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ESTIMATION OF GINSENOSIDE IN ORIENS®-PANAX GINSENG CAPSULES AS A PART OF HERBAL NUTRACEUTICAL STANDARIZATION

Medical Science

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ABSTRACT

Ginsenosides are unique saponins that are isolated from the plant Panax ginseng, and are the prominent pharmacologically active ingredients in ginseng. In the current study, we aimed to estimate the amount of ginsenosides in Oriens®-Panax ginseng capsules, a widely known potential therapeutic choice in Ayurveda, using gravimetric and HPLC method. We obtained a ginsenoside percentage of 5.61% and 7.95% respectively. Ginsenoside in Oriens®-Panax ginseng capsule play a vital role in the medicinal effects of cardiovascular disease through improving blood circulation, regulation of lipid profile and in the treatment of neurodegenerative disorders.

KEYWORDS

Panax Ginseng, Ginsenoside, Gravimetric Method, Hplc, Nutraceuticals

Introduction

Panax ginseng are commonly called 'ginseng' is a well-known plant especially in the East Asia where the whole plant is used directly or in combination in traditional Chinese and/or Korean medicine. The plant belongs to the family Araliaceae, and etiology of the genus name Panax lies in the Greek word meaning "all-healing". This genus consists of several species including *P. ginseng*, *P. quinquefolium* (Xiyangshen or American ginseng), *Panax notoginseng* (Sanqi) and *Panax japonicus* (Japanese ginseng). Overall, the worldwide sale of ginseng products has been estimated to be around 300 million US$ (Eliason et al., 1997; Harnack et al., 2001). Ginseng has been reported to modulate blood pressure, body metabolism and improve immune functions (Xiang et al., 2008).

The mechanism of ginseng activity behind its effectiveness in medicine was not known until ginsenosides were isolated in 1963 (Leung and Wong, 2010). Since then, several researchers have focused on elucidating and understanding the molecular mechanism of each of the identified ginsenoside which has exceedingly increased the number of publications on ginseng as well as ginsenosides.The root like tubers and leaves of Ginseng is widely used for its promising healing and restorative properties as well as for its possible tonic effect in traditional medicine. Ginseng and ginsenosides have been reported to exihibitvasorelaxation, antioxidative, anti-inflammatory, and anticancer properties. Also, ginsenosides have been reported to have a healing or positively effect on the nervous system (Nah et al., 2007). In addition to all these, consumption of ginseng based products have been shown to be beneficial to diseased patients compared with healthy individuals.

In the recent past, several studies have focused on purified individual ginsenosides, to specifically find a application for exact disease condition, and study their mechanism of action instead of studying the effect of whole-plant extracts in case of patients with cardiovascular disorders (Lee and Kim, 2014) and neurodegenerative diseases (Nah et al., 2007).

Materials and methods

Gravimetric method to estimate Ginsenoside content

Chemicals and apparatus required:

Methanol, Whatman filter paper, Acetone, Glass rod, Water bath

Sample:

Capsules of *Panax ginseng* (VNL-016-070) were obtained from Oriens Global Marketing (P) Ltd and its contents were carefully emptied to be used as samples for gravimetric method.

Sample preparation:

Five (5) grams of the samples were taken in 100 ml conical flask. To this 50 ml of methanol was added and refluxed on water bath for one hour. After this, the dry mixture was cooled and filtered through Whatman filter paper. The residue from the filter paper was taken and was above process repeated twice. The filtrate methanol from all the three washes was concentrate to make it upto 20-25 ml. One hundred milliliters (100ml) of Acetone was taken in beaker and the methanol concentrate was precipitated by adding it drop wise with continuous stirring using a glass rod. The precipitate was kept for settling for half an hour, decant acetone and take precipitate and dry at 105 °C.

Percent of ginsenoside= Weight of residue/Weight of Sample (in gm) X 100

Estimation of Ginsenoside using HPLC method

Chromatographic conditions:

The HPLC analysis was performed by a SHIMADZU SPD-20A system using photo diode array detector (PDA). The chromatographic separation was accomplished on an Agilent C18 column, 4.6×250mm (5micron). The elution system consisted of Water (A) and Acetonitrile (B). The flow rate was set at 1.0 ml/min and the sample injection volume was 2.0 µl. The ginsenosides were detected by PDA at 203 nm.

Results and discussion:

Panax ginseng has been considered as one of the most valuable oriental medicinal herb East Asin countries for 2,000 years, and is still used in the modern age in complementary, alternative medicine and health foods (Soldati, 2000). The ginsenosides generally belong to triterpenes class of chemical molecules and are considered to be the major bioactive ingredient of ginseng which are responsible for its various pharmacological effects such as an anti-carcinogenicity, immune-modulation, anti-inflammatory and anti-allergic effects (Christensen, 2009). We aimed to study the Ginsenoside content in *Panax ginseng* capsules from Oriens Global Marketing (P) Ltd using the gravimetric method. The results obtained are tabulated in Table 1 below.

Table 1. Ginsenoside content in *Panax ginseng* capsule

Sample	Chemical analyzed	Results	Method used
Panax Ginseng (VNL-016-070)	Ginsenoside	5.61%	Gravimetric

HPLC is the most employed analytical method. Because of its rapidity, sensitivity and adaptability to non-volatile and polar compounds, HPLC is ideal for the analysis of ginsenosides (Fuzzati, 2004). As shown in Fig.1, the investigated ginsenosides were well separated within 54 min for the standard solution. The peaks were identified by comparing the retention time of the peaks with those of the individual standard solutions under the same conditions and calculated the total amount of ginsenoside in the given sample was 7.95%. Park et al., (2013) has been reported nearly 30 ginsenosides in Panax ginseng preparations using ultra performance liquid chromatography.

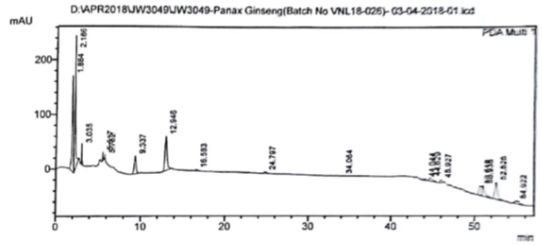


Fig.1: Representative HPLC chromatogram of Panax ginseng capsule preparation to detect the active compound Ginsenoside.

Conclusions:

We found that the amount of active Ginsenosides in Oriens®-Panax ginseng capsules were found to be 5.61% using gravimetric method. Moreover, we identified the ginsenosides present in the capsules using HPLC analysis. This shows that a significant amount of ginsenosides are present in Oriens®-Panax ginseng capsules which can be a potential nutraceutical for humans.

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