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REPORT ON THE SEVENTH INTERNATIONAL “FASCINATION OF PLANTS DAY” (FOPD) THAT BROUGHT TO LIGHT THE VOLUNTARY SPIRIT INTO THE FACULTY OF BIOLOGY

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Abstract. The seventh international “Fascination of Plants Day” (FoPD) was held in May 2024 at the Faculty of Biology (BF) of Sofia University “St. Kliment Ohridski” (SU), in collaboration with the Agrobioinstitute (ABI) of the Agricultural Academy (AA). The event was a part of Sofia University’s “May Days of Culture” and aimed to highlight the significance of plant science and the fascinating world of plants. FoPD-2024 brought together academic members and student volunteers, which resulted in a unique combination of fresh perspectives, creativity, and high
quality presentations. Through interactive talks and demonstrations, curious facts were shared about topics such as vampire plants, urban tree species, and plant communication through light. Key discussions explored the role of plants in our lives, addressing questions like: What are plant "superfoods"? Why are legumes important? What exactly is organic farming, and is it practiced in our country? How do electromagnetic fields impact precision agriculture? How do microalgae serve as vital sources of useful substances? Answers were also provided to questions about plant diseases and their defense mechanisms. Visitors were introduced to a “laboratory oasis” that showcased the powers and health benefits of medicinal plants. STEM experiments

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involving plants were organized for the curious ones, offering hands-on learning experiences. Attendees were also delighted by the plant collections at the Faculty of Biology and the Institute of Decorative and Medicinal Plants, which featured a variety of greenhouse-grown plants suitable for decoration or as gifts. The S.K.O.R.E.C. student club demonstrated its volunteer initiatives focused on biodiversity knowledge and conservation. The organizers' creativity shone in a special plant workshop and a children's corner. Additionally, an entertaining quiz was held to test what visitors had learned during FoPD. This exciting event successfully celebrated the captivating world of plants and their invaluable role in our lives.

Keywords: academic members, Faculty Student Council, methodology, plant sciences

Fascination of Plants Day (FoPD) was initiated and supported by the European Plant Science Organisation (EPSO), whose mission is to enhance the impact and visibility of plant science (Zhiponova et al. 2020). The event was first launched in 2012 and through its biennial editions evolved into an international initiative and steadily gained worldwide recognition. In 2024, the seventh FoPD initiative united 65 countries, hosting 868 plant-based outreach activities for people of diverse backgrounds (FoPD Statistics-2024).

The Faculty of Biology (BF) at Sofia University "St. Kliment Ohridski" (SU) and the Agrobioinstitute (ABI) of the Agricultural Academy (AA) began collaboratively organizing plant-related events in 2015, marking Bulgaria's first participation in FoPD (Zhiponova et al. 2020). Since then, both institutions have consistently promoted plant science as part of FoPD initiatives (Zhiponova et al. 2020, 2022; FoPD-Success story-2022). FoPD-2024 was celebrated on May 17, 2024, with remarkable contributions from representatives of the Faculty Student Council (FSC) and academic members specializing in plant science (**Figures 1a, b**).

The coordination for the FoPD-2024 event began nearly two months in advance and followed a structured sequence: planning the program; drafting the announcement; distributing information to BF and ABI colleagues (staff and students), schoolteachers and media; applying for funding; and organizing logistics. Topics were collected from all interested representative groups within BF and ABI, who individually selected the focus of their presentations and invited students to participate in the demonstrations (**Table 1**). This approach allowed researchers to effectively disseminate information about ongoing projects while introducing young colleagues to the art and skills of popularizing science. As a result, a significant academic participation activity was recorded: approximately 53 bachelors, 7 magisters/masters, and 3 PhD students; 18 members of BF from six departments; four senior researchers from ABI; and one senior researcher from the Institute of Ornamental and Medicinal Plants (**Table 1**).

