

**Public knowledge, attitudes and practices regarding
herbal products and *Urtica dioica* (nettle):
An ethnopharmacological survey***

**Wiedza, postawy oraz praktyki społeczne dotyczące produktów
ziołowych i pokrzywy zwyczajnej (*Urtica dioica*):
badanie ankietowe***

Kalina Maja Sikorska-Zimny^{1,2}, Ewelina Białek¹, Agnieszka Wiosetek-Reske^{1,3}

¹ Stefan Batory State University, Batorego 64c Street, 96-100 Skierniewice, Poland

² The National Institute of Horticultural Research, Pomologiczna 13b Street, 96-100 Skierniewice, Poland

³ Department of Nutrition, Medical University of Applied and Holistic Science, Marcina Kasprzaka St. 49, 01-234 Warsaw, Poland, e-mail: kalinasikorskazimny@gmail.com

Key words: nettle (*Urtica dioica*), health-promoting properties, survey, supplements

Słowa kluczowe: pokrzywa zwyczajna (*Urtica dioica*), właściwości prozdrowotne, badanie ankietowe, suplementy

Summary

Herbal products are widely used in nutrition and self-medication, yet public knowledge of their safety and health effects remains insufficient. This study evaluated awareness, attitudes, and practices regarding herbal and nettle-based products among adult respondents using a structured anonymous questionnaire. Over half of participants (55%) reported using herbs and 48% used herbal supplements, with the Internet being the primary information source (61%). While 87% believed herbs support health, 64% were uncertain about supplement effectiveness. Nettle was consumed by 67% of respondents, but only 16% rated their knowledge of its properties as good, and 65% indicated that information about nettle's health benefits is inadequately promoted. Despite widespread use of *Urtica dioica* and other medicinal plants, particularly in Central and Eastern Europe where nettle is valued for

* The manuscript was based on the bachelor's thesis of the student E. Białek in the field of Dietetics. Acknowledgements. Not applicable. Declaration of Interest statement: We have nothing to declare.

its nutritional, diuretic, and anti-inflammatory properties, public understanding remains limited. These findings highlight significant knowledge gaps and underscore the need for broader educational campaigns and improved access to evidence-based information on medicinal plants to support safer and more informed use of herbal products in daily practice.

Streszczenie

Produkty ziołowe są powszechnie stosowane w żywieniu i samoleczeniu, jednak wiedza społeczeństwa na temat ich bezpieczeństwa oraz wpływu na zdrowie pozostaje niewystarczająca. W niniejszym badaniu oceniono świadomość, postawy oraz praktyki związane ze stosowaniem produktów ziołowych oraz preparatów na bazie pokrzywy wśród dorosłych respondentów na podstawie ustrukturyzowanego, anonimowego kwestionariusza. Ponad połowa uczestników (55%) zgłosiła stosowanie ziół, a 48% deklaroowało stosowanie suplementów ziołowych; głównym źródłem informacji był Internet (61%). Chociaż 87% badanych uważało, że zioła wspierają zdrowie, 64% wyrażało niepewność co do skuteczności suplementów ziołowych. Pokrzywę spożywało 67% respondentów, jednak jedynie 16% oceniło swoją wiedzę na temat jej właściwości jako dobrą, a 65% uznało, że informacje dotyczące jej korzystnego wpływu na zdrowie są niewystarczająco promowane. Pomimo szerokiego zastosowania *Urtica dioica* i innych roślin leczniczych, szczególnie w Europie Środkowej i Wschodniej, gdzie pokrzywa ceniona jest za właściwości odżywcze, moczopędne i przeciwzapalne, poziom wiedzy społecznej na ich temat pozostaje ograniczony. Uzyskane wyniki podkreślają istotne luki informacyjne i wskazują na potrzebę szerszych działań edukacyjnych oraz poprawy dostępu do opartej na dowodach wiedzy na temat roślin leczniczych, co może przyczynić się do bezpieczniejszego i bardziej świadomego stosowania produktów ziołowych w codziennej praktyce.

