June 30th, 2026
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Re: Authenticity of VIVAZEN Kratom Extracts

To quantitatively test for mitragynine and to verify the natural alkaloid profile of the major alkaloids present in kratom leaf and VIVAZEN extracts and finished products, we employ the AOAC Official Method of Analysis 2017.14. As an Official Method of Analysis (OMA) this is a fully validated, legally enforceable method that is recognized Internationally by CODEX. OMA 2017.14 has been validated for quantitation of mitragynine as a positive marker for Kratom.

Kratom leaf, while reported to contain up to 40 alkaloids, has only a few that are >0.5% of the total alkaloids composition, with the predominant alkaloids being speciociliatine, paynantheine, speciogynine and mitragynine. In Figure 1 below you can see the typical alkaloid profile of a kratom leaf (top) and the profile of an example chromatogram of a synthetic "7-OH" product. It is very clear the 7-hydroxymitragynine is not present in the leaf material and that the synthetic product contains not only 7-hydroxymitragynine but other unknown synthetic by-products that are not naturally occurring.

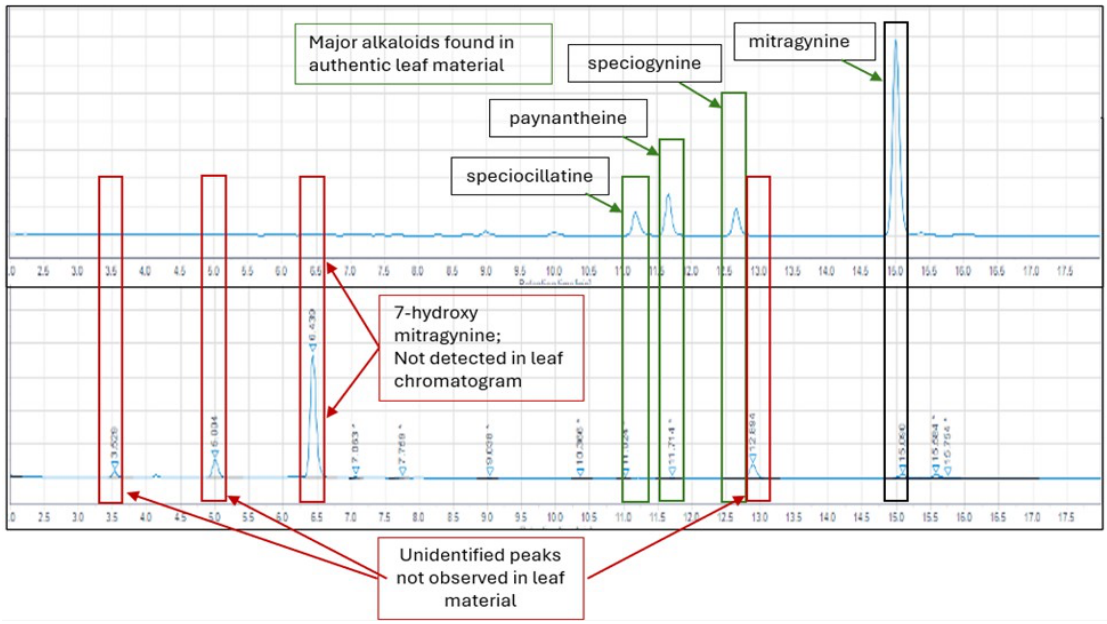


Figure 1. HPLC chromatograms of authentic kratom leaf material (top) and a 7-hydroxymitragynine product (bottom). Source: Elevated 7-Hydroxymitragynine Levels Found in Products Misbranded as Kratom; Brown et. al; *Journal of AOAC INTERNATIONAL*, Volume 109, Issue 1, January-February 2026, Pages 124–130.

At the request of FDA in 2016 it was also validated for 7-hydroxymitragynine, a negative marker that should not be detected in kratom leaves or products. This method is sensitive to detection of 7-

hydroxymitragynine at 0.4 µg/mL, which translates to 0.004% w/w in materials. Given the emergence of additional synthetic analogues of natural kratom alkaloids, we have expanded the method to detect dihydro-7-hydroxymitragynine (MGM-15) and mitragynine pseudoindoxyl. Each of these synthetic ingredients has a unique retention time in the HPLC Chromatogram and UV Spectra, as shown in the table below:

Identification	Retention Time (min)	UV (nm)
7-hydroxymitragynine	7.0	223, 246, 308
dihydro-7-hydroxy mitragynine	7.1	210, 240
mitragynine pseudoindoxyl	7.7	215, 242, 290, 400

Mitragynine pseudoindoxyl and dihydro-7-hydroxymitragynine exhibit highly similar chromatographic retention times, however the two synthetic analytes can be easily differenitated by monitoring their respective UV spectral peaks and cutoffs (see Figure 2.)