For the first time, FSC was exclusively involved in every stage of the FoPD 2024

event's organization. From the outset, representatives of ABI, BF, and FSC worked collaboratively on the event planning. Notably, the FSC contributed

significantly by creating the visually appealing announcement and booth map (**Figure 2**), coordinating the Diaphanum funding project, decorating the Exhibition Hall (**Figures 1c, d**), and organizing the QUIZ content, as well as workshops for children alongside the representatives of ABI.

Fig. 1. FoPD-2024 organization. **a**) Opening the event. From left to right: the main coordinator of the event Prof. Anelia Yantcheva from ABI; the main organizer - Assoc. Prof. Miroslava Zhiponova from the Department of Plant Physiology in BF, Assoc. Prof. Lyuben Zagorchev - Dean of BF and Assoc. Prof. Lyubomir Kenderov - Vice-Dean of Economic Affairs of BF. **b**) FSC representatives in front of the wall for pictures: students in the organization Yordan Geor giev and Zlatina Zheleva; **c**) Setting up the booths of the event in the Exhibition Hall of BF; **d**) The arrangement of the wall for pictures by FSC.

The FSC also played a key role in promoting the event among BF students, while colleagues from the Department of Methodology of Biology Teaching at BF disseminated information to schools through the regional departments of education. For the general public, an audio invitation to attend FoPD-2024 was broadcast on the program Afternoon for the Curious (hosted by Ani Kostova interviewing Assoc. Prof. Miroslava Zhiponova) on Radio Hristo Botev (Radio show "A□ternoon □or the Curious" 2024).

Scientists and educators from ABI and BF departments, as well as many students with a passion for various aspects of plant science worked collaboratively to share their enthusiasm and knowledge with other students from BF and school pupils (**Figure 3**; **Table 1**).

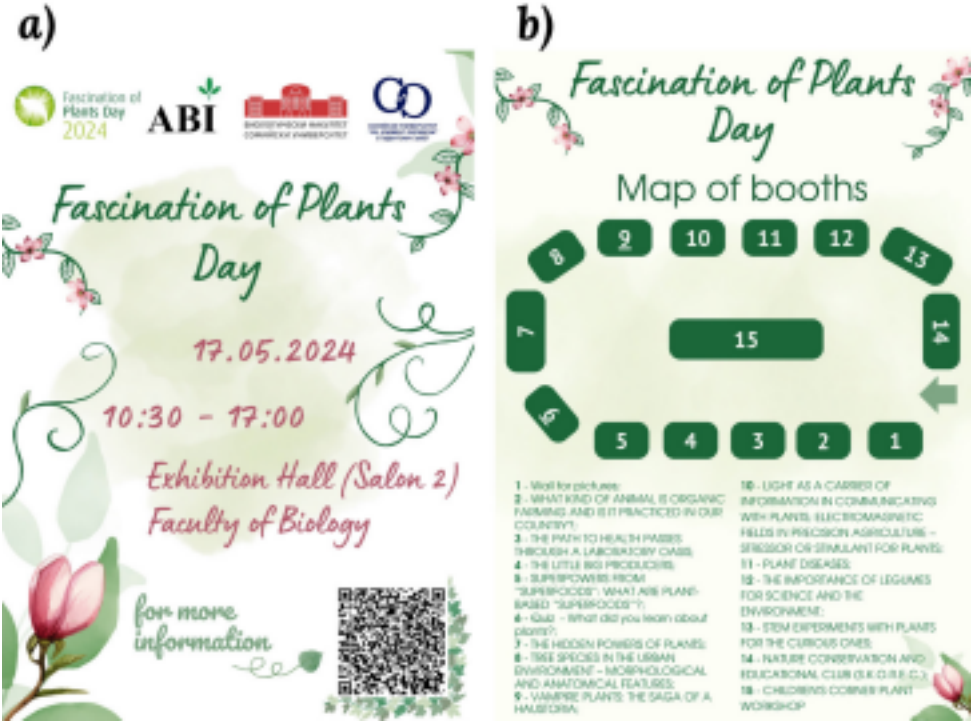

Fig. 2. FoPD-2024 announcement and map of the interactive boots (in Bulgarian).

