CAMELINA SATIVA

ABSTRACT

Camelina sativa, a sustainable, short-season oil crop high in protein (38%), is gaining interest due to the increasing global demand for protein-rich products and for novel plant proteins. Effective methods for protein extraction have yet to be developed for camelina. In order to process a camelina seed cake as a protein-rich ingredient, an efficient means of protein extraction needs to be established.

We sought to develop an extraction method that maximized protein recovery, while maintaining the quality and functionality of the protein. Protein extraction by salt precipitation and salt precipitation, with and without the use of salt wash, enzymes, and pH adjustment, were tested for Camelina sativa obtained from cold and hot press. Extracts were characterized by measuring gelation, gelation time, water holding capacity, pH, and protein concentration. A new method—salt precipitation using DCM—was selected for processing Camelina sativa, as it exhibited the greatest effectiveness among the methods tested. Enzymes and pH adjustment were applied during the extraction process to increase protein recovery. Salt precipitation was also carried out on DCM for solubilizing the proteins for further analysis. Additionally, cold and hot press extracts were compared for the first time.

INTRODUCTION

Increased interest in sustainable, low-cost, and high-quality protein sources has increased the demand for protein-rich ingredients. Cold and hot-pressed camelina seed cake have been a source of protein for many years, but the protein extract was often neglected. The objective of this study was to optimize protein extraction methods and establish a reliable and effective protocol for the production of camelina protein concentrate and isolate.

METHODS

EXTRACTION OPTIMIZATION

Salt Precipitation Method

Optimal Protein Extraction Methods

Table 1: Textile & poultry protein extracted by optimized protein precipitation & salt precipitation methods from 2% 12% protein

<table>
<thead>
<tr>
<th>Method</th>
<th>Cold Press</th>
<th>Hot Press</th>
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<tbody>
<tr>
<td>Yield</td>
<td>10.4%</td>
<td>13.3%</td>
</tr>
<tr>
<td>Protein</td>
<td>74.6</td>
<td>70.9</td>
</tr>
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SALT PRECIPITATION METHOD

Salt precipitate pH 3.4 was centrifuged to separate the salt precipitate from the soluble protein. The supernatant was precipitated using 96% DCM at pH 3.4 and centrifuged to obtain a salt precipitate for further analysis. The remaining supernatant was then precipitated using 96% DCM and centrifuged to obtain a salt precipitate for further analysis. The remaining supernatant was then precipitated using 96% DCM and centrifuged to obtain a salt precipitate for further analysis.

RESULTS

Table 2: Protein concentration and yield of cottonseed protein extracts

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CONCLUSIONS & FUTURE WORK

Salt precipitation produced protein extracts with the highest yield and highest purity, as well as better solubility, emulsification capacity, and foaming capacity. The salt precipitation protocol produced a high-quality protein isolate with promising functional properties. Further research is needed to evaluate the biological activity of the produced protein isolate.

ACKNOWLEDGEMENT

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REFERENCES