



SENGUNTHAR ARTS AND SCIENCE COLLEGE
(Affiliated to Periyar University, Salem and Approved by AICTE, New Delhi)
An ISO 9001:2015 Certified Institution
Recognised under section 2(f) and 12(B) of the UGC Act 1956
Accredited by NAAC A+
Tiruchengode – 637 205, Namakkal dt., Tamil Nadu



3.4.1 The Institution has several collaborations/linkages for Faculty exchange, Student exchange, Internship, Field trip, on-the- job training, research etc during the year

(2022-2023)

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Probing of an Appreciable Antimicrobial Compound Producing Lactobacillus Strain from Milk Products of Thanjavur Region, Tamil Nadu and its Enhanced Production

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Lactobacillus is a heterogeneous class of lactic acid strains that synthesize bioactive compounds which contribute many health benefits to our mankind. Focusing this view, different *Lactobacillus* strains were collected from dairy products and were screened for their bioactive efficiencies against an infant diarrheal bacterial pathogen. 11 morphologically unique *Lactobacillus* strains were procured from curd, yoghurt and buttermilk purchased from the Thanjavur region, Tamil Nadu, India. While screening on a microtiter plate-based test, YMP3 revealed the best antimicrobial activity against a human pathogenic *Vibrio cholerae* with $67.0 \pm 2.1\%$ inhibition. Further, the most appreciable strain was molecularly identified as *Lactobacillus apis* YMP3 based on 16S rRNA sequencing methodology. Based on the growth kinetics profile, this strain showed maximum production of antimicrobial compound between 72 to 108 hrs of incubation. Furthermore, this strain evidenced the cultural conditions of pH 6.3 and 35°C temperature for the appreciable production of the antimicrobial compound. Based on these overall observations, the research stood as the promising baseline data for the enhanced antimicrobial investigation of this probiotic *L. apis* YMP3 against many human pathogenic strains and its possibilities for drug development.


Keywords: Bioactivity; Dairy products; Growth kinetics profile; *Lactobacillus*; Screening.

Microorganism produces numerous metabolites that have been determined to be either useful or harmful to human health¹. Among these, *Lactobacilli* are widespread lactic acid bacteria (LAB) and they are found in diverse sources including plants, dairy products, mucosal surface of the human body and other food products^{2,3,4}. The distinct characteristics of these species include gram-positive bacteria, thermophilic, homofermentative and non-spore-forming rods.

In addition, they are also characterized by the formation of lactic acid during carbohydrate metabolism⁵. According to U.S. Food and Drug Administration (FDA), *Lactobacillus* is considered a "GRAS" status strain and hence can be utilized for various industrial purposes. In recent scenarios, LAB plays a vital role in pharma industries because the probiotic properties of these bacteria help to maintain gastrointestinal tract health by inhibiting penetration of pathogens and also help to promote a good immune system⁶.

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Purification and Structural Characterization of an Antimicrobial Compound, Lipoxazolidinone A Produced by a *Lactobacillus Apis* YMP3

Dayanidhi Satish Kumar^{1,2} and Palanisamy Venkatachalam^{1*}

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Strains of *Vibrio cholerae* are one among the most causative and serious disease causing human pathogenic agents, its infections are caused mostly by ingesting contaminated water and/or food. According to the recent estimates, between 1.3 and 4.0 million individuals are infected all around the world every year. The lactic acid bacteria are an important class of probiotics microbes have their ability to produce diversified bioactive compounds, hence this study focused on the identification of a promising antimicrobial agent from a *Lactobacillus apis* YMP3. This strain was cultured on MRS broth and the cell free supernatant was ethyl acetate extracted for the antimicrobial agent. The crude extract was further purified with C18 silica gel column chromatography and structurally characterized by FT-IR, NMR, GC and MS/MS spectrum. The chemistry of the compound was confirmed as Lipoxazolidinone A which has the IUPAC name of (2E)-5-butyl-2-[(E)-4-methyl-2-oxoundec-3-enylidene]-1,3-oxazolidin-4-one. This is the first report of Lipoxazolidinone A produced by a bacterium, *L. apis* YMP3 which was originally isolated from yoghurt. This finding expands the scope of identifying more promising bioactive compounds from probiotic *Lactobacillus* sp., further, this systematic procedure for purification of this antimicrobial agent stood as the baseline data for more elaborate therapeutic studies in future.

