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Weed diversity in Rabi wheat crop of Rewa District (M.P.), India

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Abstract

The present communication deals with the diversity of common weeds in wheat crop cultivation during Rabi season of Rewa district (M.P.), India. In this study 76 weed species belonging to 24 dicotyledons and 03 monocotyledons families are reported. Among dicotyledons families the maximum dominance shown by Asteraceae, Fabaceae, Amaranthaceae, and Euphorbiaceae while monocotyledons families with 15 weed species, having dominance of Cyperaceae and Poaceae. The common dominant weeds of Rabi wheat crop are *Anagalis arvensis*, *Chenopodium album*, *Portulaca oleracea*, *Melilotus indica*, *Phaselous aconitifolius*, *Parthenium heterosporus*, *Tridax procumbence*, *Rumex dentatus*, *Alternanthera spinosus*, *Euphorbia thymifolia*, *Cyprus rotundus* and more.

Keywords: Wheat crop, weed, Rabi season, Rewa district

Introduction

Weed flora has been in a state of dynamism brought about by mankind for his benefits, thus paving the way for superior competitive species to gain the foothold in changed soil conditions. Species which have same ecological demands are inclined to occupy the same habitats with much rapidity. Crop type and soil properties have greatest influence on the occurrence of weed species (Streibig *et al.* 1984, Andreasen *et al.* 1991) ^[1-2]. Jethro (1731) ^[3] for the first time defined 'a weed as a plant can grow where it is not desired' in his much esteemed 'Horse Hoeing Husbandry'. Weeds are unwanted plants that grow in association with agricultural crops and bring about significant decline in yield through their competition with crop plants for sunlight, space, nutrients etc. (Dangwal *et al.*, 2010) ^[4]. However, some weeds are also allelopathic in nature (Oudhia and Tripathi, 1997; 1998) ^[5-6]. While Holm *et al.*, (1977; 1979) ^[7-8] estimated that about 8000 weed species growing in world, of which only 250 are of particular importance to agricultural crops.

The type of irrigation, cropping pattern, weed control measures and environmental factors have a significant influence on the intensity and infestation of weeds (Saavedra *et al.* 1990) ^[9]. In view of significant yield decline by weeds in different crops, numerous studies have been carried out on various aspects of weed biology and control in India. Wheat (*Triticum aestivum* L.) is the second important staple food crop, next to rice in India. Rice – Wheat cropping system is predominant in our country of which 40% wheat is grown. The grasses and broad leaf weeds flourish luxuriantly because of availability of moisture and nutrient in abundance and lesser competitive ability of wheat cultivars. In general, seasonal long competition for major weeds culminates in yield reduction to an extent of 15- 40% in this context Kaul (1986) ^[9] studied the weed flora in Kashmir valley and reported 401 weed species belonging to 251 genera and 56 angiosperm families. Shailey and Gaur (1993) ^[10] studied the phyto-sociological association of crops and weeds of Pauri district of Uttrakhand, India and recorded 180 weed species belonging to 50 angiosperm families. The dominant dicot families were Amaranthaceae, Apiaceae, Asteraceae and Brassicaceae and Commelinaceae and Poaceae from monocot families. Singh *et al.*, (2007) ^[11] studied the phytosociological association of weeds in winter crops of Kashmir valley. Gupta *et al.*, (2008) ^[12] studied the dynamics of cereal crop weeds of Doon valley with special reference to rice, maize and wheat fields. They reported 151 weed species belonging to 118 genera. 31 families; 57 weeds were reported from rice, 77 from maize and 71 from wheat fields.

As the Rewa district separated then there is only the taxonomical and Ethnobotanical exploration is done by some workers as (Nigam, 1973, Mishra, 1993, Neeta *et al.* 2013, Gupta and Khare, 2022a&b) ^[13-17] but the studies on weed plants is still unscreened. Hence in the present study attempts were made to screen the weed plants associated with rabi wheat crop of Rewa district (M.P.).

