

PHARMACOGNOSTICAL AND PHARMACEUTICAL EVALUATION OF MUSTAKADI
VATISonam Chaudhary*¹, K. S. Patel², V. K. Kori³, Harisha C. R.⁴ and Shukla V. J.⁵¹PG Scholar Dept, of Kaumarbhritya.²Prof. & H.O.D. Dept, of Kaumarbhritya.³Asso. Prof., Dept. of Kaumarbhritya.⁴Head, Pharmacognocny Lab.⁵Head, Pharmaceutical Chemistry lab, IPGT & RA, Jamnagar.

*Corresponding Author: Sonam Chaudhary

PG Scholar Dept, of Kaumarbhritya.

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ABSTARCT

Grahani is the *Adhishthana* of *Agni* and *Agni Dushti* is the main reason of the disease. The disease *Grahani Dosha* is very commonly seen in present pediatric practice due to highly faulty dietary habits with clinical features of *Muhurbaddha Muhurshithila Mala Pravritti* (bowel disturbances), *Udara Shula* (abdominal pain), *Aruchi* (loss of appetite) etc. and it aggravates to form a critical condition if the proper care is not taken. As per classical literature *Mustakadi Churna* is indicated in such condition. In this study *Mustakadi Churna* is converted into *Vati* form due to easy palatability in pediatric patients. **Methods:** Final product was subjected to Phrmacognostical and physico-chemical analysis such as microscopic study, loss on drying, ash value, pH etc. **Results:** Phrmacognostical study showed the presence of contents such as; Silica deposition and Starch grains of *Musta*, Rhomboidal Crystal, Stone cells and Cork cells of *Kutaja*, Oil globule, Cork cells and Stone cells of *Bilwa*, Brown content, *Starch grains and Pitted Vessels* of *Ativisha*. **Conclusion:** The present work was carried out to standardize the finished product *Mustakadi Vati* in terms of its identity, quality and purity. Pharmacognostical and Physico-chemical observations revealed the specific characters of all active constituents used in the preparation.

KEYWORDS: *Grahani Dosha*, *Mustakadi Vati*, Pharmacognosy, Pharmaceutics, HPTLC.

INTRODUCTION

Grahani Dosha is common problem in childhood due to over eating, more ingestion of cool (ice cream), heavy, dry, fried food and changing lifestyle. Children generally have irregular *Agni*, it can be vitiated easily by above food habits and life style. All these disturb the function of digestion and absorption. These digestions and absoption related problems lead to malnutririon and hamper growth of child, these all are covered under *Grahani Dosha*. *Grahani Dosha* is due to functional derangement of *Grahani*. *Grahani Roga* is advanced stage of it. *Grahani Dosha* is the disease of G.I. tract and is related with *Agnidushti*. *Grahani Dosha* is explained in *Bruhatrayee* as well *Laghutrayee*. In ayurvedic text it is one of the main disorder of G.I. tract. *Grahani Roga* is *Tridoshatamka*, there is vitiation of *Pachaka agni*, *Samana vayu* and *Kledaka kapha*. It presents with symptoms like *Muhurbadhha-Muhurdrava Malapravruti*,^[1] *Udarshoola*, *Aamyukta Malapravruti*, *Arochaka* etc.

Grahani is the *adhishthana* of *Agni*,^[2] and due to weakness of *Agni*, *Grahani* gets vitiated and releases

indigested food. This overall stimulates formation of *Ama* which leads to *Grahani Dosha*. *Agnimandhya* is important causative factor of *Grahani Dosha*. Thus, drug should administer in *Grahani Dosha* which has *Agnivardhaka* and *Deepana*, *Pachana* properties. In *Bhavprakash Samhita*, *Mustakadi Vati*,^[3] has been mentioned in the management of the *Grahani Dosha*. *Mustakadi Vati* contains 4 ingredients i.e. *Ativisha*, *Mustaka*, *Bilwa*, *Kutaja* which have the *Agnivardhaka* and *Deepana*, *Pachana* properties. In the present study, the formulation is subjected to Pharmacognostical and pharmaceutical analysis to standardize the finished product *Mustakadi Vati* were verified and all the ingredients were proved to be authentic.

