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ANALYTIC STUDY OF STANAYASODHANA GANA: AN AYURVEDIC FORMULATION FOR THE MANAGEMENT OF PCOS

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ABSTRACT

Background: PCOS is the most common syndrome among reproductive age as well as adolescence girls. The prevalence in India of **polycystic ovary syndrome** (**PCOS**) in women of reproductive age ranges between 9.13% to 36%. It is an endocrinal disorder in which the pathology establishes from the alteration of HPO axis. In Ayurvedic texts, eight type of *Artava Dushti* is described by the *Acharya Shushruta* in which Vata – Kapha Artava Dushti is resemble to the PCOS. Stanayasodhana Gana shown encouraging result in the management of PCOS. **Aims and objectives:** To analyse the pharmacological and pharmaceutical character of Stanayasodhana Gana. **Material and method:** Final product of the drug was subjected to pharmacological and pharmaceutical study like loss on drying, ash value, microscopic analysis etc. **Result:** Pharmacognostical analysis shown drug content like Cork cell of Guduchi, stone cell of Sariva, fibers passing through medullar vesseles, prismatic crystal of Kutaj etc. while in pharmaceutical analysis ash value, LOD, HPTLC, etc was evaluated. **Conclusion:** Present study is carried out to standardize the formulation and to know specific characters of the formulation.

KEYWORDS: PCOS, Artava Dushti, Stanayasodhana Gana, Pharmacognosy, Pharmaceutical.

INTRODUCTION

PCOS is the most common syndrome among reproductive age as well as adolescence girls. The prevalence in India of **polycystic ovary syndrome** (**PCOS**) in women of reproductive

age ranges between 9.13% to 36%.[1] In spt. 2018, A cross section community based study was conducted among the school going girls in five schools of Ahmedabad Gujarat region in which Out of 881 girls, 119 (13.54%) girls were found to have PCOS, as defined by the Rotterdam criteria.[2] It is an endocrinal disorder in which the pathology establishes from the alteration of HPO axis. In PCOS, there is changes in ovarian morphology due to the undermine function of endocrine glands like hypothalamus and pituitary. PCOS appears with the distinct signs and symptoms in the person. 68% of the women suffer from the lifestyle disorder.[3] Defective life style, stress, anxiety, lack of physical activity, unhealthy eating, alcohol, drugs and smoking are the causes of PCOS. Initially disease appears with the mild symptoms like weight gain, pigmentation of skin (neck region, inner thigh and arm pit), irregular and scanty menstruation etc. With the time disease advanced as result of further intake of causes. The exact patho physiology of PCOS is poorly known.

In Ayurvedic texts, eight type of *Artava Dushti* is described by the *Acharya Shushruta* which ultimately results in the *Beeja Dushti*.[4] This condition is same as of the anovulation in the PCOS, which is leading cause of infertility. Acharya Charak has described Stanayasodhana Gana under the heading of Mahakashaya.[5] Stanaya and Artava both are said Updhatu of Rasa Dhatu.[6] Therefore the Stanayasodhana Gana (SSG) may also effective in the management in Artava Dushti.

According to World Health Organization (WHO) traditional, complementary, alternative, or nonconventional medicines are used by 70-95% of global population particularly in developing countries for their healthcare.[7] Moreover, the use of herbal medicines has increased remarkably in line with the global trend of people returning to natural therapies.[8]

The Indian system of medicine, mainly comprising of Ayurveda, Siddha and Unani, is one of the oldest holistic management system with thoroughly documented remedies. Ayurveda, a part of the cultural heritage of India, is widely respected for its uniqueness and global acceptance as it offers natural ways to treat diseases and promote healthcare.[9]

MATERIAL AND METHODS

Collection of raw drugs

All the raw drug was collected from the pharmacy of Gujrat Ayurveda University.

Table no 1: Ingredient of Stanayasodhana Gana.

