they are crucial in the pollination of cotton and flax, the most commonly used natural materials in textile production. **The pharmaceutical and cosmetic industries often use honey and beeswax as the base for their products, and bees, as we all know, produce honey - a beneficial and medicinal food used since ancient times.**

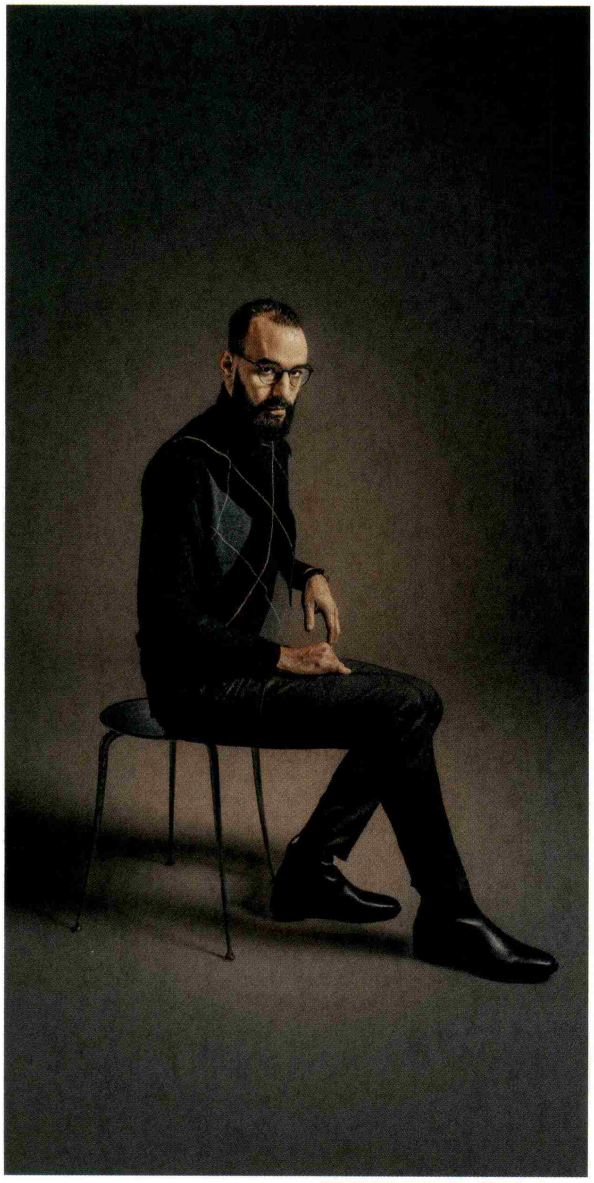
One might say that the survival of almost all ecosystems depends on bees - the survival of the world as we know it. Bees today, like many other animal species, are more endangered than before, and this is due to a multitude of factors. Changes in lifestyle are one of them, both globally and in Serbia. We increasingly live in urban areas, and there are fewer meadows that were a source of the best nectar and high-quality meadow honey. This honey, besides



TRANSFORMACIJA OTPADA U PČELINJU HRANU

Industrijski otpad sadrži veoma korisne materije (fenole, polisaharide i td) koje će zajednički izolovati tim Uroša Glavinića i tim sa Fakulteta za fizičku hemiju kojim rukovodi prof. dr Miloš Mojović. Nakon niza testiranja, različitih tipova ekstrakcija i optimizacije, dobijeni ekstrakti bi, dodavani kroz ishranu, pčelama trebalo da pomognu u borbi sa mnogim štetnim faktorima, kao što su različite vrste patogena, pesticidi, problem sa kvalitetom hrane, zagađenjem životne sredine i mnogim drugim koje pčele danas ugrožavaju. Krajnji cilj je smanjenje gubitka pčela i dobijanje kvalitetnih pčelinjih proizvoda, ali i pametnije iskorišćavanje onog što je do sada završavalo u prirodi isključivo kao „prazna" masa.

