



THE NEW YORK BOTANICAL GARDEN

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Is That *Ginkgo biloba* Supplement Really What You Think It Is?

New Study by NYBG Scientist Uses DNA Barcoding To Check Authenticity of This Popular Herbal Supplement

In a new study published in the journal *Genome*, Damon Little, Ph.D., Associate Curator of Bioinformatics in the Cullman Program for Molecular Systematics at The New York Botanical Garden, tests the authenticity of *Ginkgo biloba* (*G. biloba*), an herbal dietary supplement sold to consumers that is supposed to boost cognitive capacity.

Dr. Little's research is part of a larger effort to evaluate many of the popular herbal supplements on the retail market using DNA barcoding, in which the DNA extracted from samples of the supplements is compared to the DNA of the actual plants. Dr. Little has designed a novel DNA mini-barcode assay that can validate the authenticity of *G. biloba* or other plants in herbal dietary supplements.

Herbal supplements on the market are subject to mislabeling, and therefore consumers may not be getting the products and benefits they believe they are getting. Dr. Little cites two potential dangers of mislabeled supplements: some adulterants are toxic (alone or in combination with other supplements or drugs), and mislabeled supplements may not provide the health benefit consumers seek, possibly worsening their health.

Herbal products can be mislabeled either because the supplier incorrectly identified the plant materials (some grow their own materials; some contract with growers; some buy raw materials in bulk; and some buy processed materials in bulk) or because another (usually less expensive) material was substituted.

Although it is difficult to determine how or why a supplement is mislabeled, the process developed with this new research can help to estimate the frequency of mislabeled supplements on the market. It also provides a validated method that can be used by supplement manufacturers for better quality control.

"I found that 83.8 percent of ginkgo supplements certainly contained ginkgo," Dr. Little said. "In comparison, previous work has shown that 75 percent of black cohosh (*Actaea racemosa*) and 85 percent of saw palmetto (*Serenoa repens*) supplements contained the correct species. For the supplements in which I found no evidence of ginkgo, I cannot be sure if that is because the DNA was destroyed (for example by drying at very high temperatures) or if the samples simply do not contain any ginkgo."

In any case, it is hoped that mini-barcode assays will be used by supplement manufacturers to ensure their supplements contain the expected ingredients.

Dr. Little intends to continue his research with a focus on other popular herbal supplements.

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“Authentication of *Ginkgo biloba* herbal dietary supplements using DNA barcoding” was published online today in the journal *Genome*. <http://www.nrcresearchpress.com/doi/abs/10.1139/gen-2014-0130>

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The New York Botanical Garden, 2900 Southern Boulevard, Bronx, New York 10458

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