

THE QUALITY INDICES OF ENERGY BIOMASS FROM SOME *BRASSICACEAE* SPECIES IN MOLDOVA

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Abstract

The Brassicaceae family includes many economically important species used as edible crops, industrial oilseeds, spices, fodder, and vegetables. This study was aimed to determine the quality indices of energy biomass from four Brassicaceae species - *Brassica napus*, *Bunias orientalis*, *Isatis tinctoria*, and *Sinapis alba* - grown in the experimental plots of the “Alexandru Ciubotaru” National Botanical Garden (Institute) of Moldova State University, Chișinău. The lignocellulosic composition of the harvested biomass showed that the dry matter contained 401-424 g/kg of cellulose, 191-226 g/kg of hemicellulose, and 83-88 g/kg of acid detergent lignin. The theoretical ethanol yield from cell wall carbohydrates was estimated to range from 430 to 473 L/t. The biochemical methane potential of the substrates varied from 232 to 268 L/kg of organic dry matter, indicating their suitability as co-substrates in biogas production systems.

The physical and mechanical properties of the biomass included: ash content of 5.48-6.40%, 18.34-18.60 MJ/kg higher heating value, and 17.00-17.40 MJ/kg lower heating value. These characteristics suggest that the studied species can also serve as suitable feedstock for the production of solid densified fuels such as pellets.

Keywords: biochemical methane potential, *Brassica napus*, *Bunias orientalis*, energy biomass, *Isatis tinctoria*, pellets, *Sinapis alba*, theoretical ethanol yield