Introduction

Medicinal plants have long played an essential role in traditional healthcare systems and continue to attract growing scientific interest due to their pharmacological potential and sustainability [1]. Among them, *Urtica dioica* L. (stinging nettle) stands out as one of the most versatile species used in both ethnomedicine and modern phytotherapy [2]. Rich in a variety of bioactive compounds, this plant has been extensively studied for its nutritional, therapeutic, and functional properties [3]. The following section provides an overview of the chemical composition, biological activity, and traditional as well as modern applications of *U. dioica*, emphasizing its importance as a valuable source of natural bioactive substances.

Chemical composition

Urtica dioica L. (stinging nettle, family Urticaceae) is a perennial, rhizomatous, dioecious species widely distributed across Europe, Asia, and Africa, and naturalized in North America and Australia. The plant contains a broad spectrum of bioactive

constituents responsible for its nutritional and pharmacological properties. The main chemical groups include polyphenols—particularly flavonoids such as quercetin, rutin, and kaempferol—known for their potent antioxidant and anti-inflammatory effects [4]. Organic acids (formic, oxalic, citric, silicic), tannins, carotenoids, chlorophylls, and lignans further contribute to its biological activity. The plant is also rich in vitamins (C, K, and B complex) and minerals, including iron, calcium, magnesium, potassium, and silicon [5]. Nettle roots contain sterols and lignans. High protein content and essential amino acids enhance its dietary value, while triterpenoids and fatty acids found in leaves and roots play additional roles in its pharmacological profile [6].

Medical properties

The diverse phytochemical composition of *U. dioica* determines its wide range of biological activities. Numerous studies have confirmed its antioxidant, anti-inflammatory, antimicrobial, diuretic, and immunomodulatory properties. Polyphenolic fractions have demonstrated the ability to modulate inflammatory signaling, protect cells from oxidative stress, and exhibit moderate cytotoxic effects against colorectal adenocarcinoma cells, suggesting potential anticancer activity [7]. Traditional and experimental data indicate that nettle supports hematopoiesis through its iron, folic acid, and copper content, improving erythrocyte production and hemoglobin levels [8]. Extracts have been shown to stimulate bone marrow activity and protect hematopoietic cells from oxidative damage. Additionally, nettle enhances immune response by increasing macrophage and lymphocyte activity and regulating cytokine production [9]. The plant also exerts antibacterial effects against both Gram-positive and Gram-negative bacteria, attributed to its high phenolic content. Furthermore, its root extracts are known for their beneficial influence in benign prostatic hyperplasia through anti-inflammatory and anti-androgenic mechanisms [10].

Traditional and modern usage

U. dioica has a long history of use in traditional medicine and nutrition. It has been employed as a diuretic, anti-rheumatic, and blood-purifying agent, and is recommended in anemia, arthritis, allergies, and diabetes. Nettle preparations – infusions, hydroalcoholic extracts, and dried leaves – are commonly used to support metabolism, enhance immunity, and relieve inflammatory conditions [6]. In modern phytotherapy, nettle is valued as an adjunctive treatment for urinary tract disorders, rheumatism, and allergic diseases, while root extracts are used to alleviate symptoms of benign prostatic hyperplasia. Beyond pharmacological use, *U. dioica* is appreciated in dietary supplementation and cosmetics, where its antioxidant and mineral-rich composition supports skin and hair health [11]. Culinary applications include

soups, teas, and green vegetable dishes, reflecting its nutritional and ecological importance [2]. Its sustainable growth and versatile bioactive profile make *U. dioica* one of the most valuable medicinal plants in ethnopharmacology and functional food research.

Given the widespread traditional and modern use of *Urtica dioica*, understanding public awareness and perceptions regarding its medicinal applications is essential for evaluating its role in contemporary health practices. Therefore, the present survey aims to assess knowledge, attitudes, and patterns of nettle use among different population groups to support evidence-based ethnopharmacological research.

Materials and Methods

Study design

A cross-sectional, survey-based study was conducted to assess public knowledge, attitudes, and practices related to the use of *Urtica dioica* L. (stinging nettle). The study aimed to evaluate the popularity of nettle-based products, awareness of their health-promoting properties, and the extent of their application in daily life. The research also sought to identify demographic factors influencing respondents' attitudes toward herbal medicine and natural supplementation.