Keywords: Antimicrobial compound; *V. cholerae*; Lipoxazolidinone A; *Lactobacillus apis*; Purification; YMP3.

Antibiotics have historically been derived from natural compounds, therefore, novel scaffolds are typically of interest. Concerns have been raised concerning the potential source of new chemical compound (NCEs) that can address the issue of constantly emerging resistance in the lack of new antibiotics. Till 2002, the vast majority of NCEs

approved for use as antibiotics were derived largely from microorganisms^{1,2}. *Lactobacilli* are essential microorganisms renowned for their fermentative activities as well as their nutritional and physiological benefits³. *Lactobacilli* have traditionally been utilized as natural bio-preservatives in food and animal feed viz.,

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The Quest for Identity in the Novels of Rohinton Mistry

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Article Received: 05/07/2022, Article Accepted: 15/08/2022, Published online: 22/08/2022, DOI:10.36993/RJOE.2022.7.3.28

Abstract

Being a social humanist, Rohinton Mistry, a Canadian, has seen the middle-class Parsi family's way of life in Bombay. The oppression and solace of interpersonal and familial ties are central themes of the book. The tale of a middle-class Parsi family going through a domestic crisis is told in the book, which is situated in Mumbai, the city where Mistry was born and raised. The consequences of state policies on private life are alluded to both now and in the past. This epic from Bombay spans three generations and laments the loss of the Parsi family. Said, Mistry wants to bring about harmony in society by comprehending the numerous issues that people face. The only allusion to Canada in Mistry's books is longing for the political and social chaos of India's postcolonial past.

Keywords: Loneliness, Identity, Struggle

Social humanist Rohinton Mistry. From his vantage point in Canada, Mistry has seen the life of a middle-class Parsi family in Bombay. The third book written

by Indian-born novelist Rohinton Mistry is titled *Family Matters*. McClelland and Stewart released the book for the first time in 2002. The story is about a middle-class Parsi family going through a home crisis and is situated in Mumbai, where Mistry was born and raised. Mistry uses one family to express various themes, including the problems facing India's Parsis and Zoroastrians of Persian ancestry and more general worries about corruption and communalism. Mistry uses a lot of dialogue while writing in straightforward language.

From his vantage point in Canada, Mistry has seen the life of a middle-class Parsi family in Bombay. The book's central themes are oppression and the consolation of personal and familial relationships. It raises questions about how public policies have affected private lives in the past and present. This Bombay epic laments the rejection of the Parsi family through a three-generational series of events. In his book *Family Matters*, Rohinton Mistry examines human fragility's emotional, financial, moral, and spiritual ramifications as we age. However, India is where it is precisely geographically and culturally situated. *Family Matters* demonstrates

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Docking of potentially bioactive compounds from *Schefflera stellata* (Geartn.) Baill against Epidermal Growth Factor Receptor in Lung cancer

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2. PG and Research Department of Biotechnology, Sengunthar Arts and Science College, Tiruchengode, Namakkal- 637205, Tamil Nadu, INDIA

3. PG and Research Department of Biotechnology, K.S. Rangasamy College of Technology, Tiruchengode-637215, Tamil Nadu, INDIA

4. Department of Zoology, Sengunthar Arts and Science College, Tiruchengode, Namakkal- 637205, Tamil Nadu, INDIA

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Abstract

Receptor tyrosine kinase is a large transmembrane protein family that is often deregulated to cause lung cancer. EGFR is a cell membrane receptor that is over-expressed in lung cancer with numerous active mutated genes. Pharmacologically active compounds were purified from methanolic leaf extract of *Schefflera stellata* (Geartn.) Baill. which shows the potent inhibitory effect on over-expressed EGFRs. FTIR analysis D4 and D5 shows the presence of different functional groups such as carboxylic acids, phenol, amines, alcohols, alkanes, alkenes, aromatics, alkyl halides, esters, aromatic amines, ethers, aliphatic amines, saturated aliphatic compounds with 14 major characteristics peaks of bioactive components.

