

***Passiflora incarnata* : Extraction and characterization of valuable compounds**

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Abstract

Passiflora is a nourishing plant grown at the tropical forests of Central and South America but it is also cultivated elsewhere. There are many species of *Passiflora* but the most common in Greece are: *Passiflora caerulea*, *Passiflora incarnata* and *Passiflora quadrangularis*. *Passiflora incarnata* is a medicinal plant known for its sedative properties. *Passiflora* has been used to alleviate various diseases, especially as a treatment for insomnia and anxiety. It had also been used as analgesic and downer. The types of active compounds which are responsible for *passiflora*'s properties are flavonoids, glycosides, alkaloids, phenolic compounds and volatile constituents. Although, the most abundant active compounds responsible for its sedative effects are the flavonoids.

In this work the medicinal properties of genus *Passiflora* are presented; methods of valuable compounds extraction are shown and compared with each other; extracts characterization and product quality control is demonstrated.

Keywords: *passiflora*; *flavonoids*; *alkaloids*; *passion flower*; *compound extraction*

1. INTRODUCTION

Passiflora is also known as passion flower, passion vines, maypop, apricot vine and granadilla of the family *Passifloraceae*. It belongs at the category of deciduous climbing and fast growing plants.

Passiflora consists of 4 parts: the main plant, the leaves, the flower and the fruits. The main plant can be woody or herbaceous. The leaves are green and large with wide 3 or 6 bowls. *Passiflora*'s flowers are pentamerous with fine trellis petals; they have many colours such as white, purple, red. Its fruits have oval shape and they also have many colours like orange, yellow, red etc.

2. MATERIALS AND METHODS

Passiflora plants were collected from Greece. They were grown on the most suitable soil; only natural fertilization was employed; throughout their production

synthetic fertilizers, pesticides, insecticides, fungicides or herbicides were not used. The plant harvest was based on a strict protocol and collection rules. According to the protocol, the harvest took place during the spring months (May-June) late in the morning to avoid moisture. After harvesting, meticulous cleaning of all kinds of impurities (organic or inorganic) was done. Only the completely dry flowers of the plant were used after being thoroughly cleaned. Growth of harmful enzymes and fungi should be ruled out. Possibility of growth of such entities increases when the flowers are packaged in liquid form. The transport-time of the plant-flower was as short as possible and it never exceeded 48 hours; the flowers were transported in well-ventilated packages (perforated bags, baskets of reeds, boxes full of holes e.t.c.). The flowers were split in two parts. The first one was first subjected to segmentation into alcohol vapor and then to liquid extraction. The second part was dried. A sample from this part, was used to determine the dry residue and the moisture content of the plant; this was necessary in order to calculate the degree of alcohol for the process. Finally, the second part was dried at 50°C for 24hr.

Percolation was the selected method of extraction. It was used for extraction of finely powdered solid-streams, slightly swollen upon wetting; then the solids were treated with a hydroalcoholic medium for the complete depletion of the valuable drug compounds. The procedure which was followed included preparation of the drip, humidification with water-alcoholic solvent (only pure alcohol and deionized water were used as solvents) to inflate the solid, stacking the drip into the percolator carefully and adding quantity of the solvent to its saturation, maceration for at least 48hr, adjustment of percolation and receipt of certain volume of extract within a specified time. Safe keeping and repetition for new quantity in which condensation was made, mixing the two extracts, leave them to rest for 24 hr and filtrate. Quality controls were made during the procedure. In the end, the final quality control of the extract was conducted. It included determination of alcoholic degree and degree of acidity (pH) of the crude, fiber content, coefficient of expansion, bitterness limit and immediate flavonoid identification which was used to confirm that the employed plant was *passiflora*.

OUR PRODUCTS

The treatment of *passiflora* plant employed dried flowers to form powder and liquid extracts. They lead to production of pharmaceutical products such as capsules, tablets, drops, powder and elixirs. The most important feature of this production is that all materials and products are non-toxic, natural and friendly to the environment.

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