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*Article*

# Diversity of Weed Ecology of Aliero Local Government Areas, Kebbi State, Nigeria

**Dharmendra Singh**

*Department of Biological Sciences, Kebbi State University of Science and Technology, Aliero, Kebbi State-1144, Nigeria*

Email:singhdharmendra12@yahoo.com

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**Abstract:** The study diversity of weed ecology is concerned with growth characteristic and adaptations that enable weeds to survive changes in the environment. The environment include climatic, edaphic and biotic factor and determines the distribution, prevalence, competing ability behavior and survival of weeds. The collections have been found to be spread in 23 weed families, 50 genera, and 55 species of angiorspermic weeds. They are Acanthaceae 2 species, Amaranthaceae 3 species, Asclepiadaceae 1 species, Asteraceae (Compositae) 5 species, Boraginaceae 1 species, Caesalpinaceae 2 species, Capparaceae 2 species, Commelinaceae 3 species, Convolvulaceae 1 species, Cyperaceae 2 species, Fabaceae (Papilionaceae) 3 species, Lamiaceae 2 species, Malvaceae 3 species, Nyctaginaceae 1 species, Onagraceae 1 species, Pedaliaceae 1 species, Poaceae 11 species, Rubiaceae 2 species, Scrophulariaceae 2 species, Solanaceae 4 species, Sterculiaceae 1 species, Tiliaceae 2 species, Zygophyllaceae 1 species.

**Keywords**: Weed ecology, Diversity, growth characteristic, Aliero, Kebbi State, Nigeria

## 1. Introduction

Weeds are unwanted plants which interfere with the utilization of land and water resources and thus adversely affect human welfare (Singh, 2015). They can also be referred to as plants out of place.

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Usually this means that weeds grow where we either want other plants to grow, we want no plants at all. In croplands and forest, weeds compete with the beneficial and desire vegetation reducing the yield and quality of products. Undesirable vegetation also flourishes in aquatic systems, forestry and cropped area such as industrial sites, roadside, landscape planting water tanks water ways etc. thus all plants may become weeds in particular situations (Rao, 2000).

Weeds are important factor in the management of all land and water resources but their effective impacts are greatest on agriculture. In the Aliero local government area due to favorable climatic, soil fertility, average rainfall and marketing conditions lead to concentration of agricultural activities by cultivation of different kind of crops such as vegetables, cereals legumes, fruits, onions ,pepper, forage for animals feed etc. However there is no reliable study on different types of weeds their habitat, ecology, biology, and dispersals and damage causes on different agricultural crops in the Aliero local government. However, it is apparently known that the losses causes by weeds is quite attracting and exceed the losses caused from any categories of agricultural pest such as insect, nematodes diseases, rodent etc of the total annual loss of agriculture's produce from various pest (Buhler, 1995). Weeds also compete with crops plants for nutrient, sunlight, soil, water, and spaces. The intensity of weeds competition depends upon, several factors such as climatic condition types of species weed, severity of weeds infestation etc (Bridges, 1994).

On the other hand weed ecology; is concern with growth characteristic and adaptations that enables weeds to survive changes in the environment. The environment includes climatic, edaphic and biotic factors and it determines the distribution, prevalence, competing ability behavior and survival of weeds. In spite of using manual and mechanical method for thousands of years and adopting modern herbicides technology extensively for over 50 years weeds have not disappeared from agricultural fields. As man control certain weed species, new weeds species always take their place. Even if control of a particular species is achieved, it is not always complete. Certain plants of the same species are left behind so they can take control of the whole field in the following years. In a situation where in total weed free crops production is possible for several years, a year of negligence or complacency in using an effective weed control system could lead to the field once again being choked with weeds (Singh, et. al 2010). One of the most important reasons why weed are not successful despite the numerous and sustained effort to eliminate then, is their biodiversity. Biodiversity is an inevitable consequence of the struggle of an individual weed species undergoes in the presence of neighbor and occupying a physical space, in an agro system (Taylor, 1998).

