

## Full Length Research Paper

# Phytosociology of some weeds of wheat communities around Kotli fields, Western Himalaya

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There were ten plant communities of weeds in wheat fields of Kotli. The communities were *Euphorbia-Desmostachya-Coronopus*, *Parthenium-Galium-Taraxacum*, *Zanthium-Bidens-Bothriochloa*, *Silybum – Amaranthus-Avena*, *Ranunculus-Silybum-Imperata*, *Oxalis-Cannabis-Vicia*, *Calendula-Fimbristylis-Desmodium*, *Taraxacum-Geranium-Poa*, *Phalaris-Geranium-Cynoglossum* and *Themeda-Cardus-Urtica*. The soil texture differs from loam to clay loam, loam and sandy loam with basic pH. Organic matter was high in all the communities; saturation varied from 30 to 51%, Nitrogen differed from 0.53 to 0.87%, Phosphorus from 9 to 16 ppm, Potassium from 256 to 768 ppm; electrical conductivity varied from 2.3 to 5.6.

**Key words:** Kotli fields, plant communities, weeds.

## INTRODUCTION

Weeds are those plants species which damage the yielding potential of the land surface or water volume managed by man (Anonymous, 1994). Weeds cause direct losses depriving crops of water, light, space, mineral nutrients (Reddy and Reddi, 2001), exhibit allelopathy (Tafera, 2002; Singh et al., 2003), harbour insects, pests, and diseases (Majid et al., 1998; Hussain et al., 1988). It exists internationally and both in Azad Jammu and Kashmir, Pakistan (Mortimer, 1990; McClly et al., 1991; Frick and Thomas, 1992; Smith and Smith, 1998; Majid et al., 1998; Anonymous, 2000; Reddy and Reddi, 2001; Nasir and Sultan, 2002; Rozsireni et al., 2003; Lososova et al., 2003; Kaar and Freyer, 2003; Ahmad and Shaikh, 2003; Oad et al., 2003; Bukun, 2004; Hussain et al., 2004; Lososova, 2004; Malik, 2004; Bukun, 2004; Bukun and Guler, 2005; Nasir and Sultan, 2006; Lososova et al., 2006; Kazi et al., 2007; Oad et al., 2007; Akhtar and Hussain, 2007; Ige et al., 2008; Abbas et al., 2009) (Table 1).

## MATERIALS AND METHODS

Kalah, Tenda, Chowki, Thaler colony, Malahar, Dheri, Sarsawa, Panjeera, Dakhari, Chak Mir all localities lies 141 km from Muzaffarabad, were surveyed during May, 2009. Density, frequency and cover of each species were determined using 20, 0.5mx 0.5 m quadrats laid randomly in each community and importance values were determined (Malik et al., 2005). Plant communities were recognized on the basis of highest importance values of species and were named after the leading dominants following the Curtis and Macintosh, 1950 method. Nomenclature followed here is that of Stewart (1972). Soil was collected from each community up to the depth of 15 cm and analyzed physically and chemically in the soil and water research centre Kotli (Table 2).

## RESULTS AND DISCUSSION

### *Euphorbia-Desmostachya-Coronopus* community

This community was recorded from Thaler colony at an altitude of 400 m. The dominants were *Euphorbia*

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**Table 1.** Metrological data recorded from District Kotli during (2001-2008).

