EM Treatments of Odor, Waste Water, and Environment Problems

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Dr. Teruo Higa and Mr. Nobumasa Chinen

1. Reduction of Odor

EM contains various organic acids due to the existence of microorganisms such as Lactic acid bacteria that secrete organic acids, enzymes, antioxidants, and metallic chelates.

First, odor substances are of weak alkaline represented by ammonia and will be neutralized with organic acids in EM solution. Secondly, the enzyme and antioxidants reduce odor in a synergistic way, a sort of buffer effect. Thirdly, the metallic chelates react with odor substances instantly, change them into non-odor substances and reduce them quickly.

Organic matter produce odor when they are putrefied with putrefactive type of microorganisms. When EM is applied to a local environment and starts to dominate it with its fermentation type of microorganisms, they will stop the process of putrefaction and move towards a fermentation process. Thus if EM is applied to the treatment of waste water, the treatment takes place in this fermentation system with odor fairly well suppressed.

2. Treatment of Waste Water

A mechanism in the EM treatment system is depicted in Figure 1. EM simply enhances the natural cleaning process. Figure 2 shows the conceptual differences between the natural oxidation process and the EM treatment process. The EM treatment process compared with the conventional method is characterized with the existence of antioxidants secreted by EM microorganisms and the resulting antioxidation environment, both of which enhance solid-liquid separation (separation through depositing), the basis for cleaning the water.

It has been eight years since EM was introduced to the waste water treatment at the Gushikawa City Public Library in Okinawa, Japan. The system has been very stable and is able to maintain the quality of treated water at a high level passing all requirements for discharge, even though the water is recycled at the premises.

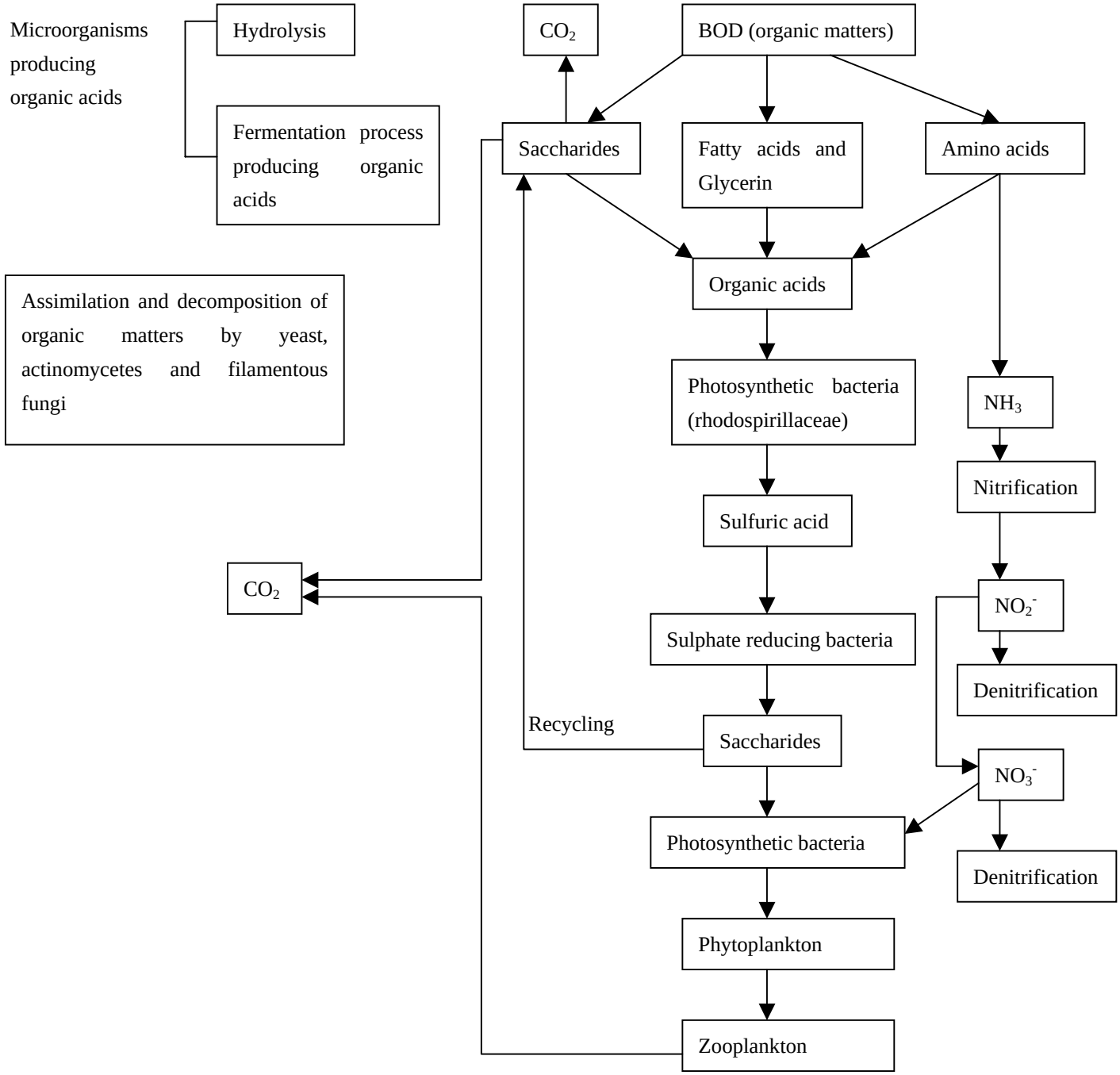
3. Does EM affect the environment negatively?