MATERIALS AND METHODS

Drug Material

Raw drug materials were collected from the pharmacy of Gujarat Ayurveda University. The ingredients and the part used are given in table no 1.

Methods of preparation of Mustakadi Vati

All the dried ingredients of *Mustakadi Vati* were taken and first converted into *Churna* (fine powder) was prepared. For the purpose of the binding 10% gum acacia was mixed in this combination. Then this mixture was converted into granules by using the granular machine. Lastly, 500 mg Tablets were made in Tablet making machine.

Pharmacognostical study

Raw drugs were identified and authenticated by the Pharmacognosy laboratory, I.P.G.T & R.A., Jamnagar. The identification was carried out based on the morphological features, organoleptic features and powder microscopy of the individual drug. Later, Pharmacognostical evaluation of the Tablets were carried out. Tablet was dissolved in small quantity of distilled water, filtered through filter paper and studied under the microscope attached with camera, with stain and without stain. The microphotographs were also taken under the microscope.^[4]

Physicochemical Evaluation

Mustakadi Vati was analyzed by using standard qualitative and quantitative parameters, HPTLC was carried out after making appropriate solvent system with Methanolic extract of *Mustakadi Vati* at the Pharmaceutical Chemistry lab, I.P.G.T. & R.A. Gujarat Ayurved University, Jamnagar.^[5,6]

OBSERVATION AND RESULTS

Organoleptic Evaluation

Various parameters of the material such as colour, odour, touch and taste of the *Mustakadi Vati* observed and recorded. Touch were analyzed with the help of *Darshana, Sparshana, Ghrana and Rasana Pareeksha* mentioned in Ayurveda. Results are mentioned in the Table no.2.

Table 1: Ingredients of Mustakadi Vati.

No.	Drug Name	Botanical Name	Part to be Used	Quantity
1	<i>Ativisha</i>	<i>Aconitum heterophyllum</i> Wall. Cat.	<i>Shushka Mula (Kanda)</i>	1 Part
2	<i>Mustaka</i>	<i>Cyperus rotundus</i> Linn.	<i>Shushka Kanda</i>	1 Part
3	<i>Bilva</i>	<i>Aegle marmelos</i> Corr.	<i>Shushka Beejamajja</i>	1 Part
4	<i>Kutaja</i>	<i>Holarrhena antidysenterica</i> Wall.	<i>Shushka Twaka</i>	1 Part

Table 2: Organoleptic characters of Mustakadi Vati.

S. No.	Parameter	Result
1	Color	Creamish Grey
2	Odour	Slightly Aromatic
3	Taste	Bitter Pungent
4	Touch	Hard
5	Form	<i>Vati</i>

Microscopic study

The powder microscopy of *Mustakadi Vati* confirmed the features of Silica deposition of *Musta*, Rhomboidal Crystal of *Kutaja*, Oil globule of *Bilwa*, Compound starch grain of *Musta*, Rhomboidal Crystal of *Bilwa*, Stone cells of *Kutaja*, Stone cells of *Bilwa*, Fibre of *Bilwa*, Brown content of *Ativisha*, Cork cell of *Bilwa*, Stone cells of *Musta*, Pitted vesicles of *Ativisha*, Starch grains of *Musta*, Starch grains of *Ativisha*, Lignified stone cells of *Bilwa*, Lignified stone cells of *Musta*, Lignified stone cells of *Kutaja*, Cork cells of *Kutaja* which are depicted in [plate 1].

Physico-chemical Analysis

Following Physical parameters of *Mustakadi Vati* were analyzed and results are mentioned in the table no.3. Physical analysis like Shape, Size, Weight variation, Hardness, Disintegration time and Uniformity of weight were recorded.

