



MOSAIC
DIAGNOSTICS
Formerly Great Plains Laboratory

ORGANIC ACID ELEVATIONS AND TOXIC SUBSTANCES ASSOCIATION

Review over 55 references at [MosaicDX.com/resource/how-the-organic-acids-test-provides-insights-into-toxic-exposures](https://mosaicdx.com/resource/how-the-organic-acids-test-provides-insights-into-toxic-exposures)

Elevations and Association with **Specific** Toxic Substances

ORGANIC ACIDS	ASSOCIATION WITH TOXIC SUBSTANCE	RELATED TESTS
1. Citramalic Acid	<p>Reportedly by-product of <i>Aspergillus</i>, as well as some yeasts.⁹</p> <p>If mycotoxins are present, they can disrupt the microbiome potentially causing dysbiosis.⁸</p> <p>Chronic exposures to mold can influence how the immune system responds.⁵³</p>	 MycoTOX PROFILE  Comprehensive Stool ANALYSIS WITH PARASITOLOGY  Mold IgE ALLERGY TEST
2. 5-Hydroxymethyl-2-furoic Acid (HMFA)	<p>Reportedly by-product of <i>Aspergillus</i>.¹</p> <p>If mycotoxins are present, they can disrupt the microbiome potentially causing dysbiosis.⁸</p> <p>Chronic exposures to mold can influence how the immune system responds.⁵⁴</p>	 MycoTOX PROFILE  Comprehensive Stool ANALYSIS WITH PARASITOLOGY  Mold IgE ALLERGY TEST
4. Furan-2,5-dicarboxylic Acid	<p>Reportedly by-product of <i>Aspergillus</i>.²</p> <p>If mycotoxins are present, they can disrupt the microbiome potentially causing dysbiosis.⁸</p> <p>Chronic exposures to mold can influence how the immune system responds.⁵⁴</p>	 MycoTOX PROFILE  Comprehensive Stool ANALYSIS WITH PARASITOLOGY  Mold IgE ALLERGY TEST
5. Furancarboxyl-glycine	<p>Reportedly by-product of <i>Aspergillus</i>.³</p> <p>If mycotoxins are present, they can disrupt the microbiome potentially causing dysbiosis.⁸</p> <p>Chronic exposures to mold can influence how the immune system responds.⁵⁴</p>	 MycoTOX PROFILE  Comprehensive Stool ANALYSIS WITH PARASITOLOGY  Mold IgE ALLERGY TEST
6. Tartaric Acid	<p>Reported to be a fungal by-product (yeast and molds).¹⁰⁻¹²</p> <p>If mycotoxins are present, they can disrupt the microbiome potentially causing dysbiosis.⁸</p> <p>Chronic exposures to mold can influence how the immune system responds.⁵⁴</p>	 MycoTOX PROFILE  Comprehensive Stool ANALYSIS WITH PARASITOLOGY  Mold IgE ALLERGY TEST

