INTERNATIONAL VIDEO CONFERENCE
22nd- 24th October 2021
SLOVENIA

Bees, Children and Health

BOOK OF ABSTRACTS

November 2021

Bees, Children and Health

International Virtual Conference

When: 22 to 24 of **October 2021**

Venue: Internet, ***online*** communication platform: **ZOOM**

Organisers:

Apimondia
https://www.apimondia.com/en/

Slovenian Beekeepers Association, Public Advisory Service
www.czs.si

Romanian Apitherapy Society
www.apiterapie.ro/en

Institute Eneja
https://zavodeneja.wixsite.com/

Apitherapy section of Beekeeping Association of Maribor
https://czdm.si/

CONFERENCE ORGANISATION STRUCTURE

APIMONDIA

President: **Dr. Jeff Pettis**

Vice-President: **Dr. Peter Kozmus**

Secretary-General: **Riccardo Jannoni-Sebastianini**

President of the Apimondia Scientific Commission on Apitherapy: **Dr. Cristina Mateescu**

LOCAL ORGANISING COMMITTEE:

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Vice-president:	**Nina Ilič**
Member:	**Dr. Andreja Kandolf Borovšak**
	Vlado Pušnik
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	Aleša Mižigoj
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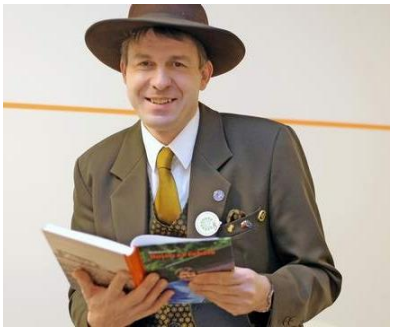
	Dr. János Körmendy-Rácz	**Ina Stojanovič**
	Dr. Jozef Simuth	**Dr. Nataša Lilek**
	Dr. Badiaa Lyuossi	

MAIN TOPICS

- **Medicinal bee plants useful for bees and children**
- **Medicinal beekeeping, rules, and principles**
- **Bio-pharmacology and quality of beehive products**
- **Prevention and treatment of children diseases, including allergies to beehive products**
- **Prevention and treatment of viral diseases in children**
- **Api-Tourism and Api-Education for Children**



Dear friends,

We are really honored that you participated to the virtual conference: **"Apitherapy for children"**. Nowadays people are increasingly turning to nature for help with their health. By consuming bee products, we strengthen our health and relieve many symptoms of many diseases, and apitherapy is just that, consuming bee products to improve and strengthen our health. For many years, our grandmothers believed that local bee products are a real nature's treasure for our health. Children are our greatest wealth, and we dedicate this virtual conference Apitherapy for Children "Bees, Children and Health" to them.

Through the international conference we wanted to show how important Apitherapy for children really is, especially in respect to living a healthy lifestyle, regular consumption of locally produced food with the emphasis on bee products for preventive purposes as well as the use of different bee products to relieve various diseases.

In Slovenia we have a saying: "**Kar se Janezek nauči, to Janez zna**", meaning what a little child learns that is what an adult knows. Having that in mind we must at least try to encourage our children to use bee products regularly to a point where it becomes a part of their routine, daily diet. That will affect them as adults. We have to offer our children the best that nature has to offer. Giving them bee products and apitherapy preparations that are locally made is the best and the right choice.

Boštjan Noč, president of the conference

FINAL PROGRAMME

Friday, 22 October (CET, Ljubljana, Bratislava, Belgrade)

9:00-9:30	Opening Ceremony	
	Apitherapy and Education in the World *Moderators: Nina Ilič, Andreja Kandolf Borovšak*	
9:30-9:45	**Beekeeping in Slovenia** *Boštjan Noč*	Slovenia
9:45-10:05	**Apitherapy in Slovenia** *Andreja Kandolf Borovšak, Vlado Pušnik, Karl Vogrinčič*	Slovenia
10:05-10:25	**An Introduction to the Importance of Medicinal Beekeeping for Beekeepers and Apitherapy Practitioners** *Stefan Stângaciu*	Romania
10:25-10:45	**An Introduction to the World of Children and Api-Education** *Nina Ilič*	Slovenia
10:45-11:05	**Apitherapy Approach in Kindergarten** *Ina Stojanović*	Slovenia
11:05-11:25	**An Effective Educational Tool to Promote Psychological Development in Children** *Astrid Sarapa, Gordana Hegić*	Croatia
11:25-12:00	Honey Break Invitation for Photo Contest voting	
12:00-12:20	**Croatian Experiences in Promoting the Consumption of Bee Products** *Gordana Hegić, Miroslav Antolčić, Elvira Jakopinec Lacković*	Croatia
12:20-12:40	**Autochthonous Melliferous Plants in Education** *Katja Malovrh*	Slovenia
12:40-13:00	Summary of the Section	
13:00-14:30	Lunch Break	
	From Bee Plants to Bee Products *Moderators: Janko Božič, Cristina Mateescu*	
14:30-15:00	**Bee Biology** *Janko Božič*	Slovenia
15:00-15:20	**A Survey of Medicinal Bee Plants Used in Traditional Medicine for Children's Diseases in Sefrou City in Morocco** *Badiaa Lyoussi, Meryem Bakour, Hassan Laaroussi*	Morocco
15:20-15:50	**Quality and Safety of Beehive Products** *Etienne Bruneau*	Belgium (Apimondia)
15:50-16:10	**Apitherapy in Croatia, Stamp of Quality by the Croatian Apitherapy Society** Gordana Hegić, Miroslav Antolčić, Zrinka Franić	Croatia
16:10-16:40	**Legal Status of Bee Products** *Cristina Mateescu*	Romania (Apimondia)
16:40-17:00	Honey Break Invitation for Photo Contest voting	
	Composition, Biological and Pharmacological Properties of Bee Products *Moderators: Badiaa Lyoussi, **Stefan Stângaciu***	
17:00-17:20	**Extracts of Lithuanian Propolis Extracts and Poplar Buds: Comparison of Their Composition and Biological Activities**	Lithuania

	Monika Stanciauskaite, Asta Marija Inkeniene, Ruta Marksiene, Daiva Majiene, Kristina Ramanauskiene	
17:20-17:50	**Pharmacology of Bee Products** *Badiaa Lyoussi*	Morocco
17:50-18:20	**An Introduction to Clinical Apitherapy** ***Stefan Stângaciu***	Romania
18:20-18:40	Summary of the Day and General Discussion	
18:40-18:45	Invitation for Photo Contest voting	
Saturday, 23 October (CET, Ljubljana, Bratislava, Belgrade)		
	Clinical Apitherapy for Children Moderators: *Mamdouh Abdulrhman,* ***Stefan Stângaciu***	
9:00-9:20	**Apitherapy for Children: Therapeutics Uses of Bee Products and Medicinal Plants in Daraa Tafilalet Region of Morocco to Prevent and Treat Pediatric Ailments** *Karima El-Yagoubi, Badiaa Lyoussi*	Morocco
9:20-9:45	**Honey in Childhood Diseases** *Mamdouh Abdulrhman*	Egypt
9:45-10:15	**Honey Nebulization Against Respiratory Diseases in Children** *Mamdouh Abdulrhman*	Egypt
10:15-10:35	**Efficacy of Honey Bee Products in Upper Respiratory Tract Infections in Children** *Sibel Silici, Duran Arslan, Selma Gökahmetoglu , Mustafa Altay Atalay*	Turkey
10:35-11:00	**Health Benefits of Royal Jelly and its Use in Children's Apitherapy** *Martin Lalić, Ana Soldić, Zdenka Lalić, Andrija Lalić*	Croatia
11:00-11:5	Summary of the Section	
11:15-11:45	Honey Break Invitation for Photo Contest voting	
	Bee Hive Air Therapy *Moderator*: ***Stefan Stângaciu***	
11:45-12:05	**Experience from Practice Using Api-Inhalation in Children** *Josipa Kujundžić, Armin Nuhanović*	Croatia Bosnia and Herzegovina
12:05-12:25	**Api-Aromatherapy: How Can Propolis Products Help Children with Dermatological Problems?** *Zrinka Franić, Gordana Hegić*	Croatia
12:25-12:45	**Inhalation of Beehive's Air in Children with Hyper Reactivity of Bronchial Mucosa** *Zorica Plavšić*	Serbia
12:45-13:00	Summary of the Section	
13:00-14:30	Lunch Break	
	Role of Bee Products in Children's Nutrition *Moderators: Nataša Lilek, Mirela Strant*	
14:30-14:50	**Bee Products for Children as Food and Remedies** *Mirela Strant*	Romania
14:50-15:10	**Api-Nutrition for Infants and Children** *Alina Varadi, Rodica Margaoan, Mirela Strant, Banu Yücel*	Romania Turkey
15:10-15:30	**Improving Children Nutrition with Bee Products** *Midhat Jasic, Azra Sinanovic*	Bosnia and Herzegovina

15:30-15:50	**Bee Pollen as a Source of Essential Elements in Children Nutrition** *Nataša Lilek, Andreja Kandolf Borovšak, Jasna Bertoncelj, Katarina Vogel Mikuš, Marijan Nečemer*	Slovenia
15:50-16:10	**Enhanced Nutritive and Functional Value of Multifloral Bee Pollen Fermented in a Kombucha Consortium and Its Potential Immune Benefits for Children** *Ionut Moraru, Angela Moraru, Cristina Mateescu*	Romania
16:10-16:30	**Development Problems with Children and Experience with Bee Products** *Thomas Gloger*	Germany
16:30-16:45	Summary of the Section	
16:45-17:00	Honey Break Invitation for Photo Contest voting	
Saturday, 23 October (CET, Ljubljana, Bratislava, Belgrade)		
17:00-18:30	**Round Table: *Doses, Side Effects (Including Allergies) and Quality and Safety of Bee Products*** *Stefan Stângaciu, Badiaa Lyoussi, Mamdouh Abdulrhman, Mirela Strant, Chris Kleronomos, Cristina Mateescu, Sibel Silici, Janko Božič, Ali Timuçin Atayoğlu*	
Sunday, 24 October (CET, Ljubljana, Bratislava, Belgrade)		
	Projects in Api-education *Moderators: Nina Ilič, Janko Božič*	
9:00-9:20	**Learning about Bees in Preschool Children** *Jasmina Kumar*	Slovenia
9:20-9:40	**Science Day for Motivation and Inspiration in Secondary Vocational School Students** *Monika Očko*	Slovenia
9:40-10:00	**Effects of Beekeeping on Child Development** *Nina Ilič, Loretta Andrade, Michelle Jose*	Slovenia India
10:20-10:40	**Training Courses in Beekeeping for Person with Mental Disability** *Dušan Milinkovič*	Slovenia
10:40-11:00	**Children and Bees** *Maja Rodić Škondro, Mato Anić*	Croatia
11:00-11:30	Honey Break	
11:30-11:50	**Honey Breakfast** *Nataša Klemenčič Štrukelj*	Slovenia
11:50-12:10	**Honey: from Local Tradition to Cross-Generation Education** *Borjan Batagelj*	Croatia
12:10-12:30	**Api-Education and Apitourism for Children** *Dominika Trepel Koritnik*	Slovenia
12:30-12:45	**Our Friends Bees** *Tomislav Terzin, Barbara Drezga*	Canada Croatia
12:45-13:00	Summary of the Section	
13:00-14:00	Closing of the Conference and Announcement of the Winners of Photo Contest Video of Children from Latina America with speech of Mr. Jose Cabrera (Ecuador)	

