

Water catchment systems need to be properly maintained

By Sophie Cocke

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COURTESY TIM POPE / AMERICAN RAINWATER CATCHMENT SYSTEMS ASSOCIATION

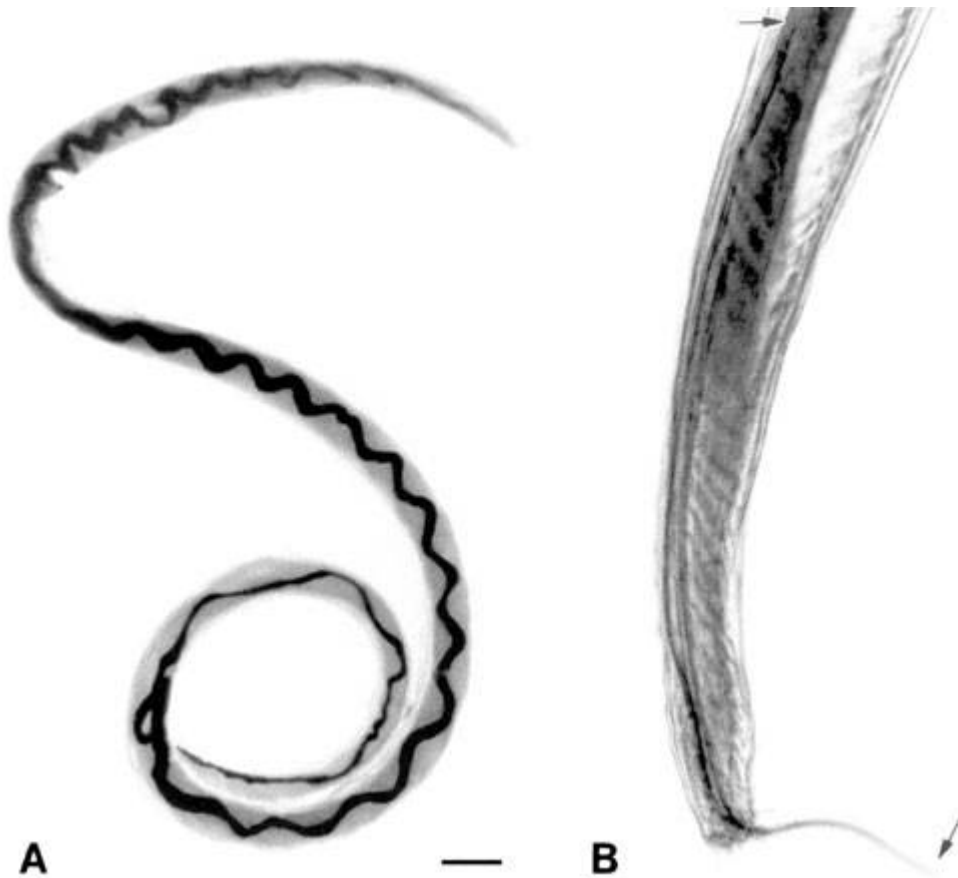
A poorly maintained catchment tank on Hawaii island. “There is nothing wrong with drinking rainwater,” said Tim Pope of the American Rainwater Catchment Systems

Association. “Rainwater that’s been treated properly is very high quality. It’s better than anything you are going to get out of anybody’s municipal water system. But if it is not treated at all, it’s not. It’s like drinking out of a puddle.”



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Semi-slugs crawl on a water catchment tank on Hawaii island.



COURTESY STATE DEPARTMENT OF HEALTH

The rat lungworm parasite is responsible for 15 confirmed cases this year. There have been 73 cases tied to the Puna district on Hawaii island in the past decade.

When Betsy Morrigan showed up at her rustic Airbnb rental in Pahoia on Hawaii island this year, she was alarmed to find its water catchment system consisted of what she described as an “open swimming pool with about a foot of scummy water in it.”

Inadequately treated water can make people sick, and Morrigan said there were no signs inside the rental warning visitors not to drink the tap water or use it for brushing their teeth or cooking.

“I wouldn’t even want to bathe in that water,” said Morrigan by email. “There were no signs about anything related to what you could or should not drink in the house.”

Morrigan is more savvy about catchment water than most people. A Hawaii island resident, she has a catchment system herself. But she worries that many visitors to the island, and even residents, aren't aware of their potential risks.

If the systems aren't properly maintained with filters and covers, experts say, the water can cause serious illnesses and expose people to chemical contaminants, such as lead and other heavy metals.

Concerns about the systems have mounted this year as local scientists worry that catchment water could also be acting as a conduit for rat lungworm disease, a potentially devastating illness in which worm larvae infect a person's brain.

There have been 15 confirmed cases this year of the disease, a significant spike from prior years. Over the past decade the majority of the 73 confirmed cases have been tied to the Puna district, which has the highest rates of catchment water systems in the state.

Despite the risks, the state Department of Health, which administers laws on safe drinking water, says it would be too hard to regulate the systems for individual homeowners, while officials with Hawaii County said it's not their responsibility.

