

# Noni

## Applications

- Healthy Inflammatory Response Support
- Antioxidant Support
- Immune Support
- Microbial Support



## Introduction

**NutraMedix Noni** is a hydro-ethanol extract made from **noni fruit** (*Morinda citrifolia*), which belongs to the Rubiaceae family.<sup>1</sup> Noni is believed to have originated in the Indonesian archipelago and spread during the Polynesian migration.<sup>2</sup> While Noni is native to Southeast Asia and Australasia, it is now cultivated on multiple continents in nutrient-rich volcanic soil. Polynesians have used noni in traditional folk health practices for over 2,000 years, including the fruit, flowers, leaves, bark, stems, and roots.<sup>1,3</sup> The fruit has been consumed as a food for hundreds of years, particularly in times of famine,<sup>3</sup> and in 2003, noni was approved as a novel food by the European Commission.<sup>1</sup> Other common names for noni include Indian mulberry, hog apple, canarywood, cheese fruit, and *mengkudu*.<sup>4</sup>

In traditional Chinese health practices, the root of related species *Morinda officinalis*, known as *ba ji tian*, has been used for centuries, with the oldest known written mention dating back to the second century *Shen Nong Ben Cao Jing*.<sup>5</sup> Noni fruit from *M. citrifolia*, a new addition to the traditional Chinese materia medica, is described as having an affinity for the kidney, liver, and spleen, and is used for deficiency conditions, tendon health, and bone health.<sup>6</sup>

The many constituents of **noni fruit** include polysaccharides such as homogalacturonan and rhamnogalacturonan I, iridoids such as

asperuloside and asperulosidic acid, flavonoid glycosides such as rutin and narcissoside, anthraquinones such as ribiadin and damnacanthal, lignans such as 3,3'-bisdemethylpinoresinol and morindolin, and coumarins such as scopoletin, in addition to carotenoids, phytosterols, and others.<sup>1</sup> Some sources suggest that anthraquinones, particularly alizarin, rubiadin, and lucidin, are absent in ripe Noni fruit, attributing their presence in some samples to the inadvertent inclusion of fruit skin, seeds, or leaves.<sup>2,7</sup> Noni also contains potassium (K<sup>+</sup>), Calcium (Ca<sup>2+</sup>), sodium (Na<sup>+</sup>), magnesium (Mg<sup>2+</sup>), and vitamin C.<sup>1</sup>

**NutraMedix Noni** is made at our U.S. manufacturing facility using a specialized proprietary extraction process that optimizes the constituents of the herbs in their original, unprocessed state to obtain broad-spectrum concentration. Because our extracts are made in our own facility, we control all aspects of quality, including stringent ID testing, microbial testing, and heavy metal testing. NutraMedix rigorously follows current good manufacturing practices (cGMP), as do our suppliers.

## Healthy Inflammatory Response Support

**Noni fruit** (*Morinda citrifolia*) may help support a healthy inflammatory response, as seen both in vitro and in vivo,<sup>8</sup> and current ethnobotanical use for this purpose persists in the Fiji islands

and beyond.<sup>9</sup> Noni may help maintain phase II enzyme function already within the normal range through the support of quinone reductase (QR), which may help support a healthy inflammatory response by promoting normal cell signaling.<sup>7</sup> Noni fruit may also help maintain TNF-alpha, 5-lipoxygenase (5-LOX), and Nrf2 levels already within the normal range.<sup>3,4,9</sup>

Constituent flavonoids such as quercetin and kaempferol may contribute antioxidant activity to support a healthy inflammatory response.<sup>8,10</sup> Constituent flavonoids may also help maintain histamine release, leukocyte migration, PGE<sub>2</sub> and leukotriene-B4 (LTB-4) already within the normal range.<sup>4</sup> Additionally, flavonoids may help maintain IL-2 secretion and T-cell proliferation already within the normal range via MAPK and phospholipase-C pathways.<sup>4</sup> Constituent iridoids may help maintain COX-1, COX-2, prostaglandin E<sub>2</sub> (PGE<sub>2</sub>), and nitric oxide (NO) already within the normal range.<sup>4,7,8</sup>

A heteropolysaccharide including homogalacturonan and rhamnogalacturonan was found to contribute healthy inflammatory response support both in vitro and in vivo, via multiple mechanisms including maintaining leukocyte migration, nociception, and bradykinin levels already within the normal range.<sup>11</sup>

Noni fruit was comparable to a positive control in maintaining metalloproteinase 9 (MMP-9) already within the normal range in human monocytes, and was comparable to a positive control for comfort in a study with mice, validating centuries of ethnobotanical use for healthy inflammatory response support.<sup>9</sup> Additionally, Noni may help maintain levels of high-sensitivity C-reactive protein (hsCRP) already within the normal range ( $p < 0.05$ ;  $p < 0.001$ ).<sup>12,13</sup>

