

# Effect of Carica Papaya seeds in the Treatment of Intestinal Parasitic Worms

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## ABSTRACT

**Histolytica infection which is compared with Metronidazole using Mice model. This review was conducted to evaluate the possibility of Anti-helminthic activity of leaf & stem of Carica Papaya as potent remedy in both human & veterinary practice. Intestinal infection with Entamoeba histolytica is an important cause of diarrhea world-wide especially where sanitation conditions are poor. Medicinal plants have played a significant role in various traditional systems of medications including intestinal infections caused by E. histolytica.**

**Keywords: Entamoeba histolytica, Carica papaya, seeds water extract, metronidazole, intestinal tissue.**

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## INTRODUCTION

Papaya, or carica papaya, is a tropical fruit that is well-known for its anti-inflammatory and digestive qualities, among many other health advantages. The papaya plant has several sections, but the seeds have drawn interest due to their possible medical benefits, especially for the treatment of intestinal parasitic worms. Throughout the world, intestinal parasite infections continue to pose a serious threat to public health, especially in areas with poor sanitation and hygiene standards. Numerous health problems, such as anemia, stunted growth, and malnourishment in children, can result from these infections. Across many cultures, carica papaya seeds—which are frequently thrown away as waste—have long been utilized in folk medicine due to their alleged anthelmintic qualities. [1,2,3]

### Amoebiasis:

Amoebiasis is a disease which is caused by Entamoeba histolytica. It is a Protozoan Parasite of the humans and they are causative agent of intestinal amoebiasis. Amoebiasis becomes a major health issue the world of developing countries. About 90% people in the population of 50 million people are suffering from the symptoms of Amoebiasis.[4] The symptoms of this disease are “Pain in Abdomen, Diarrhea, Fatigue, Loss of Appetite, Fever, Weight Loss, etc. [5,6]

### Carica papaya:

Carica Papaya is one of the most popular and major fruit crops which is cultivated in the topical and sub-topical zones. In worldwide zone about 6.8 million tons of fruits was produced in 2004 on about 389,990 Ha.[7] The plant was recognized usually by its weakness and unbranched soft stem yielding copious white latex and crowded by a terminal cluster of large and long stalked leaves, is rapidly growing and can grow up to 20m tall.[8,9]



Figure 1: Carica Papaya

**Carica papaya seeds:**

The most important and common part of this fruit which is used for the treatment of Amoebiasis.[10] It is also known for the activity of Anti-carcinogenic. The essential oil which is extracted from the seeds of carica papaya fruit which contain Benzyl Isothiocyanate and has shown an inhibitory effect against ten strains of *Candida* spp., including *C. albicans*.[11]



**Figure 2: Carica Papaya with their seeds**

**Uses:**

It is also well-known for having anti-carcinogenic properties. The essential oil derived from the seeds of the carica papaya fruit has been demonstrated to have an inhibitory impact on 10 strains of *Candida* spp., including *C. albicans*. These seeds contain Benzyl Isothiocyanate. [12,13]

**Carica papaya dried seeds:**

The leaves, peels, and seeds of the carica papaya possess significant pharmacological and therapeutic qualities.[14] The plant, which belongs to the Caricaceae family, is well known for its culinary and nutritional qualities.[15,16,17]



**Figure 3: Dried seeds of carica papaya**

**Uses**

Clean, dry, and bake the papaya seeds; then, crush them into a powder and add them to your favorite spice blend. Add it to a vinaigrette, salad dressing, or smoothie; this may add a bitter taste, so cut the bitterness with other flavors.[18] Pour it into a marinade made of lemon zest, cream, lemon juice, chopped garlic, and cilantro.[19]

**History of intestinal parasite worm disease:**

Since ancient times, parasites like roundworms and tapeworms have been recorded. Early civilizations in Egypt, Greece, and Rome were aware of these organisms and how they affected human health. Considerable progress was achieved in the study of parasites in the early modern period. Pioneering microscopist Antonie van Leeuwenhoek used his microscope to view the protozoan *Giardia lamblia* in 1681.[20,21] This contributed to our

growing knowledge of tiny parasites by being one of the first reports of a parasitic protozoan. Later, the prominent doctor and biologist Francesco Redi made contributions to the science by describing a variety of parasites. He conducted in-depth observations of both exterior parasites like ticks and internal parasites like the sheep liver fluke (*Fasciola hepatica*). Redi made significant contributions to the early study of parasitology and laid the framework for later investigations into parasitic illnesses.[22]

#### **Origin of intestinal worm:**

Eating and drinking tainted food and water contributes significantly to the spread of diseases, especially those brought on by parasites, germs, and viruses.[23] Sewage leaks, industrial pollution, agricultural runoff, and other factors can contaminate water sources, including private and public drinking water supplies.[24] Recreational water bodies like lakes, rivers, and pools may also be impacted by this contamination. In these areas, germs may proliferate and endanger swimmers and anyone else who comes into contact with the water. In a similar vein, food contamination is a serious issue.

