



SOUTH AFRICAN RIVER REMEDIATION DESOLVED OXYGEN LEVELS INCREASED BY 250% IN 4 MONTHS COLI-FORM REDUCED FROM 51000ppm to >51ppm

A river's health is measured by the amount of oxygen in its water, which scientists call dissolved oxygen (DO). The lower the amount of oxygen, the less healthy the river. Reduced oxygen levels are a direct result of industrial and chemical spills and pollutants, such as raw human and animal waste, entering a river. Efforts to restore the Isipingo River illustrate how Xcelbio can return a polluted, dying river to life. Once an ideal habitat for tropical trees and shrubs and a rich variety of fish, crabs, shrimps, snails and birds, the River situated in South Africa flows quietly by industrial and residential areas before entering the Indian Ocean near Durban, South Africa. The amount of oxygen in the river had dropped to less than 3 mg/l, which is 50% less oxygen than is needed to keep fish and other wildlife alive. At this level, all forms of life in the river were dying. The water became cloudy and grayish-brown. Also, disease causing (fecal) bacteria thrived. As a result, the beautiful river became a miles long poisonous, ugly, smelly, disease ridden drainage ditch.

Reducing Disease Causing Organisms

At one time, the River had been one of the country's major recreational areas. Because there are no sewer plants or septic tanks along the river, raw human and animal waste entered the water all the time. As a result, the amount of oxygen in the water dropped. When the low amount of oxygen combined with the waste, fecal bacteria were able to grow at alarming rates. The total coli form count prior to treatment was **>51000 ppm** after treatment this was reduced to **<51 ppm**. Because fecal bacteria can cause people to get very sick and Xcelbio containing bacteria phages was introduced upstream from the industrial/residential area at a rate of eight approximately 100lts per hour. The graph below shows that the amount of oxygen (DO level)

Why You're Just Now Hearing About Crenarchaeota?

Crenarchaeota, one of the oldest life forms on Earth, makes up an estimated 35% more of the planet's life.

Carl R. Woese, Ph.D. discovered Crenarchaeota in 1977 at the University of Illinois. He made an enclosed vacuum hood, which created one of the most oxygen-free (anaerobic) environments in history. In this oxygen-free zone, the Archaea grew and were discovered. Other labs were not able to study Archaea until they were able to create the same oxygen free atmosphere, which took some time. Through further studies we now know that Xcelbio also contains bacterial Phages.

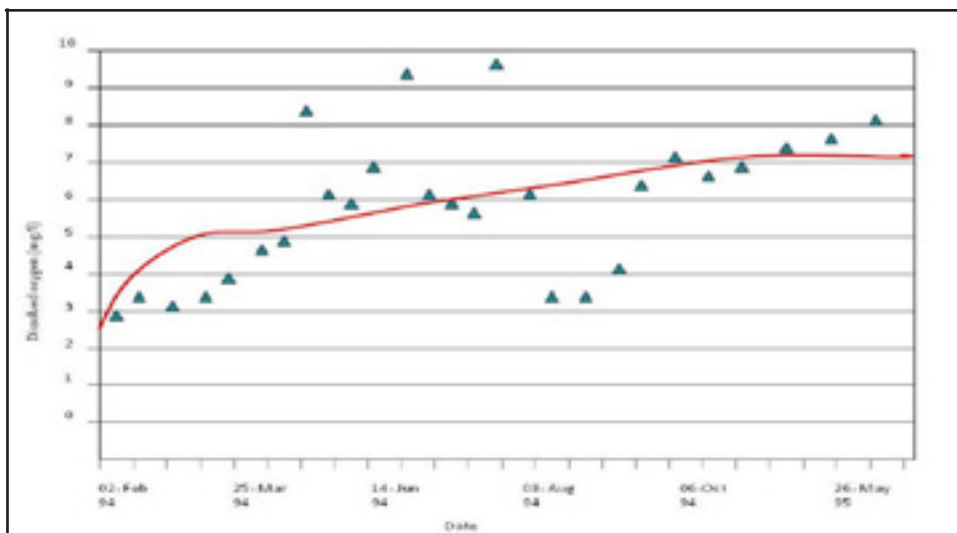


South African River Rehabilitation with Xcelbio

When scientists began describing Crenarchaeota in detail, they found several unexpected things: Crenarchaeota looked like bacteria; small microbes without a nucleus. But Crenarchaeota controlled their genes like a plant, animal or human. This went against hundreds of years of knowledge about living things. Few scientists climbed out on this slippery slope.

In recent years, however, this has changed. Research has shown that Crenarchaeota is the final step in waste breakdown. The key is its enzymes, which breakdown toxin and poisons that were previously thought untouchable. Xcelbio is the owner of this exclusive biotechnology that can provide you concentrates of natural Crenarchaeota sources to resolve waste water problems.

DO increase following Xcelbio treatment.



Eliminating Sludge

Rivers not only need oxygen for plants and animals to live but also to give microbes (called aerobic bacteria) the energy they need to break down dead and decaying plants, fish, animals and other molecules into simple, stable end-products. These end-products then can be washed away, released into the atmosphere or used by the river to provide food for the living plants and animals. Over the years, the Isipingo River built up a lot of mud and slime (sludge) beneath its surface. This sludge is a source of bad smelling substances such as ammonia and hydrogen sulfide (rotten egg odor). Also, many other bad substances collected in the sludge. These included phosphorous, lead, asbestos, zinc, cadmium and difficult to breakdown molecules and herbicides, which are used to kill weeds and other unwanted plants. These substances contributed to lower the amount of oxygen in the river.

For sales and technical enquiries contact: infoxcelbio@gmail.com



South African River Rehabilitation with Xcelbio

During the four-month period following the addition of the Xcelbio (Crenarchaeota) and other now healthy aerobic bacteria in the river biodegraded approximately 50% of the settled sludge.

With less sludge, the bad compounds were released and became available for the Xcelbio and the now healthy aerobic bacteria to break down.

These microbes then attached themselves to the root hairs of grasses on the river banks and transferred these bad substances out of the river.



Improving the Appearance

When there was enough oxygen in the river to once again support life, the water's color began to change from brownish-gray to green and then finally back to blue.

The scum along the banks began to go away and then disappeared altogether. Also, grasses began to grow on the sand bars in the river.

The overall impact is best seen in the picture to the left, a clean water river leisurely flowing to the South African coast.

Handling Future Shocks

With population and industry growth along the Isipingo River, the dumping of more human and animal waste and other pollutants into the river is more likely to occur in the future. This dumping is referred to as "shocks."

The combination of enhanced Crenarchaeota activity and more robust aerobic bacteria will allow the river to more easily and fully handle these extra amounts of waste materials and pollutants. The result: The Isipingo River is once again a healthy place for trade, business and recreation.