Biodiversity in weed population result from taxonomist diversity, as well as diversity in those that affect the survival, mortality and reproduction of individual weeds. In a crop –weed situation, crop plants have a lot of more homogeneity and uniformity than weeds as a result of this the crops

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population comprises genetically and phenotypically uniforms individuals. Weeds on the other hand are heterogeneous collection of genotype and phenotype that can exploit the many niches left available by crop plants (Dekker, 1997). Selection and adaptations are special characteristic that weed plants posses and those occur at the level of the individual plants. The crops yield loss caused by weed, by interfering with production, is the aggregate consequence of competition between the less efficient and homogenous crop phenotype and more efficient heterogeneous collection of weed genotype and phenotypes. In this situation, the weed will always win (Dekker, 1997). Diversity in weeds ensures their enduring and persistent occupation of a field, and allows them to exploit new and diverse opportunities as they occur in an agro ecosystem (Singh and Abubakar, 2013).

## 2. Materials and Method

### *2.1. Study Area*

The Aliero local government area is located at approximately latitudes $11^0$ 03' S, $12^0$ 47'N and longitudes $3^0$ 6'W and $4^0$ 27'E . In kebbi state, north western part of Nigeria, It also has a total area of 412 square kilometer and is bordered in the east by Tambuwal Local government area of Sokoto state in the North West by Birnin Kebbi local government area in the South West by Jega local government area. The study was carried out in Aliero local government area, Kebbi state Nigeria (Singh, 2013).

**Geographical position:** Aliero local government is located at approximately latitudes $11^0$ 03' S, $12^0$ 47'N and longitudes $3^0$ 6'W and $4^0$ 27'E . In Kebbi state, north western part of Nigeria and is bordered in the east by Tambuwal Local government area of Sokoto state in the North West by Birnin Kebbi local government area in the South West by Jega local government area (Singh, 2013).

**Topography:** Aliero local Government area is dominated by massive flood plains of the in- land river valley system. Thus, it typically has a flat but undulating elevation of about 150 m in the flood plains. The alluvial sediment in the flood plains ranges from gravel level to clay level. It is this sediment which get saturated during the rains, to store water in the sands for dry season use. The geology of Aleiro local government is characterized by thick sedimentary deposited of the Sokoto-Rima basin. And it also under laid by Precambrian Basement Complex rocks (Singh, 2013).

**Climatic condition:** Aliero local government area enjoys a tropical type climatic condition, generally characterize by wet and dry season. The rainfall begins in April with the heaviest rainfall recorded in the month of July and August. The cold harmattan periods characterized by dust laden wind prevails in the month of November to January while the month of February and March are extremely hot. The mean annual temperature vary considerably but usually stand at 42$^{\circ}C$. the mean annual rainfall is 500 mm (Singh, 2013).

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*2.2. Method*

Taking into consideration of the local government area and physiographical information about it, collections areas were chalked out so as to cover maximum geographical and topographical range. During the collection drives observations on habit and habitat, flower colour and fragrances, besides dominance and sociability of the collected plants, were entered in the field books. At least five tagged specimens were pressed on spot for preparing herbarium sheets and a bundle of few plant specimens tagged with same field number, was also collected in polythene bag for study at laboratory (Singh and Abubakar, 2013). Macrospic and microscopic studies on collected specimens, determination of their identity and preparation of the herbarium specimens were performed after (Jain and Rao, 1978) and (Okali 2002). Duly processed herbarium specimens of weeds have been housed in the herbarium of Department of Biological Science, Kebbi State University of Science and Technology, Aliero, Kebbi State, Nigeria for record and references.

*2.3. Justification of Research*

Literature reveals that areas undertaken by earlier floribiologist and Agriculturist has been either too large (Hutchinson and Dalziel 1963, and Singh et al, 2010) or too small (Abdullah 2001). Former due to a very large canvas and latter due to incomplete coverage area do not serve as an exclusive and specific weed flora for Aliero Local government area. Present weed ecological study carries the objective to bring out a comprehensive, weed of Aliero local government, for the benefit of person engage in higher studies and research in weed floristic, and agriculturist and allied branches.

