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Enhancement of gum acacia solubility by single process of humidification and drying (granulation)

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Introduction: Gum arabic is a complex, loose aggregate of sugars and hemicelluloses composed of arabic acid nucleus connected with calcium, magnesium, potassium and sugars arabinose, galactose, and rhamnose. It is found in mechanically ground or spray dried forms. The solubility varies between 2 hours in the raw gum form and 20 minutes in spray dried form. This study tended to enhance the solubility by producing an instant soluble granulated form.

Methodology: The study was performed using atomized fluid bed drier. 50 kg of raw gum, subjected first to mechanical comminuting into powder, then treated with water by spraying at rate of 200 ml/min for 90 minutes. The inlet temperature was 70°C, and the outlet temperature was 40°C. The cabinet temperature was 40°C. Finally, after water treatment process, the powder resized through mesh size of 40 micrometer and the microbial test was done for the finished product.

Results: The solubility of the granulated instant soluble gum in room temperature was found to be less than 2 minutes compared to the spray dried form which is 20 to 30 minutes and 2 hours for mechanical ground gum. The volume increased to three times compared to the mechanical form.

Conclusions: Granulation of gum under water spray significantly enhances the solubility and hence it is beneficial for uses in pharmaceutical technology as a binder, suspending agent, surface active agent and tablet coating materials.

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