Full reference	Esther del Amo-Mateos Juan C. López-Linares, **M. Teresa García-Cubero**, **Susana Lucas**, **Monica Coca** (2022). *Green biorefinery for sugar beet pulp valorisation: Microwave hydrothermal processing for pectooligosaccharides recovery and biobutanol production*. Industrial Crops and Products 184, 115060.
DOI	https://doi.org/10.1016/j.indcrop.2022.115060
URI	https://uvadoc.uva.es/handle/10324/53587
Project	Estrategias para la valorización efectiva de residuos hortofrutícolas: producción de compuestos bioactivos y biocombustibles avanzados. VALORFRUIT (2021-2024) Funding: Spanish Ministry of Science, Innovation and Universities (PID2020-115110RB-I00/AEI/10.13039/501100011033)
Project Activities	2,3,4
Abstract	The complete valorisation of sugar beet pulp (SBP) through pectooligosaccharides (POS) extraction and biobutanol production was studied. A central composite experimental design was planned to optimise the time and temperature of the hydrothermal microwave-assisted extraction. 59.7 % of the POS present in the SBP were recovered, and a prehydrolysate with 31.1 g POS/L was obtained under optimal conditions (165 °C and 12 min). The prehydrolysate was further precipitated by ethanol. One-step and stepwise alcohol precipitation were evaluated. The prehydrolysate:ethanol ratio was increased from 1:1 to 1:3 in the stepwise precipitation, whereas a ratio of 1:2 was used in the one-step precipitation. The pectin fractions differed from each other in their chemical composition. The molecular weight of the pectin fractions ranged from 474 to 523 kDa, and the degree of esterification of all of them was higher than 50 %, so they can be considered high methoxyl pectins. On the other hand, the pretreated solid enriched in glucan was subjected to enzymatic hydrolysis with cellulases and fermented by *Clostridium beijerinckii*, producing 8.3 g butanol/L after 48 h of fermentation (53 kg butanol/t SBP). As this research has demonstrated, SBP is a suitable feedstock for a green biorefinery approach. The fractionation of SBP by hydrothermal treatment avoids using acid and alkaline solvents and allows high POS and biobutanol production yields.
Keywords	Microwave-assisted extraction, biomass fractionation, pectin, ABE fermentation, sugar beet industry