Bionetix® Newsletter

February 2023

New Exclusive Bionetix® Article Featured in *WATER & WASTEWATER ASIA*!

If you want to educate yourself further on wastewater bioaugmentation, or if you want to share a professional article on bioaugmentation with one of your industrial wastewater clients, this new article is an excellent place to start!

Water & Wastewater Asia, a Singapore-based magazine with a global reach, published an exclusive article from Bionetix® entitled "Overcoming Excess: Adapting Biological Treatments to High Ammonia, Salt, and Chemical Wastewaters" in its January/February edition. The article talks about how biologicals can help the three common industrial wastewater problem areas mentioned in the title. Included in this discussion, you will find . . .

- Reasons for high ammonia levels
- Advantages of denitrifying bacteria
- Tips for improving aerobic conditions
- Keys to overcoming chemical toxicity for biological treatments
- Examples of Bionetix® biological success in Southeast Asia

The article concludes by saying that industrial wastewater will always face problems like these, but being able to adapt the right biological solution to the situation could ultimately make the difference.

Click here to read the article: https://www.yumpu.com/en/document/read/67476047/water-wastewater-asia-january-february-2023/43

FOCUS

OVERCOMING EXCESS: ADAPTING BIOLOGICAL TREATMENTS *to high ammonia, salt, and chemical wastewaters*

By **Julie Holmquist**, marketing content writer, Cortec Corp, and **Tonya Decterov**, technical sales representative, Bionetix International

Biological wastewater treatment takes advantage of what micro-organisms do best: biodegrade organic chemicals into harmless substances in the course of everyday activities. The main food source for microbial growth in heterotrophic bacteria is carbon, which happens to be the backbone of organic chemicals. By digesting organic compounds found in wastewater, the micro-organisms are able to consume carbon to support their normal life processes of growth and reproduction. The more carbon is available, the larger the colony can become, and the more waste the colony can degrade. Micro-organisms also derive nutrients from wastewater pollutants in order to grow. To put it simply, wastewater provides food and nourishment for micro-organisms, making it an ideal environment for micro-organisms to flourish in, all while providing a service to humankind.

One of the major challenges of wastewater treatment comes in dealing with excess pollutants from industrial wastewaters. However, by properly understanding the content of the wastewater loads, as well as the aptitudes and abilities of the microbes chosen, industrial and municipal wastewater operators can leverage biological treatment to the best advantage. This article will look at adaptability of biologicals with regards to three common factors of excess; high-ammonia, high-chemical, and high-salinity wastewater.

HIGH AMMONIA PROBLEMS

Ammonia is a common wastewater pollutant, both because of its widespread industrial use and because nitrogen is converted into ammonia under anaerobic conditions. Ammonia not only causes malodours, but can also be harmful to aquatic life and is therefore carefully regulated under wastewater effluent guidelines*. One option for ammonia removal is to add nitrifiers. However, nitrifiers are temperature dependent and require abundant oxygen to function. They also need a certain level of alkalinity. Furthermore, the ammonia removal process by nitrification requires two steps: first converting ammonia to nitrites, before converting nitrites to nitrates.

Glove factories have high chemical wastewaters that may need an extra dose of chemical resistant biologicals (Image: Cortec/Adobe)

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Adding BCP10 to waste at the chemical plant (Image: Cortec)

In contrast, some heterotrophic bacteria have a better advantage and can use a variety of mechanisms to remove nitrogen from waste. They can use organic nitrogen to build their cells and grow, as well as act as denitrifiers when they use oxygen from nitrate and nitrite to grow. Nitrogen gas is thus produced as a by-product and can evaporate. Some bacteria can even use ammonia as a food source under favourable conditions.

Under certain conditions and when the denitrifying bacteria population is large enough, it can remove more nitrogen in the form of nitrate and nitrite than nitrifying bacteria can. As heterotrophs, these bacteria can also consume certain organic compounds that can become toxic to nitrifiers. A further advantage of heterotrophic denitrifying bacteria is that they can be used in cooler temperatures and at lower oxygen levels than nitrifying bacteria. Ultimately, they can increase wastewater treatment efficiency.

