

JAVAcid: Safety and Efficacy

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Introduction

JAVAcid is a food additive containing five ingredients: deglycyrrhizinated licorice (DGL), inulin (from chicory root), maltodextrin (prebiotic fiber), Vitamin D₃ and calcium carbonate. This essentially flavorless powder counteracts the discomfort and irritation caused by certain foods and beverages, such as coffee, teas, fruit juices, spaghetti sauce and other acidic food and beverages. Initial analysis of the blend of ingredients seemed to indicate that it worked by reducing stomach acid. While this is still accurate, careful study of the ingredients suggests that JAVAcid has other ways of helping the body tolerate coffee and other irritating foods and beverages. For example, JAVAcid helps protect the digestive system by increasing mucus production in the stomach, enhances the natural repair of the lining of the intestines, and promotes healthy bacteria in the colon. Moreover, these ingredients may act synergistically to improve health (i.e. taking them together allows them to work with each other in the body). Vitamin D₃ is important for the health of many organ systems and, when taken with calcium carbonate, improves and maintains bone density. The inulin and resistant maltodextrin improve digestive system function and help maintain regularity. This report summarizes what is currently known about the safety and effectiveness of the ingredients contained in JAVAcid and discusses the probable reasons why users report beneficial effects to a wide variety of health issues such as GERD, acid reflux, IBS, interstitial cystitis, and bowel irregularity.

Generally Recognized as Safe (GRAS)

The US Food and Drug Administration reserves a designation called GRAS for products that are used as food additives. GRAS stands for Generally Recognized as Safe and means that qualified experts deem these additives as safe. All five ingredients in JAVAcid have the GRAS designation by the FDA. Importantly, the doses of the five ingredients are well within the range of safe doses even if several doses are taken in the same day. Not only are these ingredients generally safe, there are no reports of interactions between the five components. In other words, they are safe when taken together.

Deglycyrrhizinated Licorice (DGL)

Licorice has been used since ancient times to treat a number of health problems.¹ In its pure form, licorice may cause high blood pressure and certain people may be sensitive at moderate doses.² However, it is believed that the toxic effects of large quantities of natural licorice are due to a chemical called glycyrrhizinic acid. The form that is present in JAVAcid is deglycyrrhizinated, meaning glycyrrhizinic acid has been removed. DGL does not appear to have the same safety issues as natural whole licorice, especially at the doses included in each packet of JAVAcid. Therefore the DGL dose in JAVAcid should be safe. Nevertheless, it is reasonable for anyone with high blood pressure or liver disease to use DGL with caution.

DGL has a number of properties that improve and protect the digestive system. Dyspepsia is a term that describes indigestion, bloating, pain (heartburn), and nausea. Functional dyspepsia is dyspepsia that occurs without a clear, obvious cause (an ulcer would not be functional dyspepsia). Foods like coffee, tea, chili, and curry have been associated with functional dyspepsia.³ Two independent research groups have found that licorice improves symptoms of functional dyspepsia in double-blind, randomized, placebo-controlled trials.^{4,5} One explanation for this effect could be in DGL's ability to heal and fortify the stomach lining. Van Marle and colleagues showed that DGL caused the stomach to produce more cells, thereby thickening the lining of the stomach and increasing the amount of protective mucus in the stomach.⁶

DGL may also protect the stomach and promote its healing. In laboratory tests, licorice is a potent anti-inflammatory agent and is able to protect against ulcer formation in rats.⁷ While much work has focused on glycyrrhizinic acid, DGL apparently works in a similar fashion. Drs. Larkworthy and Holgate examined the duodenum (upper small intestine) in 32 patients with duodenal ulcers after they had taken DGL for some time. In each case, when the researchers looked at the small intestine with an endoscope (camera mounted on a pliable tube) the appearance of the ulcer had improved.⁸

One of the more surprising medical findings of the last 50 years is that vast majority of ulcers are caused, not by stress or "nerves," but by a bacterium called *Helicobacter pylori*. DGL appears to have several ways to fight against *H. pylori*. The licorice extract works by destroying the bug itself⁹ but also in preventing the microorganism from attaching to the stomach wall.¹⁰ While the clinical studies examining the effects of DGL on ulcers have been mixed, this component of JAVAcid should improve overall digestive health. In fact, the collective data on DGL shows it to have many positive effects on the digestive system.

Inulin (Chicory Root)

Inulin is safe in very high levels in the diet and does not result in "mortality, morbidity, target organ toxicity, reproductive or developmental toxicity, or carcinogenicity."¹¹ The amount of inulin contained in JAVAcid is only a small fraction of the amounts used for toxicity testing. Therefore, the inulin dose contained in JAVAcid is quite safe. Most (90%) passes through the digestive system entirely and the kidneys effectively remove inulin from the body.

