

Pseudoscientific and Unhealthy Approaches to Gastrointestinal Health and Detoxification in Natural Medicine

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Abstract

This paper discusses concerns with specific approaches in identifying and eliminating gastrointestinal (GI) pathogens, as well as detoxifying toxic metals, that may be misleading and harmful to a patient's health. These are non-scientific methods that claim to improve GI microbial balance and mineral nutritional status that persist in the nutritional and natural medicine market, and unfortunately many are actively promoted through

specific products and protocols marketed by nutritional supplement companies that should know better. The potential toxicity and mucosal damage of the long-term use of aggressive laxative herbs such as Cascara sagrada, rhubarb and/or Senna, as well as potential adverse events from ingredients containing fulvic acids and/or humic acids are discussed.

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Controversial Approaches to Eliminating Pathogenic Bacteria, Fungi and Parasites: Lack of Scientific Clinical Assessments

Optimizing GI health includes a periodic assessment of the gut microbiome, including pathogens, followed by scientifically validated interventions with either safe natural agents or pharmaceutical therapeutics.

A variety of stool assessments exist, from Clinical Laboratory Improvement Amendments (CLIA)-certified laboratories, which offer clinicians choices in assessments. These include scientifically accepted DNA/PCR based testing methods, including quantitative polymerase chain reaction (qPCR), of microbial presence in the GI tract.¹

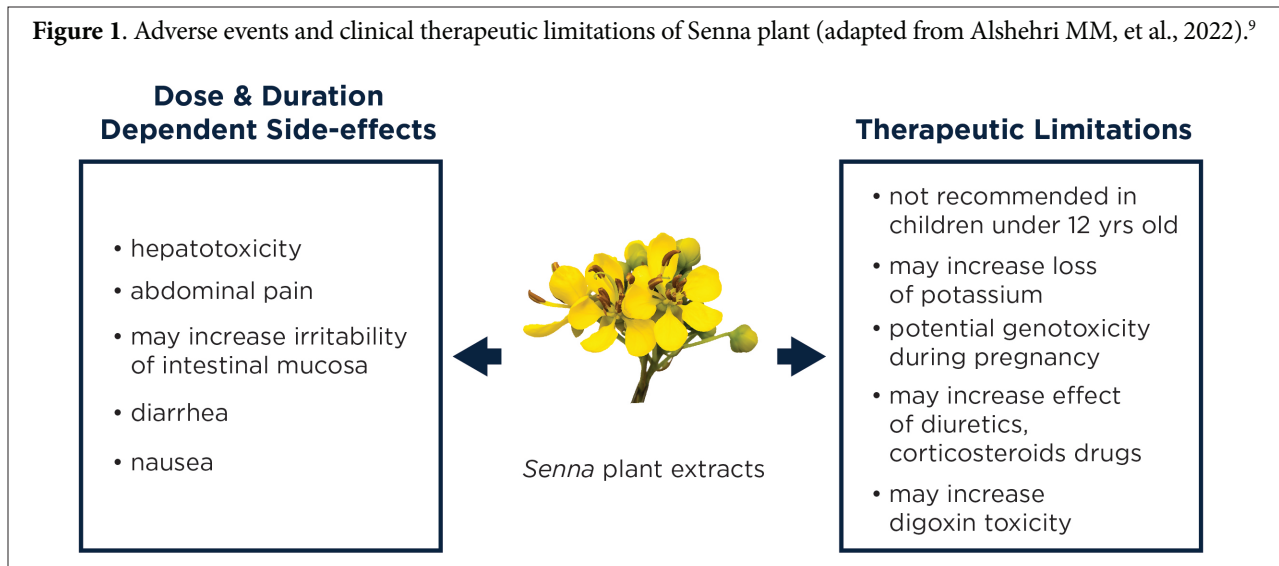
In the past several years, subjective visual methods of identifying so-called “parasites” (also named “rope-worms”), have been promoted in a misleading manner to unsuspecting patients and clinicians through various means. Websites created by layman that claim to have

experienced “rope worms”, encourage others to share their experiences, non-scientific treatments and explanations. Many similar postings exist on social media (YouTube, Facebook, etc.).

