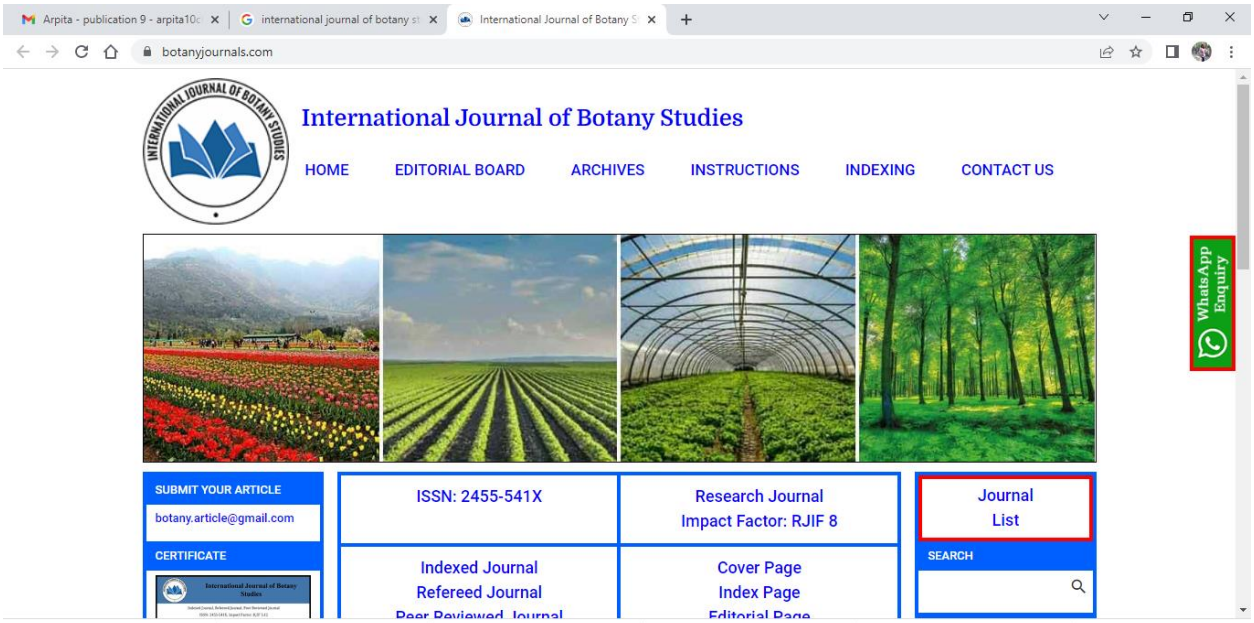
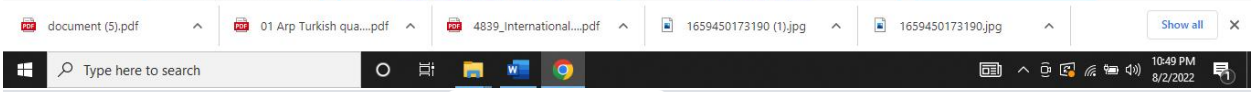
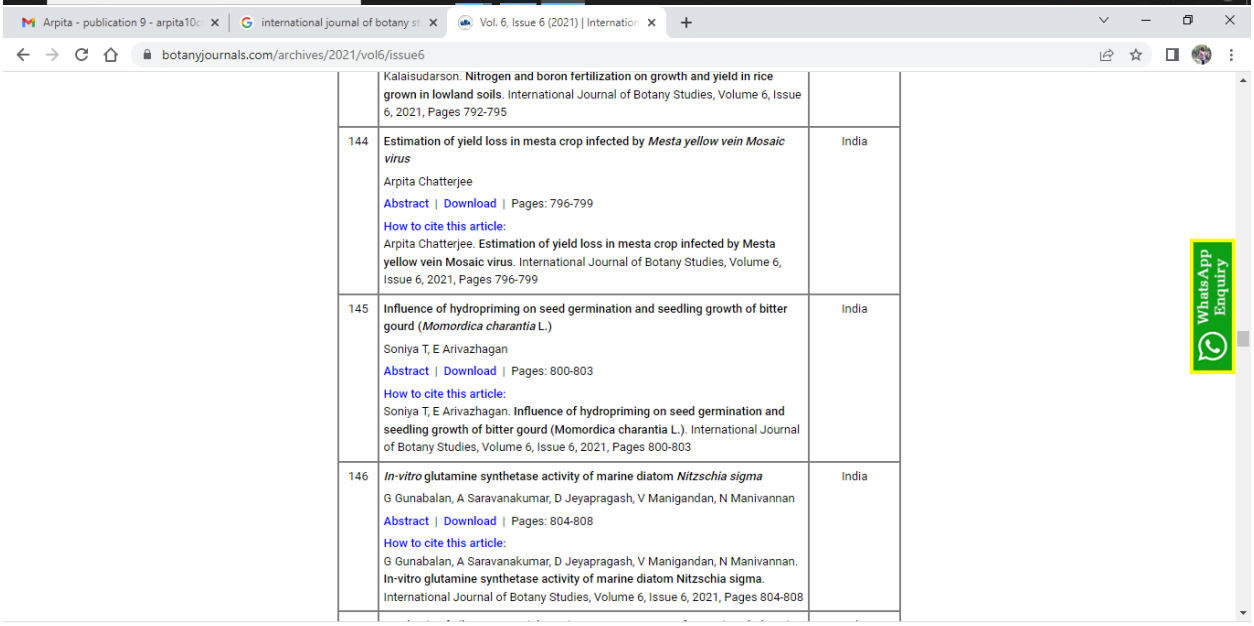
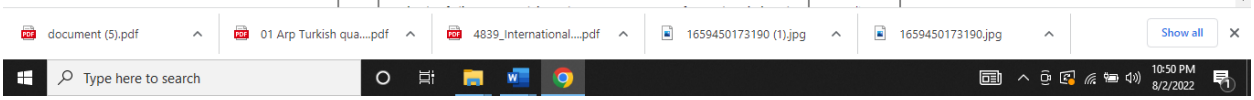






