



Short Communication

Climbing Weeds of Agricultural Crops of District Rajouri, Jammu and Kashmir, India

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Abstract

The present study deals with climbing weeds associated with agricultural crops of district Rajouri (J&K). The study was based on extensive and intensive field surveys made during the period 2009-2011, in different months of Rabi and Kharif seasons. During the course of field study the authors have selected 4 important agricultural blocks in the district Rajouri i.e. Nowshera, Sunderbani, Kalakote and Thanamandi and 5 sites were selected in each block for the collection of climbing weeds. In this period the authors have reported a total of 22 climbing weeds belonging to 9 angiospermic families from both Rabi and Kharif crops of the selected sites. Out of 9 angiospermic families of climbing weeds the predominance was shown by family Convolvulaceae having 6 climbing weeds followed by family Fabaceae and Rubiaceae each represented by 4 climbing weeds.

Key words: Climbing weeds, agricultural crops, rabi and kharif, yield.

Introduction

In the state Jammu and Kashmir district Rajouri is one of the most important agricultural district having 7 blocks. It is located at western part of Jammu division in the foot hill of Pirpanjal range between 32°-58' and 33°-35' latitude and 74°-81' longitude at an elevation range of 370 – 6000 msl. Covering an area of 2630 sq. km. Out of the seven blocks of district Rajouri Nowshera, Sunderbani, Kalakote and Thanamandi are important agricultural blocks. Wheat is the major Rabi crop but along with wheat, maize and rice are the major Kharif crops grown in these blocks. The per hectare yield of crops in this district is less as compared to other parts of India due to high weed infestations¹. Although some work has been done in the field of ethnobotany², but yet no work has been done in the field of unwanted weeds of the study area.

Weeds are the oldest problem in agriculture since about 10000 B.C. and have represented one of the main limiting factors in profitable crop production³. They are the most complex and serious problems in natural resource management. Weeds cause significant losses each year in the agriculture, forestry, aquaculture, water supply and a host of other human enterprises. They also affect the health and quality of life of people all over the world by causing allergies and other health hazards⁴. Apart from quantitative losses caused by weeds due to competition for water, light, space, nutrients and to the antagonism (parasitism and allelopathy) they also cause qualitative indirect damage due to unitary seed reduction, contamination of seeds slowing of tillage and harvesting practices⁵⁻⁶. They transmit bad smell or tastes to milk or dairy products⁷.

The climbing weeds are different from others because they possess special structures (tendrils hooks, twinning stem, twinning leaves etc.), which help them in climbing. Some of these weeds grow along with agricultural crops and competes for resources hence reduce their yield. These climbing weeds climb up and shaded the crop plants; they absorb maximum proportion of sunlight and resulted in their stunted growth. Once crop plants are shaded their growth as well as yield is reduced. Some of the climbing weeds like *Cuscuta reflexa* wrap itself around the crop plants and produces haustorium which absorbs water and the important nutrients from the vascular system of crop plants.

The present study was conducted as first ever attempt from the study area to explore the climbing weeds that grows along with agricultural crops and competes for space, moisture, nutrients, CO₂, sunlight and shaded them. This study will also help in identifying the climbing weeds that infests the Rabi and Kharif crops of the study area and thus help in planning a suitable strategy for their control.

Material and Methods

The present communication pertains to climbing weeds associated with agricultural crops of district Rajouri (J&K). The study was based on extensive and intensive field trips made during different months of Rabi and Kharif crop seasons of 2009-2011. During the course of field study the authors have selected 04 important agricultural blocks in district Rajouri i.e. Nowshera, Sunderbani, Kalakote, Thanamandi and 05 sites were selected in each block for the study. Regular field trips were made once a month in each site for the collection of climbing

weeds and important field notes on flowering and fruiting season and their association with crops were reported. During this course the interviews were conducted from farmers and agriculturalists of each site about climbing weeds and their effect on agricultural crops. The collected weeds were pressed, dried, preserved and properly identified with the help of available literature and monographs⁸⁻¹⁰ and confirmed from the authentic regional herbaria at Botanical Survey of India, Northern Circle (BSD), Dehradun, Forest Research Institute Herbarium (DD), Dehradun and deposited them in the H.N.B.Garhwal Central University Herbarium, Department of Botany, S.R.T. Campus, Badshahithaul, Tehri Garhwal, Uttrakhand, India.

Results and Discussion

During the study period the authors have reported a total of 22 climbing weeds belonging to 9 angiospermic families from both the Rabi and Kharif crops of the study area. Out of 9 families of climbing weeds reported from the selected sites the predominance was shown by family Convolvulaceae having 6 climbing weeds followed by family Fabaceae and Rubiaceae each having 4 climbing weeds while the family Cucurbitaceae was represented by 3 climbing weeds. Each of the remaining families Asclepiadaceae, Cuscutaceae, Menispermaceae, Ranunculaceae and Sapindaceae were represented by 1 climbing weeds.

