Six monthly Probiotic Newsletter

Issue 11: March 2016 to September 2016

Probiotic Association of India

From editor's desk

Dear Esteemed Readers
Season's choicest Greetings and a very warm welcome !!!

Hope, all of you are having a wonderful and pleasant time at your respective places both personally and professionally as usual and your interest in probiotics has been growing more and more with the new breakthroughs in this ever emerging area from human health perspective. Probiotics and probiotic based food products specifically dairy based continue to attract a growing interest due to their promising physiological effects as well as the value they add to the new products from commercial and scientific point of view. The credit for the tremendous growth of probiotic sector both locally and across the countries goes to the enlightened and health conscious consumers who find probiotic formulations worth for daily consumption to lead a happy and healthy life to minimize their visits to their respective family doctors.

Our upcoming issue of the PAi Newsletter is a witness to the growing popularity of probiotic dairy based formulations in our country too besides other South-Eastern Asian countries. I am sure, you will find the contents of this issue interesting and useful to update your knowledge from a broader perspective. I will greatly appreciate if you could be kind enough to send us your feed back on the quality of the articles figuring in this special issue of the Newsletter along with your valuable suggestions for improving it further to make it more reader friendly. We also look forward to you for contributing new articles or current news items for general public and society along with common man to apprise them of the claimed health benefits of probiotics both as foods and nutraceuticals for management of common gastrointestinal diseases. Hope, you will actively participate in this process to keep this mission going with your full support.

Looking forward to hearing from you soon

Sunita Grover

(Sunita Grover)
Chief Editor

Consumption of probiotics can reduce body weight and BMI – A meta analysis of randomized, controlled trials

Qingqing Zhang[a], Yucheng Wu[b] and Xiaoqiang Fei[a]

a: Department of Endocrinology , Taizhou People's Hospital,Taizhou,China,

b: Department of Cardiology , Taizhou People's Hospital , Taizhou , China

Corresponding author : Xiaoqiang Fei ;512592677@qq.com

The benefits of probiotics have attracted increasing attention as their incorporation to dairy products may support general health in addition to improving immunity. Not only, probiotics can improve immune system function and prevent diarrhea but may also ameliorate physiological function. This review and meta analysis was conducted to clarify the effects of probiotic consumption on body weight and BMI control. Based on the findings of authors from the 25 randomized human trials, they found that consumption of probiotics significantly decreased body weight and BMI by a modest degree in over 1,900 healthy adults. They found probiotics intake reduced BMI and body weight with the greatest reduction in BMI occurring in overweight adults. Interestingly, ingesting more than one type of probiotic and taking probiotics for 8 weeks or more resulted in increased weight loss. Similar results about the effect of probiotics on other physiological parameters have also been reported .

Overweight and obesity, the most common nutritional disorders, are known to be caused by the metabolic imbalance. Furthermore, the identification of differences in the intestinal microbiota of obese and thin people suggests the involvement of microbiota in energy homeostasis and storage of lipids. The impact of probiotics on weight may work through several different mechanisms. For example, probiotic treatment may increase gut microbiota fermentation, lower appetite and increase satiety, which is associated with an increase in plasma gut peptide concentrations (glucagon-like peptide 1 and peptide YY). Other mechanisms such as improving other metabolic issues may explain the effect of probiotics on body weight.

The study also suggested a greater effect from consuming multiple rather than single species of probiotics. This anti-obesity effect could be an important adjunct in the treatment of obesity, because apart from surgery, no medical treatment can efficiently support the fight against obesity to date. Although the amount of weight loss documented in this study was minimal, even a small reduction can have enormous public health benefits by reducing weight-related diseases such as Type 2 diabetes and high blood pressure.

Source : International Journal of Food Sciences and Nutrition , 2016; 67 (5): 571

Probiotics in the modulation of maternal–infant immunity: Implications for allergic diseases

Vamshi Saliganti, Rajeev Kapila, Suman Kapila and Mohd Iqbal Bhat
Animal Biochemistry Division, National Dairy Research Institute, Karnal 132001, Haryana, India
Corresponding author :Rajeev Kapila; rkapila69@rediffmail.com

Most people do not realize that 80 percent of their immune system is located in their digestive tract, making a healthy gut a major focal point if you want to achieve optimal health. The root of many health problems is related to an imbalance of intestinal bacteria, and this foundation of good health is laid even while in utero. Without a well-functioning gastrointestinal (GI) tract, a newborn baby will be more vulnerable to pathogens, allergens, and other immune-related diseases, so getting an infant's gut healthy and running efficiently is crucial. Women who are pregnant or planning to become pregnant would be wise to address their own gut health as early as possible to give their child the best start possible in this regard. Optimization of nutrition, particularly with probiotics, in the prenatal and postnatal periods as potent immune modulators has particular significance on the prevention of newborn allergies which has been elaborately reviewed in this article.