Participants and data collection

The study included 112 respondents, selected through random sampling to ensure representation across age and gender groups. Participation was voluntary and anonymous. The survey was administered online (winter 2024/2025), using the Google Forms platform. Prior to participation, all respondents provided informed consent after being informed of the study's objectives, confidentiality, and their right to withdraw at any time. The study was conducted in accordance with ethical research principles and guidelines for human subject research.

Survey instrument

A structured questionnaire consisting of multiple-choice questions (ABCD format) was developed by the authors. It comprised three main sections: Botanical awareness – knowledge of the morphological and ecological characteristics of *U. dioica*; Usage patterns – individual experience with nettle-based food, cosmetic, and medicinal products; and Health perception – self-assessed awareness of nettle's benefits, perceived effects, and potential risks.

Additional items assessed general attitudes toward herbal products, sources of information about phytotherapy, and the frequency of herb use in household and dietary practices.

Data analysis

Collected data were analyzed using descriptive statistics. Quantitative variables were expressed as percentages to illustrate the distribution of responses across demographic and behavioral categories. The analysis focused on identifying patterns of knowledge, accessibility, frequency of use, perceived effectiveness, and public perception of nettle and herbal products in general. Results were interpreted in relation to sociocultural and environmental factors affecting the use of medicinal plants.

Discussion

The survey results indicate a growing interest in herbal products among respondents. More than half of the participants (55%) reported using herbs, and nearly half (48%) declared using herbal supplements. The majority of respondents (61%) obtain information about herbs primarily from the Internet, which reflects the growing role of online sources in shaping health-related knowledge and attitudes (Fig. 1.A), with the Internet was the main source of information (61%) (Fig. 1.B).

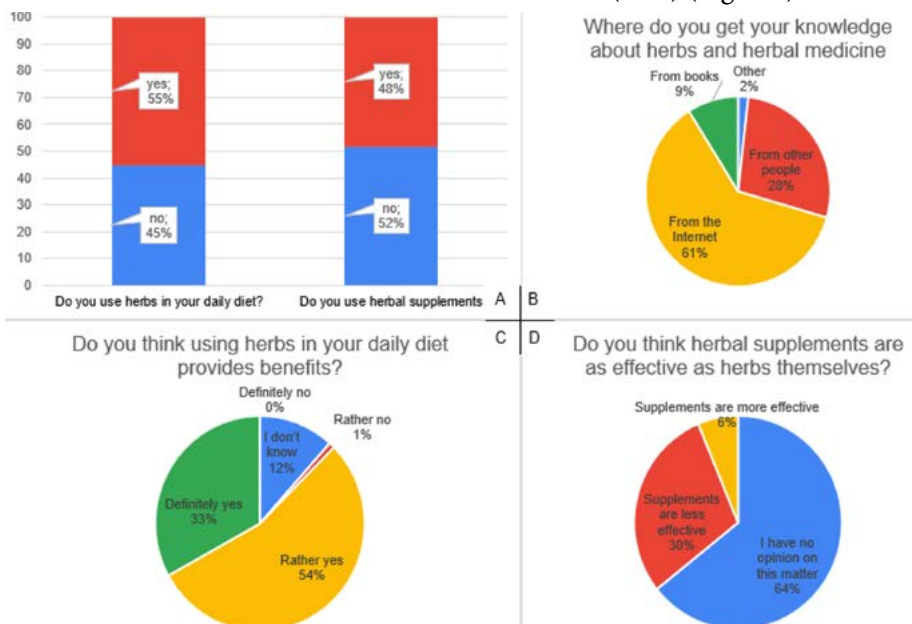


Figure 1. Public awareness, attitudes, and usage patterns of herbs and herbal supplements

Rysunek 1. Świadomość społeczna, postawy oraz wzorce stosowania ziół i suplementów ziołowych

Źródło: opracowanie na podstawie badań własnych.

When asked about the perceived benefits of including herbs in the diet, 54% of respondents stated that they “rather agree,” and 33% “strongly agree” that such practices bring health benefits (Fig. 1.C). However, 64% of participants had no clear

opinion on whether herbal supplements have the same effectiveness as herbal preparations, indicating a knowledge gap regarding the pharmacological equivalence of these products (Fig. 1.D).