Since the main cause of high ammonia levels is the presence of anaerobic environments, it is also important to support healthy levels of dissolved oxygen in wastewater. Aeration can go a long way towards helping micro-organisms have sufficient oxygen for aerobic digestion, which is overall less odourous and is a faster process than anaerobic digestion. Another strategy for low-oxygen wastewaters is to use facultative bacteria that can function in both aerobic and anaerobic conditions, because facultative bacteria can derive some oxygen from nitrates. A third option for low-oxygen wastewaters is to add an oxygen booster — a slow-release supply of oxygen — to the effluent to help micro-organisms carry out their normal metabolism.

HELPING BIOLOGICAL TREATMENTS RESIST CHEMICAL WASTEWATERS

Another set of challenges arises with wastewater effluents from chemical plants or factories that use many chemicals in their processes. These problems are nutrient deficiency and chemical toxicity. While high chemical wastewaters often contain carbon-rich organic chemicals for micro-organisms to feed on, they often lack nutrients critical to microbial health. Just as humans need a full range of vitamins and minerals as well as carbohydrates, fats, and proteins to function healthily, micro-organisms need the proper nutrients to support their growth into a colony that is large enough to handle digestion of abundant chemicals. When nutrients are deficient, the micro-organisms grow too slowly to keep up with pollutants, leading to problem indicators, such as foam and filament growth.

For this reason, biological treatments that need to function in a high chemical environment should be supplemented with the proper nutrients to support healthy microbial growth and resist the inhibitions of a chemical environment. A simple solution is for operators to either add nutrients to the wastewater as a separate supplement, or buy them prepackaged in an enriched microbial formula designed for high chemical environments. Bionetix International, a biotechnology company based in Quebec, Canada, offers both forms and has seen results with several examples of the latter.

In one instance, a chemical manufacturing plant faced surcharges for excess chemical oxygen demand (COD) loading of wastewater effluent to the municipal plant at COD levels ranging from 4,000–10,000mg/l. They began adding a three-day shock dose of a biological formula, BCP10, which was

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PERSONNEL® NEWS

Meet Kevin Fox – Our New Inside Sales & Customer Service Rep

If you haven't met him yet, we are pleased to introduce our newest Inside Sales & Customer Service Rep, Kevin Fox, who joined us last summer! Since then, Kevin has been busy providing customer support, overseeing order entry and follow-up, distributing product literature, and coordinating samples.

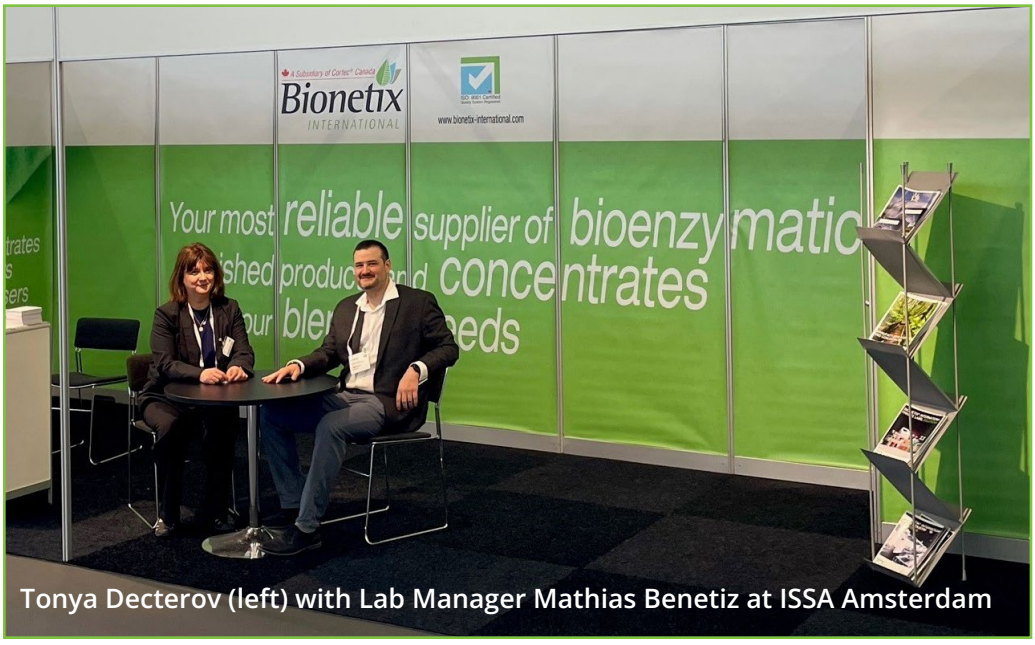
Kevin's background in business management, marketing, and sales over a successful 15-year career in animal pharmaceuticals and biologics gives him a strong skill set to transfer into the field of probiotics. He is impressed with the diversity of Bionetix® applications and commented, "I am fascinated how probiotics and good bacteria play a major role in the production of our products . . . that are non-hazardous to humans, animals and the environment. An excellent alternative to harsh chemicals."