Dosadašnja iskustva su veoma pozitivna i obećavajuća. Preliminarni rezultati su pokazali da ovi ekstrakti mogu da



being of high quality for consumers, was also essential for the health of the bees themselves. Meadows are either overgrown or replaced by monotonous monoculture, and a deficit of quality food inevitably leads to bee health problems. We must not forget the negative impact of general environmental chemicalization (pesticides in urban and agricultural areas), pollution, global climate change, and even changing and increasingly virulent pathogens. With all this in mind, we must do everything in our power to protect bees as much as possible.

This is precisely why the Waste2ProtectBees project was initiated - to support the survival of bees and improve their nutrition. This project brings together honeybees and waste from the food industry, aiming to utilize by-products generated during the production of wine and mushrooms to extract compounds rich in very useful elements for bee nutrition.

The Waste2ProtectBees project was conceived by a team led by **Assoc. Prof. Dr. Uroš Glavinić,** guided by the long-standing scientific work of Prof. Dr. Zoran Stanimirović at the Faculty of Veterinary Medicine, who has been researching bees, their biology, behavior, and pathology for decades. Waste2ProtectBees is supported by the Science Fund of the Republic of Serbia and is implemented in collaboration with the Faculty of Physical Chemistry and the Institute of Forestry.

TRANSFORMING WASTE INTO BEE FOOD

Industrial waste contains very useful substances (phenols, polysaccharides, etc.) that the team led by Uroš Glavinić and the team from the Faculty of Physical Chemistry, led by Prof. Dr. Miloš Mojović, will jointly isolate. After a series of tests, various types of extractions, and optimization, the obtained extracts, when added to bee nutrition, are expected to help bees combat various harmful factors, such as different types of pathogens, pesticides, problems with food quality, environmental pollution, and many others that currently threaten bees. The ultimate goal is to reduce bee losses and obtain high-quality bee products, as well as smarter utilization of what has so far ended up in nature solely as "empty" mass.

The experiences so far are very positive and promising. Preliminary results have shown that these extracts can strengthen bee immunity, compensate for certain nutritional deficiencies, and facilitate the fight against

DOSADAŠNJA ISKUSTVA SU VEOMA POZITIVNA I OBEĆAVAJUĆA. PRELIMINARNI REZULTATI SU POKAZALI DA OVI EKSTRAKTI MOGU DA OJAČAJU IMUNITET PČELA.

THE EXPERIENCES SO FAR ARE VERY POSITIVE AND PROMISING. PRELIMINARY RESULTS HAVE SHOWN THAT THESE EXTRACTS CAN STRENGTHEN BEE IMMUNITY.

ojačaju imunitet pčela, nadomeste određene nutritivne nedostatke i olakšaju borbu sa mnogim štetnim noksama koje ih ugrožavaju. Očekuje se da će ovi rezultati, kada se pokrene implementacija projekta, biti podržani i novim rezultatima iz laboratorijskih i terenskih eksperimenata.

Docent dr Glavinić napominje da ne treba paničiti i pridavati veliki značaj apokaliptičnim člancima koje možemo pročitati u medijima o potpunom nestajanju pčela. Pčele su nastale mnogo pre, a verovatno će i ostati na planeti mnogo duže od nas. Jesu ugrožene, kao i mnoge druge vrste, u nekim aspektima više, u nekim manje, ali mi već znamo šta bi trebalo da radimo - da damo sve od sebe da se vratimo prirodi i životu u skladu s njom, čime ćemo obezbediti prave uslove i za pčele i druge ugrožene vrste.

Svakako, institucije bi trebalo da nastave da podržavaju nauku i istraživanja iz ove oblasti, a na projektima i njihovim rezultatima ostaje da to opravdaju i pomognu očuvanje životinja, biodiverziteta i životnog ekosistema.

many harmful factors that threaten them. It is expected that these results, when the project implementation is initiated, will be supported by new findings from laboratory and field experiments.

Assoc. Prof. Dr. Glavinić emphasizes that there is no need to panic and give great importance to apocalyptic articles we may read in the media about the complete disappearance of bees. Bees existed long before us and will probably remain on the planet much longer than we will. They are endangered, like many other species, to some extent more in some aspects, less in others, but we already know what we should do - make every effort to return to nature and live in harmony with it, thereby providing the right conditions for bees and other endangered species.

Certainly, institutions should continue to support science and research in this field, and it remains for projects and their results to justify and assist in the conservation of animals, biodiversity, and the living ecosystem.