

DNA barcoding can ID natural health products, study says

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DNA barcoding developed by University of Guelph researchers has proven up to 88 per cent effective in authenticating natural health products, according to a new U of G study.

The study appears in the latest issue of *Food Research International*.

It's a crucial finding because the health product industry is under-regulated worldwide and mislabelling poses economic, health, legal and [environmental implications](#), says study author Mehrdad Hajibabaei.

"Currently there is no other broadly applicable tool that can identify the species used in both animal and plant natural health products as rapidly and cost-effectively," said Hajibabaei, a U of G [integrative biology](#) professor and director of technology development for the Guelph-based Biodiversity Institute of Ontario (BIO).

Up to about 80 per cent of people in developed countries use natural health products, including vitamins, minerals and herbal remedies. In Canada, these products have been regulated since 2004. But regulators face a backlog of licence applications, and thousands of products on the market lack a full product licence. In the U.S. and the U.K., regulatory problems involving natural health products have affected consistency and safety.

Authenticating natural product capsules or tablets—containing dried fragments rather than whole specimens—poses challenges.

[DNA barcoding](#) allows scientists to use short standardized regions of [genetic material](#) to identify species and compare them to reference genetic sequences, said Hajibabaei.

The technique works for all life stages and even for fragments of organisms, allowing scientists to ID even dried contents of a small pill.

"DNA barcoding provides a simple and efficient method for accurate identification and can play a key role in developing a more robust protocol for their regulation," Hajibabaei said.

For the study, researchers tested 95 plant and animal products bought in Toronto and New York City. Samples included capsules, tablets, roots, extracts, teas and shredded products. The researchers also sampled for products containing widely used shark tissue or ginseng.

Fully 81 per cent of natural health products made from animals correctly matched their commercial label. The rest contained everything from cheaper alternatives to fragments of protected species. One product labelled as tiger shark fins actually contained a catfish species.

Several of the identified shark species are on the "red list" of the International Union for the Conservation of Nature.

Half of the plant products labelled as Korean ginseng – which is more expensive and is sold for different medicinal benefits than other types – were really American ginseng.

Besides Hajibabaei, the study was headed by Lauren Wallace, a former President's Scholar at U of G and now a doctoral student at McMaster University. Wallace received a summer research fellowship from the Ontario Genomics Institute in 2010 to work on the BIO project.

Other researchers were Stephanie Boilard, now a technician in Hajibabaei's lab; graduate students Shannon Eagle and Jennifer Spall; and post-doc Shadi Shokralla.

Three of the researchers were using DNA barcoding for the first time. "Ultimately, the study showcases the utility of DNA barcodes for use in the real world," Hajibabaei said.

Provided by University of Guelph

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