S.n.	Drug	Botanical Name	Part Used	Form	Ratio
1.	Patha	*Cissampelos pareira* Linn.	Whole plant	Churna (Fine powder)	1 Part
2	Shunthi	*Zingiber officinale* Roxb	Rhizome	Churna (Fine powder)	1 Part
3.	Devdaru	*Cedrus deodara* Roxb	Bark	Churna (Fine powder)	1 Part
4.	Musta	*Cyperus rotundus* Linn	Rhizome	Churna (Fine powder)	1 Part
5.	Murva	*Marsdenia tenacissima* W.&A	Root	Churna (Fine powder)	1 Part
6.	Guduchi	*Tinospora cordifolia* Willd.	Stem	Churna (Fine powder)	1 Part
7.	Kutaj	*Holarrhena antidysenterica* Wall	Seed	Churna (Fine powder)	1 Part
8.	Chiraita	*Swertia chirata* Roxb.	Whole plant	Churna (Fine powder)	1 Part
9.	Kutki	*Picrorhiza kurroa* Royle ex Benth.	Rhizome	Churna (Fine powder)	1 Part
10.	Sariva	*Hemidesmus indicus* R. Br.	Whole plant	Churna (Fine powder)	1 Part

Preperation of Stanayasodhana Gana Churna

All the raw drug mentioned in Stanayasodhana Gana i.e. Patha, Shunthi, Devdaru, Musta, Murva, Guduchi, Kutaj, Chiraita, Kutki, sariva was taken individually and grind to make a fine powder. All the powder was mixed well to attain a homogenous mixture. Powder was than packed in air tight container.

Organoleptic Evaluation

Organoleptic character like colour odour taste and touch are recorded of Stanayasodhana Gana.

Microscopic Evaluation

To perform the microscopic study of Stanayasodhana Gana, powder was stained with different stains for the observation of different crystals. First the powder was dissolved in distilled water for the observation of calcium oxalate crystal and other cellular materials. After that stained with Phloroglucinal and conc. HCl for the lignified charecters. For the observation of starch grain it was stained with iodine. The diagnostic characteristic microphotographs are taken by using Carl zeiss trinocular microscope.

Physico-chemical analysis

In API and CCRAS, common parameters mentioned for Churna are total Ash value, pH value, water soluble and methanol soluble extracts.[10] Drug was tested on all these parameters.

High performance thin layer chromatography[11]

The HPTLC profiles of methanolic extract of the polyherbal formulation Stanayasodhana Gana.

- Stationary Phase – Silica Gel GF 254.
- Mobile Phase – Toluene: Ethyl Acetate: acetic acid (7: 2 : 1) V/V.
- Detection – Short UV (254 nm), Long UV (366 nm)

The chromatograph was performed by spotting metahanolic extract of Triphaladi Compound on pre coated silica gel aluminium plate GF-254 (250 µm thickness) using Camag Linomat V sample applicator and 100µl Hamilton syringe. The 05 µl of samples, in the form of bands of length 05 mm, were spotted 15 mm from the bottom, 10 mm apart, using nitrogen aspirator. Subsequent to the development, TLC plates were dried in a current of air with the help of an air dryer. Densitometric scanning was performed on Camag TLC scanner III in the remmision mode.

OBSERVATION AND RESULT

Pharmacognostical study

Table no 2: Organoleptic characters.

Sr. no	Characters	Result
1.	Color	Light Greenish Grey
2.	Odour	Slightly Aromatic
3.	Taste	Astringent followed by bitter
4.	Touch	Fine Course
5.	Texture	Powder

Table no. 3: Microscopic characters of raw drugs of Stanayasodhana Gana.

Sr. no	Drug Name	Part Used	Characters observed.
1.	*Patha*	Whole plant	Cystolith, Annular vessels, Pitted vessels
2.	*Sunthi*	Rhizome	Starch grain, Oleo-resin content, Fragment of scleriform vessels.
3.	*Devdaru*	Bark	Fibers, Phloem fiber.
4.	*Musta*	Rhizome	Starch grain.
5.	*Murva*	Root	Fibers, Rosette crystal, Stone cell.
6.	*Guduchi*	Stem	Cork cell, Starch grain, Cholencyma cell.
7.	*Kutaja*	Seed	Prismatiuc crystal, Stone cell.
8.	*Kiratikta*	Whole plant	Stone cell.
9.	*Kutki*	Rhizome	Brown content, Pitted vessels, Fiber.
10.	*Sariva*	Whole plant	Stone cell, Cork cell, Lignified fiber.