CONTENT

BEEKEEPING IN SLOVENIA

Boštjan Noč, Andreja Kandolf Borovšak

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Beekeeping is a traditional agricultural activity in Slovenia. More than 230 years ago, the knowledge of the Slovenian beekeeper was presented to the world by Anton Janša, the first teacher of beekeeping in the court of the Habsburg Empress Maria Theresa. His birthday (May 20) was on the initiative of Republic Slovenia declared as World Bee Day. Slovenia is a homeland of bee *Apis mellifera carnica*. Painted beehive panels are an essential element in the history of Slovenian beekeeping and even in the history of Slovenian folk spiritual culture. In October 2020, there were 11,293 beekeepers in Slovenia, who were beekeepers with 213,581 bee colonies. Beekeepers join local beekeeping societies, which make up the Slovenian Beekeepers' Association (SBA). The Ministry of Agriculture, Forestry and Food has assigned SBA a concession to provide a public advisory service in beekeeping, the main task of which is to advise beekeepers in the field of technology, food safety and economics. SBA also has the status of approved breeders' organization and the Observation and Forecasting Service of nectaring has been operating for more than a hundred years. There is also a professional library, as one of the main tasks of SBA is the education and training of beekeepers. We created a 3D model physical model of a honeybee in a ratio of 1: 100, which also contains educational animations about the functioning of the bee organism. We work with children in schools in year 2019 were more than 185 beekeeping clubs with more than 2430 children. We are the initiator of honey breakfast in Slovenia, which was also spread to Europe. We work also with vulnearable target group, like people with physical and mental disabilites, we prepared a beekeeping teaching path for people with visual impairments.

Keywords: Slovenia, beekeeping, Slovenian Bekeepers' Association

APITHERAPY IN SLOVENIA

Andreja Kandolf Borovšak[1], Karl Vogrinčič[2], Vlado Pušnik[2]

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Beekeeping has a rich tradition and is very important in Slovenia. Honey and wax were produced and traded in Slovenia as early as the 12th century. At the end of the 19th century, the field of apitherapy was most marked by dr. Filip Terč. He was of Czech descent and moved to Maribor with his family in 1875. As early as 1879, he began trying to treat rheumatic diseases with apitoxin. He performed this type of treatment on about 700 patients, thus gaining the title of a pioneer of modern apitherapy in the history of medicine and beekeeping. At the Congress of Apitherapy in March 2006 in Passau, March 30, the birthday of Dr. Filip Terč, for the International Day of Apitherapy was announced.

The Slovenian Beekeeper's Association in cooperation with Apitherapy section of Beekeeping Association of Maribor named by dr. Filip Terč runs a training program for apitherapists.

One of the peculiarities of Slovenians beekeeping is a bee house. A bee house is a building in which we put beehives under a common roof. Often, we can find a bed in bee houses, intended for the beekeeper. Many have used the favourable microclimate of the bee house for the implementation of apitherapy as apiair therapy.

Recently a standard of national professional qualification as Apitherapist was prepared and in the future a modern Apicenter that will combine apitherapy, wellness and wellbeing is planning to be build.

Keywords: Slovenia, apiair therapy, Filip Terč

AN INTRODUCTION TO THE IMPORTANCE OF MEDICINAL BEEKEEPING FOR BEEKEEPERS AND APITHERAPY PRACTITIONERS

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Most beekeepers do their best to collect, process and deliver high quality products, especially honey, for consumption as food. When we need though bee products to prevent or treat diseases in children, the quality standards should be much higher, because we need not only excellent nutrients, but also high amount healing substances. Goal of the work was to establish guidelines on the practice of health oriented beekeeping (medicinal beekeeping).

We have analysed and compared different types of beekeeping (regular, industrial, bio/ecological...) with the intention to find the areas that can be improved in order to be able to collect beehive products rich in certain substances that can prevent or treat certain diseases.

The beekeepers that want to produce beehive products for a better protection of the human health need to respect all conditions required for bio/ecological beekeeping, but with an even higher standard for cleanness and safety, ensuring in the same time that they do everything to get medicinal degree, mainly mono-floral, beehive products which have high concentration in specific substances. In the case with a child that has sleep disorders and/or dry cough, a mono-floral linden honey would be better than a multi-floral honey.

In the case of child having a dangerous infection, a honey rich in antibacterial substances (like thyme, chestnut, honeydew, or manuka honey) is much more valuable than a regular honey.

Nutrition is extremely important for Health, but Health depends on more things than nutrition. Every single beekeeper on Earth should be educated in medicinal beekeeping methods and technics and also on the basics of Apitherapy.

Keywords: medicinal beekeeping, healing substances, mono-floral based bee products

AN INTRODUCTION TO THE WORLD OF CHILDREN AND API-EDUCATION: EDUCATIONAL NEEDS OF PRESCHOOL CHILDREN

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In the first place, the educational needs of the preschool child are definitely experience. And not just any experience. The most important educational need of a preschool child is an experiences that he or she co-creates. So, experience with child's active participation.

Experiential learning in kindergarten is of the highest quality when it is 'life-coloured': individual activities (guided and spontaneous activities), joint activities (guided activities and especially spontaneous activities) and group activities (guided activities).

The bee engages in experiential learning as an unobtrusive and free element of nature. Through the proper pedagogical approach, the bee teaches children about nature protection, coexistence, respect. It teaches about differences and similarities (Carniolan bee is characterized by very diverse development between families of the same apiary) and also about the most important values. The bee teaches child about space and time.

Experiential learning with the bee means developing emotional abilities and creating intrinsic motivation for lifelong learning through a deep sense of interconnectedness of all living beings.

Key words: child, development, bee, education

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APITHERAPY APPROACH IN KINDERGARTEN

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Apitherapy approach in api-kindergarten is very helpful for achieving different goals in development of children, i.e., curricular goals. Apitherapy within the api-kindergarten program develops the principle of integrated approach and supports optimal development of psychosocial skills – higher motivation of children for carrying out different activities. Apitherapy approach in the program has positive effects on development of imagination, interpersonal relations, enhancement of social skills and achieving higher empathy in a group. Apitherapy also effectively improves sensory development of the youngest. With the introduction of the apitherapy in kindergarten children get to know more easily different cultures, civilizations, strengthen care for social justice and tolerance between people.

With getting to know apitherapy we got familiar with bees and small insects, nature and its diversity. We learned how important it is that the youngest get familiar with care for nature, because it is the only way that we as a society can work well as a whole.

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Key words: apitherapy, bee, preschool children, kindergarten

AN EFFECTIVE EDUCATIONAL TOOL TO PROMOTE PSYCHOLOGICAL DEVELOPMENT IN CHILDREN

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In the spring of 2021, 40 state elementary school children ages 8-10 had a workshop at ETI Vinkovec to discover the world of honeybees, beekeeping and art. ETI Vinkovec is an educational and therapeutic country centre situated nearby Zagreb. The centre has been designed to that end, featuring green construction, renewable energy and careful use of natural resources, with an educational and therapeutic purpose in mind.

The aim of the workshop was to make children become more familiar and have a closer look at the whole bee world as well as expressing feelings and attitude in a creative musical way. In this introductory workshop, the children learned about the surprising history of beekeeping, the importance of bees to our food system, colony collapse, the basics of constructing a hive, bee biology, and how honeybees communicate through smell, sound, and dance.

The methods used in this interactive workshop were interactive discussions about the unique world of bees, a walk to the bees' immediate surroundings, e.g. to the nearest meadow and forest, donning the cotton bee jacket, a closer look inside the hive - to observe how the tiny creatures collaborate to build and maintain a complex community within the hive, and reflection through art, e.g. music, dance and movement improvisation.

During the workshop, the children's social, emotional, communication, motor, cognitive, and sensory developmental domains were observed. These observed indicators of the workshop provided learning opportunities that enhanced student development. The overall environment also positively impacted their social interaction, active learning, and self-motivation. At the end of the workshop, the children had to take a quiz to review everything they had learned and seen. They were divided into small groups and asked to write down all the things bees can do, have and are.

The results of the workshop were divided into 3 parts: developing cognitive skills, integrating five senses, and improving social skills. The children worked spontaneously and completely unconsciously on their personal development and positive behaviour patterns.

Since this workshop has shown positive and educational impact, the goal is to involve other schools throughout Croatia to become familiar with this "golden insects".

Keywords: beekeeping, bee products, children, education, honeybees

CROATIAN EXPERIENCES IN PROMOTING THE CONSUMPTION OF BEE PRODUCTS

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The Croatian Apitherapy Society is continuously working on the promotion of bees and bee products among our youngest. Thus, we have published an illustrated picture book Bees, which describes all bee products and their effects on the body in verses, adapted to children ranged from 4 to 12 years. The picture book has so far been printed in almost 10,000 copies and distributed to children throughout Croatia and, to a lesser extent, Serbia, Montenegro and Bosnia and Herzegovina. The picture book aroused great interest and was translated into Hungarian, English, German and Slovak. We also held a fashion show of beekeeping suits for children, as part of the Healthy Living Fairs for several years in a row in cooperation with primary schools we hold lectures on bee products, workshops, and tastings. The children paint the hives which we then populate with bees. This year we distributed over 3,000 picture books of Bees on the occasion of World Bee Day to kindergartens called Bees from Istria to Dubrovnik. The interest in our education of children is really great, it is equally represented in kindergartens and schools and I am sorry that everything has been reduced to good will and limited volunteer activities of individual members of society. With maximum effort and commitment, we want what we do to be available to all who show interest in bees and bee products, but due to limited funds and time we invest in the work of society, we cannot satisfy all those who want to participate in our education program. The result of the education was that children themselves asked for bee products to be included in the diet if they were left out, some of children planted honey plants in cooperation with breeders, some became interested in the life and work of bees. We have also recived requests from several kindergartens and primary schools if we will continue to implement such education projects to include them.