Contact Kevin (in French or English) at kfox@bionetix.ca!

Our New Product Manager Has a Familiar Face!

Many of you have already worked with Tonya Decterov and know how dedicated she is to providing prompt service and keen technical advice. So, it is probably only a small surprise to hear that Tonya was promoted to the role of Bionetix® Product Manager in December 2021!

Diana Di Marco (Technical Sales Director), said this was a well-deserved promotion and noted, "Tonya showed a big interest in gearing her career path towards product management while working as a technical sales rep. She has become strong on identifying opportunities and collaborating with other members of the R&D team."



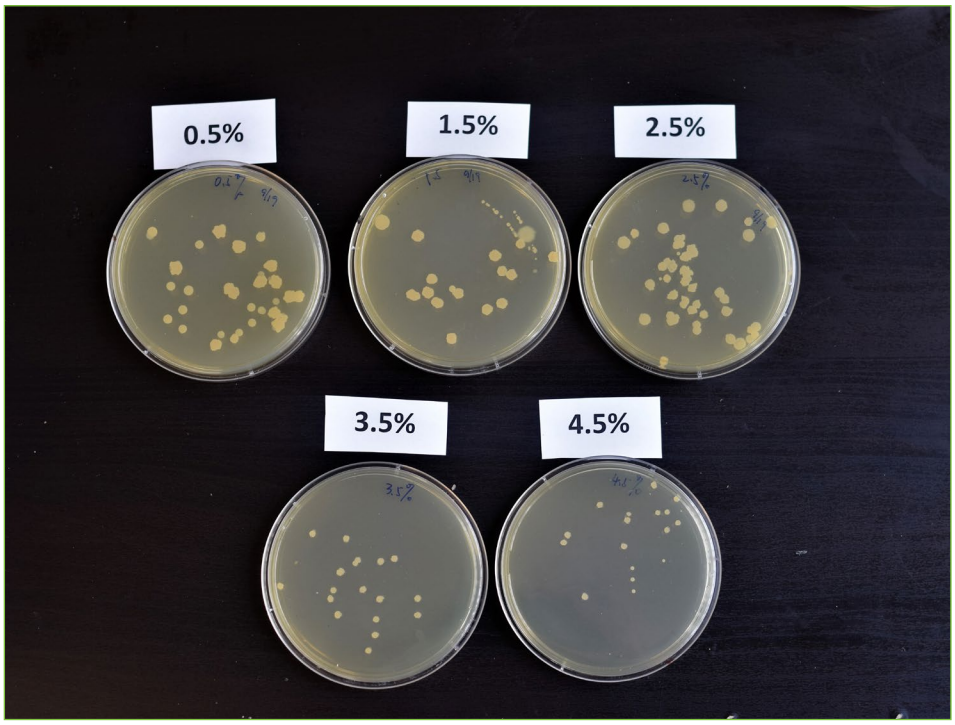
Tonya Decterov (left) with Lab Manager Mathias Benetiz at ISSA Amsterdam

