

Isolation of a substance from Begger's rosehip plants and study of its chemical composition

A. Aituarova^I, B. Assetova^I, A. Zhussupova^I, G. Zhusupova^I, S. Ross^{II}

^Ial-Farabi Kazakh National University, Center for physical and chemical methods of research and analysis, Almaty, Kazakhstan

^{II}University of Mississippi, Oxford, United States of America

Development of pharmaceutical production is one of the main objectives of the state program for innovative industrial development in Kazakhstan. Due to the limited scholarly research on the phytochemical makeup of *Rosa beggeriana* (specific for Asia and scarcely studied in chemical profile plant), our GC-MS findings were compared with the data on other *Rosa* species. It is important to highlight that this investigation marks the firstever exploration of the fatty acids' profiles associated with this plant species. Diverse range of compounds of the leaves incorporates terpenoids, such as aristolene and phytosterols, like stigmastan-3,5-diene. Moreover, saturated and unsaturated fatty acids, along with their corresponding esters, were identified. Fatty acids include myristic acid, palmitic acid, palmitoleic acid, ethyl linoleate, (e)-9-octadecenoic acid ethyl ester, ethyl oleate, alphalinolenic acid, 11-octadecenoic acid (z), 11-octadecenoic acid (e)-, oleic acid (z)-, stearic acid, 9,12-octadecadienoic acid (z,z)-, and 2-hydroxy-1--(hydroxymethyl)ethyl ester. A comprehensive analysis of the collective findings underscores the substantial abundance of saturated and unsaturated acids, terpenoids, and other substances in both leaves and fruits of the species. Among these, β sitosterol, betulin, (+)-catechin, lupeol, and ethyl linoleate were recognized, having been previously found in the *Rosa* genus, but not specifically in *Rosa beggeriana*. Two compounds, namely 3 β ,23-dihydroxyurs-12-ene and ethyl linolenoate, were discovered for the first time, offering novel insights for both genus and species.



Key Findings

- **Isolated Compounds:**
- 3 β ,23-dihydroxyurs-12-ene,
- β -sitosterol,
- betulin,
- (+)-catechin,
- lupeol,
- ethyl linoleate,
- ethyl linolenoate.

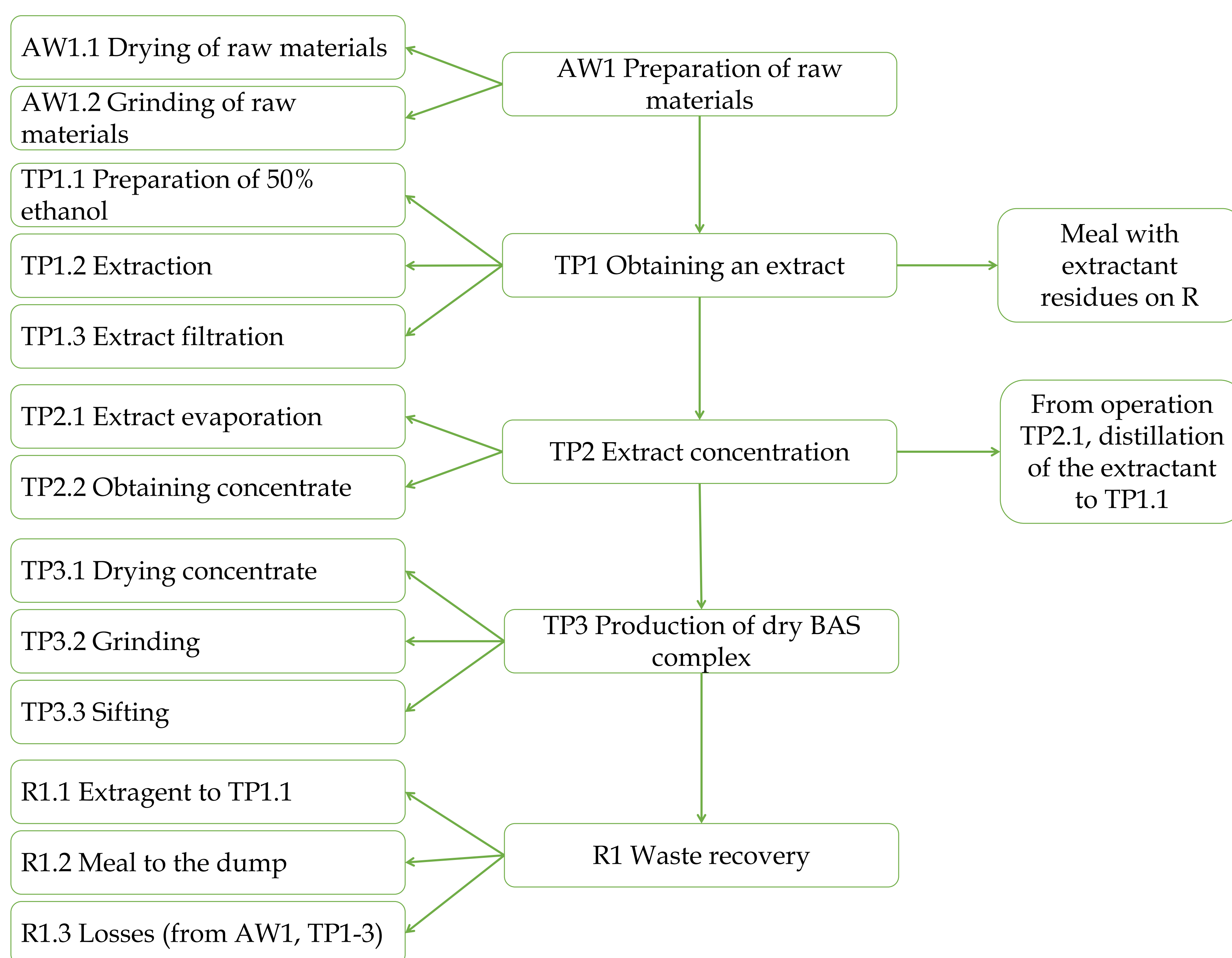
Chemical Composition:

- Identified volatile esters and acids



Analytical Methods:

- ¹H, DEPT, ¹³C NMR spectroscopy, mass spectrometry, GC-MS, also Column chromatography, Vacuum liquid chromatography, Thin-layer chromatography.
- Spots in Thin-layer chromatography were visualized by spraying with 2% vanillin-sulfuric acid in ethanol followed by heating at 110 °C on a hot plate.
- To analyze fatty acids by GC-MS, it was prepared by refluxing 20 mg of the isolated fractions with 20 mL CH₃OH and 2 mL H₂SO₄ for 4 h.
- The plant was harvested at a 23–25 °C temperature near Ili River and in the Almaty oblast N44°79.3959, E76°29.8245 in September 2021, and was deposited at the herbarium collection at the Institute of Botany and Phytointroduction of the Ministry of Science and Higher Education, Almaty, Kazakhstan (0002540).



TP - Technological process; AW - Auxiliary works; R - Recycling



Conclusion

This study provides data on the chemical constitution of *Rosa beggeriana* Schrenk



Correspondence: aizhan.zhusupova@gmail.com



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