Chicory root has been used as a coffee substitute in Europe and the United States in times of economic hardship. As much as one fifth of chicory root is made up of a compound called inulin. Inulin is a plant starch that is about one-tenth as sweet as table sugar and is used as an artificial sweetener at high doses. More interestingly, inulin has two recently found medicinal purposes: as a prebiotic and as a dietary fiber.¹² These effects may partially explain the beneficial effects of JAVAcid.

The average Western diet does not contain nearly enough dietary fiber. Most foods that Westerners eat are highly processed which destroys the fiber content. This lack of dietary fiber is at least partially to blame for various diseases of the digestive tract including inflammatory bowel disease,¹³ polyps,¹⁴ and colon cancer.¹⁵ Inulin is one of the main types of commercially available dietary fiber and is generally used to treat constipation and promote bowel regularity.

Perhaps the more interesting effect of inulin is that it is a prebiotic. While *probiotic* is an actual bacterium that promotes colon health, a *prebiotic* is a substance that makes the colonic environment a favorable place for good bacteria to live. Helpful bacteria (e.g. Bifidobacteria) take up space and prevent harmful bacteria (e.g. *E. coli*) from moving into that space and causing disease. Probiotics also aid in digestion. Research has shown that inulin is a prebiotic and makes the local environment of the colon ideal for good bacteria.¹⁶ Inulin also stimulates the growth of helpful bacteria,¹⁷ and eliminates certain harmful bacteria.¹⁸ Given its excellent safety profile and ability to improve the health of the colon, inulin is a key dietary supplement. Inulin's ability to improve colon health is one of the main benefits of JAVAcid.

Resistant Maltodextrin

Maltodextrin is a polysaccharide or type of sugar. In its natural form, maltodextrin is easily digested and metabolized, like table sugar. Resistant maltodextrin, on the other hand, is polymerized (exists in long, branching chains) and resists digestion by the body. This means that resistant maltodextrin is more like a dietary fiber than a sugar. Dietary fibers, for the most part, are not absorbed and pass through the digestive tract. Like any dietary fiber, there is extremely little risk for health issues or toxicities, even at relatively large doses.

Resistant maltodextrin, like inulin, is a prebiotic and a dietary fiber. In a randomized, double-blind clinical study, Fastinger and colleagues showed that resistant maltodextrin increased the number of good bacteria (Bifidobacteria) in the colon. Patients in the study reported that taking the dietary fiber helped promote regularity and was very well-tolerated.¹⁹ Therefore, the resistant maltodextrin in JAVAcid is safe, well-tolerated, and promotes intestinal health.

Vitamin D₃

Vitamin D₃ is one of the fat soluble vitamins that humans need to survive. As a fat soluble vitamin, there is some risk of overdose at high levels since the vitamin accumulates in the fatty tissues. However, toxicity from Vitamin D₃ is extremely rare. In fact, we are currently in the midst of an epidemic of Vitamin D₃ deficiency.²⁰ It is estimated that at least one billion people have Vitamin D₃ levels that are too low. While traditionally Vitamin D₃ deficiency causes thinning of bones and osteoporosis, we are recently realizing the other problems that are caused by too little Vitamin D. For example, Vitamin D deficiency is related to the development of cancer, hypertension, multiple sclerosis, rheumatoid arthritis, osteoporosis, muscle weakness and diabetes.²¹

In addition to the many health benefits listed, Vitamin D plays a role in digestive health. Vitamin D₃ is critically important for maintaining the mucosal barrier in the intestines.²² Apparently the vitamin helps hold the cells of the large intestine together (preserves tight junctions) and improves the ability of the intestine to heal itself.²² In fact, Vitamin D deficiency may lead to inflammatory bowel disease. These studies suggest that JAVAcid helps promote health in various ways, but has a direct benefit on the digestive system as well.

Calcium Carbonate

As with Vitamin D₃, people can have too much calcium, but more often the opposite is true. Since Vitamin D₃ is responsible for helping calcium find its way from the gut into bones. Just as we are facing a Vitamin D₃ deficiency epidemic, so too are people faced with too little calcium in their bones. In healthy people (specifically those without cancer or parathyroid hormone problems) the calcium carbonate in JAVAcid is probably a much needed supplement. In addition, calcium is important for the proper function of virtually every cell in the body, including the digestive system.

One of the main reasons that people find that coffee is irritating to the stomach is because it stimulates gastrin release and gastric acid secretion in the stomach.²³ Gastrin is a hormone that makes the stomach contents more acidic. Calcium carbonate, such as that found in JAVAcid, safely neutralizes stomach acid.