Fruits and vegetables can contain dangerous germs like *Salmonella*, *E. Coli*, or parasites if they are produced in soil contaminated by chemicals or untreated waste, or if they are irrigated or cleaned with contaminated water. [25,26] It is possible for customers to inadvertently consume these bacteria without realizing it, which can result in foodborne illnesses. The contamination may not always be evident or detectable.[27] These problems highlight how crucial it is to take appropriate steps for food safety, water purification, and sanitation in order to reduce exposure to toxins that may have detrimental effects on public health.[28]

#### **Symptoms of intestinal worms:**

Roundworms, tapeworms, and hookworms are examples of the parasitic worms that cause intestinal worm illnesses, also referred to as helminth infections. These parasites usually enter the body by contaminated food, drink, or soil and then make their way into the digestive tract.[29] The worms cling to the intestinal membrane after they are within the intestines, impairing regular digestion processes. A common symptom is abdominal pain, which is sometimes characterized as cramping or a dull ache that can get worse as the infestation progresses. Due to the worms' obstruction of normal digestion processes, the gastrointestinal system becomes irritated, resulting in nausea and vomiting.

Due to the worms' interference with food absorption, gas accumulation and a feeling of fullness are frequently experienced, along with bloating and a swollen abdomen.[30] Another important symptom is diarrhea, which occasionally alternates with constipation as the body tries to get rid of the worms. The presence of worms can induce inflammation that results in soreness in the stomach, making it uncomfortable to touch or apply pressure.

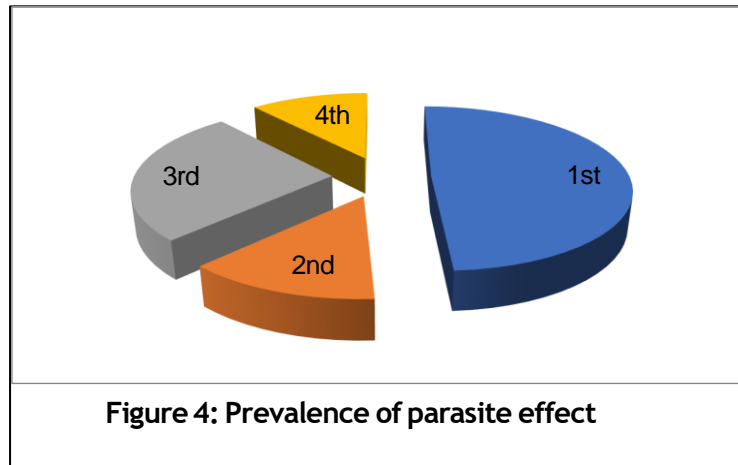
Over time, these digestive disturbances might result in severe nutritional deficits that can cause weakness, exhaustion, weight loss, and malnutrition. [31] If left untreated, intestinal worms can have a serious negative effect on a person's health.[32] They can cause anemia, persistent gastrointestinal problems, and, in certain situations, problems in other organs if the worms spread outside of the intestines.  
.[33]

#### **Prevalence of parasite effect:**

The prevalence of parasitic effects refers to the widespread occurrence and impact of parasitic infections on human populations, particularly how these infections increase or spread due to environmental and ecological changes. Parasitic diseases, often zoonotic (transmitted from animals to humans), are heavily influenced by the conditions of the environment in which their vectors, like mosquitoes, ticks, or snails, thrive.[34]

Environmental changes, whether natural or caused by human activities such as deforestation, agricultural development, urbanization, or climate change, can disrupt ecosystems and create favorable conditions for parasites and their vectors to flourish. For example, clearing forests or constructing roads can expose new areas to parasites that previously inhabited only wildlife.[35,36] Water control projects, like dams or irrigation, can alter local water sources, creating stagnant water bodies that are ideal breeding grounds for parasites like malaria-carrying mosquitoes.[37,38,39]

Climate change also plays a major role by shifting temperatures and rainfall patterns, allowing parasites to spread to new regions that were previously unsuitable for them.[40] As these environmental changes continue, the risk of parasitic infections, particularly in vulnerable populations, rises, contributing to a higher prevalence of diseases like malaria, schistosomiasis, or Chagas disease.[41,42] The widespread effects of these parasitic infections can lead to significant health burdens, especially in areas with limited healthcare resources and infrastructure.[43,44,45]