In terms of nettle (*Urtica dioica*) availability, 29% of respondents rated it as “good” and 38% as “very good.” (Fig. 2.). A significant proportion (67%) reported consuming nettle in some form. Nevertheless, only 16% of respondents assessed their knowledge about the health properties of nettle as good, while 48% believed that nettle has a positive impact on health, and 44% had no opinion on this matter (Fig. 2.). Despite the limited awareness, more than half (56%) of the participants would recommend using nettle. Unfortunately, as many as 65% of respondents believe that information about the health-promoting properties of nettle is not sufficiently promoted (Fig. 2.).

Overall, the findings highlight both the popularity of herbal products and the need for broader educational initiatives to improve public understanding of their health effects and evidence-based use.

Conclusion

This study provides insight into public knowledge, perceptions, and practices concerning *Urtica dioica* L. consumption and use. The results demonstrate that although nettle is widely available and generally perceived positively, its regular use remains limited, and awareness of its pharmacological properties is only moderate.

The findings highlight the following key points:

- The majority of respondents have access to nettle in their natural environment but use it infrequently.
- Knowledge about nettle’s health-promoting effects is average and primarily derived from informal sources.
- Perceived benefits are mainly cosmetic, while awareness of systemic effects such as anti-inflammatory or hematopoietic activity is low.
- Nettle is well tolerated, and no serious adverse reactions were reported, supporting its safety in dietary and therapeutic use.
- There is a clear need for educational and promotional initiatives to increase consumer awareness and encourage the evidence-based integration of nettle into preventive healthcare and nutrition.

In conclusion, *Urtica dioica* remains a valuable yet underappreciated medicinal resource. Enhancing public understanding through scientific dissemination, education, and responsible marketing may contribute to its broader and more rational use in ethnopharmacological and dietary contexts.

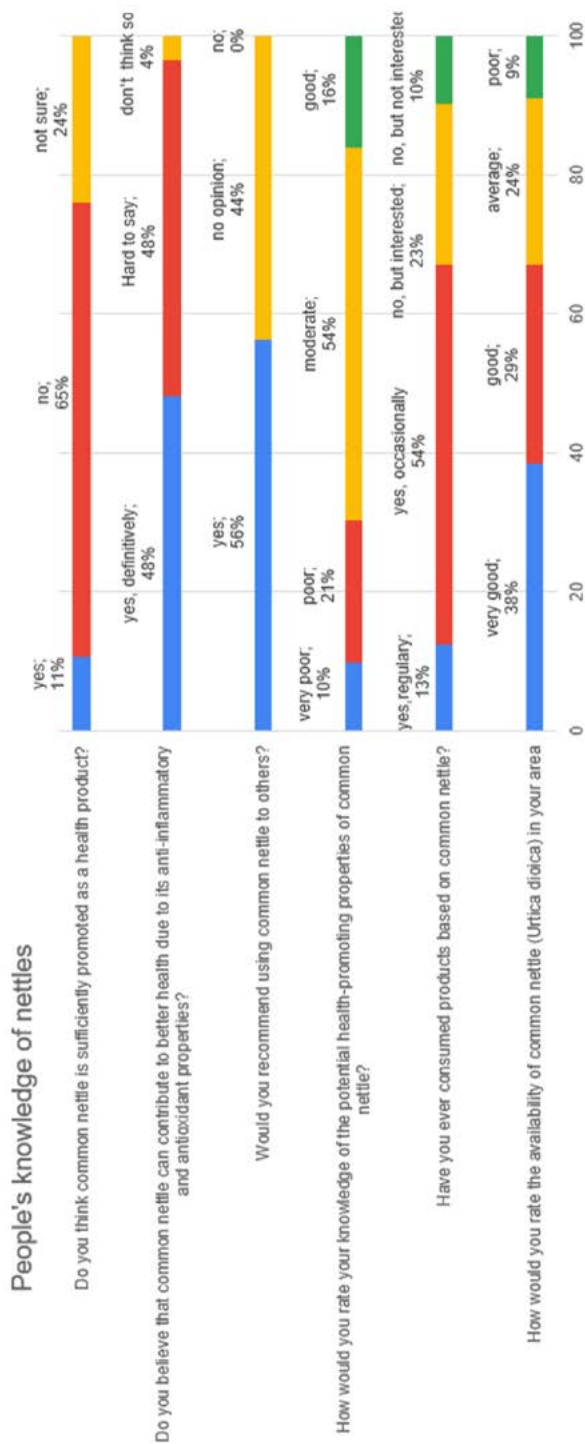


Figure 2. Perceptions and public awareness of the health benefits of common nettle (*Urtica dioica*)

Rysunek 2. Wiedza i świadomość społeczna dotycząca korzyści zdrowotnych ze stosowania pokrzywy zwyczajnej (*Urtica dioica*)

Źródło: opracowanie na podstawie badań własnych.