Rewa is located at 24°32' N 81°18' E. It has an average elevation of 275 meters (902 feet). It is connected by all weather roads to Allahabad, Mirzapur, Sidhi, Shahdol, Satna, Katni and Sirmour. Rewa town has its own importance on account of its location, where rich mineral deposits are found out of these three main rock formations; mirror sand, iron ore and Limestone are prominent.

Materials and Methods

The present study was undertaken to find out common weeds of Rabi wheat crop in Rewa District. (M.P.) India. Extensive field surveys were conducted during different months of Rabi crop season of 2019-21 in Rewa district. Randomly three sites were selected in each tehsil. Weeds were collected from all the sites of the study area at seedling, premature & mature stages of crop. During this period survey of wheat field, interviews with farmers and agriculturists were conducted to collect information about the seasonal weed plants and their vernacular names if known. The collected weed plants were Photograph and properly identified with the help of available literature, monographs and confirmed from the authentic regional floras.

Results and Discussion

During wheat cropping season in all 76 weed species belonging to three monocot and twenty four dicot families were found under the survey of the cropping session from Eleven tehsils of Rewa district (M.P.) India. The predominance was shown by Asteraceae, Acanthaceae, Poaceae, Papilionaceae, Caesalpiniaceae Euphorbiaceae, which included major weed species, while Amaranthaceae,

Polygonaceae, Brassicaceae, Caryophyllaceae, Chenopodiaceae, Malvaceae and Solanaceae, Asclepiadaceous, Convolvulaceae, Oxalidaceae, Primulaceae, were represented as minor weeds.

The yield losses due to weeds are generally more than the combined losses caused by insects and pathogens together (Gupta and Khare, 2022a & b) ^[16-17]. The impact of weeds is always obscure and it becomes visible when the critical time has gone; whereas that of insects and pathogens is visible at all times. This is the reason the why the weeds are mostly ignored and on contrary the insects and pathogens attacks are given proper heed.

It is astonishing to note that grasses existed only to the extent of 9.5% among the weed flora of the target site. Out of weed species reported from the study area, weeds like *Anagallis arvensis*, *Cyperus rotundus*, *Fumaria parviflora*, *Lathyrus aphaca*, *Melilotus indica*, *Parthenium hysterophorus*, *Rumex dentatus* and *Vicoa indica* are common weeds of Rabi wheat crops dominated spin the study area. The weeds like species of Euphorbia, and *Polygonum barbatum*, *Polygonum persicaria* *Melilotus alba*, were reported particularly from irrigated fields. Some weeds reported from the study area, such as *Achyranthus aspera*, *Calotropis procera*, *Cannabis sativa*, *Chenopodium album* and *Cynodon dactylon* are of medicinally importance. The weeds like *Amaranthus viridis*, *Chenopodium album*, *Lathyrus aphaca*, *Vicia hirsuta* and *V. sativa* are used in cooking recipes by Gond and other local tribes of the study area. The present study may be helpful in identification of some common weeds of Wheat Rabi crops.

It may be helpful for taxonomists, agriculturists and scientists involved in the management of weeds. Two monocot and eighteen dicot families are arranged alphabetically with their botanical names, available vernacular names and flowering and fruiting season are mentioned (Table 1). These findings are in a greater analogy with the previous work of Kaul (1986) ^[9] and Singh *et al.* (2007) ^[11], moreover, the recent studies of Sharma *et al.* (1995) ^[18], Sahu *et al.* (2020) ^[19] also show a varying flora.