District Rajouri is one of the hilly district of J&K state whose boundaries are attached to district Poonch in north, district Jammu in south, Udhampur in east and Mirpur (Pakistan) in the west. District Rajouri has two regions with characteristic topography and climate *i.e.* the temperate and sub-tropical. The temperate region comprising of the blocks Thanamandi, Darhal, Budhal and some part of Rajouri and sub-tropical region comprising of areas like Nowshera, Kalakote and Sunderbani. The economy of this district revolves around its agricultural crops but the per hectare yield of crops is less as compared to other parts of India due to heavy weed infestation. Weeds reduce the yield of wheat and maize crop by 25.35% and 30.61% respectively in the study area¹¹⁻¹². Some of the climbing weeds were growing along with agricultural crops and compete for resources. The climbing weeds like *Lathyrus aphaca* and *Vicia sativa* etc. possess thin wiry structures known as tendrils which when come in contact with crop plants curls around them forming a coil that allow them to climb up. The weed like *Clematis montana* possesses twinning leaves which help in climbing and the weeds like *Gallium aparine* and *Gallium elegans* etc. use hooks as a support for climbing while the weeds *Ipomoea nil*, *Ipomoea purpurea*, *Ipomoea pes-tigridis* and *Ipomoea triloba* contained twinning stem which twist around the crop plants and help them to climb up. Once these weeds climb up the crop plants they use maximum proportion of sun light and compete with them for resources therefore, resulted in stunted growth, this ultimately affects the yield of agricultural crops. Apart from competition for resources the weeds like

Ipomoea nil, *Ipomoea purpurea* and *Ipomoea pes-tigridis* crawl around the maize plants and cover their canopy from all the sides. The vegetative growth of these weeds is so vigorous that whenever their weight become excess they breaks the crop plants and cause heavy loss of crops. The weed like *Clematis montana* and *Ceropegia bulbosa* were reported particularly from the maize fields near by the forests. However, some of the climbing weeds reported during the study period *i.e.* *Ipomoea nil*, *Ipomoea purpurea* and *Ipomoea pes-tigridis*, *Lathyrus aphaca*, *Lathyrus sphaericus* and *Gallium aparine* etc. are used as fodder for rearing the livestock. The weeds like *Lathyrus aphaca*, *Vicia hirsuta* and *Vicia sativa* are also used in some cooking recipes of the study area. Further research work is needed in the fields of weed control, weed biology and weed utilization as the component of integrated weed management.

Conclusion

The conclusion is drawn on the basis of field study that the climbing weeds grows along with agricultural crops and compete for space, moisture, CO₂ and nutrients in the early stages of competition, in the latter stages these weeds climb up with the help of special structures (tendrils hooks, twinning stem, twinning leaves etc.) on crop plants and absorb maximum proportion of sunlight thus resulted in their stunted growth, this ultimately affects the yield of agricultural crops.

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Table-1
Showing Botanical names, Families, Flowering and Fruiting seasons and Association of climbing weeds

S.No.	Family	Botanical Name	Flowering & Fruiting Season	Associated Crops
1.	Asclepiadaceae	<i>Ceropegia bulbosa</i> Roxb.	Jun.-Jul.	Maize
2.	Convolvulaceae	<i>Convolvulus arvensis</i> L.	Sept.-Apr.	Wheat
		<i>Ipomoea eriocarpa</i> R. BR.	Jul.-Oct.	Maize, Rice
		<i>Ipomoea nil</i> (L.) Roth	Mar.-Dec.	Maize, Rice
		<i>Ipomoea pes-tigridis</i> L.	Jul.-Dec.	Maize
		<i>Ipomoea purpurea</i> (L.) Roth	Feb.-Oct.	Maize
		<i>Ipomoea triloba</i> L.	Jul.-Dec.	Maize
3.	Cucurbitaceae	<i>Diplocyclos palmatus</i> L.	Aug.-Nov.	Maize
		<i>Momordica dioica</i> Roxb.	Aug.-Dec.	Maize
		<i>Trichosanthes cucumerina</i> L.	Jul.-Oct.	Maize
4.	Cuscutaceae	<i>Cuscuta reflexa</i> Roxb.	Jun.-Dec.	Maize, Rice
5.	Fabaceae	<i>Lathyrus aphaca</i> L.	Feb.-May	Wheat
		<i>Lathyrus sphaericus</i> Retz.	Apr.-May	Wheat
		<i>Vicia hirsuta</i> (L.) S.F.Gray	Mar.-May.	Wheat
		<i>Vicia sativa</i> (L.)	Mar.-Oct.	Wheat
6.	Menispermaceae	<i>Tinospora cordifolia</i> (Willd.) Hook.	Feb.-Jul.	Maize
7.	Ranunculaceae	<i>Clematis montana</i> Buch.	Mar.-Aug.	Maize
8.	Rubiaceae	<i>Gallium aparine</i> L.	Feb.-Aug.	Wheat
		<i>Gallium elegans</i> Wallich.	Jul.-Nov.	Wheat
		<i>Gallium vestium</i> D.Don	Apr.-Sept.	Wheat
		<i>Rubia manjith</i> Roxb.	Jul.-Nov.	Maize
9.	Sapindaceae	<i>Cardiospermum halicacabum</i> L.	Jul.-Nov.	Maize



Figure-1
Vicia sativa



Figure-2
Cuscuta reflexa



Figure-3
Ipomoea triloba



Figure-4
Vicia hirsuta



Figure-5
Convolvulus arvensis



Figure-6
Lathyrus aphaca



Figure-7
Ipomoea purpurea



Figure-8
Ipomoea pes-tigridis



Figure-9
Trichosanthes cucumerina



Figure-10
Rubia manjith

Figures-1-10
Some Important Photographs of Climbing Weeds showing Association with Crops