

The logo for the 'Perspective' section, featuring the word 'Perspective' in a bold, sans-serif font. The letter 'P' is significantly larger and is enclosed within a square frame. To the right of the word, there are several smaller, overlapping square frames that create a sense of depth and perspective.

## Eco-Friendly Tiny Omnipotent Microbe

Anil Kumar Ghosh

Microbes are really omnipotent. The microbes integrate ores destroy synthetics and make metabolism of greenhouse gases harmless. Certainly by its metabolic action, the environment and economy gain decidedly. Microorganisms have a bad image. After HIV, EHEC, Ebola, Dengue and recently Coronavirus (COVID-19) the fear of disease producing virus and bacteria is intense. However the smallest living being which is working today pleasant: beer, wine, cheese, curd would not have been made without the energy activated by the association of bacteria, fungus and yeast. They can do much more often they eat away one unique substance in preference give up one connection, which get located to the human being. Basak Ötürk of Leibnitz Institute DSMZ in Braunschweig saw in sea water bacteria which destroy artificial foils. A solution for the garbage removing of the sea has not yet been found with that as said by the researcher. For that the swimming plastic islands in the ocean are simply too big. An important step in that direction however seems to be observed.

Other bacteria are in the position to detoxicate tetrachlorethylene. The researchers of the University of Jena discovered that the substance which in chemical purification and from there metal manufacturing industry is highly poisonous. If it attains that in soil one must exclude it from shell and the pump out ground water in order to do away with the damages. An US researcher now found one way i.e. to inject in ground water bacteria in bigger quantity and therefore avoid the contamination” says Jörg Overmann, scientist director of DSMZ.

When the researchers anywhere in the world announce their success and are involved on the

bacteria, these microbes originate possibly direct von Braunschweig. Then the DSMZ register at the biggest collection of microorganism and cell culture of the world and place these at the disposal of science.

At the University of Jena a new centre for research of microorganism planned as the centre piece of excellent clusters ‘balance of the microverse’. Bacteria help as comrades at the TU mining School Freiburg. These dissociate copper from indigenous shale occurrence. Others avoid poisonous chemicals and destroy climate damaging gas. Again others occupy magnet tendency. Few cultivate an unique radiation protection, what they for the space journey make interesting. And in it these eliminate-resistant hospital germs, the microbes could rather serve as antibiotic substitute of health.

### **Biomining becomes mining of future sustainable preparation of strategic metals:**

The mining industry gets new comrades. One is named as for example acidithiobacillus ferrooxidans and can oxidize iron, as also sulphate and sulphur. It is put in biomining or bioleaching. This could be the mining method in future while it is in force as it specially sustainable. Among other, the scientists of technical university, mining faculty Freiburg and Helmholtz Centre, Dresden Rosendorf (HZDR) develop corresponding technologies for biomining. A team under participation of HZDR and Brain AG has succeeded already to extract with the help of microbes almost completely copper out of indigenous state occurrence. The bacteria first of all convert to insoluble ore minerals in water soluble. Through a biochemical overall after that upto 97% of the copper can be recovered back.

Biomining in addition to that are set in order to product from gold, cobalt nickel, zinc and uranium.

**Methane disintegrating bacterium: requires only air for survival :** The researchers of the University of Vienna have nurtured one bacterium that can exclusively survive in air. For that they have developed a special technique for the culture of air devouring microbes feeding in air only. Now methylocapsa gorgona methane ( $\text{CH}_4$ ) reduces from the atmosphere in order from that to detach energy and carbondioxide for the building of biomass. The scientists could apart from that show that the bacterium also out of respiration from carbon monoxide (CO) and oxygen which just occur as methane in disappearing small quantities in the atmosphere, can gain energy.

**Growth on nitrogen monoxide :** Less release of greenhouse gas Nitrogen monoxide (NO) destroy the ozone layer. But it gives also microbes which change, NO components. Researchers at Boran Kartal have discovered that at the Max Planck Institute for Mining Microbiology in Bremen. Anaerobic ammonium oxidising using bacteria link the ammonium oxidation with the reduction of NO and generate molecular nitrogen ( $\text{N}_2$ ). Other microbes change NO in the greenhouse gas. Laughing gas ( $\text{N}_2\text{O}$ ) could be the bacterial changeover more in the direction of  $\text{N}_2$  production is inclined; this would reduce the release of climate damaging gas.

**Tungsten as radiation protection: Survival even in outer space :** How can humanbeing protects himself in case of evacuation from the earth against interstellar radiation? A team at Tetyana Milojevic of the University of Vienna has now shown that the ancient bacterium in presence of carbon and metal tungsten build in metal organic deposit in its surface. These form in crustation to a type of coating which acts even against interstellar radiation.

**Eucaryotic microorganisms in Sea: The colonization of micro plastic**

Previously it was hardly researched to what extent microbes' micro plastic colonises in the

sea and which type with that dominates. The researchers of the leibnitz Institute of Water ecology and freshwater fishing (LGB) in Berlin have made that now. They examined the sample out of polyethylene and polystyrol from the east sea the number of encaryotic microbes, therefore of similar which in contrast to bacteria and virus occupying the cell nucleus.

**The result of research:** A plastic particle of 1 gram weight can give shelter to more living organisms than the 1000 litre seawater, in which the particle swims. About 500 different eucaryote type bustle around on the tiny plastic particle. Leading under the plastic colony were the poisonous dino flagellate pfiesteria piscicila. They reached about 50 times so high density as in surrounding seawater.

**Orientation with magnet sense organ :** Bacteria of the family (magnetospirillum) with magnet sense organ system live in water and orient themselves on the magnetic field of the earth. If a magnet is held in a test in pond sludge, these oblong spiral forming and even multi cell microbes swim towards magnetic pole. The Italian Salvatore Bellini has discovered these first time in 1963. However after 12 years Richard Blakemore first after Bellini's discovery succeeded to confirm this with electromagnetic telescope. He showed as like chains magnetic crystals in the microbes as one compass needle straighten along magnetic field. Side by side with the orientation the bacteria could use for harnessing energy also as inner electrochemical battery. Apart from that the researchers consider to put in place the microbes as magnetic contrast medium in the magnet resonance tomography (MRT).

Magnet spirals are moreover the microbes of the year 2019. This title was granted to them by the Association of General and Applied Microbiology (VAAM) in Frankfurt am main Every year VAAM glorifies a special microbe type.

Re: VDI nachrichten, 26 Juli 2019,  
Nr 30/31 Seite 1, Von Bettina Reckter