Atopic diseases like asthma and allergies to various foodborne proteins are among the widespread chronic diseases in newborns because of their allergy-prone Th2-skewed immune response. Increasing scientific reports indicate that the mother's immune system plays a crucial role in mediating the development of fetal-infant immune responses. Lactating mammary glands are part of an integrated mucosal immune system with confined production of antibodies particularly targeted against pathogenic agents in the mother's environment and later encountered by newborns. Passive immunity through mother's milk is critical for a newborn's immune maturation. Thus, understanding the maternal influence of childhood atopic risk on newborn immune maturation could suggest novel treatment and prevention strategies.

Probiotics have been proposed to harmonize Th1/Th2 imbalance in allergic diseases; however, the mechanism remains largely unknown. Feeding probiotics to mothers and offspring during the prenatal and postnatal periods to inhibit allergies in newborns may be a possible preventive approach in atopic diseases.

Hence, this review focuses majorly on the role of feeding probiotics to mothers during pregnancy and lactation as well to newborns during suckling and post weaning periods as possible modulators for the activation of maternal infant immune response to down regulate the allergy-prone Th2-biased newborn system.

Source: : Food Reviews International,2016 / DOI: 10.1080/87559129.2016.1198913

Probiotic *Lactobacillus* strains- The Future Biological Missiles to Treat Autism

Poornachandra Rao K and Sreenivasa M Y

Department of Studies in Microbiology, University of Mysore, Manasagangotri, Mysore-06, Karnataka, India
Corresponding author: Poornachandra Rao K; pckrao.06@gmail.com

Autism is categorized by a collection of neurobehavioral, neurological, gastrointestinal and immunological dysfunctions which include deficiency of eye contact, deficiencies in socialization and communication, abnormal theory of mind function, language dysfunction, restrictive, repetitive, and stereotypical behaviours, food allergies, constipation, yeast infections and other behavioural and medical conditions. Autism is called a “spectrum disorder” since it affects individuals differently and to varying degrees. The connection between gut bacteria, intestinal disease and autism is a promising area of investigation.

People with autism often have more digestive health problems than average. Researchers have reported that one in four children with autism have at least one chronic gastrointestinal symptoms. Moreover autistic children also acts as the carries of some of the pathogenic bacteria such as *Clostridia* in their gut than children without autism. Reports were also available regarding presense of bacterial genus called *Sutterella* linked with intestinal disorders such as loose stool and altered microbiota in the children suffering from autism. In view of this, there is a need of a biological missile to target the spectral disorder like autism.

Probiotic Lactobacillus have beneficial effects on gut microbiota and communicates with the central nervous system which influences the brain function and behaviour during alleviation of autism like symptoms. The interactions between brain and intestinal microflora are bidirectional and have an important role in modulating the gut and brain functions. These interactions play a key role in modulating some of the important functions such as mucosal-immune activity, pain perception and general wellbeing. Specific strains of *L. plantarum* may have the positive impact on the gut immune system and help in restoration of healthy intestinal microflora of the children where excessive intervention of vaccinations and antibiotics would be done during birth. Now a days, probiotic therapy for the treatment of autism like spectral disorders is gaining importance. Immense research is being carried out to prove the positive impact of the probiotic *Lactobacillus* on the gut system of the mice induced with the autistic symptoms and outcome was found to be fruitful with positive results. For many of the potential benefits, research is limited and only preliminary results are available. In view of this, the probiotic therapy is one the research interests ready to unveil the link between gut and brain. Thus, probiotic *Lactobacillus* species may be considered as future missile to prevent the autistic symptoms in children with autism.

