# *Supplementary information*

*for*

## Evaluation of the Disintegration Action of Soy Polysaccharide by Image Analysis

Rana Amayreh[a], Lorina Bisharat[b], Marco Cespi[c], Giovanni Filippo Palmieri[c] and Alberto Berardi[a*]

a Department of Pharmaceutical Sciences and Pharmaceutics, Faculty of Pharmacy, Applied Science Private.

b University, Amman 11931, Jordan Department of Pharmaceutics and Pharmaceutical Technology, School of Pharmacy, The University of Jordan, Amman 11942, Jordan

c School of Pharmacy, University of Camerino, 62032 Camerino (MC), Italy.

* Corresponding author: Department of Pharmaceutical Sciences and Pharmaceutics, Faculty of Pharmacy, Applied Science Private University, Amman 11931, Jordan Mail: a_berardi@asu.edu.jo, Tel. +9626 5609999; Fax: (+962) 65515017.

**Table S1. Tensile strength of DCP_SP_0.5% MgSt tablets prepared at variable compression pressures and of DCP-PVA tablets prepared at constant compression pressure**

| Formulation | Compression pressure (MPa) | Tensile strength (MPa) | |
|---|---|---|---|
| | | Mean (n =3) | S.D. (±) |
| DCP_SP_0.5% MgSt | 37 | 0.21 | 0.02 |
| DCP_SP_0.5% MgSt | 92 | 0.53 | 0.02 |
| DCP_SP_0.5% MgSt | 203 | 1.75 | 0.13 |
| DCP:PVA (3:1)_SSG | 148 | 2.82 | 0.15 |
| DCP:PVA (3:1)_XPVP | 148 | 3.20 | 0.12 |
| DCP:PVA (3:1)_SP | 148 | 3.10 | 0.18 |
| DCP:PVA (2:1)_SSG | 148 | 3.44 | 0.21 |
| DCP:PVA (2:1)_XPVP | 148 | 4.20 | 0.14 |
| DCP:PVA (2:1)_SP | 148 | 3.88 | 0.10 |