| Month     | Rain fall (mm) | Temperature (°C) |         | Humidity (%) |           | Wind direction |           | Wind speed (Knots) |            |
|-----------|----------------|------------------|---------|--------------|-----------|----------------|-----------|--------------------|------------|
|           | Mean total     | Maximum          | Minimum | At 8.00AM    | At 5:00AM | At 8:00AM      | At 5:00AM | At 8:00 AM         | At 5:00 AM |
| January   | 80.63          | 17.65            | 4.42    | 79.37        | 53.75     | N-W            | N-W       | 1.7                | 0.57       |
| February  | 116.73         | 20.47            | 7.81    | 76           | 49.87     | N-E            | N-E       | 2.2                | 2.96       |
| March     | 114.51         | 26.52            | 12.65   | 65.25        | 41.37     | N-E            | N-E       | 2.8                | 1.42       |
| April     | 55.23          | 31.97            | 17.47   | 56           | 35.12     | N-W            | N-W       | 2.71               | 1.42       |
| May       | 42.28          | 36.52            | 6.77    | 49           | 31.12     | N-E            | N-E       | 2.78               | 1.47       |
| June      | 109.9          | 37.18            | 23.33   | 59.37        | 40.75     | N-E            | N-E       | 2.07               | 1.17       |
| July      | 236.38         | 34.36            | 23.55   | 79.25        | 60.87     | S-W            | S-W       | 1.27               | 0.75       |
| August    | 218.82         | 33.38            | 23.15   | 84           | 67.87     | S-W            | S-W       | 1.21               | 0.77       |
| September | 80.25          | 32.35            | 20.57   | 76.87        | 58.12     | S-W            | S-W       | 2.28               | 0.82       |
| October   | 35.97          | 30.27            | 15.88   | 71.62        | 47.5      | N-E            | N-E       | 2.656              | 0.91       |
| November  | 13.68          | 24.76            | 10.13   | 73.75        | 47.62     | N-W & N-E      | N-W & N-E | 1.72               | 0.23       |
| December  | 41.7           | 19.67            | 6.27    | 78.37        | 54.12     | N-E & N-E      | N-W & N-E | 1.2                | 0.4        |
| Average   | 95.50 mm       | 28.75°C          | 12.40°C | 70.73%       | 49%       | N-E            | N-E       | 2.04               | 0.90       |

Source: Pakistan Metrological Department, Lahore.

**Table 2.** Physical and chemical characteristics of soil from 10 communities recorded from Kotli during May, 2009.

| Community | Texture    | pH  | Saturation (%) | O.M  | N.%  | P (ppm) | K (ppm) | E.C |
|-----------|------------|-----|----------------|------|------|---------|---------|-----|
| 1         | Clay loam  | 7.6 | 51.86          | 1.75 | 0.87 | 13      | 370     | 3.2 |
| 2         | Loamy      | 7.6 | 34.76          | 1.75 | 0.87 | 14      | 398     | 2.5 |
| 3         | Loamy      | 7.5 | 34.03          | 1.44 | 0.72 | 11      | 342     | 2.7 |
| 4         | Loamy      | 6.9 | 37.04          | 1.75 | 0.87 | 16      | 382     | 2.3 |
| 5         | Loamy      | 7.6 | 40.82          | 1.06 | 0.53 | 10      | 276     | 2.5 |
| 6         | Loamy      | 7.7 | 33.14          | 1.75 | 0.87 | 13      | 272     | 2.7 |
| 7         | Clay loam  | 7.4 | 47.76          | 1.44 | 0.72 | 15      | 390     | 5.6 |
| 8         | Loam       | 7.3 | 36.45          | 1.06 | 0.53 | 09      | 256     | 4.5 |
| 9         | Clay loam  | 7.1 | 49.48          | 1.44 | 0.72 | 11      | 768     | 5.0 |
| 10        | Sandy loam | 7.3 | 30.38          | 1.06 | 0.53 | 09      | 256     | 4.2 |

pH = Power of hydrogen ion concentration, O.M = organic matter, N = nitrogen, P = Phosphorus, K = potassium, E.C = electrical conductivity, ppm = parts per million.

*helioscopia*, *Desmostachya bipinnata* and *Coronopus didymus*, having I.V of 35.16, 30.36 and 27.53 respectively (Table 3). *Chenopodium album* and *Oxalis corniculata* having I.V of 27.22 and 25.90 were the co-dominant. *Rumex*, *Zanthium* and *Fimbristylis* were the associated species. The remaining two species namely: *Poa* and *Cirsium* were rare. The soil in this community was clayey loam having basic pH. Nitrogen 0.87%, phosphorus 13 ppm. Organic matter was very high (1.75), E.C 3.2 (Table 2).