## 3. Results

**Systematic Enumeration of the Taxa:** The present research work enumerates the taxa (weeds) collected during weed survey into varied areas of Aliero local government areas from January 2014 to march 2015. After a thorough study on over 200 field numbers, the identified number have been found to spread in about 55 species in 23 families of angiosperms. In the present enumeration the families have been arranged alphabetical order, and the same pattern has followed in arranging lower order taxa (weeds) under each family.

**[1]. FAMILY: ACANTHACEAE**

**(I) Botanical name**: *Lepidagathis hamiltoniana* Wall.
Local name*:* Danfarkami
Common weed of Millet, Sorghum, Maize Cowpea, Groundnut, Onions, pepper and Tomato crops.
Kashin Zama, D.Singh: 04
**(II) Botanical name**: *Nelsonia canescens* Lam.
Local name*:* Tsamiyar kasa
Common weed of Cowpea, Groundnut, Millet, Sorghum, Maize Onions, pepper and Tomato crops.
Danwarai, D.Singh: 16.

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**[2]. FAMILY: AMARANTHACEAE**

**(I) Botanical name:** *Amaranthes viridis* L.
Local name*:* Rukubu
Common weed of Maize, Onions, Pepper, and Tomato crops.
Aliero, D.Singh: 33

**(II) Botanical name:** *Celosia trigyra* L.
Local name*:* Nannafa
Common weed of Cowpea, Groundnut, Millet, Sorghum, Maize, Onions, pepper and Tomato crops.
Danwarai, D.Singh: 52.

**(III) Botanical name:** *Gomphrena celosioids* Mart.
Local name*:* Leshinyara
Common weed of Millet, Sorghum, Maize Onions, Pepper and all cultivated crops.
Aliero, D.Singh: 25.

**[3]. FAMILY: ASCLEPIADACEAE**

**(I) Botanical name:** *Pergularia tomentosa* L.
Local name*:* Fatakka
Common weed of Millet, Sorghum, Maize.
Kyara, D.Singh: 12.

**[4]. FAMILY: ASTERACEAE (COMPOSITAE)**

**(I) Botanical name**: *Acanthospermum hispidum* D.C.
Local name*:* Kashin yawo
Common weed of Millet, Sorghum, Maize Onions, Pepper and Tomato crops.
Aliero, D.Singh: 02.

**(II) Botanical name*:*** *Biden pilosa* L.
Local name*:* Ganwon Fulani
Common weed of Millet, Sorghum, Maize Onions, Pepper and Tomato crops.
Jiga Sala, D.Singh: 61.

**(III) Botanical name**: *Centaurea calcitrapa* L.
Local name*:* Kayanrakumi
Common weed of Millet, Sorghum, Maize, and Tomato crops.
Jiga, D.Singh: 40.

**(IV) Botanical name**: *Eclipta alba* L.
Local name*:* Tukura
Common weed of Millet, Sorghum, Maize Onions, Pepper and Tomato crops.
Jiga, D.Singh: 58.

**(V) Botanical name**: *Tridax procumbens* L.
Local name*:* people don't know.
Common weed of Cowpea, Groundnut, Millet, Sorghum, Maize, Onions, pepper and Tomato crops.
Aliero, D.Singh: 58 A.

**[5]. FAMILY: BORAGINACEAE**

**(I) Botanical name:** *Heliotropium ovalifolium* L.
Local name*:* Bindinkusa

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Common weed of Rice, Watermelon, Okro, Maize, Onions, Pepper and Tomato crops.
Kyara, D.Singh: 13

**[6]. FAMILY: CAESALPINACEAE**

**(I) Botanical name**: *Cassia mimosoides* L.
Local name*:* Bagaruwan kasa
Common weed of Millet, Sorghum, Maize, pepper and Tomato.
Kyara, D.Singh: 38.

**(II) Botanical name**: *Cassia tora* L.
Local name*:* Tafasa
Common weed of Millet, Sorghum, Maize Onions, Pepper and Tomato crops.
Aliero, D.Singh: 03.