Docking studies were carried out between the EGFR tyrosine kinase and purified bioactive compounds (D4 and D5). Totally 5 bioactive molecules were docked with both wild and mutated EGFR. The 3 ligand molecules were picked out based on their binding energy. Among 3 bioactive molecules 1, 2-benzene dicarboxylic acid, mono (2-Ethylhexyl) ester (CID 20393) was found to be most effective that inhibiting over-expressed EGFR tyrosine kinase. The results confirmed that the purified bioactive compounds of *Schefflera stellata* (Geartn.) Baill. methanolic leaf extract possessed different bioactive functional constituents and its inhibitory role in binding with the D5 compound in over-expressed EGFR in lung cancer cells using docking studies.

Keywords: *Schefflera stellata*, EGFR, FTIR, Docking, Bioactive compounds.

Introduction

Plant based medicines create more attention in recent years compared to synthetic medicines due to their dreadful consequences. Medicinal plants with their refined bioactive constituents have proven favorable therapeutic applications with lower risks. The plant contains a wide range of phytochemicals for the defense mechanism to exhibit

medicinal properties. Cancer ranks as a major reason for death worldwide. Cancer is a lethal disease that causes abnormal cellular functions that are passed on to the offspring. WHO in 2019 estimated cancer as the first or second leading cause of death before the age of 70 years in 112 out of 183 countries and ranked third or fourth in further 23 countries. In 2020, WHO estimated 2.2 million new cancer cases and 1.8 million deaths; lung cancer is the second most common and the leading cause of cancer death in 2020, constituting approximately 1 in 10 (11.4%) cancers detected and 1 in 5 (18.0%) deaths¹.

Lung cancer is commonly divided into two types, small cell and non-small cell lung cancer cells. The non-small cell lung cancer cell (NSCLC) is sub grouped as adenocarcinoma (30–40%), squamous cell carcinoma (30%) and large cell carcinoma (10%) and in small cell lung cancer (SCLC) (20%), cancer cell rapidly proliferate to other parts of the diagnosis and are also found in carcinoid and lymphoma (5%). The development of a therapeutic approach to lung cancer is one of the most challenging areas in cancer research. Bioactive plant compounds have been recognized as a class of promising anticancer agents¹². NSCLC shows the vast majority of lung cancer patients with approximately 85% and commonly diagnosed at an advanced stage with a low prognosis¹³. Receptor tyrosine kinase (RTK) is the most deregulated protein family in lung cancer⁴.

Receptor tyrosine kinase is involved in the signal transduction pathway that regulates overall cellular and metabolic processes including cell proliferation, growth, differentiation, migration and cell-to-cell communications which took over the functional activities of RTKs. The over expression of RTKs developed from mutations and gene rearrangement associated with tumor growth and progression. Epidermal growth factor receptor (EGFR) is the foremost identified receptor of tyrosine kinases which is vital for the biological functions of the cell. EGFR is over-expressed in numerous solid tumors such as GI tract, prostate, NSCL, breast, ovarian and glioblastoma¹⁴.

Schefflera is the wide geographically extensive genus in the Araliaceae with 400 to 650-700 species found in most tropical and subtropical regions but for the most part in Southeast Asia, Madagascar, New Caledonia, the Andes and

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Rajarajeshwari Ramakrishnan^{1,2}, Selvankumar Thangaswamy^{1*}, Mythili Gnanamangai Balasubramanian¹,

Mohanraj Rajamanickam¹ and Dhana Sekaran Ganesan¹

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Energy Efficient Routing Protocol for Mobile Adhoc Networks

P. Balamurugan ¹, Dr. S. Dhanalakshmi ²,

¹Research Scholar, Periyar University, Salem, India.

²Professor, Department of Computer Science, Vivekanandha College of Arts and Science for Women (Autonomous), Tiruchengode, India.

