



Pyrrrolizidine Alkaloids (PAs) in Teas, Herbal Infusions, and Other Foods Containing Herbal Ingredients

Pyrrrolizidine Alkaloids (PAs), a class of plant toxins, are produced by an estimated 6000 plant species (about 3% of the world's flowering plants). PAs can be found in measurable amounts throughout the food chain due to the ease at which they spread through accidental co-harvesting of PA producing weeds, especially in agricultural and minimally processed foods and food supplements. PAs have been detected in contaminated grain crops, teas, liquid infusions, and other select botanicals and spices. Additionally, they have been detected in milk, honey, egg, and offal due to animals grazing on PA-producing plants or feeds. PAs with certain structural features are linked to cancer in the liver and changes to DNA and chromosomes which imposes a public health risk. The European Commission Regulation (EU) 2020/2040¹ has recently implemented new regulation regarding 35 PAs and their maximum limits (MLs) in certain foods, especially those containing botanical ingredients.

Challenge: Currently there are only two known laboratory testing approaches used for the quantification of PAs. These methods are complex, costly, and do not provide accurate measurements of all 35 PAs listed in the regulatory documents - as 14 PAs with different structures are currently indistinguishable using available methods. This may result in trade barriers for those who export items impacted by the regulation, leading to a heightened need for accessible internationally recognized voluntary consensus standards and fit-for-purpose compendial methods that accurately distinguish and quantify the 35 PAs.

Analytical Solution: AOAC INTERNATIONAL is proposing to establish a working group under the umbrella of our Botanical Ingredients and Dietary Supplement Integrity program to develop voluntary consensus standard(s) and methods for the 35 PAs in teas, herbal infusions, herbs, seed spices, and botanical dietary supplement ingredients. The standards adopted and methods developed through this working group will drive support of regulatory compliance and provide the analytical basis for the development of new testing methods that will corroborate good agricultural collection practices, monitor prevalence of PAs in raw agricultural commodities and finished botanical products, and support prevention measures and minimize the risk for importers, exporters, finished product producers, and consumers.

Impact: This work will become a driving force for development of internationally recognized *Official Methods of Analysis*SM, which become the benchmark for trade resolutions and instill consumer confidence and safety. It will help companies meet the newly adapted regulatory compliance levels, allow consumers to be more confident in trusting product labels, and give suppliers confidence in the integrity of product(s) they sell.

Get Involved: With your financial support you will have the opportunity to drive development of criteria for testing, steer the revision and updating of globally accepted method validation criteria, and lead the progress of much needed laboratory end-use guidance and quality testing program components. We are asking organizations for contributions of \$10,000. Other levels of contributions will be considered as well. Volunteering for the working group will allow you to influence the development of consensus standards, ensure project priorities meet your needs, and generate reliable data for effective compliance-driven quality control of food materials and products.

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