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**Research Article**

# STUDIES ON WEED DIVERSITY IN SOME SELECTED AGRICULTURAL FIELDS AT SPSR NELLORE DISTRICT, ANDHRA PRADESH, INDIA

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**ABSTRACT**

Weeds cause serious ecological problem in crop fields. Weed species can reduce crop production 12-98 percent depending on type of cultivation. It also results in reducing the high quantities of minerals, nutrients and moisture more efficiently than the crops in farm lands as they grow faster than the crops. The diversity and distribution of weed diversity is mainly dependant on soil, climatic, cropping, fertilizers and management factors. The present paper discusses the weed species diversity and distribution in various crop fields of south coastal Andhra Pradesh. The study is mainly conducted based on field survey across different cropping seasons during the year 2014-2015. Empirical field survey has been conducted in selected areas of various agricultural fields, since paddy is predominant crop in this region. The survey for the current was mainly conducted in rice fields followed by cotton and sugarcane. A total of 168 weed species were documented during the field survey belonging 50 different families of plant kingdom such as Mimoceaceae, Fabaceae Cesalpinaceae Amaranthaceae, Euphorbiaceae, Poaceae, Asteraceae Rubiaceae, Cyperaceaeand, Bignoniaceae etc. Out of 168 species, 27 were monocots and 147 species were dicots. The dominant families found in the study included Poaceae, Fabaceae, Acanthaceae, Amaranthaceae, Rubiaceae, Cyparaceae which consists of minimum ten species each. This paper mainly discusses about weed species diversity and distribution in crop fields and their management.



## INTRODUCTION

The undesirable or unwanted plants that grow in agricultural fields along with crops are known as weeds. Weeds being unwanted plant species growing along with crops and affect crop production. There are large numbers of weeds species growing widely in cultivated fields of India, of which some are introduced while others are native. Weeds are a menace as they have faster growth rate than the crop resulting in its rapid spread throughout the fields. It also absorbs higher nutrient content with greater efficiency than crop plants thus limiting its availability to crop plants (Murty *et al,* 2011). Weed species differ from other plants in their adaptation mechanisms to the local environment. In addition, they have peculiar characteristics in natural habitats which make them more competitive enhancing their growth (Vishwas *et al,* 2013). Generally weeds grown in all type of ecosystems but their intensity is greater in manmade ecosystem such as crop fields wherein farmers desire growth of only agricultural crops and unprecedented growth of weeds in these lands will affect the farmers adversely. These weeds compete with agricultural crops for space, sun light, and nutrients which has an impact on the growth rate of desired crops thereby reducing yield and affecting quality (Kumar *et al*, 2013). Weed diversity causes great economic loss in crop fields with the yield reducing from 12 to 51 percent (Vishwas *et al,* 2013). Weed species also support diversity in animals like insects and micro organisms that may cause reduced crop production. The herbaceous species growing in cultivated lands are highly influenced by different factors like the biotic and abiotic factors, type of cultivation, season of cultivation (Kharif and Rabi), type of soil, irrigation types, use of fertilizers and type of weed management. The present study explores the different weed species and their distribution across different crop fields of Nellore district.

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### *Study Area and Geographical Location*

The current study focused on the south coastal district of Andhra Pradesh, Nellore district with an average latitude 14.43$^{o}$ N, longitude 79.97$^{o}$ E and at an elevation of 59 ft. The district spreads over an area of 13076 sq.km, accounting 4.75% of the total area of the state. The district is bounded in the east by Bay of Bengal, north by Prakasam district, south by Chittoor district and Chengalpattu district of Tamil Nadu State and on the west by Veligonda hills (Figure 1). The district primarily has 3 natural divisions from south to north and western belt.

### *Climatic Features*

The study area falls under semi arid region of southern India. Climatically the study area is very hot with less rain fall and high temperature during summer months. Of the region have three seasons - summer from March to mid June, rainy season from September to November, rain fall mainly depend on North-west moon soon, the average rain fall is 992 mm in both seasons and winter from December to mid February.