Qualitative analysis

Physico-chemical analyses were carried out by following the parameters. Physico-chemical analysis like loss on drying at 110°C, pH value, ash value, water soluble extractive, methanol soluble extractive¹² were recorded. Results are mentioned in the table no. 4.

High Performance Thin Layer Chromatography (HPTLC)

HPTLC was carried out after making appropriate solvent system with Methanolic extract of *Mustakadi Vati*. On performing HPTLC, visual observed tablet under UV light, showed few spots but on analyzing under densitometer at 254nm and 366nm it resulted into 3 spots respectively. Results of HPTLC are given in Table no. 5 and densitogram is shown in plate 2.

Table 3: Physical analysis of Mustakadi Vati.

1	Shape	Round	
2	Size	0.6cm	
3	Weight Variation	5%	
4	Hardness	4 Kg/Cm ²	
5	Disintegration Time	28 Minutes	
6	Uniformity	Max.(Mg) Wt.	520mg
		Min.(Mg) Wt.	458mg
		Avg.(Mg) Wt	495mg

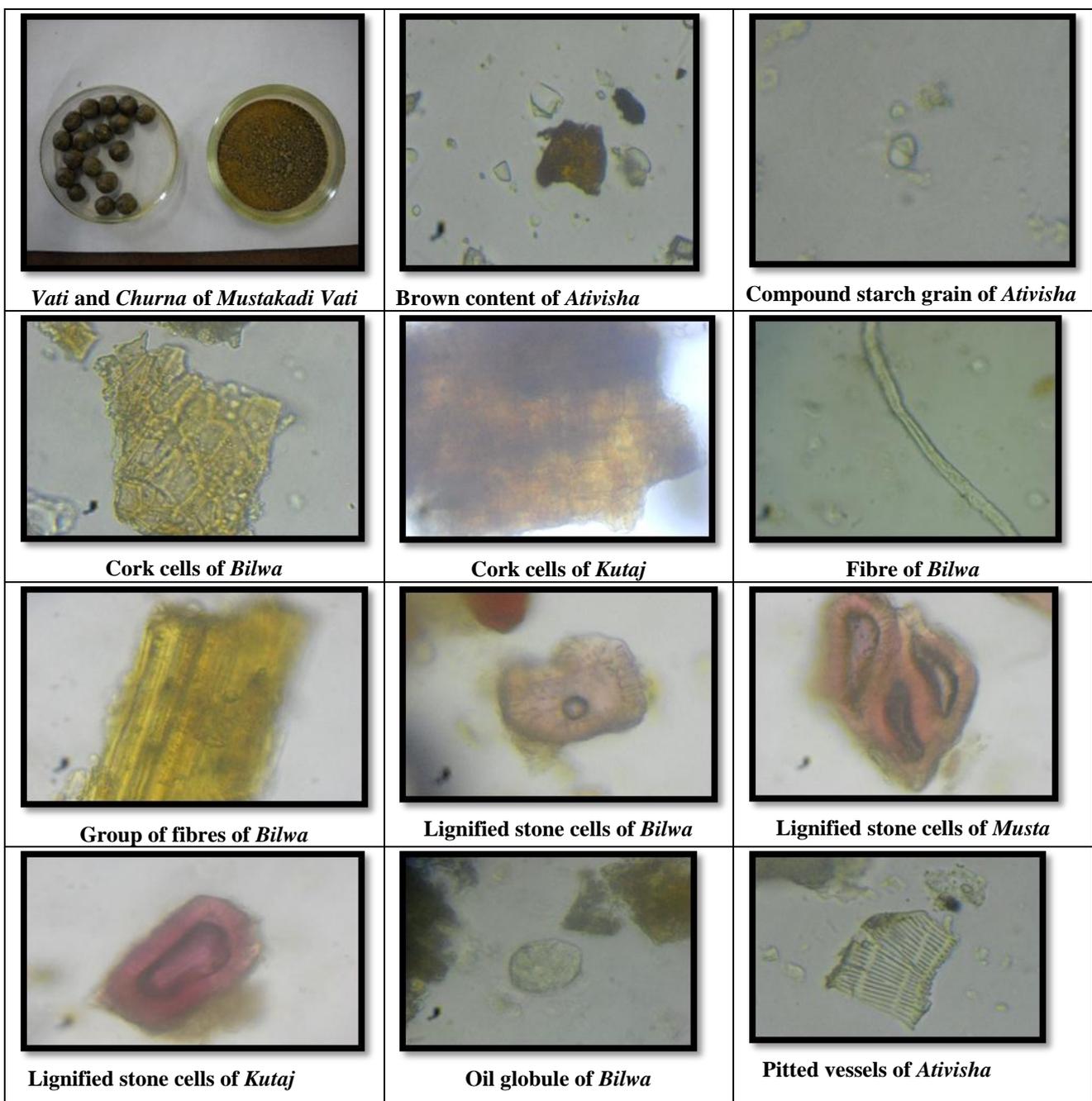
Table 4: Physico-chemical analysis of *Mustakadi Vati*.