Presentation of work at international Conference

Dr. V.K.Lule Ph. D. scholar at Dairy Microbiology Division, NDRI, Karnal participated at International Conference on Beneficial Microbes (ICOBM-2, 2016) organized by University Sains Malaysia, Malaysia and King Mongkut's Institute of Technology Ladkrabang, Thailand held in Phuket, Thailand on 31 May – 2 June 2016 and presented the paper for young scientist award entitled **"Zinc Enrichment of *Lactobacillus spp.* and Assessment of its Bioavailability in Caco-2 Cell Culture Model: New Biological Approach with Improved Bioavailability" .**

Abstract

Micronutrient malnutrition affects >50% of the worldwide population. In particular, zinc (Zn) deficiency is considered an emerging public health problem in India and in other developing countries. At any rate, it is quite well known that inorganic salts of Zn have very low bioavailability and systemic effect. Zn enriched biomass of lactobacilli can be exploited for the development of dietary organic source of this mineral to overcome its deficiency and to improve the human health. The study was undertaken to produce Zn enriched biomass of lactobacillus spp. and to evaluate its bioavailability in cell culture model by using Caco-2 cells in bicameral chambers (Transwell system). In the present study, forty human and dairy products origin lactobacilli and *Lactobacillus rhamnosus* GG (LGG) as a probiotic standard, were screened for their ability to accumulate Zn by growing them in a medium added with zinc sulfate. Estimation of Zn accumulated by cultures was carried out by Atomic absorption spectroscopy (AAS). The highest Zn accumulating culture with LGG, Zinc gluconate (organic) and ZnSo4 (inorganic) was used for assessing bioavailability of zinc in cell culture model. Among all the isolates, *Lactobacillus fermentum* SR4 was found to have greater ability to accumulate Zn (2 mg/g dw) followed by LGG (1.57mg/g dw). Experimental data demonstrated a significantly higher bioavailability of Zn internalized by *L. fermentum* SR4 followed by LGG i.e., 57% and 48% respectively, compared with the inorganic and even organic forms tested which has 15.6% and 21.7%) respectively. The present study utilizes human origin lactobacilli strains having potential to accumulate significant amount of Zn in their biomass and ability of delivering the same minerals in a highly bioavailable form. Harnessing this potential culture can serve as a novel application of their cell factories for the production of Zn enriched functional dairy foods and as dietary supplements.

New corporate members–Company profiles

Unique Biotech : A leading manufacturer of probiotics and nutraceuticals

Unique Biotech Ltd. established in the year 2001 is an ISO, WHO-GMP certified leading manufacturer of probiotics and nutraceuticals. We have envisioned ourselves to become the benchmark standards in value creation as well as providing innovative product solutions with best in class clinical outcomes for a better and healthier tomorrow. We have more than 24 patented probiotic strains and our global presence spans over 29 countries.

Our dedicated and highly qualified R&D team is committed in developing effective probiotic solutions for various diseases. Right from isolation of probiotic strains, characterization, establishing probiotic properties and efficacy, Unique Biotech provides an end to end solution. Our state of the art large scale fermentation facility has made it possible to commercialize effective and stable products which adhere to the best standards in the industry.

Probiotic strains manufactured by us include '*Bacillus coagulans (UniqueIS2), 'Saccharomyces boulardii (Unique28), 'Bacillus clausii (UBBC07), Bacillus subtilis, Lactobacillus sps, Bifidobacterium sps, Streptococcus sps.* etc. These strains are used for food, pharmaceutical and veterinary applications. Our probiotic strains have been well characterized and documented with our quality ratified by exports to Europe, USA, Japan, South Africa, LATAM , Australia etc. In addition, we offer customized probiotic formulations either alone or in combination with prebiotics, vitamins, minerals and other ingredients in the form of capsules, sachets, tablets or suspension.

Equipped with a state of the art microbiological laboratory complemented by modular rooms and air handling systems, we have a manufacturing facility constructed over 1 lakh sq. ft., sprawling over 22.4 acres of land. Our fermentation capacity is around 275KL (Kilolitres), the formulation facility for probiotics and bio-therapeutics generates an output of 1 billion capsules and 72 million sachets annually. At Unique Biotech, quality is a way of life. Our products are stringently scrutinized at every stage and phase of production as per WHO standards.

Our employees thrive to create a strong distribution network and provide best possible services to all our esteemed customers. We consider ourselves as one big family where we take care of the smallest needs of an individual.