Abstract

Energy Efficient Power Reduce Routing (EEPRR) protocol reduces the energy consumption by turning off the nodes which are idle or Sleep mode. As a node consumes significant amount of energy when it is idle, that node is made to go to sleep mode and the difference of energies consumed in idle and sleep mode has been saved. Simulation results show a significant reduction in energy consumption, increase in network lifetime without affecting the throughput. Energy efficient AODV increases the network survivability and leads to a longer battery life of the nodes. They achieve balanced energy consumption with minimum overhead.


Keywords : Routing Protocols, AODV Protocol, Energy Efficient Routing Random Waypoint Mobility Model

1. INTRODUCTION

The limited energy resources of MANET force the researchers to adapt a multi-hop route communication strategy in order to preserve the node's energy and prolong the MANET's lifetime [1]. Unfortunately, route failures frequently occur in MANETs because of the mobile node's mobility and limited energy resources. For this reason, therefore, an efficient routing protocol is needed to reconnect the source-destination route whenever routes are broken, and the routing protocol algorithms must react rapidly to environmental changes. In this chapter, developed an Energy efficient power reduced an AODV routing protocol to elimination of delay and reduce routing overhead among MANET devices.

2. ROUTING PROTOCOLS

In adhoc networks all nodes are mobile and can be connected dynamically in an arbitrary manner. All nodes of these networks act as routers and take part in the discovery and maintenance of routes to other nodes in the network. Several routing protocols have been proposed for routing in MANET with the goal of achieving efficient routing. The proposed algorithms differ in the approach used for discovering a new route and maintaining an identified route when a node moves. The mobile adhoc routing protocols may be categorized as proactive (table driven), reactive (On-demand) and hybrid routing protocols.

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Bioactive Compounds of *Schefflera stellata* (Geartn.) Baill. Leaf Methanolic Extract and their Cytotoxic Effect on Lung cancer Cell Line (A549)

Rajarajeshwari Ramakrishnan^{1,2}, Selvankumar Thangaswamy^{1,*}, Mythili Gnanamangai Balasubramanian³, Mohanraj Rajamanickam³, Naresh Srinivasan³, Dhana Sekaran Ganesan⁴

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⁴Department of Botany, Sengunthar Arts and Science College, Tiruchengode, Namakkal, Tamil Nadu, INDIA.

ABSTRACT

Objectives: The present study was focused on the fractionation and isolation of biologically active plant secondary metabolites from methanol leaf extract of *Schefflera stellata* (Geartn.) Baill. and their cytotoxic effect were evaluated by performing an MTT assay over the Lung cancer cell line (A549). **Materials and Methods:** Bioactive molecules were fractionated and purified using Column and TLC. Purified constituents exhibit its antioxidant property by dot plot assay using DPPH method. The cytotoxic activity of the purified compound was evaluated by MTT assay. **Results:** Extraction, isolation, separation of bioactive molecules from methanol leaf extract of *Schefflera stellata* (Geartn.) Baill. Using silica column chromatography. 32 fractions were obtained in column and subjected to TLC and dot plot assay by DPPH method. Out of 32 fractions, 2 fractions (D4 and D5) revealed the presence of antioxidant property and were characterized by GC-MS. D5 exhibit bioactive compound, which were taken for cytotoxic studies against lung cancer cell line by MTT assay, the cell viability was found to decrease with increasing concentration (50, 100, 150, 200, 250 µg/ml) with an IC₅₀ concentration of 150 µg/ml. **Conclusion:** The present study proves that the purified D5 compound of *S. stellata* (Geartn.) Baill. has the natural source of antioxidant, which possess the strong cytotoxic activity against lung cancer line (A549).

Key words: *Schefflera stellata*, GC-MS, Cytotoxic activity, Dot plot assay, DPPH, Lung Cancer.

Submission Date: 23-04-2021;

Revision Date: 05-11-2021;

Accepted Date: 18-03-2022.

