

# Threatened weeds of Bt cotton field in Nimar region of Madhya Pradesh

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The weeds in the Bt cotton field of Nimar region of Madhya Pradesh, India were studied and 55 weeds belonging to 21 families and 47 genera have been reported. Present study reveals that some exotic weeds have established them dominant in the Bt cotton field and suppressed to grow other plants which were commonly found before Bt cotton cultivation. 11 weed have been recorded to be threatened in Nimar region due to of Bt cotton cultivation.

**Key words :** Bt cotton, Exotic weeds, Cotton fields, Threatened weeds

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## INTRODUCTION

The agriculture sector in India can rightly be called the lifeline of the economic system (Debyani and Sinha, 2012). Cotton, the major commercial crop is grown extensively in Karnataka, Tamil Nadu, Andhra Pradesh, Punjab, Haryana, Gujarat, Maharashtra and Rajasthan (Chaturvedi, 2013) and millions of people engaged in its cultivation, processing and marketing. Cotton plays an important role in national economy. After China, India is the largest producer and consumer of cotton (Dubey, 2013). More than 20 million people depended on Bt cotton for their livelihood. Bt cotton supplies cash return to farmers (Rabia *et al.*, 2007). Bt cotton was introduced in 1995 and it is a transgenic plant producing an insect controlling protein *Cry 1 A(C)*. The gene has been derived from naturally occurring bacterium *Bacillus thuringiensis* and it is responsible for protection of Bt cotton plant from certain Lepidoptera (Caterpillars).

Nimar region is situated in the south western part of Madhya Pradesh lying between 21<sup>o</sup>-05' and 22<sup>o</sup>-25'N latitude and 74<sup>o</sup>-25' -76<sup>o</sup>-14' E longitude. Politically there are four districts covering the Nimar region mainly West Nimar (Kargone), Barwani, East Nimar (Khandwa), and Burhanpur. Topographically Nimar region is situated centrally in Northern part covered with Vindhyan scabs and in southern part with Satpura hill ranges. The Satpura in East Nimar bifurcates into

two parallel ridges on either side of Tapti Valley. The northern part of Satpura extends up to eastern part of Harsud and more other or less along the boundary between Khandwa and Burhanpur.

The whole Nimar region is known for Bt cotton cultivation and cotton is the major cash crop of Nimar region. Now indigenous variety of cotton has been totally replaced by Bt cotton in whole Nimar region except few places namely Ghotia, Raibidpura, Sangvi, Shrikandi, Raibid, Kaili and Gongawa village of Kargone. Tribal communities of these remote areas are growing indigenous cotton in 40-50 acre land only. Before the advent of Bt cotton, cultivars used to grow indigenous variety of cottons which were generally called Kakadi kapas. These varieties are Vikram, Khandwa-2, Jawahar Tapti, JKHY-1, JKHY-2, and JKHY-3. All of these were the varieties of *Gossypium hirsutum* and *Gossypium arboreum*.

The cotton plant belongs to genus *Gossypium* of the dicot family Malvaceae. Genus *Gossypium* has 35 species, distributed in tropical and subtropical regions. Cotton is a summer crop, usually sown between April and June in different parts of the country. *Gossypium hirsutum*, *Gossypium barbadense*, *Gossypium arborium*, *Gossypium herbaceum* are the four species of cotton were grown in Nimar region. Kargone, Barwani, Khandwa and Burhanpur are the major region of Bt cotton cultivating in Nimar region. Present study had been carried out to record the impact of Bt cotton