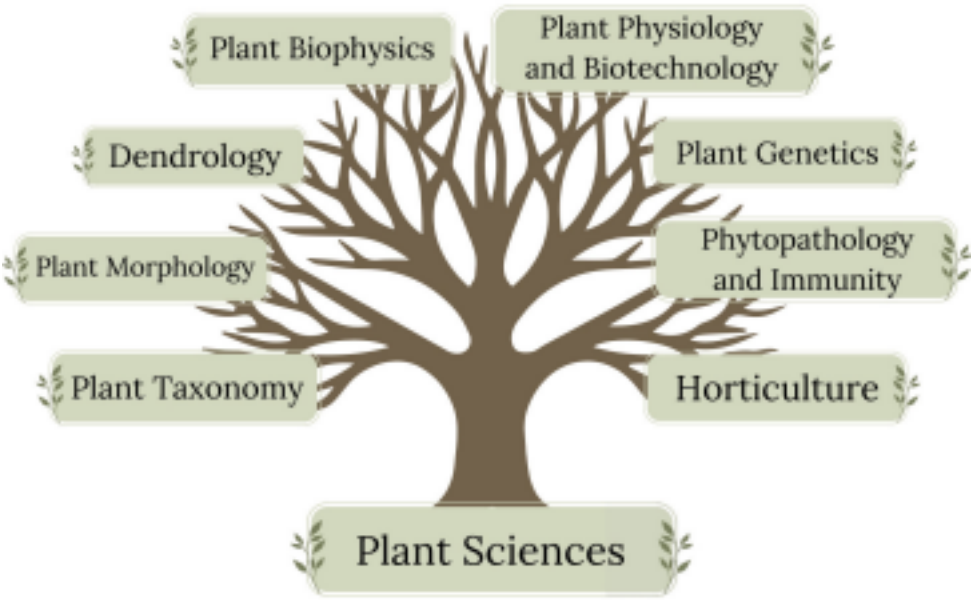

Fig. 3. Plant Sciences on the FoPD-2024 in BF, SU.

Table 1. FoPD Program (May 17, 2024) in BF, SU.

Participating Organization	**Information – Topics, Participants and Funding**	**Description**
Department of Biochemistry, BF (**Fig. 4c**)	"VAMPIRE PLANTS: THE SAGA OF A HAUSTORIA" Bianca Marinova (MSc 2y Bio chemistry) Supervisors: Assoc. Prof. Dr. Denitsa Teo□anova; Assoc. Prof. Dr. Lyuben Zagorchev Financing: European Union-Next GenerationEU, under the National Recovery and Resilience Plan of the Republic of Bulgaria, Project No BG RRP-2.004-0008	Young and old will have the oppor tunity to get acquainted with some strange and lesser-known types of plants, namely the parasitic ones. With us you will learn more about parasitism in plants - what their "vampire teeth" (haustoria) are, what is cuckoo yarn and how the science around it is entangled and unraveled. Welcome to the world of vampire plants, they don't bite!