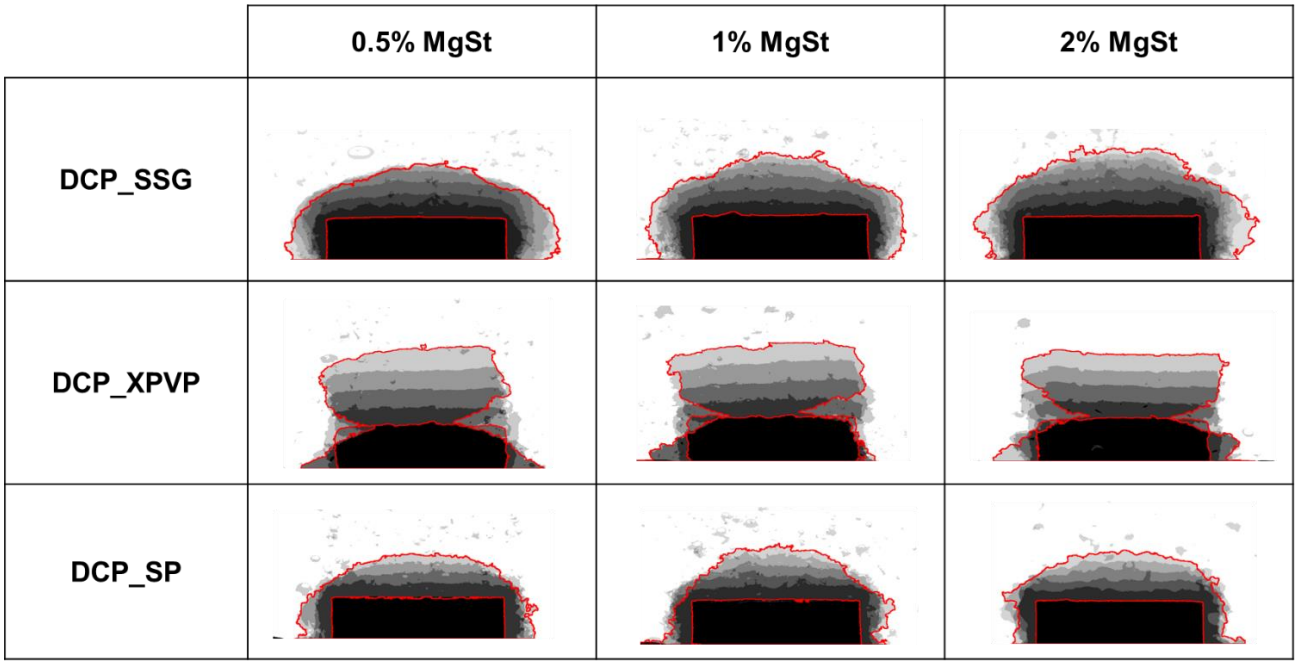


**Figure S1. Z-stack relative to the disintegration of DCP tablets containing 4% disintegrants and different concentrations of magnesium stearate in water. The mechanism of disintegration, i.e. omni-directional swelling, shape-recovery and omni-directional swelling of DCP_SSG, DCP_XPVP and DCP_SP tablets, respectively, can be clearly visualised. The concentration of magnesium stearate did not affect the mechanism of disintegration of each disintegrant.**

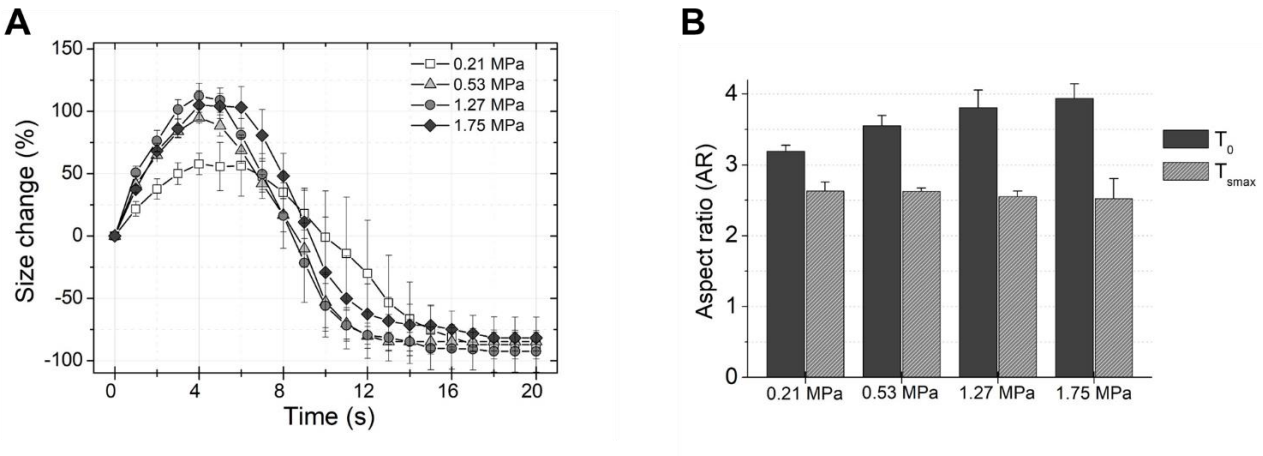


**Figure S2. Disintegration of DCP_SP_0.5% MgSt tablets prepared at different tensile strength in water. (A) Size change (mean ± SD, n = 5) as a function of time. (B) AR (mean ± SD, n = 5) at $t_0$ and $t_{smax}$. Tensile strength did not have a significant effect on disintegration.**