The concept of “expelling rope-like worms” through aggressive laxation seems to have originated from 2 articles by Alex Volinsky, et. al. He has mechanical engineering training and holds a patent for an aggressive enema formula, which supposedly helps expel “rope-like worms.”^{2,3} The co-authors of these two papers have credentials not related to the field of gastroenterology or helminthic sciences. These papers do not have a scientific format and contain several red flags that point to a lack of credibility of their content and their authors, as follows:

1. They are not peer-reviewed and were posted on a website meant to hold pre-prints for unrelated sciences (math, physics, etc.). This is simply an internet holding place, probably meant to give these articles the appearance of published papers.
2. The authors claim that all humans must have these “rope-like worms” because all who had received specific enemas were found to expel them. However, no other scientific reports confirmed them. On the contrary, there are reputable publications describing “delusional parasitosis,” in which patients claimed to have expelled “rope-like worms” but when these were tested by adequate laboratory evaluation, were not confirmed to be parasites.⁴⁻⁶
3. They do not advocate DNA or microbiological tests of the so-called “rope-worms,” because DNA testing is claimed by them to be “inconclusive.” In some so-called “parasite stages,” as defined by

Figure 1. Adverse events and clinical therapeutic limitations of Senna plant (adapted from Alshehri MM, et al., 2022).⁹



them, these artifacts were found to contain more than 99% human DNA and subsequent states were composed of more than 99% human mitochondrial DNA, which makes no sense, while other stages contained DNA impossible to associate with any known parasites. So, they suggest relying just on subjective visual assessment, and cite compiled evidence from patient reports on YouTube, Facebook, etc.

4. Several scientists have proposed that these intestinal artifacts may represent tissue detached from the GI wall composed of mucin and various colonic cells, while Alex Volinsky’s papers claim that this is not the case, with no logical explanation.⁷
5. Claims, such as “humans harboring these so-called parasites often have a blood pH in the range of 8-10, which is reflected in the color of their corneas” show a complete lack of knowledge of human physiology.
6. They hypothesize that these so-called parasites may contribute to the pathology of Lyme disease, autism and other diseases with no scientific proof.

In conclusion, it is unfortunate that the concepts promoted by these 2 papers, along with reports from the internet and even specific products and protocols marketed by nutritional supplement companies, are misleading a lot of unsuspecting individuals. Unfortunately, this includes healthcare providers who should know better, yet advocate for these interventions. They end up taking, or recommending, aggressive enemas or other laxative regimens, which are health damaging, in the hope of “curing” themselves of these hypothetical parasites and various conditions/diseases presumed to be caused by them. Sadly, and alarmingly, some understandably desperate parents of autistic children are reported to follow or be given such damaging protocols.

Serious Adverse Events as a Result of Using Certain Cathartic Herbs that Are Meant to Stimulate and Produce Aggressive Laxation

Certain groups and companies recommend a regimen of very aggressive laxative herbs to achieve the type of bowel movements that expel rope-like tissues. These herbs include Cascara sagrada, rhubarb and Senna. Some of these herbs are recommended to be taken continuously or in multiple cycles, which may lead to a variety of serious adverse events.

All 3 herbal-based supplements trigger aggressive laxation, which causes a rapid loss of fluids and electrolytes. In particular, increased potassium excretion may result in muscle spasms/weakness, and even heart failure.^{8,9} Rapid laxation can also cause malnutrition due to reduced time allowed for nutrient absorption. Frequent use of such modalities is unfortunate, especially considering that functional medicine has a lot to offer with regard to comprehensive approaches in support of proper functioning of the bowels.

