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PREDPLATNÉ



SITUÁCIA NA UKRAJINE MODERNÁ KRAJINA BIZNIS LIFE TECHNOLÓGIE GASTRO MOTIVÁCIA VZDELÁVANIE REŠTART BRANDLAB

REBRÍČKY A ŠPECIÁLY VYDANIE PREDPLATNÉ



STARTUPY

They say they have to drive investors away. The discovery of a Slovak startup helps miners and farmers

Foto: archív ekolive | Darina Štyriaková, CEO startupu ekolive.



Peter Matijek

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Like many great discoveries, this one was born as a by-product. The company, led by biotechnologist Darina Štyriaková, originally tried to develop an innovation that would use a new type of bacteria in so-called bioleaching, the extraction of metals with the help of microorganisms. However, the tests showed that the resulting product also has a significant effect in agriculture.

When Darina Štyriaková speaks via Zoom, three words flash behind her: bioleaching, bioremediation and biostimulants. The first two technologies are somewhat similar, the difference is that in bioremediation, thanks to the action of microorganisms, it is not metal that is removed from the raw material, e.g. from soil or waste, but pollution with toxic substances, e.g. oils or pesticides.

The founder of the startup *ekolive* was brought to this field by the previous research of her parents, microbiologist Igor Štyriak and biotechnologist Iveta Štyriaková. In 2019, her daughter, together with geologist Jaroslav Šuba and thanks to the support of the European Institute of Innovation and Technology, began testing bacteria in industrial conditions.

From waste to treasure

“Originally we wanted to use our technology to extract metals, treat mining waste and improve the quality of minerals. We also have a European Union certificate for this eco-innovation,” says Štyriaková.

“However, it turns out that what we happened to find has an even better use. The biological lye from our process has a very significant impact on agriculture. Put simply, no matter what we poured it on, it grew. This has completely turned our business model around.”

Bacteria resulting from bioleaching and some products of their activity, for example organic acids, but also dissolved elements such as iron, manganese, zinc and magnesium, appear to have a positive effect on soil renewal.

They support the ability to store water, as well as the absorption of nutrients in plants and the functioning of their hormones. This should explain why they have a positive effect on plant growth and improve their health.

Bio-substitutes for pesticides and nitrates

ekolive came to this realization at a time when the European Union is significantly restricting the use of pesticides and nitrogen fertilizers. Without these substances, however, plants often have difficulties in reaching the quality required for food use, so that farmers are intensively searching for bio-substitutes.

There are already many so-called biostimulants on the market, mostly amino acids, some of which have positive effects, but in most cases, says Štyriaková, farmers are disappointed. Some permitted microorganisms are already listed on the so-called European Input List of products that meet the standards of organic farming.

“So far, however, only four microorganisms are on the list,” explains Štyriaková, “but their entire spectrum is needed in the soil. And certainly not in pure cultures. They often don't even survive after being deployed in the natural environment. We're using bacteria that come straight from the soil, so they're used to it because we're also eliminating biohazards with it.”

Too few bacteria on the list

So *ekolive* decided to offer its product to farmers. However, the European certificate required for proper marketing is not easy to obtain. This requires around three years of testing and adding more bacteria to the input list. The startup therefore initially chose the path of mutual recognition of approvals across the member states.

But even such an authorization is not easy. “Most biostimulants are chemically produced, and the authorities know the process of their production,” says Štyriaková. “But when you apply for a permit for bacteria and their natural metabolites, it takes quite a long time for the authorities to check everything. But we went through this process, we received registrations in Germany and mutually recognized registrations in the Czech Republic and Slovakia. Although it's different in every country,” she says.



Darina Štyriaková, CEO of the ekolive startup with her mother Iveta. Photo: ekolive archive

In Slovakia, the product *ekofertile* was included in the category “Organomineral NK (nitrogen-potassium) fertilizers with iron and manganese”, in the Czech Republic it is listed as a biostimulant. “Actually, it’s not even a classic biostimulant like the others on the market,” explains Štyriaková.

“The essence of this new product is that it brings back the natural biotic weathering process to the soil. In some countries, our product is also classified as a plant additive.”



We don't need any expensive technology, no bioreactors, nor do we consume a lot of energy, says Darina Štyriaková. Photo: ekolive archive

A great pit is being dug...

Either way, the product can already be sold in the Netherlands, Germany, the Czech Republic, Slovakia, Austria, Spain and Slovenia, Italy, France and Croatia, says the *ekolive* boss. “The way we do it is that in every country where we find a customer, we have product recognition.”

In their opinion, the production is neither financially nor technologically demanding, nor limited by production capacities. “Our production partners are mostly mines. Apart from that, we don't need any expensive technology, no bioreactors and we don't use a lot of energy either. A large pit is simply dug and sealed with foil. We put in our bacteria, provide them with nutrients, minerals, water and the bioleaching process begins.”



