Ignacio de la HIGUERA Final report rcvd. 1.24.23
Lewis and Clark Fund for Exploration and Field Research in Astrobiology

Extreme Ecology of a Virus in Japanese Hot Springs

PROJECT REPORT

I traveled to Japan during the Fall of 2022 to collect samples from volcanic hot springs, the main purpose of the awarded project. On my way to my main sampling destination in the island of Kyushu, the thermal town of Beppu, I had the opportunity to know part of the country, learn about the Japanese culture, and had a first interaction with the volcanic features of this country in the town of Hakone, placed inside the large caldera of an active volcano. Although sampling was not carried out at Hakone, this stop offered a great opportunity to learn about the geology of the area, and to explore a possible future sampling site.

Overall itinerary, mostly by carried out by high-speed trains (shinkansen).

Aerial view of Hakone's active thermal areas from a gondola.

I arrived to Beppu on 5 December, and met with our collaborators Dr. Sonoko Ishino and Dr. Yoshizumi Ishino (his husband) on the morning of 6 December. Together, and with the help of Mr. Kentaro Io, we toured the different thermal hot springs in Beppu, guided by one of the workers of the Beppu Jigoku organization (Jigoku, *hell* in Japanese, is the term given to those springs that have extreme temperatures). We collected samples from 7 different springs, taking the required precautions (photos below):

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The samples were shipped from Japan and arrived at our laboratory in the Center for Life in Extreme Environments at Portland State University on the 19 December 2022. Since then, we have extracted and amplified viral DNA, and we have isolated extremophilic organisms. The characterization of these samples is ongoing.

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Samples in our laboratory at Portland State University