Keywords: beekeeping suits for children, bee products and apitherapy, education of children

AUTOCHTHONOUS MELLIFEROUS PLANTS IN EDUCATION

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Children are mostly aware of the importance of bees. In order to keep bees we also need plants. Pollinators are feeding themselves with nectar and pollen from flowers. Plants are often not interesting for children, and they don't notice them, which we refer to as plant blindness. Plants don't move and children don't even know that plants are alive, because they connect life with movement. That is why we need to prevent plant blindness. It is important that we use plants from child's environment - autochthonous plants. If we want good plants for pollinators, we use plants with a lot of nectar. But we need to be careful. A lot of melliferous plants, that grow in Slovenia, are introduced species. Species for which is typical that they have quick growth, and they threaten our species are called invasive plants (*Impatiens grandiflora, Solidago gigantea, Heliantus tuberosus*). It is important that we use autochthonous melliferous plant).

The goal of the work is to introduce autochthonous melliferous plants to kindergartens and primary schools. Children will be working together with teachers, and they will be planting their own gardens of melliferous plants. They will learn about proper care and use of those plants. With straightforwardly work they will learn about the importance of plant conservation and relationship between bees and plants.

The things that we need are a place for a garden, plants or seeds and garden equipment. The method that is used in the project is practical work. First, we need to plan a garden with nontoxic plants (preferable edible or otherwise useful to make growing more interesting for the students.). In the beginning children will be planting or seeding autochthonous melliferous plants, later they will learn how to care for the garden. We can also educate children about seed banks. They can collect seeds for the next year when they can sow them again.

With taking care of a school garden students can transfer their knowledge to the home environment and encourage others to start their own gardens with autochthonous melliferous plants. They study autochthonous melliferous plants, understand the importance of plant conservation, learn about interdependence of plants and bees with demonstration, observation, and practical work.

Even with daily guided tours in botanical gardens we notice a change in attitude toward plants. When children are in direct contact with plants and if the teacher has a positive attitude toward plants, most of the children internalize his opinion and they have a better attitude towards plants. This is more common among young children. It is important to use the right methods of teaching. They remember facts that are unusual and interesting. The best method is practical work, either in groups or working alone, because children are active, and they find information by themselves. That is why we choose learning about plants by making their own garden.

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Keywords: autochthonous melliferous plants, edible plants, education, garden planting, pollinators

BEE BIOLOGY

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Honeybee products are based on collection of resources outside of the hive and transformation into valuable bee products inside of the hive. First is important to know how honeybees recognize food resources and how they can even select most profitable and valuable for a bee colony. Two major processes are involved. First, bees use sensory perception during search flight and check quality at the resource alone. Second, they compare collected value based on individual experience and with sharing food resource location information along with quality of the brought resource in the hive with social communication using waggle dance. Inside of the hive starts processing of the collected material. Nectar and pollen can be stored for future use, but they need specific treatment to prevent spoilage with microorganisms. Secretions of the bee workers glands are crucial in this process. The result is honey and bee bread. Pollen can be collected also at the hive entrance and in that case it has much smaller contribution by bees. Bees also collect plant resins to prepare propolis depositions inside of the hive. This process doesn't have so intensive processing by excretion of the glands, but there is still some significant contributions made during manipulation and forming depositions, especially addition of nearby wax from the comb and specific gland secretions. On the other hand bee wax is mainly product of the worker bee's wax glands. Some extrinsic compound can be incorporated during the time in the form of wax comb. Two additional products are result of the workers gland secretion. Royall jelly is produced by secretion of all glands that have orifice in mouth cavity and can be collected from the artificial queen cells as depositions for larvae that are reared as a new queens. With special apparatus we can collect honey bee venom, secreted through the stinger. Along these traditional bee products also bee larvae, especially drone larvae get some recent attention to be used as special food supplements, although it has been practicing for a while in Romania as apilarnil. In recent years became popular hive air, which is mix of volatile due to stored bee products and volatiles released by adult bees and larvae in the comb. To understand properly and potentially influence quality of bee products we have to know how the environment and the bees contribute to specific bee products. Based on that we can adapt management of honeybee colonies to improve quality or produce specific quality of the bee product of interest.

Keywords: honeybee, bee products, apilarnil

A SURVEY OF MEDICINAL BEE PLANTS USED IN TRADITIONAL MEDICINE FOR CHILDREN DISEASES IN SEFROU CITY IN MOROCCO

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This study was designed to recognize the diversity of bee plants that existed in Sefrou city (Latitude: 33°49’49.89” N; Longitude: 4°50’7.14” W; Altitude 823 m) and to shed a light on medicinal bee plants used in traditional medicine to treat childhood illnesses. A questionnaire was distributed for professional beekeepers to collect data about the apicultural importance of melliferous plants and then we have studied the pharmacological evidence of some medicinal bee plants used in traditional medicine for children's diseases in this city. The results of the survey showed the presence of ninety-three plants belonging to twenty-three families. Ten plants from this list were used for children's diseases such as cough, fever, wounds, and spasms. The outcome of this study contributes to reveal the importance of bee plants for bees and children.

Keywords: Bee plants, survey, Sefrou, children

QUALITY AND SAFETY OF BEEHIVE PRODUCTS

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The range of hive products that can be used in apitherapy is very wide. Each product is different and must be treated with knowledge of its characteristics and stability. Moreover, the same product can have different properties depending on its botanical origin but also on the way it was harvested and packaged. The production, harvesting and packaging environments will have an impact on the contaminants that can be found in the final product. The techniques used by beekeepers and packers may cause some degradation of these products. Advice will be given to beekeepers so that they can limit as much as possible the loss of activity or the development of undesirable elements in the various harvested and packaged products. The presentation will end with a quick overview of the elements to be checked to verify the quality of the product and the absence of adulteration.

Keywords: bee product, contaminants, quality

APITHERAPY IN CROATIA, STAMP OF QUALITY BY THE CROATIAN APITHERAPY SOCIETY

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The stamp of quality by the Croatian Apitherapy Society is a sign of controlled quality and possible optimal apitherapy effect to the users of bee products and apitherapy services.The stamp of quality by the Croatian Apitherapy Society implies constant education of our members to achieve maximum quality in the production of bee products and the standard-abiding provision of apitherapy services in compliance with the Code of Ethics of Croatian Apitherapy Society.

Consumers have already started asking us whether all bee products are of equal quality for the apitherapy we are talking about, or whether there is a difference between them. The difference certainly exists because for the use in apitherapy we always choose the highest quality bee products of controlled quality. Bee products with the stamp of quality by the Croatian Apitherapy Society are firm and reliable indication to the consumer that the product he uses is suitable for the needs of apitherapy, and that we can expect the optimal health-preserving effect from the products labelled with our stamp of quality. The stamp of quality is also used to recognize beekeepers who have completed our course in apitherapy (that we organize once a year) and that they are constantly improving their skills and knowledge through participation at symposia and other gatherings related to beekeeping, bee products and apitherapy. In apitourism, in api-inhalation houses that are labelled with our stamp of quality, visitors can expect responsible and educated staff who take care of even the smallest details that are important for their safety.

The Croatian Apitherapy Society has been promoting bee products for years, and has been educating consumers about bee products' importance in preserving human health, as well as about daily use of bee products. In proportion to the amount of public promotion and education, there is a rise in demand for bee products, but unfortunately this does not mean that the customer will always get a healthy, safe, and good quality product. Actually, consumers are usually buying a "cat in the sack". In order to provide some protection to standard-abiding producers of bee products as well as to their consumers, we decided to register a stamp of quality at the level of the Croatian Apitherapy Society that would label bee products who have passed all the analyzes needed to really be sure not only of the health safety of the products themselves, but also of the quality and preserved biological value, which is a basic prerequisite for all the beneficial health effects we expect from such products.

Keywords: beneficial health effects, Stamp of Quality by the Croatian Apitherapy Society

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LEGAL STATUS OF BEE PRODUCTS

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Looking for a healthy and natural lifestyle, both consumers and producers are more and more interested in bee products from primary production to food supplements and/or medicines, medical devices, or cosmetics. That is why an attentive review on the legal status of the bee products (honey, bee pollen, bee bread, propolis, royal jelly, bee larvae, bee venom etc.) on the international market is an important issue in both valuing the beekeeping production and protecting the consumers' health.

If defined as food, bee products make no exception and should comply primarily with the requirements of Codex Alimentarius – the „Food Code" adopted by the Codex Alimentarius Commission, which is the central part of the Joint FAO/WHO Food Standards Programme meant to protect consumer health and promote fair practices in food trade.

In the European Union, food (food supplements or functional food included) is regulated by EU Regulation (EC) 2002/178, the „General Food Law" which aims to protect human health and consumer's interest in relation to food. Other regulations are related to the nutritional and health claims made on for food - EC 1924/2006, EC Regulation 1169/2011 and EU Novel Food Regulation 2015/2283 are particularly important as regards the safety, health effects on consumers etc. Almost the same regulations for food are to be found for FDAs in various other parts of the world.

However, there are still many obstacles for bee products as, according to the evaluations of the experts many of them cannot be labelled but with a nutritional declaration, health claims not being authorized.

As for traditional medicines, the registration procedure should consider the products with a long tradition of safe use" including "substances of animal origin (honey, royal jelly, propolis etc.). In Europe, a possible extension of the scope of EC Directive 2004/24 is expected. Even if this extension is not accepted, a legal framework of their use is to be considered.

Keywords: bee products, food supplements, medicines, traditional medicines

EXTRACTS OF LITHUANIAN PROPOLIS AND POPLAR BUDS: COMPARISON OF THEIR COMPOSITION AND BIOLOGICAL ACTIVITIES

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Nowadays, propolis is widely used in bio pharmacy, as a supplement or as a cosmetic component for its antioxidant, anti-inflammatory and antimicrobial properties [1]. The chemical composition of propolis is closely connected with and dependent on plant raw material, which is collected by bees in different regions of the world, therefore its chemical composition may differ. Some scientific research was done on that, and it was noticed that the main components in poplar buds were phenolic acids and flavonoids [2]. It is actual to compare the composition of propolis and its precursor – poplar buds – qualitatively and quantitatively. The aim of this research is to compare qualitative and quantitative composition of active compounds in the produced poplar and propolis extracts, and to determine their antioxidant and antimicrobial activity *in vitro*. The research results showed that *p*-coumaric, caffeic and ferulic acids were present in all analysed extracts. The amount of vanillic and ferulic acids found in propolis was larger than in poplar bud extracts. An exceptionally large amount of cinnamic acid was found in balsam poplar extract. The differences between the quantities of phenolic acids in analysed extracts were statistically significant. A significant variation of flavonoid quantity was determined in the analysed extract samples. Meanwhile, in propolis extract vanillin was determined as one of the dominant active compounds. A strong correlation ($\rho = 0.93 > 0$) between the total amounts of flavonoids in the samples determined by HPLC analysis and the results of antioxidant activity test. The results of our research show that poplar buds are a source of active compounds in propolis, which have antioxidant and antimicrobial actions. It also provided some information about possible applications of this raw material in the production of food, cosmetic and pharmaceutical products.

