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Estimation of boswellic acid in S. compound capsule

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Abstract

S. compound capsule is a proprietary herbal market formulation claimed to be used for treatment of osteoarthritis. It contains Sallaki (*Boswellia Serrata*). Today there are requirements for modern routine quality control of botanical raw materials and finished formulation in addition to the regular physical tests and identification. Hence in present study, an attempt was made to estimate boswellic acid from S. compound. TLC fingerprinting profile of market formulation was performed and was compared with standard Boswellic acid. Total organic acids as boswellic acid in formulation estimated by titrimetric method and were found to 64.42%. TLC fingerprinting profile shows presence of eight bands in S. compound extract at R_f 0.13, 0.21, 0.26, 0.52, 0.57, 0.73. 0.76 and 0.99, it was found to be comparable with standard boswellic acid. Hence, it was concluded that S compound contains Boswellic acid

Introduction

Health related problems are on high today. The diseases associated to blood, liver, heart, brain, kidneys, spleen, pancreas, nerves, hormones etc. are paying much attention and numerous research work is been done in respective areas[1].

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The inflammatory response forms the basis of several pathological and pathophysiological processes including wound healing, rheumatoid arthritis, atherosclerosis and neurodegenerative disorders. Rheumatoid arthritis is a chronic multi systemic inflammatory disease of unknown etiology characterized by symmetrical polyarthritis, synovitis and joint erosion usually involving peripheral joints[2]. Traditional medicine 'Ayurveda' since antiquity it has been in serving the mankind in defending against chronic conditions[3]. Natural compounds or compounds derived from natural leads can be used for treatment of inflammatory processes and there are records from traditional medical systems of plants being used for such purposes[4]. The use of plant products as immunostimulants has a traditional history. Modern herb research and new understanding of the immune system have explained many mechanisms by which these herbs work[5]. Despite the widespread uses of various plants in treating human and animal diseases in this environment, little work has been done on its phytochemistry and its effects on some major organs in the body[6]. The concept of quality in old days was based on physical aspects of the plant materials such as identification, colour, odour, size, type, age, etc. Today there are additional requirements, distinct in nature, for modern routine quality control of botanical raw materials, in addition to physical tests and identification i.e. chemical composition. The Govt. of India has adopted the "fingerprint" approach for botanicals because it supports the traditional concept and is easy to practice at different levels of sophistication. The British Pharmacopoeia has had an emphasis on using TLC and HPLC profiles to identify characteristic and active principles of herbal materials[7].

Boswellia serrata (Burseraceae), occurs in tropical parts of Asia and Africa. The oleo-gum-resin of the plant is known to possess a variety of activities such as antiarthritic, antiinflammatory, antitumour and anticarcinogenic effect. This plant is widely used for its antiinflammatory activity, which is mediated by its active constituents, boswellic acids[8]. S. Compound as per label claim is a proprietary herbal formulation based on Sallaki (*Boswellia serrata*), a non-steroidal, anti-arthritic, and 100% herbal formulation. Composition of S. Compound is processed in herbal extracts (Rasnadi & Suranjan) 300 mg.

Hence, an attempt has been made to standardize S. compound by TLC and estimating the main active constituent boswellic acid by titrimetric method.

Materials and Methods

S. compound capsule (Rahul pharma- Jammu) product was procured from local market. All the chemicals and reagents used were of analytical grade. All the chemicals and reagents used were of analytical grade. The standard marker boswellic acid used in this study was purchased from Yucca enterprise, Mumbai, India.

Methods

1. Chromatographic conditions: Thin layer chromatography (TLC) finger printing was performed on aluminium plates precoated with silica gel 60 F_{254} (Merck) as the stationary phase for standard boswellic acid and the methanolic extract of S. compound.

Test sample (T) preparation: 1 gm/25 ml extract was prepared by extracting the ingredients in the capsule S. compound in methanol and was applied on TLC plate.

Standard sample (S) preparation: Boswellic acid (S) 5 mg/ml was prepared by dissolving of standard boswellic acid in methanol and was used for TLC.

Solvent system: Chloroform : Methanol (90:1)

Solvent front was run upto 9 cms and detection was done by spraying vanillin sulphuric acid reagent[9].

2. Estimation of Boswellic acid in S. Compound

S. compound capsule market formulation was purchased from the local market and estimation of total organic acids as boswellic acid by titration.

Reagents

Sodium Hydroxide, 0.1M: 4.2 gm of sodium hydroxide was dissolved in sufficient carbon dioxide-free water to produce 1000 ml. Standardised the solution in the following manner:

Accurately weighed about 0.4 gm of potassium hydrogen phthalate, previously powdered and dried at 120°C for 2 hours, and dissolved in 75 ml of carbon dioxide-free water. Added 0.1 ml of phenolphthalein solution and titrate with 0.1M sodium hydroxide solution until a permanent pink colour is produced. Each ml of 0.1M sodium hydroxide is equivalent to 0.20422 gm of $C_8H_5KO_4$. Stored in bottles with well-fitted suitable stoppers, which prevent access to atmospheric carbon dioxide. Volumetric solutions of sodium hydroxide must be re-standardised frequently.

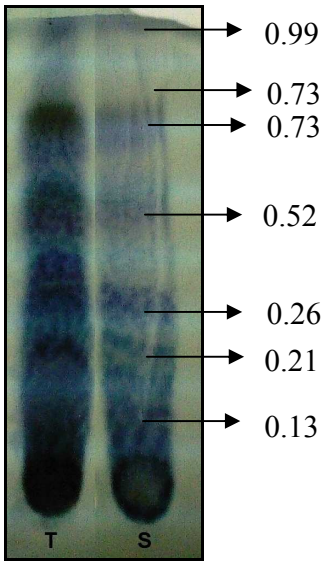

Figure 1. TLC finger-printing of test (T) and standard sample (S)

Procedure: Weighed accurately 1.5g of the material in to a dried conical flask. Added 150 ml of pre-neutralised alcohol to the weighed material. Dissolved the sample and titrate with 0.1M NaOH till pink colour persists for at least 30 seconds. Each ml of 0.1M NaOH is equivalent to 45.36 mg of boswellic acid[9].

Results

TLC fingerprinting profile of S. compound extract and standard boswellic acid showed the presence of eight bands at R_f 0.13, 0.21, 0.26, 0.52, 0.57, 0.73. 0.76 and 0.99 (Figure 1).

Fingerprinting profile of S. compound was comparable to standard boswellic acid. Hence S. compound contains boswellic acid and was estimated to be 64.42% by titrimetric method.

Discussion

On the basis of TLC fingerprinting profile it was concluded that S. compound contains boswellic acid as total organic acids. The proposed titrimetic method was found to be rapid and precise for estimation of boswellic acid (64.426%) in S. compound extract. This method was also suitable for rapid screening of boswellic acid in polyherbal market formulation as well as quality control and batch to batch consistency in raw materials.

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