doi 10.18699/bgrs2024-3.2-21

Systematic regulation of essential oil extracted from *Perilla Frutescens L.* against inflammation in zebrafish model: combining the transcriptomic and metabolomic analysis

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Key words: essential oil; anti-inflammation; metabolic regulations; zebrafish

Motivation and Aim: Belonging to the Lamiaceae family, *Perilla frutescens L.* is extensively cultivated across Asian countries including China. Known as s a "drug homologous food" with aromatic taste, its leaves have been widely used as a culinary herb and a representative flavor and food agent, mainly owing to a compelling aromatic profile in its essential oils. However, the chemical components in relation to the pharmacological potentials of its essential oils (PFO) has not been well understood currently. Therefore, our aim of this study is to investigate the chemical composition and potential anti-inflammation effect of PFO and to understand the body response of its function by combining the transcriptomics and metabolomics data, emplying in a tail-fin amputated zebrafish model.

Results: The PFO contains high concentration of Perilla ketone (42.41 %), significantly inhibited neutrophils migration to the amputation site, and inhibited the gene expressions of pro-inflammatory cytokines TNF-α, IL-6 and IL-1β. The combined analysis of transcriptomics and metabolomics revealed that the regulatory inflammation of the PFO is closely related to amino acid metabolism and oxylipins pathways represented by prostagladins.

Conclusion: The PFO shows potentials as anti-inflammatory agent as a valuable supplement, which provides an important reference for its development value and rational utilization as functional food in the future.

Funding: This research was supported by the National Natural Science Foundation of China (No. 82004030); the Scientific and Technological Developing Project of Jilin Province (No. 20210402042GH); the Jilin Provincial Development and Reform Commission (No. 2023C028-1); the Scientific and Technological Developing Project of Jilin Province (No. YDZJ202101ZYTS119); the Scientific and Technological Developing Project of Jilin Province (No. YDZJ202301ZYTS151).