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Keywords: Propolis, poplar buds, *p*-coumaric acid

PHARMACOLOGY OF BEE PRODUCTS

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Bee products are inexhaustible sources of bioactive molecules. There are extensively used in folk medicine for the prevention and self-treatment of several diseases and has become actually the objective of many scientific investigations. Different biological and pharmacological effects of honey, pollen, propolis, royal jelly and bee bread have been referred to their antioxidant, antibacterial, antitumoral, anti-inflammatory agents, antihyperglycemic effect and renal disease protection. Oxidative stress is believed to be responsible for the occurrence of several pathologies. Scientific reports from our laboratory have shown that bee products have a wide chemical composition and multi-functional properties. In this context, and to understand the relationship between biomolecules from beehive products and their functional potential, we will investigate the antioxidant properties of Moroccan bee products, their capacities for preventing lipid peroxidation and scavenging free radicals was generally correlated with their phytochemical screening.

Zantaz honey is a monofloral variety produced from the melliferous plant *Bupleurum spinosum* (Apiaceae), a shrub that grows mainly in the Atlas Moroccan Mountains. Determination of the polyphenol composition revealed that methyl syringate accounts for more than 50% of total polyphenols, which represents a very useful parameter for the characterization of this monofloral honey. Epicatechin, syringic acid and catechin are also abundant. Caco-2 and THP-1 cells were used for determination of antioxidant and antiproliferative activities in Zantaz honey, respectively. All six commercial samples that were used for these studies exhibited antioxidant activity and inhibited cell proliferation. Interestingly, these activities had a positive correlation mainly with the content in methyl syringate and gallic acid. The recognition of health promoting activities in Zantaz honey should increase its commercial value, which would have a positive economic impact on the poor rural communities of Morocco where it is produced.

In vivo, propolis and honey preparations were able to attenuate diabetic hepato-renal damage, probably through antioxidant and detoxification properties. The protective role of some honeybee products against reactive oxygen species induced damage and nephrotoxicity in diabetic rats, gives hope that some of these products will have similar protective action in humans. In the rat diabetic nephropathy model, honey, propolis and pollen also showed significant effect on glucose homeostasis and improving kidney function. The possible mechanism of action is discussed. A compilation on therapeutic properties of honeybee products in experimental animal models and human health will be presented. It might be concluded that bee products are a potential target, to be used in the management of chronic kidney diseases, proteinuria, diabetes, cancer and inflammation. Overall, chemical characteristics of bee products may allow the extracts to be used as bioactive ingredients in the food industry, but they also present potential for the pharmaceutical or nutraceutical sectors for the prevention and/or treatment of health disorders.

Keywords: Propolis, Bee pollen, Honey, Bee Bread, Royal jelly, Phenolic compounds, Api pharmacology

AN INTRODUCTION TO CLINICAL APITHERAPY

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During the last over 6,000 years the human beings have used, all over the world, hundreds of different raw honeybee products, voluntary (honey, bee bread, propolis) or involuntary (bee stings).

In the last about 70 years, due to the increase in technology and scientific knowledge, we have succeeded to get hundreds of different extracts of bee products (ultrasounds propolis extract, lyophilized royal jelly and drone brood, etc.).

The composition and properties of the bee products are very important for the beekeepers and all scientists which study them, but for the ill people, having thousands of different possible diseases, the big question is: *„Can these bee products really heal my disease?"*. The goal of this paper was to present some of the best apitherapy protocols used in the prevention and treatment of human and animal diseases.

In the last 30 years we have studied and organized in a data base over 5,000 articles on bee products, spoke directly with over 1,000 medical doctors from over 50 countries and have personally treated with apitherapy over 30,000 patients.

For simple diseases, simple bee products and/or extracts (like propolis tincture, or water extract) can be used.

For complex and/or severe diseases though, the best apitherapists are using all bee products, in synergy with extracts from medicinal bee plants (phytotherapy) with essential oils (aromatherapy), with nutrition and with a well guided psychotherapy.

Apitherapy can prevent and treat over 800 diseases. All health practitioners but also all beekeepers need to know that to diversify their methods and technics to obtain best possible medicinal grade bee products.

Keywords: Api-Pharmacopeea, phytotherapy, aromatherapy, nutrition, psychotherapy

APITHERAPY FOR CHILDREN: THERAPEUTICS USES OF BEE PRODUCTS AND MEDICINAL PLANTS IN DARAA TAFILALET REGION OF MOROCCO TO PREVENT AND TREAT PEDIATRIC AILMENTS

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The threat of immune escape and the emergence of new Covid-19 variants, as well as the discovery of antibiotic-resistant pathogens and the failure of certain conventional drugs that are already in use for symptomatic treatment of diseases, have prompted a re-evaluation of ancient therapeutic remedies such as apitherapy. In fact, honey and bee products have been used all over the world for several years in traditional medicine. Each civilization has its own uses. Shedding lights on the importance of apitherapy in the region of Daraa Tafilalet will be of great importance. The aim of this study was to investigate the therapeutic applications of bee products alone or in combination with aromatic and medicinal plants in Daraa Tafilalet region, namely their usage in the treatment of pediatric ailments. For this reason, an ethnobotanical study was conducted using pre-prepared questionnaires addressed to the population of this region. The results of this study showed that among 142 interviewed, 108 use local products, particularly medicinal plants and hive's products to strengthen their immune system. However, 34 interviewees prefer conventional medicine. Among these 108 users of local products, 100 were parents and 83 of them give bee products, especially honey alone or in combination with Aromatic and medicinal plants (nigella, oregano and cumin) to their children to treat respiratory infections, abdominal pain and anemia.

Keywords: Apitherapy, aromatic and medicinal plants, bee products, Daraa Tafilalet, pediatrics, ethnobotanical study, immune system

HONEY IN CHILDHOOD DISEASES

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Based on the facts that honey, as a natural substance produced by honey bees, has anti-microbial, anti-oxidant, immune-modulator, anti-tumor, prebiotic and probiotic effects, this minireview summarizes the therapeutic effects of honey, as a sole treatment, in different childhood diseases. Aim of the work is highlighting the therapeutic effects of honey in some childhood diseases. The results of 9 studies, done by the author, using honey as a medicine in treating different childhood diseases are summarized. Honey added to oral rehydration solution promoted rehydration of the body and sped recovery from vomiting and diarrhoea in 50 infants suffering from gastroenteritis. In respiratory disorders, both oral and honey nebulization proved effective and safe in treating 342 infants and children suffering from mild to severe acute attacks of bronchial asthma, 5 children suffering from croup, and 6 children suffering from pneumonia. In 40 children suffering from acute lymphoblastic leukaemia, 12-week honey consumption resulted in positive effects on febrile neutropenia and hematologic parameters. In 20 children suffering from type 1 diabetes mellitus (T1DM), 12-week honey consumption had positive effects on the metabolic derangements of T1DM. In 50 children suffering from hepatitis A, 4-week honey consumption improved the symptoms and sped the recovery. In 20 infants suffering from moderate to severe malnutrition, 8- week honey consumption resulted in increased plasma levels of short chain fatty acids and increased body weight. As a conclusion, honey, as a medicine, has multitargeted positive therapeutic effects.

Keywords: honey, gastroenteritis, respiratory diseases, diabetes mellitus, hepatitis, malnutrition

HONEY NEBULIZATION AGAINST RESPIRATORY DISEASES IN CHILDREN

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Honey, as a natural product produced by honey bees, has antimicrobial, anti-oxidant, anti-inflammatory, and immune-modulator effects.

Aim of the work is **e**valuation of the effects of bee honey nebulization (BHN) on some respiratory diseases in children. The age of the patients was 3 months to 14.5 years, and they were of both sexes. 1 to 2 ml raw, unprocessed honey (most frequently *Ziziphus* honey) was dissolved in 20 – 40 ml normal saline to get 2.5 to 10% concentrations. An ultrasound nebulizer was used. Each patient received from 1 to 6 nebulization sessions/day, and the duration of each session was 30 min. From 2000 until today more than 5000 nebulization sessions were given to more than 500 children with acute bronchial asthma, 6 children with pneumonia and 5 children with croup. In addition to honey nebulization, each patient ingested 5ml honey/kg/day. The honey therapy, both oral and nebulized, continued until resolution of all symptoms. Honey therapy (oral and nebulization) was the sole treatment used; no medicines, including antibiotics, steroids, or bronchodilators, were given.

No toxicity was observed with BHN. In all diseases, BHN resulted initially in increased frequency of cough, which was usually productive and was sometimes associated with vomiting of sputum; this was temporary and followed by improvement of symptoms. Especially in bronchial asthma, initial negative or misleading reactions to BHN sometimes included, in addition to cough, wheezing and respiratory distress. These negative reactions were transient and did not result in worsening of the disease. Because they may be misinterpreted as toxicity or allergy from honey, they are also termed ***misleading reactions***.

Increased frequency of cough, with or without chest wheezes and respiratory distress, associating honey nebulization is a benign, false negative misleading reaction, which is almost always followed by improvement.

In the respiratory diseases mentioned in this paper, we should not prescribe medicines, which suppress cough or lead to dryness of secretions because getting rid of sputum helps recovery, whereas keeping the sputum inside the bronchial tree delays recovery and may result in worsening of the disease.

Key words: honey, nebulization, children, respiratory diseases

EFFICACY OF HONEY BEE PRODUCTS IN UPPER RESPIRATORY TRACT INFECTIONS IN CHILDREN

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Upper respiratory tract infection (URTI) is one of the very common diseases and a major health problem with its high incidence and economic costs. Disease limits children's daily activities such as eating, sleeping, playing and causes them to stay back from school. Therefore, in this research, it was aimed to investigate the effect of bee products mixture (BPM) consists of honey, royal jelly and propolis on the children of 5-12 years of age, with the diagnose of URTI. The study scheme was randomized, double-blind, placebo-controlled trial. The research was conducted on 200 children of 5-12 years of age, who have the main symptoms and signs of tonsillo-pharyngytis such as fever, sore throat and dysphagia at the Erciyes University Mustafa Eraslan-Fevzi Mercan Children's Hospital. In the samples taken from the throat of patients the most common bacteria and the virus were *Moraxella catarrhalis* (44.5%) and *Rhinovirus* (18%) species, respectively. Children diagnosed with bacterial infection were divided into two groups, as the first group (BacA) treated with antibiotics, and the second group (BacA+BPM) treated with BPM (20g/day) in addition to antibiotic treatment. The patients diagnosed with the viral infection were divided into two groups, as the first group (Vir-P) treated without medication, and the second group (Vir-BPM) treated only with BPM (20 g/day for children less than 30 kg and 40 g/day for children over 30 kg). CARIFS scale was distributed to the parients these children for a 10-day follow-up of URTI symptoms, and the data was compared . As a result, in the groups who were treated with BPM numerically lower scores were seen on the 2nd day. It was remarkable for Vir-BPM group on the 4 th day. Following the 4th day a significant low scores were seen in Vir-BPM in comparison with Vir-P and bacterial groups.