**[7]. FAMILY: CAPPARACEAE**

**(I) Botanical name**: *Cleome rutidosperma* DC.
Local name*:* Farin biyarana
Common weed of Millet, Sorghum, Maize Onions, Pepper and Tomato crops.
Kashin Zama, D.Singh: 51.

**(II) Botanical name**: *Cleome vicosa* L.
Local name*:* Yar' unguwa
Common weed of Millet, Peanut Sorghum, Maize, Onions, pepper and Tomato crops.
Aliero, D.Singh: 11.

**[8]. FAMILY: COMMELINACEAE**

**(I) Botanical name**: *Commelina benghalensis* L.
Local name*:* Balasa
Common weed of Cowpea, Millet, Sorghum, Maize Onions, Pepper and Tomato crops.
Aliero, D.Singh: 17.

**(II) Botanical name**: *Commelina diffusa* Burman. F.
Local name*:* Balasa
Common weed of Cowpea, Millet, Sorghum, Maize Onions, Pepper and Tomato.
Aliero, D.Singh: 07.

**(III) Botanical name**: *Cyanotis lanatus* Benthum.
Local name*:* Balasan hoko
Common weed of Cowpea, Peanut, Millet, Sorghum, Maize Onions, Pepper and Tomato crops.
Jiga sala, D.Singh: 08.

**[9]. FAMILY: CONVOLVULACEAE**

**(I) Botanical name:** *Ipomoea pestigridis* L. (Roth ex Roem. ex Schult).
Local name*:* Yar-yadi
Common weed of Millet, Sorghum, Maize, Onions, pepper, Cowpea and Tomato crops.
Aliero, D.Singh: 18.

**[10]. FAMILY: CYPERACEAE**

**(I) Botanical name:** *Cyperus rotundus* L.
Local name*:* Aya-aya
Common weed of Millet, Sorghum, Maize, Onions, pepper, Tomato and cowpea crops.

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Dakala, D.Singh: 18 A.

**(II) Botanical name**: *Klinga squamulata* Thorn. Ex Vail

Local name*:* Turare

Common weed of Millet, Sorghum, Maize, Onions, Pepper and Tomato crops.

Sabiyal, D.Singh: 32.

**[11]. FAMILY: FABACEAE (PAPILIONACEAE)**

**(I) Botanical name:** *Crotolaria retusa* L.

Local name*:* Biyaranan kasa

Common weed of Millet, Sorghum, Maize, Onions, pepper and Tomato crops.

Dorawai, D.Singh: 20.

**(II) Botanical name**: *Indigofera hirsute* L.

Local name*:* Kaykayi koma Kan mashekiya

Common weed of Millet, Sorghum, Maize, Onions and Tomato crops.

Aliero, D.Singh: 09.

**(III) Botanical name:** *Rhynchosia minima* L.

Local name*:* Gujiyar awaki

Common weed of Millet, Sorghum, Maize, Onions, Pepper, Tomato and Cassava crops.

Aliero, D.Singh: 57.

**(IV) Botanical name:** *Sesbania grandiflora* L.

Local name*:* Kyamro

Common weed of Millet, Sorghum, Maize Onions, Pepper, Tomato and Cassava crops.

Danwarai, D.Singh: 46.

**[12]. FAMILY: LAMIACEAE**

**(I) Botanical name:** *Leonotis nepetifolea* L.

Local name*:* Kanbarawo

Common weed of Millet, Sorghum, Maize, Onions, pepper and Tomato and Cowpea crops.

Aliero, D.Singh: 21.

**(II) Botanical name:** *Plastostoma africanum* P. Beavv.

Local name*:* Doddoyo

Common weed of Millet, Sorghum, Maize Onions, Pepper and Tomato and Cowpea crops.

Aliero, D.Singh: 22.

**[13]. FAMILY: MALVACEAE**

**(I) Botanical name:** *Urena lobota* L.

Local name*:* Garmani

Common weed of Millet, Sorghum, Maize Onions, Pepper and Tomato crops.

Gumbulu, D.Singh: 37.

