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ABSTRACTS**

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## Fig pomace biochar modified using gamma irradiation for Pb<sup>2+</sup> ions adsorption from aqueous solution

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Fig (*Ficus carica L.*) is a fruit of the Moraceae family, which is mostly grown in subtropical regions, but also grows in Serbia. Fig trees are usually grown in warm and dry climates. According to the FAO world production of figs is stable, with a decade-long average of about 1.1 million tons a year. Fig pomace are formed after fermentation of this fruit which is used for the preparation of brandy. The brandy industry generates huge amounts of pomace as industrial waste, so pyrolysis as thermochemical technologies was used for organic agro-industrial waste treatment. Biochar produced by pyrolysis of fig pomace at 500 °C were characterized and investigated as adsorbents for the removal of Pb<sup>2+</sup> ions from aqueous solution.

Fig pomace before and after pyrolysis was characterized using proximate, inorganic and elemental analysis, Fourier transform infrared spectroscopy (FTIR), scanning electron microscopy (SEM), X-ray diffraction (XRD), thermogravimetric analysis (TGA) and differential thermal analysis (DTA).

Biochar has a carbon matrix with a high degree of porosity and large surface area, suggesting that it can be used as a surface adsorbent and thus have a significant role in controlling environmental contaminants.

The surface modification by gamma irradiation was done to enhance the adsorption capacity of biochar. The Pb<sup>2+</sup> ions contents in aqueous solution were analyzed using ICP-OES. The adsorption capacity was estimated using the Freundlich and Langmuir model.

The results of this work suggest that pyrolysis and irradiation of biomass is a promising way to produce efficient heavy metal sorbents for waste-water treatment.

**Keywords:** Fig pomace, biochar, gamma irradiation, Pb<sup>2+</sup> ions adsorption

