

The health-promoting potential of *Salix* spp. bark: from the phenolic composition to the *in vitro* bioactivity

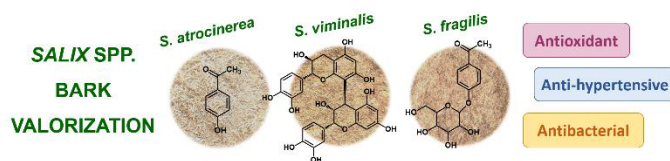
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Salix spp. (Salicaceae) cultivation has attracted attention, not only as source of biomass for energy generation, but also as source of extracts with health benefits.¹ Although salicin usually represents the marker bioactive of *Salix* spp. bark extracts, their flavanones and proanthocyanidins also exhibit interesting biological properties.¹ However, the phenolic composition and related bioactivity of *Salix* spp. bark extracts is still underexploited, particularly regarding to *S. atrocinerea* Brot., *S. viminalis* L. and *S. fragilis* L.,² whose knowledge may prompt innovative nutraceutical applications. Therefore, the present work aims at adding value to *S. atrocinerea* Brot., *S. viminalis* L. and *S. fragilis* L. bark, through the detailed characterization of phenolic compounds, by UHPLC-DAD-MSⁿ analysis, and the evaluation of the *in vitro* antioxidant, anti-hypertensive and antibacterial effects of their extracts (**Scheme 1**).

Thirteen phenolic compounds, including 2 acetophenones and 2 proanthocyanidins were detected. *S. atrocinerea* Brot. extracts revealed the highest DPPH[•] and ABTS^{•+} scavenging effects, as well as inhibitory activity on angiotensin I-converting enzyme. Considering the 24 h-inhibitory effect against *Staphylococcus aureus* growth, extracts of *S. fragilis* L., *S. viminalis* L. and *S. atrocinerea* Brot. bark were bactericidal at 1250 µg mL⁻¹. Phenolic compounds may be associated to the bioactivity of *Salix* spp. bark extracts. In sum, these promising insights can contribute for envisaging the sustainable and integrative use of the studied *Salix* spp. bark extracts, in the spite of the biorefinery concept.



Scheme 1: *Salix* spp. bark valorization, via phenolic characterization and the *in vitro* bioactivity evaluation.

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