**(II) Botanical name:** *Sida acuta* L.

Local name*:* Miyar tsanya

Common weed of Millet, Sorghum, Maize, Onions, Pepper and Tomato crops.

Aliero, D.Singh: 43.

**[14]. FAMILY: NYCTAGINACEAE**

**(I) Botanical name:** B*oerhavia diffusa* L.

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Local name*:* Sarkin buzu
Common weed of Millet, Sorghum, Maize Onions, Pepper and Tomato crops.
Unguwar gabas, D.Singh: 26.

**[15]. FAMILY: ONAGRACEAE**

**(I) Botanical name**: *Ludwigia decurrens* Walt.
Local name*:* Lallen jiba
Common weed of Sweet potato, Sorghum, Maize, Onions, Pepper and Tomato crops.
Danborori, D.Singh: 60.

**[16]. FAMILY: PEDILIACEAE**

**(I) Botanical name:** *Sesamum indicum* L.
Local name*:* Karkashi (yodo)
Common weed of Millet, Sorghum, Maize, Onions, Pepper and Tomato crops.
Gumbin Dari, D.Singh: 15.

**[17]. FAMILY: POACEAE (GRAMINAE)**

**(I) Botanical name:** *Brachiaria lata* Schumach.
Local name*:* Garaji
Common weed of Millet, Sorghum, Maize Onions, Pepper and Tomato crops.
Jiga kanbarori; D.Singh: 36.
**(II) Botanical name:** *Cynodon dactylon* L.
Local name*:* People don't know
Common weed of Millet, Sorghum, Maize Onions, Pepper and Tomato crops.
Sadam -sadam, D.Singh: 36 A.
**(III) Botanical name:** *Dactyloctenium aegyptium* L.
Local name*:* Gude-gude.
Common weed of Millet, Sorghum, Maize Onions, Pepper and Tomato crops.
Gumbin dari maigishiri, D.Singh: 44.
**(IV) Botanical name:** *Digitaria nuda* Schumach.
Local name*:* Harkiya
Common weed of Millet, Sorghum, Maize, Onions, Pepper and Tomato crops.
Rafin bauna, D.Singh: 31.
**(V) Botanical name:** *Echinochloa colanum* (L.)
Local name*:* Hakin ruwa
Common weed of Rice, Millet, Sorghum, Sugarcane and Maize crops.
Aliero, D.Singh: 10.
**(VI) Botanical name**: *Eleusine indica* L.
Local name: people don't know.
Common weed of Millet, Sorghum, and Maize.
Aliero, D.Singh: 62.
**(VII) Botanical name**: *Eragrotis atrovirens* L.
Local name*:* Burbuwa
Common weed of Millet, Sorghum, and Maize crops.
Unguwar son Allah, D.Singh: 63.

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**(VIII) Botanical name**: *Eragrotis cillaris* L.
Local name*:* Kutukku
Common weed of Millet, Sorghum, Maize, and Groundnut.
Sadam sanda, D.Singh: 49.
**(IX) Botanical name:** *Eragrotis tremula* Hotch. Ex Steud.
Local name*:* Burbuwa
Common weed of Millet, Sorghum, and Maize, onions and watermelon crops.
Aliero, D.Singh: 30.
**(X) Botanical name:** *Panicum ripens* L.
Local name: people don't know.
Common weed of Millet, Sorghum, Maize and Rice.
Aliero, D.Singh: 31 A.
**(XI) Botanical name:** *Paspalum conjugatum* Berg
Local name*:* People don't know.
Common weed of Millet, Sorghum, and Maize and onions crops.
Jiga makera, D.Singh: 31 B.

**[18]. FAMILY: RUBIACEAE**

**(I) Botanical name:** *Mitracarpus hirustus* (L.) DC.
Local name: Harwatsi.
Common weed of Millet, Sorghum, Maize Onions, Pepper and Tomato crops.
Jiga kanbarori; D.Singh: 01.
**(II) Botanical name:** *Oldenlandia herbaceae* L.
Local name*:* Geron tsuntsaye
Common weed of Onion, Maize, Tomato and Potato crops
Gumbin darin ari, D.Singh: 27.