#### **Parthenium-Galium-Taraxacum community**

Dakhari fields at an altitude of 420 m were dominated by *Parthenium*, *Galium Taraxacum* having I.V of 39.3, 37.75

and 34.73 respectively. *Oenothera rosea*, and *Phalaris minor* having I.V of 32.5 and 31.92 were the co-dominant. *Cynodon*, *Melilotus* and *Medicago* were the associated species. The remaining two species including *Sauromatum* and *Avena* were rare. The soil in this community was loamy having basic pH. Nitrogen 0.87%, Phosphorus 14 ppm, Organic matter was very high (1.75), E.C 2.5 (Table 2).

#### **Zanthium-Bidens-Bothriochloa community**

At an altitude of 460 m *Zanthium-Bidens-Bothriochloa* community was present. Importance values were 27.42, 24.37 and 23.62 respectively. *Chrysanthemum indicum*

**Table 3.** Weeds in the wheat fields of Kotli recorded during May, 2009.

| Name of the species                           | I.V of 10 weed communities |       |       |       |       |       |       |       |       |       |
|---|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|   | E-D-C                      | P-G-T | Z-B-B | S-A-A | R-S-I | O-C-V | C-F-D | T-G-P | P-G-C | T-C-U |
| <i>Amaranthus viridis</i> L.                  | 20.92                      | -     | -     | 23.19 | -     | -     | -     | -     | -     | -     |
| <i>Scandix pectveneris</i> L.                 | -                          | -     | -     | -     | 21.9  | -     | -     | -     | -     | 17.35 |
| <i>Sauromatum venosum</i> (Ait.) Prodr        | -                          | 20.74 | -     | -     | 17.62 | -     | -     | 14.45 | -     | -     |
| <i>Calatropis procera</i> (Ait.) Ait.f.       | -                          | -     | -     | 22.52 | -     | -     | -     | -     | -     | -     |
| <i>Artemisia scoparia</i> Waldst. & kit.      | -                          | -     | -     | 22.44 | -     | -     | -     | -     | -     | -     |
| <i>Bidens bipinnata</i> L.                    | -                          | -     | 24.37 | -     | -     | -     | 22.97 | -     | -     | -     |
| <i>Calendula officinale</i> L.                | -                          | -     | 14.00 | -     | -     | -     | 21.06 | -     | -     | 25.93 |
| <i>Cardus edelberghii</i> L.                  | -                          | -     | -     | 17.68 | -     | -     | -     | -     | 13.80 | 30.27 |
| <i>Chrysanthemum indicum</i> L.               | -                          | -     | 21.86 | -     | -     | 13.31 | -     | -     | 19.14 | -     |
| <i>Cirsium arvense</i> Miller                 | 10.60                      | -     | -     | -     | -     | -     | -     | -     | -     | -     |
| <i>Conyza canadensis</i> L.                   | -                          | -     | 18.57 | -     | -     | 11.64 | -     | -     | -     | -     |
| <i>Parthenium parviflorum</i> L.              | -                          | 39.30 | -     | -     | -     | -     | 23.78 | -     | 12.81 | -     |
| <i>Silybum murianum</i> L.                    | -                          | -     | -     | 25.83 | 24.26 | -     | -     | -     | -     | -     |
| <i>Sonchus asper</i> (L.) Pers                | -                          | -     | -     | -     | 14.56 | 14.43 | -     | -     | -     | -     |
