Content of selected bioelements and antioxidant potential of *Urtica dioica* on the body of a pregnant woman

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Introduction

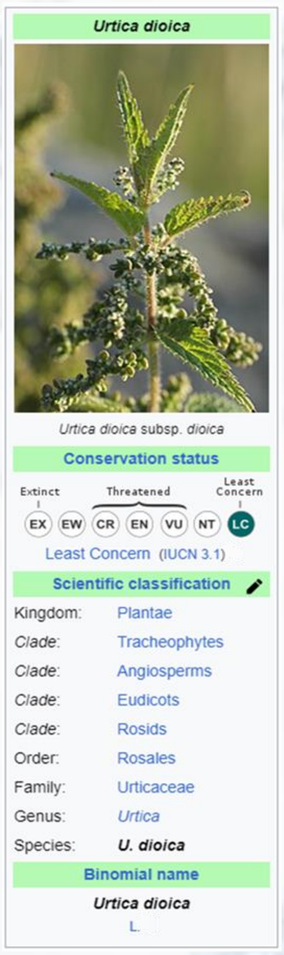

Figure 1. Conservation status and scientific classification *Urtica dioica.*

Urtica dioica, often known as common nettle, burn nettle, stinging nettle (although not all plants of this species sting) or nettle leaf, or just a nettle or stinger, is a herbaceous perennial flowering plant in the family Urticaceae. Originally native to Europe, much of temperate Asia and western North Africa [1], it is now found worldwide. The species is divided into six subspecies, five of which have many hollow stinging hairs called trichomes on the leaves and stems, which act like hypodermic needles, injecting histamine and other chemicals that produce a stinging sensation upon contact ("contact urticaria", a form of contact dermatitis) [2, 3]. The plant has a long history of use as a source for traditional medicine, food, tea, and textile raw material in ancient (such as Saxon) and modern societies [1, 4].

Common nettle (*Urtica dioica*) is a source of minerals, phenolic and protective compounds. Nettle is also a good antioxidant because of the high content of quercetin, rutin and ascorbic component, and its antibacterial activity affects Gram-positive and Gram-negative bacteria, yeasts from the groups *Candida albicans*, *Staphylococcus* aureus and *Escherichia coli*. Due to the vitamin content, common nettle tea is recommended for pregnant women.

The aim of the study was to determine and compare the concentration of selected bioelements and antioxidant potential in herbal medicinal raw materials from nettle.

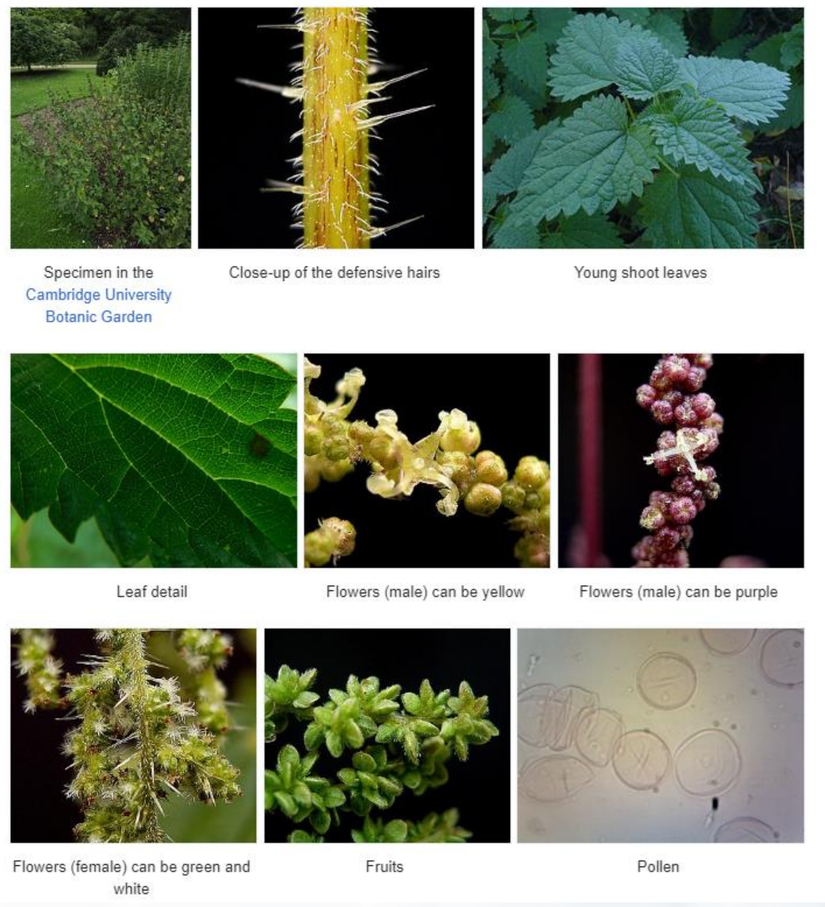

Figure 2. Description *Urtica dioica.*

Material and method

- The research material consisted of samples from randomly selected medicinal preparations from different manufacturers, which contained *Urtica dioica* and were available to consumers in Poland.
- The total content of phenols in herbal medicinal raw materials was determined using the Folin-Ciocalteu colorimetric method, while the concentrations of selected chemical elements: Zn, Cu, Mg, Fe and Mn were determined using flame atomic absorption spectrometry.
- The probability level was considered statistically significant when the p-value was less than 0.05.

