

Rheological Study of *Sterculia Urens* and *Butea Monosperma* Gum From Gadchiroli District, Maharashtra, India

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Manuscript Details

Available online on <https://www.irjse.in>
ISSN: 2322-0015

Editor: Dr. Arvind Chavhan

Cite this article as:

Kadu Ashwini M and Rewatkar Suresh B. Rheological Study of *Sterculia Urens* and *Butea Monosperma* Gum From Gadchiroli District, Maharashtra, *Int. Res. Journal of Science & Engineering*, 2021, Special Issue A11: XX-XX.

Article published in Special issue of National online Conference on "Emerging Trends in Science and technology 2021" organized by Arvindbabu Deshmukh Mahavidyalaya Barsingi, Tal. Narkhed, Dist. Nagpur, Maharashtra, India date, June 10, 2021.



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Abstract

The work is related to variation in viscosity at the different concentration of the gum samples. The gum sample was collected from Gadchiroli District of Maharashtra State, during summer season. The study of viscosity is carried out at 30⁰ C. The resulted relative viscosities for the concentration of the gum samples 0.2%, 0.4%, 0.6%, 0.8%, 1.0% are 12.08, 13.09, 14.23, 15.42, 16.85 and 10.38, 10.76, 11.27, 11.78, 12.44 for *Sterculia urens* and *Butea monosperma* gum samples respectively.

Keywords: Rheological study, *Gterculia urens*, *Butea monosperma*, gum, Gadchiroli.

Introduction

Gadchiroli is one of the district of Maharashtra State. The complete Gadchiroli district has twelve talukas, with the total land area 14412 Sq.Km. with about 78.4% area covered by reserve forest. The Gadchiroli district has a rich heritage of flora and fauna. The trible (S.T.) population of the district is 38.3% [1]. Thus, the district is named as 'Tribal District of Maharashtra'. Similarly, the district is categorized as 'Non-Industrial District of Maharashtra'. Due to this reason an economy of the district people depends on forest products and agriculture.

At present the Gadchiroli district has twelve talukas, showing the following map. Figure 1.

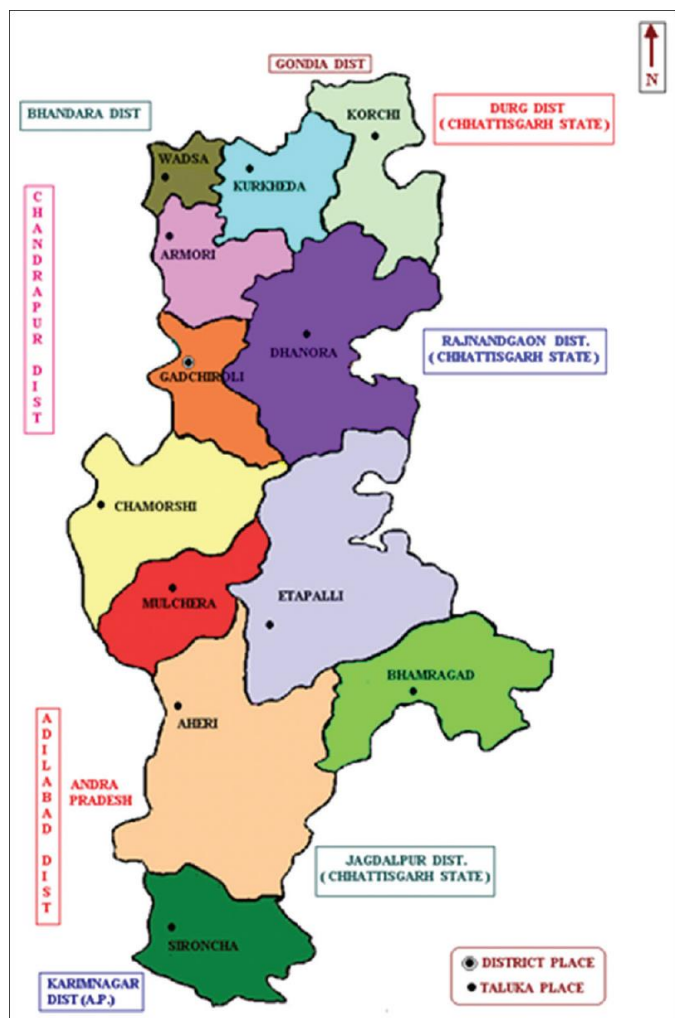


Figure 1: Gadchiroli district Map

Sterculia urens is a plant native to India from the family sterculiaceae, commonly known as Karaya. It is deciduous tree and branches spreads horizontally upto a height fifteen meters [2]. The gum karaya excuded by a tree, when a bark is damaged by making deep gashes at the trunk by an axe. The gum karaya is acetylated polysaccharides with high molecular weight and it is safe to use as a food additive [3].

Butea monosperma is a plant species from fabaceae family. The most common name of this tree is Palash. It is deciduous tree with small to medium size generally about ten-meter height palash is a beautiful tree with number of traditional and medicinal uses. It is called as "The flame of forest". It is widely used in the medicines. The plant gum is used for the treatment on microbial

and fungal infections [4]. The gum exudate is the oldest natural gum which being used from last 5000 years. as thickening agent. These gums are collected from the stems and branches of the trees in the form of dry exudates [5].

India is the major country in the world which produces nature gum about 281000 tons of gum resins annually [6]. The gums are water soluble or water swellable polysaccharides, extractable form plants and possesses an ability to contribute viscosity of gelling ability to their dispersions [7].

Present study is focused on viscosity of gum samples of *Sterculia urens* and *Butea monosperma* at different concentration.

Methodology

All the gum samples of *Sterculia urens* and *Butea monosperma* were collected from the Gadchiroli District of Maharashtra during summer season. The handpicked select gum method was used to separate and to obtain quality gum, further the gum spread out at room temperature.

Table 1: Relative viscosity for *Sterculia urens*

Sr. No.	Concentration of gum sample (%)	Relative viscosity
1	0.2	12.08
2	0.4	13.09
3	0.6	14.23
4	0.8	15.42
5	1.0	16.85

Table 2: Relative viscosity for *Butea monosperma*.

Sr. No.	Concentration of gum sample %	Relative viscosity
1	0.2	10.38
2	0.4	10.76
3	0.6	11.27
4	0.8	11.78
5	1.0	12.44



Fig.2 Gum of *Sterculia urens*



Fig.3 Gum of *Butea monosperma*

The dried sample was crushed into the fine powder with the help of a mortar and pestle, further passed through 0.4 mm mesh screen. The prepared sample was kept in tight borosil glass container and store at room temperature for further analysis.

The viscosity measurements were carried out by using U-shaped viscometer for the gum samples with concentrations 0.2%, 0.4%, 0.6%, 0.8% and 1.0%, at 30°C.

Results & Discussions

The relative viscosity of *Sterculia urens* and *Butea monosperma* gum varies from 10.08 to 16.85 and 10.38 to 12.44 respectively for the concentration 0.2% to 1.0% sample. These values are comparable with the literature values. the gum karaya used in cosmetics and medicines, in ice creams, jellies, inks, varnishes etc. the gum palash is generally used in several medicines of Ayurvedic, Unani and Siddha. The viscosity and swelling ability of the gum decides the quality of gum in industrial application.

Conflicts of interest: The authors stated that no conflicts of interest.

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