Department of Biophysics and Radio biology, BF (**Fig. 4b**)	"LIGHT AS A CARRIER OF IN FORMATION IN COMMUNICAT ING WITH PLANTS" Assist. Prof. Dr. Momchil Paunov; Assist. Prof. Dr. Boyana Angelova; Assist. Prof. Dr. Vladimir Alexan drov; Assoc. Prof. Dr. Margarita Kuzmanova; Prof. Dr. Vasiliy Golt sev	"Fluorescence experts" will demon strate the capabilities of chlorophyll fluorescence to obtain a large set of data on the functional state of photosynthesis. However, the large amount of information requires reli able analysis, which is possible only through the application of modern information methods, such as neural networks, allowing the recognition of various stress factors (drought, mineral deficiencies) and even spe cies affiliation in plants.
Department of Biophysics and Radiobi ology, BF (**Fig. 6c**)	"ELECTROMAGNETIC FIELDS IN PRECISION AGRICULTURE – STRESSOR OR STIMULANT FOR PLANTS" Assist. Prof. Dr. Momchil Paunov; Assist. Prof. Dr. Boyana Angelova; Assist. Prof. Dr. Vladimir Alexan drov; Assoc. Prof. Dr. Margarita Kuzmanova; Prof. Dr. Vasiliy Golt sev Financing: Bulgarian National Sci ence Fund-MES КП-06-Н67/4 12.12.2022	Wireless communication technolo gies are the basis of "precision agri culture". What is known so far about the influence of electromagnetic fields used in wireless communica tions on the physiological state of plants, and what are the results of current scientific experiments.

Participating Organization	**Information – Topics, Participants and Funding**	**Description**

Department of Botany, BF (**Fig. 4a**)	"TREE SPECIES IN THE URBAN ENVIRONMENT – MORPHO LOGICAL AND ANATOMICAL FEATURES" Rayna Nikolova (BSc 3y, Agrobio technologies); Supervisors: Assoc. Prof. Dr. Tsveta Ganeva; Assoc. Prof. Dr. Miroslava Ste□anova	How to recognize some of the most common tree species in city parks? We will show you morphological features that serve as a distinction. We will introduce you to structures that are invisible to the human eye, but necessary for the survival of plants. We will give you a different perspective on the trees that surround us in everyday life.
Department of Methodolog y of Biology Teaching, BF (**Fig. 4d**)	"STEM EXPERIMENTS WITH PLANTS FOR THE CURIOUS ONES" Gabriela Dimitrova; Ioanna An gelova; Gabriela Yankova; Emily Markova; Victoria Alexandro va; Gabriel Goranov; Mikhail Dobrev; Krassimira Shopova; Stanislav Todorov; Iva Petrova; Margarita Eremieva; Borislav Kolev (BSc Binary specialities); Supervisor: Assoc. Prof. Dr. Kameli ya Yotovska	STEM experiments and demonstra tions with plants will be presented by student-to-be teachers, who are sure to enrich the knowledge about plants of young and old curious peo ple. And maybe some future scientist and discoverer will fall in love with science in the outdoor laboratory.
Department of Plant Physiol ogy, BF (**Fig. 6a**)	"WHAT IS ORGANIC FARMING AND IS IT PRACTICED IN OUR COUNTRY?" Dimitar Danchev (PhD student); Margarita Popova; Georgi Iva nov; Ivanka Malincheva (MSc 1y, Plant Biotechnologies); Financing: PhD project Research Fund of SU-№80-10-38/09.04.2024	Demonstration of plant crops, seeds and organic farming practices. We will tell you why organic farming is a necessary alternative for the future – for cleaner and sufficiently large production, as well as for the protec tion and restoration of the soil and the organisms in it.