Conclusion

Stinging nettle products showed the highest significant concentration of Mg in the analyzed medicinal products, therefore they can be recommended to pregnant women as a natural ingredient that reduces the contractility of uterine smooth muscles in the prevention of premature birth.

The amount of polyphenols contained in nettle should not pose a health risk to mothers. The mechanism of the antioxidant action of polyphenols may have a predictive effect during pregnancy by reducing the amount of free oxygen radicals produced in excess by the mitochondria of the developing placenta.

Due to the different content of this element in medicinal products available on the market, it is advisable to choose a given preparation based on the manufacturer, country of origin, and in the case of confirmed pregnancy, consult its supplementation with a gynecologist.

References

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Results

Table 1. Concentrations of Zn, Cu, Mn, Mg and Fe in *Urtica dioica* (mg/kg). Mean ± SD.

Raw material	Producer	Country	Zn	Cu	Mn	Mg	Fe
Urtica dioica	Kawon	Poland	27.8 ± 3.8	8.6 ± 1.6	80.9 ± 13.0	4721 ± 175	176 ± 39
	Agrest	Ukraine	26.3 ± 2.9	7.8 ± 2.6	70.0 ± 8.0	5701 ± 253	260 ± 7
	Natura Wita	Poland	32.1 ± 1.5	6.9 ± 2.7	50.9 ± 4.9	5278 ± 101	128 ± 8

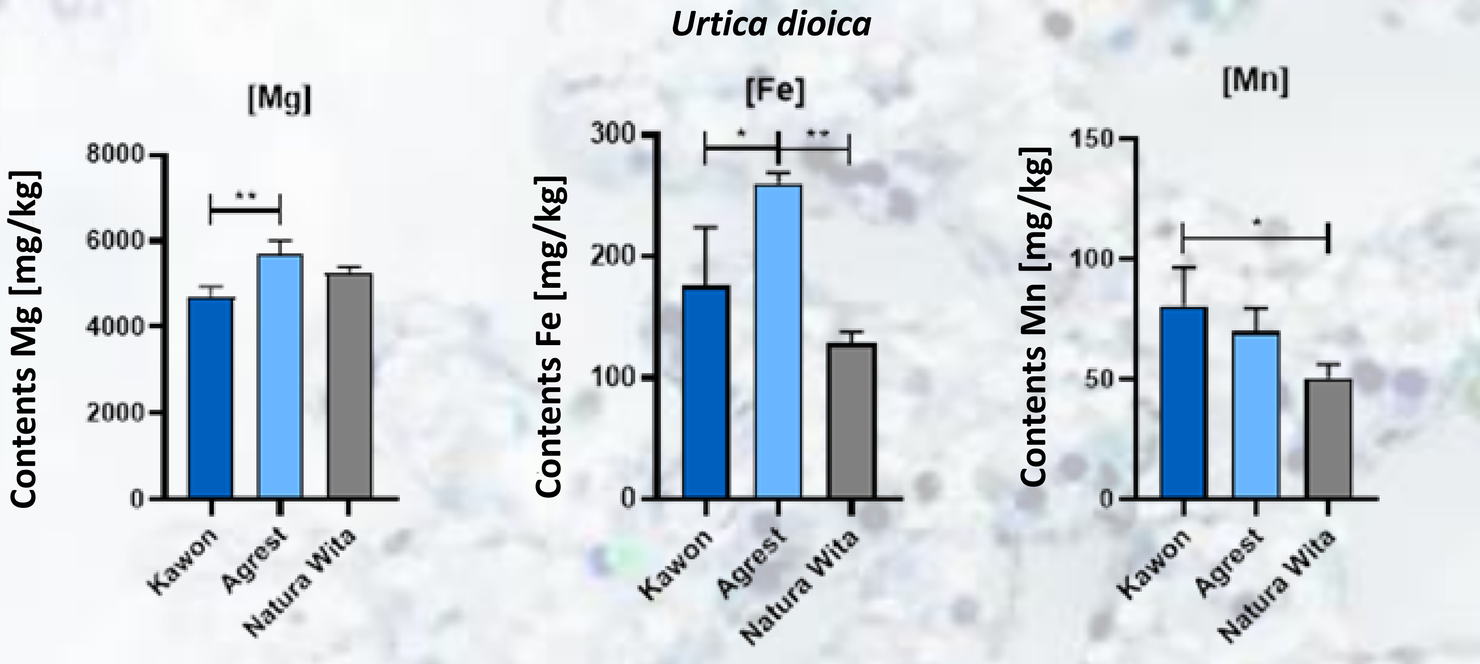

Figure 1. Comparison of Mg, Fe and Mn content in various nettle producers. Mean ± SD, ** p≤0.01, * p≤0.05.

Table 2. Total phenol content in herbal medicinal raw materials. Mean ± SD.

Raw material	Producer	Country	Phenol content [mg/g]
Urtica dioica	Kawon	Poland	27.03 ± 4.82
	Agrest	Ukraine	11.05 ± 0.12
	Natura Wita	Poland	18.91 ± 0.15

$\bar{x}$-arithmetic mean; Me-median; SD-standard deviation;
p-level of probability for the Mann-Whitney U test; p <0.05

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