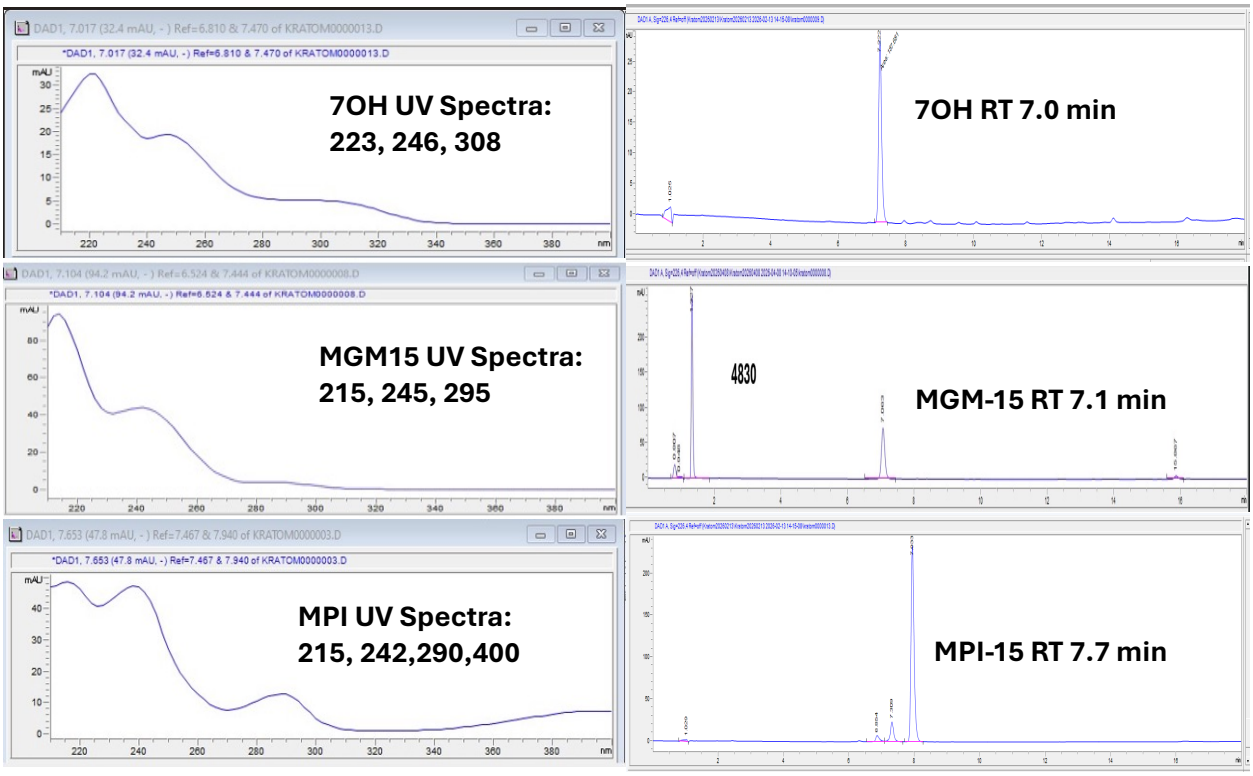


Figure 2. HPLC chromatograms and associated UV Spectra of (top) 7-hydroxymitragynine (7-OH), (middle) dihydro-7-hydroxymitragynine (MGM-15) and (bottom) mitragynine pseudoindoxyl (MPI).

The proprietary VIVAZEN extracts and their dietary supplement finished products do not contain any detectable synthetic ingredients. The alkaloid profile in the HPLC chromatogram demonstrates the same signature as authentic kratom leaf. We have extensively studied the VIVAZEN ingredients for quality, consistency, purity and safety and can attest to their being only composed of naturally occurring alkaloids. Below is an overlay of authentic kratom leaf, a

traditionally prepared kratom leaf tea and VIVAZEN's ingredient, which shows the alkaloids are highly conserved and present in their natural abundance (See Figure 3).

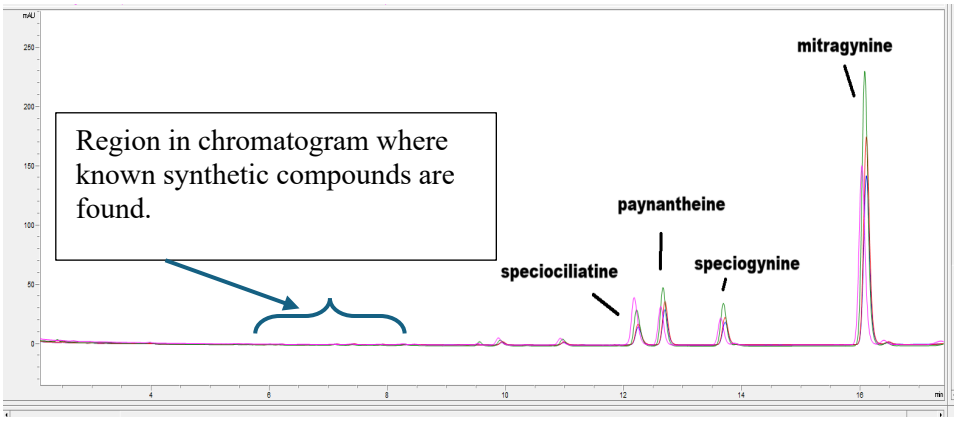


Figure 3. Chromatographic overlay of authentic kratom leaf (green), traditional prepared kratom leaf tea (blue) and VIVAZEN Ingredients (red and pink).

From the chromatogram in Figure 3 it can be observed that there are no peaks in the region corresponding to 7-hydroxymitragynine (retention time 7.0 min), dihydro-7-hydroxymitragynine (retention time 7.1 min) and mitragynine pseudoindoxyl (retention time 7.7 min). In fact the VIVAZEN extracts exhibit a phytochemical chemical profile that is indistinguishable from authentic leaf, demonstrating chemical authenticity.

While I understand that there is interest in additional analogues that are not naturally occurring in leaf but rather are potential synthetic targets as transient metabolic intermediates during human metabolism, many of these compounds are not readily available as chemical standards nor have methods been developed and validated for product testing. Given that synthetic analogues are a moving target, it is my recommendation that products be monitored for *any deviations* from the natural kratom alkaloid profile, rather than attempting to identify specific compounds that should not be present.

Best Regards,

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