Keywords: children, honey, propolis, royal jelly, URTI

Introduction

Upper respiratory tract infections (URTI) are an important health problem in childhood. Children struggle with this disease, which lasts for 8-10 days on average 6-8 times a year. URTI is one of the most common diseases encountered in primary health care institutions and in which antibiotic and analgesic abuse are thought to be common in its treatment. Reasons such as irrational drug use, insufficient or toxic effect, especially antibiotic resistance, undesirable effects due to wrong drug selection, unnecessary drug consumption cannot provide the desired treatment and cause economic losses. Unnecessary antibiotic use facilitates the emergence of antibiotic-resistant infections, as well as increasing the cost of antibiotic-related side effects and treatment. However, it is known that most of the URTIs are viral and self-limited, and usually heal without the need for medication.

Aim

Acute URTI is the most common cause of outpatient visits, job and school losses. Although URTI is often self-limiting and mild and short-lived, when it is evaluated between quality of life and job losses; The magnitude of the effect is equivalent to chronic diseases. The lack of definitive treatment, fast pace of life, and the desire to recover as soon as possible push both patients and physicians to seek different treatments. For this reason, this research was planned to determine the supportive effect of natural bee products, which have no side effects and are known to have many beneficial effects.

Materıal and Methods

The research was carried out in accordance with the ethical principles adopted by the Erciyes University Clinical Research Ethics Committee's decision. A randomized, double-blind, placebo-controlled trial was used in the study, and the study was conducted at Erciyes University Mustafa Eraslan-Fevzi Mercan Children's Hospital, with a diagnosis of tonisllopharyngitis such as fever, sore throat, and dysphagia in the 5-12 age group. conducted on 200 children with main symptoms and signs. Group selection was based on completely randomized computer assignment. There were 50 children in each of the 4 groups formed of volunteer children. Of these, 50 contained the same amount of starch and brown sugar as the placebo (control group) AUC and were prepared by the commercial company. This is because all products given to patients must have the same packaging, color, packaging and appearance. The products given to the patients are numbered and given in bags of 10 pieces each. For this reason, neither the doctor nor the patient knows which product is given to the patient.

Clinical findings and follow-up

At the time of admission, detailed histories of the patients included in the study were taken, allergy history was questioned, physical examination findings were made, height kg etc. were recorded, and the case form was filled. The clinical findings of the cases were recorded. A digital thermometer and 10 Canadian Acute Respiratory Illnes and Flu Scale (Canadian Acute Respiratory Illnes and Flu Scale) were given to the families included in the study and whose children's voluntary consent was obtained. Families whose scores were suppressed front and back were asked to fill in this score table. In addition, they were asked to record when the complaints started, whether the child took any medication before the treatment, and if any side effects were observed during the treatment. On the first day, the score was filled by the doctor and fever was recorded. Jacobs et al. (2000). The score table used in this study was previously evaluated on 220 children and was found suitable for 206 (94%). The answers given to each question (no problem=0, little problem=1, moderate problem=2 and big problem=3) were evaluated.

Bacterial and viral analyzes

Both throat and nasopharyngeal swabs were taken from the patients. Upper respiratory tract samples taken from the patients were delivered to the Virology Laboratory of the Department of Medical Microbiology in viral transport transport medium. Nucleic acid isolation from respiratory tract samples was performed on the QIAsymphony device (Qiagen, Germany). The amplification process after nucleic acid extraction was studied with multiplex real-time PCR method (The Fast Track Diagnostics Respiratory Pathogen 33, Luxembourg). The swabs taken were delivered to the laboratory in an appropriate transport medium, and cultured and diagnosed on sheep blood agar for group A beta-hemolytic streptococci. Nasopharyngeal swabs were taken from the patients and delivered to the

laboratory in viral transport media. After the nucleic acid isolation was done in the automatic isolation device, the viruses that were active in the respiratory tract were investigated with the 'real time PCR' method. Throat swabs sent to the Bacteriology Laboratory were applied to 5% sheep blood agar by turning the swab. The cultures were incubated for 18-24 hours at 37°C, and the loops from the colonies thought to be group A beta-hemolytic Streptococci (AGGBHS) were inoculated on 5% sheep blood agar medium. Bacitracin (0.04 U) and trimethoprim/sulfamethoxazole (SXT) (1.25 + 23.75 µg) discs were incubated in an oven at 37 ºC for 24 hours.

Strains that were Gram positive, chain-shaped microscopically, resistant to bacitracin-sensitive STX and confirmed as group A by latex agglutination test (SLIDEX® Strepto Plus, Biomerieux) were accepted as AGBHS (Streptococcus pyogenes). Influenza A, Influenza B, Influenza C, Influenza A(H1N1) swine flu, parainfluenza viruses 1, 2, 3 and 4 with The Fast Track Diagnostics Respiratory Pathogen 33 kit; coronaviruses NL63, 229E, OC43 and HKU1, human metapneumovirus A and B, rhinovirus, raspiratory syncytial viruses A and B, adenovirus, entererovirus, parechovirus, bocavirus, siella pneumonia, Legionella sp. Salmonella sp. and the nucleic acids of Haemophilus influenza microorganisms were investigated (Huh et al., 2014). Microbiological diagnosis and tests were made according to CLSI (2012), Baron and Gtes (1979), Borah and Mahata (2011).

Groups

1. Group bacterial URTI- Antibiotic (amoxicillin + clavulanic acid) group
2. Group bacterial URTI- Antibiotic + AUC given group (20-40 g/day)
3. Group viral URTI- antibiotics/ no drug given group, placebo
4. Group viral origin URTI- AUC given group (20-40 g/day)

*(When fever rises above 38°C in Groups 3 and 4, paracetamol 10mg/kg every 6 hours and Ibuprofen 5mg/kg every 8 hours are recommended.
The content of the mixture (honeybee products) was prepared as 96.7% honey, 3% royal jelly, 0.03% propolis.

Statistical analysis

Age group, gender, viral/bacterial etiology will be analyzed by ANOVA. Spearman correlation test will be used, intragroup correlation coefficient REM “Random Effects Model” will be used, variation between scores was calculated with “repeated measures ANOVA”.

Results and Discussion

Although 200 people were included in the research, 104 scoreboards could be recycled (52%). Although the patients were followed throughout the study, the reasons for not providing higher recycling in the score tables.

Of the patients, 59 (56.73%) were male and 45 (43.27%) were female. 11 of the patients (11.44%) were 5 years old, 8 (8.32%) were 6 years old, 14 (14.56%) were 7 years old, 16 (16.64%) were 8 years old, 18 (18.72%) were 9 years old. 14 (14.56%) were 10 years old, 12 (12.48%) were 11 years old, and 11 (11.44%) were 12 years old. According to these results, males in the research group as gender and 9 age group in terms of age group were represented with more numbers than the other groups.

The complaints identified in the patients who applied to Erciyes University Mustafa Eraslan-Fevzi Mercan Children's Hospital and were diagnosed with URTI and the course of these complaints is given. These complaints; fever, cough, sore throat, vomiting, nasal congestion, dizziness, earache, nausea, abdominal pain, weakness, runny nose and one or more of these complaints together.

When the answers given about the secondary factors created for the patients participating in the study are evaluated; it was determined that 78.1% of the patient's parents were not working and 34.7% of them were primary school graduates. It was also determined that 77.1% of the sick children did not have any allergies, but 53.5% of them smoked at home. The EBV negative status of the patients was 98.3%.

A randomized, double-blind, placebo-controlled trial scheme was used in the study, and the results of 104 patients could be evaluated at the beginning of the study with 200 patients.

Microorganisms isolated from 200 patients diagnosed with URTI tonsillopharyngitis were identified at the beginning of the study. As a result of the research, 6 bacteria, 16 viruses and 1 fungus were detected. The most commonly diagnosed bacteria was *Moraxella catarrhalis* (44.5%), followed by *S. aureus* (35.5%), *H. influenzae* (30%), *S. pneumoniae* (26%), *K. pneumonia* (5.5%), and *M. pneumonia* (0.5%) followed. The most commonly diagnosed virus is rhinovirus with 18%. H1N1 (16%), Adenovirus (10.5%), Influenza B (8.5%), HBoV (7.5%), Influenza A (6%), RSV (5.5%), Coronavirus HKU1 (3%), HPIV1 (3%), HPIV3 (1.5%), HPIV4 (1.5%), Influenza C (1.5%), Coronavirus OC43 (1.5%), Coronavirus 229E (1%), Coronavirus NL63 (1.5%) and enterovirus.

According to the scoring table obtained from the parents of the patients for 10 days in the study, the p value for the Day x groups was found to be 0.030 and is given in Table 4.10. According to the results of the general linear model, the interaction between the groups and the measurements is statistically significant. According to the day scores (scores) of the groups; 1st and 3rd day score values are similar to each other. On the 2nd day, BAK group A score value was statistically higher than the VIR K group, while the groups were similar. On the 4th day, the VIR K group score value is lower than the BAK A and VIR P groups. On the 5th and 6th days, the BAK A group score value was higher than the VIR K group, while the other groups were similar. On the 7th, 8th, and 9th days, VIPR was higher than VIR K and the other groups were similar.10. On the other hand, while the VIR P group was higher than the BAK A+K and VIR K groups, the other groups were similar.

As a result, it was observed that the score decreased numerically on the second day, but the low score in the VIR C group on the 4th day was remarkable. In the days following the fourth day, the low score in the VI C group was found to be statistically significantly lower in both the VIR P and bacterial URTI patient groups.

It has been reported that the majority of URTIs of viral origin are rhinovirus, parainfluenza virus, coronavirus, adenovirus, respiratory syncytial virus and influenza virus (Clarke et al., 2004; Lykova et al., 2003). Bacterial pathogens that cause UTIs other than viruses are stated as Haemophilus influenzae, Staphylococcus aureus, Streptococcus pneumoniae, Klebsiella pneumoniae, Pseudomonas aeruginosa and some Enterobacteriaceae. (Isenberg and D-Amato, 1985; Ndip et al., 2003). Rhinovirus; It is a single-stranded RNA virus, has more than 100 antigenic types, and is the most common cause of URTI in children and adults (Turner, 2007). Since rhinovirus is difficult to culture, only sensitive and specific reverse transcriptase polymerase chain reaction techniques have documented the natural

history. Pappas et al. (2008) in a survey conducted in the USA, 81 cases from children aged 5-15 years were followed for 10 days and rhinovirus was detected in 37 (50%) of the cases. The most common symptoms are cough and sneezing, while the most common symptoms are congestion and tearing. There are two studies on the observation of respiratory tract infections caused by rhinovirus in hospitalized children. In the USA, rhinovirus was found in 26% of children younger than 5 years old hospitalized for acute upper respiratory tract disease (Miller et al. 2007). Rhinovirus is detected more frequently than RSV. In a similar study conducted in children under the age of two in Spain, rhinovirus was detected in 25% of those who entered with respiratory tract diseases (Calvo et al., 2007). Influenza A, B, and C are double-banded RNA orthomyxoviruses, while A and B are usually responsible for influenza outbreaks in humans. Influenza can cause serious sequelae such as pneumonia, encephalopathy or encephalitis, myocarditis and secondary bacterial infections (Falsey et al., 2007).