S. No.	Physicochemical constants	Mustakadi Vati Value
1	Percentage of loss on drying	8.54%
2.	Percentage of ash content	11%
3	Percentage of alcohol soluble Extract	6.9%
4.	Percentage of water-soluble Extract	13%
5	pH	6

Table 5: Results of HPTLC of *Mustakadi Vati*: Solvent system – Toluene: Ethyl acetate: Acetic Acid (7:2:1)

Wave Lengths	Short UV (254nm)	Long UV (366nm)
No of Spots	6	4
Max. Rf value	0.02, 0.09, 0.16, 0.41, 0.50, 0.90	0.02, 0.13, 0.22, 0.51

Plate 1: Microscopic characters of *Mustakadi Vati*.



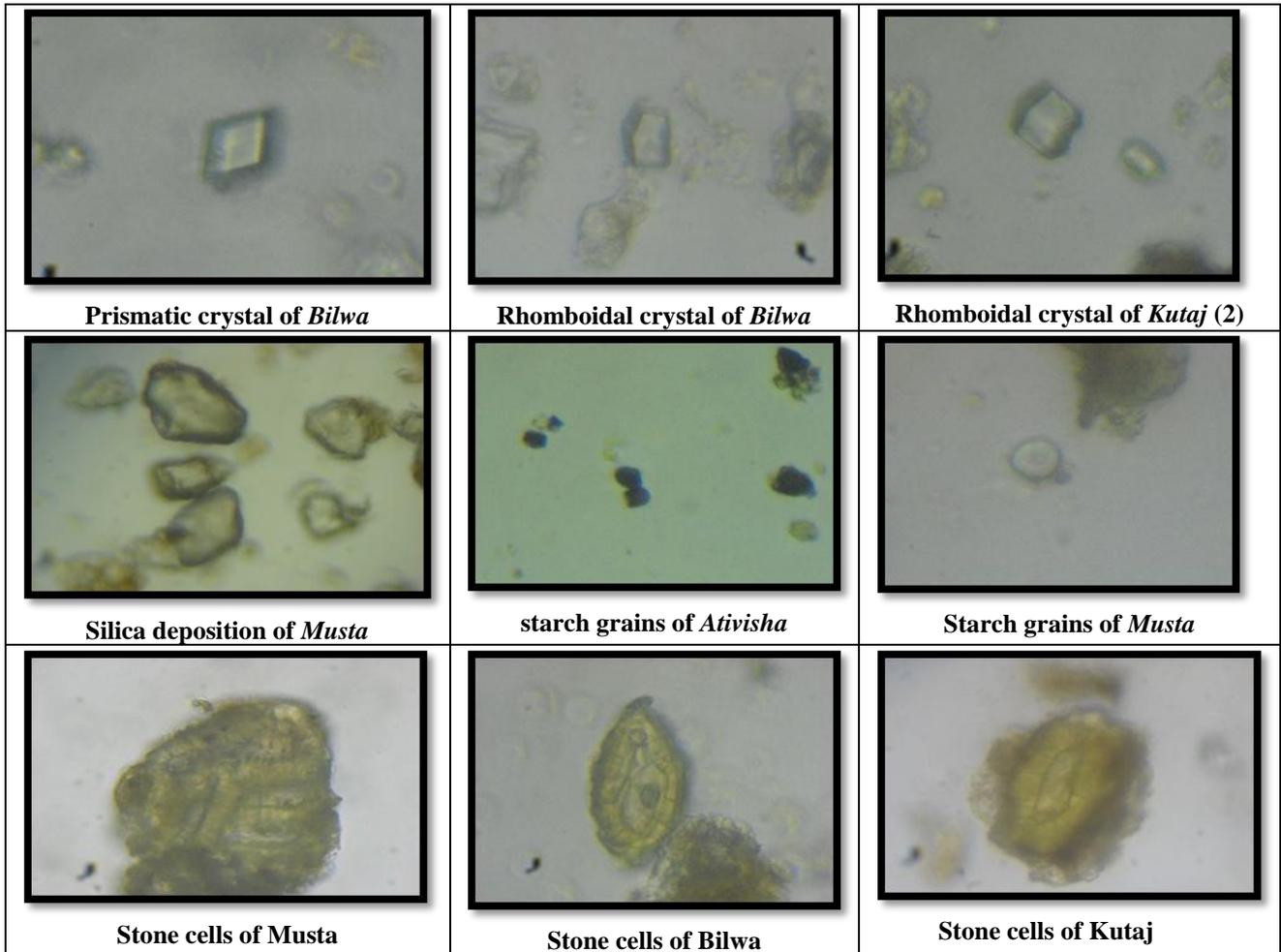


Plate 2: Densitogram of *Mustakadi Vati* at 254 nm and 366 nm.