Participating Organization	Information – Topics, Participants and Funding	Description
Department of Plant Physiology, BF (**Fig. 4e; Fig. 5b**)	"THE PATH TO HEALTH PASSES THROUGH A LABORATORY OA SIS" Anna Zaharieva (MSc 1y, Plant Biotechnologies); Ana-Maria Ned elcheva; Desislava Raykova; An ton Pozumentschikov; Georgi Spakhiev; Pavel Pintev; Yordanka Bakalska; Desislava Goranova; Nadya Toleva (BSc 4y Molecular Biology) Supervisors: Assist. Prof. Dr. De sislava Mantovska; Assist. Prof. Dr. Mariya Rogova; Assoc. Prof. Dr. Zhenya Yordanova Financing: Bulgarian National Sci ence Fund-MES: КП-06-Н56/9 12.11.2021 & КП-06-М71/1 05.12.2023; Research Fund of SU-№ 80-10-27/8.4.2024	Plant biotechnology is an important approach for preserving and studying medicinal plants, producing valuable compounds that plants, animals, and humans use for their health. We will show you an in vitro collection of Bulgarian medicinal plants and ex plain why and how we study them.
Department of Plant Physiology, BF (**Fig. 10**)	"DO YOU KNOW ABOUT THE PLANT TREASURY AT THE FAC ULTY OF BIOLOGY?" Yordan Georgiev (BSc 4y, Mo lecular Biology), Zlatina Zheleva (BSc 3y, Biology&Chemstry) Supervisor: biologist Aneliya Ray cheva Financing: Operational Program "Research, Innovation and Digital ization for Smart Transformation", PRIDST 2021-2027, funded by EU and Bulgarian Government	The Faculty of Biology has secret gardens (greenhouses) where plants are grown, saved and propagated. These diverse species are studied or simply serve to aesthetically comple ment and enjoy the spaces we inhab it. Come and learn about the potential of greenhouses, where you can work yourself or buy a floral gift+surprise, made with care, skill and love.

Department of Plant Physiology, BF (**Fig. 5c & 8c**)	“THE LITTLE BIG PRODUCERS” Zornitsa Karcheva; Zhaneta Georgieva (PhD students) Financing: PhD project Research Fund of SU-№80-10-119/16.04.2024	The "Microalgae Girls" are ready to introduce guests with a smile to the endless treasury of the Earth's green "liquid gold" to tell about the incred ible possibilities of microalgae. They will assure guests that in their own interesting way, algae have beauty, charm and bring hope – for new dis coveries that will make the planet a better place!

Participating Organization	**Information – Topics, Participants and Funding**	**Description**
Department of Plant Physiology, BF (**Fig. 7**)	“THE HIDDEN POWERS OF PLANTS” Adriana Parisheva; Alex Hris tov; Bilyana Piperkova; Borislava Stoycheva; Vasilena Dimitrova; Vasilena Stoichkova; Viktoria Marinova; Viktoria Terziyska; Virginia Spasova; Evgenia Sot irovska; Zornitsa Tileva; Iren Ilieva; Kalina Georgieva; Kate rina Taraninova; Katrin Nikolo va; Maria Kostova; Mila Ilieva; Monika Konstantinova; Nikolay Genov; Niya Atanasova; Rumyana Ste□anova, Yordan Georgiev (BSc 4y Molecular Biology) Supervisors: Assist. Prof. Dr. De telina Petrova; Assoc. Prof. Dr. Miroslava Zhiponova Financing: Bulgarian National Sci ence Fund-MES КП-06-Н56/9 12.11.2021; NextGenerationEU, № SUMMIT BG-RRP-2.004-0008-C01	Students from the elective course in Plant Resistance and Phytoimmun ity will present developed projects aimed at studying two interesting Bulgarian plants – catnip and moun tain plantain.

Department of Plant Physiology, BF (**Fig. 5a**)	“SUPERPOWERS FROM “SUPER FOODS”: WHAT ARE PLANT BASED “SUPERFOODS”?” Kristina Stoyanova (BSc Biotech nology) Supervisor: Assist. Prof. Dr. Marie ta Hristozkova	What are the scientific ideas behind the marketing term "superfoods," which are emerging as an increas ingly important category of healthy eating products? Are they only asso ciated with exotic places of origin, or can we grow them at home?
S.K.O.R.E. C., BF	NATURE CONSERVATION AND EDUCATIONAL CLUB in the Faculty of Biology, University of Sofia (https://www.facebook.com/groups/170251143796/about) Plamen Petrov, Vyara Ivano va, Yuzelim Komarevska, Petya Kairyakova, Detelina Hristova, Angelina Dandarova, Siyana Sto eva, So□ia Berkova, Anna Lukano va, Nikola Tariyski, Supervisor: Asst. Prof. Dr. Atanas Grozdanov	Student club for volunteer activities related to the study and conservation of biodiversity.