Since 90% of URTIs in children are viral, the use of antibiotics is controversial. Current reasons for prescribed antibiotics; diagnostic uncertainty, socio-cultural and economic pressures, malpractice litigation and parental expectation of an antibiotic (Pichichero et al., 1999). Highly prescribed antibiotics increase antibiotic resistance (Dowel et al., 1998). Topaloglu et al. (2013) conducted a study; 214 patients/families diagnosed with cough, sore throat, whezing and upper/lower respiratory tract infections between October and February 2012 in Çanakkale 18 Mart University and Research Hospitals General Pediatrics Clinic were included. While 93.7% of the families reported that they did not use drugs in such cases, it was determined that 62.7% of those using alternative applications, 6.7% of those using them together with drugs or 1.9% of those who did not use them at all.

It has been reported that the most frequently used application to reduce cough is giving pure honey (30.6%) and taking a warm shower (48.1%) to reduce fever is the most frequently used application. It was determined that health professionals such as doctors/nurses were mostly consulted (84.5%) for information on this subject. A positive correlation was determined between educational status and the use of drug-free applications.

For this reason, supportive and complementary treatment is used rather than antibiotic therapy. resting and drinking plenty of fluids (fruit juice, water, water with lemon, clear tea with honey), consuming soft foods, gargling frequently with warm salt water, not being able to smoke and avoiding smoking, taking aspirin or acetaminophen if pain and fever are present, throat It is recommended to take lozenges and increase the humidity of the room (Doğan et al., 2012). Although CAM (National Complementary and Alternative Medicine Center) practices in our country are quite low when compared to Europe and America, it is seen that herbal treatments are at the forefront. However, the use of bee products in URTI is not new and many studies have been carried out in recent years.

Conclusion

As a result; Although the negative effects of antibiotics in the treatment of URTI are known, patients prefer the treatment with herbal and bee products due to the fact that many non-prescription drugs such as DM, DPH, which are used in the treatment of cough, are not more effective than placebo, have many side effects and are costly. This research demonstrated the effectiveness of bee products mixture in URTI in children. These functional products are both inexpensive and have many beneficial effects. For this reason, we think that a mixture of bee products will be useful as an alternative treatment in the treatment of URTI in children.

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HEALTH BENEFITS OF ROYAL JELLY AND ITS USE IN CHILDREN'S APITHERAPY

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Royal Jelly is one of the most appreciated bee products whose most valuable biologically active substance is 10-hydroxy-2-decenoic acid (10-HDA). It is used worldwide as prophylaxis, a supplement to a given therapy, or independently. It is consumed in form of fresh royal jelly, lyophilized royal jelly, or as part of dietary supplements. This paper aims to collect and sum up some of the available knowledge on the health benefits of royal jelly in children's apitherapy. An overview of royal jelly and its biological potentials was highlighted. Royal Jelly has proven effects on immunomodulation, cardiovascular system, central and vegetative nervous system, it also has an anti-oxidative effect, antibacterial, antiviral, and antifungal effect and is known for its antiaging activity. It has shown positive effects on patients suffering from cancer, diabetes, respiration diseases, on children suffering from asthma, but also on infants with nutritional deficiencies, and premature babies, where the general conditions of all patients have increased. The potential health benefits of royal jelly are described, and even though there is still no recommended dose for children, Bogdanov (2016) has given a proposal for an apitherapy dose for children in the amount of 20-100 mg/day of fresh royal jelly. Due to the positive effects of royal jelly on children's health, this apitherapeutic product should be standardized to 10-hydroxy-2-decenoic acid (10-HDA) as soon as possible.

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Keywords: 10-hydroxy-2-decenoic acid, apitherapy, children, dose, royal jelly

EXPERIENCES FROM PRACTICE USING API-INHALATION IN CHILDREN

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Api-inhalation is the inhalation of air directly from the hive or the aerosol of volatile compounds that makes up everything in the hive. It is a type of topical apitherapy where a whole range of almost all bee products is used. This form of application of apitherapy is recognized by users as well as the profession (physician) because, thanks to its positive results and significant improvements in users, it plays an increasingly important role in helping to treat respiratory infections.

Ten treatments are needed to see the results, but it all depends on the condition of the body of the person using the api-inhalation service and the reaction of the organism to api-inhalation. It is best to do them every day for 10 days in a row for 30 minutes a day, twice a year: most often in spring, summer or early fall.

Indications for use are: asthma, bronchitis, allergies, sinusitis, infections of the upper and lower respiratory tract, migraines, and to raise immunity. Children do not have a sufficiently developed immune system, so they are prone to various infections and allergies, and api-inhalations have proven to be very helpful.

Laryngitis-inflammation of the larynx; bronchial asthma, rhinitis, sinusitis, allergies to dust, mites, feathers, and various external allergens such as birch pollen, grass, ragweed.

All of the above diagnoses in children can occur once or recur, ie they can be acute or chronic. In most cases, it is a combination of several diseases (along with bronchial asthma, there is also rhinitis, often accompanied by dermatitis).

Drugs that relieve symptoms are used (in such children the quality of life is often impaired), such as rinolan, clarit (loratadinum), ventolin (salbutamol sulfate), flixotide (fluticasone propionate), nasonex (mometasone furoate), etc.

With the application of api-inhalation, the symptoms of these diseases are alleviated, reduced, and in some cases they completely disappear. Also, in agreement with the doctors who prescribed the therapy, a reduced use of drugs was noticed, and in many cases a complete cessation of the use of drugs with a doctor's recommendation.

Api-inhalation is a great help in the treatment of various diseases of the respiratory system in children. It is very important to note that everything is done under medical supervision.

Keywords: api-inhalation, apitherapy, asthma, allergies, bronchitis, sinusitis

HOW CAN PROPOLIS PRODUCTS HELP CHILDREN WITH DERMATOLOGICAL PROBLEMS

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Propolis cream whose recipe, as well as the production process, is protected in the State Intellectual Property Office of the Republic of Croatia, is part of the Api-Aromatherapy cosmetic line. Ten years of practical use of propolis cream in various skin diseases has shown rapid skin recovery, wound healing, reduction of scars and hyperpigmentation, as well as reduced use of corticosteroid preparations in dermatitis, atopic dermatitis, and psoriasis. Propolis cream reduced redness and hydrated, regenerated, and soothed the skin after excessive exposure to sunlight, and reduced redness in people who are sensitive to UV radiation. The cream has also been shown to be very effective in exfoliating and flaking the skin in seborrheic scalp, as well as in cracking (scratching) of the skin on the feet. It has also shown its effect on various skin irritations, especially in children and people with disabilities with diaper rash.

In the healing of wounds, blisters, and burns, propolis cream has proven to be a preparation that, in addition to hydrating the skin and stimulating cell proliferation, reduces pain and soothes irritation that promotes itching, most likely thanks to the optimal combination of propolis extract and lavender and chamomile essential oils. In psoriasis, atopic dermatitis, and various other forms of dermatitis, especially in children, it showed an extremely fast action in combination with perga or a mixture of fresh pollen and honey in the 1: 1 ratio used orally. Also, in accidents with open flames or hot water (burns), propolis cream not only accelerates the healing of the skin but also prevents the appearance of hyperpigmentation and scarring. In youthful skin prone to acne, it has shown an encouraging effect in solving this problem. During exacerbation of atopic dermatitis, especially in children who are exposed to stress (addition of a new child to the family, going to kindergarten or school, divorce of parents, death, etc.), corticosteroid preparations are used several times a year. In such children, using the previously mentioned combination of perga or fresh pollen and honey daily, and propolis cream, the use of corticosteroids decreased in many cases.

In 70% of users, corticosteroids were no longer needed at all, while in 25% of users the use of corticosteroids was reduced to a minimum once a year or even once every two years. In the other 5% of users, corticosteroid use was reduced.

Keywords: api-aromatherapy, atopic dermatitis, propolis cream, skin diseases

INHALATION OF BEEHIVE'S AIR IN CHILDREN WITH HIPER REACTIVITY OF BRONCHIAL MUCOSA

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There are vapours of precious essential oils, flavonoids, etc. in the air in active beehives. With their movement and work in the hive, bees create a warm, healing aerosol with a specific smell. It contains essential oils of bee products. Some of healing particles are: isoflavonoids, carotenoids, terpenes, essential oils, hormones, pheromones, alcohols, enzymes, antibiotics, phytohormones. Inhaling air from the hives has positive effects on overall health and enables psychophysical well-being. The air from the hives is suitable for both adults, as well as for children and adolescents.

The respiratory organs are constantly exposed to potentially harmful agents such as bacteria, viruses, fungal spores, pollens, various organic and inorganic particles, and toxic gases. However, there is a higher percentage of children with increased sensitivity of bronchial system. In such conditions inhalation od beehive's air is highly recommended.

- Inhalations can be performed in a sitting or lying position, or playing in the chamber, without an inhalation mask, just by inhaling air from the hive in the api chamber. The hives should be opened at least 3 hours before the arrival of the user.
- Inhalation with the specially designedinhalation systems with mask is also recomended.

Therapy is always performed in cooperation with a doctor or a doctor of alternative medicine and an apitherapist.

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Keywords: beehive's air, bronchial hypersensitivity, children

BEE PRODUCTS FOR CHILDREN AS FOOD AND REMEDIES

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Children's needs are very specific and their response to a health condition is significantly faster than adults. Nowadays, foods are increasingly poor in nutrients and most often contaminated with chemicals. That means we need to pay more attention to the nutrition of the child. Bee products are lately attracting the attention of the consumers, but also of the researchers due to their valuable characteristics: significant effects on human health and nutrition. For example, raw pollen and bee bread due to their complex composition are accepted as superfoods. Raw honey not only replaces sugar in daily diet, but offers a variety of phytonutrients that can play important roles for maintaining good health: enzymes, probiotics, antioxidants, etc. Propolis has very good antimicrobial and anti-inflammatory properties. Royal jelly and apilarnil are very good for body and brain development, for premature babies, immune problems, etc. Introducing bee products in children's diet helps to maintain a good state of health and harmonious development. Their taste is well accepted and appreciated by kids, which is important for good compliance. The use of bee products has shown very good effects in boosting immunity: children who start in kindergarten or school are protected from recurrent infectious diseases. Cures with individualized mixture of bee products (twice a year) decreased dramatically infections and use of antibiotics among them. This presentation will show some of our experience introducing bee products as part of the diet and remedies for children of all ages.