Table no 4: Physio chemical analysis.

No.	Name of the Test	Value
1.	Loss of drying (at 110°c)	1.3 % w/w.
2.	Ash Value	5.6% w/w
3.	Water soluble extraction	8.14 % w/w.
4.	Alcohol soluble extraction	7.38 % w/w.
5.	pH value by pH paper	6.5

High performance thin layer chromatography (HPTLC)

Chromatographic study (HPTLC) was carried out under 254 and 366 nm UV to establish Finger printing profile. It showed 7 spots at 254 nm with Rf values and 5 spots at 366 nm with Rf values were recorded which may be responsible for expression of its pharmacological and clinical actions. (PLATE- 2).

Table no 5:

Sr. no	Sample	Condition	No. of spot	Rf
1.	Stanayasodhana Gana	Short UV–254 nm	6	0.03, 0.10, 0.33, 0.61, 0.64, 0.92.
		Long UV–366 Nm	4	0.03, 0.33, 0.61, 0.64.

Plate no 1: Microphotographs of Stanayasodhana Gana.

Image 1: *Stanayasodhana Gana* powder.

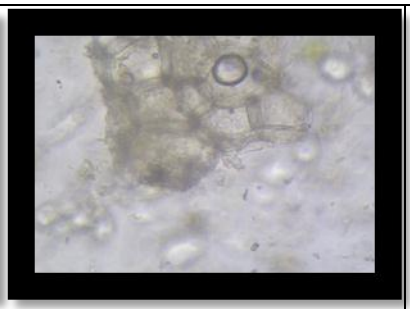


Image 2: Cork cell of *Guduchi*.

Image 3: Stone cell of *Sariva*.

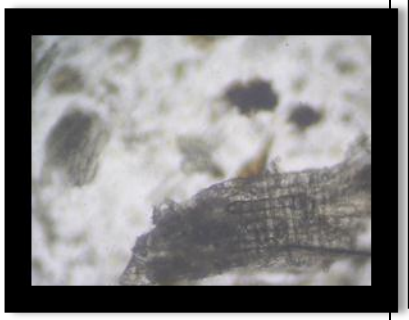


Image 4: Fibers passing through medullary vessels.

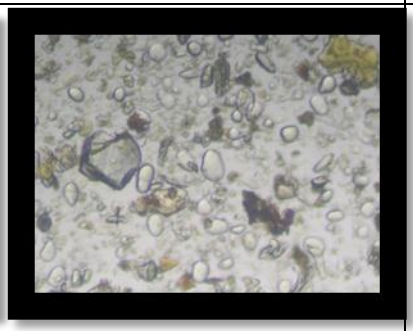


Image 5: Prismatic crystals of *Kutaj*.

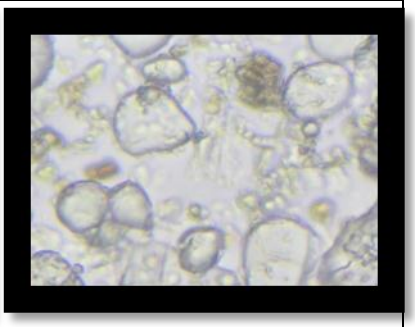


Image 6: Starch grain of *Shunthi*.