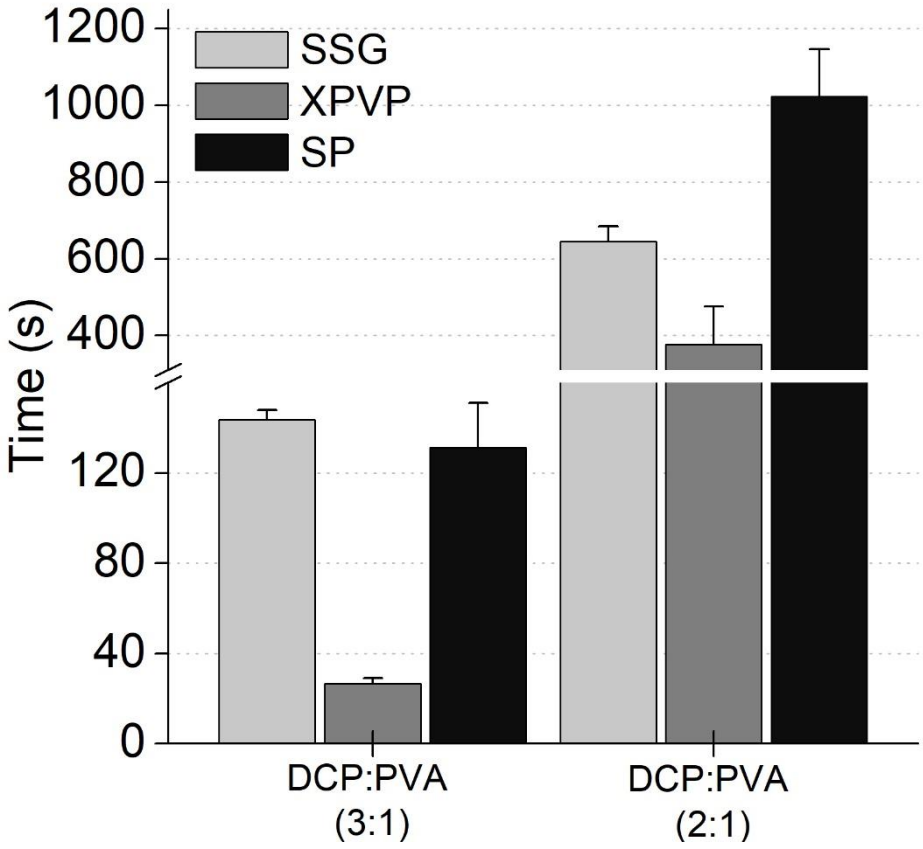


**Figure S3. Disintegration time (mean ± SD, n = 6) in water of DCP:PVA tablets containing 4% disintegrant and prepared at a compression pressure of 148 MPa, using a USP disintegration apparatus. For both DCP:PVA 3:1 and 2:1 disintegration was always more rapid when XPVP was used as disintegrant.**

