

Growing Importance of Natural Products Research

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Received: 16 December 2019; Accepted: 17 December 2019; Published: 18 December 2019

Natural products and preparations based on them play a stable and ever-increasing role in human and veterinary medicine, agriculture, in food and the cosmetic industry, and in other increasing numbers of fields. Their importance is based on the fact that they are mostly bound to renewable sources, which in fact makes them valuable within a circular economy, inter alia. At the same time, natural products give the origin of stereochemistry, optical activity, regioselectivity, chirality, and many other concepts and directions within science, development, and industry in a scope, which is indispensable. They serve as a constant powerful stimulus and model that inspires researchers to create new effective tools, similar to natural ones for controlling bioregulation mechanisms and solving practical problems. This was the reason for organizing this Special Issue aimed to underline current developments in all fields connected to natural products.

Hence, the Molecules Special Issue “Synthesis, Study and Utilization of Natural Products” brought in 15 papers, four reviews, and 11 full research communications.

The scope of the selected topics was rather broad, it showed the importance of the pegylated purpurin 18 for photodynamic therapy of cancer [1], it presented the anti-platelet aggregation activity study of ginkgolide-1,2,3-triazole derivatives [2], it showed that the overexpression of the melatonin synthesis-related gene *SLCOMT1* improves the resistance of tomato to salt stress [3]. Another study revealed the effects of isosorbide incorporation into flexible polyurethane foams: reversible urethane linkages and antioxidant activity [4]. The synthesis and in vitro evaluation of caffeoylquinic acid derivatives as potential hypolipidemic agents [5] and the first total synthesis of varioxiranol A [6] were also presented. Another study introduced to the readers the preparation of polysaccharides from *Ramulus mori*, and their antioxidant, anti-inflammatory, and antibacterial activities [7]. Studied were also the effect of enzymolysis on the performance of soy protein-based adhesive [8] and the study of new octadecanoid enantiomers from the whole plants of *Plantago depressa* [9]. Connected studies that combined the biological properties of another type of secondary metabolite described the biosynthesis of fluorescent β subunits of C-phycocyanin from *Spirulina subsalsa* in *Escherichia coli*, and their antioxidant properties [10] and presented the synthesis of the sex pheromone of the tea tussock moth based on a resource chemistry strategy [11].

Review articles described well the synthesis and anticancer activity of CDDO and CDDO-Me, two derivatives of natural triterpenoids [12], the advances in biosynthesis, pharmacology, and pharmacokinetics of pinocembrin, a promising natural small-molecule drug [13], as well as recent advances in the discovery and biosynthetic study of eukaryotic RiPP natural products [14]. Another review article addressed the issue of whether polyphenols could help in the control of rheumatoid arthritis [15].

Summing up, the current development in the chemistry of natural products proved to be so exciting that now Molecules itself organized recently several special issues oriented to this unfinished and fruitful field of the activity of the world chemical community. It is important to wish chemists

and their friends in connected fields much enthusiasm and success in their work as it brings so many useful fruits and tools for all humankind.

Acknowledgments: The Guest Editor wish to thank all the authors for their contributions to this Special Issue, all the Reviewers for their work in evaluating the submitted articles and the editorial staff of Molecules for their kind assistance.

Conflicts of Interest: The author declares no conflict of interest.