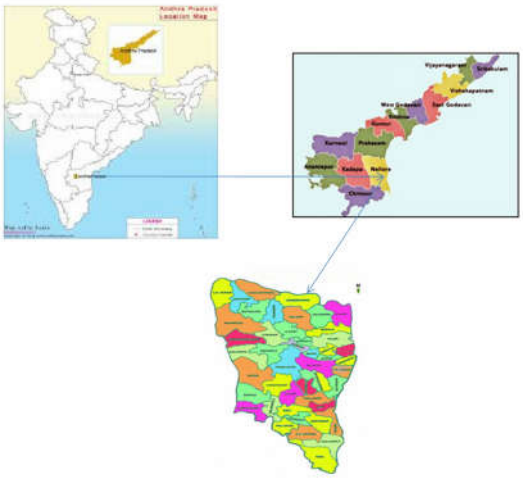

**Figure 1** Geographical location of the study area

### *Land Use and Agriculture*

The total geographical area is distributed across 13.6 lakh hectares; of which around 20.09% is under forest land, 10.56 percent is barren and uncultivable land and non agricultural activates take up about 18.68%. The total area sown for cultivation forms 25.96 percent and cultivable waste and fallow lands consists of around 17.75 percent. The region has agricultural activities in both the Kharif and Rabi season. Rice (*Oryza sativa*) is the major crop cultivated throughout the district followed by Cotton, Tobacco, Chilly, Sugarcane etc. More recently farmers have started to venture into aquaculture. Vegetables and pulses are commonly grown in small areas and kitchen gardens for their own requirements.

## MATERIALS AND METHODS

The present studies main objective is to document the weed flora in different crop fields such as Rice, Cotton and Sugarcane. Since rice is predominant crop in the study area, the study focused mainly on rice fields followed by cotton and sugarcane.

### *Survey and Sampling*

The documentation of weeds in the study area has been conducted through extensive field survey during the study period. Random sampling methods were followed for the documentation and collection of specimens. The study was carried during 2014-2015 in different cropping seasons. The studies were conducted in selected areas (taluk) of the district i.e. Atmakur, Udayagiri, Gudur and Rapur. Several field trips were made to assess the weed species. Each field visit involved spending 7-10 days in the study area during each cropping season. The specimens were collected from the crop fields and its taxonomical character such as flowers, fruit, colour, odor, roots characters was recorded. Photographs of the sample specimens were taken for recording purposes. A herbarium was prepared where in the specimens were preserved according to BSI rules and regulations.

## RESULT AND DISCUSSION

Extensive field survey was carried during the study period. In the present study a total 168 weed species were found in different agricultural fields belonging to 137 genera and 50 families (Figiure 2 and 3). Out of these 168 species, 27 were monocots and 141 were dicots; all monocots were dominantly present in both the crop fields. The dominant families were recorded from the study region and included species like Poaceae, Euphorbaceae, Fabaceae, Amaranthace, Asteraceae, Asclepiadaceae, Cyperacae, Convolvulaceae, Acanthaceae, Malvaceae, Solanaceae, Commelinaceae, Lamiaceae, Caesalpiniaceae, Cleomaceae and Onagraceae (Figure-4). Monocot represents the 16.06 % of the total weed flora of the region and 83.92 % were dicots. The top ten (10) families listed above contributed to 55.95 percent of the total documented weed species.

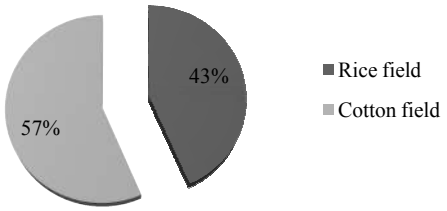


**Figure 2** Weed species in the crop fields

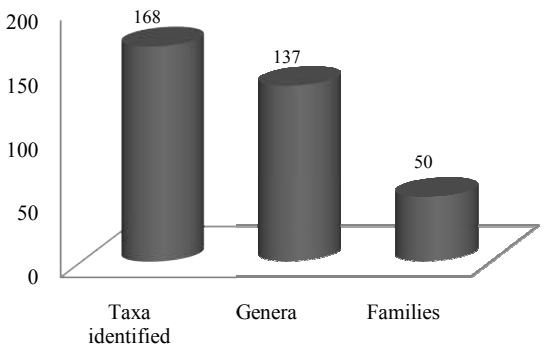


**Figure 3** Weed diversity in crop fields

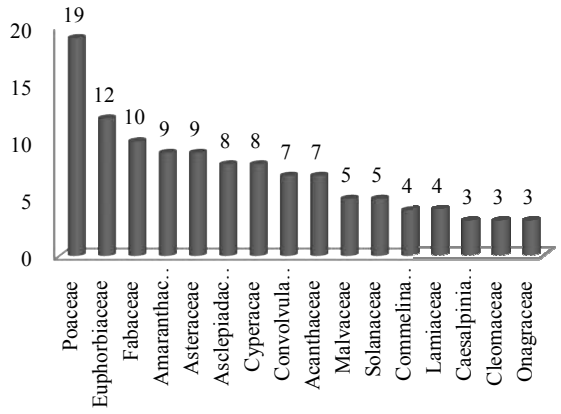


**Figure 4** Dominant families in the study region

### *Weeds Species from Only Rice Field (Oryza Sativa)*

Out of 168 species 41 weeds were recorded only from the rice field; belonging to 25 families and 34 genera. In rice field monocots, sedges were predominantly distributed. The families that were present in rice field according to dominance are as follows: Poaceae (8), Cyperaceae (7), Scrophulariaceae (3), Portulacaceae (2), Pontederiaceae (2), Polygonaceae (2), Nymphaceae (2). The rest of the families were present as single species.

