

Екологічні проблеми сьогодення та шляхи їх вирішення // Ecological problems of the present and ways of their solving

Healthing capacities of the mineral waters from Olanesti resort, Romania and identification of the minerals that confer curative properties

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The mineral waters from Băile Olăneşti are indicated depending on the intended purpose, the spa treatment can be prophylactic, therapeutic or for recovery. Belts are indicated in locomotor system disorders, trauma or rheumatic algie, digestive tract disorders, kidney and urinary tract disorders, nutritional diseases, occupational diseases, certain skin conditions.

The mineral waters from Băile Olăneşti are characterized by the presence of chlorine, sodium, iodine, magnesium, bicarbonates, and a lower content of sulfates, boric acid and ammonium. These characteristics place them in the category of deep groundwater. We studied 5 springs that are used either in internal or external cures. The pH, the minerals and the presence of some bacteria were assessed.

It was found that the water is safe for human consumption and complies with all the requirements established by law, all results being below the maximum limits allowed by law no. 458/2002. This law regulates the quality of drinking water, with the objective of protecting the health of consumers against contamination.

Cultivation peculiarities of *Eragrostis tef*(Zucc.) Trotter gluten-free culture in Central Europe

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The global climatic changes may gradually lead to significant rise of average annual temperatures which, in its turn, would result in drying out of some areas on the Earth. In 2022, nearly half of Europe experienced the hottest and the driest summer over the past 500 years.

Such negative climatic changes may lead, among other consequences, to losses of agribiodiversity which is one of the major problems faced by sustainable development. Agricultural farming must react to these problems by selecting new and acclimatising existing drought-resistant varieties.

Eragrostis tef (Zucc.) Trotter is an annual crop belonging to the Poaceae family that is widely cultivated in Africa. Its flour is the main product of the Ethiopian cuisine, and its thin straw is used as livestock fodder. Wholegrain flour produced from this culture becomes ever more important in the healthy food market. It is used as an ingredient of many gluten-free products, including pasta and bread. Unlike wheat, maize and sorgo, tef is resistant to extremal climatic conditions and grows well on arid and waterlogged soils.

In May 2022, four 0.5 m² monitoring parcels planted with tef were laid in the Demonstration Garden of Nyíregyháza University. The culture was harvested in October, and the obtained results were extrapolated to kg/ha. The average plant's yield approximated to 5 tons/hectare (see Table), though these figures were achieved with irrigation. With purity taken as 90%, the average seed yield was 1.2 tons/hectare.

It is worth noting that these figures were significantly lower than those of conventional grain crops of our region, but potentially low production expenses and high selling price may prove its yield as quite competitive.

Parcel No.	Plant yield (kg/ha)	Seed yield (kg/ha)	Seed kernel weight, *1,000 (g)
1	5216	1410	0.297
2	4420	1205	0.277
3	4996	1350	0.307
4	4678	1405	0.323
Average:	4827.5	1342.5	0.301

The weight of a thousand seeds was 0.301 g, which was higher than the figures shown in available literary sources.

Molecular targets and drug-likeness analysis of chrysin against Alzheimer's disease: bioinformatics approach

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Chrysin is a natural compound with numerous pharmacological properties, especially antioxidant, anti-inflammatory, antiviral, antitumor, anticancer, and hepatoprotective activities. Although the biological activities of chrysin have been described and its possible pharmacological properties have been previously determined, its pharmacokinetic properties against Alzheimer's disease (AD) have not been fully elucidated based on gene targets, drug-likeness, molecular signaling pathways, and network-based pharmacology analyses. In this study, we aimed to reveal the molecular targets and potential interactions of chrysin against AD by gene-set enrichment and bioinformatics approach. The chrysin was entered into the PubChem and ChEBI database, and the targets of chrysin were estimated using DIGEP-Pred. Then, GeneCards, DisGeNET, PharmGKB, and SwissTargetPrediction were used to identify possible interacting genes and proteins. The drug-likeness properties and toxicity characteristics of chrysin were determined using SwissADME and ProToxII databases. In addition, STRING and KEGG enrichment database were used to elucidate the role of probable interacting proteins to construct a protein-protein interaction (PPI) network and a network of molecular targeting pathways, respectively. Based on the results of pharmacokinetic properties and drug-likeness analysis, chrysin predicted to have a good drug-likeness activity (score = -0.21), as well as good brain barrier permeability (BBB score = 3.71) with no observable toxicity. A total of 38 genes were identified as the top genes that interact with chrysin against Alzheimer's disease. ILB, IL6, TNF, MAPK1, CASP3, PSEN1, PSEN2, PTGS2, NFKB1, AKT1, GSK3B, and APP were selected as top core targets that may play a significant role in AD treatment. Furthermore, a total of 158 different pathways were identified as the probably modulated pathways, corresponding to 38 protein targets. Besides neurodegeneration and AD, pathways in cancer, lipid and atherosclerosis, EGFR tyrosine kinase inhibitor resistance, AGE-RAGE signaling in diabetic complications, HIF-1 signaling, PI3K-Akt signaling, MAPK signaling, IL-17 signaling, neurotrophin and sphingolipid signaling were defined as the top pathways associated with chrysin-regulated proteins. Overall, the results indicated that the network-based approach could provide a novel approach to uncover the therapeutic mechanisms of chrysin against AD.