| <i>Taraxacum officinale</i> Weber             | -                          | 34.73 | -     | -     | -     | -     | 22.11 | 44.92 | -     | -     |
| <i>Zanthium strumarium</i> L.                 | 23.78                      | -     | 27.42 | -     | -     | -     | 28.94 | -     | -     | -     |
| <i>Cynoglossum lanceolatum</i> Forssk         | -                          | -     | -     | -     | -     | -     | -     | -     | 25.14 | -     |
| <i>Cannabis sativa</i> L.                     | -                          | -     | -     | 16.61 | -     | 23.77 | -     | -     | -     | -     |
| <i>Chenopodium album</i> L.                   | 27.22                      | -     | -     | 20.11 | -     | -     | -     | -     | -     | -     |
| <i>Convolvulus glomeratus</i> Boiss           | -                          | -     | 13.57 | -     | -     | -     | -     | -     | -     | -     |
| <i>Evolvulus alsinoides</i> (L.) Boiss        | -                          | -     | 12.95 | -     | -     | -     | -     | -     | -     | 25.46 |
| <i>Coronopus didymus</i> (L.) Smith           | 27.53                      | -     | -     | -     | -     | -     | -     | -     | -     | -     |
| <i>Lepidium capitatum</i> Hook.f.&Thoms       | -                          | -     | -     | -     | 22.49 | 17.75 | -     | 35.00 | -     | -     |
| <i>Fimbristylis miliacea</i> L.               | 21.91                      | -     | -     | -     | -     | -     | 29.81 | -     | -     | -     |
| <i>Cyperus stoloniferus</i> Retz              | 17.12                      | -     | 10.34 | -     | -     | -     | -     | -     | -     | -     |
| <i>Euphorbia helioscopia</i> L.               | 35.16                      | -     | -     | -     | -     | -     | -     | -     | -     | -     |
| <i>Euphorbia hirta</i> L.                     | -                          | -     | -     | -     | -     | 14.96 | -     | -     | -     | -     |
| <i>Geranium occellatum</i> Camb               | -                          | -     | 15.49 | -     | -     | -     | -     | 39.39 | 25.40 | -     |
| <i>Malvestrum coromandelianum</i> (L.) Carcke | -                          | -     | -     | -     | -     | 9.17  | -     | -     | 25.06 | -     |
| <i>Mollugo pentaphylla</i> L.                 | -                          | -     | -     | 16.31 | 17.29 | -     | -     | -     | 21.51 | -     |
| <i>Oxalis corniculata</i> L.                  | 25.9                       | -     | -     | -     | -     | 25.40 | -     | -     | 20.25 | -     |
| <i>Desmodium gangeticum</i> (L.) Dc.          | -                          | -     | -     | -     | -     | -     | 29.65 | -     | -     | 15.75 |
| <i>Lathyrus aphaca</i> L.                     | -                          | -     | 19.20 | -     | 23.62 | -     | -     | -     | -     | -     |
| <i>Medicago laciniata</i> (L.) Mill           | -                          | 21.53 | -     | -     | -     | 12.24 | -     | -     | 22.72 | -     |
| <i>Melilotus alba</i> Desr                    | -                          | 27.04 | -     | -     | -     | -     | 22.17 | -     | -     | -     |

Table 3. Contd.