What does Tonya do in her new role? In addition to her previous duties, Tonya has spent the last year in training and development on product benchmarking, competitive analysis, forecasting, product positioning, and pricing strategy development. We look forward to seeing exciting results come from her adoption of these new responsibilities—as they have already. Please join us in congratulating Tonya!

TEST RESULTS

The results are in for biological saltwater testing!

Last fall, Bionetix® decided to test BCP35™ to see how well it worked in various saltwater concentrations. The problem is that salt hinders microbial growth and reproduction, limiting the effectiveness of bioaugmentation in high salt environments that are often found in the field. This could be a problem for those who want to do, for example, bioremediation in a saltwater marsh.



With this in mind, the BCP35M™ strain was tested at salt concentrations of 0.5%, 1.5%, 2.5%, 3.5% (average seawater content), and 4.5%. The lab observed colony growth after an incubation period of 18-24 hours at 95 °F (35 °C) and found no significant difference in the number of colonies that grew. However, colony size was smaller with higher salinity. These observations led the lab to conclude that BCP35M™ can indeed work in saline waters with concentrations as high as 4.5%, even though growth may take slightly longer and higher dosages may be needed.

What does this mean for users of Bionetix® probiotics? The growth of BCP35™ even at 4.5% saltwater concentration is an encouraging sign for those who want to do oil spill cleanup in saltwater marshes or treat high salt wastewaters, because it shows that bioremediation with BCP35™ is a viable option. It also gives an optimistic outlook for other Bionetix® products that contain the same microbial strain.

If you have a high salinity environment that needs treatment, contact us to discuss options in more detail: https://www.bionetix-international.com/contact-us/

ISO QUALITY AUDIT RESULTS

We are pleased to report that Bionetix® International has passed its ISO 9001:2015 recertification audit! After a long stretch of virtual audits due to the pandemic, the quality management system audit took place in person once again on January 5th-6th, with Michel Morin of SGS finding no major or minor non-conformities. Maintenance of our quality certification helps ensure that Bionetix® products and services consistently meet the expectations and requirements of our customers and spurs us on to more efficient and improved customer satisfaction.


Certificate CA08/4215

SGS

Bionetix International Corporation Inc.

ISO 9001:2015

PRODUCT NEWS

The last half year has been an exciting time for new product announcements, including some innovative solutions for sports odors and litter box maintenance. Here's a glance at six recent product releases.

ECO-SCENT SPORT™ is a ready-to-use odor neutralizer designed specifically to tackle sports-related odors. It can be used in standard spray bottles and sprayed directly over the odor problem area at the gym, in the locker room, in the duffel bag, or on your clothes. Learn more: https://www.bionetix-international.com/products/eco-scent-sport/

BIOBOOSTER SR™ is a new wastewater sludge treatment option for industrial and municipal wastewater lagoons. These tablets are designed specifically to reduce wastewater sludge at the bottom of lagoons and ultimately reduce dredging frequency and cost. This development uncovers an exciting new method of sludge treatment for an expensive problem! Learn more: https://www.bionetix-international.com/products/biobooster-sr-sludge-reducer/

ABC 9000™ is our newest ABC Series waste-digesting deodorizing concentrate. It can be used to formulate a wide variety of products including laundry detergent, carpet cleaner, or self-deodorizing cat litter. Its multi-spore bacteria blend is great for controlling odors and removing stains. Choose from pine, floral, or custom fragrances and light green, blue, pink, off-white, or custom colors for this water-soluble probiotic powder additive. Learn more: https://www.bionetix-international.com/products/abc-9000/