Participating Organization	**Information – Topics, Participants and Funding**	**Description**
FSC, BF (**Fig. 8a, b**)	QUIZ & PLANT WORKSHOP Yordan Georgiev (BSc 4y, Mo lecular Biology), Zlatina Zheleva (BSc 3y, Biology&Chemstry)	Students will organize a fun quiz and a plant workshop.
ABI	“PLANT DISEASES” Assist. Prof. Dr. Aneta Lyubenova	Visitors will receive information about diseases of plants and agricul tural crops.

ABI (**Fig. 6b**)	"THE IMPORTANCE OF LEGUMES FOR SCIENCE AND THE ENVIRONMENT" Prof. Anelia Iantcheva, Assoc. Prof. Mariana Radkova Financing: 101081329 Legume Generation project	Visitors will learn about model and cultivated legumes, the process of nitrogen fixation, research related to the function of genes involved in this process, the morphology of nitrogen-fixing bacteria, and many more curious and scientific facts about legumes.
ABI (**Fig. 8b**)	CHILDREN'S CORNER Assist. Prof. Dr. Lilia Georgieva, Assist. Pavlina Vassileva	Children will be able to have fun and learn with drawing, coloring, and special activities with plants.
Institute of Ornamental and Medicinal Plants, AA (**Fig. 10**)	PLANT SALES EXHIBITION Assoc. Prof. Dr. Nadezhda Zapry anova	Presentation of variety of plant species that you can purchase.

Fig. 4. FoPD-2024 program. **a**) "Trees in the urban areas"; **b**) "Communication between plants through light"; **c**) "Plants vampires"; **d**) "Coloring chrysanthemums"; **e**) In vitro culturing and adaptation of plants.

Fig. 5. FoPD-2024 program. **a**) "Superfoods"; **b**) "Bulgarian medicinal plants in vitro collection"; **c**) "Microalgae".

Fig. 6. FoPD-2024 program. **a**) “Organic farming”; **b**) “The importance of legumes”; **c**) “Effect of electromagnetic fields on plants”.

Fig. 7. FoPD-2024 program. "The hidden powers of plants".

Through narratives and demonstrations fascinating facts were presented on topics such as "plants vampires", trees in the urban areas, plants' communication through light, and many others (**Figures 4-9**). Moreover, questions about the roles of plants in our lives, superfoods derived from plants, the concept of agriculture, and its development in our country were addressed using innovative educational methodologies. The full FoPD-2024 program, including all topics, is summarized in Table 1.

The online platform "Quizizz" proved to be an excellent tool for testing children's and students' understanding of the covered topics while also serving as a fun and engaging form of entertainment. The game consisted of 30 questions – some with multiple-choice answers, while others required filling in words, values, or full responses. Throughout the event, the quiz was played in six repetitions with

Fig. 8. FoPD-2024 program. Groups taking part in the quiz (**a**) and workshops (**b**). **c**) Art activities with microalgae.

Fig. 9. FoPD-2024 program. Handmade items used for quiz awards and decorations. Courtesy of Babka.handknitting https://www.facebook.com/Babka.handknitting/photos

different groups of closely aged students. Each round took around 30 minutes to be completed. The winner of each round received a prize – handmade keyholders made from organic materials and plants from the greenhouse, which brought great joy to the winners (**Figures 8a, 9**). Additionally, plant workshops and art initiatives encouraged creativity and fostered communication among the participants.

The Students Council of Sofia University "St. Kliment Ohridski" accounts for a significant portion of students' projects funding through the Diaphanum system. For the FoPD event, the project covered expenses related to planting pots, soil and decorations (**Figure 10**). The plants were planned for use in educational activities, demonstrations and as prizes for the quiz. The project was written by the students

involved in organizing the event and was successfully presented and approved in its entirety. After acquiring the necessary materials, a group of students with an

Fig. 10. FoPD-2024 program. “Plant treasures” in BF greenhouse and the Institute of Ornamental and Medicinal Plants, AA.

interest in botany and plant physiology volunteered to repot all the plants from the greenhouse. Members of the Student Council provided valuable support with documentation, deadlines, and advice on preparing reports. They also showed great interest in the event and ensured they visited on the day to see the results.