Microorganisms in EM are not genetically engineered, but are gathered mainly from those used in the food processing industry. They are carefully chosen passing very strict criteria in terms of no harm to plants, animals, humans and especially the environment either directly or indirectly.

EM was introduced first in the field of agriculture about fifteen years ago and has been extended to many other fields. This has been done in Japan and in many other countries. Though it has been used in an extensive range of environments throughout the world, no single case of the use of EM reported any problem over the entire period of time.

We conclude that EM, a multi-culture of beneficial microorganisms, does no harm on the environment and that its safety on the environment is supported by no single case of any harmful effect.

Figure 1. Mechanism in the EM Waste Water Treatment



Note: Processes of respiration and assimilation must be also taken into consideration for each step.

Figure 2-a. Comparison between EM Process and Natural Oxidation Process from the Point of View of Energy Flows

EM Process

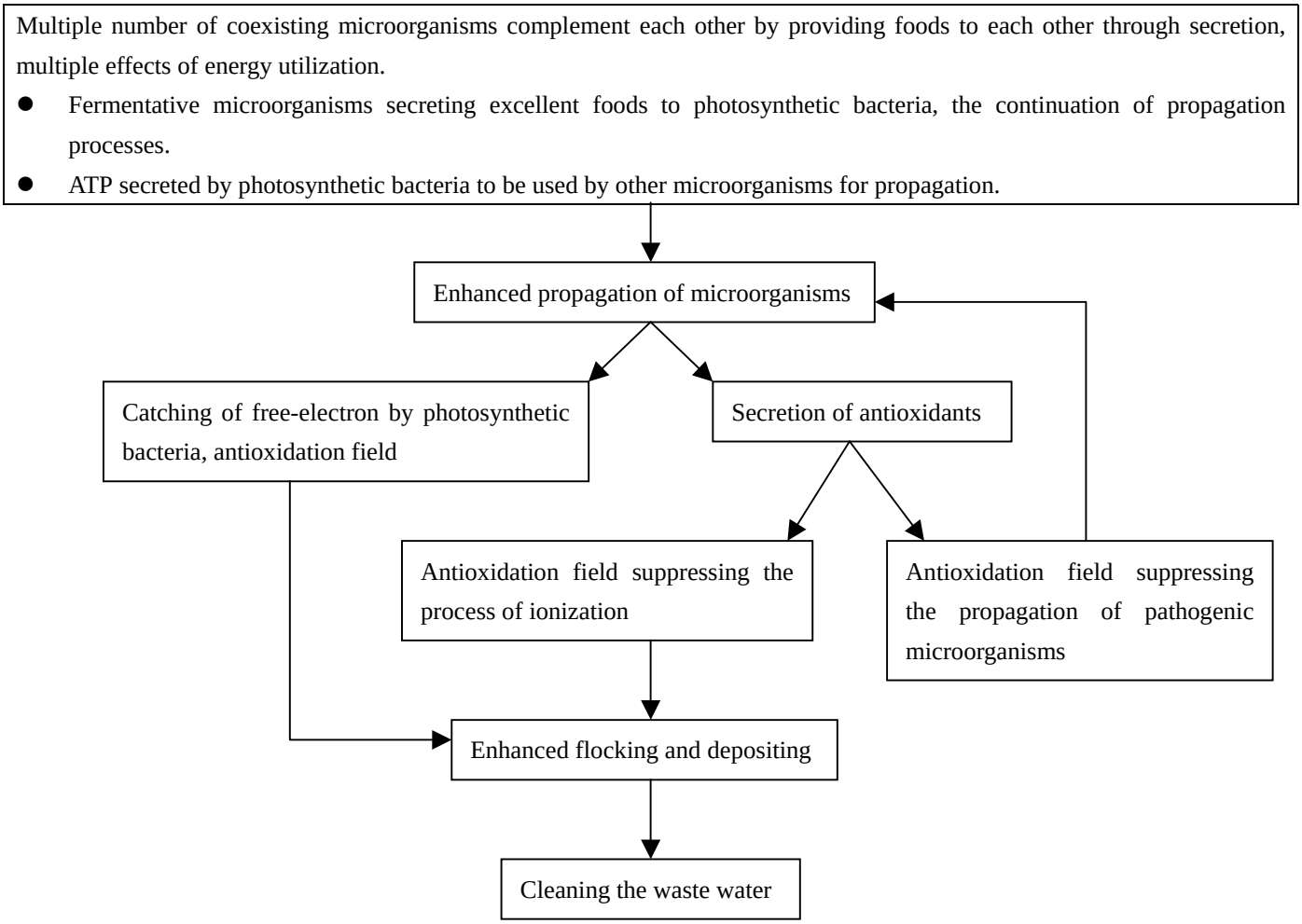


Figure 2-b. Natural Oxidation Process