### *Weeds Species from Only Cotton Field (Gossypium herbaceum)*

72 species were recorded only from cotton field which belonged to 30 families and 64 genera. In cotton fields dicot species were present in abundance. Asclepiadaceae (8), Fabaceae (6), Euphorbiaceae (5), Convolvulaceae (5), Amaranthaceae (4), Euphorbiaceae (4), Malvaceae (4), Solanaceae (4), Asteraceae (3), Cucurbitaceae (3), Acanthaceae (2), Caesalpiniaceae (2), Lamiaceae (2), Menispermaceae (2), Mimosaceae (2), Rubiaceae (2), Verbenaceae (2) and other family's single species were reported.

### *Weeds in Rice and Cotton Field*

Out of 168 weed species, 55 species were reported in both the fields which belonged to 21 families and 47 genera (Fig.4). Twenty one (21) family species of plant kingdom were distributed in greater frequency in both the fields. The dominant families recorded included Poaceae (10), Euphorbiaceae (07), Asteraceae (05), Amaranthaceae (05), Commelinaceae (04), Fabaceae (04), Cleomaceae (02). The other species were as listed from both the fields (Figure 5).

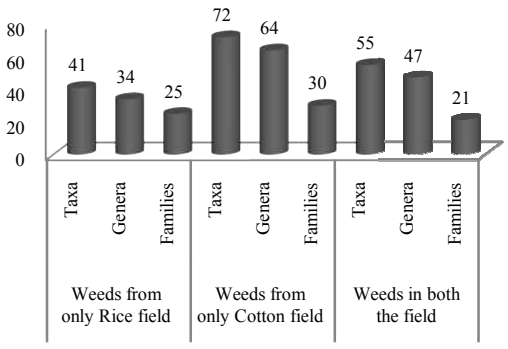


**Figure 5** Species distribution in crop fields

### *Iucn (International Union for Conservation of Nature) Status of Weed Species*

IUCN provides the threatened species' taxonomy, conservation status and global distribution. In the study area a total 168 weed species were documented which included herbs, grasses, sedges, aquatic plants, shrub, semi shrub and creepers. The IUCN status has given value of species, their range and distributionand based on the IUCN list, one specie (*Eclipta prostrata*) was recorded under Data deficient (DD), 128 species are under Not evaluated and 39 species were reported as Least concern as per IUCN category such as *Aeschynomene indica, Alternanthera sessilis, Ammannia baccifera, Aponogeton natans, Asteracantha longifolia, Bacopa monnieri, Brachiaria reptans, Centella asiatica, Commelina benghalensis, Cyperus difformis, Cyperus iria, Cyperus pangorei, Cyperus rotundus, Dentella repens, Desmodium triflorum, Echinochloa colona, Eichhornia crassipes, Fimbristylis dichotoma, Fimbristylis ferruginea, Grangea maderaspatana, Hydrilla verticillata, Ischaemum indicum, Lemna gibba, Ludwigia octovalvis, Mimosa pudica, Monochoria vaginalis, Nymphaea stellata, Nymphoides hydrophylla, Panicum psilopodium, Phyla nodiflora, Pistia stratiotes, Polygonum barbatum, Polygonum glabrum, Rhynchosia minima, Saccharum spontaneum, Sphaeranthus indicus, Tephrosia purpurea, Typha angustifolia* and *Wolffia globosa*. No Endangered and Vulnerable species were reported (Figure 6). The recorded species from rice and cotton field and IUCN status has given Table 1.

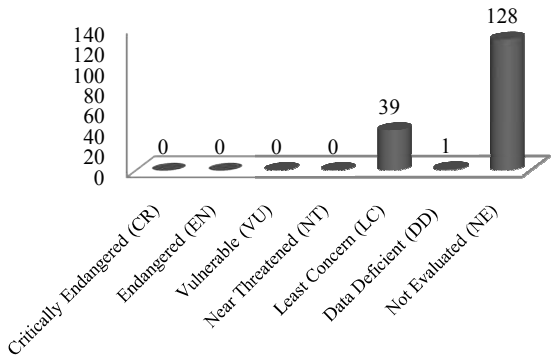


**Figure 6** IUCN Status of weed species from the study region

## DISCUSSION

It is essential to understand weed species to control weed diversity in crop fields. Several studies have been conducted on weed diversity and their distribution in various crop fields across the global level. To name a few, Saritha (2013) studied *Celosia argentea* in groundnut fields of Chittor district, Vishwas and Prakash (2013) studied the weeds of Satara district of Maharashtra, Sharrif and Forghanipoor (2011) studied the ecological character of weed flora of Iran, Kiran and Rao (2013) explored the weed flora of rice fields in Krishna district, Olorunmaiye and Olorunmaiye (2008) reported weeds of Maize field in Nigeria, Ramamoorthy *et al,* (2004) has discussed weeds of dry lands and how they can be controlled, Bambaradeniya and Gunatilleke (2002) described about ecological aspects of weed flora in an irrigated rice field of Sri Lanka, Ghani *et al,* (2013) studied weeds of Nile valley in Egypt, Bukun (2005) reported weeds of Cotton field in Turkey.

