



Science

A STUDY OF BIOCHEMICAL COMPOSITION ON *SOPHORA FLAVESCENS SOLAND*

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Abstract

The purpose of the present study was to determine plant first metabolites: is dry matter, general acidity, an ash, protein, oil, cellulose, and ascorbic acid, citrine and enzymes: catalase, polyphenoloxidase and extractive substances, plant secondary metabolites : is coumarin, total amount of flavonoids, saponin, total amount of alkaloids in natural plant's root of *Sophora flavescens Soland*.

Keywords: Plant First Metabolites; Plant Secondary Metabolites.

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1. Introduction

Sophora flavescens Soland is a perennial shrub of family Fabaceae and herbaceous plant with thin thread, short downy stemrhizous. It grows up to 100 cm in height and deltoid – sword like leaves are from 3 to 5 cm long, 10 to 20 mm wide. It distributed to Mongol Daguur, and Dornod Mongol in Mongolia [4, 5]. *S. flavescens* was included Red Book of Mongolia [5]. Because, this plant's germination rate of seeds is low, less than 50% [1].

Sophora flavescens Soland is a traditional Mongolian, Japanese and Chinese medicinal herb and has been used for anti-tumor, viral hepatitis, anti-ulceration, analgenic, and anti-arthritis. Also, various bioactive compounds such as quinolizidine alkaloid, flavonoids and saponin have been reported in *S. flavescens* of these major bioactive materials against various insect pests, pathogenic fungi, bacteria, and nematodes [2, 3, 6, 8, 9, and 10].

2. Plant Materials, and Methods

The plant material was collected during its seeding period in the summer of 2014. The material was authenticated as *Sophora flavescens Soland*. By Ms. Byambasuren M. More than 1 kg of

plant material (root and seeds) was collected from the Sumber area of Dornod province, Mongolia, on august, 2014.

Ascorbic acid (Vitamin C) was determined by titration with 2, 6-dichlorophenolindolephenol, Citrine (Vitamin P) was determined by Murri method.

Dry matter and an ash were determined by the weight method, general acidity was determined using by titration sodium chloride, enzyme catalase was determined by method destructive hydrogen peroxide, (Bakh and Oparin), polyphenoloxidase was identified by colour formation speed of dimethyl – n – phenylenediamine, coumarion was determined by method neutralization, extractive substances were determined using by the weight method, total amount of flavonoids was determined by Minaev method, saponin was determined by the method glycerrhizine acid precipitated, a spectrophotometric, total amount of alkaloids were determined by the weight method [7].

3. Results

We used *Saphora flavescens* Soland.'s root in natural plant for our biochemical research work. We revealed the plant first metabolites biochemical composition (10 indexes) and plant secondary metabolites biochemical composition (4 index) (shown Table 1).

Table 1: Biochemical composition of *Sophora flavescens* Soland

№	Composition		Content	Amount of biochemical composition
1	Protein	First metabolites	%	17,66±0,12
2	Cellulose		%	15,9±0,01
3	Ash		%	4,13±0,25
4	Oil		%	0,71±0,02
5	Dry mater		%	1,38±0,03
6	Extractive substances		%	33,97±0,04
7	Citrine		mg%	0,112
8	Vitamin C		mg%	8,8±0,02
9	Catalase		Unit	2.27
10	Polyphenoloxidase		Unit	NA*
11	Saponin	Secondary metabolites	%	0,112±0,01
12	Total alkaloid		%	4,7±0,3
13	Total flavanoid		%	0,91±0,006
14	Coumarin		%	0.23

*NA- no activity, **ND – No determined

Cellulose is the principal scaffolding component of all plant cell walls. Amount of cellulose was contained 15, 9%. Cellulose is the most abundant plant polysaccharide, accounting for 15% to 30% of the dry mass of all primary cell walls and even larger percentage of secondary walls.

Amount of ash was contained 4.13%, and amount of protein was contained 17, 66% in root. Proteins perform most of the other membrane functions and there by define the specificity of each membrane system. Proteins play crucial roles in virtually all biological process. Oil was contained 0, 71% of *S.flavescens*. Oil crops are second only to cereals as a source of calories for human societies as well as providing essential fatty acids, such linoleic acid, plus many of the lipid soluble vitamins including carotenoids and tocopherols. Some plant oil-derived food stuffs such as cooking oils. Subsequently, we determined the activity an enzyme: catalase and polyphenoloxidase. Activity of catalase was contained 2, 27 unit. Catalase that catalyses the decomposition of hydrogen peroxide to oxygen and water. Activity of polyphenol oxidase was not activity in natural plant.

We were determined plant secondary metabolites: is coumarin, total amount of flavonoid, triterpen saponin and total amount of alkaloid in sample of natural plant's root of *S.flavescens*. Amount of coumarin was contained 0, 23%. Coumarins belong to widespread family of plant metabolites called the benzopyranones. Their roles in plants appear to be mainly defence – related, given their antimicrobial, antifeedent, UV-screening, and germination inhibitor properties. Total amount of flavonoid was contained 0, 91%. While flavonoids are generally located in leaves as water soluble glycosides in the vacuoles of epidermal cells, they are also found less frequently on the upper leaf surface in the epicuticular wax. Saponin was contained 0,112%. Saponins have detergent properties and cause disintegration of membranes and hence are capable of bringing about haemolysis of erythrocyte. Other oxygenated triterpenoid natural products which unusual biological properties include the phytoecdysones, a family of plant steroids that act as hormones and stimulate insect molting, the saponins so named because of their soaplike and the cardenolides, which, like the saponins, are glycosides. Total amount of alkaloid was contained 4, 7%. They are a approximately. Many alkaloids are still in use today as prescription drugs. One of the best –known prescription alkaloids is the antitussive and analgesic codeine from the opium poppy.

4. Conclusion

Sophora flavescens Soland. in Mongolia was contained varies biological activity substances. In the results of research work the content of plant first metabolites and plant secondary metabolites, we would conclude the following:

In the result of research work the content plant first metabolites: is protein, cellulose, mineral and extractive substances, citrin, vitamin C, oxidative enzyme – catalase, and plant secondary metabolites: is triterpen saponin, total alkaloid, total flavonoids and coumarin was contained in dried root sample of natural *S. flavescens*.

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