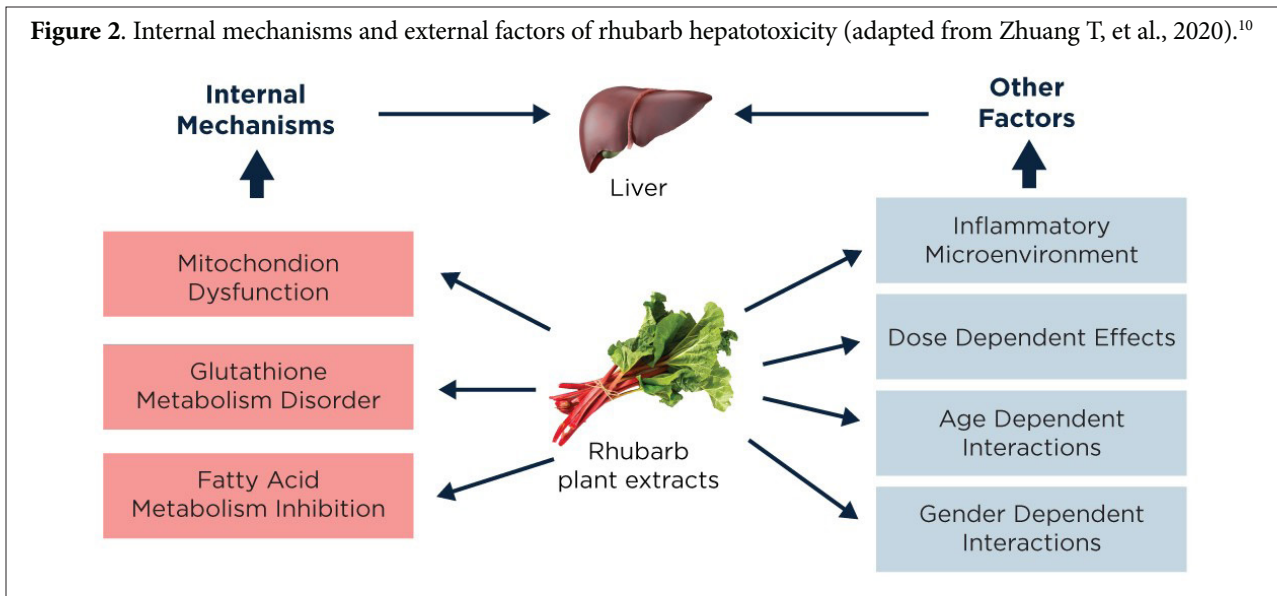
In addition, extensive use of these herbs has been found to have hepatotoxic and genotoxic effects, as detailed below.

Cascara (*Cascara sagrata*) is a well-known herbal remedy used occasionally to support laxation. However, this application is aggressive and not meant for long-term or frequent cyclic use. It contains anthraquinone derivatives, believed to be the components that irritate the colon, which speeds up peristalsis causing cramps, diarrhea and weight loss.⁸

Mild to severe liver injury has been reported after a few days to 2 months of Cascara use. These effects have been attributed to the Cascara-specific anthraquinone derivatives.⁸

Senna (*Senna alexandrina*) is a plant with strong laxation effects. A review paper by Alshehri MM, et al. highlights potential adverse events from prolonged use of Senna extracts, as well as its therapeutic limitations; see Figure 1.⁹

Figure 2. Internal mechanisms and external factors of rhubarb hepatotoxicity (adapted from Zhuang T, et al., 2020).¹⁰



Some of Senna’s ingredients, called sennosides, are irritants to the intestinal mucosa and may be responsible for its laxative effects. Hepatotoxicity and genotoxicity were also observed when Senna is abused as a laxative, but an explanation for the mechanisms of action is lacking.⁹ The authors also advise caution for individuals with kidney disorders and those taking antiarrhythmic, cardiotoxic drugs and medicinal products inducing QT-prolongation and digoxin, as it may potentiate their effects and toxicity.⁹

