"Tea bag" filter provides safe drinking water

Scientists of Stellenbosch University (SU) in South Africa have developed a new system of filtering water, SU reported in July 2010. It was referring to a high-tech disposable filter that looks like a tea bag and cleans highly polluted water. It is a portable, easy-to-use and environmentally-friendly water filter bag that fits into the neck of a bottle. According to SU the new invention promises to provide easy access to clean drinking water for vulnerable communities, such as those living near polluted water streams.

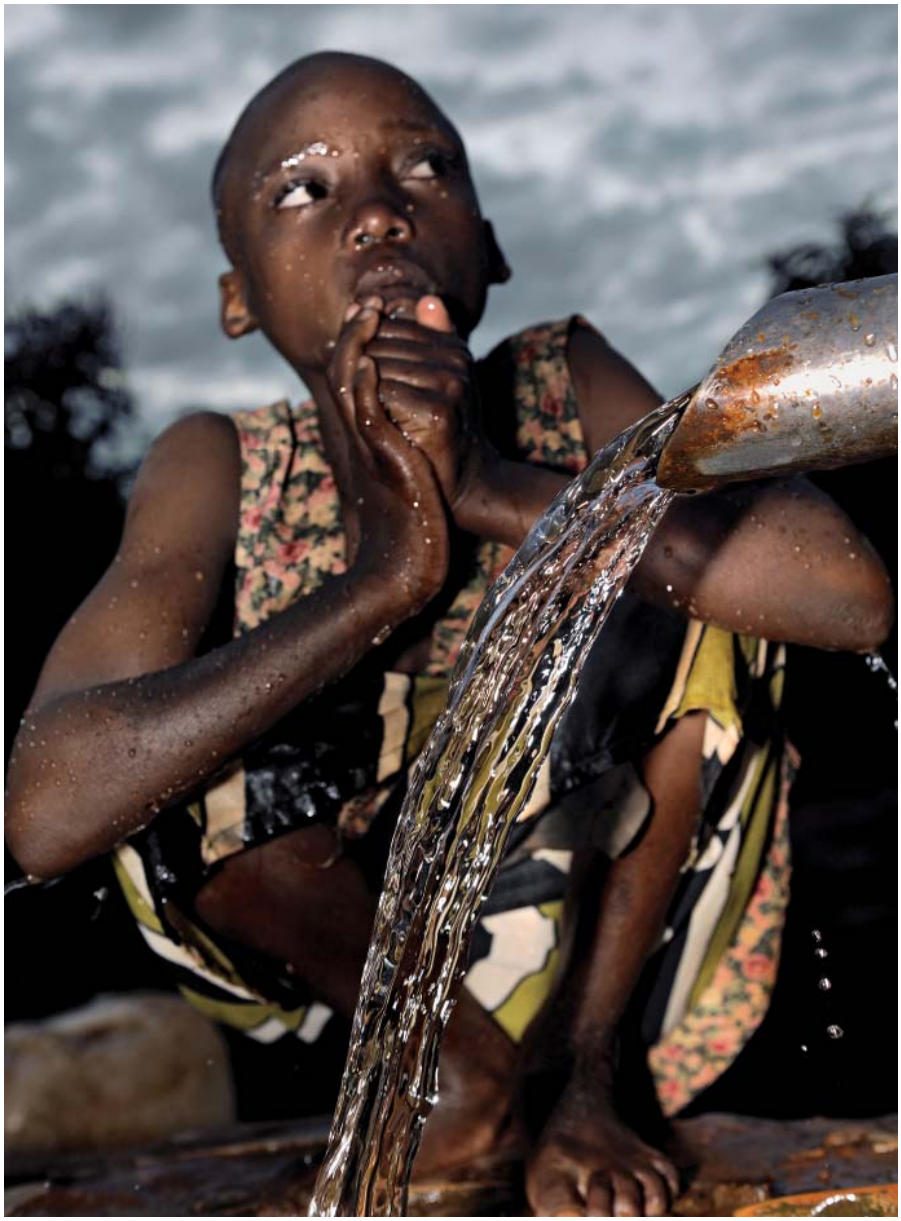

Photo: laif

The filter sachet is made of the same material as off-the-shelf *rooibos* tea bags. The inside of the bag is coated with a thin film of biocides encapsulated within minute nanofibres, which kill all disease-causing microbes. The bag is filled with active carbon granules that remove all harmful chemicals such as endocrine disruptors. Each "tea bag" filter can clean one litre of the most polluted water to the point where it is 100 percent safe to drink. Once used, the bag is thrown away, and a new one is inserted in the bottle neck. Throwing the bag away after use is not damaging to the environment. Its raw materials are 100 percent biodegradable, and the nanofibres break down after being exposed to water for 24 hours. Moreover, the activated carbon in the filter is a good soil fertiliser.

The "tea bag" filter is currently being tested by the South African Bureau of Standards, after which the team hopes to roll it out to various communities. It is expected that the filters will be available on the market in January 2011. Several philanthropic organisations have expressed an interest in distributing the filters to the rural areas. It is not yet clear what the product will ultimately cost, but the scientists are confident that it will be a mere fraction of the price of water filters and bottled water used at present.

About 1 billion people worldwide currently have no access to clean water. According to the World Health Organisation (WHO), four percent of the global disease burden could be prevented by improving water supply, sanitation, and hygiene. *(ib/SU)*

Photo: Stellenbosch University

The tea bag filter could give vulnerable communities far easier access to clean drinking water.