INTRODUCTION

Cancer is abnormal cell growth, incursion of other tissues and dissemination to other sites in an unregulated way without regarding the body's need. In recent days, one in six people is dying due to cancer all over the world. The risk factors, that depends upon genetic constitutions, lifestyle and environmental conditions, such as food habits, exposure to carcinogenic chemicals. According to a WHO report, premature death by non-communicable disease is highest in India like cardiovascular, respiratory problems and Diabetics, cancer which is the vital public health concern.¹

In India, non-communicable diseases were estimated at 63% of all deaths and cancer was one of the prime causes (9%). Among males Lung, mouth, oesophagus and stomach were most regular and in the female breast, cervix uteri are the most regular sites of cancer. One in 68 males is affected by lung cancer, which is one of the common cancer in the year 2020 for males.² Lung cancer is mainly because of cigarette smoking, exhibit to toxins or inhaled chemicals can rapidly increase the risk. Current treatments encompass chemotherapy, radiotherapy and synthetic drugs. Treatments such as chemotherapy can put sufferer under a lot

DOI: 10.5530/ijper.56.3s.155

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From

Dr P. Venkatachalam
Head cum Assistant Professor,
PG and Research Department of Microbiology,
Sengunthar Arts and Science College,
Thiruchendgode -636205

TO

The Vice-Chancellor
The Dean

To

The Principal,
Sengunthar Arts and Science College,
Thiruchengode-636205

9/8/23

Sub: Permission to visit Aavin Dairy Plant, Salem-reg
(SDCMPU Ltd., Salem, Visit of Salem Dairy Permission Granted)

Respected Sir,

As per our request, we got permission to visit Aavin Dairy Plant, Salem on 16.08.2023 at 10.00 am to 1.00 pm for 55 Nos (53 Students and 2 Staff). So I kindly request you to grant me permission to visit the Dairy Plant and also provide the transport facilities for the same.

Thanking you,

Place: Tiruchengode
Date 08.08.2023

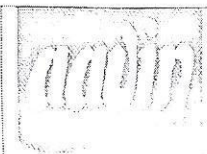
Yours faithfully

A.P. [Signature]
8/8/23

Enclosure: Permission letter from (Deputy General Manager) Aavin Dairy Plant, Salem

permission granted
at 9.8.2023

P. Venkatachalam
at 16.8.2023



The Salem District Co-op. Milk Producers' Union Ltd.,
Sithanur, Thalavaipatti Post, Salem- 636 302 (TN)

Phone: 7373704802

E-Mail :aavinslm@gmail.com

Ref.No: 04860 /Dairy Visit /DGM [P]/2019

Date: 04-08-2023

To

The Principal,
Sengunthar Arts and Science College,
Tiruchengode
Cell: 9842574782
Sir,

Sub: SDCMPU Ltd., Salem-Visit of Salem Dairy-Permission - Granted.

Ref: No: 13320/M/M4/2016, dated, 21-03-2022 of General Manager,
SDCMPU Ltd., Salem.

Permission is granted to 55 Nos of students and Staff of your College / School to visit our Dairy on **16-08-2023** by 10.00 A.M. To 1.00 P.M.

Kindly arrange to depute sufficient number of your staff to take care of the students during the visit of the Plant. Both the staff and students may be advised to observe the Dairy operations without any disturbance to the routine works of the Dairy. Further the students should be advised not to mishandle any products or articles inside the Dairy. No photographs should be taken inside the Dairy.

It is hereby informed that ₹ 135/- [Rupees one hundred and Thirty five only] per head must be paid (including Teaching Staff) at Marketing Section. For ₹ . 135 /- they will be given Lunch, one 50 Grm Khoa and one Milk Shake (200 ml).

Kindly advise the students to discard the wastes in the dustbins only.

for Salem Dist Co-op. Milk
Producers' Union Ltd.,

Encl.: Visitor Health Questionnaire Form.

Deputy General Manager (Production)

Copy to:

1. The A.G.M. (Dairying), FBD, Salem
2. The A.G.M. [Mkg], Salem.
3. The Security Officer.
4. Aavin Canteen in-charge. (9443219691)

(By giving the assurance, we prepared for lunch but in case if you failed to attend the IV, The food amount will be reimbursed by the concerned college)

Copy submitted to: The General Manager,
- for kind information please.