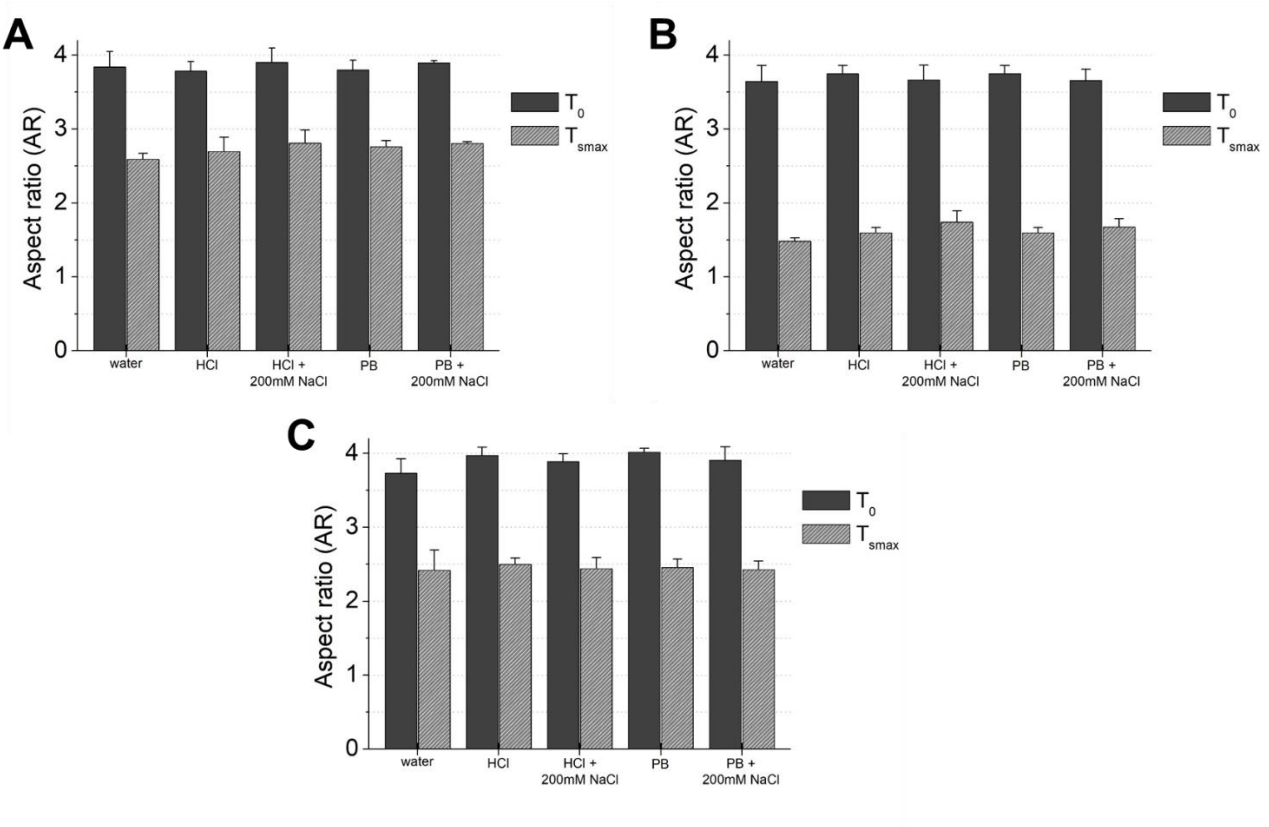


**Figure S4. AR (mean ± SD, n = 5) at $t_0$ and $t_{smax}$ of DCP tablets containing different disintegrants in media of different pH and ionic strength. (A), (B) and (C) represent DCP_SSG, DCP_XPVP and DCP_SP, respectively. In all cases, the media composition did not influence the AR, indicating that the mechanism of disintegration was unchanged.**

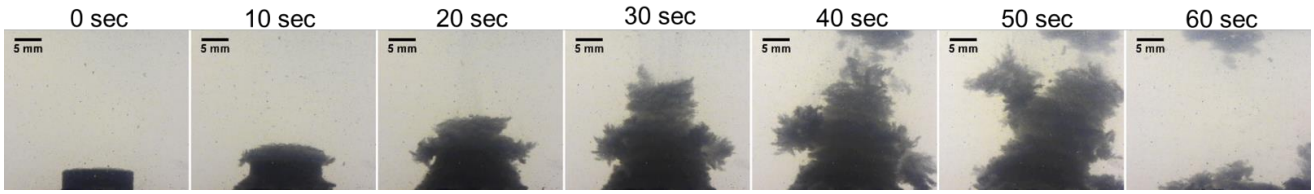


**Figure S5. Images of pure SP tablets taken at different time points during the expansion in 40% aqueous ethanol. Tablets rapidly expanded losing their integrity over few tens of seconds. A gelled matrix plug could not form. Results can be compared to those in water (Figure 1C), where, on the contrary, tablets clearly formed a gelled matrix which remained intact for over 5 minutes.**

**References**

1. Berardi A, Bisharat L, Blaibleh A, Pavoni L, Cespi M. A simple and inexpensive image analysis technique to study the effect of disintegrants concentration and diluents type on disintegration. J Pharm Sci [Internet]. Elsevier; 2018 [cited 2018 Jun 21];0. Available from: https://linkinghub.elsevier.com/retrieve/pii/S0022354918303411