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Abstract	Discarded red beetroot (DRB) is an organic waste generated in the food industry. This study is focused on the valorization of DRB through the recovery of bioactive compounds. The characterization of the DRB juice confirmed a higher content of antioxidants (DPPH 504 ± 24 μmol TE/L, FRAP 10920 ± 440 μmol TE/L, ABTS 22012 ± 592 μmol TE/L), phenolic compounds (1789 ± 56 mg GAE/L), flavonoids (471± 17 mg CE/L) and betalains (1426 ± 24 mg/L) than commercial juices. DRB pomace contains pectin that was recovered by microwave extraction aided by a surfactant (polyethylene glycol, PEG4000). Conditions (temperature, time and surfactant concentration) for the extraction of galacturonic acid (GalA) or pectooligosaccharides (POS) were optimized by a central composite experimental design. POS were extracted at high temperatures (160 °C, 5.3 min, 8.4 g PEG4000/L, yield of 271.2 g POS/kg dry pomace). In comparison, galacturonic acid extraction was favored at moderate conditions (137 °C, 5 min, 2.5 g PEG4000/L, yield of 120.1 g GalA/kg dry pomace). The characterization of the freeze-dried hydrolysates revealed that the solid obtained under moderate temperature conditions (137 ºC) showed a higher GalA content (49.5%) and lower neutral sugars (11.4%), as GalA degrades at lower temperatures than pentoses. The recovered pectin can be considered high-methoxyl pectin, as the degree of esterification was higher than 50%. FTIR spectra of the freeze-dried hydrolysates showed functional groups consistent with pectin. MALDI-TOF-MS analysis revealed the presence of oligosaccharides of hexoses and pentoses with different structures and degrees of polymerization. Thus, DRB, a low-value vegetable waste, can be converted into high-value-added bioproducts in a biorefinery framework.
Keywords	Microwave-assisted extraction, Galacturonic acid, Pectooligosaccharides, Polyethylene glycol, Antioxidants, Betalains