

How a desert beetle make self filling water bottles possible

Posted on [July 20, 2015](#) by [RUCHIRA WIJESENA1](#) [Comment](#)

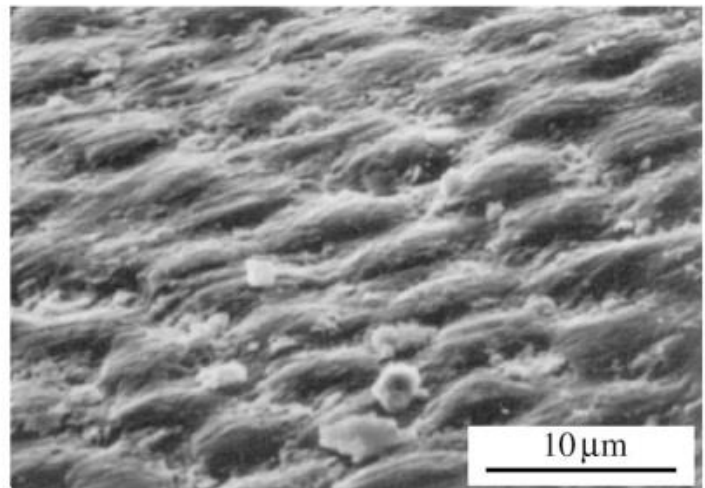


Every morning in [Namib Desert](#), an ingenious little beetle, slowly climb up to the highest dunes of the plain. Then it put its back to the cold breeze to collect the life giving liquid: water. Namib desert is one of the driest places on the world where water precipitation is only 2 millimeters in most areas and there are no substantial water sources. Yet this so called, namib desert beetle, beat the heat thanks to a special nanostructures on its skin. These allow the bug to harvest water from thin air for its survival.

How the beetle does it

Although seems strange, air is one of the biggest reservoirs of water. An average room at 30 degrees Celsius and 60% relative humidity contains around 3.5 liters of water, more than enough to survive a day. However, the challenge is to condense the water vapor in air to liquid state so we can use it. This is usually achieved by cooling the temperature down to dew point to initiate condensation, which hinders the widespread applicability of the technique.

Namib desert beetle can pull off this trick without the need of cooling the surface and air down. Bumps and groves on beetle's back increases the surface area to maximize the condensation. The bumps are made of material that can attract water and initiate the condensation, while groves, that are made of waxy compounds repels it. When droplets condense on the bumps and grow to bigger sizes, they break off and roll down the waxy channels, directly to the mouth of the Namib desert beetle.



Water for those who need it most

It's estimated that about three billion people in the world-almost 50% of world population- suffer from some level of water scarcity. If we can make surfaces similar to namib beetle skin through fabrication of special nanostructures on surfaces, we would be able to provide relief to at least some of the people who are worst affected. This is exactly what a group of graduate students from [MIT](#) attempts to do through their spin-off company called [NBD nano](#). This company aims to economically produce a nanocoating on a surface that can harvest water from air. The company has progressed in to prototype stage and their first prototypes have been very successful. These innovates hope to expand these nano surfaces to common things like roofs, fabrics and water bottles. The idea is to enhance fog collection especially in the morning when the humidity is usually high allowing the water bottles or containers to be filled with water.

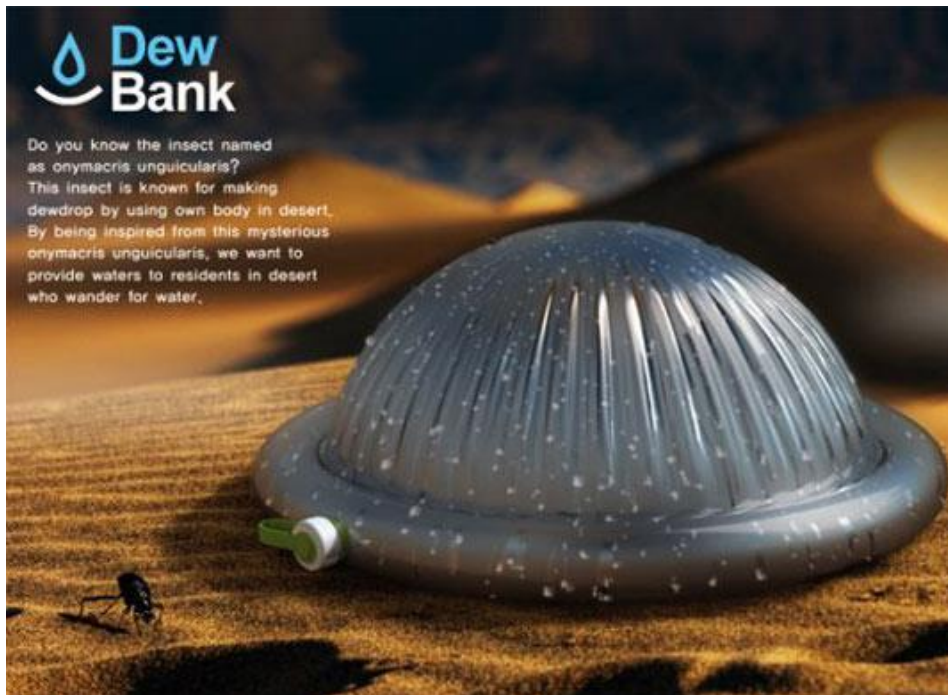
“So if we're creating [several] litres per day in a cost-effective manner, you can get this to a community of people in Sub-Saharan Africa and other dry regions of the world. And if you can do it cheaply enough, then you can really create an impact on the local environment.” said Mr. Miguel Galvez , one of the co founders of the company to BBC.