**Table 1** Inventory of weed species from Agricultural fields.

| S.No | Botanical Name | Vernacular Name | Family | Rice field | Cotton Field | IUCN Status |
|---|---|---|---|---|---|---|
| 1 | *Abutilon indicum* (L.) Sweet | Tutturubenda | Malvaceae | | √ | NE |
| 2 | *Acalypha indica* L. | Muripenda | Euphorbiaceae | | √ | NE |
| 3 | *Achyranthes aspera* L. | Uttareni | Amaranthaceae | √ | √ | NE |
| 4 | *Aerva lanata* (L.) Juss. Ex Schultes | Pindikura | Amaranthaceae | √ | √ | NE |
| 5 | *Aeschynomene indica* L. | Jeeluga | Fabaceae | | √ | LC |
| 6 | *Ageratum conyzoides* L. | | Asteraceae | √ | √ | NE |
| 7 | *Alternanthera pungens* Kunth | | Amaranthaceae | | √ | NE |
| 8 | *Alternanthera sessilis* (L.) R. Br. | Ponnaganti | Amaranthaceae | √ | √ | LC |
| 9 | *Alysicarpus vaginalis* (L.) DC. | | Fabaceae | √ | √ | NE |
| 10 | *Amaranthus spinosus* L. | Mullu thotakura | Amaranthaceae | | √ | NE |
| 11 | *Amaranthus viridis* L. | Thotakura | Amaranthaceae | | √ | NE |
| 12 | *Ammannia baccifera* L. | | Lythraceae | √ | | LC |
| 13 | *Anisomeles malabarica (L.) R. Br. Ex Sims* | Moga-bira | Lamiaceae | | √ | NE |
| 14 | *Apluda mutica L.* | Konda gaddi | Poaceae | √ | √ | NE |
| 15 | *Aponogeton natans* (L.) Engl. & K.Krause | Kittigaddalu | Aponogetonaceae | √ | | LC |
| 16 | *Argemone mexicana* L | Kittanara | Agavaceae | | √ | NE |
| 17 | *Aristida adscensionis L.* | Cheepuru gaddi | Poaceae | √ | √ | NE |
| 18 | *Aristida setacea* Retz. | Cheepuru gaddi | Poaceae | | √ | NE |
| 19 | *Aristolochia bracteolata* Lam. | Gadidagadapaku | Aristolochiaceae | | √ | NE |
| 20 | *Asteracantha longifolia* (Schum.) Heine | | Acanthaceae | √ | | LC |
| 21 | *Bacopa monnieri* (L.) Pennell | | Scrophulariaceae | √ | | LC |
| 22 | *Barleria prionitis L.* | Mullagorinta | Acanthaceae | √ | √ | NE |
| 23 | *Basilicum polystachyon* (L.)Moench. | | Lamiaceae | | √ | NE |
| 24 | *Bergia capensis* L. | | Elatinaceae | √ | | NE |
| 25 | *Boerhavia diffusa* L. | Atikamamidi | Nyctaginaceae | | √ | NE |
| 26 | *Brachiaria reptans (L.) Gard.& Hubb.* | | Poaceae | √ | √ | LC |
| 27 | *Brassica nigra* L. | Avalu | Brassicaceae | | √ | NE |
| 28 | *Calotropis gigantea (L.) R.Br.* | Jilledu | Asclepiadaceae | | √ | NE |
| 29 | *Calotropis procera* R. Br. | Tella Jilledu | Asclepidaceae | | √ | NE |
| 30 | *Cardiospermum halicacabum* L. | Buddakakara | Sapindaceae | | √ | NE |
| 31 | *Celosia argentea* L. | | Amaranthaceae | √ | + | NE |
| 32 | *Cleome viscosa* L. | Kukkavaminta | Cleomaceae | √ | + | NE |
| 33 | *Centella asiatica* (L.) Urban | | Apiaceae | √ | | LC |
| 34 | *Centotheca lappacea (L.) Desv.* | | Poaceae | √ | √ | NE |
| 35 | *Chloris barbata* (L.) Sw | | Poaceae | √ | + | NE |
| 36 | *Cleome aspera* Koen. Ex DC. | | Cleomaceae | √ | | NE |
| 37 | *Cleome gynandra* L. | Vaminta | Cleomaceae | √ | √ | NE |
| 38 | *Clitoria ternatea* L. | Adavichikkudu | Fabaceae | | √ | NE |
| 39 | *Coccinia grandis* (L.) Voigt | Donda | Cucurbitaceae | | √ | NE |
| 40 | *Cocculus hirsutus*(L.) Diels | Dusari teega | Menispermaceae | | √ | NE |
| 41 | *Commelina benghalensis* L. | | Commelinaceae | √ | √ | LC |
| 42 | *Commelina longifolia* Lamk | | Commelinaceae | √ | √ | NE |
| 43 | *Corchorus aestuans* L. | | Tiliaceae | √ | | NE |
| 44 | *Corchorus trilocularis* L. | | Tiliaceae | √ | √ | NE |
| 45 | *Crotalaria pusilla Heyne ex Roth.* | | Fabaceae | | √ | NE |
| 46 | *Crotalaria retusa L.* | | Fabaceae | | √ | NE |
| 47 | *Croton banplandianum* Bail. | Kusuma | Euphorbiaceae | √ | √ | NE |
| 48 | *Cryptostegia grandiflora* | | Asclepiadaceae | | √ | NE |
| 49 | *Cucumis callosus (Rottler) Cogn.* | Nakka dosakai | Euphorbiaceae | | √ | NE |
| 50 | *Cyanotis tuberosa* (Roxb.) Schult. & Schult.f. | | Commelinaceae | √ | √ | NE |
| 51 | *Cynodon dactylon* (L.) Pers. | Garika | Poaceae | √ | √ | NE |
| 52 | *Cyperus difformis* L. | | Cyperaceae | √ | | LC |
| 53 | *Cyperus haspan* L. | | Cyperacae | √ | | NE |
| 54 | *Cyperus iria* L. | | Cyperacae | √ | | LC |
| 55 | *Cyperus pangorei Rottb.* | | Cyperaceae | √ | | LC |
| 56 | *Cyperus rotundus* L. | Thunga | Cyperacae | √ | √ | LC |
| 57 | *Dactyloctenium aegyptium* (L.)P.Beauv. | | Poaceae | √ | √ | NE |
| 58 | *Datura metel L.* | Nalla Ummetta | Solanaceae | | √ | NE |
| 59 | *Dentella repens* (L.)Forst.&Forst.f | | Rubiaceae | | √ | LC |
| 60 | *Desmodium triflorum* (L.) DC | | Fabaceae | | √ | LC |
| 61 | *Dichanthium annulatum* (Forssk.) Stapf. | | Poaceae | √ | √ | NE |
| 62 | *Digera muricata* (L.) Mart. | Chenchalaku | Amaranthaceae | √ | √ | NE |
| 63 | *Digitaria bicornis* (Lam.) Roem, & Schult. | | Poaceae | √ | | NE |
| 64 | *Digitaria ciliaris* (Retz.) Koel | | Poaceae | √ | √ | NE |
| 65 | *Diplocyclos palmatus* (L.) Jeffrey | | Cucurbitaceae | | √ | NE |
| 66 | *Dipteracanthus patulus* (Jacq.) Nees | | Acanthaceae | √ | √ | NE |
| 67 | *Echinochloa colona* (L.) Link. | | Poaceae | √ | √ | LC |
| 68 | *Eclipta prostrata (L.)L.* | Guntagalijeru | Asteraceae | √ | | DD |
| 69 | *Eichhornia crassipes (Mart.) Solms* | Gurrapudekka | Pontederiaceae | √ | | LC |
| 70 | *Eleocharis geniculata (L.) Roem. & Schult.* | | Cyperaceae | √ | | NE |
| 71 | *Emilia sonchifolia (L.) DC* | | Asteraceae | | √ | NE |
| 72 | *Eragrostis tenella (L.) Beauv. Ex Roem. Ex Schult.* | | Poaceae | √ | | NE |