Keywords: Apitherapy, nutrition, bee products, children

API-NUTRITION FOR INFANTS AND CHILDREN

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Children are the "light of the eyes" of their parents, but they also represent the future of humanity, so it's very important to assure them proper conditions for an adequate development. Nutrition plays a very important role in the first stage of life. Unfortunately, nowadays, foods are increasingly poor in nutrients and most often contaminated with chemicals (pesticides, additives, etc) which leads to the need to pay more attention to the nutrition of the child both on the part of parents as well as health professionals and even society in general. Api-nutrition refers to the addition of bee products in the daily diet to support nutrition and revitalize health. Bee products can be considered functional food providing benefits beyond basic nutrition. Honey can replace sugar but contains other nutrients also. Honey can be regarded as a good food for both infants and adults, but many people, including healthcare professionals, are afraid to use it for children under the age of 1 or 2 because of risk for botulism. Botulism is a serious problem, but it's correlation with honey consumption is not precisely identified. Clostridium botulinum is present in the environment, baby's toys, pacifiers, etc. Regarding honey, a correct process of harvesting and storage can avoid the contamination with *C. botulinum*, adding the benefits of immune stimulation for babies. Raw pollen and bee bread can be considered real superfoods due to their complex composition (proteins, fatty acids, minerals, vitamins, probiotics, antioxidants). Pollen and bee bread can be used in cases of proteins or mineral deficiency, as probiotics, gaining weight problems of small children. Royal jelly and Apilarnil are very good for body and brain development.

The geo-botanical variety of the sources of the hive products, their composition and properties, and also the different professional skills of beekeepers (whose education can vary from 4 primary classes to doctors, teachers, etc.), all influence the quality of and the benefits brought by the bee products. So, high quality food enriched with bee products can be a very good start for a proper nutrition and development of our children.

Keywords: Apitherapy, nutrition, bee products, children

IMPROVING CHILDREN NUTRITION WITH BEE PRODUCTS

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In the children's nutrition, it is recommended to include biologically valuable bee products, such as various types of honey, pollen (perga) and royal jelly. Additionally, propolis and beeswax can be used in exceptional circumstances.

The aim of this paper is to collect and analyse data on the possibility of improving children's nutrition by including bee products.

Honey is recommended for preschool and school children as a good source of bioavailable carbohydrates and protective biologically active components. Pollen and royal jelly have exclusively protective functions in strengthening the immune system and are not relevant as building and energy components. Although pollen is often rich in protein components, consumption of pollen is quantity limited. The use of bee products also carries certain health risks, such as various forms of food hypersensitivity. Preschool children are a particularly sensitive group.

Bee products in children's nutrition are still underrepresented due to insufficient production, poor information, adulteration and especially due to insufficient promotion.

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Keywords: bee products, children nutrition, improving nutrition

BEE POLLEN AS A SOURCE OF ESSENTIAL ELEMENTS IN CHILDREN NUTRITION

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For the normal function of a human body low quantities of macro and microelements are required. Elements are essential for many physiological processes, including for the growth and development of children. Recommended dietary allowances (RDA) for nutrients in human nutrition vary according to many factors such as age, gender, weight, activity, etc. To provide adequate intake of essential nutrients a healthy and balanced diet has to be provided in all periods of life. Bee products are natural and nutritional food supplements that can be used in everyday nutrition. Among them bee pollen has the richest elemental composition. In our research contents of K, Ca, P, Fe, Zn, and Mn, using a non-destructive energy dispersive X-Ray fluorescence spectrometry (EDXRF), were determined. Multielemental determination was performed on the samples of monofloral (sweet chestnut, maple, dandelion, rapeseed, flowering ash, buckwheat, common ivy and plantain) bee pollen (n=34) as well as on the samples of polyfloral bee pollen (n=35). On average, the highest concentrations of K, P and Ca were determined in buckwheat bee pollen (11.4 mg/g, 7.78 mg/g and 2.36 mg/g, respectively), while the highest concentrations of Fe were found in sweet chestnut (145 µg/g) and maple bee pollen (141 µg/g). Average Mn concentrations were the highest in sweet chestnut (93.1 µg/g) and buckwheat bee pollen (90.1 µg/g) while average Zn concentrations were the highest in maple, sweet chestnut, common ivy and rapeseed bee pollen (46.5 µg/g, 46.5 µg/g, 50.6 µg/g and 54.0 µg/g, respectively). The obtained data were compared to RDA for elements for children. The use of bee pollen can contribute to meet RDA for essential elements, mainly for Mn, Fe and Zn. Nevertheless, the botanical origin of bee pollen and daily consumed quantity have to be taken into consideration while evaluating RDA.

Keywords: bee pollen, EDXRF, elements, nutrition, RDA

ENHANCED NUTRITIVE AND FUNCTIONAL VALUE OF MULTIFLORAL BEE POLLEN FERMENTED IN A KOMBUCHA CONSORTIUM AND ITS POTENTIAL IMMUNE BENEFITS FOR CHILDREN

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A vital role in keeping a good health condition is played by the immune system. Immune functions are sometimes disturbed by several stressors, among which malnutrition, especially in children, is an important factor which can affect the body defence against various pathogens.

The aim of this study was to evaluate the nutritional value, the specific compounds as well as – the biological effect - antioxidative activity of a food ingredient obtained from raw bee collected pollen fermented in a Kombucha consortium, using an original technology, in order to properly and efficiently use it as an active ingredient in dietary supplements, or as functional foods, with immunomodulatory properties, so important nowadays, that can also address to children.

Bee collected pollen, kombucha fermented green or dark tea (SCOBY 20 - symbiotic culture of bacteria and yeasts). The original technology used for the fermentation of bee collected pollen in symbiotic micro-organisms cultures is a dynamic process which increases the bioavailability of pollen compounds. Specific methods for food analysis - nutritional label, were applied. Determination of the total polyphenols/ flavonoids/ SCFA/ organic acids/ rare sugar content and the specific ABTS and DPPH methods for AO activity were also used to characterize the ingredient.

The original product shows an improved nutritional value, an increased bioavailability of the active compounds, an important increase of the lactic bacteria population (possibly assigned to the bee pollen contribution – *Lactobacillus fructivorans*, too) and an important antioxidative activity (DPPH and ABTS, indicating two times higher values than control). Maximum values were recorded within 5 to 7 days of pollen fermentation in the Kombucha consortium. This is due to the synergetic effects of the natural antioxidant compounds. Symbiotic bacteria and yeasts, polyphenols and other active compounds are important factors involved in supporting the immune system. As the intake of immunomodulatory supplements is considered effective in improving immune functions and reducing the incidence of immunological disorders, such an active ingredient broadens the spectrum of new and improved formulations of such products to be used for both adults and children.

Keywords*:* bee pollen, kombucha consortium, nutritional value, antioxidants, immunomodulatory dietary supplements

DEVELOPMENT PROBLEMS WITH CHILDREN AND EXPERIENCE WITH BEE PRODUCTS

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Apilarnil, a widely unknown apitherapy product has also a lot of applications within children. The mechanism of Apilarnil can be divided in three parts.

Apilarnil contains a lot of micronutrients. The value consists in the heterogeneity of proteins, sugars, fats, and minerals. This composition supports children with developmental problems and malnutrition.

Apilarnil contains messenger molecules or neurotransmitters, hormones, and precursors of hormones. These ingredients have obviously also a strong influence on the human body. Children with developmental problems profit by “restarting” their developmental processes, as well as all brain and nerve processes

Like other bee products Apilarnil is also a strong support of the immune system. Generally, it is better to talk about its immunomodulatory power. This helps children to overcome several types of infections whether they are of bacterial or viral origin.

Apilarnil works against developmental disorders, malnutrition, nerve problems, general fatigue and some other special syndromes like epilepsy in children. This mechanism could explain why Apilarnil works against developmental disorders, malnutrion…

Generally, bee products help to prevent health issues or to recover easier after disease with children. Gently starting and collecting experience is essential for parents. Children are different. Even healthy things must be tasty and fascinating. It is up to the parents neither to neglect bee products nor to force their children to take them against their will.

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Keywords: Apilarnil, drone broth homogenate, bee products, children

LEARNING ABOUT BEES WITH PRESCHOOL CHILDREN

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In my group of preschool children, ages five to six, we were learning about bees, their life, beekeeping, and at the end of the project we built an apiary from cardboard. Children were painting cardboards in different colours and drawing various images on cardboards. We then built the apiary and made bees that were »flying« around and meadow around the apiary. We also had a garden on our playground, which helped children learn where does the food come from and how important bees for us as pollinators are.

We were fallowing a lot of pedagogical aims: children would learn about bees, what a »home of bees« looks like, how to behave in presence of bees, recognizing beekeeping as part of Slovenian tradition, and also simply enjoying in art, colouring, drawing.

The research of life of bees was conducted in a pedagogical way, together with the children, with many books, pictures and movies. We also visited the Museum of Apiculture in Radovljica and invited a beekeeper to our kindergarten. In the museum we had an opportunity to discover an apiary with traditional Slovenian beehive panels. In addition to pedagogical aims we were also interested in learning how participating in the project helps children taking care of their bodies and their health and how motivated the children are in activities connected to the bees. We were exploring children's duration of motivation, their attention and how much encouragement they need for participating in the activities. As indicator we also used API kindergarten monitoring – didactic tool, with which we were testing the knowledge of children before and after the project.

Children have learnt a lot of facts about bees, they developed a positive attitude towards them. They have learnt how important the bees are for nature and for providing food for humans. Children were highly motivated by topics of the API kindergarten program. They have learned new ways to improve the quality of their lives and health.