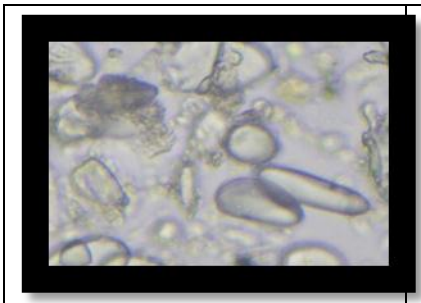
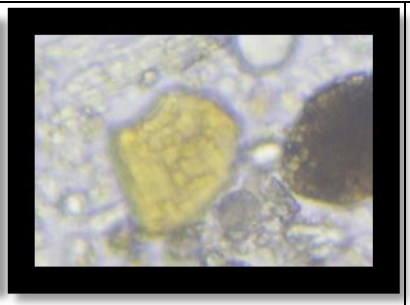
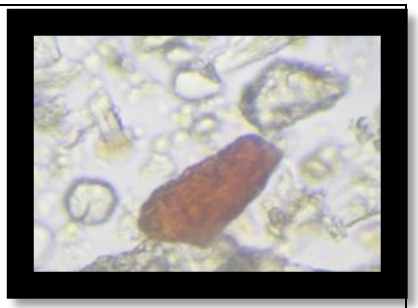
		

Image 7: Starch grain of *Guduchi*.	**Image 8: Oleo-resin content of *Shunthi*.**	**Image 9: Brown content of *Kutki*.**

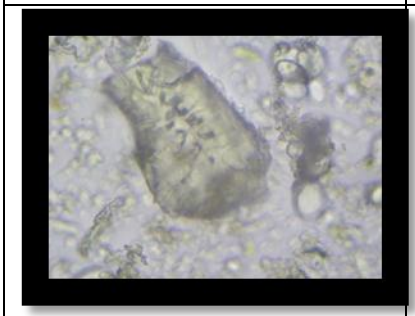
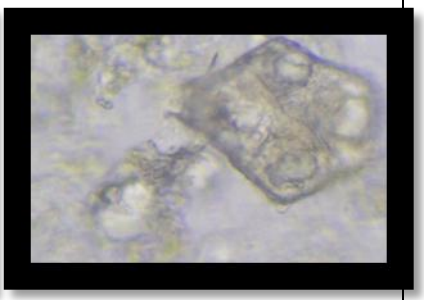

		

Image 10: Stone cell of Kutaj.	**Image 11: Fibers of *Devdaru*.**	**Image 12: Collenchyma cell of *Guduchi*.**

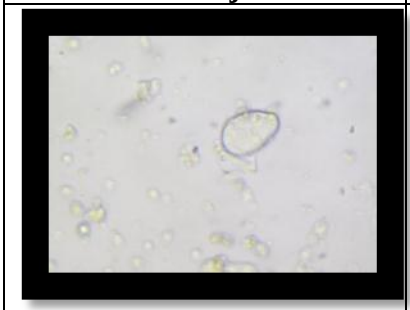
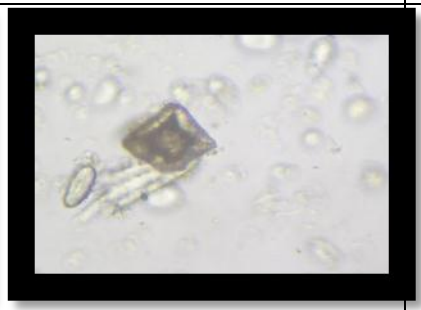

	

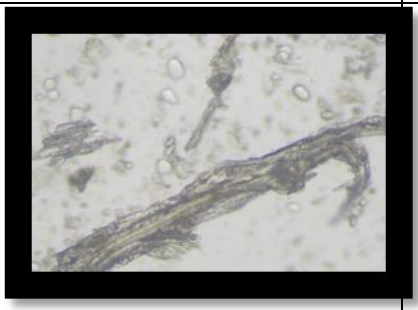
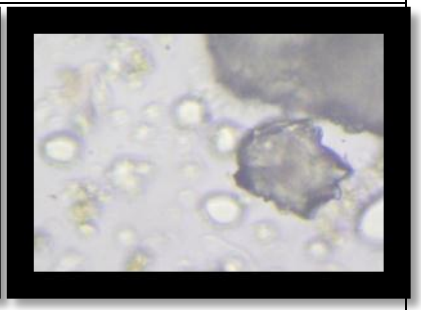
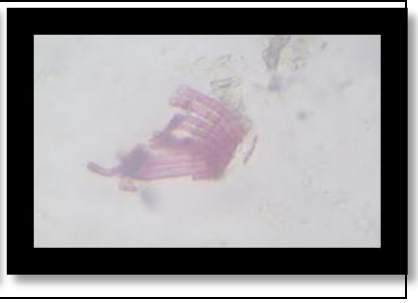
Image 13: Cork cell of *Sariva*.	**Image 14: Starch grain of *Musta*.**	**Image 15: Stone cell of *Kiratikta*.**
		