'Improved efficacious healthcare solutions for everyone at affordable prices' is our motto!

Bacillus clausii UBBC07- The Probiotic for Diarrhea

Bacillus species which are spore forming bacteria have been used as probiotics for the last five decades. The advantage of spore forming probiotics is that they are heat stable and can be stored at room temperature without any loss of viability. Spore forming bacteria are also resistant to acidic conditions of the stomach (low pH) and hence can survive the transit to reach the intestine. *Bacillus clausii* UBBC07 has been isolated and characterized by Unique Biotech Limited. It has been deposited with the Microbial Type Culture Collection (MTCC) and Gene Bank with an accession number MTCC 5472. It exhibits all probiotic properties like resistance to low pH and bile salts, high adherence capacity (as evidenced by in vitro binding of *B. clausii UBBC07* to intestinal epithelial cell lines Caco2-TC7 (human colorectal adenocarcinoma) and HT29 (human colon adenocarcinoma) .

The safety of *B. clausii* UBBC07 has been established by a) acute and Repeat dose (28 days) studies in Sprague Dawley rats and b) by whole genome sequencing. The results of the Acute toxicity study indicated that the LD50 of *B. clausii* UBBC-07 is greater than 5000 mg/kg bw. Results of the repeat dose (28 days of *Bacillus clausii* consumption daily) study show that oral administration of *B. clausii* UBBC-07 is well tolerated in rats at levels up to 1000 (126 billion or $126x10^9$ cfu) mg/kg bw/day. Based on the results, the No Observed Adverse Effect Level (NOAEL) was considered to be 1000 mg or $126x10^9$ cfu/kg bw/day. Whole genome sequencing (Upadrasta *et al.,*2016) has established the absence of toxin genes and that antibiotic resistance is intrinsic and not transferable.

A clinical study by Sudha *et al.,* (2013) investigated the effects of *B. clausii* UBBC-07 in patients suffering from acute diarrhea. In this study, a total of 27 patients (average age of 35.44±8.08 years) with acute diarrhea participated. The criteria for selection included for all subjects were ≥3 loose stool motions within 24 hours and for more than 7 days. The subjects received one capsule of *B. clausii* UBBC-07 (containing 2×109 cfu) two times a day for a period of 10 days. The subjects were assessed for duration of diarrhea, frequency of defecation, abdominal pain and stool consistency on days 1, 3, 6 and 10. Safety was evaluated by assessing the incidence and type of adverse effects such as increase in blood pressure and pulse rate, physical examination and clinical laboratory tests , i.e. complete blood count, serum glutamic pyruvic transaminase, serum creatinine, and stool examination and microscopy, on day 1 and day 10. The results of this study clearly showed that the mean duration of diarrhea decreased from 34.81±4.69 to 9.26±3.05 ($P<0.0001$) min per day, the frequency of defecation also decreased from 6.96±1.05 to 1.78±0.50 ($P<0.0001$) times per day, abdominal pain also decreased and stool consistency improved. No significant change in safety parameters were observed during the treatment. The results of this study show that the *B. clausii* UBBC-07 is highly effective in alleviating the symptoms of diarrhea without causing any adverse effects.

Apart from the prevention of diarrhea, *B. clausii* enhances immunity and prevents respiratory tract infections. *B. clausii* UBBC07 is available in spore suspension, capsules and sachets under the brand name BACIPRO at a dosage of 2 billion cfu/ mini bottle/ capsule/ sachet.

References:

- Sudha, M. Ratna, S. Bhonagiri, and M. Asin Kumar. "Efficacy of Bacillus clausii strain UBBC-07 in the treatment of patients suffering from acute diarrhoea." *Beneficial microbes* 4.2 (2013): 211 -216.
- Upadrasta, Aditya, Swetha Pitta, and Ratna Sudha Madempudi. "Draft genome sequence of Bacillus clausii UBBC07, a spore-forming probiotic strain." *Genome announcements* 4.2 (2016): e00235-16.

Tropilite Foods Private Ltd. — A Profile

Tropilite Foods Pvt Ltd (TFPL) has a well-known repute in the food processing industry. Established in the year 1982 by the Davars Group, located at Gwalior, Madhya Pradesh, it was formerly known as 'Davars MP Organics'. The group founder Late Shri K. S. Davar was a visionary enthusiast. The same spark kept igniting the minds of his progeny who made a mark in their destined disciplines.

