

GLOBAL JOURNAL OF ENGINEERING SCIENCE AND RESEARCHES

PHYTOCHEMICAL INVESTIGATION OF ASPARAGUS RACEMOSUS

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ABSTRACT

The very important medicinal plant *Asparagus racemosus* is widely distributed in the tropical and sub-tropical regions of India. The ancient and traditional systems of medicines i.e. Ayurveda and Unani etc. have reported it's broadly usages treating many diseases and disorders in indigenous system of medicine i.e. antioxidants, aphrodisiac, anti-diarrheal agent, curing and treating the immune system modulator and menopause. It is very much useful threatened miscarriage, decreased libido, infertility, menopause and leucorrhea, balancing pH in the cervical area. The main purpose of this work is to study and identify the medicinally active substances present in the methanolic extract found from the root powder of the plant *Asparagus racemosus*. The preliminary phytochemical screening of the extract gave the glimpses of the presence of the carbohydrates, tannins, alkaloids, sterols and flavonoids.

Keywords: *Asparagus racemosus*, Liliaceae, Antioxidants, Medicinal plant, Alkaloids.

I. INTRODUCTION

Shatavari (*Asparagus racemosus* Willd.) is a well known Ayurvedic drug (Sharma et al., 2005). *Asparagus racemosus* Willd. is belonging to both Liliaceae and Asparagaceae plant families (Madhavan et al., 2010). This is a woody climbing plant growing to 1-2m in height that grows in low forest areas throughout India (Gomase et al., 2010). In Indian system of medicine *A. racemosus* is an important medicinal plant and its root paste or root juice has been used in various ailments and as health tonic (Krtikar et al., 1975), (Goyal et al., 2003). The root is used to prepare medicine.

It is an important monocot medicinal plant which is distributed in tropical and subtropical forest and in central parts of India, *Asparagus racemosus* Willd., is a perennial shrub, with a tuberous rootstock, stems covered with recurved spines, linear leaves arranged in a tuft, white flowers which is sweet-scented appears in October (Patel et al., 2013). The promising potential of antimicrobial plant derived substances has attracted the attention of pharmaceutical and scientific communities during the last few years. The primary benefit of plant derived medicines is that they are relatively safer than their synthetic counterparts and offer profound therapeutic benefits and more affordable treatment (Rahman et al., 2018). *Asparagus racemosus* is used to treat various diseases such as ulcer, dyspepsia and debility. In Indian medicine it is well known as an antispasmodic, aphrodisiac, demulcent, diuretic, galactagogue, nervine tonic and refrigerant. It is also used in the treatment of diarrhoea, rheumatism, diabetes, brain complaints, jaundice, urinary disorders, blood diseases, cough and bronchitis (Battu and Madhavan et al., 2010), (Raval et al., 2012).

II. MATERIAL AND METHOD

From Nature Nursery Pipliyapala, Choithram Square, Dist. - Indore (M.P.), India the fresh and healthy roots of plant *Asparagus racemosus* were collected. The plant was identified and authenticated by the Dept. of Botany from PMB Gujarati Science College Indore.

Preparation of Extract

First of all the small amount of dried root powder was mixed in a flask with the 70% Methanol and allowed to stand for 6-7 days for the extraction after covering the flask with the aluminium foil. The extraction was allowed to put on the rotary evaporator at 50⁰ C temperature after being filtered with the whatman filter paper no.1. Thus the stock solution 50mg/ml was prepared.

Preliminary Phytochemical Screening

Using the standard procedures to identify tannins, sterols, saponins, alkaloids, flavonoids, carbohydrates and amino acids the qualitative phytochemical analysis of the extract of methanol was carried out.

Table 1. Ferric Chloride Test

<i>Experiment</i>	<i>Observation</i>	<i>Inference</i>
In small amount of water some part of the powdered plant sample was boiled and filtered , then in about 5 ml of the filtrate a few drops of freshly prepared 0.2% ferric chloride were added.	Blue black colour appeared.	Presence of tannins.

Table 2. Salkowski's Test

<i>Experiment</i>	<i>Observation</i>	<i>Inference</i>
To the methanolic extract few drops of concentrated sulphuric acid was added and shaken well before allowing to the stand.	Red colour appeared.	Presence of sterol.

Table 3. Foam Test

<i>Experiment</i>	<i>Observation</i>	<i>Inference</i>
With the little quantity of distilled water the small amount of extract was mixed and shaken well and was allowed to stand for 10 minutes.	Foam produced.	Presence of saponins.

Table 4. Wagner's Reagent Test

<i>Experiment</i>	<i>Observation</i>	<i>Inference</i>
In the extract solution few drops of dilute hydrochloric acid and few drops of Wagner's reagent were mixed.	Reddish brown colour appeared.	Presence of alkaloids.

Table 5. Shinoda's Test

<i>Experiment</i>	<i>Observation</i>	<i>Inference</i>
The extract was dissolved in ethanol in a test tube with few drops of diluted hydrochloric acid and magnesium turnings.	Reddish pink colour appeared.	Presence of flavonoids.