|  |       |       |       |       |       |       |       |       |       |       |
|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| <i>Trifolium dubium</i> Smith                      | -     | -     | -     | 21.64 | 18.99 | -     | -     | 27.65 | -     | -     |
| <i>Vicia sativa</i> L.                             | 19.82 | -     | -     | -     | -     | 20.87 | -     | -     | -     | 25.87 |
| <i>Agrostis viridis</i> L.                         | -     | 21.25 | 21.61 | -     | -     | -     | -     | -     | -     | -     |
| <i>Avena fatua</i> L.                              | -     | 4.46  | -     | 23.15 | -     | 13.60 | 24.7  | -     | -     | -     |
| <i>Catabrosa aquatica</i> (L.) P.Beauv             | -     | -     | -     | 18.85 | -     | -     | 27.90 | -     | 14.59 | 26.27 |
| <i>Cynodon dactylon</i> (L.) Pers                  | -     | 28.33 | -     | -     | -     | -     | -     | -     | -     | 20.45 |
| <i>Desmostachya bipinnata</i> (L.) Stapf           | 30.36 | -     | -     | -     | -     | -     | -     | -     | -     | -     |
| <i>Dichanthium annulatum</i> (L.) Stapf            | -     | -     | 21.85 | -     | -     | -     | -     | -     | -     | -     |
| <i>Elymus repens</i> (L.) Gould                    | -     | -     | -     | 7.57  | -     | -     | -     | -     | -     | -     |
| <i>Imperata cylindrica</i> L.                      | -     | -     | -     | -     | 23.91 | 16.12 | -     | -     | 10.86 | -     |
| <i>Phalaris arundinacea</i> L.                     | -     | -     | -     | -     | -     | 15.64 | -     | 30.42 | -     | -     |
| <i>Phalaris arvensis</i> L.                        | -     | -     | -     | -     | 20.41 | -     | -     | -     | -     | -     |
| <i>Phalaris minor</i> Retz                         | -     | 31.92 | -     | -     | -     | -     | -     | -     | 31.75 | 25.74 |
| <i>Poa annua</i> L.                                | 14.52 | -     | -     | -     | -     | -     | -     | -     | 24.88 | -     |
| <i>Poa sinaica</i> Steud                           | -     | -     | 18.43 | -     | 19.44 | -     | -     | 35.41 | -     | -     |
| <i>Saccharum officinarum</i> L.                    | -     | -     | -     | -     | -     | 18.04 | -     | -     | -     | -     |
| <i>Themeda anathera</i> (Nees ex Steud) Hack       | -     | -     | 17.08 | -     | -     | 16.33 | -     | -     | -     | 34.83 |
| <i>Vetiveria zizanioides</i> (L.) Nash Vilfa Adans | -     | -     | -     | 15.54 | 21.21 | -     | -     | -     | -     | -     |
| <i>Polygonum molliaeforme</i> Boiss                | -     | -     | -     | -     | -     | 18.92 | -     | 24.73 | -     | -     |
| <i>Rumex dentatus</i> L.                           | 24.52 | -     | -     | -     | -     | -     | -     | -     | -     | -     |
| <i>Rumex hastatus</i> D.Don.                       | -     | -     | 19.43 | -     | 23.55 | -     | -     | 24.72 | -     | 32.92 |
| <i>Anagallis arvensis</i> L.                       | -     | -     | -     | 15.17 | -     | -     | -     | -     | -     | -     |
| <i>Ranunculus muricatus</i> L.                     | -     | -     | -     | -     | 30.52 | 19.95 | -     | 23.12 | -     | -     |
| <i>Oenothera rosea</i> L.                          | -     | 32.5  | -     | -     | -     | -     | -     | -     | 15.70 | -     |
| <i>Galium elegans</i> Wall                         | -     | 37.75 | -     | -     | -     | -     | -     | -     | 16.18 | -     |
| <i>Urtica dioica</i> L.                            | -     | -     | -     | 17.43 | -     | -     | 15.36 | -     | -     | 27.93 |
| <i>Verbena officinalis</i> L.                      | -     | -     | -     | -     | -     | 17.07 | -     | -     | -     | -     |
| <i>Viola canescens</i> Wall ex Roxb                | -     | -     | -     | 15.75 | -     | -     | 21.29 | -     | -     | -     |

E-D-C = *Euphorbia-Desmostachya-Coronopus* community, P-G-T = *Parthenium-Galium-Taraxacum* community, Z-B-B = *Zanthium-Bidens-Bothriochloa* community, S-A-A = *Silybum-Amaranthus-Avena* community, R-S-I = *Ranunculus-Silybum-Imperata* community, O-C-V = *Oxalis-cannabis-Vicia* community, C-F-D = *Calendula-Fimbristylis-Desmodium* community, T-G-P = *Taraxacum-Geranium-Poa* community, P-G-C = *Phalaris-Geranium-Cynoglossum* community, T-C-U = *Themeda-Cardus-Urtica* community.

and *Dichanthium annulatum* having I.V of 21.86 and 21.85 were the co-dominant, *Agrostis*, *Rumex* and *Lathyrus* were the associated species. The remaining two species including *Evolvulus* and

*Cyperus* were rare. The soil in this community was loamy having basic pH. Nitrogen 0.72%, Phosphorus 11 ppm, Organic matter was very high (1.44), E.C was 2.7 (Table 2).