The major target groups of FoPD include students, school pupils, children within various age groups and people involved in any plant subjects with the aim of sparking their interest and educating them to respect nature. The Department of Biology Education integrated the preparation of future biology teachers with their participation in the event by creating a booth featuring demonstrations designed by students for their peers and other visitors. This exemplifies the multifaceted nature of the FoPD initiative.

Another form of student participation involved presenting their projects developed during elective courses, such as Plant Resistance and Phytoimmunity. Additionally, diploma students from various BF departments joined their supervisors to present interesting aspects of the projects they were involved in.

The event highlighted not only the beauty of plant sciences but also the process of active learning and the competence-based approach, which fosters a combination of skills, knowledge and perspectives essential for developing teaching and educational strategies throughout one’s career (**Figure 11**). Students were prompted to apply teamwork, curiosity and interest in specific subjects, effectively sharing their enthusiasm and ideas with others in an impactful and inspiring way.

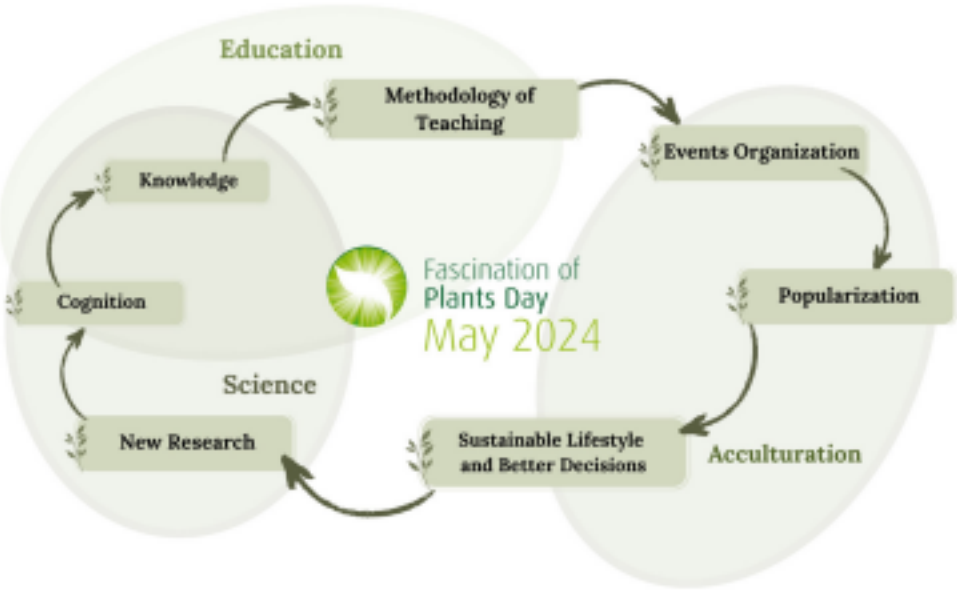

Fig. 11. Connections between transferring knowledge, methodology and events about plants.

FoPD-2024, like previous initiatives, successfully highlighted the fascination of plants among students and outside visitors. The researchers' enthusiasm was strongly supported by the volunteer spirit of interested students and the FSC, creating a unique atmosphere of learning, teaching, celebration and fulfillment. The event established a solid foundation for organizing similar initiatives in the future and brought together individuals with a shared passion for plant biology and science.

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CONFLICT OF INTERESTS

The authors declare that there is no conflict of interests regarding the publication of this article.

AUTHORS CONTRIBUTION

Y.Y.G., Z.D.Z. and M.K.Z. designed and wrote the manuscript, D.I.M., A-M.R.N., and A.V.I. contributed in adding information and improving the manuscript.

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