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Short Communication

FIELD TEST FOR THE DETECTION OF PHYTOSTEROLS

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ABSTRACT
There are some standard tests which are used for the detection of phytosterols. Field test is quick and efficient method. It is also advantageous because of the use of less quantity plant material and chemical. A small portable kit can solve the purpose of detection of Phytosterols.
Keywords: Phytosterols, Field test, Portable kit.

INTRODUCTION

Plant derived substances have recently become of great interest owing to their versatile applications. The traditional medicines involve the use of different plant extracts and the bioactive constituents Secondary metabolites are responsible for medicinal activity of plants[1]. Phytosterols and phytostanols are a large group of compounds that are found exclusively in plants. Phytosterols, phytostanols and their esters are a group of steroid alcohols and esters that occur naturally in plants. Phytosterols can be found at widely varying concentrations in the fat-soluble fractions of roots, stems, branches, leaves, seeds and blossoms etc. They are constituents of both edible and ornamental plants, including herbs, shrubs and trees[2]. Phytosterols inhibit the intestinal absorption of cholesterol[3]. The use of foods containing phytosterols is a relatively recent development in human nutrition[4]. Phytosterols, as functional ingredients in foods, reduce total cholesterol and LDL-cholesterol levels through a reduction in cholesterol absorption[5]. This paper contains a quick phytosterols detection test called as field test. This is modified Solkowski test[6]. It is easier way in which one can carry a portable kit and can quickly and easily detect phytosterol content in the field itself. Screening of number of plants for the presence of phytosterol is possible in the field itself within a short span of time.

MATERIALS AND METHODS

Plant material

20 locally available plants were collected in the field and tested with quick field test kit. The plants which had given positive field test were collected and identified and authenticated in the Post Graduate Teaching Department of Botany, Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur, Maharashtra, India.

Chemicals

Sulphuric acid, Chloroform, Hexane

Apparatus

Culture tubes, Mortar and pestle, Funnel, Muslin cloth

Detection of Phytosterols

This research deals with the following tests for the detection of phytosterols.

Field test

A quick method (field test) was done in the field (Figure 1).

Confirmatory test

Detection of phytosterols was confirmed by Standard Solkowski test[6] and Libermann Burchurd's test[7].

Collection of Plants

Plants detected by quick field test were collected from the different local areas of Nagpur, Maharashtra, India. The material was cleaned, shed-dried and ground to powder.

Extraction

The powder of leaves, seeds was extracted in Soxhlet apparatus. Hexane was used as solvent. Extract was then analyzed for the presence of phytosterols by Solkowski test and Libermann Burchurd's test.

Solkowski Test

Solkowski test was done with the plant extracts. 2 ml extract taken in a test tube. 2 ml Chloroform and 2 ml conc. Sulphuric acid was added in it; brown or red colored ring on the sulphuric acid layer given the confirmatory test.

Libermann Burchard's Test

Libermann and Burchurd's test was done after the extraction and reflux of the plant material. 2 ml extract taken in a test tube. 2 ml Chloroform, 2 ml Acetic Anhydride and 2 ml conc. Sulphuric acid was added in it; translucent green colour given the confirmatory test.

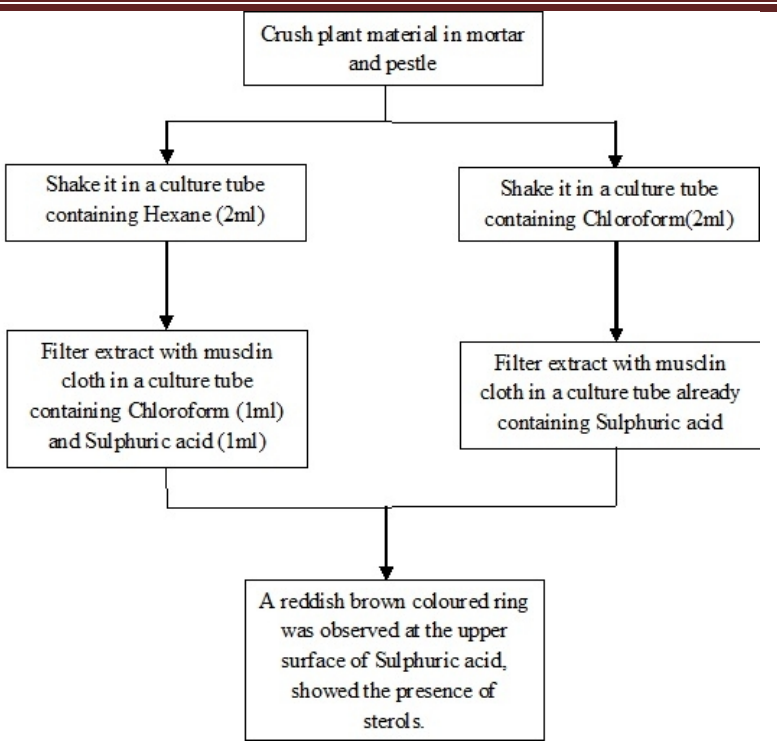

Figure 1: Steps of Quick field test for phytosterol detection

Table 1: Showing the presence of phytosterols by different methods

S. No.	Plant Name	Parts used for the test	Field test	Solkowski test	Libermann and Burchurd's test
1.	*Cascabella thevetia* (L).	Leaves Latex	+ +	+	+
2.	*Plumeria alba* L.	Leaves Latex	+ +	+	+
3.	*Plumeria rubra* L.	Leaves Latex	+ -	+	+
4.	*Bombax ceiba* L.	Leaves	+	+	+
5.	*Nerium indicum* Mill.	Leaves Latex	+ +	+	+
6.	*Ficus hispida* Linn.	Leaves Latex	+ +	+	+
7.	*Solanum xanthocarpum* Schrad. and Wendl.	Leaves	+	+	+
8.	*Cullen corylifolia* (L.) Medik.	Seeds	+	+	+

'+' indicates presence of phytosterols

RESULTS

Total 20 plants were detected by the kit in the field only for the presence of phytosterols in it. Out of them only 8 has shown the positive Field test, namely, *Nerium indicum* Mill., *Cascabella thevetia* (L)., *Plumeria alba* L., *Plumeria rubra* L., *Cullen corylifolia* (L.) Medik., *Solanum xanthocarpum* Schrad and Wendl, *Ficus hispida* Linn., *Bombax ceiba* L. Standard Solkowski test and Libermann Burchurd's test also confirmed the result of quick Field test. Other plants showed negative tests for phytosterols. (Table 1)

DISCUSSION

References showed until about Solkowski test and Libermann Burchurd's test for the detection of phytosterols are usually performed in laboratory conditions. First time field test has been introduced in this research; which is very easy to perform in the field only by carrying a small portable kit. This test was confirmed by the standard test namely, Solkowski test and Libermann Burchurd's test. This test is useful for researchers to identify the sterols contents in the field within few seconds. So it will help to minimize the exploitation of plants which was earlier happen in another case.

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