<http://inhabitat.com/beetle-inspired-bottle-harvests-drinking-water-from-thin-air/>

Beetle-Inspired Bottle Harvests Drinking Water From Thin Air

by [Lea Stewart](#)

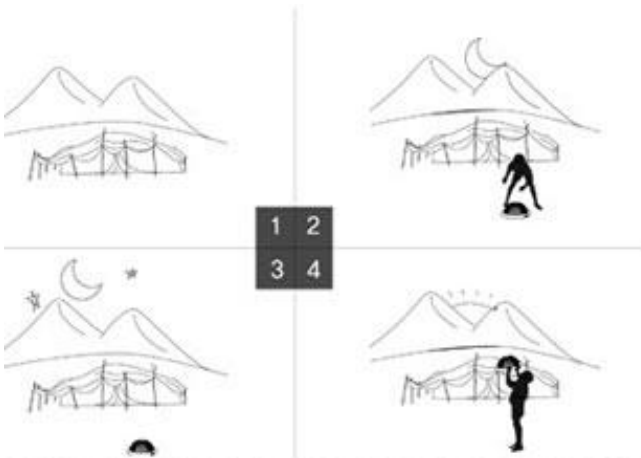
For over one hundred years, scientists and engineers have been studying ways to effectively [harvest fog](#) as a source of water in arid regions. Although some of these [man-made systems](#) have proved useful, the plants and insects that inhabit deserts are far more efficient dew collectors. One ingenious bug known as the “fog beetle” collects drinking water by perching in an opportune position that allows dew droplets to collect in ridges on its back. Seeing this, designer Pak Kitae developed an ingenious [biomimicking](#) Dew Bank bottle that could provide hydration to millions of [people that lack accessible drinking water](#).





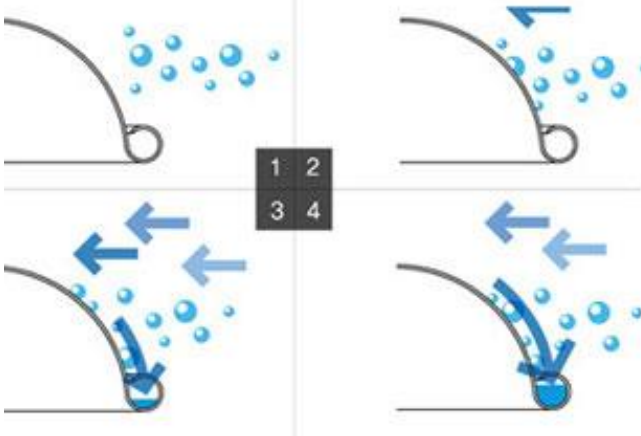
It is usually used as gourd or basket.

One glass of water in morning.. It' s a daily life to you, but it is a happiness to this child.



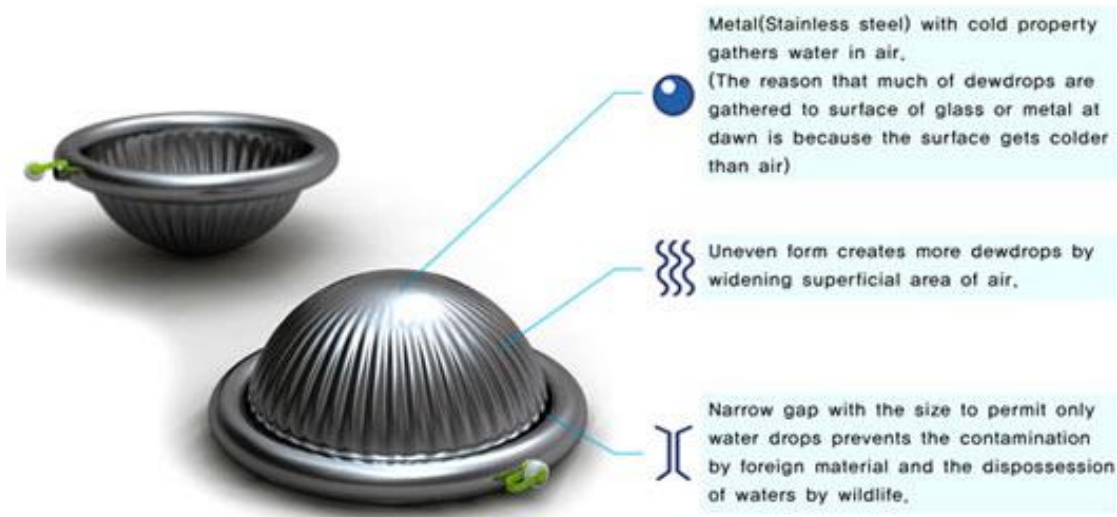
1 2
3 4

Putting it on flat and calm space before sleep and checking it early in the morning.



1 2
3 4

The moisture of air gathers to empty space with rolled surrounding lower part along sloped surface by generating dewdrops.



In the morning, the bottle's ribbed stainless steel dome becomes colder than the air, forming dew drops that slide over the shell and into a channel circling the base. Each day, the [Fog Beetle](#) can collect enough water to match 40% of its body weight. Kitae's suggests that his bottle could collect at least enough for one glass of thirst quenching water.

The Dew Bank was a Bronze Prize winner in the [2010 IDEA Design Awards](#). We agree that Kitae's bottle is notable, and we hope to see more amazing [water-harvesting innovations](#) for desert dwellers.