Image 16: Cystolith of *Patha*.	**Image 17: Pitted vessels of *Kutki*.**	**Image 18: Annular vessels of *Patha*.**
		

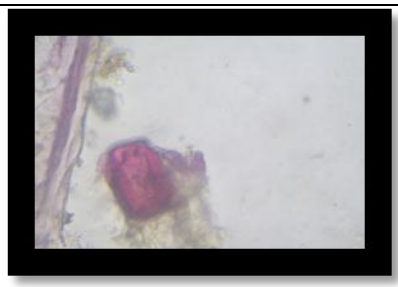
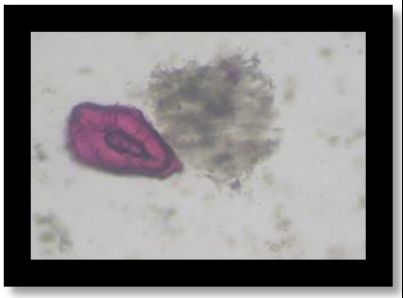
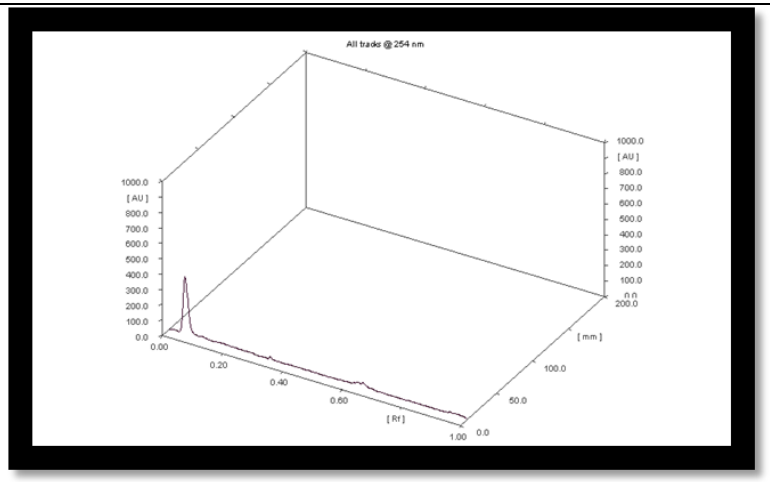
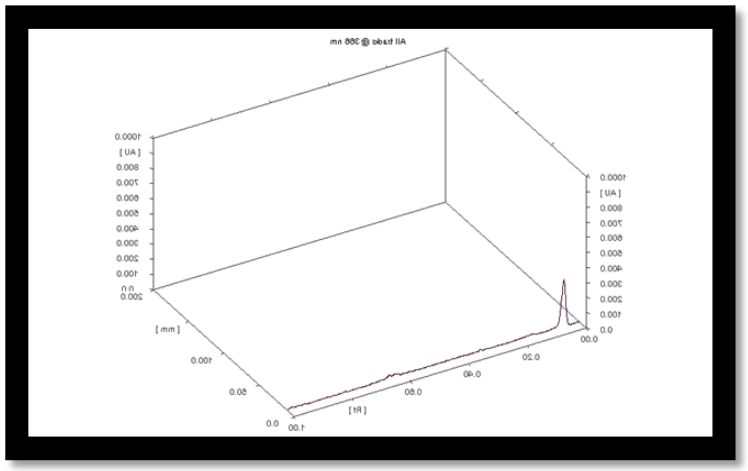
Image 19: Fibers of *Murva*.	Image 20: Roseate crystals of *Murva*.	Image 21: Phloem fibers of *Deodara*.
		
