Dry powder formulation from fruits of *Physalis peruviana* L. standardized extract with hypoglycemic activity

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Dry powder formulation from fruits of *Physalis peruviana L.* standardized extract with hypoglycemic activity

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Abstract

The aims of this study were to develop a dry powder formulation from standardized extract of fruits of *Physalis peruviana L.*, for oral administration, and to choose the best drying process for retaining the hypoglycemic activity, applying a factorial type experimental design. The development of a pharmaceutical formulation from an herbal extract has technological complications arising from inappropriate pharmaceutical characteristics related to its extract nature as a multicomponent system. *Physalis peruviana* extract showed the following technology difficulties: high hygroscopicity (which affects its flow, blend uniformity and stability), reduced flow properties (poor, non-uniform flow), high cohesivity, and low compressibility. To solve these problems, physical state changes of the extract (e.g. by absorption processes in a substrate) could contribute to improving its physical properties. The selection of excipients for use in the formulation was based on a compatibility study with binary solid mixtures (extract and each excipient) analyzed trough HPLC, and additionally, applying a factorial statistical experimental design to choose the best absorbent for the extract and the best drying method, evaluating like response variables: particle size, bulk and tap densities, angle of repose and hygroscopicity. Finally, a hypoglycemic assay was conducted in mice, using the best formulation. According to the compatibility study, the following excipients may be considered promising for use in a possible solid formulation from the ethanolic extract of fruits of *Physalis peruviana:* Disintegrants, absorbents and diluents: microcrystalline cellulose and corn starch; binder: polyvinylpyrrolidone. From the extract and the excipients selected as absorbents and binder (microcrystalline cellulose PH 101, 102, 200, corn starch and polyvinylpyrrolidone), different granules were produced,

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