Big pits, soil and bacteria, this is what the “laboratory” of a scientific startup looks like. Photo: ekolive archive

What is waste for miners is multiple input for *ekolive*. Bad sand that is cleaned can sell better. “And such sand, which is of very poor quality and is not suitable for building or for the production of glass or ceramics because it contains too much iron and manganese, is for us an ideal raw material for the production of biostimulants, because the plants lack iron and manganese,” says Štyriaková.

With bioremediation, the added value is that the owner or remediator of industrial waste or contaminated soil, like the German Köster Bau they work with in Germany, solves the difficult problem of landfilling.

Basically, *ekolive* is a company based on scientific discoveries, summarizes Štyriaková. “We have a registered patent, we have a trade secret, our own know-how, which is necessary, for example, for feeding and training bacteria, and finally the bacteria themselves. It is this combination that protects us from imitation.”

The essence of her technology, she adds, is mainly the ability to use bacteria outside of laboratory conditions, in a non-sterile industrial or ground environment.

Investors? They say they reject her

The company that aims to bring the product to the world was originally based in Košice but also founded a sister company in Paderborn, Germany in 2021. *ekolive* has found managers in Austria, the Netherlands, Germany, and has people from Switzerland and Hungary on the board. They are currently mainly trying to find sellers and distributors.



The ekofertile product is produced during bioleaching. Photo: ekolive archive

“We managed to find them abroad, for example in Croatia, where we have two production sites with Victory Organics, in Pula and Osijek, and we found a distributor in Zagreb.”

However, as Štyriaková says, they tend to “chase away” investors. “We get offers but we turn them down because we don't need a lot of capital. We do have to pay the staff, but we're careful and try not to take too many until we have enough income.”

They would like to avoid having an investor in the company controlling them, she says. After all, her exit from the academic environment at the time was actually a striving for independence. “We want to be our own bosses, so we only chose two investors who promised us that they would only act in the background.”

Today the Slovak *ekolive* is majority owned by the Swiss consulting company OCW. “We are creating a structure in which several sister companies will communicate. The German company takes care of the biostimulants, we leave the development to Slovakia. We also have the patents needed for things like backfilling abandoned mines or cleaning mine tailings, for example.”

The power of biotechnology

They have already won several awards this year. In its “Respond” accelerator, the BMW Foundation voted them among the 10 most innovative start-ups from all over the world. And they received an award from the Dutch Agricultural University in Wageningen, which they want to use to reach the market there.

In November, they were among the two winners of the international “Innovation Hub” competition, organized by the chemical company BASF. “This already implemented system has a broader perspective for a sustainable future,” said BASF jury member Ivan Staňa, Country Manager of BASF Slovakia.

Tests on different cultures

ekolive has already established a first cooperation with BASF and is preparing joint tests. This season it has already conducted tests on a smaller scale in Slovakia, but is mainly active abroad with another large company from the European food industry. Tests have also been conducted in Spain, Croatia, Slovenia, Germany, Hungary and even Sri Lanka.

The advantage could not only be the possibility of refining organic fruit, vegetables or, for example, wine, which usually guarantees a higher price. It could also prove to be an advantage that farmers have a solution at all should pesticides be explicitly banned in the European Union.

“Probiotic bacteria present in the bioleaching leachate restore the natural immunity of plants and healthy microflora in the soil,” says Štyriaková.

What specific use could the product ultimately have? So far, according to the head of *ekolive*, there are many options. “We have already tested it on about 70 different crops, the portfolio is very broad,” she adds.

“Barley, wheat, beets, potatoes, various fruits, olives, fruit trees, vines, flowers, cacti, potatoes have responded positively ... And the way of application can also differ, for example, potatoes can be pre-germinated in it before planting, but An application during the vegetation period using classic root irrigation or spraying the leaves is particularly fruitful.”

How to expand

How does a startup want to gain market share? Although it is a new type of product and the market is still relatively new, it is also quite competitive. “Because we are a startup without an investor, we have so far opted for the option of first selling our product to farmers so that they can give us feedback and thus help to familiarize the market with the product,” says Štyriaková.

“As soon as we have sales, we also want to carry out systematic tests, for example with and at Wageningen University.”



Bioremediation, in this case with the help of algae. Photo: *ekolive* archive

The market: maybe even millions of euros per year

Of course, the final price can also determine market success. A similar product based on so-called thiobacilli from an English company is currently available on the market. According to Štyriaková, farmers describe it as high-quality, it helps plants survive low temperatures and, for example, increases the oil content of their seeds. However, it's also very expensive: "Farmers tell us they can't afford it, so we want to offer them an economical alternative," she suggests.

So what should the likely or at least potential market be? If all goes well, he could grow very large. "Just by working with a large European agricultural company, the volume could reach around 9 million euros per year, although in reality we will probably not be the only companies," estimates the entrepreneur and scientist.

"But we are also working on expanding into Sri Lanka or the Arabian Peninsula, where there is a lot of desert sand. And compared to Europe, North and South America are also very open to the use of biostimulants."