

Probiotic *Lactobacillus* and the Recent Taxonomic Change to Some Species

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EDITORIAL

You're welcome to volume 8 Issue 3 of the Journal of Probiotics and Health. Despite the current global pandemic, the Journal has continued to forge ahead to publish novel findings in probiotics and health by great scientists and researchers following our thorough peer-reviewed processes. As many of you must have read, the long-awaited taxonomic change to bacteria is out. Once fully accepted, the new taxonomic change will affect the probiotic industry (especially in product labelling) and probiotic research institutions. Probiotics continue to play essential roles in boosting health in human and animal. The health benefits of most probiotics are achieved through their interactions with the host immune system, competition with pathogenic organisms in the gastrointestinal tracts, mucosal barrier function improvement and production of anti-inflammatory and anti-microbial substances. Of the known beneficial bacteria, *Lactobacillus* strains have continued to play significant roles as probiotics. *Lactobacillus* species have been implicated in several beneficial functions, including the improvement of hepatic conditions such as cirrhosis, hepatocellular carcinoma and viral hepatitis by immunomodulation and reduction of pathogenic bacterial toxin among other mechanisms. Although the genus *Lactobacillus* was considered the fifth most important living organisms in the world, there were long-standing taxonomic issues with the genus. This was a result of inability to properly characterize the genus using the available technologies as at then. Infact, before the discovery of DNA, classification into genus was based on morphological and biochemical properties. After DNA was discovered, it became very obvious that there were issues with the classification of bacteria, including *Lactobacillus*. Since then, Scientists have been working towards a better reclassification as technological advancement in genomics, proteomics, transcriptomics, interactomic etc has provided more valuable information.

Recently, 15 scientists from around the world (from 12 different institutions and 7 different countries) worked together and applied whole genome analysis to characterize each *Lactobacillus* species. They suggested that the *Lactobacillus* species that were previously within the *Lactobacillus* genus should be reclassified into 25 genera, including 23 novel genera. Unlike previous classification that grouped bacteria based on morphological and biochemical properties, the Scientists suggested that bacteria with similar functions or physiology should be grouped together. They based their new findings on the results of genomic and proteomic analyses. The 23 novel genera suggested by the Scientists include *Acetilactobacillus*, *Amylolactobacillus*, *Bombilactobacillus*, *Companilactobacillus*, *Dellaglioia*, *Fructilactobacillus*, *Furfurilactobacillus*, *Holzapfelia*, *Lacticaseibacillus*, *Lactiplantibacillus*, *Lapidilactobacillus*, *Latilactobacillus*, *Lentilactobacillus*, *Apilactobacillus*, *Levilactobacillus*, *Ligilactobacillus*, *Limosilactobacillus*, *Liquorilactobacillus*, *Agrilactobacillus*, *Loigolactobacillus*, *Paucilactobacillus*, *Schleiferilactobacillus*, and *Secundilactobacillus*. Furthermore, the proposed taxonomic change affected some important *Lactobacillus* probiotic species. These include *Lactobacillus casei* changed to *Lacticaseibacillus casei*; *Lactobacillus paracasei* to *Lacticaseibacillus paracasei*; *Lactobacillus plantarum* to *Lactiplantibacillus plantarum*; *Lactobacillus brevis* to *Levilactobacillus brevis*; *Lactobacillus salivarius* to *Ligilactobacillus salivarius*; *Lactobacillus fermentum* to *Limosilactobacillus fermentum*; *Lactobacillus reuteri* to *Limosilactobacillus reuteri*; and *Lactobacillus rhamnosus* to *Lacticaseibacillus rhamnosus*. Those that were not changed include *Lactobacillus acidophilus* (unchanged); *Lactobacillus delbrueckii* subsp. *Bulgaricus* (unchanged); *Lactobacillus crispatus* (unchanged); *Lactobacillus gasseri* (unchanged); *Lactobacillus johnsonii* (unchanged) and *Lactobacillus helveticus* (unchanged).

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