ORGANIC ACIDS	ASSOCIATION WITH TOXIC SUBSTANCE	RELATED TESTS
9. Tricarballic Acid	<p>Can be increased by <i>Fumonisin</i> mycotoxins from <i>Fusarium</i> mold, commonly found on corn products.⁵</p> <p>Corn is commonly contaminated with glyphosate.⁵⁵</p> <p>If mycotoxins are present, they can disrupt the microbiome potentially causing dysbiosis.⁸</p> <p>Chronic exposures to mold can influence how the immune system responds to them.⁵⁴</p>	 <p><i>Fumonisin</i> is not on MycoTOX Profile, but other common <i>Fusarium</i> mycotoxins are such as Zearalenone and Enniatin B^{56,57}</p>   
10. Hippuric Acid	<p>Biomarker of toluene exposure.³⁰</p> <p>Produced from phenylalanine by various gut bacteria.⁵⁸</p>	 <p><i>Toluene</i> not on panel, measure for body burden purposes</p> 
12. 4-Hydroxybenzoic 13. 4-Hydroxyhippuric	<p>Associated with Paraben exposure.³³</p> <p>Markers associated with dysbiosis.^{34,35}</p>	 <p><i>Parabens</i> are not on panel, measure for body burden purposes</p> 
15. 4-Hydroxyphenylacetic 16. HPHA 17. 4-Cresol 18. 3-Indolacetic	<p>Indicates the presence of <i>Clostridia</i> bacteria.^{25,26}</p> <p>Common causes of <i>Clostridia</i> overgrowth are exposures to glyphosate and organophosphates.^{23,24}</p>	 
21. Oxalic Acid	<p>Elevations can be related to ethylene oxide exposures.³²</p>	
23. Pyruvic Acid	<p>Reflective of pyruvate dehydrogenase enzyme function.</p> <p>Enzyme can be inhibited by arsenic, cadmium, antimony, mercury, causing an elevation.^{17,20}</p>	
29. Citric Acid	<p>Arsenic can block acotinase enzyme, which converts citrate to isocitrate.²¹</p>	
39. Quinolinic Acid	<p>Comes from Tryptophan metabolism that can cause neuroinflammation.²⁸</p> <p>Phthalates inhibit the enzyme that allows quinolinic acid (QA) to convert to Nicotinamide, causing an elevation.²⁷</p>	
68. Mandelic Acid	<p>From phenylalanine breakdown and also a major metabolite of styrene.^{29,30}</p>	

Elevations that can Indicate Toxic Exposure

ORGANIC ACIDS	ASSOCIATION WITH TOXIC SUBSTANCE	RELATED TESTS
7. Arabinose	Indicator of <i>Candida</i> overgrowth. ^{36,37} Mycotoxins and toxicants disrupt the microbiome and intestinal epithelial barrier, and influence the immune system, influencing candida growth. ³⁸⁻⁴¹	 MycoTOX PROFILE and/or  TOXDetect PROFILE *Depending on clinical assessment  Comprehensive Stool ANALYSIS WITH PARASITOLOGY  IgG Food MAP WITH CANDIDA + YEAST
24. Succinic Acid	Succinate dehydrogenase enzyme, which converts succinate to fumarate, can be directly inhibited by chemical toxicants, mycotoxins, and heavy metals. ⁴²⁻⁴⁶	 MycoTOX PROFILE  TOXDetect PROFILE  Metals TOXIC + NUTRIENT *Depending on clinical assessment
33. Homovanillic Acid (HVA)	Both metabolites of Dopamine. ^{15,22} Various pesticides can affect dopamine metabolism causing elevated HVA and DOPAC. ²²	 TOXDetect PROFILE  Metals TOXIC + NUTRIENT
36. DOPAC (3,4-dihydroxy-phenylacetic acid)	Heavy metals have been associated with elevated HVA. ¹⁵ Certain mycotoxins from <i>Aspergillus</i> and <i>Fusarium</i> can influence dopamine metabolism. ^{6,7}	 MycoTOX PROFILE
34. Vanillylmandelic Acid (VMA)	Elevations may result from heavy metal exposure. ¹⁶	 Metals TOXIC + NUTRIENT
58. Pyroglutamic Acid	Reflects glutathione (GSH) status. Elevations can indicate insufficient levels or high demand. ⁴⁸ Exposures to toxicants, heavy metals, and mycotoxins all influence glutathione levels. ⁴⁹⁻⁵¹	 MycoTOX PROFILE  TOXDetect PROFILE  Metals TOXIC + NUTRIENT *Depending on clinical assessment
59. 2-Hydroxybutyric Acid	Biprodut of homocysteine to cystathionine pathway. Elevations can allude to high demand for cysteine for GSH or methylation defects related to various toxic exposures. ^{52,53}	 MycoTOX PROFILE  TOXDetect PROFILE  Metals TOXIC + NUTRIENT *Depending on clinical assessment