	Kalaisudarson. **Nitrogen and boron fertilization on growth and yield in rice grown in lowland soils**. International Journal of Botany Studies, Volume 6, Issue 6, 2021, Pages 792-795	
144	**Estimation of yield loss in mesta crop infected by *Mesta yellow vein Mosaic virus*** Arpita Chatterjee Abstract | Download | Pages: 796-799 How to cite this article: Arpita Chatterjee. **Estimation of yield loss in mesta crop infected by Mesta yellow vein Mosaic virus**. International Journal of Botany Studies, Volume 6, Issue 6, 2021, Pages 796-799	India
145	**Influence of hydropriming on seed germination and seedling growth of bitter gourd (*Momordica charantia* L.)** Soniya T, E Arivazhagan Abstract | Download | Pages: 800-803 How to cite this article: Soniya T, E Arivazhagan. **Influence of hydropriming on seed germination and seedling growth of bitter gourd (Momordica charantia L.)**. International Journal of Botany Studies, Volume 6, Issue 6, 2021, Pages 800-803	India
146	***In-vitro* glutamine synthetase activity of marine diatom *Nitzschia sigma*** G Gunabalan, A Saravanakumar, D Jeyapragash, V Manigandan, N Manivannan Abstract | Download | Pages: 804-808 How to cite this article: G Gunabalan, A Saravanakumar, D Jeyapragash, V Manigandan, N Manivannan. **In-vitro glutamine synthetase activity of marine diatom Nitzschia sigma**. International Journal of Botany Studies, Volume 6, Issue 6, 2021, Pages 804-808	India



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Estimation of yield loss in mesta crop infected by *Mesta yellow vein Mosaic virus*

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Abstract
Losses in both fibre yield, seed yield and fibre quality of Mesta crops infected with *Mesta Yellow Vein Mosaic Virus* has been studied. Estimation of yield losses were compared in field condition in infected and uninfected Mesta plants with varying fertilizers regimes. The study was conducted in three different farmers' field of Basirhat District of West Bengal, India for consecutive three years. Results showed that the disease caused considerable yield losses in Mesta plants. Further, infected plants showed reduction of fibre fineness and fibre strength, and this caused reduction of fibre quality in diseased crop.

