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Re-purposing invasive plants as bioeconomic solutions [Prof. Simona Oancea; Dr. Maria Denisa COCÎRLEA]

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Invasive plants, despite being viewed with skepticism due to their negative effects mainly on environmental biodiversity, proved to be valuable resources, from a medical or an industrial perspective. Some of these plants are characterized by relevant biological properties, relatively low cytotoxicity, coloring properties, being also used in environmental remediation, as biopesticides or in biorefinery processes. The present study aimed to investigate two invasive species well represented in Romania, *Ailanthus altissima* and *Rhus typhina*, often mistaken for each other due to the similarity of their leaves'appearance, but differentiated by chemical composition. Ethanol extracts of dried powder of autumnal *A. altissima* leaves presented a significant antioxidant activity, supported by the polyphenol content such as gallic acid, catechin and quercetin. The extract showed inhibition diameters of 10 mm against several strains of pathogenic bacteria, in particular against *Staphylococcus aureus* and *Enterococcus faecalis*. Fruits of *R. typhina* proved to be a valuable source of phenolic compounds, such as myricetin, *p*-coumaric and ferulic acids, the ethanolic extract showing antibacterial activity against *Streptococcus pyogenes* and *Salmonella enterica*, with inhibition diameters >10 mm. From a practical viewpoint, the high tannin content in *A. altissima* leaves and the presence of anthocyanins in *R. typhina* fruits suggest that these species could serve as relevant raw materials for the textile ecodyeing, tannins being well known for their ability to bind strongly to textile fibers, improving dye fixation and color fastness, while anthocyanins provide a wide range of natural red to purple hues.
Considering our results regarding good bioactivities of the investigated species and the successful cotton dyeing with *R. typhina* fruit extracts, these species may find application for pharmaceutical and industrial purposes. Transforming these species into useful products can contribute to reducing environmental pollution, improving human well-being and supporting the gradual development of a sustainable economy.

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