| | | | | | | |
|---|---|---|---|---|---|---|
| 73 | *Euphorbia hirta* L. | Nanabala | Euphorbiaceae | √ | √ | NE |
| 74 | *Euphorbia indica* Lam. | | Euphorbiaceae | √ | √ | NE |
| 75 | *Euphorbia thymifolia* L. | | Euphorbiaceae | √ | √ | NE |
| 76 | *Evolvulus alsinoides* L. | Vishnukrantham | Convolvulaceae | | √ | NE |
| 77 | *Fimbristylis dichotoma* (L.) Vahl | | Cyperaceae | √ | | LC |
| 78 | *Fimbristylis ferruginea (L.) Vahl. Enum.* | | Cyperaceae | √ | | LC |
| 79 | *Gomphrena celosioides* Mart. | | Amaranthaceae | | √ | NE |
| 80 | *Grangea maderaspatana* (L.)Poir. | | Asteraceae | √ | √ | LC |
| 81 | *Hedyotis puberula* (G.Don) Arn.Pugill. | Chiruveru | Rubiaceae | | √ | NE |
| 82 | *Heliotropium indicum* L. | Nagadanthi | Boraginaceae | | √ | NE |
| 83 | *Hemidesmus indicus* (L.) Schult | Sugandhapala | Asclepiadaceae | | √ | NE |
| 84 | *Hybanthus ennaespermus* (L.) F.V.Muell | | Violaceae | | √ | NE |
| 85 | *Hydrilla verticillata (L.f.) Royle.* | | Hydrocharitaceae | √ | | LC |
| 86 | *Ipomoea aquatic* Forsk | Panjaku | Convolvulaceae | √ | | NE |
| 87 | *Ipomoea carnea* Jacq. | Samudrapala | Convolvulaceae | | √ | NE |
| 88 | *Ipomoea obscura* (L.) Ker-Gawl. | | Convolvulaceae | | √ | NE |
| 89 | *Ischaemum indicum* (Houtt.) Merr. | | Poaceae | √ | | LC |
| 90 | *Jatropha gossypiifolia* L. | Sima nepalam | Euphorbiaceae | | √ | NE |
| 91 | *Justicia adhatoda L.* | Addasaram | Acanthaceae | √ | √ | NE |
| 92 | *Kirganelia reticulate* (Poir.) Baill. | | Euphorbiaceae | | √ | NE |
| 93 | *Lantana camara* L. | Phalikampa | Verbenaceae | | √ | NE |
| 94 | *Lemna gibba* L. | | Araceae | √ | | LC |
| 95 | *Leptochloa chinensis* (L.) Nees | | Poaceae | √ | | NE |
| 96 | *Leucaena leucocephala* (Lam.) de Wit | | Mimosaceae | | √ | NE |
| 97 | *Leucas aspera* (Willd.) Link | Tummi | Lamiaceae | | √ | NE |
| 98 | *Lindernia ciliate* (Colsm.) Pennell | | Scrophulariaceae | √ | | NE |
| 100 | *Ludwigia octovalvis* (Willd.)Bold | | Onagraceae | | √ | LC |
| 101 | *Ludwigia parviflora* L. | | Onagraceae | √ | | NE |
| 102 | *Marsilia quadrifolia* L. | | Marsileaceae | √ | | NE |
| 103 | *Merremia aegyptia* (L.) Urban. | | Convolvulaceae | √ | √ | NE |
| 104 | *Merremia tridentata* (L.) Hall.f. | Elikachevalaku | Convolvulaceae | | √ | NE |
| 105 | *Mimosa pudica* L. | | Mimosaceae | √ | √ | LC |
| 106 | *Mollugo nudicaulis* Lam. | | Molluginaceae | √ | √ | NE |
| 107 | *Monochoria vaginalis* (Burm.f.)Presl | | Pontederiaceae | √ | | LC |
| 108 | *Mukia maderaspatana* (L.) Roem. | | Cucurbitaceae | | √ | NE |
| 109 | *Nelumbo nucifera* Gaertn. | Tamara | Nelumbonaceae | √ | | NE |
| 110 | *Nymphaea stellata* Willd. | Allitamara | Nymphaceae | √ | | LC |
