

DIFFERENTIATION OF KOREAN AND SIBERIAN GINSENG EXTRACTS BY THIN-LAYER CHROMATOGRAPHY

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Thin-layer chromatographic profiles derived from authentic samples of *Panax ginseng* C.A. Meyer and *Eleutherococcus senticosus* (Rupr. et Maxim). Maxim. are presented as an aid for the analyst to distinguish between samples marketed as Korean and Siberian Ginseng.

INTRODUCTION

Eleutherococcus senticosus (Rupr. et Maxim). Maxim., (Family: Araliaceae), a far eastern shrub, is becoming an increasingly important economic plant as a good substitute for ginseng (*Panax ginseng* C.A. Meyer). It is, perhaps, unfortunate that under regulations set by the United States Food and Drug Administration plant products must be marketed in the U.S.A. under their "common family name". Thus, any araliaceous plant would be known as "ginseng" on the market. For this reason medicinal plant dealers offer preparations from *Eleutherococcus senticosus* under the commercial name "Siberian ginseng" because this particular specie grows abundantly in the southern regions of the Soviet Far East. This nomenclature is unfortunate since the plant does not comply with either the phytotaxonomical or phytogeographical characteristics of *Panax ginseng* C.A. Meyer.

It is, therefore, important that these two plants should be readily distinguished since they or their extracts are presented in various dosage forms and this communication describes a thin-layer chromatographic procedure suitable for this purpose.

At least fifteen saponin glycosides have been isolated from the root of *Panax ginseng* [1-4]. They are named according to the sequence of R_f values on the thin-layer chromatogram from the lower to the higher as ginsenosides R_x ($x = 0, a, b_1, b_2, b_3, c, d, e, f, 20\text{-gluco f, g, g}_2, g_3, h_1$ and h_2). Ginsenoside R_0 is the least polar having the lowest R_f value and ginsenoside R_h is the most polar having the highest R_f value. Among these saponin ginsenosides the R_b and R_g groups are the main constituents. Six glycosides have been isolated from the stem, roots and rhizomes of *Eleutherococcus senticosus* designated eleutherosides A, B, B₁, C, D and E 5,6,7,8.

The method described below does not necessitate a detailed consideration of the glycosidal content of the two drugs but compares the thin-layer chromatographic profiles of their extracts chromatographed under the same experimental conditions.

MATERIALS AND METHOD

Drug Samples. The samples of *Panax ginseng* was obtained from Korea and that of *Eleutherococcus senticosus* from Russia.

Preparation of Extract. The powdered drug (0.5 g) is heated on a bath of boiling water with methanol (20 ml) for 20 min, with occasional shaking; the extract filtered and the filtrate evaporated to dryness and the residue dissolved in methanol (2.5 ml).

Thin-layer Chromatographic Procedure.

Layer	: Silica gel 60 (Merck)
Solvent system	: Chloroform: methanol: water 65:35:10 (lower phase)
Load	: 25 μ as 1 cm band on baseline
Distance	: 10-12 cm
Spray reagent	: (I) Ferric chloride-sulphuric acid reagent (10% solution of ferric chloride in glacial acetic acid (0.4 ml) is diluted to 100 ml with a mixture of glacial acetic acid and sulphuric acid in the ratio of 3:2, respectively).

(II) Anisaldehyde-sulphuric acid reagent (conc. sulphuric acid (1 ml) is added to a solution of anisaldehyde (0.5 ml) in glacial acetic acid (50 ml)). The re-

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gent is freshly prepared before use.

Visualisation

After spraying with reagent (I) the developed plate is heated at 105° for 5 min and after spraying with reagent (II) at 105° until maximum colour intensity developed.

RESULTS

The profiles of two commercial types of Korean ginseng (white and red) and of Siberian ginseng are given in Figs. 1 and 2 after spraying with reagents (I) and (II), respectively.