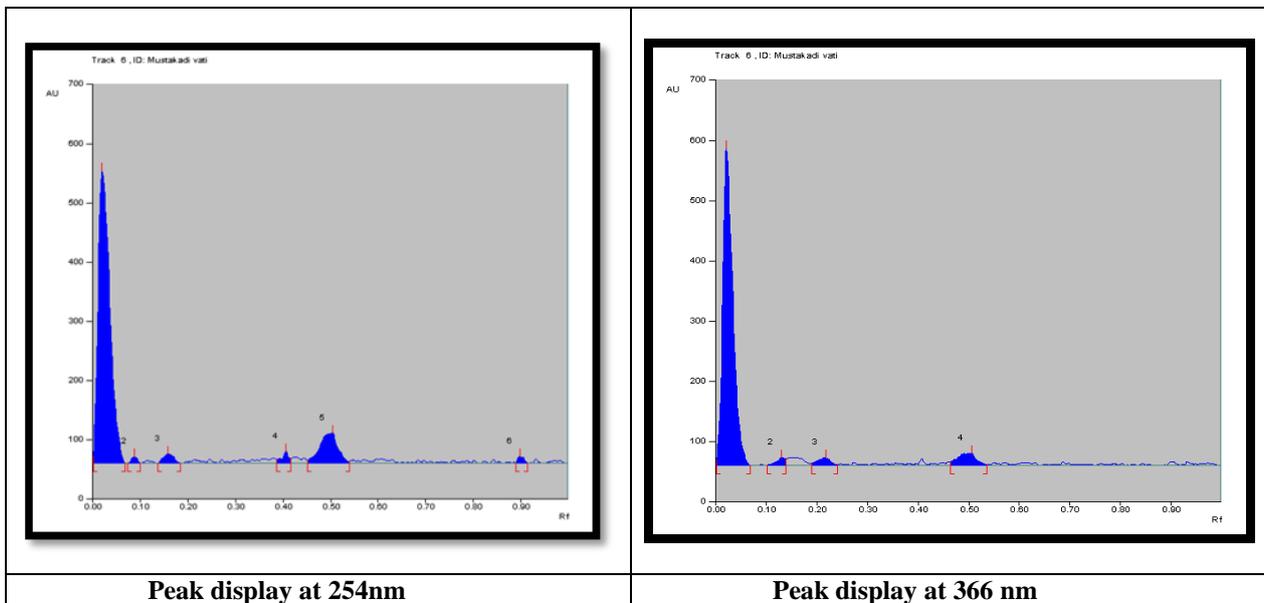
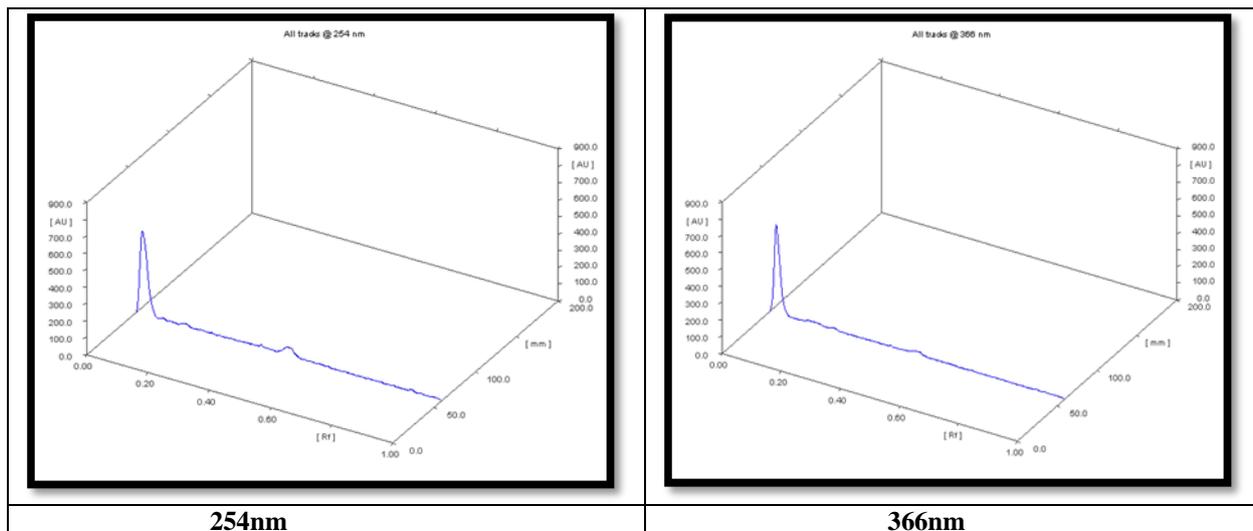


Plate 3: Three dimensional HPTLC (3D) Densitogram



DISCUSSION

Pharmacognosy and pharmaceutical evaluation of *Mustakadi Vati* was performed which is a potent medicine in the management of *Grahani Dosh*. In physicochemical analysis, Uniformity of Tablets, Hardness of Tablets, Loss on Drying (110° C), Ash Value, Water Soluble Extract, Methanol Soluble Extract, and pH (10% Aqua solution) were assessed. Though the important analysis and investigations are required for the identification of all the active chemical constituents of the test drug to substantiate the clinical efficacy.

CONCLUSION

Pharmacognostical study findings confirm that all characters were found in ingredient drugs of *Mustakadi Vati*. The physicochemical analysis is inferred that the formulation meets maximum qualitative standards and all the parameters discussed here may be used as identifying tools for the quality assessment of *Mustakadi Vati*. Thus, Outcome of the study may be taken as standard references groundwork requisites for the standardization of *Mustakadi Vati* are covered in the current study, additional for the further studies.

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