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Keywords: apiary, art, bees, beekeepers, children, preschool

SCIENCE DAY FOR MOTIVATION AND INSPIRATION IN SECONDARY VOCATIONAL SCHOOL STUDENTS

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In the last school year 2020/2021 we started science days at the Secondary Vocational and Technical School of the Šentjur School Centre, which attracted a lot of interest and enthusiasm from teachers and students. The first of these was called: Courgettes, pumpkins, pumpkin seeds. The science day was prepared as a part of the project "What we sow is what we harvest", in which our school takes participation with Slovenian Beekeepers´ Association. At the Šentjur School Centre we sowed pumpkin seeds, namely the well-kown "Golica". This pumpkin is a honey plant, and we were extremely happy with their harvest. On the day of the project day, the representatives of the classes first carved the pumpkins and then decorated them as they wished. At the end of the project day, all of these pumpkins also took part in the selection for the Best Pumpkin in the School. Instead of lessons, the students had various workshops in the fields we teach at our school centre. We first took them 110 years back in time that is when classes at our school began. Then followed interesting workshops, which were related to beekeeping or pumpkins. The food processing and nutrition technician educate program researched about the fats and health. About the Štajersko Prekmursko pumpkin oil … The veterinary technician educate program researched anatomy of bees in general, the characteristic organs and glands, development of the bee, family development … Baker and confectioner educate program got to know sweets, which contained honey, pumpkin or pumpkin seeds as one of the main ingredients. The workshops were extremely attractive to the students and with such original project days it is necessary to inspire young people to know how to live with nature. Honey is also extremely important in a healthy diet and that is also something we would like to remind our students about, that as future experts they will be able to include this extremely important food in their profession.

Key words: beekeeping, honey plant, pumpkins, science day, workshops

EFFECTS OF BEEKEEPING ON CHILD DEVELOPMENT

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For children beekeeping is a proper activity in terms of developmental psychology. A combination of scientific research methods was used in the research, sc. an experiment, systematic observation, questionnaire, interview, and case study. Dependent and independent variables and hypothesis were identified: Experiential learning through activities with bees, develops empathy, social competences, altruism, and a sense of connection with the environment and nature in children.

The research used a predominantly deductive approach, data collection, data analysis and interpretation or synthesis of conclusions. The process took place through monitoring the child's development over a longer period of beekeeping or working with bee families.

It should be noted that working with live bees as part of apitherapy has positive effects on the cognitive-motor and psycho-social development of the child, esp. positive self-image, self-confidence, strategic and critical thinking, and independent solving of challenges.

Keywords: beekeeping**,** children, development, honey

TRAINING COURSES IN BEEKEEPING FOR PERSONS WITH MENTAL DISABILITY

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We started our work therapy with bees at the Črnomelj Occupational Activity Centre in April 2012. The occupants of the Occupational Activity Centre are handicapped people with motor and mental disabilities. At the beginning we set up a small apiary with four hives next to the residential unit. The beekeeping club, being run by mentor Dušan Milinković once a week, has been joined by occupants coming to the Occupational Activity Centre every day as well as those who live there. At first there were six people in the club but at the moment it has 14 active participants who are quite independent beekeepers. The occupants present their bee products outside the institution as well; among other things they participated at the international honey judging in Semič. Their honey received the Silver and Gold Medal.

The goals of the work project at OAC are:

- Teaching the occupants how to keep bees.
- Getting to know how significant bees are for nature and people.
- Getting to know bee plants and planting these in the garden.
- OAC occupants being self-sufficient in beehive products.
- Occupant inclusion in the broader social environment.

Apiculture connects the occupants with local beekeepers, fruit growers and communities, and makes the most vulnerable groups a part of the sustainable development of our environment.

By opening the apitherapy apiary this year we have made it possible for the occupants to strengthen their immune systems by resting in the apiary, through api-inhalations and through using bee products. Being in and around the apiary has a beneficial effect on people's mental and physical condition. The air around the apiary itself is full of natural aerosol containing a mixture of honey, pollen, propolis and essential oils that bees disperse with their wings. A few hours' rest in the apiary breathing in air saturated with the smells of essential oils and a positive charge in the immediate vicinity of a bee colony strengthen your immune system, have a beneficial effect on your respiratory conditions, reduce your stress symptoms and improve your general well-being and mood.

When we began the project, we had no example from abroad or at home to follow because we had no knowledge of any similar therapies with bees when we got the idea. But we had a great desire to combine the two seemingly incompatible worlds and enrich the daily routine of this vulnerable group of people. We try to motivate the occupants as much as possible, to exploit their potential and skills, and to bring about positive thinking and improvement in their self-image through various work techniques and types of work. Being driven by the enthusiasm of the occupants and members of our beekeeping society, our idea about the beekeeping club in the form of work therapy and then apitherapy has grown into something very original and into a great community service.

Keywords: beekeeping, apiary, mental disability, api-inhalations

CHILDREN AND BEES

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Roda Kindergarten is an institution of early and preschool education founded by a person. It has existed since 2014. Mr. Mato Anić has been the president of the Moslavina Otok Ivanić Beekeeping society since 2017. The practice in kindergartens is to mark days that are in line with the implementation of the curricular goals of each institution, so we mark bee day. In 2021, in cooperation with the Croatian Apitherapy Society, we made our first film in stop animation, which the children did completely independently, and received picture books from the Croatian Apitherapy Society as a gift.

Kindergarten Roda has implemented in its curriculum the project Let's meet the world of bees. With the arrival of spring and the awakening of nature, bees become part of our daily lives during our stay in nature and outdoors. The children had the opportunity in the kindergarten yard to observe the bees on the flowers and their actions. A new stimulus in a group is always a challenge and children always show interest when they come in contact with something new, and the full hit was the apiary - a glass hive with bees. Through meeting and talking to the beekeeper and his obligations, responsibilities the children gained experience and heard what it is like to be a beekeeper.

The children watched the animated film Pčelica Maja. We enriched the research corner with honeycombs, honey, wax, pollen grains, and a protective suit for our beekeeper. One of the activities in which children express their creativity and ingenuity is artistic expression in order for the project to cover all development areas, they adopted the song Bumblebees and Bees. They sang it in various ways: quietly-loudly, quickly-slowly. As a gift from Beekeeping Society we were given a hotel for solitary bees and insects that we set up near our garden which the children take care of. The children heard that the bee product is used both for cosmetics and as an aid in the implementation of some therapies. We learned that bees communicate through dance, so we used the "writing dance" method. Writing dance is a method by which we encourage the development of hand-finger coordination, fine motor skills and graphomotor skills throughout the body.

The project Meet the World of Bees was an overture to the magical world of nature where we came that bees are the only insects that produce food that humans eat.

The bee has become a symbol of nature in danger

Keywords: bee, children, danger, insect, nature

HONEY BREAKFAST

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The Slovenian Beekeepers' Association is the initiator of honey breakfast in Slovenia, which involves organized visits of children in schools. On the third Friday in November the Slovenian beekeepers traditionally participate in a honey breakfast in kindergartens, primary and secondary schools. As the campaign has been very well received by the public since its inception, the beekeepers have launched the initiative to overhaul it into a traditional Slovenian breakfast, which was adopted on the national level in 2011. Children, teachers, beekeepers, mayors of municipalities, civil servants and other public figures have breakfast together eating bread with honey, drinking tea sweetened with honey, talk with children about bees and beekeeping, create beekeeping-related products, etc. The initiative has a very strong message of raising public awareness of the importance of bees and other pollinators, bee products, healthy lifestyle, and the importance of locally grown food. This year, the Slovenian Beekeepers' Association will mark the fifteenth anniversary of the honey breakfast initiative in Slovenia. We believe that this successful example of good practice will spread from Slovenia to Europe as a European Honey Breakfast, eventually becoming a global movement.

Keywords: breakfast, children, honey, local food

HONEY: FROM LOCAL TRADITION TO CROSS-GENERATION EDUCATION

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Beekeeping in the Labin area dates back around thousand years. With an extremely favourable climate Labin region is known for the development of beekeeping and honey production. There used to be a social apiary in the Labin area. In the 20th century, with the development of industry and mining, many agricultural and related activities almost disappeared, so beekeeping was endangered. In recent years, primarily thanks to private beekeepers gathered through the Labin Beekeeping Society, this trend has changed.

The goal is to bring beekeeping and the benefits of honey products closer to the largest possible population, especially children and young people, with numerous activities, including the opening of the city apiary, and the organization of local Honey Days as a central event.

Over the past four years, numerous demonstration workshops were held in kindergartens and primary schools in the Labin area, where professional beekeepers and visiting experts introduced children to beekeeping, honey production and introduced them to healthy habits related to the consumption of bee products. With the help of the City of Labin, an educational city apiary was built, equipped, and put into operation. At the central event, Honey Days, part of the program and activities are regularly dedicated to children of kindergarten and school age. Every year a School Honey Day is organized in schools, where children are given free jars of local honey.

Labin has laid a good foundation and has a perspective for long-term sustainability of beekeeping and continuous education of children of kindergarten and school age, so that the tradition of beekeeping can be passed onto future generations as successfully as possible.

Keywords: beekeeping, city apiary, children, education, honey, tradition

API-EDUCATION AND API-TOURISM FOR CHILDREN

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I will present “the Api-tourist guide” program in terms of tourist offer for children. The idea of designing an education for an api-tourist guide was born out of the desire to provide quality guidance to guests who visit beekeeping providers (tourists in api-tourism) and are also interested in beekeeping.

As the current social situation is to be followed in the field of tourist services, the need for sustainable tourist products with a high degree of responsibility and professionalism should not be overlooked. The essential differences between a tourist guide and an api-tourist guide must therefore be defined. In the presentation, I will present api-tourist products for children on the Bee Path in Ljubljana, Slovenia. Presentation will show what is needed for an api-tourist guide to become, the purpose of cooperation with various stakeholders, the tourist innovations that result from this cooperation and the first results i.e., user experiences.

Keywords: Apitourism, Api-tourist guide, Bee Path in Ljubljana

OUR FRIENDS BEES

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Initial thesis for creating this project was: Could a kindergarten make progress in the local community, by acting in the direction of promoting care for the well-being of honeybee colonies?

The main goal of this project is to educate children and their families about the wonderful world of bees, their colonies, their products and their role in the ecosystems.

The author of the book "Honeybee”, molecular biologist prof.dr.sc. Tomislav Terzin, held a Zoom lecture for parents and preschool teachers. Anatomy of bees, architecture of the hive, bee communication, the organization and hygiene of bees, honey bee products were some of the covered topics.

Since the life of honeybees in colonies resemble fantastic worlds in fairy tales, we collaborated with writers of the Croatian Literary Society and a musician Ivan Simić for the poetic and musical design of the projects’ theme. Likewise, writer Tatjana Udović wrote an educational fable “Honeybee Ančica” to announce that pesticide poisoning makes it difficult for bees to survive.

We organized a charity fair with children’s themed artwork, and a charity lottery in which honeybee products were given as prizes. With the raised money, we supported the schooling of children in Uganda, who participated in this project through exploring and sharing their research experience.

We verified the acquisition of concepts and competencies through artistic representations, by elaborating individual reflection and collective discussion. Through systematic observation of children's behaviour in relation to the offered educational materials, we noticed that interest in offered activities was high and that children used the materials enthusiastically.

Children recognized honeybees as a symbol of the nature in danger. The honeybees are very important pollinator, are an indispensable element in the conservation of biological diversity, fundamental for the survival of living beings.

Keywords: Children, honeybee, project

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