| 111 | *Nymphoides hydrophylla* (Lour.)O.Ktze | | Nymphaceae | √ | | LC |
| 112 | *Ocimum americanum L.Cent.* | Kukka thulasi | Lamiaceae | √ | √ | NE |
| 113 | *Oxalis corniculata* L. | | Oxalidaceae | | √ | NE |
| 114 | *Oxystelma esculenta (L.f.) R.Br.* | | Asclepiadaceae | | √ | NE |
| 115 | *Panicum psilopodium* Trin. | | Poaceae | √ | | LC |
| 116 | *Parthenium hysterophorus* L. | Congress kalupu | Asteraceae | √ | √ | NE |
| 117 | *Passiflora foetida* L. | Gabbudonda | Passifloraceae | | √ | NE |
| 118 | *Pavonia zeylanica* (L.) Cav | Chirubenda | Malvaceae | | √ | NE |
| 119 | *Pedalium murex* L. | Yenugapalleru | Pedaliaceae | | √ | NE |
| 120 | *Pergularia daemia* (Forssk.) Chiov. | Juttepala tega | Asclepiadaceae | | √ | NE |
| 121 | *Peristrophe paniculata* (Forsk.) Brummitt | | Acanthaceae | | √ | NE |
| 122 | *Perotis indica (L.) Kutze.* | | Poaceae | √ | | NE |
| 123 | *Phyla nodiflora* (L.) Greene | Bokkenaku | Verbenaceae | √ | | LC |
| 124 | *Phyllanthus amarus* Schum.&Thonn. | Nelausiri | Euphorbiaceae | √ | √ | NE |
| 125 | *Phyllanthus debilis* Klen ex Willd. | | Euphorbiaceae | √ | √ | NE |
| 126 | *Phyllanthus virgatus* Forst. | | Euphorbiaceae | √ | √ | NE |
| 127 | *Physalis minima* L. | Budama | Solanaceae | | √ | NE |
| 128 | *Pistia stratiotes* L. | Antaratamara | Araceae | √ | | LC |
| 129 | *Polygonum barbatum* L. | | Polygonaceae | √ | | LC |
| 130 | *Polygonum glabrum* Willd. | | Polygonaceae | √ | | LC |
| 131 | *Portulaca oleracea* L. | | Portulacaceae | √ | | NE |
| 132 | *Portulaca quadrifida* L. | | Portulacaceae | √ | | NE |
| 133 | *Prosopis juliflora* (Sw.) DC. | Karratumma | Mimosaceae | | √ | NE |
| 134 | *Rhynchosia minima (L.) DC.* | | Fabaceae | | √ | LC |
| 135 | *Rivea hypocrateriformis (Desr.) Chhoisy.* | Boddi tega | Convolvulaceae | | √ | NE |
| 136 | *Rostellularia japonica* (Thunb.) Ellis | | Acanthaceae | √ | √ | NE |
| 137 | *Ruellia tuberosa* L. | | Acanthaceae | | √ | NE |
| 138 | *Saccharum spontaneum* L. | Rellu | Poaceae | √ | √ | LC |
| 139 | *Sebastiania sesban* (L.) Merr. | Jeeluga | Fabaceae | √ | √ | NE |
| 140 | *Securinega leucopyrus* (Willd.) Muell.-Arg. | Tellapurugudu | Euphorbiaceae | | √ | NE |
| 141 | *Senna auriculata* L. | Tangedu | Caesalpiniaceae | | √ | NE |
| 142 | *Senna italica* (Mill.) Lam. | Nela tangedu | Caesalpinaceae | | √ | NE |
| 143 | *Senna occidentalis* L. | Kasintha | Caesalpiniaceae | √ | √ | NE |
| 144 | *Sesamum alatum Thonn.* | | Pedaliaceae | √ | √ | NE |
| 145 | *Sida acuta* Burm.f. | | Malvaceae | √ | √ | NE |
| 146 | *Sida cordata* (Burm.f.) | Gayapaku | Malvaceae | | √ | NE |
| 147 | *Sida cordifolia* L. | | Malvaceae | | √ | NE |
| 148 | *Solanum nigrum* L. | Kamanchi | Solanaceae | | √ | NE |

