5-5-2021

CAHS researchers receive provisional patent for potential plant sweetener

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A team of Prairie View A&M University (PVAMU) College of Agriculture and Human Sciences (CAHS) researchers have received a provisional patent for the potential use of the *phyla dulcis* plant in non-caloric sweetener production.

The provisional patent was granted last week and opens the way for further studies to prepare the plant for usage in sweetener production. “This is great news, and a major step forward in the research of the *phyla dulcis*,” CAHS Dean and Director of Land Grant Programs Gerard D’Souza said. “This natural zero-calorie sweetener is a healthier substitute for synthetic sweeteners and, by assisting in chronic disease management, this discovery represents a tremendous commercialization opportunity.”

CAHS scientists Aruna Weerasooriya Ph.D., Godson Osuji, Ph.D., Laura Carson, Ph.D., Peter Ampim, Ph.D., Subhani Bandara, Ph.D., Eric Obeng, Ph.D., and Sela Woldesenbet, Ph.D., have been studying the *phyla dulcis* plant since 2013 for use as a possible non-caloric sweetener.

The plant is a perennial herb native to southern Mexico, the Caribbean, Central America, Colombia, and Venezuela. It is commonly known as the Aztec sweet herb, bushy lippia, honey

herb, or hierba dulce, used as a natural sweetener and medicinal herb in its native Mexico and parts of Central America. The Aztecs used it and introduced it to the Spanish when they arrived. A compound called Hernandulcin, whose sweetness is about 1,000 times higher than in sucrose, provides the plant's sweet taste.

The plant has low Hernandulcin production in its tissues. Despite its sweetness, it isn't used in the natural sweetener industry due to its complexity, difficulty in chemical synthesis, and the presence of another camphor. This aromatic compound gives an unpleasant taste to the natural extract.

The researchers conducted various studies on PVAMU's Governor Bill and Vara Daniel Farm and Ranch and determined that the *phyla dulcis* is well suitable for growth in Texas. Additionally, Osuji mapped out the complex biosynthetic pathways of Hernandulcin and camphor. Through his research, Osuji found a way to manage the essential nutrient levels and combinations needed during the growth to increase the production of Hernandulcin and stop the biosynthesis of the camphor production in the plant tissues.

The team is now working on a microbiology-mediated method to eliminate camphor from the plant extract. In the future, Bandara is working to develop transgenic *phyla dulcis* plants with less or no camphor and a higher yield of sweetener using the CRISPR gene-editing technique.

Weerasooriya said the addition of two new greenhouses on the farm aided in the group's research. "We have thousands of medicinal plant species in our germplasm collection," he said. "*Phyla dulcis* is just one of them, and this research started when we didn't have properly functioning greenhouses. Now CAHS has brand new two greenhouses to support medicinal plant research including industrial hemp."