Table 1: List of weed plants in Rewa district

| Family | S. No. | Name of weed plant | Propagation |
|-----------------|--------|--|-------------|
| Amaranthaceae | 1. | <i>Achyranthes aspera</i> L. | Seeds |
| Amaranthaceae | 2. | <i>Aerva lanata</i> (L.) Juss. | Seeds |
| Amaranthaceae | 3. | <i>Alternanthera pungens</i> Humb. | Seeds |
| Amaranthaceae | 4. | <i>Amaranthus spinosus</i> L. | Seeds |
| Amaranthaceae | 5. | <i>Amaranthus viridis</i> L. | Seeds |
| Lythraceae | 6. | <i>Ammannia baccifera</i> L. | Seeds |
| Primulaceae | 7. | <i>Anagallis arvensis</i> L. | Seeds |
| Poaceae | 8. | <i>Apluda mutica</i> L. | Seeds |
| Poaceae | 9. | <i>Arundo donax</i> L. | Seeds |
| Asteraceae | 10. | <i>Bidens biternata</i> (Lour.) Merr. & Sherff. | Seeds |
| Oxalidaceae | 11. | <i>Biophytum sensitivum</i> (L.) DC | Seeds |
| Nyctaginaceae | 12. | <i>Boerhavia diffusa</i> L. | Seeds |
| Asclepiadaceae | 13. | <i>Calotropis procera</i> (Ait.) R. Br. | Seeds |
| Sapindaceae | 14. | <i>Cardiospermum helicacabum</i> L. | Seeds |
| Caesalpiniaceae | 15. | <i>Cassia occidentalis</i> L. | Seeds |
| Caesalpiniaceae | 16. | <i>Cassia tora</i> L. | Seeds |
| Amaranthaceae | 17. | <i>Celosia argentea</i> L. | Seeds |
| Gentianaceae | 18. | <i>Centaurium centaurioides</i> (Roxb.) Rao & Hemadri. | Seeds |
| Chenopodiaceae | 19. | <i>Chenopodium album</i> L. | Seeds |
| Poaceae | 20. | <i>Chrysopogon fulvus</i> (Spreng) Chiov | Seeds |
| Cleomaceae | 21. | <i>Cleome viscosa</i> L. | Seeds |
| Papilionaceae | 22. | <i>Clitoria ternatea</i> L. | Seeds |
| Brassicaceae | 23. | <i>Cochlearia cochlearioides</i> (Roth) Sant | Seeds |