## Antioxidant

**Noni fruit** may contribute antioxidant activity, as evidenced by Oxygen Radical Absorbance Capacity (ORAC) assay, 2,2-diphenyl-1-picrylhydrazyl (DPPH) assay, and peroxynitrite (ONOO<sup>-</sup>) assay.<sup>8,14</sup> The phenolic content has been verified by the Folin-Ciocalteu method.<sup>8</sup> The antioxidant activity is attributed to the constituent iridoid glycosides, ascorbic acid, and phenolic compounds such as flavonoids,<sup>4,8</sup> and has been seen both in vitro and

in vivo.<sup>8</sup> The constituent phenolics may support both antioxidant activity and a healthy inflammatory response.<sup>10</sup> Noni may help maintain levels of malondialdehyde (MDA) already within the normal range ( $p < 0.001$ ).<sup>13</sup> It may also help maintain plasma superoxide anion radicals ( $p < 0.01$ ;  $p < 0.001$ ) and lipid hydroperoxide ( $p < 0.001$ ) already within the normal range.<sup>15</sup>

## Other Support

### Immune System Support

**Noni fruit** may help with immune system support for innate, cell-mediated, and humoral immunity, generally attributed to the constituent polysaccharides.<sup>4</sup> Noni's polysaccharides help promote a normal cytokine and chemokine response and support normal phagocytic neutrophil activity.<sup>4</sup>

### Microbial Support

**Noni fruit** may offer microbial support, attributed to the constituents acubin, *L*-asperuloside, and alizarin.<sup>3</sup>

## Safety and Cautions

**Noni fruit** has been used safely in 2,000 years of ethnobotanical practice,<sup>1</sup> and it is considered safe when used appropriately.<sup>16</sup> After ingestion of Noni puree, the constituent scopoletin peaks after two hours, has a half-life of four hours, and is excreted in the urine.<sup>16,18</sup> Small clinical trials have used Noni without significant side effects,<sup>17,18</sup> though there have been reports of nausea and abdominal discomfort with the use of dehydrated Noni fruit.<sup>18</sup> While there have been case reports of hepatotoxicity as evidenced by elevated liver enzymes, these were mostly, though not solely, attributed to multiple-ingredient formulas or a prior history of liver toxicity.<sup>19-21</sup> It remains unclear whether the hepatotoxicity was due to Noni, additional ingredients, possible contaminants, or other factors in the medical history.<sup>19-21</sup> In most cases, elevated liver enzymes returned to normal levels after discontinuing Noni.<sup>19,21</sup>

Noni may have additive effects with hypotensive medications.<sup>16</sup> Noni should be used with caution in chronic kidney disease, as its potassium content may contribute to hyperkalemia.<sup>4</sup> Due to Noni's relatively high potassium content of approximately 56 mEq of potassium per liter, it

should be used with caution in patients taking medications that may raise potassium levels, including potassium-sparing diuretics such as amiloride or spironolactone, ACE inhibitors such as lisinopril or captopril, and angiotensin receptor blockers (ARBs) such as losartan or valsartan, due to the risk of hyperkalemia.<sup>16,22</sup> Taking Noni with potentially hepatotoxic drugs may theoretically increase the risk of hepatotoxicity.<sup>16,20</sup> There has been one case report regarding Noni decreasing the effectiveness of coumadin; however, it is noted that the Noni was part of a combination

product with over 115 other substances, many of which had high vitamin K levels.<sup>16,23</sup> Use during pregnancy and lactation should be avoided, as there is insufficient reliable evidence of safety in these circumstances.<sup>16</sup>

Safety is not documented in breastfeeding or pregnant women, or in children under age 3, due to insufficient safety research.

\*This statement has not been evaluated by the Food and Drug Administration. This product is not intended to treat, cure, or prevent any diseases.

## References

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**NutraMedix**

**SHAKE WELL BEFORE EACH USE:**  
Put 15 to 30 drops in 4 oz (120 mL) of water and wait one minute before drinking. Take 2-4 times per day, or for maximum support every 15 minutes, or as directed by your physician. Do not use if pregnant or nursing. Stop use if adverse reactions develop. Keep out of reach of children.

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# NONI

SUPPORTS HEALTHY  
INFLAMMATORY RESPONSE †

Dietary Supplement

1 fl. oz. (30mL)

Supplement Facts	
Serving Size 30 drops Servings Per Container 20	
Amount Per Serving	
Noni fruit extract	1.5 mL*
*Daily Value not established	
Other ingredients: mineral water, ethanol (20-24%)	

**NutraMedix**   
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V324171  
 Lot #  
 Exp.