PUMPKIN SEED PRE-TREATMENT PRIOR TO COLD PRESSING TO ENHANCE OIL EXTRACTION EFFICIENCY

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Pumpkin seed oil is rich in tocopherols and sterols. Phenolic profile of pumpkin seed oil is diverse and comprises six phenolic acids: protocatechuic, caffeic, syringic, vanillic, p-coumaric and ferulic. Based on its seed oil features and health benefits, pumpkin may be considered as a valuable source for new multi-purpose products for industrial, cosmetic, and pharmaceutical utilisation. Therefore, it is important to determine a suitable extraction technique for pumpkin seed oil which enables maximum extraction efficiency.

Conventional vegetable oil extraction is carried out by solvent extraction or pressing. Solvent oil extraction is usually used for seeds with low lipid content. It is the most efficient method, but its application presents some industrial disadvantages such as security problems and high operation costs. The safety and simplicity of the oil seeds mechanical pressing process is more advantageous than efficient solvent extraction equipment. Furthermore, materials pressed out generally have better preserved native properties. However, extraction by just pressing the seeds is relatively inefficient. It is advisable to research new approaches for oilseeds pre-treatment that also enable better recovery and availability of desirable plant metabolites. Within these pre-treatments, the microwave heating is recommended, due to its special warming mechanism and moderate capital cost.

Pumpkin seeds were subjected to steaming followed by microwave treatment prior to pressing to enhance the extraction efficiency. Steaming treatment during 20 min was used to adjust the moisture content (11..12%) of starting pumpkin seeds and to help heat soften and break down the oil containing cells. As a result the extraction efficiency increased from 32, 8% for control oil sample to 60, 4 % for microwave treated. Consequently, microwave pre-treatment coupled with steaming resulted in pumpkin seed oil extraction efficiency that increased almost twice.

KEY WORDS: pumpkin seed oil, extraction efficiency, steaming, cold pressing