

PLENARY PRESENTATIONS

PHYTOCHEMICAL INVESTIGATION AND COMMERCIALIZATION OF HEALTH-IMPROVING PRODUCTS FROM MEDICINAL AND EDIBLE PLANT RESOURCES OF KAZAKHSTAN

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Kazakhstan, located in the heart of Central Asia, boasts rich medicinal plant resources. Medicinal and edible plants continue to receive significant research attention due to their proven pharmacological effects, including antioxidant, antidiabetic, antitumor, anti-inflammatory, and antibacterial properties. These therapeutic benefits are attributed to the diverse bioactive secondary metabolites present in the plants, such as flavonoids, triterpenoids, steroids, alkaloids, saponins, proteins, and amino acids. Our aim to search promising, potential active *Artemisia* species candidates, encouraging us to analyze Protein Tyrosine Phosphatase 1B (PTP1B), α -glucosidase, bacterial neuraminidase (BNA) inhibition and antioxidant potentials of nine *Artemisia* plant extracts in which mostly endemic species have not been explored their secondary metabolites and bioactivities so far. Among all species *A. scopaeformis*, *A. albicerata*, *A. transiliensis*, *A. nitrosa*, and *A. albida* showed has a high potential to α -glucosidase, PTP1B and BNA inhibition. We focused on *Artemisia albida* Willd., a semi-white wormwood native to several regions of Kazakhstan, including Almaty, Altai, Tarbagatai, Zaysan, and Akmola. From the dichloromethane extract of *A. albida*, we isolated 30 compounds. Their structures were elucidated using HRMS, NMR, and other spectroscopic methods, revealing two previously undescribed sesquiterpenoids.

Meanwhile, our research center has developed bioactive herbal supplements based on decades of scientific research of our team. For the first time in Kazakhstan, we have created herbal supplements in granule and capsule forms. These consist of several medicinal and nutritional plants native to Kazakhstan and are designed for both prevention and treatment, with a focus on strengthening immunity, protecting the liver, and providing antidiabetic, antihypertensive, and anti-influenza properties. The practice of using medicinal and edible plants to improve health has expanded in recent years due to their low cost, holistic therapeutic effects, and the potential for long-term use without side effects.

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