GC-MS Analysis of an Ayurvedic medicine “Modified Arjunarishta”

B. Santhosh Kumar¹, Manickam Diwakar¹, R. Sri Kamatchi Priya¹, Dr. Shyama Subramaniam², Dr. S. Subramaniam¹

¹Department of Biochemistry, Regenix Super Specialty Laboratories, Affiliated to the University of Madras
²Department of Biochemistry, Apollo Hospitals

Corresponding Author: Dr. S. Subramaniam
Department of Biochemistry, Regenix Super Specialty Laboratories, Affiliated to the University of Madras

Abstract

Modified Arjunarishta is an ayurvedic formulation used for treatment of cardiovascular diseases. The main ingredients of this formulation are Terminalia arjuna bark, Vitis vinifera fruit and Mudhaca longifolia flower. This is a liquid formulation. GC MS analysis of this formulation is done in the present study to know the various bioactive compounds present therein. It was found that major peaks represented 2,3-dihydro-3,5-dihydroxy-6-methyl-4H-pyran-4-one, 4-ethyl-2-hydroxycyclopent-2-en-1-one and 1,1-dichloro-2-propanone as compared with NIST software associated instrument. Further work is in progress to prove the validity of this medicine.

Keywords: Arjunarishta, Terminalia arjuna, GC MS analysis.

Introduction

Ayurveda is an oldest serving complete medical system in the world. The word Ayurveda derived from ancient Sanskrit in which ‘Ayus’ means life and ‘ved’ means knowledge. It originates back to 5000 years. There art spread around sixth century BC to Tibet, China, Mongolia, Korea, and Sri Lanka carried over by Buddhist monks travelling to these lands. The prime raw material of Ayurveda are the medicinal plants. Around 8,000 species of medicinal plants are being used in India for betterment of health (Anon, 1996). Some of the factors for this state of Ayurveda and Sidhha medical system is discussed by Raj et al., 2011; Rao et al., 2015a, b; Ravi et al., 2015). Pordie’ and Gaudiliere 2014, have discussed in details about the factors involved in polyherbal formulation in drug discovery and related issues pertaining to Ayurveda as an industry.

Arishta and Asava have been used as medicines for over 3000 years to treat various disorders and also taken as stimulants and appetizers. In Ayurveda, Arishtas are an important formulations. Arjunarishta also said as parthadyarishta is one of the ancient liquid oral formulations prescribed in Ayurveda for cardiovascular disorders. It nourishes and strengthens cardiac muscle and there function by regulating cholesterol and blood pressure. Usually there ingredients are Terminalia arjuna, Madhuca indica, Vitis vinifera, Woodfordia fruticosa and Jaggery. As it is a formulated product, a modulatory form of Arjunarista is used to bring alcohol free. The studying of Modified Arjunarista’s ingredients are Terminalia arjuna, Madhuca longifolia and Vitis vinifera (Raisins). The formulation was prepared by making a decoction of these three plants in specified amounts as listed in AFI.

A knowledge of the phytochemical constituents of plants is desirable not only for the discovery of therapeutic agents, but also because such information may be of great value in disclosing new sources of economic
Materials and Methods

Collection and Authentication

The selected plants for the proposed study include *Terminalia arjuna* bark, *Vitis vinifera* fruit, and *Mudhuca longifolia* flower which are collected from Villivakkam, chennai, K.G. Kandigai, tiruttani and from Ayurvedic shop. These are identified and authenticated by Mr. K.N. Sunilkumar, Research officer (Pharmacognosy) from Siddha central research institute, Chennai.

Results and Discussion

The GC-MS Analysis of modified Arjunarishta were analysed and the results were tabulated in Table 1. The GC-MS Analysis chromatogram of the modified Arjunarishta obtained from tri herbal constituents is shown in figure 1.
Table 1

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Retention time</th>
<th>Compound name</th>
<th>Molecular weight</th>
<th>Peak area %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2.558</td>
<td>Acetamidoacetaldehyde</td>
<td>101</td>
<td>3.053</td>
</tr>
<tr>
<td>2</td>
<td>2.774</td>
<td>1,1-dichloro-2-propanone</td>
<td>127</td>
<td>8.489</td>
</tr>
<tr>
<td>3</td>
<td>8.126</td>
<td>2-hydroxy-2-cyclopenten-1-one</td>
<td>98</td>
<td>2.795</td>
</tr>
<tr>
<td>4</td>
<td>11.212</td>
<td>2,3-dihydro-3,5-dihydroxy-6-methyl-4H-pyran-4-one</td>
<td>144</td>
<td>45.329</td>
</tr>
<tr>
<td>5</td>
<td>11.702</td>
<td>2-amino-octadec-7-ene-1,3-diol butaneboronate</td>
<td>365</td>
<td>3.431</td>
</tr>
<tr>
<td>6</td>
<td>13.913</td>
<td>4-ethyl-2-hydroxy-cyclopent-2-en-1-one</td>
<td>126</td>
<td>32.146</td>
</tr>
<tr>
<td>7</td>
<td>26.868</td>
<td>Hexamethyl-cyclotrisiloxane</td>
<td>222</td>
<td>1.964</td>
</tr>
<tr>
<td>8</td>
<td>27.023</td>
<td>Trimethyl[4-(2-methyl-4-oxo-2-pentyl)phenoxy]silane</td>
<td>264</td>
<td>2.793</td>
</tr>
</tbody>
</table>

Figure 1

From the GC-MS chromatogram many peaks are obtained. But only eight compounds were identified with the comparison of NIST Software available in the instrument and also peak area percentage. It is found that the compound 2,3-dihydro-3,5-dihydroxy-6-methyl-4H-pyran-4-one was present higher in the formulation (45.329 area %). It shows the more synergic effect of the formulation. Following the compound, 4-ethyl-2-hydroxy-cyclopent-2-en-1-one was present in moderate concentration in the formulation (32.146 area %). The other compounds present in minimum concentration such as 1,1-dichloro-2-propanone, 2-amino-octadec-7-ene-1,3-diol butaneboronate, Acetamidoacetaldehyde, 2-hydroxy-2-cyclopenten-1-one, Trimethyl[4-(2-methyl-4-oxo-2-pentyl)phenoxy]silane, Hexamethyl-cyclotrisiloxane.

ACETAMIDOACETALDEHYDE

1,1-DICHLORO-2-PROpanone

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2-HYDROXY-2-CYCLOPENTEN-1-ONE

2,3-DIHYDRO-3,5-DIHYDROXY-6-METHYL-4H-PYRAN-4-ONE

2-AMINO-OCTADEC-7-ENE-1,3-DIOL BUTANEBORONATE

4-ETHYL-2-HYDROXYCYCLOPENT-2-EN-1-ONE
Conclusion

The results of GC-MS analysis revealed that the Modified Arjunarishta contains the enriched compounds like 2,3-dihydro-3,5-dihydroxy-6-methyl-4H-pyran-4-one and 4-ethyl-2-hydroxycyclopent-2-en-1-one. Further investigation on the cardioprotective and therapeutic activity of this Ayurvedic formulation in an in-vivo model is under way.

References

1. Anon, Pharmacopiea of India. Govt. of India, New Delhi, Ministry of Health and Family Welfare. 1996.

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