The Research & Development division of TFPL is recognized by Department of Science and Industrial Research (DSIR), Govt. of India. Tropilite Foods Pvt Ltd is a first Indian company involved in the mass production of starter cultures for Curd and Yogurt. We have a state-of-the-art production facility which is fully automated with the latest equipment. TFPL launched its second aseptic food processing and packaging facility (Ultra-high temperature processing, UHT) at Gwalior in 2016.

TFPL is aimed at working in different areas of Food technology, Industrial Microbiology and Biotechnology with an emphasis on Non-dairy creamers, Bakery Ingredients, fermentation based production of probiotic culture, starter culture and different bioactive molecules. The company has in-house R&D laboratories for the development and standardization of food, pharmaceutical and industrial grade additives.

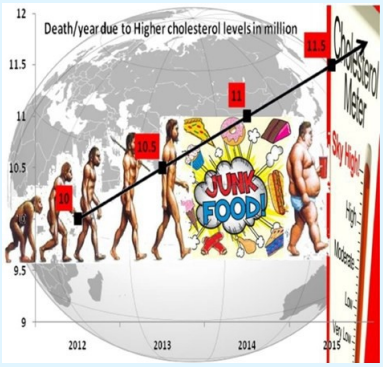
Our state-of-the-art laboratories with world-class research team are capable of production, analysing and investigating properties of Microbial cultures, hydrocolloids, high nutrition ingredients and other food elements.

All the products developed are approved by C.S.I.R. before actual production release for use by the industry. Based on the consistent quality of our products and our unwavering focus on QC and R&D activity, our products have received the best ratings. The company has always placed importance on innovation and thus continues to develop and offer newer and novel products. Davar's products also have huge presence in the overseas markets and are today available in over 20 countries across the globe.

Translation Research: NCL Spinoff Start-Up Offering Better Options of Managing Cholesterol

Abhiruchi Probiotics Pvt Ltd.

Hrishikesh Mungi;hrishikesh_mungi@yahoo.co.in



Current life style and food habits are one the major reasons for abnormal levels of cholesterol. It causes cardiovascular problems, blood pressure and diabetes. 75% of Indians are suffering from this problem. The problem is equally found in rural and urban areas. A report published by ICMR–INDIAB in PLOS ONE journal show that 65-70% of cases are present in people earning less than Rs.5000/month. Cholesterol management is no longer an urban health concern and Government surveys have established the fact that rural India is equally afflicted with the scourge of high cholesterol. Indicating the problem is affecting major section of Bottom Of Pyramid (BOP) people. The death rate due to cholesterol associated cardiovascular deaths in India accounts to 1.2 million deaths/year and globally 11.2 million deaths/ year.

Recent studies by reputed medical journals like Lancet have reported that Lipitor (statins), drug used to control cholesterol levels make users predisposed to diabetes and also some genetic groups amongst humans have shown resistance to the action of these drugs. These are the more serious side effects of Lipitor apart from unexplained muscle pain, tenderness, or weakness; confusion, memory problems; fever, unusual tiredness, and dark colored urine; swelling, weight gain, urinating less than usual or not at all.

In a breakthrough research outcome, Abhiruchi Probiotics, a start-up incubatee at Venture Center, NCL, Pune, has come up with a novel probiotic formulation for better management of Cholesterol levels with no side-effects (Pre-Clinical Trials) and with a better reduction of cholesterol levels when compared to statins. Throughout the last decade, various researches have shown that probiotics indeed have a role in cholesterol management in humans.

Throughout the last decade, various researches have shown that probiotics indeed have a role in cholesterol management in humans. However, organisms like *Lactobacillus reuteri* have shown limited rate of reduction of cholesterol levels, thus limiting the potential of probiotics in cholesterol management. But in 2012 a technology was developed on lowering cholesterol by Dr. Archana Pundle serving as a Chief Scientist and Hrishikesh Mungi as a Project assistant at National Chemical Laboratory, Pune in 2013. Also, in 2013 the technology was patented and a PCT application was filled.

