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Ankita Pradhan
B. Pharm Student, Himalayan Pharmacy Institute, Majhitar, Sikkim, India

Meerakh Subba
B. Pharm Student, Himalayan Pharmacy Institute, Majhitar, Sikkim, India

Md. Asif
B. Pharm Student, Himalayan Pharmacy Institute, Majhitar, Sikkim, India

Chandrika Sharma
Assistant Professor, Pharmacognosy Department, Himalayan Pharmacy Institute, Majhitar, Sikkim, India

Corresponding Author:
Chandrika Sharma
Assistant Professor, Pharmacognosy Department, Himalayan Pharmacy Institute, Majhitar, Sikkim, India

Formulation and evaluation of Polyherbal tablet using *Carica papaya, Emblica officinalis, Foeniculum vulgare*

Ankita Pradhan, Meerakh Subba, Md. Asif and Chandrika Sharma

Abstract
The objective of the present study was to create a polyherbal tablet using *Carica papaya, Emblica officinalis and Foeniculum vulgare*. The formulation was prepared using the unripe fruits of Papaya, fruits of Amla and seeds of Fennel. Granules were prepared by mixing with excipients. The technique used was wet granulation. After the preparation of tablet it was evaluated with different evaluation tests such as: Physical appearance of tablet, weight variation, friability test, hardness, thickness test.

Keywords: Genetic combining ability, specific combining ability, okra, variance, growth, yield and quality

Introduction
One of the most common fruit crops grown in tropical and subtropical regions is papaya. *Carica papaya* belongs to the small family of Caricaceae. Papaya is a year round fruit that is a nutritional powerhouse. It is a plentiful source of vitamin C, vitamin E, vitamin A. It also contains minerals, potassium and magnesium, pantothenic acid, folic acid and fibre. Along with all of these, it includes papain which is a digestive enzyme that successfully addresses issues related to allergies, sports injuries and trauma. Papaya as a whole strengthens the heart and defends against preventing and combating heart disease, heart attack, strokes and stomach cancer. Papaya is an enzyme powerhouse. The unripe fruit contains papain, chymopapain, fruits contains B carotene, carotenoids, crytoxanthin, monoterpenoids and a seed contains all distinct enzymes. The leaves of papaya are rich in zinc, manganese, iron, potassium and minerals. It has been demonstrated that the plant has number of medicinal properties including antioxidant, antihypertensive, wound healing, hepatoprotective, anti-inflammatory, antimicrobial, anthelmintic, tumor fighting, malaria prevention, blood sugar lowering, anti ulcer and immune modulatory properties.

Table 1: Scientific classification

Kingdom	Plantea
Order	Brassicales
Family	Cariacaea
Genus	*Carica*
Species	*Papaya*

Table 2: Vernacular names

Botanical name	*Carica papaya*
English name	Papaya
Tamil	Pappali
Hindi	Papita
Bengali	Pey pey

Gaertn's *Emblica officinalis*, other name includes *Phyllanthus emblica* belongs to the family of Euphorbiaceae. It is typical in India's mixed deciduous forests, where it can be found both in wild and in cultivation state. When ripe, fresh fruit is globose, depressed and bright yellow green. There are distinct ridges. It tastes sour and astringent, then subtly sweet. Major components includes vitamin C (2%), tannins including gallic acid and ellagic acid, embricol and phyllembic acid. Others includes two alkaloids, phyllantidine and phyllantine. It also contains pectin and minerals. Asthma, bronchitis, diabetes, cephalalgia, hyperacidity, peptic ulcer, eye diseases, inflammation, cardiac disorders, anemia, colic, flatulence, diarrohea,

dysentery can be treated by the fruits of *Embilca officinalis.* It is also useful for the treatment of intermittent fevers.

Table 3: Scientific classification

Kingdom	**Plantae**
Division	Magnoliophyta
Class	Magnoliopsida
Subclass	Rosidae
Order	Euphorbioaceae
Family	Euphorbiaceaea
Genus	*Phyllanthus*
Species	*emblica*

Table 4: Vernacular names

Botanical name	*Phyllanthus emblica*
English name	Indian gooseberry
Sanskrit	Amalaka
Hindi	Amla
Bengali	Amlokki

An aromatic and medicinal biennial plant from the Apiaceae family is *Foeniculum vulgare*. It is a resilient perennial herb with yellow flowers and feathery leaves too. The plant is a notice of Asia and southern Europe. Between wild and domesticated fennels, there are numerous types and races that vary in the size, aroma and flavour of fruits. The varieties of *vulgare* are mostly grown in Russia, Romania, Hungary, Germany, France, USA, Japan and India. The seeds of fennel are used in alcoholic beverages, baked goods, meats and fish meals and herb blends. The main phytoconstituents of the plant have been identified as phenols, phenolic glycosides and volatile fragrance compounds as trans-anethole, estragole and fenchone. Numerous infectious diseases with bacterial, fungal, viral, mycobacterial and protozoal origins are successfully treated by *F.vulgare.* It has anti-inflammatory, cytoprotective, hepatoprotective, anticancer, hypoglycaemic and oestrogenic properties.