**[19]. FAMILY: SCROPHULARIACEAE**

**(I) Botanical name:** *Scoparia duIcis* L.
Local name*:* Shashatu
Common weed of Rice, Maize, Sorghum, Onion
Aliero, D.Singh: 54.
**(II) Botanical name:** *Striga lutea* L.
Local name*:* Wuta-wuta
Common weed of Millet, Sorghum, and Maize
Rafin bauna, D.Singh: 54 A.

**[20]. FAMILY: SOLANACEAE**

**(I) Botanical name:** *Physalis angulata* L.
Local name*:* Tumatirin kaji
Common weed of Onion, Maize, pepper and Cowpea
Aliero, D.Singh: 14.
**(II) Botanical name:** *Schwenckia aremericana* L.
Local name*:* Dandana
Common weed of Onion, Pepper, Tomato, and Maize

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Danwarai, D.Singh: 35.
**(III) Botanical name:** *Solanum nigrum* L.
Local name: people don't know.
Common weed of Onion, Maize, Millet, crops.
Unguwar gabas, D.Singh: 35 A.

**[21]. FAMILY: STERCULIACEAE**

**(I) Botanical name**: *Waltheria indica* L.
Local name*:* Damaigin fadama
Weed of Onion, Maize and Sweet Potato.
Aliero, D.Singh: 45.

**[22]. FAMILY: TILLACEAE**

**(I) Botanical name**: *Corchurus aestuans* L.
Local name*:* Lalo
Common weed of Ground nut Maize, Cowpea.
Gumbulu, D.Singh: 29.
**(II) Botanical name:** T*riumfatha rhomboidea* Jaca.
Local name*:* kashin kolo (dankaura)
Weed of Sorghum, find in road-side
Aliero, D.Singh: 06.

**[23]. FAMILY: ZYGOPHYLLACEAE**

**(I) Botanical name:** *Tribulus terrestis* L.
Local name*:* Tsaida
Common weed of Sorghum, Maize and Millet.
Aliero, D.Singh: 39.

## 4. Discussion

Ecology is the interrelationship between an organisms and their environment. Weed ecology is thus concerned with growth characteristic and adaptations that enable weeds to survive changes in the environment. The environment include climatic, edaphic and biotic factor and determines the distribution, prevalence, competing ability behavior and survival of weeds (Harper, 1977).

It is apparently known that the losses causes by weeds is quite attracting and exceed the losses caused from any categories of agricultural pest such as insect, nematodes diseases, rodent etc. of the total annual loss of agriculture's produce from various pest (Buhler,1995). Weeds also compete with crops plants for nutrient, sunlight, soil, water, and spaces. The intensity of weeds competition depends upon, several factors such as climatic condition types of species weed, severity of weeds infestation etc. (Takim and Fadayomi, 2013).

Weed biology is related to the study of weeds in relation to their geographic distribution habitat growth and population dynamics of weed species and communities. Development of an appropriate

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and effective weed management program is dependent on the sound knowledge of weed biology (Singh, *et al*. 2010).

A persistent weed species will not necessarily pose a hazard if suitable control measures are applied. Persistence of a weed is largely influence by climatic, adaptive (soil) and biotic factors, which affect its occurrence, abundance, range and distribution (Rao, 2000). Plant and animal are among the biotic factor that modified the growth of weeds in varieties of ways that affect weed persistence directly and indirectly. In cropping situation, the major effects on weeds are those exerted by the crop as it competes for available resources.

## 5. Conclusion

From this research work we can conclude that there is 7 weeds dominant families, these are Poaceae (Graminae) of 11 species, Astereceae (Compositae) of 5 species, Solanaceae of 4 species, Commelinaceae 3 species, Malvaceae 3 species, Fabaceae 3 species of 3 species, Amaranthaceae 3 species. And there is great infestation of different of weeds in of Aliero belonging to different families of both the dominant families and other families as indicated above, which were found in cultivated field, abandoned side, road sides and waste places.

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