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DETERMINING THE LEVEL OF SUBSTITUTION IN HERBAL PRODUCTS CONTAINING HARPAGOPHYTUM SPP. THROUGH A STANDARD REFERENCE BARCODE LIBRARY

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Background: *Harpagophytum procumbens* (the preferred species) has traditionally been used as a treatment for inflammation, fever and in some cases malaria. Due to the commercial demand and unsustainable harvesting techniques, the industry is subjected to the possibility of substitution with the more inferior species, *H. zeyheri*. Granting that several pharmacopeias allow the use of either *H. zeyheri* or H. procumbens, the pharmacological effect on consumers (patients) and the equivalence of this interchangeable use has not been studied. The industry is starting to explore DNA barcoding as a method for quality control of botanical medicines.

Results: In this study, we explored the potential application of DNA barcoding to determine authenticity in commercial products. Authentic botanical reference material of both *H. procumbens* (n=30) and *H. zeyheri* (n=20) were obtained. A total of 10 commercial products were purchased on the internet in 2016 using the search term "Harpagophytum" or "Devil's Claw". The two barcoding regions *(rbcLa* and *matK*) and the additional plastid region trnL-F was first used to construct a standard reference barcode library for the genus Harpagophytum, and secondly to barcode the purchased herbal products claiming to contain Harpagophytum. The barcode library was able to authenticate all commercial products (query samples) up to species level. Furthermore, the character based (BRONX) analysis was performed to verify taxonomic identity of the query samples. BRONX results indicated that 69% of the commercial samples tested, labeled as *H. procumbens* were substituted with *H. zeyheri*.

Significance: Our study is the first to construct a reference barcode library for Harpagophytum. This approach of DNA barcoding could significantly support the authentication of herbal products containing *Harpagophytum* spp.

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