DISCUSSION

The profiles obtained from *Eleutherococcus senticosus* are sufficiently dissimilar from those obtained from *Panax ginseng* (white ginseng and red ginseng) to enable the analyst to distinguish the materials marketed as white, red and/

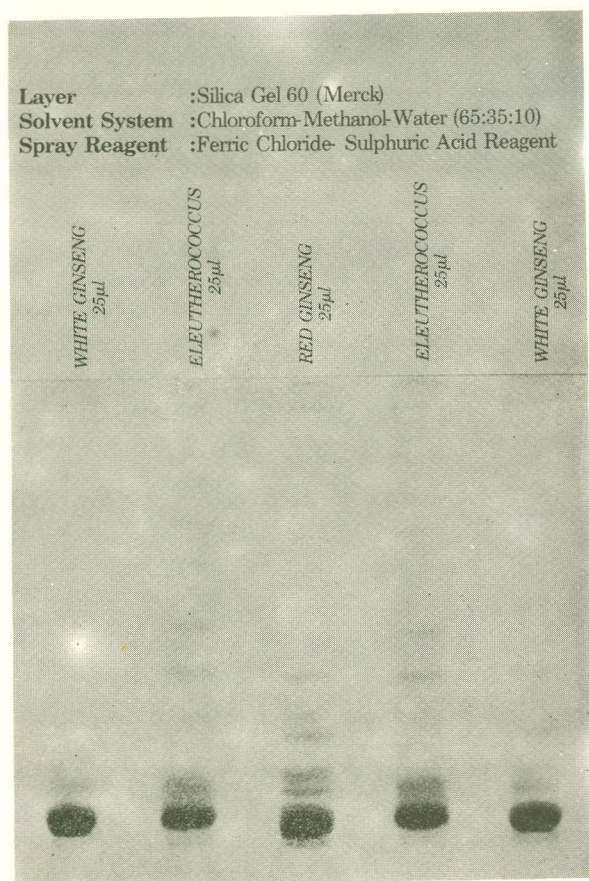


Fig.1 Chromatogram of White and Red Korean Ginseng and Eleutherococcus Extracts. Solvent system: Chloroform:methanol: water (lower phase) 63:35:10; Spray Reagent I

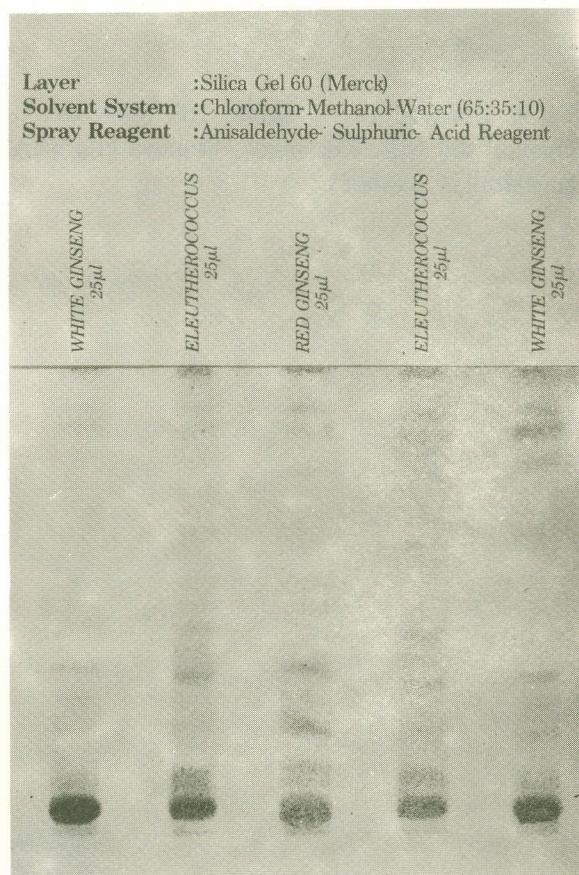


Fig. 2. Chromatogram of White and Red Korean Ginseng and Eleutherococcus Extracts. Solvent system: Chloroform:methanol: water (lower phase) 63:35:10; Spray Reagent II.

or Korean ginseng and Siberian ginseng without the need for authentic reference compounds. In this respect it should be noted that the ginsenosides and eleutherosides are not available for purchase as reference compounds on the commercial market.

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