| | | | | | | |
|---|---|---|---|---|---|---|
| 149 | *Solanum xanthocarpum* Schrad & Wendl | Mullavankai | Solanaceae | | √ | NE |
| 150 | *Spermacoce hispida* (L.) K.Schum | Madana | Rubiaceae | √ | √ | NE |
| 151 | *Sphaeranthus indicus* L. | Bodasaram | Asteraceae | | √ | LC |
| 152 | *Stachytarpheta jamaicensis* (L.)Vahl | | Verbenaceae | | √ | NE |
| 153 | *Stemodia viscosa* Roxb. | | Scrophulariaceae | √ | | NE |
| 154 | *Tephrosia purpurea* (L.) Pers | Vempali | Fabaceae | √ | √ | LC |
| 155 | *Tinospora cardifolia (Willd.) Hook.f. & Thoms* | Tippa teega | Menispermaceae | | √ | NE |
| 156 | *Tonningia axillaries* (L.) O. Ktze | | Commelinaceae | √ | + | NE |
| 157 | *Trianthema portulacastrum* L. | | Aizoaceae | √ | | NE |
| 158 | *Tribulus terrestris* L. | Palleru | Zygophyllaceae | √ | √ | NE |
| 159 | *Tridax procumbens* L. | Gaddi chamanthi | Asteraceae | √ | √ | NE |
| 160 | *Tylophora indica* (Burm.) Merr. | Kakkupala tega | Asclepiadaceae | | √ | NE |
| 161 | *Typha angustifolia* L. | Jambu thunga | Typhaceae | √ | | LC |
| 162 | *Vernonia cinerea* (L.) Less. | | Asteraceae | √ | √ | NE |
| 163 | *Vinca rosea* (L.) G.Don | | Apocynaceae | | √ | NE |
| 164 | *Vigna trilobata* (L.) Verdc. | Pillipesara | Fabaceae | √ | √ | NE |
| 165 | *Waltheria indica* L. | | Sterculiaceae | | √ | NE |
| 166 | *Wattakaka volubilis* (L.f) Stapf | Kalisi | Asclepiadaceae | | √ | NE |
| 167 | *Wolffia globosa* (Roxb.) Hartog & Plas | | Araceae | √ | √ | LC |
| 168 | *Xanthium indicum* Koen. Roxb. | Marulamatangi | Asteraceae | | √ | NE |

