

Russian researcher helps volcano park

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T-H photo by lorry Kodooka

VISITING SCIENTIST - Ivan Vtorov, a Russian scientist, is studying the effect of feral pigs on the native Hawaiian ecosystem of the mauka rain forests in Hawaii Volcanoes National Park. He is pictured here in his laboratory with soil samples drying in a series of Tullgren funnels.

Ivan Vtorov spends his days studying the nearby residents - in this case the many small creatures which live under and on the forest floor in the humid Olaa fern forest in Hawaii Volcanoes National Park.

He's a long way from his hometown of Moscow and the much colder forests of his native Russia,

The young scientist is part of a unique, intercultural exchange program where volunteers from other countries work at the volcano park, thereby gaining experience and at the same time helping out our National Park Service.

Vtorov's research is aimed at documenting the effect of feral pigs on the fragile, native Hawaiian ecosystem of the park's mauka rain forests.

He uses a special system to extract soil invertebrates (microarthropods) from the soil.

He takes soil samples, then dries them in rows of Tullgren funnels - containers specifically designed for this purpose - for several days under lights in his laboratory at the park.

As the soil dries out, the invertebrates burrow deeper and deeper into the more humid part of the soil until they fall through the screen mesh at the bottom of a funnel and into the alcohol in a container below.

When the soil is dry, and all of the specimens collected from a sample, Vtorov then makes microscope slides and counts and identifies the mites, which are tiny decomposers with eight legs, and insects, which have six legs.

Vtorov is studying the effect feral pigs have on the soil invertebrates by looking at samples from four different places in the Olaa forest.

The first area is a section of the forest which has been fenced and, therefore, free from pigs for seven years. The second has been fenced and sans pigs for four years, the third pig-free for two years, and the fourth is open to pigs.

Vtorov has been working on the project since the beginning of January. Preliminary results - based on 20 soil samples taken from each of the four locations - showed a gradient of pig damage corresponding to the length of time an area has been fenced or not.

The critters collected in the system of funnels are microarthropods - soil invertebrates measuring from 0.1 to 3 millimeters.

Vtorov also collects mesofauna, soil invertebrates measuring from 3 millimeters on up. These include earthworms, millipedes, insect larvae and snails.

He also collects above-ground invertebrates of any size. To capture these bigger specimens he buries plastic jars in the ground, leaving the tops open. The jars are left in the forest for one week, catching all of the above-ground invertebrates which fall into the alcohol bath at the bottom during that period.

He carefully compares the numbers, species, lifeforms and biomass of the collections taken from the four control areas.

By counting the numbers, he discovers the population density for an area. By looking at the different species, he determines what lives where. By investigating lifeforms, he learns about different species living under the same conditions. And by determining biomass, he learns the weight of the total number of invertebrates living within one square meter of land.

Initial results indicate that in the unfenced, feral pig impact area there are a two-times lower population density and biomass of invertebrates, fewer numbers of species, and very few native species of soil invertebrates, as of vegetation.

“The soil invertebrates are the soil decomposers and play a vital role. Without the decomposers, there would be no soil,” said Vtorov.

“Some of the effects of pigs are more obvious,” said Tunison. “Changing the decomposers is a more subtle type of impact.”

Earthworms are among the pigs’ favorite taste treats. In addition to robbing the soil of these valuable, tiny earth movers, the pigs also compact the soil, which is not good for the invertebrates which live in small soil cavities.

The health of the local soil invertebrate population can be used as an indicator of soil conditions such as humidity, density, fertility and chemical pollution.

In regular life, Vtorov works at the Laboratory of Biogeography at the Institute of Geography Academy of Sciences of the USSR.

How in the world did he wind up in Hawaii?

If it weren’t for Soviet leader Mikhail Gorbachev’s policy of “glasnost” (openness), he probably wouldn’t be here.

“About a year and a half ago our institute received a paper about a volunteer project in resource management,” Vtorov said. It was a letter from the park’s chief of resource management, Dan Taylor.

“For about the last five years, we’ve been hiring European students as intern/volunteers. Most have been from West Germany and Britain,” said Tunison.