#### ***Silybum-Amaranthus-Avena* community**

*Silybum-Amaranthus-Avena* community was present in Malahar at an altitude of 490 m having I.V

of 25.83, 23.19 and 23.15 respectively. *Calatropis procera* and *Artemisia scoparia* having I.V of 22.52 and 22.44 were the co-dominant. *Trifolium*, *Chenopodium* and *Catabrosa* were the associated species. The remaining two species viz *Vetiveria* and *Anagallis* were rare. The soil in this community was loamy having acidic pH. Nitrogen 0.87%, Phosphorus 16 ppm, Organic matter was 1.75, E.C 2.3 (Table 2).

#### **Ranunculus-Silybum-Imperata community**

From Dheri fields at an altitude of 500 m *Ranunculus-Silybum-Imperata* community was recorded having I.V of 30.52, 24.26 and 23.91 respectively. *Lathyrus aphaca* and *Rumex hastatus* having I.V of 23.62 and 23.55 were the co-dominant. *Lepidium*, *Vetiveria* and *Scandix* were the associated species. The remaining two species *Mollugo* and *Sonchus* were rare. The soil in this community was loamy having basic pH. Nitrogen 0.53%, Phosphorus 10 ppm, Organic matter 1.06, E.C 25 (Table 2).

#### **Oxalis-Cannabis-Vicia community**

From Chowki at an altitude of 510 m *Oxalis-Cannabis-Vicia* community was recorded having I.V of 25.4, 23.77 and 20.87 respectively. *Ranunculus muricatus* and *Polygonum molliaeforme* having I.V of 19.95 and 18.92 were the codominant. *Saccharum*, *Lepidium* and *Verbena* were the associated species. The remaining two species viz *Conyza* and *Malvestrum* were rare. The soil in this community was loamy having basic pH. Nitrogen 0.87%, Phosphorus 13 ppm, Organic matter was 1.75, E.C 2.7 (Table 2).

#### **Calendula-Fimbristylis-Desmodium community**

At an altitude of 520 m from the fields of Chak Mir *Calendula-Fimbristylis-Desmodium* community was present having I.V of 31.06, 29.81 and 29.65 respectively. *Zanthium strumarium* and *Catabrosa aquatica* having I.V of 28.94 and 27.9 were the co-dominant. *Avena*, *Parthenium* and *Bidens* were the associated species. The remaining two species viz *Viola* and *Urtica* were rare. The soil in this community was clayey loam having basic pH. Nitrogen 0.72%, Phosphorus 15 ppm, Organic matter was 1.44, E.C 5.6 (Table 2).

#### **Taraxacm-Geranium-Poa community**

From Sarsawa fields at an altitude of 580 m *Taraxacum-Geranium-Poa* community was present having I.V of 44.92, 39.39 and 35.41 respectively. *Lepidium Capitatum* and *Phalaris arundinacea* having I.V of 35 and 30.42 were the co-dominant. *Trifolium*, *polygonum* and *Rumex*

were the associated species. The remaining two species viz, *Ranunculus* and *Sauromatum* were rare. The soil in this community was loamy having basic pH. Nitrogen 0.53%, Phosphorus 9 ppm, Organic matter 1.06, E.C 4.5 (Table 2).