Certain information for Advance Booking

- 1). Aavin Parlour at Salem Dairy (96296 23749)

Cone Ice Cream, Khoa, Mysorepa, Badam Mix Powder, Butter (500 Grm pack), Ghee (200 ml, 500 ml, 1 Lit, 5 Lit)

Tetra Products: Chocolate Milk, Strawberry, Cardamom, Mavin, 1 Lit. STD Milk, 1 Lit Toned Milk, ½ Lit. Fino.



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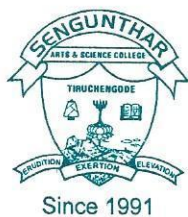
Dr. S. RAVIKUMAR M.Sc., M.E., M.Phil., Ph.D.,
PRINCIPAL

Date: 11.08.2023

TO WHOMSOEVER IT MAY CONCERN

The following students of our institution are on INDUSTRIAL VISIT to Aavin Dairy Plant, Salem on 16.08.2023 and they are accompanied by our staff members

S.No	Programme	Roll No	Name of the Student
1	III B.Sc Microbiology	21B703	Chellaperumal M
2		21B705	Dinesh R
3		21B707	Gopinath T
4		21B708	Hariprakash A
5		21B709	Jena V
6		21B710	Kavin M
7		21B712	Myilarasan B
8		21B714	Praveenkumar M
9		21B715	Priyadharshan M
10		21B716	Sabarinathan G
11		21B719	Senthilnathan K
12		21B721	Symon Bovas R
13		21B722	Tharaneesh M
14		21B724	Vishwa K
15		21B725	Abinaya P
16		21B726	Abirami S
17		21B727	Bhuvanasankari S
18		21B728	Dhivya R
19		21B731	Kiruthika G
20		21B732	Mohanapriya D
21		21B733	Nivetha C
22		21B735	Ramya V
23		21B736	Ramya C
24		21B738	Sasi M
25		21B739	Shankaripriya G
26		21B740	Sneha S
27		21B741	Sowmiya K
28		21B744	Swetha M
29	II B.Sc Microbiology	22UMB716	Asin T
30		22UMB717	Chithiraiyalini S



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Dr. S. RAVIKUMAR M.Sc., M.E., M.Phil., Ph.D.,

Date:

PRINCIPAL	31		22UMB719	Dharanika M
	32		22UMB720	Dharshini K
	33		22UMB721	Harini D
	34		22UMB722	Hema K
	35		22UMB723	Kaviya K
	36		22UMB729	Niranjana P S
	37		22UMB731	Sandhiya C
	38		22UMB732	Santhiya K
	39		22UMB733	Santhiya R
	40		22UMB735	Saranya Sri V
	41		22UMB736	Sargunadevi S
	42		22UMB737	Sneha S
	43		22UMB740	Subathra B
	44		22UMB744	Varsha B
	45	II M.Sc Microbiology	22PAM1101	Arunkumar M
	46		22PAM1104	Gajendran R
	47		22PAM1110	Ponvalavan P
	48		22PAM1113	Abinaya R
	49		22PAM1115	Archana A
	50		22PAM1116	Devayani S
	51		22PAM1118	Kiruthika R
	52		22PAM1121	Vijayalakshimi S

Staff members

1. Dr. P. Ashokkumar
2. Dr. S.Navamani
3. K.P.Gopal

Date : 11.08.2023

Place : Tiruchengode

Principal
PRINCIPAL,

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Tiruchengode – 637 205, Namakkal Dt., Tamil Nadu



Exposure and field visit for problem identification

Microbiology Department students visited the Aavin Dairy, Salem on 16.08.2023. Mr A. Veerakumar Technical Assistant of the dairy plant take all our students (No.54) to various processing unit (Milk collection, Ghee, Butter, Milk powder preparation, Pasteurization process the point which were create the problem to spoil the milk and milk products and Waste water plant etc.,) explained well. Our students are learned about Daily functions of Dairy in the on-site visit.



Industrial Visit to Aavin Dairy Salem, 16.08.2023



Visit Ghee preparation at Aavin Dairy Salem, 16.08.2023


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