#### Treatment of intestinal parasitic worm by carica papaya seeds:

Carica papaya seeds have gained attention as a natural remedy for treating intestinal parasitic infections due to their efficacy and safety profile.[56] These seeds contain bioactive compounds such as benzyl isothiocyanate, which has strong anti-parasitic properties that help eliminate intestinal worms like roundworms, tapeworms, and other parasitic infections commonly found in tropical regions. One of the key advantages of papaya seeds is their accessibility and affordability.[57] In many parts of the world, especially tropical and subtropical regions where papaya grows abundantly, the seeds are easily obtainable, making them an inexpensive treatment option for communities with limited healthcare resources. This is crucial in low-income areas where expensive pharmaceuticals may be out of reach for many people. Being a natural treatment, papaya seeds are often preferred over synthetic anti-parasitic drugs, which can have side effects such as nausea, headaches, or dizziness. The seeds are generally considered safe for human consumption, with minimal to no side effects, making them a gentle yet potent solution for parasitic infections. This makes papaya seeds especially suitable for use in children and individuals who may have sensitivities to conventional medications.[48]

The seeds are also effective as monotherapy, meaning they can be used alone without the need for combining with other treatments.[49] This simplicity adds to their appeal, especially in rural or isolated areas where access to complex medical regimens may be challenging. By using papaya seeds, individuals can treat parasitic infections effectively without the need for multiple therapies. In addition to their therapeutic use, papaya seeds offer potential as a preventive strategy against future parasitic infections.[50] Regular consumption of the seeds, for instance, can help reduce the risk of contracting parasites, particularly in regions with high prevalence rates.[51] This is particularly valuable in tropical communities, where environmental factors like poor sanitation and contaminated water sources contribute to the spread of parasites. Thus, papaya seeds provide a holistic and sustainable approach to managing and preventing parasitic infections.[52] They not only serve as an affordable, effective, and safe treatment but also contribute to long-term health strategies by reducing the incidence of parasitic diseases.[53] This makes them an invaluable resource in global health efforts, particularly in regions burdened by high rates of parasitic infections.[54,55]

### EXTRACT OF SEEDS OF CARICA PAPAYA FRUITS

#### Materials and method:

##### Collection of sample:

The Sango Ota market in Ogun State, Nigeria, provided mature pawpaw fruits at different stages of ripening. After being put in sterile polyethylene bags, the samples were allowed to decompose naturally at a temperature of between 25 and 28°C. The fruits were allowed to naturally decompose in this controlled environment, which may be useful for research on microbial activity, enzyme alterations, or the ripening process.[41]

##### Preparation of papain extracts:

The mature green female tree was the source of the papain extract. Using a sterile scalpel, cuts were made about 3 cm deep on the mature female tree (*C. papaya* L.) to bleed milky latex fluid (papain) into a 200 ml beaker. The bleeding was done in the wee hours of the morning, just before dawn. Hermaphrodite trees are not recommended for bleeding since female trees release more exudates.[58]

#### **Preparation of aqueous seeds extract:**

A sterilized scalpel was used to cut open the decaying fruits from the samples. After being removed, the seeds were washed in distilled sterile water. Soiled seeds were spread out on a piece of foil and ground into a semi-pulverized, mashed shape with a ceramic mortar and pestle. With the use of a blender (Binatone Model BLG401), this was further homogenized. Using Whatman No. 1 filter paper, blended extracts were filtered. [59]

#### **Isolation of spoilage fungi from rotten pawpaw:**

Pieces of the rotting pawpaw fruit, measuring 3.4 x 3.4 x 3 mm, were cut from the rot's expanding edge. This was sterilised for two minutes in 70% alcohol, dried with sterile tissue paper, and then put on sterile Sabouraud Dextrose Agar (SDA) and allowed to incubate for three days at room temperature. According to Okigbo and Ikediugwu (2000), fungal growths connected to the tissue damage were found, and their frequency of occurrence was calculated.[60]

### **CONCLUSION**

Studies on how *Carica papaya* seeds affect intestinal parasite worms show encouraging therapeutic prospects. The active ingredients in *C. papaya* seeds, especially the proteolytic enzymes papain and other ones, have strong anthelmintic properties. Several *in vitro* and *in vivo* investigations have demonstrated the seeds' capacity to interfere with parasitic worms' life cycle and drive them out of the digestive system. According to the research, *C. papaya* seeds may be used as a good, natural substitute for or addition to traditional anti-parasitic therapies, possibly lowering the need for synthetic drugs and the negative effects that go along with them. To completely validate these advantages, more study is needed to determine the best doses, efficacies, and safety profiles.

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