In brief

50 years of international rice research

This year the International Rice Research Institute – IRRI – based in Los Baños, Philippines, is celebrating its 50th birthday. To mark this anniversary Dr Achim Dobermann, research director of IRRI, provided an overview of global rice research in the 21st century at the "Tropentag", an annual international conference on tropical and subtropical agricultural research held in Zürich, Switzerland in September 2010. Rice farming has an annual value of over 150 billion US dollars and directly or indirectly affects over 2 billion people who either depend on rice as their food staple or are involved in its production. Rice is often the only food that 400 million of the chronically hungry have to eat, reported Dr Dobermann.

Rice is not only the staple food of Asia, it is also rising in importance in Africa and Latin America. According to the IRRI research director, international rice research has adapted to this trend. IRRI, the African Rice Center in Benin and the International Center for Tropical Agriculture in Colombia have joined forces under the umbrella of the Consultative Group for International Agricultural Research (CGIAR) with the aim of improving rice productivity in changing environmental, economic, demographic, and social landscapes. The resultant research efforts will be reflected in the Global Rice Science Partnership (GRiSP), one of CGIAR's mega-programmes for the next century. *(wi)*

Could self-vaccinating cattle cut disease?

Malaysian scientists are testing a vaccine that spreads by itself as a solution to haemorrhagic septicaemia, a highly infectious buffalo and cattle disease that costs millions of dollars a year, SciDev.Net reported in September 2010. Haemorrhagic septicaemia is hard to vaccinate against where livestock roam freely, because animals are difficult to capture and restrain long enough for an injection. Scientists have now developed a live vaccine – a disabled form of the bacterium that triggers an immune response without causing the disease. Researchers spray the vaccine up an animal's nose and they breathe it out, where it remains airborne and is inhaled by animals within two metres of them. Haemorrhagic septicaemia is a fatal bacterial disease found in buffalo and cattle in many African, Asian and Middle Eastern countries. *(SciDev.Net)*

Intercropping increases harvest yields

The simultaneous cultivation of two or more crops on a single field – known as intercropping – increases harvest yields. This was reported by agricultural scientists of the Institute of Crop Science at the University of Hohenheim in Germany in their current study entitled "Extension and evaluation of intercropping field trials using spatial models". The scientists tested a combination of maize/wheat in China as well as maize/legume and maize/peanuts in Germany. In two out of three cases higher grain and dry matter yields were obtained – an average of 20 to 30 percent higher than in monocultures. The study was included in the Research Highlight Program 2010 of the American Society of Agronomy. *(University of Hohenheim/ib)*

Photo: J. Boethling

New substance against malaria

Reports of increased resistance to artemisinin derivatives – currently the best weapon against malaria – have highlighted the need for new treatments. An international team of scientists from the Swiss Tropical and Public Health Institute, together with the Novartis Institute for Tropical Diseases and the Genomics Institute of the Novartis Research Foundation, has developed a new substance. It is a completely synthetic molecule belonging to the class of so-called spiroindolones. NITD609 is capable of killing the bloodstream forms of both main pathogens of malaria, *Plasmodium falciparum* and *Plasmodium vivax*, fast and efficiently, say the scientists. The findings were published in the September 2010 issue of the journal Science. *(Swiss TPH/Science/ib)*

"Orange maize" a good source of vitamin A

Scientists have for the first time shown that "orange maize" is a good source of vitamin A, HarvestPlus reported in September 2010. This means that orange maize, a variety of maize bred to improve nutrition, could provide vitamin A through the diet to millions of poor people at risk of vitamin A deficiency. The maize was bred using conventional means (non-GMO) to have higher levels of beta-carotene, which gives it its orange colour. The body converts beta-carotene into vitamin A. The study found that beta-carotene from orange maize was converted at nearly twice the rate previously assumed for maize, and at a higher rate than from vegetables. Preliminary studies indicate the African consumers are likely to accept orange maize which does not carry the stigma of yellow maize. *(HarvestPlus/ib)*

Protein-rich potatoes bring higher yields

In 2003 researchers at India's Central Potato Research Institute developed a genetically-modified high-protein potato. When the team spliced this gene into seven commercial potato varieties and field-tested them for several seasons, the results were surprising, reported New Scientist in September 2010. Not only do the potatoes contain more protein, but the plants also photosynthesised more, and produced 15 to 25 percent more potatoes per hectare by weight – the only time this has ever been reported for a plant with just one extra gene. *(New Scientist/ib)*

Scientists decode wheat genome

Scientists from the University of Liverpool in collaboration with the University of Bristol and the John Innes Centre have decoded the wheat genome. They will make the DNA data available to crop breeders to help them select key agricultural traits for breeding, reported the University of Liverpool in August 2010. The wheat genome is the largest genome to be sequenced to date; it is five times larger than the human genome. *(University of Liverpool/ib)*

Salt-tolerant rice developed

A team of scientists at the Australian Centre for Plant Functional Genomics (ACPFG) has used genetic modification (GM) to improve the salt tolerance of rice, ACPFG reported in September 2010. The research team has used a new GM technique to trap salt in the root of the rice plant, reducing the amount of toxic salt building up in the plant and increasing its tolerance to salinity. The research has been conducted in collaboration with scientists now based in universities in Cairo, Copenhagen and Melbourne.

The research team expressed a gene to increase the number of salt-transporting proteins in specific cells in the roots of the rice plant. The genetic modification resulted in salt being trapped in the root, where it is less harmful to the plant, thus avoiding salt travelling to the shoot where it does the most damage.

The new GM technique is a biotechnological approach to helping rice grow in saline conditions. *(ACPFG)*

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