#### **Phalaris-Geranium-Cynoglossum community**

From Kalah fields *Phalaris-Geranium-Cynoglossum* community was recorded having I.V of 31.75, 25.4 and 25.14 respectively. *Malvestrum coromandelianum* and *Poa annua* having I.V of 25.06 and 24.88 were the co-dominant. *Medicago*, *Mollugo* and *Oxalis* were the associated species. The remaining two species viz *Parthenium* and *Imperata* were rare. The soil in this community was clayey loam having basic pH. Nitrogen 0.72%, Phosphorus 11 ppm, Organic matter 1.44, E.C 5.0 (Table 2).

#### **Themeda-Cardus-Urtica community**

From Panjeera at an altitude of 600 m *Themeda-Cardus-Urtica* community was recorded having I.V of 34.83, 30.27 and 27.93 respectively. *Catabrosa aquatic* and *Calendula officinale* having I.V of 26.27 and 25.93 were the co-dominant. *Vicia*, *Phalaris* and *Evolvulus* were the associated species. The remaining two species viz *Scandix* and *Desmodium* were rare. The soil in this community was sandy loam having basic pH. Nitrogen 0.53%, Phosphorus 9 ppm, Organic matter was high (1.06), E.C 4.2 (Table 2).

Ten weed plant communities were recorded from Kalah and its outskirts of District Kotli. The investigated area differs from 400 to 600 m. Every community has different dominants due to altitude and climatic conditions. Most of the dominant communities were *Euphorbia-Desmostachya-Coronopus*, *Parthenium-Galium-Taraxacum*, *Zanthium-Bidens-Bothriochloa*, *Silybam-Amaranthus-Avena*, *Ranunculus-Silybum-Imperata*, *Oxalis-Cannabis-Vicia*, *Calendula-Fimbristylis-Desmodium*, *Taraxacum-Geranium-Poa*, *Phalaris-Geranium-Cynoglossu*, *Themeda-Cardus-Urtica*. In Kalah the most common weed species were *Oxalis*, *Phalaris*, *Oenothera*, *Cynoglossum*, *Medicago*, *Galium*, *Malvestrum*, *Parthenium*. *Catabrosa*, *Chenopodium*, *Amaranthus*, *Urtica*, *Cynodon*, *Euphorbia*, *Rumex*, *Cirsium*, *Anagallis*, *Zanthium* and *Medicago* were the most common weeds in all other localities.

At the base (400 m) *Euphorbia-Desmostachya-Coronopus* was dominant with clayey loam soil having basic pH and high organic matter. The dominant weeds are annuals that can easily be eradicated before flowering and fruiting. From 420 to 500 m *Parthenium*, *Galium*, *Taraxacum*, *Zanthium*, *Bidens*, *Bothriochloa*, *Sililum*, *Amaranthus*, *Avena*, *Ranunculus*, *Imperata*, *Oxalis* and *Vicia* were dominant species with loamy soil

and high organic matter. Most of the species in these localities were annual except *Bothriochloa* and *Imperata*.

*Avena fatua*, *Cynodon dactylon*, *Calendula officinale*, *Ranunculus muricatus*, *Cannabis sativa* and *Imperata cylindrica* are *allelopathic* plants which can suppress the growth of other plants and are susceptible (Hussain et al., 1987; Zebun Nisa, 1984; Hussain and Khan, 1987; Inam et al., 1989; Allien, 1979; Qurashi et al., 1987). From 510 to 600 m species such as *Calendula*, *Fimbristylis*, *Themeda*, *Cardus* and *Urtica* were dominant weeds with clay loam and sandy loam with high organic matter. *Poa annua* is a cosmopolitan plant which exists everywhere, *Phalaris* is a notorious weed. *Themeda* is also an allelopathic weed that suppresses the other species found in its vicinity. It is a fine fodder grass (Malik et al., 2005).

## Conclusion

Annual weeds were dominant in the era that can be controlled by eradicating them before flowering and fruiting. Weeds reduce the crop yield production. Several control mechanisms could be employed to control weeds.

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