The students usually stay for three to five months. While at the park they work on technical projects involving some aspect of wildlife or vegetation monitoring. Other projects have included nene restoration and the effects of fire on the park.

“For some students, they are projects to complete their school-ing,” Tunison said.

Vtorov, 25, is a doctoral candidate working on his dissertation research. He is seeking a degree as doctor of biogeography, a field which deals with the distribution of soil invertebrates.

Amazingly enough, his research in the Hawaiian rain forest ties in neatly with what he is studying in Moscow. He said he finds that the Hawaiian soil invertebrates look like their European relatives.

After the letter from Taylor arrived at the Moscow institute, a competition was held among the students to decide who would get to go on the prized trip to Hawaii. Determining factors included knowledge of English and direction of individual studies.

Following the in-house contest, two candidates were selected and submitted their proposals to national park officials, who liked Vtorov’s best.

Once he learned the good news, it took another two months for Vtorov to arrange for his travel documents. His passport stayed in the U.S. Embassy in Moscow for one month, waiting to be stamped with his visa.

Airline travel was another fun thing to arrange, he recalled. He had to change his flight two times because even though he was ready to go, his passport wasn’t.

“It was difficult to buy a ticket from Moscow to New York, because many people now are flying to New York to visit relatives,” Vtorov said.

At that time the only air connections between the USSR and the U.S. were four flights a week from Moscow to New York and two a week from Moscow to Washington, D.C.

On the other hand, 15 times a week flights left Moscow for Tokyo. So Vtorov arrived in Hawaii via the Moscow-Tokyo-Honolulu route.

Funding was arranged incrementally. His Moscow institute considered the venture a business trip, so paid for the Moscow-Tokyo and New York-Moscow portions of the round-trip. The rest of the airfare was covered by a special international fund for assisting research. This fund is administered by the United Nations.

Arranging to pay for the ticket also provided its share of hassles, since Vtorov couldn't purchase the Tokyo-U.S. air ticket with rubles, the currency of his homeland.

Even with all of the hangups, the trip did prove possible. And this wouldn't have been the case before Gorbachev's policies of "glasnost" and "perestroika" (societal and economic restructuring).

Vtorov's Hawaii stay is supported by a grant from the Hawaii Natural History Association. He is staying in park housing.

The Russian scientist studied English in school from ages 13-17. In Soviet schools everyone learns a foreign language, primarily English' German or French. But, like so many American students who try to learn another language, although he studied it, he couldn't really speak it.

"But I like English rock music, especially Pink Floyd, my favoite," said Vtorov, who turned to rock and roll to give him a true command of English.

Other favorite bands include Genesis, Queen, The Who and the Beatles. He studied English by translating the words of the songs from the record albums, and found it a lot more fun than formal classroom study.

The songs taught him how to pronounce the foreign words. These days, when complimented on his good accent, he will respond, "only with the help of rock music." He's quite happy to point out that he learned most of his functional English from the back of record covers.

Here in Hawaii he is speaking English on a regular basis for the first time.

In addition to his field work in the wilds of the Volcano area, he also has given talks at park headquarters about soil invertebrates; land management problems in Soviet Central Asia; and the Caucasus region of the USSR and the ethnic problems within.

He also has given the same three talks at the University of

Hawaii at Hilo and recently spoke to the Rotary Club of Hilo. He illustrates his talks with slides and maps and personal anecdotes. He's enjoying his sojourn in the islands, where "every day is a wonderful time."

Vtorov spent one recent weekend climbing Mauna Loa and believes he's probably the first Soviet to have done so.

He also is enjoying seeing a volcano close up in action, and has been assisting rangers at the flow front.

Using a video camcorder supplied by the National Park Service, he is busy making a movie about the NPS for Soviet television.

Vtorov will stay at the volcano park until mid April. On his way back he'll stop off at Colorado State University, where a friend works.

He noted that by the time he returns home from his travels - Moscow/Tokyo/Hawaii/Colorado/New York/Moscow - he will have circled the globe.

The Moscow scientist said the thing he likes best about Hawaii is the climate. Back home he has a terrarium containing tropical plants and animals. He likes to open it and smell the air.

"Hawaii, for me, is like a big greenhouse," he smiled.