The patent being published in WIPO with a strong International Search Report accepting all 10 claims on novelty & inventive steps and 7 claims on industrial application. They have taken the technology forward from Lab to Market by formation of company Abhiruchi Probiotics Pvt. Ltd. with Hrishikesh Mungi as the executive director & Dr. Archana Pundle as the Non executive of Director of company (as per CSIR Entrepreneur Scheme-1995) and had applied for BIG-BIRAC grant of 50 Lakhs. The company was incorporated on 16th June 2014 and began operation on 10th March 2015 after induction of BIG funds. The company has been incubated at Venture Center-NCL, Pune. The BIG-BIRAC funds were provided to identify a stable formulation and test the formulation on animals for lowering of cholesterol (Pre-clinical trials). The technology has been proved on animal model with 12% better reduction in cholesterol levels. These results have facilitated for carrying out clinical trials. The clinical trials would be partly funded by BIRAC-BIPP Scheme.

The technology has accolades from “Young Entrepreneur- Eureka 2014” IIT Bombay, “ Startup conclave -2015” SJSOM and Runners up at “Young Innovator Challenge-2016” 3M-CII.

Considering the growing obesity levels in the country and in the world, leading to cardiovascular diseases with a global burden of 1.2 trillion dollars such a novel formulation can indeed be the panacea for cholesterol management in India. With CHOLOREST we plan to reach out to the masses making preventive healthcare the foundational block of healthcare in India. The formulation would be undergoing clinical trials, expecting a launch in 2019-2020, cholesterol.

.

Ongoing Probiotic related Doctoral projects at NDRI, Karnal

Name of the student	Division	Title
Radha Yadav	Animal Biochemistry	Evaluation of hypocholesterolemic and antidiabetic attributes of probiotic Lactobacilli fermented milk.
Taruna Gupta	Animal Biochemistry	Role of probiotic Lactobacilli in immune signaling in intestinal epithelial cells.
Mohd Iqbal Bhat	Animal Biochemistry	Evaluation of probiotic Lactobacilli on *E.coli* induced changes in epithelial barrier function.
Diwas Pradhan	Dairy Microbiology	Assessing preclinical safety of Indigenous probiotic *Lactobacillus* Lp91 and *L. fermentum* Lf1 strains".
Rashmi H M	Dairy Microbiology	Elucidation of signaling mechanism underlying the release of Glucagon like peptide-1 (GLP-1) from enteroendocrine cells by a probiotic Lactobacillus strain.
Chhaya Goyal	Dairy Microbiology	Whole genome sequencing of indigenous probiotic *Lactobacillus reuteri* (LR6) and validation of its unique features.
Sheenam Garg	Dairy Microbiology	Impact of probiotic *Lactobacillus reuteri (LR6)*on the gut and systemic immunity using protein energy malnutrition murine model.
Narendera Kumar	Dairy Microbiology	Cadmium bio-adsorption potential of probiotic *Lactobacillus* species.
Rohit Panwar	Dairy Microbiology	Evaluation of *Lactobacillus* species for reduction of aflatoxin M1 bio-accessibility and toxicity.
Sunita Verma	Dairy Microbiology	Hepatoprotective potential of probiotic *Lactobacillus* species against non alcoholic steatohepatitis in mouse model.
Aparna SV	Dairy Microbiology	Comparative analysis of predominant gut microflora and their metabolites in autistic versus normal children for probiotic interventions.
Varsha Garg	Dairy Microbiology	Functional characterization of Pediococus species for their applications in dairy foods.
Sidharth Singh	Animal biotechnology	Functional analysis of mucus binding domains of lactobacillus species.
Urvashi Mothwal	Animal biotechnology	Biochemical and physicochemical properties of recombinant leucyl amino peptidase of Lactobacillus species.
Ritu Chaudhary	Animal biotechnology	Functional and physicochemical characterization of putative adhesion promoting surface layer protein of Lactobacilli.

