GREEN CLEANING MYTHS; BIODEGRADABLE, BACTERIA, ENZYMES AND MICROBES

Ignorance, as they say, is bliss – except when it involves “green” practices that are merely harming the environment in a different way, or having no effect at all. As the popularity of “eco-friendly” products continues to rise, manufactures and distributors are attempting to differentiate their products through the use of inaccurate statements, skewed facts and downright myths. In this instance, knowledge truly is power – especially when it comes to reading between the marketing material lines to determine whether or not green cleaning products are truly green.

Usually, companies that sell “green” cleaning products position these items within one of four categories; biodegradable products, enzymatic products, bacterial products (biological), or essential microorganism products (microbes and their metabolites).

While biodegradable cleaning chemicals sound like a perfect solution, the standard measure of their biodegradability can only be achieved in the laboratory where perfect conditions are supplied. These perfect conditions are pH neutrality and sufficient supply of nutrients and beneficial bacteria (that cause the biodegradation event). The obvious problem with this is that these perfect conditions are rarely, if ever, available in the variable environments that these chemicals are flushed into. Therefore ‘biodegradable’ chemicals are certainly far from the ideal that they are marketed to be.

Bacterial products, on the other hand, utilise single celled organisms that have the ability to reproduce by simple cellular division. When using the correct bacteria, nutrients in the environment are recycled, as organic matter is broken down into simple compounds such as carbon dioxide and water. When using massive concentrations of the correct bacteria, hyper-accelerated biodegradation of soils is achievable in the process of cleaning, bypassing the need for chemical lift and shifting of soils into the environment, accompanied by the chemicals used. These are the only products that can naturally penetrate the unwanted bacteria’s biofilm, which forms a protective layer against other chemical cleaners.

Enzymes, which are produced by bacteria, are proteins that act as catalysts, thereby accelerating the rate of reaction with a substrate. Enzymes are substrate specific, meaning that different enzymes can be put into particular products in order to clean distinctive kinds of dirt. It is important to note that enzymes are not living things. Therefore they cannot adapt to different conditions. In contrast, bacteria are living organisms that adapt to their environment and produce specific enzymes that break down organic matter, such as fats, oils, cellulose, xylan, proteins and starches. As a result of this, and the short life-span of an enzyme, living bacteria is preferred in products, as it constantly produces fresh enzymes. However, some cleaning products can be "boosted" by adding a certain amount of prepared enzymes to the product to begin degrading the organic matter. While these enzymes die out, the bacteria present reproduce, creating more enzymes to continue the cleaning process.

Essential microbes, or Effective Microorganisms (EM®) is a brand name referring to a family of microbial-based products using a technology developed by Japanese scientist, Dr Teruo Higa. The main product, EM·1®, is a liquid bacterial product comprising three groups of microbes: Yeast, Photosynthetic Bacteria, and Lactic Acid Bacteria. EM·1® works together with local and native beneficial microbes, creating a synergy among microorganisms and larger forms of life including; insects, worms, pets, livestock, and people. All the formulations and intellectual property are owned and managed by EM Research Organization in Okinawa, Japan (EMRO). However, when claiming "green" product status, it is highly likely that EM is non-functional as a cleaning agent, due to the fact that no enzymes are release to degrade the organic soil. As such, cleaning is achieved through the chemical based surfactants at work, which are not considered eco-friendly.

It is clear that a carefully calculated combination of bacterial strains (considered beneficial microorganisms) and added enzymes, each selected for its efficiency at degrading certain waste materials, is the winning formula in green cleaning. When used correctly, these products are completely safe and effectively tackle the wide variety of compounds found on surfaces and waste systems.

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