

# Effects of bael fruit on gastrointestinal disorder

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The fast paced lifestyle of our modern times takes a toll on everybody's health. Irregular eating habits, increasing pollution, consumption of fast food and extreme change in climate lead to many gastro intestinal disorders and Diarrhoea is one of the most common of them. It is defined as increase in frequency of stool (watery) and sometimes a sense of fecal urgency. A person suffering from diarrhea has loose motions more than 3 times a day. The present study was conducted on Diarrhoea patients to check the effect of Bael fruit in relieving from the same. The fruit was supplemented in different ways and the subjects chosen for the study were divided into groups according to the severity (severe, 8-10 times and moderate 4-6 times) of loose motions. It was seen that there was very successful reduction in the number of stools per day. So it was concluded that Bael fruit is a very healthy, nutritious and safe option in controlling Diarrhea without any side effects.

**Key Words :** Bael fruit, Gastrointestinal disorder

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## INTRODUCTION

Diarrhoea is one of the most common health problems worldwide. It is defined as an increase in frequency of stools or liquid consistency of stool or some times fecal urgency. A person suffering from diarrhoea has watery or loose stool more than 3 times a day. Diarrhea is a debilitating condition that can significantly affect quality of life. Among the GI infections is a common symptom of the intestinal disorder and has remained a global threat to human health. Diarrhoeal infection is the leading cause of morbidity and mortality with over 4 million deaths annually in children under 5 years of age.

Generally main cause of diarrhoea is microbial infection caused by contaminated water or food, but apart from this many other condition can also manifest into diarrhoea like food or drug allergy, inflammation of intestine, irritable bowel syndrome, celiac diseases, too much consumption of caffeine, mal absorption etc.

In the present scenario outbreak of GI infection and other diarrhoeal diseases has necessitated search for new anti diarrhoeal substances from other sources including plants. Medicinal plants in traditional Indian system of medicine are known to produce a variety of compounds with therapeutic properties. The use of medicinal herbs for curing diarrhoeal infections has been documented in all civilisations. Increased side effects, high cost, increase in microbial resistance and emerging new intestinal pathogens has led to renewed interest and focus in the medicinal plant research.

Among many plants and natural products Bael fruit (*Aegle marmelus*) is one such fruit which is very helpful in curing diarrhoeal infections. This fruit contains

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phytochemicals like Marmelosin, luvagentine, Auraptin and marmelide these components are anti microbial, reduce inflammation, anti cancer and increase nutrient absorption (Borell, 2006)

Many studies have shown that beal fruit decreases incidence of diarrhoea due to its anti microbial and astringent properties.

### Objectives:

Keeping in view the benefits of Beal fruit on diarrhoea following objectives were framed to see the effects of Beal fruit on diarrhoea patients:

To identify diarrhoea patient.

To develop a functional food using beal fruit.

To assess the effect of beal supplementation in different on diarrhoea patients.

## METHODOLOGY

In this study samples were selected from 2 local hospitals of Bhubaneswar. The sampling was done using purposive method *i.e.* those who are suffering from diarrhoea. Of varying severity without any other complications. Total number of samples were 54, who were divided into 3 groups of 18 each. The three groups were Severe (8-10 stools per day), moderate (4-6 stools per day) and control group (9 samples having severe diarrhoea and 9 samples having moderate diarrhoea), control group was not on supplementation. From the samples data was collected in form of questionnaire which contained questions regarding general information, food allergies, hygiene practices, food frequency table, symptoms, frequency of tools etc. The data collected was then tabulated under various headings. Medication of patient continued only for first 2 days of supplementation after that medicine was discontinued and

supplementation was continued.

The beal fruit was supplemented in 2 tasty forms: Sherbat and Murabba.

Sherbat was prepared by using pulp of beal fruit. Pulp and seeds were scooped out of the broken fruit. Water was added in 1:1 ratio and heated for 1-2 min at 80 degrees and mixed properly. Then it was passed through a pulper and strainer, the pulp was stored in an air tight jar. For sherbet the fruit pulp is mixed with sugar and squash is made. Everyday 50 gms of this squash is diluted to make 1 glass of drink and supplemented to patients. Murabba was prepared in a traditional way by deseeding and cutting the fruit and then cooking it in sugar syrup. The dosage of supplementation was 150 gms murabba per day divided into 3 servings of 50 gms each and 1 glass of beal sherbet per day. The supplementation continued for 4 weeks (Table A).

| Frequency              | Beal Murraba    | Beal Sherbet    |
|------------------------|-----------------|-----------------|
| 1 <sup>st</sup> 5 days | Daily           | Daily           |
| Upto 3 weeks           | Thrice per week | Thrice per week |
| Upto 4 weeks           | Twice per week  | Twice per week  |

For first 5 days both murabba and sherbet were given daily, then from 6<sup>th</sup> day to 3<sup>rd</sup> week it was reduced to thrice a week then in the last week supplementation was done only twice a week.

## OBSERVATIONS AND ASSESSMENT

After 4 weeks of supplementation analysis of result showed decrease in number of stool between pre and post supplementation.

From Table 1 it is evident that supplementation of

**Table 1 : Result after supplementation**

| Type of patient | No. of patient | Number of stools       |                              |                              |                               |
|-----------------|----------------|------------------------|------------------------------|------------------------------|-------------------------------|
|                 |                | Before supplementation | 5 days after supplementation | 7 days after supplementation | 1 month after supplementation |
| Severe          | 18             | 8-10                   | 4-5                          | 3-4                          | 1-2                           |
| Moderate        | 18             | 4-6                    | 2-3                          | 1-2                          | 1                             |
| Control grp.    | 18             | 6-8                    | 5-7                          | 4-5                          | 3                             |

**Table 2 : Percentage reduction of stool frequency**

| Type of point | After 5 Days      | After 1 week      | After 4 weeks    |
|---------------|-------------------|-------------------|------------------|
|               | Average value (%) | Average value (%) | Average value(%) |
| Severe        | 50                | 56.25             | 83.75            |
| Moderate      | 50                | 70.83             | 79.16            |
| Control       | 14.58             | 35.41             | 43.75            |

baele fruit was helpful in reducing frequency of stool. In severe diarrhoea patients 1-2 stools per day was seen and moderate diarrhoea patients it was reduced to 1 per day by the end of 4 weeks supplementation. Control group which was without supplementation did not show any significant difference, by the end of 4 weeks patients suffered from 3-4 loose motions per day.

Table 2 indicates that beale supplementation reduced stool frequency significantly. Within first 5 days 50 per cent reduction was seen in severe and moderate patient, who were supplemented with beale murraba and sherbet. Control group which did not receive any intervention showed only 14 per cent reduction in first 5 days. After 1 week severe and moderate patient showed reduction in number of stools by 56 per cent and 70 per cent, respectively, in control group only 35 per cent reduction was seen. After 4 weeks immense decrease was seen in severe and moderate groups of 83 per cent and 79 per cent, respectively. In control group only 43 per cent decrease in stool frequency was seen.

Finally it was concluded that supplementation of beale fruit effectively reduced number of loose motions in diarrhoeal subjects. The results of severe and moderate group indicated that beale fruit recipes showed significant fall in stool frequency, but not much change was seen in control group.

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