

Phytoprofilling of *Achillea millefolium* morphotypes

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Achillea millefolium, commonly known as yarrow, is a versatile and widely distributed plant species known for its therapeutic and pharmacological potential. Two prominent morphotypes, distinguished by their distinct pink and white inflorescences in the Lithuanian natural habitats, were selected for an in-depth phytoprofilling study. This investigation aimed to characterize and compare these morphotypes' phenolic and triterpenic profiles in different plant parts (inflorescences, leaves, and stems) through high-performance liquid chromatography (HPLC) analysis. Our findings revealed that the caffeoylquinic acid complex predominated the phenolic profile in both pink and white morphotypes of *Achillea millefolium*. However, significant variations in the concentrations of phenolic compounds were observed between the morphotypes and plant parts. These variations highlight plant's dynamic and adaptive nature in response to its local environment. Furthermore, the triterpenic profile analysis revealed several biologically active compounds, with the predominance of betulinic acid derivatives in all plant parts tested. These triterpenic compounds exhibited variability in their concentrations within the tested samples, with potential implications for the medicinal properties of *Achillea millefolium*. This study provides valuable insights into the phytochemical diversity of *Achillea millefolium* morphotypes in Lithuanian natural habitats, elucidating perspectives for further investigations into this versatile plant's ecological, medicinal, and pharmaceutical potential. It highlights the importance of conserving and understanding the phytochemical variations in *Achillea millefolium*, revealing the dynamic chemophenetic interplay.