Dead Sea researchers discover freshwater springs and numerous micro-organisms

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Ben-Gurion University of the Negev (BGU) researchers have discovered deep freshwater springs on the Dead Sea floor that feed into this rapidly dwindling body of water.

In the first-ever Dead Sea diving expedition, the researchers also found new types of micro-organisms growing around fissures in the sea floor as part of a collaboration with the Max Planck Institute of Marine Microbiology scientists in Germany.

Diving expeditions have been, up to now, too dangerous to undertake in the saltiest body of water on earth. Using highly skilled divers and high-tech equipment, BGU sent the team to study the springs they had previously detected, but were unable to see from the surface.

The Dead Sea has been rapidly evaporating approximately three feet (one meter) per year, as its main source of fresh water, the Jordan River, has been siphoned off just below the Sea of Galilee for drinking by Israelis, Palestinians and Jordanians.

These Israeli and German scientists have been researching groundwater springs which discharge from the sea floor to understand the impact of this process on the unique Dead Sea ecosystem.

BGU Prof. Jonathan Laronne and research student Yaniv Munwes in BGU's Department of Geography and Environmental Development, working with divers, devised the first system to directly measure spring

discharge and study the structure of the upward jet-like, plume flow.

Their study reveals complex springs hundreds of feet long and as deep as 90 feet (30 meters). The springs appear from the sea floor through craters as large as 45 feet (15 meters) in diameter and 60 feet (20 meters) deep -- with steep, finely laminated walls and alternating layers of sediment and minerals.

"By developing a measurement system for these springs, we will be able to determine more accurately how much water is actually entering the Dead Sea," Prof. Laronne says.

"While researchers have known for decades that the 'Dead' Sea was a misnomer, the rich variety of life as evidenced in the vicinity of the springs was unexpected," says Dr. Danny Ionescu of the Microsensor Group, Max Planck Institute for Marine Microbiology, Bremen, Germany who is leading the study of the micro-organisms.

"While there are no fish present, carpets of micro-organisms that cover large seafloor areas contain considerable richness of species," he says. Ionescu has shown that some had been previously unknown to live in such highly saline environments while others were newly discovered species.

"The micro-organisms in the Dead Sea water mainly belong to the domain Archaea and they number around 1,000 to 10,000 per ml, much lower than regular sea water," according to Ionescu. "Never before have microbial mats/ biofilms been found in the Dead Sea and not much is known about sediment micro-organisms in the Dead Sea."

Provided by American Associates, Ben-Gurion University of the Negev