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Insight into the microbial diversity of healthy human milk by metagenomic approach

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Breast milk is considered as an essential component in metabolic and immunologic activity of neonate's health. Mothers transfer the breast milk microbiota to their infants to impact infant growth and development. Breast milk provides an optimal nutrition for infants and reduces their risk of infectious diseases. As many as 60% of organisms detected using molecular techniques will not grow in standard bacterial culture media. So the aim of the present study is to use the metagenomic approach to explore bacterial diversity by 16S rRNA gene amplicon sequencing of 16 healthy human milk samples. The data were analyzed in MG-RAST using best hit approach with 80% identity. Out of which 93% of the total reads were allotted to bacteria. Detection using molecular techniques has broadened our understanding of microbiota about 14% of sequences cannot be classified suggesting an expansive microbial world. However 87% sequences are predominantly aligned with the phyla Proteobacteria followed by Firmicutes. Genus like *Pseudomonas* (11.94%), *Bacillus* (5.81%), *Pantoea* (4.24%), *Escherichia* (3.88%), *Serratia* (3.74%), *Staphylococcus* (2.46%), *Enterococcus* (0.19%), *Lysinibacillus* (0.12%), *Erwinia* (0.10%), *Brevibacillus* (0.02%), *Paenibacillus* (0.02%), *Lactobacillus* (0.02%), *Anoxybacillus* (0.01%), *Brevundimonas* (0.01%) and *Yersinia* (0.01%) were predominated. Our results indicate that breast milk has a dynamic microbial ecology with a microbiota composed of skin and enteric-associated bacteria and pathogens. With improved understanding of the impact of breast milk microbiota, it may be possible to manipulate these microbial communities to improve the health and development of mothers and their neonates.

Biography

Yati Vaidya has completed her MSc Integrated Biotechnology (specialization in General Biotechnology) from Ashok and Rita Patel Institute of Integrated Study and Research in Biotechnology and Allied Sciences, Anand, Gujarat, India. During Master's her dissertation topic was "Isolation and characterization of probiotic bacteria from human milk". Presently, she is pursuing PhD in Genetics under the guidance of Dr. Anju Kunjadia (Associate Professor in Biotechnology) on "Exploring the microbiota from human milk". In her PhD studies she is trying to explore the microbes present in the healthy human milk using both culture dependent and independent technique.

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