About 75 percent of homes in the Puna district have catchment systems — which collect rainwater from roof gutters — because county water isn't available. Statewide it's estimated that as many as 60,000 people rely on rainwater for household needs. The systems have gone unregulated for decades.

"It's kind of a nightmare," said Tim Pope, an educational instructor with the American Rainwater Catchment Systems Association, a national nonprofit that provides information on rainwater catchment systems and advocates for their use. He's traveled to Hawaii in recent years to conduct educational workshops.

Pope noted that a lot of people in the Puna district might not have the money to spend on proper tanks and disinfection. A well-designed system can cost upward of \$10,000.

"So there are a whole lot of (above-ground) pools with bird netting across the top and dead rats floating on top of the bird netting and just awful, awful

systems,” he said. “I want to be supportive. I’m supposed to be promoting this industry, which is doing well in a lot of places.” But in Hawaii, Pope said, “the state has, through neglect or whatever, just turned their back on the whole thing.”

While some states and counties on the mainland provide various degrees of regulation, in Hawaii there is none. “You don’t have to ask permission; you just do it,” said Pope.

ARCSEA doesn’t have data on how many rainwater catchment systems exist throughout the country, but Pope said Hawaii likely has more than other states and has relied on the systems for longer.

“There is nothing wrong with drinking rainwater. Rainwater that’s been treated properly is very high quality. It’s better than anything you are going to get out of anybody’s municipal water system,” he said. “But if it is not treated at all, it’s not. It’s like drinking out of a puddle.”

Lack of maintenance

Owners and managers of Hawaii island companies that install and service the systems shared similar concerns. They say a lot of people aren’t properly maintaining their systems, while at the same time relying on them for drinking water.

“It can be really bad,” said Stefan Larsson, owner of Big Island Catchment Cleaning, who shared a photo of a system he cleaned where the water had turned a deep green color and was filled with scum and debris.

Operators of catchment companies stressed that it’s important for homeowners to use filters, which should be changed regularly, and an ultraviolet light system, if they are going to drink the water. Chlorine can also be used as a disinfectant but must be maintained at the correct level of dilution.

They stressed that tanks should be well sealed so animals and other contaminants can’t get in them and that shrubs be cleared away from the tanks. Animal fecal matter and urine can cause illnesses such as leptospirosis and giardiasis, which can cause painful diarrhea and vomiting. In severe cases, particularly in infants, or people with weakened immune systems, the diseases can be life-threatening, according to medical experts.

Residents should also be aware of the risk of chemical contaminants. In older plantation homes, for example, lead paint was often used on roofs and inside water tanks, according to a report from the University of Hawaii's College of Tropical Agriculture and Human Resources.

No government rules

Catchment company owners also warned that they have been finding slugs in catchment systems, which can carry rat lungworm disease.

"Especially when there is a drought, they crawl up into the tank and die," said Larsson.

The semi-slug, which is a good climber and highly infected with rat lungworm, is particularly worrisome.

Scientists are still trying to determine whether rat lungworm can be transmitted through catchment water. The worm larvae carried by slugs can survive for weeks after a slug dies, said Sue Jarvi, a professor of pharmaceutical sciences at UH Hilo. She said studies have shown that rats can become infected with the larvae from drinking water, so it makes sense that humans could, too.

In 2010, the UH College of Tropical Agriculture and Human Resources, with the help of the state Health Department, put out a 52-page manual that includes guidelines for maintaining safe water catchment systems. If strict standards aren't complied with, the water should not be used for drinking, cooking or brushing your teeth, and users must remember not to drink the water while in the shower, the manual warned.

But Morigan said she doubts most people using catchment systems are aware of all the requirements.

"Honestly, few of us on catchment water really know how to treat it, how much chlorine to use, exactly how to apply it, and how often, etc.," she said in an email.

Morigan said the state should regulate catchment water and the county should extend its safe, municipal water system to all residents.

As a taxpayer, “it strikes me as archaic that we are forced to use water catchment and extremely unfair that rural residents on the island of Hawaii are paying taxes yet have no safe water systems,” said Morrigan.

But government officials in Hawaii say they have no plans to step in with regulations, and the county says it’s too expensive to extend water infrastructure.

Will people comply?

The state lacks the resources to oversee the thousands of individual systems, said Stuart Yamada, director of the state Department of Health’s environmental management division. Further, he said residents of the district are resistant to government regulation.

“You also need a willingness to comply, and if they don’t even take in the education they have been provided, then regulation isn’t going to solve that,” he said.

Yamada said it’s been the long-standing recommendation of the Health Department that residents shouldn’t drink water from individual catchment systems. The county provides areas where Hawaii island residents can fill jugs with county water for free.

“I respect their right to decide what they want to do in terms of the maintenance and treatment of their water, but think of this: Would you normally eat off of your roof? Most people would say, ‘Hell no.’ Why would you drink off it?” said Yamada. “So it’s the oddity — people don’t necessarily see the contradiction of their choices. The sheer refusal to treat their water sometimes is mind-boggling.”