Table 6. Benedict's Test

<i>Experiment</i>	<i>Observation</i>	<i>Inference</i>
With the few drops of Benedict's reagent a small amount of extract was boiled in water bath.	Green reddish brown precipitate appeared.	Presence of carbohydrate.

Table 7. Ninhydrin's Test

<i>Experiment</i>	<i>Observation</i>	<i>Inference</i>
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A small amount of extract was heated and was stand for 10 minutes in boiling water bath after being added few drops of Ninhydrin's solution.	Purple colour should be appeared.	Found negative result.
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III. RESULT AND DISCUSSION

The presence of various secondary metabolites are very important for the curative properties of medicinal plants. Whatever be the results of the preliminary phytochemical screening, they all will be very helpful in future for qualifying the root powder of *Asparagus racemosus*. The below given table 8 reveals the result of the phytochemical investigation of methanolic extract of the root of *Asparagus racemosus*.

The alcoholic, aqueous and benzene extracts of *Asparagus racemosus* were subjected to different chemical tests for the detection of phyto-constituents such as Sterols, Saponins, Alkaloids, Tannins, Carbohydrates, Flavonoids, Lactones, Amino acids/Proteins, Resins and Starch (Garabadu and Sairam et al., 2009).

The root of *Asparagus racemosus* revealed the presence of the following in the phytochemical investigation of methanolic extract i.e. tannins, sterols, saponins, alkaloids, flavonoids, carbohydrates and amino acids.

Table 8 : Phytochemical investigation of metabolic extract of the root of Asparagus racemosus

Secondary Metabolites	Metabolic extract of the root of <i>Asparagus racemosus</i>
Tannins	+
Sterols	+
Saponins	+
Alkaloids	+
Flavonoids	+
Carbohydrates	+
Amino acid	-

IV. CONCLUSION

For the identification and authentication of a drug the importance of the standardization of crude drugs has increased very much today. In various cases identifying drug techniques fail its originality and may exploit the uses of drug from its medicinal traditional system. That's why this investigation was aimed and found to be significant and encouraging as well towards the result and goal.

V. ACKNOWLEDGEMENT

The author wants to put on record her grateful thanks to all the staff members of the Department of Chemistry P.M.B. Gujarati Science College Indore and the Department of Botany P.M.B. Gujarati Science College Indore (for providing laboratory facilities), Prof. Dr M.L. Gangwal, Prof. Dr Mrs. Kumud Modi and Mr Yogesh Titariya for fulfilling this task under their kind guidance. No funding was provided by any organization for this work.

REFERENCES

- [1] Sharma, P. V., Dravyaguna, V. (2005), Vol. II (in Hindi), reprint, Chaukambha Bharti Academy, Varanasi.
- [2] Madhavan, V., Tijare, R. D., Mythreyi, R., Gurudeva, M. R., Yoganarasimhan, S. N. (2010). Pharmacognostical studies on the root tubers of *Asparagus gonocladus* Baker - Alternate source for the Ayurvedic drug Satavari, *Indian J Nature Resour.*, 1(1), 57-62.
- [3] Gomase, V. S., Sherkhane, A. S. (2010). Isolation, structure elucidation and biotransformation studies on secondary metabolites from *Asparagus racemosus*, *Inter J Microbio.*, 2, 7-9.

- [4] Krtikar, K. R., Basu, B. D. (1975). *Indian Materia Medica, India*, 3, 2499-2501.
- [5] Goyal, R. K., Singh, J., Lal, H. (2003). *Asparagus racemosus- An update. Ind. J Med Sci.*, 57, 408-414.
- [6] Patel, L. S., Patel, R. S. (2013). *Preliminary phytochemical analysis of root extracts of Asparagus racemosus Willd. Life Sciences Leaflets*, 5, 72-77.
- [7] Rahman, Magbool, F. Al., Elnima, I., Shayoub, M. E., Hussein, S. E. (2018). *Antifungal Potential of Quercus Infectoria Galls against Candida Abican-An Invitro Study, European Journal of Biomedical and Pharmaceutical Sciences*, 5(2), 22-27.
- [8] Battu, G. R., Kumar, B. M. (2010). *Anti-inflammatory activity of leaf extract of Asparagus racemosus Willd. Int. J. Chem. Sci.*, 8(2), 1329-1338.
- [9] Madahavan, V., Tijare, R. D., Mythreyi, R., Gurudeva, Yoganarasimhan (2010). *Pharmacognostical studies on the root tubers of Asparagus racemosus Baker- Alternative source for the Ayurvedic drug Shatavari*, 1(1), 57-62.
- [10] Raval, P. K., Nishteshwar, K., Patel, B.R., Shukla, J. (2012). *Asparagus racemosus Wild. – A Comparative Phytochemical analysis of fresh dried roots of Shatavari. International Journal of Pharmaceutical & Biological Archives*, 3(6), 1458-1461.
- [11] Garabadu, D., Murugananadam, A.V., Joshi, V. K., Krishnamurthy, S. (2009). *PharmacolBiochemBehav*, 91(3), 283-90.
- [12] Sairam, K., Priyambada, S., Aryya, N., CandGoel, R. K. (2009). *J Ethanopharmacol*, 86(1), 1-10.