References

1. Pavlíčková, V.; Rimpelová, S.; Jurášek, M.; Záruba, K.; Fährnich, J.; Křížová, I.; Bejček, J.; Rottnerová, Z.; Spiwok, V.; Drašar, P.; et al. PEGylated Purpurin 18 with Improved Solubility: Potent Compounds for Photodynamic Therapy of Cancer. *Molecules* **2019**, *24*, 4477. doi:10.3390/molecules24244477.
2. Cui, J.; Hu, L.; Shi, W.; Cui, G.; Zhang, X.; Zhang, Q.-W. Design, Synthesis and Anti-Platelet Aggregation Activity Study of Ginkgolide-1,2,3-triazole Derivatives. *Molecules* **2019**, *24*, 2156. doi:10.3390/molecules24112156.
3. Liu, D.-D.; Sun, X.-S.; Liu, L.; Shi, H.-D.; Chen, S.-Y.; Zhao, D.-K. Overexpression of the Melatonin Synthesis-Related Gene SLCOMT1 Improves the Resistance of Tomato to Salt Stress. *Molecules* **2019**, *24*, 1514. doi:10.3390/molecules24081514.
4. Shin, S.-R.; Liang, J.-Y.; Ryu, H.; Song, G.-S.; Lee, D.-S. Effects of Isosorbide Incorporation into Flexible Polyurethane Foams: Reversible Urethane Linkages and Antioxidant Activity. *Molecules* **2019**, *24*, 1347. doi:10.3390/molecules24071347.
5. Tian, Y.; Cao, X.-X.; Shang, H.; Wu, C.-M.; Zhang, X.; Guo, P.; Zhang, X.-P.; Xu, X.-D. Synthesis and In Vitro Evaluation of Caffeoylquinic Acid Derivatives as Potential Hypolipidemic Agents. *Molecules* **2019**, *24*, 964. doi:10.3390/molecules24050964.
6. Lásiková, A.; Doháňošová, J.; Štiblariková, M.; Parák, M.; Moncol, J.; Gracza, T. First Total Synthesis of Varioxiranol A. *Molecules* **2019**, *24*, 862. doi:10.3390/molecules24050862.
7. Yu, W.; Chen, H.; Xiang, Z.; He, N. Preparation of Polysaccharides from *Ramulus mori*, and Their Antioxidant, Anti-Inflammatory and Antibacterial Activities. *Molecules* **2019**, *24*, 856. doi:10.3390/molecules24050856.
8. Xu, Y.; Xu, Y.; Han, Y.; Chen, M.; Zhang, W.; Gao, Q.; Li, J. The Effect of Enzymolysis on Performance of Soy Protein-Based Adhesive. *Molecules* **2018**, *23*, 2752. doi:10.3390/molecules23112752.
9. Song, X.-Q.; Zhu, K.; Yu, J.-H.; Zhang, Q.; Zhang, Y.; He, F.; Cheng, Z.-Q.; Jiang, C.-S.; Bao, J.; Zhang, H. New Octadecanoid Enantiomers from the Whole Plants of *Plantago depressa*. *Molecules* **2018**, *23*, 1723. doi:10.3390/molecules23071723.
10. Wu, X.-J.; Yang, H.; Chen, Y.-T.; Li, P.-P. Biosynthesis of Fluorescent β Subunits of C-Phycocyanin from *Spirulina subsalsa* in *Escherichia coli*, and Their Antioxidant Properties. *Molecules* **2018**, *23*, 1369. doi:10.3390/molecules23061369.
11. Zhang, H.-L.; Sun, Z.-F.; Zhou, L.-N.; Liu, L.; Zhang, T.; Du, Z.-T. Synthesis of the Sex Pheromone of the Tea Tussock Moth Based on a Resource Chemistry Strategy. *Molecules* **2018**, *23*, 1347. doi:10.3390/molecules23061347.
12. Borella, R.; Forti, L.; Gibellini, L.; De Gaetano, A.; De Biasi, S.; Nasi, M.; Cossarizza, A.; Pinti, M. Synthesis and Anticancer Activity of CDDO and CDDO-Me, Two Derivatives of Natural Triterpenoids. *Molecules* **2019**, *24*, 4097. doi:10.3390/molecules24224097.
13. Shen, X.; Liu, Y.; Luo, X.; Yang, Z. Advances in Biosynthesis, Pharmacology, and Pharmacokinetics of Pinocembrin, a Promising Natural Small-Molecule Drug. *Molecules* **2019**, *24*, 2323. doi:10.3390/molecules24122323.
14. Luo, S.; Dong, S.-H. Recent Advances in the Discovery and Biosynthetic Study of Eukaryotic RiPP Natural Products. *Molecules* **2019**, *24*, 1541. doi:10.3390/molecules24081541.
15. Sung, S.; Kwon, D.; Um, E.; Kim, B. Could Polyphenols Help in the Control of Rheumatoid Arthritis? *Molecules* **2019**, *24*, 1589. doi:10.3390/molecules24081589.