Funding: no funding was received.

Conflict of interest statement: Authors declare no conflict of interest.

Supplementary data: The survey is provided as supplementary data.

Literatura

- [1] Toplicean I. M., Ianuş R. D., Datcu A. D., An overview on nettle studies, compounds, processing and the relation with circular bioeconomy, *Plants*, 2024, 13(24), 3529.
- [2] Dhakal N., Joshi R., Acharya S., Bhandari S., Subedi A., Nath M., Exploring the diverse ethnopharmacological applications of *Urtica dioica* L.: An extensive review, *Journal of Agricultural Sciences and Engineering*, 2024, 6(2), s. 60–72.
- [3] Devkota H. P., Paudel K. R., Khanal S., Baral A., Panth N., Adhikari-Devkota A., Hansbro P. M., Stinging nettle (*Urtica dioica* L.): Nutritional composition, bioactive compounds, and food functional properties, *Molecules*, 2022, 27(16), 5219.
- [4] Đurović S., Kojić I., Radić D., Smyatskaya Y. A., Bazarnova J. G., Filip S., Tosti T., Chemical constituents of stinging nettle (*Urtica dioica* L.): A comprehensive review on phenolic and polyphenolic compounds and their bioactivity, *International Journal of Molecular Sciences*, 2024, 25(6), 3430.
- [5] Jan K. N., Zarafshan K., Singh S., Stinging nettle (*Urtica dioica* L.): A reservoir of nutrition and bioactive components with great functional potential, *Journal of Food Measurement and Characterization*, 2017, 11(2), s. 423–433.
- [6] Bhusal K. K., Magar S. K., Thapa R., Lamsal A., Bhandari S., Maharjan R., Shrestha J., Nutritional and pharmacological importance of stinging nettle (*Urtica dioica* L.): A review, *Heliyon*, 2022, 8(6), e09717.
- [7] Wójciak M., Paduch R., Drozdowski P., Wójciak W., Żuk M., Płachno B. J., Sowa I., Antioxidant and anti-inflammatory effects of nettle polyphenolic extract: Impact on human colon cells and cytotoxicity against colorectal adenocarcinoma, *Molecules*, 2024, 29(21), 5000.
- [8] Ngugi C. C., Oyoo-Okoth E., Mugo-Bundi J., Orina P. S., Chemoiwa E. J., Aloo P. A., Effects of dietary administration of stinging nettle (*Urtica dioica*) on the growth performance, biochemical, hematological and immunological parameters in juvenile and adult *Victoria Labeo* (*Labeo victorianus*) challenged with *Aeromonas hydrophila*, *Fish & Shellfish Immunology*, 2015, 44(2), s. 533–541.
- [9] Francišković M., Gonzalez-Pérez R., Orčić D., Sanchez de Medina F., Martínez-Augustin O., Svirčev E., Mimica-Dukić N., Chemical composition and immunomodulatory effects of *Urtica dioica* L. (stinging nettle) extracts, *Phytotherapy Research*, 2017, 31(8), s. 1183–1191.
- [10] Abbasi N., Asadzadeh R., Seydi F., Bahmani M., Ethnobotanical study of medicinal plants used for prostatitis in Dehloran County, Ilam Province, Western Iran, *Journal of Biochemicals and Phytomedicine*, 2024, 3(2), s. 20–25.
- [11] Messaoudi M., Benchikha N., Zahnit W., Rebiai A., Mineral profiling of medicinal plants, [w:] *Biotechnology and Phytochemical Prospects in Drug Discovery*, (red.) M. Messaoudi, N. Benchikha, Springer Nature Singapore, Singapore, 2025, s. 205–239.