Rhubarb (*Rheum rhubarbarum*) extracts have been used in traditional Chinese medicine for purgative effects and certain liver conditions such as carcinogenesis, hepatitis and fibrosis. However, many adverse events have also been noted in a recent paper by Zhuang T, et al., which looked at mechanisms of liver toxicity occurring after long-term use and in a dose-, gender- and age-dependent manner in animal studies.¹⁰

These effects may be caused by a variety of compounds contained in rhubarb, such as tannins and anthraquinone (emodin and rhein). *In vitro* studies have shown that tannins and hydrolyzed tannins may cause hepatocyte necrosis. For example, elevated alanine aminotransferase (ALT) and aspartate aminotransferase (AST) levels were observed in studies with female rats fed emodin, likely a result of mitochondrial damage and dysfunction, as well as disturbed glutathione and fatty acid metabolism. Figure 2 illustrates some of rhubarb’s mechanisms of action and modulating factors involved in liver damage.

Concerns Regarding the Use of Humic acids and Fulvic Acids for Heavy Metal Detoxification

Fulvic acids (FAs) and humic acids (HAs) occur together, a result of microbial/fungal breakdown of various plants/animals found in soil, clay, coal, mud, peat and the like, or specific water sources. The forms of HAs/FAs vary widely and are hard to standardize because they depend

on the source, geographic region and extraction method. HAs/FAs occur in various traditional/Ayurvedic versions of these extracts (some known as Shijalit or Moomiaii). FAs and HAs bind toxic metals and may help in detoxifying them.¹¹⁻¹³ However, 1 review claims that supplementing with FAs/HAs may also increase absorption of toxic metals from foods if ingested at the same time.¹¹

There are 3 reviews on FAs/HAs that describe some potential benefits, such as: anti-inflammatory, anti-allergic, anti-microbial and anti-fungal actions.^{11,12,13} However, this is based on a limited number of studies, with few human and mostly animal and *in vitro*-type studies. These studies describe potential adverse events such as: increased inflammation (TNF-alpha) and oxidative stress, reduced thyroid function or laxative effect. In addition, since HAs/FAs are strong chelators of metals (including toxic metals), they also bind and may deplete nutritionally important minerals such as iron, selenium, and possibly other essential elements. For example, this was noted when FAs/HAs had been ingested long term from drinking water in China.^{14,15} Some of the adverse consequences observed were: Kashin-Beck disease, anemia, skeletal and collagen defects, osteoarthritis, increased lipid peroxidation, DNA fragmentation, lower cell viability and fatty streak deposits in the arteries (a Blackfoot-like disease).¹⁵⁻²² These studies used ingredients that contained FAs/HAs along with other elements that were not clearly defined, due to the intrinsic nature of these materials. Thus, due to the lack of standardization and characterization of the HAs/FAs sources, their efficacy and safety are questionable.

Conclusions

Detox protocols that advocate long-term or cyclical use of aggressive laxative herbs, such as Cascara sagrada, rhubarb and/or Senna may involve serious adverse events involving toxicity in various organs, such as the liver.

These regimens may also cause mucosal irritation and shedding of the colon lining, which is unfortunately advocated as a benefit. This is because the “rope-like” tissues expelled during bowel movements stimulated by these herbs are mistaken for parasites (non-scientific term, “rope-like worms”). These are said to be responsible for various ailments that otherwise have no cure. These protocols are not supported by science-based microbial assessments of stool or any helminth taxonomy and may result in altered gut barrier integrity and intestinal hyper-permeability (aka: leaky gut syndrome).

Many dubious detox protocols intended for the removal of heavy metals or mold spores employ the use of ingredients that contain FAs and/or HAs without standardization and clear characterization of their sources. There are no long-term clinical trials to affirm the safety and efficacy of FAs/HAs with specific doses and duration of use.

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