A Desktop Reference Guide to Natural Superdisintegrants

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Abstract - Drugs given via mouth are best, comfortable and low costs. Superdisintegrants (SD) are very well known as tablet additives which are soluble or breakdown from the dosage form in fewer spans without the aid of water. The drawbacks of oral dosage forms are mainly trouble in consuming by children and aged people, which can be avoided by quick solubilizing tablets by the addition of SD. Herbal SD are better compared to artificial SD, as they are non-reactive, no toxic, cheap, eco-friendly and effortlessly obtainable. These natural SD have unique features in a dosage form as a binder, diluents and good dissolving capability for less hydrophilic drugs which affects the solubilizing rate and supplies as nutritional aids.

Keywords: fast dissolving; natural; solubility

INTRODUCTION

Disintegrants are the substances regularly integrated with the tablets and a variety of preparations to support the scattering of the tablet/slugs/capsules into more small entities in an aqueous atmosphere. This leads to increment in the surface area and enhancing the discharge of the drug. Disintegrants got significant notice as a vital step in getting fast drug discharge. The disintegrants have the major aim to face the competence of the tablet binder and the physical powers that act under solubility to compose the tablet. Upon the connection with water the superdisintegrants (SD) swell, hydrate and gain in bulk which makes alterations in the tablet. Best SD delivers enhanced compatibility without affecting the physical strength of the preparations with high-dose drugs [1, 2]. Natural polymers are utilized in most of the dosage forms and are more favourable over artificial polymers as they have these advantages [3].

- Reasonable
- Nontoxic.
- Straightforwardly obtainable in the sufficient amount.
- Lacking side effects
- Biodegradable.
- More patient compliance
- Renewable

ASSORTMENT OF SUPERDISINTEGRANTS

The given factors are to be kept in mind in the selection of a good SD [4].

- Quantity of disintegrates present in a preparation
- Tablet hardness.
- Kind of accumulation and mixing.
- Drug nature.
- Good flowability.
- An Occurrence of surface-active agents.
- Compressible to formulate intact tablets.
- Good mouthfeel.

MECHANISM OF SUPERDISINTEGRANTS

The primary and secondary mechanisms of SD are as follows [5].

Wicking

Tablets upon contact with water, the fluid permeate due to the capillary action and displace the air in the tablets. This projected to the weakening and breaks of bonds in the tablet into fine particles.

Swelling

High porosity in a tablet has bad disintegration due to devoid of enough swelling force. If compression is very high, the dissolution fluid faces difficulty in entering into the dosage form.
Particle disgusting forces
The non-swellable disintegrants have electric disgusting forces among particles leads to the disintegration of the tablet.

Deformation
During tablet compression, disintegrants deforms its shape and come back to its normal shape upon contact with the aqueous medium. This leads to the breakup of the tablet.

Various SD from nature were tabulated in Table 1, 2 and 3 from mucilage, gums and insects respectively.

Table 1: List of natural superdisintegrants (mucilage)

<table>
<thead>
<tr>
<th>Common name</th>
<th>Botanical name</th>
<th>Plant part</th>
<th>Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agar</td>
<td>Gelidiumamansii</td>
<td>Weed</td>
<td>Gelidaceae[6]</td>
</tr>
<tr>
<td>Banana</td>
<td>Nenthravazha</td>
<td>Ethan and nenthran</td>
<td>Musaceae[7]</td>
</tr>
<tr>
<td>Basil</td>
<td>Ocimumbacilicum</td>
<td>Seeds</td>
<td>Lamiaceae[8]</td>
</tr>
<tr>
<td>Bael</td>
<td>Aeglemarmelos</td>
<td>Fruits</td>
<td>Rutaceae[9]</td>
</tr>
<tr>
<td>China rose</td>
<td>Hibiscus Rosa-sinensis</td>
<td>Leaves</td>
<td>Malvaceae[10]</td>
</tr>
<tr>
<td>Fenugreek</td>
<td>Trigonellafoenum-graceum</td>
<td>Seed</td>
<td>Fabaceae[11]</td>
</tr>
<tr>
<td>Indian Fig</td>
<td>Ficusindica</td>
<td>Fruits</td>
<td>Cactaceae[12]</td>
</tr>
<tr>
<td>Garden cress</td>
<td>Lepidiumsativum</td>
<td>Plant</td>
<td>Cruciferae[13]</td>
</tr>
<tr>
<td>Isaphgula Husk</td>
<td>Plantagoovata</td>
<td>Seeds</td>
<td>Plantaginaceae[14]</td>
</tr>
<tr>
<td>Ispaghula</td>
<td>Plantagoovata</td>
<td>Seeds</td>
<td>Plantaginaceae[15, 16]</td>
</tr>
<tr>
<td>Mango Pectin</td>
<td>Mangiferaindica</td>
<td>Peel pectin</td>
<td>Anacardiaceae[17]</td>
</tr>
<tr>
<td>Soy fiber</td>
<td>Glycine max</td>
<td>Seeds</td>
<td>Leguminosae[18]</td>
</tr>
</tbody>
</table>

Table 2: List of natural superdisintegrants (gums)

<table>
<thead>
<tr>
<th>Common name</th>
<th>Botanical name</th>
<th>Plant part used</th>
<th>Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>Golden shower</td>
<td>Cassia fistula</td>
<td>Seeds</td>
<td>Fabaceae [19]</td>
</tr>
<tr>
<td>Guar Gum</td>
<td>Cyamopsistetragonoloba</td>
<td>Fruits</td>
<td>Fabaceae [20]</td>
</tr>
<tr>
<td>Karaya gum</td>
<td>Sterculiaurens</td>
<td>Plant exudates</td>
<td>Sterculiaceae[21]</td>
</tr>
<tr>
<td>Locust Bean Gum (Carob tree)</td>
<td>Ceretonia siliqua</td>
<td>Seeds</td>
<td>Fabaceae[22]</td>
</tr>
<tr>
<td>Mango gum</td>
<td>Mangiferaindica</td>
<td>Plant exudates</td>
<td>Anacardiaceae[23]</td>
</tr>
<tr>
<td>Winter squash</td>
<td>Cucurbita maxima</td>
<td>Pulp</td>
<td>Cucurbitus[24]</td>
</tr>
</tbody>
</table>

Table 3: List of natural superdisintegrants (Insects)

<table>
<thead>
<tr>
<th>Common name</th>
<th>Biological name</th>
<th>Part used</th>
<th>Family</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chitin and Chitosan</td>
<td>Crab (Brachyura) and shrimp (Caridea)</td>
<td>Shells</td>
<td>Cancridae[25]</td>
</tr>
<tr>
<td>Gellan Gum</td>
<td>Sphingomonas elodea</td>
<td>Bacterium</td>
<td>Sphingomonadaceae[27]</td>
</tr>
<tr>
<td>Xanthan gum</td>
<td>Xanthomonascampestris</td>
<td>Fermented polysaccharide</td>
<td>Pseudomonaceae[28]</td>
</tr>
</tbody>
</table>

CONCLUSION
Natural superdisintegrants (SD) incremented the drug release rate from the tablet and decremented the dissolution time. They are implemented as SD and additives. Thus natural SD exhibit faster drug dissolution and increased bioavailability, thereby, availing in successful therapy and impressed patient acceptance.
References