The Curious Effect of JAVAcid on Interstitial Cystitis

Interstitial cystitis (IC) is a painful, chronic inflammation of the inside wall of the urinary bladder. This condition is frustrating for both doctors and patients because the diagnosis takes years to make after ruling out dozens of other related conditions. Patients with interstitial cystitis or IC often experience pain in the pelvic region especially during sexual intercourse or urination. In fact, IC is often misdiagnosed as recurrent urinary tract infections for years before the IC diagnosis is made.

There is no cure for IC and few consistently effective treatments. Science does not yet know the cause of interstitial cystitis and research on the illness is not as robust as it is for other medical conditions. For severe pain, opioid painkillers like morphine are used. Physical therapy, surgery, or other procedures are sometimes tried to bring relief. The only drug specifically intended for the treatment of IC is Elmiron (pentosan polysulfate). Unfortunately Elmiron is related to heparin and can cause problems with bleeding.

Because treatments are not always effective and can be uncomfortable or risky, patients usually opt to restrict their diet in the hopes of avoiding a flare-up or painful attack of IC. While the specific inciting foods vary from person to person, commonly avoided foods are coffee, tea, tomatoes and tomato sauces, citrus juices, and alcohol. As you would expect, it is difficult for people to give up these foods and beverages. As a result, life becomes a balancing act between eating the foods that patients love and the sometimes debilitating pain of interstitial cystitis.

Quite unexpectedly, users of JAVAcid report relief of IC symptoms that are usually caused by drinking coffee. In some patients, adding JAVAcid to coffee or tea prevented the bladder pain that usually triggered by drinking these beverages. In some cases, adding JAVAcid to other inciting foods and beverages prevented pain with the same beneficial effect.

Since the cause of interstitial cystitis is not known, it is difficult to explain why JAVAcid exerts this beneficial effect. However, it is interesting to speculate how one or more of these ingredients could be achieving this effect. One of the most likely candidates is inulin. Inulin has been used to study the physiology of the urinary system for over 50 years. The reason that inulin is so interesting to scientists is

that it is completely filtered by the kidneys. In other words, all inulin that is in the blood ends up in the bladder. Therefore the absorbed inulin that is found within JAVAcid collects in the bladder after passing through the kidneys. This inulin may act as a protectant, similar to the way in which Elmiron works. While it is known that inulin decreases inflammation factors in the gut,^{24,25} it might be doing the same thing in the bladder; however, this has not yet been tested.

Licorice is also a potent anti-inflammatory compound.⁷ The DGL in JAVAcid that is absorbed by the gut and reaches the bladder should have a direct anti-inflammatory effect on the bladder wall as well.

One interesting connection that is in its earliest research phases is the link between interstitial cystitis and inflammatory bowel disease. Researchers have shown experimentally that if you cause inflammation in the bowel it will affect the functioning of the bladder muscle.²⁶ Since JAVAcid has clear beneficial effects on the digestive system, the link between these organ systems may explain the reports of IC patients that find relief from using JAVAcid.

Synergistic Effects

One of the most intriguing facts about JAVAcid is that the ingredients are safe together, but also work together to enhance the effects of one another. For example, Vitamin D₃ helps the calcium in JAVAcid to be absorbed from the intestines into the bloodstream and then ultimately become deposited into bone. Resistant maltodextrin increases the body's ability to absorb calcium as well.²⁷ Both inulin and resistant maltodextrin are dietary fibers that act in conjunction to improve the health of the colon. While ulcers are caused by the bacterium *H. pylori*, excessive acid can make the ulcer worse. Therefore, calcium carbonate enhances the effects of DGL in the stomach and small intestine.

Conclusions

After thoroughly reviewing the components of JAVAcid, both individually and together, the product is safe for people in good health. Each component has proven health benefits. These benefits explain why JAVAcid is effective at reducing the irritation of many foods and beverages. Moreover, the components in JAVAcid have several health benefits beyond their role as a food additive. Interestingly, the individual components in JAVAcid seem to work together and become more effective when taken together.

About the Author

Michael T. Sapko received his MD and PhD degrees from the University of Maryland. He practiced internal medicine at Mercy Medical Center in Baltimore. In 2006, Dr. Sapko established and currently operates a medical and science consulting firm that provides literature reviews, scientific and clinical study design planning, and peer-reviewed journal article writing. The makers of JAVAcid contracted with Dr. Sapko to provide an unbiased, objective review of the product's ingredients.

The information in this report is for informational purposes only and is not intended to diagnose, treat, cure, or prevent any disease. You should speak with a licensed physician before engaging in a new dietary regimen, especially if you have existing health problems.

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