Table 5: Scientific classification

Kingdom	Plantae
Division	Magnoliophyta
Class	Magnoliopsida
Order	Apiales
Family	Apiaceae
Genus	*Foeniculum*
Species	*Vulgare*

Table 6: Vernacular names

Botanical name	*Foeniculum vulgare*
English name	Fennel
Tamil	Perunseeragam
Hindi	Saunf
Malayalam	Perunjeeagham
Bengali	Mauri

Table 7: Description of plants

Sl. No.	**Common name**	**Pictures**	**Botanical name**	**Parts used**
1.	Papaya		*Carica papaya*	Fruit
2.	Amla		*Phyllanthus emblica*	Fruit
3.	Fennel		*Foeniculum vulgare*	Seeds

Table 8: Composition of tablet

Sl. No.	Ingredients	Quantity IN mg
1.	Papaya (*Carica papaya*)	15.26 gm
2.	Amla (*Phyllanthus emblica)*	14.8 gm
3.	Fennel (*Foeniculum vulgare)*	17.3 gm
4.	Microcrystalline cellulose (Diluent)	5 gm
5.	Lactose monohydrate (Filler)	3 gm
6.	Methyl paraben sodium (Antimicrobial agents)	2 gm
7.	Starch soluble (Disintegrating agent)	2.5 gm
8.	Magnesium stearate (lubricant)	2 gm
9.	Talc purified (lubricant)	2 gm
10.	Polyvinyl pyrollidone (Binding agent)	3.5 gm
11.	Isopropyl alcohol	q.s

Methodology formulation of tablet

1. Preparation of granules

Prior to the usage, all of the solid fractions and excipients were run through sieve number 80. Individual materials doses were measured out precisely in electronic balance then combined with the diluents microcrystalline cellulose and lactose and dry powder was made and passed through sieve number 44.

To the fore mentioned mixture, the necessary amounts of starch and methyl paraben were added. To create a polyvinyl pyrrolidone paste, isopropyl alcohol was added. The wet coherent mass was created and then sieved with sieve 14 and dried in a tray dryer at 40 degree Celsius for 30 minutes and again the dried granules were passed using sieve number 22. At last, pure talc and magnesium stearate was used to lubricate the granules.

2. Compression of table

After evaluation of granules, it was weighed and divided into 0.5 gm i.e. 500 mg and were punched using RIMEK MINI PRESS-I into 500 mg tablets and was evaluated.

Fig 1: Prepared tablets

Evaluation of tablet

a. Organoleptic properties

The colour and odour of the tablets were evaluated on visual and sensual basis.

b. Loss on drying

5g of tablets was weighed and transferred into a dried petridish. Then they were placed in the drying chamber, for 1 hour. It was then taken out and weighed again. After that the tablets were again kept inside the drying chamber and again weighed after 10 minutes. This is repeated until constant weight is obtained. Loss in weight is calculated by the formula-

$$\text{Loss on drying} = \frac{\text{Initial weight-final weight}}{\text{Initial weight}} \text{X100}$$

c. Angle of repose

15 gm of granules were allowed to pass through a funnel from a particular 2 cm height on to a flat surface until it formed a heap, which touched the tip of funnel. The height and the radius of the heap were measured. The experiment was repeated thrice and the angle of repose (tanθ) was calculated using the formula

Angle of repose, θ=tan-1(h/r)

d. Ph determination

The ph of the prepared herbal tablet in distilled water was evaluated by means if ph paper at room temperature.

e. Thickness of tablet

Randomly 10 tablets were taken and were measured in vernier calliper. The reading was noted. The unit is expressed in mm.

f. Hardness test

Hardness test is also known as tablet crushing strength. The hardness test was performed using Monsanto hardness tester. Lower plunger of the tester was kept in contact with tablet and zero reading was taken. Tablets were the fractured by giving the force. It is expressed in kg/cm^2.

g. Weight variation

It is also called as uniformity in weight. Weight variation test was done by weighing 20 tablets individually, calculating the average weight and comparing the individual tablet weight to the average weight.

h. Friability test

This test is done to check the combined effect of abrasion and stock. The instrument used for this test was Roche Friabilator. Pre weighed tablets were placed in the friabilator and rotated at a speed of 25 rpm for 4 minutes. The tablets were dropped from a distance of 6 inches in each revolution. The tablets were then reweighed after removal of fines and the percentage of weight loss was calculated.

$$\text{Percentage friability} = \frac{\text{weight before friability- weight after friability}}{\text{Weight before friability}} \text{X 100}$$

Results and discussion

Table 9: Evaluation test of tablets

Sl. No	Evaluation Parameters	Results
1.	Organoleptic properties	Light brown colour
2.	Loss on drying	0.5%
3.	Angle of repose	28.36
4.	Ph	5
5.	Thickness of tablets	1.5±0.001mm2
6.	Hardness of tablet	5.2kg/cm2
7.	Weight variation	500±5 mg
8.	Friability test	0.40%

Conclusion

Herbal products may contain combinations of several different herbs or a single herb and believed to have complementary or synergistic effects. The herbal tablet was formulated using fruits of unripe *Carica papaya*, fruits of *Emblica officinalis*, seeds of *Foeniculum vulgare* and were evaluated for the parameters such as: hardness, thickness, ph determination, weight variation, loss on drying, friability test. The herbal tablets showed good results for the above mentioned test. The herbal plants used in the formulation of tablet mainly have the digestive property.

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