| | | | |
|------------------|-----|--|-------|
| Commelinaceae | 24. | <i>Commelina benghalensis</i> L. | Seeds |
| Convolvulaceae | 25. | <i>Convolvulus arvensis</i> L. | Seeds |
| Asteraceae | 26. | <i>Conyza aegyptica</i> Ait. | Seeds |
| Asteraceae | 27. | <i>Conyza ambigua</i> DC. | Seeds |
| Euphorbiaceae | 28. | <i>Crozophora rotleri</i> (Geis.) Juss. | Seeds |
| Comelinaceae | 29. | <i>Cyanotis cristata</i> (L.) D. Don. | Seeds |
| Poaceae | 30. | <i>Cynodon dactylon</i> (L.) Pers. | Seeds |
| Cyperaceae | 31. | <i>Cyperus compressus</i> L. | Seeds |
| Cyperaceae | 32. | <i>Cyperus iria</i> L. | Seeds |
| Cyperaceae | 33. | <i>Cyperus rotundes</i> L. | Seeds |
| Asteraceae | 34. | <i>Eclipta prostrata</i> L. | Seeds |
| Poaceae | 35. | <i>Eleusine indica</i> L. | Seeds |
| Poaceae | 36. | <i>Eragrostiella bifaria</i> (Vahl) Bor | Seeds |
| Poaceae | 37. | <i>Eragrostis coarctata</i> Stapf. | Seeds |
| Euphorbiaceae | 38. | <i>Euphorbia dracunculoides</i> Lamk. | Seeds |
| Euphorbiaceae | 39. | <i>Euphorbia geniculata</i> Orteg. | Seeds |
| Euphorbiaceae | 40. | <i>Euphorbia heterophylla</i> L. | Seeds |
| Euphorbiaceae | 41. | <i>Euphorbia laeta</i> Heyne ex Roth. | Seeds |
| Euphorbiaceae | 42. | <i>Euphorbia prostrata</i> Ait. | Seeds |
| Euphorbiaceae | 43. | <i>Euphorbia thymifolia</i> L. | Seeds |
| Convolvulaceae | 44. | <i>Evolvulus alsinoides</i> L. | Seeds |
| Convolvulaceae | 45. | <i>Evolvulus nummularius</i> L. | Seeds |
| Amaranthaceae | 46. | <i>Gamphrena celosioides</i> Mart. | Seeds |
| Acanthaceae | 47. | <i>Hemigraphis latebrosa</i> (Roth.) Nees. | Seeds |
| Poaceae | 48. | <i>Hetropogan contort</i> L. | Seeds |
| Violaceae | 49. | <i>Hybanthus enneaspermus</i> (L.) F. Muell. | Seeds |
| Lamiaceae | 50. | <i>Leucas aspera</i> (Willd) Spreng. | Seeds |
| Lamiaceae | 51. | <i>Leucas utricifolia</i> R. Br. | Seeds |
| Scrophulariaceae | 52. | <i>Lindernia ciliata</i> (Colsm.) Penn. | Seeds |
| Scrophulariaceae | 53. | <i>Lindernia parviflora</i> (Roxb.) Haines | Seeds |
| Pappilionaceae | 54. | <i>Melilotus alba</i> Desr. | Seeds |
| Pappilionaceae | 55. | <i>Melilotus indica</i> (L.) Att. | Seeds |
| Oxaladaceae | 56. | <i>Oxalis corniculata</i> L. | Seeds |
| Asteraceae | 57. | <i>Parthenium hysterophorus</i> L | Seeds |
| Poaceae | 58. | <i>Paspalum geminatum</i> (Forssk) Stapf. | Seeds |
| Pappilionaceae | 59. | <i>Phaseolus aconitifolius</i> Jacq. | Seeds |
| Euphorbiaceae | 60. | <i>Phyllanthus maderaspatensis</i> L. | Seeds |
| Solanaceae | 61. | <i>Physalis minima</i> L. | Seeds |
| Caryophyllaceae | 62. | <i>Polycarpaea corymbosa</i> (L.) Lamk | Seeds |
| Portulacaceae | 63. | <i>Portulaca oleracea</i> L. | Seeds |
| Portulacaceae | 64. | <i>Portulaca quadrifida</i> L. | Seeds |
| Pappilionaceae | 65. | <i>Rhynchosia bracteata</i> Benth | Seeds |
| Pappilionaceae | 66. | <i>Rhynchosia capitata</i> DC. | Seeds |
| Poaceae | 67. | <i>Rottboellia exaltata</i> L. | Seeds |
| Polygoniaceae | 68. | <i>Rumex dentatus</i> L. | Seeds |
| Acanthaceae | 69. | <i>Rungia pectinata</i> (L.) Nees. | Seeds |
| Poaceae | 70. | <i>Setaria intermedia</i> Roem & Shult | Seeds |
| Solanaceae | 71. | <i>Solanum nigrum</i> L. | Seeds |
| Caryophyllaceae | 72. | <i>Spergula arvensis</i> L. | Seeds |
| Asteraceae | 73. | <i>Sphaeranthus indicus</i> L. | Seeds |
| Asteraceae | 74. | <i>Tridax procumbens</i> L. | Seeds |
| Caryophyllaceae | 75. | <i>Vaccaria pyramidata</i> Medik. | Seeds |
| Asteraceae | 76. | <i>Vicoa indica</i> (L.) DC. | Seeds |

Conclusion

It was concluded that dicotyledons families the maximum dominance shown by Asteraceae, Fabaceae, Amaranthaceae, and Euphorbiaceae while monocotyledons families with 15 weed species, having dominance of Cyperaceae and Poaceae. The common dominant weeds of Rabi wheat crop are *Anagalis arvensis*, *Chenopodium album*, *Portulaca oleracea*, *Melilotus indica*, *Phaseolus aconitifolius*, *Parthenium heterosporus*, *Tridax procumbence*, *Rumex dentatus*, *Alternanthera spinosus*, *Euphorbia thymifolia*, *Cyprus rotundus* and more Rewa district (M.P.).

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