TABLETS FORMULATION OF *Solidago chilensis* BY DIRECT COMPRESSION USING A NOVEL DRY PLANT EXTRACT

**Bucciarelli A**1*, Gallo L2, Allemandi D2, Skliar MI1

1 Departamento de Biología, Bioquímica y Farmacia, Universidad Nacional del Sur, (8000) Bahía Blanca, Argentina. 2 Departamento de Farmacia, Facultad de Ciencias Químicas, Universidad Nacional de Córdoba, (5000) Córdoba, Argentina.

**INTRODUCTION**
Folk medicine has employed plant extracts since ancient times to treat gastrointestinal diseases. *Solidago chilensis* Meyen (Asteraceae) is a native species from South America commonly known as “vara dorada”, widely used in the popular medicine of different countries (1). Recently we reported the antialcerogenic activity of the aqueous extract of the plant in mice subjected to an experimental model of ethanol-induced gastric lesions (2). The active component for the formulation of a phytomedicine in the form of tablets is usually a dry plant extract. However many dry plant extracts, including *S. chilensis*, have poor flow properties for direct compression (DC) (3). In the present work the development of solid pharmaceutical dosage formulations using a novel dry plant extract (NDPE) of *Solidago chilensis* is proposed for the first time.

**MATERIALS AND METHODS**
The fluid plant extract (FPE) was prepared by decoction of the inflorescences of the plant in water. The solid residue (SR) content of the FPE was determined by evaporation of the solvent under reduced pressure and oven drying the SR to constant weight at 80°C. The NDPE was prepared by drying the FPE and colloidal silicon dioxide in a ratio of 1:1 (colloidal silicon dioxide:SR) (4). The solid pharmaceutical formulations were formulated using a 22 factorial experimental design. The physical-mechanical properties (repose angle and Carr’s Index), hardness, friability and disintegration time were evaluated. The statistical evaluation of the results was carried out by analysis of variance (ANOVA).

**RESULTS**
The NDPE and the four formulations showed good and acceptable flow properties for direct compression (Table 1). The hardness, friability and disintegration time were acceptable. The presence of Lactose DC improved the repose angle and Carr’s Index in formulations (*P* < 0.05). On the other hand, the presence of Acdisol had a significant impact on disintegration time (*P* < 0.05).

**CONCLUSIONS**
*Solidago chilensis* NDPE possesses suitable rheological properties which makes possible its use as an active ingredient in anti-ulcer tablet formulation through the use of direct compression technology. The use of this factorial experimental design is a useful tool to properly select excipient combinations to design solid formulations with adequate pharmaceutical properties.

**REFERENCES**
(2) Bucciarelli A, Skliar MI. Medicinal plants from Argentina with gastroprotective activity. *Ars Pharm.* 2007;48,361-369.
Table 1. Experimental matrix and studied responses according to the $2^2$ factorial design.

<table>
<thead>
<tr>
<th>Formulation</th>
<th>Fillers</th>
<th>Disintegrants</th>
<th>Repose angle (°)</th>
<th>Carr’s Index (%)</th>
<th>Disintegration time (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Emcompress Avicel PH101</td>
<td>30.75</td>
<td>22.15</td>
<td>6.32</td>
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</tr>
<tr>
<td>2</td>
<td>Emcompress Acdisol</td>
<td>24.06</td>
<td>18.68</td>
<td>1.36</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Lactose DC Avicel PH101</td>
<td>22.75</td>
<td>15.40</td>
<td>16.43</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Lactose DC Acdisol</td>
<td>23.16</td>
<td>15.41</td>
<td>1.34</td>
<td></td>
</tr>
</tbody>
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