

Some Biological Features and Biochemical Composition of *Symphytum officinale* Green Mass and Potential Uses in Bioeconomy

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Abstract: The genus *Symphytum* L. of the Boraginaceae family includes 25-40 species, distributed throughout the Mediterranean and moderately temperate regions of Europe and Western Asia. In the spontaneous flora of the Republic of Moldova, three species are present: *Symphytum officinale* L., *Symphytum tauricum* Willd., and *Symphytum popovii* Dobrocz. Common comfrey (*Symphytum officinale*) is an herbaceous perennial plant native to Europe and Asia, growing approximately 40-120 cm tall. It is used as a honey, medicinal and forage plant and biomass source for energy production. The results revealed that, in the third year of growth, at the flowering stage (early May), the local ecotype of *Symphytum officinale* reached 77-89 cm in height, with an optimal proportion of leaves and flowers in the harvested mass (55-59%). The harvested green mass contained 152.6 g/kg of dry matter, with the following composition: 16.97% crude protein, 1.53% crude fat, 36.20% crude cellulose, 32.84% nitrogen-free extract, 7.13% sugars, 2.65% starch, 12.46% ash, 0.71% calcium and 0.36% phosphorus. The feed and energy values of the dry matter from natural fodder were: 687 g/kg digestible dry matter, 140.9 g/kg digestible protein, 10.57 MJ/kg metabolizable energy (ME), and 6.24 MJ/kg net energy for lactation (NEL). The harvested green mass substrates used for anaerobic digestion contained 27.1 g/kg nitrogen and 486.3 g/kg carbon, resulting in a favorable C/N ratio of 18. The calculated biochemical methane potential of the common comfrey green mass substrate reached 347 L/kg of organic matter. The local ecotype of *Symphytum officinale* provides early-season, protein-rich fodder and serves as an optimal green mass substrate for biomethane production.

Keywords: *Symphytum officinale*; Morphology & Composition; Fodder Value; Anaerobic Digestion; Biomethane Potential.

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