Keywords: mesta, fibre yield, seed yield, fibre quality, fibre fineness, fibre strength, *Mesta Yellow Vein Mosaic virus*

Introduction

Hibiscus cannabinus L. in the western world is popularly known as kenaf. It belongs to the family Malvaceae. In India it is also known as bimli, bimlipatam, Deccan hemp, gogu, chana, ambadi, gongiura, sunbeeja, sunkura, etc. *Hibiscus sabdariffa* L. is another species of *Hibiscus* and commonly known as roselle. It is a close relative of kenaf. It is also called as Pusa hemp, Java jute, Thai jute, tengrapat, lalambadi, chukair, yerragogu, palechi, pundibeeja, etc. Both of these crops are collectively regarded as mesta. The chromosome number of *H. cannabinus* and *H. sabdariffa* is 2n = 36 and 2n = 72, respectively. *H. cannabinus* is faster growing crop and at around 150 days it attains maturity. The late maturing crop, *H. sabdariffa*, is ready for harvest at around 180 days.

The plants are annual, bisexual, and characterized by large cream colours, with reddish purple or a scarlet throat. The leaves are either simple or compound in case of kenaf, whereas in roselle they are alternately borne on the stem and are generally palmate, and deeply lobed. The stem of kenaf is more or less rigid whereas in roselle it is flexible (Singh, 1997) [1].

Mesta crops produce bast fibers of commerce upon retting from the stems. These fibres are used as a substitute of jute fibers. They are used for making canvas, rope, cordage, carpet backing, sacking, and fishing nets etc. They are also cultivated for seeds secondarily.

The seeds contain about 20% oil and that are used for cooking, making salad, lubricant oils, in the manufacture of paints, soap, linoleum, varnishes. Furthermore, after extraction of oil from seed a concentrated food is produced, which is known as seed-cake, and it is used for cattle. Recently, mesta plants or fibres are used in paper-industry. Mesta especially kenaf is also used as a folk remedy. It is used for bilious conditions, fever, bruises, and puerperium (Duke and Wain, 1981) [2]. It has therapeutic role in dysentery, rheumatism, coughs, eye-sore and disease of blood, throat and bile (Ambasta, 1992; Bhandari, 1978; Duke, 1986; Hazra *et al*., 2003; Kirtikar and Basu, 1975; Pal and Jain, 1998; Watt, 1972) [3, 4, 6, 7, 8, 9]. The calyces of roselle have been found useful in the preparation of jam, jellies and sauces.

Mesta crop is cultivated in more than 26 lakh hectares of area, and produce fibres which is responsible for over 12 lakh bales annually (Singh, 1997) [1]. Data revealed that Andhra Pradesh constitutes 40.3% and 53.7% of the total acreage and production respectively and thus ranks first both in area and production. Orissa comes next and shares 15.7% and 16.0% in area and production, respectively. Bihar holds the third position and its share comes to 9.7% and 11.3% of the total area and production, respectively. West Bengal holds fourth place in area and production accounting to 4.5% and 5.7%, respectively. The contribution of other states is less than 3% (Singh, 1997) [1].

In India, among all the states, the average productivity of mesta is highest in Tripura (1441 kg/ha). It is followed by second position in Andhra Pradesh (1399 kg/ha), and then West Bengal (1334 kg/ha), Bihar (1220 kg/ha), Orissa (1083 kg/ha), Assam (880 kg/ha) and Meghalaya (844 kg/ha). The average yield is poor in other states (Anonymous, 1999).

But the average yield of mesta is quite low (900-1800 kg/ha) in India as compared with that of in Cuba (2700 kg/ha), the largest producer of these crops. Thus India is the chief importer of mesta fibres. This is due to many pathogenic attack of these crops by various pathogens, viz. viruses, bacteria, fungi, and nematodes.

A virus-disease very similar in symptomatology with that of reported yellow vein mosaic has been found to occur on both kenaf and roselle grown in this region causing severe retardation in growth and yield (Mandal *et al*., 2002; Jose and Usha, 2000) [11, 12]. Survey of literature reveals the occurrence of such type of disease in endemic form in different areas in India, viz. Andhra Pradesh, U.P., Bihar, Orissa and West Bengal (Chatterjee *et al*., 2005, 2006, 2007). For the last few years this type of disease is spreading at a fast rate causing very severe symptoms on leaves of infected plants with greater reduction in photosynthetic area and yield and thus assumes a major threat to production. The causal organism is a begomovirus named *Mesta Yellow Vein Mosaic Virus* (Chatterjee *et al*., 2005; Ghosh, *et al*., 2007). Besides these, many other viruses from different types of hosts are also found to attack these crops and induce symptoms resulting into loss in fibre yield (Chatterjee, 2020). But any detailed study on the fibre