

Plants open their pores and scientists strike gold

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Plants containing the element gold are already widely known. The flowering perennial plant alfafa, for example, has been cultivated by scientists to contain pure gold in its plant tissue. Now researchers from the Sun Yat-sen University in China have identified and investigated the characteristics of gold nanoparticles in two plant species growing in their natural environments. The study, led by Xiaoen Luo, is published in Springer's journal *Environmental Chemistry Letters* and has implications for the way gold nanoparticles are produced and absorbed from the environment.

Xiaoen Luo and her colleagues investigated the perennial shrub *B. nivea* and the annual or biennial weed *Erigeron Canadensis*. The researchers collected and prepared samples of both plants so that they could be examined using the specialist analytical tool called field-emission transmission electron microscope (TEM).

Gold-bearing nanoparticles—tiny [gold](#) particles fused with another element such as oxygen or copper—were found in both types of plant. In *E. Canadensis* these particles were around 20-50 nm in diameter and had an irregular form. The gold-bearing particles in *B. nivea* were circular, elliptical or bone-rod shaped with smooth edges and were 5-15 nm.

"The abundance of gold in the crust is very low and there was no metal deposit in the sampling area so we speculate that the source of these [gold nanoparticles](#) is a nearby electroplating plant that uses gold in its operations," explains Jianjin Cao who is a co-author of the study.

Most of the characteristics of the nanoparticles matched those of artificial particles rather than naturally occurring nanoparticles, which would support this theory. The researchers believe that the gold-bearing particles were absorbed through the pores of the plants directly, indicating that gold could be accumulated from the soil, water or air.

"Discovering gold-bearing nanoparticles in natural plant tissues is of great significance and allows new possibilities to clean up areas contaminated with nanoparticles, and also to enrich gold nanoparticles using plants," says Xiaoen Luo.

The researchers plan to further study the migration mechanism, storage locations and growth patterns of gold nanoparticles in plants and also verify the absorbing capacity of different [plants](#) for gold [nanoparticles](#) in polluted areas.

More information: Xiaoen Luo et al, Discovery of nano-sized gold particles in natural plant tissues, *Environmental Chemistry Letters* (2018). DOI: [10.1007/s10311-018-0749-0](https://doi.org/10.1007/s10311-018-0749-0)

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