Image 22: Pitted vessels of *Patha*.	Image 23: Fragments of scleriform vessels of *Shunthi*.	Image 24: Stone cell of *Sariva*.

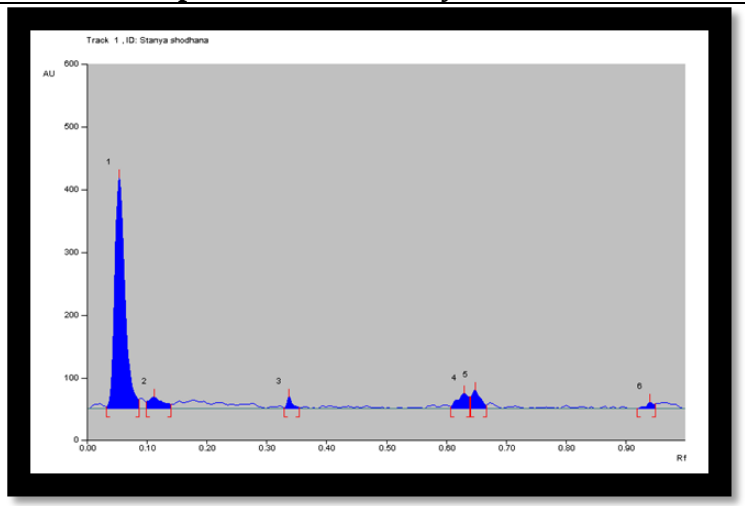
Plate no 2:



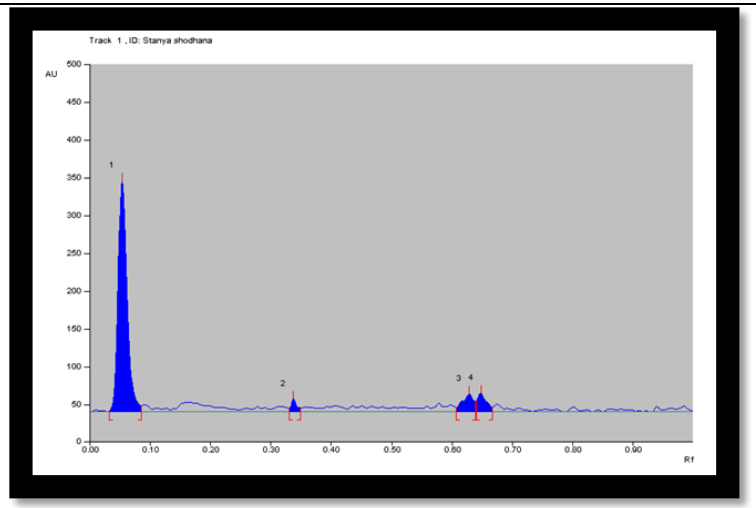
3D Graph: 254nm of *Stanayasodhana Gana*.



3D Graph: 366nm of *Stanayasodhana Gana*.



Chromatographic Results (Peak display) of *Stanayasodhana Gana* at Short ultra violet (254 nm).



Chromatographic Results (Peak display) of *Stanayasodhana Gana* at Short ultra violet (366 nm).

DISCUSSION

Pharmacognosy and pharmaceutical evaluation of *Stanayasodhana Gana* was performed by following standard measures. In Pharmacognostical evalution, organoleptic characters of the sample was light greenish yellow in color, slightly aromatic in odour, astringent followed by bitter in taste, and fine course in consistency. In pharmaceutical study, it showed 6 spots at 254 nm with Rf values and 4 spots at 366 nm with Rf values were recorded which may be responsible for expression of its pharmacological and clinical actions.

CONCLUSION

Pharmacognostical study confirm that all the characters were found in ingredient drugs of Stanayasodhana Gana. Formulation meets maximum qualitative standards and parameters. The Outcome of the study can be taken as standard references for the further studies.

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