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Institute/Department:	Institute of Environmental Biology
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UPWr Base of Knowledge - link:	https://bazawiedzy.upwr.edu.pl/info/seam?d=UPWr/f59b6dc-cd93467625fc1224c38af3a&affil=8lang-en
Researchgate:	https://www.researchgate.net/profile/Jaroslaw-Prockow
Personal website / Working group website:	
Participation in projects in last 5 years (chronological; with distinction into PI (kierownik) and RF (wykonawca)):	Analysis of historical natural healing texts in the assessment of the antibacterial potential of beds of Silesian healing clay – terra sigillata Silesiaca (key task manager, Miniatura 4.0, 2020-2021).
Name and surname:	Auxiliary supervisor
Academic Degree:	Jacek Lyczko
Institute/Department:	Dr hab. (Dr. Eng.)
Faculty/Institute/Department:	Department of Food Chemistry and Biocatalysis
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UPWr Base of Knowledge - link or most important publications from last 3 year (ICR) / patents from last 3 years (maximum 5):	https://bazawiedzy.upwr.edu.pl/info/seam?d=UPWr/red20a993fa6747269c9ff60e793fe1d8&affil=8lang-en
Researchgate:	https://www.researchgate.net/profile/Jacek-Lyczko
Personal website / Working group website:	
Projects in last 5 years (chronological; with distinction into PI (kierownik) and RF (wykonawca)):	<p>2019 – 2022 Title: The influence of physical and chemical properties of osmotic solutions with herbal extracts on the process of mass exchange during osmotic dehydration and drying of plant raw materials Program: Preludium-17 Position: Contractor Budget: 139 654,00 PLN (~30 000,00 €) Financing Institution: National Science Centre</p> <p>2018 – 2020 Title: Innovative drying methods as a factor regulating the quality of selected spice plants Program: Innowacyjny doktorat Position: Project manager Budget: 60 000,00 PLN (~13 000,00 €) Financing Institution: Wrocław University of Environmental and Life Sciences</p> <p>2020 – currently Title: Innovative horticultural substrate for cultivation of herbs and medicinal plants produced from valorized waste materials arising from agricultural production and energetic transformation of biomass Program: Inkubator innowacyjny 4.0 Position: Contractor Budget: 100 000,00 PLN (~22 000,00 €) Financing Institution: Ministry of Science and Higher Education</p> <p>2020 – currently Title: Odour sensory quality of herbs as an outcome of volatile constituents composition and plant matter correlation – described on Mentha spp Program: Preludium-18 Position: Project manager Budget: 209 640,00 PLN (~45 000,00 €) Financing Institution: National Science Centre</p> <p>2021 – currently Title: New generation appetite active agents – useful for long-term care and weight control Program: Lider XI Position: Project manager Budget: 1 495 293,75 PLN (~330 000,00 €) Financing Institution: The National Centre for Research and Development</p>
PhD topic:	Chemotaxonomy and chemical profiling of a selected group of plants, with particular emphasis on the Lamiaceae family
Research discipline in Doctoral School:	Biological Sciences
Short description of the research problem to be solved in the PhD (minimum 1000 characters):	<p>Chemotaxonomy is the method of biological classification based on similarities and dissimilarity in the structure of different compounds among the organisms being classified. This method is also used successfully in the case of plants. The main aim of the project is to investigate the phytochemistry (volatile and non-volatile compounds) and their possible biological properties of a selected group of plants (which will be agreed with the candidate at the initial stage of cooperation), with particular emphasis on the Lamiaceae family. The analytical part of the research will include a detailed investigation of the phytochemistry of selected plants. The Ph.D. candidate will personally isolate the volatile and non-volatile constituents from each plant/species/specimen chosen. After chemical skinning by liquid and gas chromatography coupled with mass spectrometry, the Ph.D. candidate will perform the fractionation of isolates in order to evaluate the bioactivities of the chemical constituents of the selected group of plants. The determination of bioactivities will include antioxidant, anticancer, and antiviral testing protocols, which will constitute the next stage of the planned research.</p> <p>However, taking into account the huge difficulties that are often encountered during the determination of the studied taxa (especially when the materials are collected in a non-optimal phase, which would facilitate the error-free determination of the species), the first/main promoter will supervise these issues. The correct designation of plant species, subspecies, variety, and form is crucial in the context of further deductions in the field of taxonomy, and thus in the chemotaxonomy of plants. Only on this basis, after conducting research on the chemical composition of selected plant species can the chemotaxonomical variations in the composition, e.g., of the essential oils be discussed more extensively. If it turns out that there are large differences in the chemical composition of the tested compounds in selected populations of plants of the same species, it should be considered whether to indicate the studied populations for typical taxonomic studies in the future in terms of possible cryptotaxa. That is, comparing the chemical compositions of essential oils shows that in many cases they can be used as chemotaxonomic markers to support taxonomic decisions related to the establishment of separate taxa. Such indications for future research will also be certainly enabled by biogeographical analyses (against the entire range and available literature data) and possibly the analysis of published to date morphological data. To reinforce this inference, chemical and statistical analyses (PCA and HCA) can be used to analyse chemotaxonomic markers to support taxonomic decisions related to the establishment of separate taxa. Some of the different compounds are considered to be chemotaxonomic markers at the family, genus, and species levels (and also below). Thus, the second main goal of this Ph.D. project is to analyse the composition of the tested chemical compounds in the context of their use for possible conclusions regarding the taxonomy of the studied group of plants. Namely, we expect that it may be possible to identify at least groups of populations that may significantly differ from each other in the context of the profile of the tested chemical compounds, but at the moment, and without any research, it cannot be said that this is obvious and will actually happen. The main promoter will support all the analyses in these directions. The plants for research will be independently collected by the Ph.D. student and also delivered by the main supervisor, depending on the arrangements for the scope of the planned work. Biogeographical issues, including the candidate's region of origin, will play a key role in the final choice of research materials.</p>
Professional skills for PhD candidate (e.g. master program, specializations, softwares, language, analytical techniques, minimum 500 characters):	<p>In terms of knowledge and experience, the Candidate should:</p> <ul style="list-style-type: none"> - have basic skills with the work with basic laboratory equipment such as automatic pipets, laboratory glassware, centrifuges, heating mantles, etc.; - have basic knowledge regarding chromatographical analyses, including the principles of liquid and gas chromatography; - have basic knowledge regarding mass spectrometry, including principles of single quadrupole and triple quadrupole detector; - have basic knowledge and skills regarding statistical analysis and have experience with some statistical software; - be fluent with MS Office (or other similar one) work; - be open-minded for working in an international and multicultural team.
a) Project title:	
b) Agreement number:	0
c) Number of months in the project to support PhD (in months; starting from 1st of October 2022):	0
Project website:	