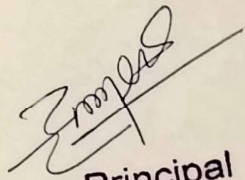


# Technical Performance of VSI Member Distilleries in Maharashtra

Financial Year 2019-20 and 2018-19



Principal  
Vasantdada Sugar Institute  
Manjari (Bk.), Tal. Haveli,  
Pune - 412 307



संशोधनेन संवृद्धिः

ISO 9001:2015

**VASANTDADA SUGAR INSTITUTE**

Manjari (Bk.), Pune 412 307, Maharashtra, India

ISBN : 978-81-934198-2-3



Peer-reviewed paper

## Treatment of spray-pond overflow wastewater of sugar mills using microalgae

Amruta Urdukhe, Sunil Dalvi and Deepali Nimbalkar

Vasantdada Sugar Institute, Pune, India; ds.nimbalkar@vsiisugar.org.in

**Abstract** Spray pond overflow is one of the effluents generated from sugar manufacturing processes and has high chemical oxygen demand (COD), total dissolved solids (TDS), total suspended solids (TSS), turbidity and hardness. Until recently it was discharged untreated, resulting in disturbance to the aquatic flora and fauna. It can also damage crops and aquatic vegetation due to the presence of excessive nutrients and is totally unfit for livestock to drink. Treatment of spray-pond overflow prior to discharge is now mandatory in India. We focused on algal treatment of spray-pond overflow. Microalgae are used for the bioremediation to reduce contaminants in the waste water due to their ability to assimilate nutrients in the cell. Here, 24- and 48-hour algal treatments were given to spray-pond overflow and physicochemical analysis was carried out by using standard methods. Measured outflow parameters and average reductions were: COD (57.9%), TDS (20.7%), total hardness (20.2%), calcium hardness (32.4%), sulphate (33.5%), potassium (35.3%), turbidity (77.6%) and TSS (97%). Algal treatment can be an effective pre-treatment method for spray-pond overflow and help to reduce the energy costs of conventional treatment to achieve disposal limits under relevant standards.

**Key words** Sugar industry, spray-pond overflow, algae, chemical oxygen demand (COD)

### INTRODUCTION

India is the second largest producer of sugar in the world with estimated production around 30 Mt in 2017-18 from more than 550 sugar mills. The sugar industry ranks second among the agro-based industries in India. The industry is seasonal in nature and operates for 150–210 days in a year (November to May). One of the major environmental impacts of a sugar mill is the generation and discharge of large quantities of wastewater and spray-pond overflow (SPOF). Sugar-mill wastewater has a high organic content and can deplete the dissolved oxygen content of water bodies if discharged untreated. The industry falls into the 'red category' of highly polluting industries as defined by the Ministry of Environment, Forest and Climate Change and must follow zero effluent discharge in inland surface waters. SPOF was, until recently, discharged untreated or with very little treatment. This resulted in disturbance to aquatic flora and fauna. The presence of excessive nutrients can also result in damage to crops if discharged on land and damage to aquatic vegetation if it enters the waterbodies. The Ministry of Environment, Forest and Climate Change revised the allowable limits for sugar industry wastewater in January 2016 (MoEFCC 2016). Accordingly, the quantity of final treated effluent discharge and SPOF or cooling-tower blow-down is restricted to 100 L/t of cane crushed. These restrictions also make it mandatory to treat the SPOF prior to discharge. The limits of different parameters allowed in discharge are given in Table 1.

Table 1. Limits for discharge of sugar mill effluent and spray-pond overflow onto land

Parameter	Range
pH	5.5-8.5
Total Suspended Solids, mg/L	≤ 100
Biological Oxygen Demand, mg/L	≤ 100
Oil and Grease, mg/L	≤ 10
Total Dissolved Solids, mg/L	≤ 2100



*Emmons*  
Principal  
Vasantdada Sugar Institute  
Manjari (Bk.), Tal. Havell,  
Dist. Pune - 412 307



## VASANTDADA SUGAR INSTITUTE PUNE

Manjari (BK.), Tal.: Haveli, Dist.: Pune 412307 : Maharashtra, India

2<sup>nd</sup> International Conference & Exhibition

on

Sustainability - Innovation & Diversification in Sugar and Allied Industry

January 31 - February 02, 2020

### CERTIFICATE

This is to certify that Abhijeet B. Muley, Sunil G. Dalvi and Rekha S. Singhal  
P. Shinde have presented a poster entitled "Effect of whey protein hydrolysates for  
promotion of in vitro growth in sugarcane (*Saccharum officinarum* L.)"  
in 2<sup>nd</sup> international Conference and Exhibition organized by  
Vasantdada Sugar Institute, Pune, India.

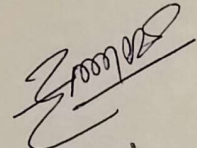
Their Contribution to the conference is highly appreciated.

Sharad Pawar  
President

Dilip Walse-Patil  
Vice-President

Shivajirao Deshmukh, IAS (Retd.)  
Director General



  
Principal  
Vasantdada Sugar Institute  
Manjari (BK.), Tal. Haveli,  
Dist. Pune - 412 307