List of New Member of PAI (April 2016-September 2016)

S.No.	Name	E mail ID	Membership ID
Life Members			
1	Shashank Singh	shishu4u21@gmail.com	405
2	Umesh Bihade	umeshrsbihade@gmail.com	406
3	Dr. Jaishree Paul	jpaul33@hotmail.com	407
4	Dr. Vasudha Sharma	kotpalvasudha@gmail.com	408
5	Mrs Shilpa Shashank Joshi	shlpajoshi@yahoo.com	410
6	Mrs Ruby Joginder Sound	soundruby@gmail.com	411
7	Mrs Naaznin Maad Husein	naazninh@gmail.com	412
8	Ms. Kriti Ghatani	kriti_scorpian@yahoo.com	415
9	Dr. Asmita Prabhune	asmita.prabhune@gmail.com	420
10	Hrishikesh Mungi	hrishikesh_mungi@yahoo.co.in	—

Corporate Members

1	Praj Matrix (Praj Industries Ltd)	aarohikulkarni@praj.net
2	Microbax (India) Ltd.	vikasrajurkar@microbax.com
3	Unique Biotech Ltd.	sudha@uniquebiotech.com
4	CHR HANSEN (I) PVT. LTD.	INRSH@chr-hansen.com
5	Tropilite Foods Pvt. Ltd	rohit@davars.com
6	Sarvotham Care Ltd.	mohan_krishna@sarvothamcare.com
7	Yakult Danone India	neerja.hajela@yakult.co.in
8	Nestle India Ltd.	Shashidhar.Rao@in.nestle.com

Ordinary members			
1	C.P. Charles	ncrownson@abtfoods.com	414
Student members			
1	Madhavi Gurrapu	madhavil75@gmail.com	409

Announcement -Upcoming Probiotics Events

1. "5th International Conference and Exhibition on Probiotics, Functional and Baby Foods" on November 14-16, 2016 going to be held at Orlando, USA.

The aim of this conference is to learn and share knowledge on Probiotics. Leading world academic scientists, industry researchers, scholars, decision makers, public health professionals, and other professionals gather in Orlando to speak on Probiotics, Functional and Baby Foods. The main theme of the conference **"Probiotics for Human Health: New Innovations and Emerging Trends"**.

For more details, kindly go through: http://probiotics.conferenceseries.com/

2. " International Scientific Conference on Probiotics and Prebiotics - IPC2017" on June 19th - 22nd, 2017 to be held at Budapest, Hungary.

The goal of conference is to provide a scientific forum for all stakeholders of probiotics and prebiotics and to enable the interactive exchange of state-of-the-art knowledge. The conference is focused on evidence-based benefits, health claims proven in scientific experiments and clinical trials. New scientific evidences that support or question the efficiency of already existing or prospective substances and applications will be conferred. In addition novel strains, controversial but scientifically solid ideas, approaches and visions will be presented as well. Participants will meet those who influenced the past, influence the present and most importantly will shape the future of probiotics and prebiotics by means of basic research, clinical trials, regulatory efforts or development of industrial technology. **Further to its scientific content, IPC2017 is a networking event. It is a unique opportunity to meet all the stakeholders of probiotics and prebiotics.**

For more details, kindly go through: http://www.probiotic-conference.net/

3."Probiotics Congress: USA" will be held on October 3-4 2016 at the San Diego Marriott La Jolla

The 2-day congress will examine a range of topics including:

- Probiotics and Digestive Health
- Probiotics in Paediatrics
- Regulation, Safety, Product Development and Quality Assurance
- Prebiotics
- Food Research and Dietary Supplements
- Pro- and prebiotics in Animal Health
- Co-located Microbiome R&D and Business Collaboration Congress

For more details, kindly go through: http://www.globalengage.co.uk/probiotics-usa.html

4. Yakult India Microbiota and Probiotics Science Foundation is organising 8th India Probiotic Symposium in Chennai on 3rd-4th December, 2016.

For more detail please visit :www.yakult.co.in

5. 57th International Annual Conference of the Association of Microbiologists of India (AMI-2016) will be held from 24th-27th November, 2016 at Guwahati University and Institute of Advanced Study in Science and Technology, Guwahati.

For more detail please visit : www.amiindia.info/AMI-Conference.php

Life Membership Fee	: Rs. 3500 (Ten Years)
Student Member	: Rs. 500 annually
Ordinary Member	: Rs. 1000 annually
Institutional Membership	: Rs. 10,000 annually
Corporate Membership	: Rs. 25,000 annually

Contact Us:

Probiotic Association of India,

National Dairy Research Institute,

Karnal-132001

The technical support rendered by Miss Taruna Gupta from ABC Division, NDRI, Karnal in compilation of this issue of the Probiotic Newsletter is duly acknowledged. The editorial board also expresses thanks to all the authors who contributed their inputs for the newsletter.