PORTA-TREAT™ P Premium treats and deodorizes portable toilets and mobile systems aboard vehicles with even more fragrance and better visual coverage of waste than the two previous versions of PORTA-TREAT™ P. Simply toss one of these water-soluble packages into the portable toilet after emptying and cleaning the retention tank, and you will leave behind a deep blue color with a pleasant fragrance while beneficial microorganisms prepare to digest organic waste in the retention tank long after application. Learn more: https://www.bionetix-international.com/products/porta-treat/

ECO-CLEAN-ALL TABS™ contain biodetergent concentrate in tablet form. This cuts down on waste, storage space, and shipping costs. One tablet added to 500 mL of tap water in a reusable spray bottle produces a probiotic cleaning solution that digests grease, oil, protein, fat, starch, and other solid organic wastes. It can be used to clean both hard surfaces and fabrics. An added benefit is that probiotics in the cleaner will continue to digest odor-causing substances in pipes and septic tanks after disposal. Learn more: https://www.bionetix-international.com/products/eco-clean-all-tabs/

HYGIEA2401™ is a new probiotic cleaner that cleans and deodorizes at the same time. This makes it great for cleaning containers and facilities associated with bad smells (e.g., recycling bins, bathrooms, fitness centers, pet rooms, etc.). HYGIEA2401™ works in five ways: (1) It physically encapsulates molecules that cause bad odors. (2) It chemically binds substances that cause bad odors. (3) It biologically degrades and digests odor-causing molecules. (4) It thoroughly cleans away the source of the smell with detergents. (5) It pleasantly masks malodors with long-lasting fragrance. Learn more: https://www.bionetix-international.com/products/hygiea2401/

UPCOMING EVENT

ISSA Show North America 2023
November 13th-16th, 2023
Mandalay Bay Convention Center
Las Vegas, NV
Booth # 1012
Show link: www.issashow.com

Case History #42: Tackling Glove Wastewater Problems

A glove manufacturer in Malaysia needed help complying with industrial effluent standards. Within just two weeks of initial BCP11™ treatment in February 2021, the manufacturer saw tremendous improvements in BOD, with lower COD as a result. As of October 2022, satisfactory treatment had continued, dosage being adjusted as needed according to BOD loading. Read more: https://www.bionetix-international.com/wp-content/uploads/Restricted_Case_Histories/ch042.pdf

Case History #45: Successful Olive Tree Transplant

It is extremely difficult to successfully transplant adult olive trees, which need strong roots to survive and adapt to different soil. However, a homeowner in Greece decided to tackle the job last year with four trees from different parts of the country. During the transplanting process, a 5% solution of ECO-TURF™ was used to generously water the soil used to plant the trees. Three months later, the olive trees were still alive and even produced olives. ECO-TURF™ was credited with adding nutrients and beneficial bacteria to the soil to aid the transplant. Read more: https://www.bionetix-international.com/wp-content/uploads/Restricted_Case_Histories/ch045.pdf

Case History #46: Budget Solution for Bakery Wastewater Overload

A bakery in Malaysia has a wastewater treatment system that is too small to handle constant overloading but cannot be upgraded due to budget constraints. This periodically results in foaming issues. In March 2021, the bakery decided to add BCP22™ as an extra boost to their MBBR (moving bed biofilm reactor). This dramatically reduced BOD, but foaming and overflow issues cropped up again after more than a year, and the customer was encouraged to increase the dose of BCP22™ until foaming disappeared. While a lasting solution would be to upgrade the system, BCP22™ has worked wonderfully as a stop gap until the customer's budget allows for a more permanent remedy. Read more: https://www.bionetix-international.com/wp-content/uploads/Restricted_Case_Histories/ch046.pdf

Keywords: Bionetix, wastewater, chemical wastewater, probiotics, probiotics in saltwater, sport odor neutralizer, probiotic cat litter, probiotic cleaner, successful tree transplant, BOD overload

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Created: 02/2023