Table 1 : Bt cotton field weeds			
Sr. No.	Botanical names	Family	Local name
1.	<i>Abutilon indicum</i> (L.) Sweet.	Malvaceae	Khangi
2.	<i>Ageratum conyzoides</i> L.	Asteraceae	Gandanio
3.	<i>Alysicarpus hamous</i> Edgew	Fabaceae	Sevro
4.	<i>Alysicarpus longifolius</i> Rottl. ex. Spre.Wig.& Arn.	Fabaceae	Bala
5.	<i>Alysicarpus rugosus</i> (Willd.)DC	Fabaceae	Chadiyo
6.	<i>Alysicarpus tetragonolobus</i> Edge.	Fabaceae	Savro
7.	<i>Aregemone mexicana</i> L.	Papaveraceae	Katlasha
8.	<i>Aerva lanata</i> (L.) Juss ex. Schult.	Amaranthaceae	Paharipura
9.	<i>Biophytum sensitivum</i> (L.) DC	Oxalidaceae	Rismanu
10.	<i>Canscora diffusa</i> (Vahl.) R. Br.	Gentianaceae	Karadkumbo
11.	<i>Celosia argentea</i> L.	Amaranthaceae	Kueduk
12.	<i>Clitoria ternatea</i> L.	Fabaceae	Gokarni
13.	<i>Commelina benghalensis</i> L.	Commelinaceae	Kancharo
14.	<i>Crotolaria juncea</i> L.	Fabaceae	Shan
15.	<i>Cynotis cristata</i> (L.) D.Don	Commelinaceae	Dangio
16.	<i>Cyathocline purpurea</i> (Buch.H.D.Don) O.Kut.	Asteraceae	Gunja
17.	<i>Dactyloctenium aegyptium</i> (L.) Stapf.	Poaceae	Duwaliyo
18.	<i>Dichanthium setgera</i> Roth. Ex. Roem &Schult	Poaceae	Daniya marvel
19.	<i>Digera muricata</i> (L.) Mart.	Amaranthaceae	Latmahuria
20.	<i>Digitaria stricta</i> Roth ex. Roem. & Sch.	Poaceae	Tipayo
21.	<i>Dinebra retroflexa</i> (Vahl.) Pang.	Poaceae	Lenighat
22.	<i>Echinochloa colonum</i> (L.) Link.	Poaceae	Sawank
23.	<i>Emilia sonchifolia</i> (L.) DC	Asteraceae	Fundi ko charo
24.	<i>Euphorbia hirta</i> L.	Euphorbiaceae	Laldhudi
25.	<i>Goniogyna hirta</i> (Willd.) Ali.	Papilionaceae	Chakri ko charo
26.	<i>Heteropogon contortus</i> (L.) P.Beav.	Poaceae	Suklio
27.	<i>Indigofera glandulosa</i> Forsk.	Papilionaceae	Dasio
28.	<i>Chloris dolichostachya</i> Lag.	Poaceae	Arniyo
29.	<i>Ipomoea pestigridis</i> L.	Convolvulaceae	Dhawale rel
30.	<i>Leucas aspera</i> (Willd.) Link.	Labiatae	Madanganti
31.	<i>Malvastrum coromandalianum</i> (L.) Gar.	Malvaceae	Bala
32.	<i>Pupalia lappaca</i> (L.) Juss.	Amaranthaceae	Bokario
33.	<i>Pennisetum pedicellatum</i> Trin.	Poaceae	Lal phundalio
34.	<i>Phyllanthus fraternus</i> Webter	Euphorbiaceae	Jenjaru
35.	<i>Physalis minima</i> L.	Solanaceae	Popti
36.	<i>Polygala chinensis</i> L.	Polygonaceae	Meradu
37.	<i>Rhyncosia minima</i> (L.) DC	Papilionaceae	Senglie ko charo
38.	<i>Senna uniflora</i> (Mill.) Irwin & Ban.	Caesalpinaceae	Charpta
39.	<i>Senna tora</i> L.	Caesalpinaceae	Fuwadiyo
40.	<i>Salvia plebeia</i> R.Br.	Labiatae	Kamarkas
41.	<i>Sida alba</i> L.	Malvaceae	Kantoibala
42.	<i>Sida cordata</i> (Burm.f.) Borss.	Malvaceae	Bala
43.	<i>Sida cordifolia</i> L.	Malvaceae	Bala
44.	<i>Sporobolus capillaris</i> Miq.	Poaceae	Machario
45.	<i>Sporobolus indicus</i> (L.) R.Br	Poaceae	Machario
46.	<i>Striga asiatica</i> (L.) Kuntze	Scrophulariaceae	Kharjalio
47.	<i>Tephrosia strigosa</i> (Dal.) Sant. & M1.	Fabaceae	Sarpunkho
48.	<i>Tephrosia purpurea</i> (L.) Pers.	Fabaceae	Sarkando
49.	<i>Tetrapogon tenellus</i> (Roxb.) Chiov.	Poaceae	Farodi
50.	<i>Themeda laxa</i> (Anderess.) A. Camus	Poaceae	Suklo
51.	<i>Tribulus terrestris</i> L.	Zygophyllaceae	Gokru
52.	<i>Trichodesma sedgwickianum</i> Banerjee	Boraginaceae	Dangio
53.	<i>Tridax procumbens</i> L.	Asteraceae	Ghawpallo
54.	<i>Triumfetta rotundifolia</i> Lamk.	Tiliaceae	Chipti
55.	<i>Zornia gibbosa</i> Span.	Papilionaceae	Chakri ko charo

cultivation on weeds of cultivated field.

## RESEARCH METHODOLOGY

A systematic plant survey and collection were carried out in different season from 2010 to 2013 by well planned schedule. Weeds of Bt cotton were studied. Plant collection was carried out by customary method (Jain and Rao, 1977). Plant specimens were identified with the help of floras (Verma *et al.*, 1994; Mudgal, 1997; Singh *et al.*, 2001; Khanna *et al.*, 2001; Roy, 1984; Sinha and Shukla, 2007), and available literature. Field observation and field data were noted down in field diary. Some plant specimens have been identified from BSI, Central Circle Allahabad. Herbarium sheets of all the plant specimens were prepared and deposited in the herbarium of PMB Gujarati Science College, Indore, Madhya Pradesh.

## RESEARCH FINDINGS AND ANALYSIS

A total of 55 plant species of weeds have been observed from the study area (Table 1). Present study reveals that some exotic weeds have established them dominant in the Bt cotton field and suppressed to grow others which were commonly found in the indigenous cotton field before Bt cotton cultivation. Some weeds almost disappeared and become threatened in the Nimar region due to Bt cotton cultivation (Table 2).

The weeds dominating after Bt cotton cultivation are *Amaranthus lividus* Polygonoides, *Echinochloa colonum*, *Chloris barbata*, *Paspalum compactum*, *Ageratum*

**Table 2 : Threatened weeds of Bt cotton**

Botanical name	Family
<i>Hemarthria compressa</i> (L.F.) R.Br.	Poaceae
<i>Ipomoea hederifolia</i> L.	Convolvulaceae
<i>Dinebra retroflexa</i> (Vahl.) Pang.	Poaceae
<i>Ischaemum pilosum</i> (Klein ex. Willd.) Wight.	Poaceae
<i>Commelina hasskarlii</i> C.B. Clarke.	Commelinaceae
<i>Desmodium triquetrum</i> (L.)DC	Papilionaceae
<i>Euphorbia chamaesce</i> L.	Euphorbiaceae
<i>Euphorbia dracunculoides</i> Lamk.	Euphorbiaceae
<i>Centella asiatica</i> (L.) Urban	Apiaceae
<i>Amaranthus lividus</i> L. sp. Polygonoides.	Amaranthaceae
<i>Eragrostis unioloides</i> (Retz.) Ness. ex. Stud.	Poaceae

*conyzoides*, *Salvia plabeia*.

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