**Note:** √ Present, NE- Not Evaluated, LC- Least concern, DD-Data deficient

**Phtoplate: 1**

Weeds growth in Rice field

Weeds spread over in Cotton field


Growth rate of Rice and Weed species in the rice field

Murthy and his team has done much work on weeds in various crops of Andhra Pradesh with different aspects such as weeds in turmeric fields of Visakhapatnam and Kadapa (2011, 2014) where around 120 weeds were reported with various ecological aspects, weed diversity of north coastal Andhra Pradesh (2011), Phytosociological attributes of weeds in rice fields of Vishakhapatnam (2010), Phtytosociological attributes of North coastal Andhra Pradesh in (2012) and weed distribution in Sugarcane Fields (2013).

Ramamoorthy *et al*, (2004) said that the weed species diversity and distribution is dependent on climatic, edaphic and biotic factors. Sharrif and Forghanipoor (2011) reported more salinity and pH cause low weed diversity; however in the current the study region maximum numbers of species were reported. It covers 23.4% of weed species of Andhra Pradesh which was reported by Pullaiah and Chennaiah (1997).

Murthy and Venkaiah (2011) had reported 532 weed species in different crops such as rice, sugarcane, ground nut, finger millet and seasum but from this study 168 weeds species were exclusively present in rice and cotton fields. A total of 46 %

species are recorded form the rice fields, *Echinochloa spp.*, *Ischaemum indicum* and *Cyperus spp.* are highly trouble species in rice fields (Bambaradeniya and Gunatilleke 2002). The studies shows that Poaceae, Cyperaceae, Amaranthaceae, Asteraceae, Commelinaceae, Euphorbiaceae and Scrophulariaceae species are highly distributed in rice fields where as in cotton fields Euphorbiaceae, Fabaceae, Poaceae, Solanaceae, Asclepiadaceae, Amaranthaceae and Acanthaceae are the most dominant species. Weed diversity in vegetable crops was studied by Gaddeyya and Kumar (2014) and they reported Asteraceae, Fabaceae, Euphorbiaceae and Amaranthaceae as the dominant families in vegetable crops. Of the total *Cyperus spp.*, *Echinochloa spp.*, *Euphorbia hirta*, *Parthenium hysterophorus, Tridax procumbens* are predominantly present. Similar studies conducted in Satara region by Vishwas and Prakash (2013) reported that *Parthenium hysterophorus, Ageratum conyzoidis and Euphorbia geniculata* were dominant weed species in crop fields. Mani *et al*, (1975) had reported that *Parthenium hysterophorus* is mainly waste land species and spread throughout cultivation fields. Tamado and Milberg (2000) reported from Ethiopia, *Parthenium hysterophorus*, a species that has spread rapidly and now affects the livelihood of numerous small-scale farmers. Most of the weeds are herbaceous species, it's annual or biennial rather than perennial, these species complete their life cycle in shorter period leading to higher breeding (Kelton and Price 2009).

From the study region around 18 submerged, emerged and marshland weed species were recorded such as *Aponogeton natans*, *Asteracantha longifolia*, *Bacopa monnieri, Bergia capensis, Cyperus rotundus, Eclipta prostrate, Eichhornia crassipes, Hydrilla verticillata, Ipomoea aquatic, Lemna gibba, Marsilia quadrifolia, Monochoria vaginalis, Nelumbo nucifera, Nymphaea stellata, Nymphoides hydrophylla, Phyla nodiflora, Typha angustifolia* and *Wolffia globosa*, of this *Eichhornia crassipes, Nymphaea stellata, Nelumbo nucifera, Hydrilla verticillata* and *Typha angustifolia.* These are of primary concern in Indian agricultural fields (Varshney *et al*, 2008).

The present study shows that the majority of weed species reported from A handbook of some south Indian weeds by Tadulingam and Narayana (1932) were described about 108 weeds and in the revised edition 64 more species have been added by Rajasekhara and Sakharam (1955).

IUCN status is described as the value of a species and their range of distribution. From the study region a total of 39 least concern weeds are reported; of this *Brachiaria reptans, Commelina benghalensis, Panicum psilopodium, Tephrosia purpurea* found rich in cotton fields and *Cyperus rotundus, Lemna gibba, Marsilia quadrifolia* were found high in rice fields. Of the total least concern species 12 are aquatic weeds.

## CONCLUSION

Studies on weed biodiversity in agricultural fields are essential to help prevent them. Many researchers have worked on weeds of Andhra Pradesh in various crops in different regions except the present study region. Keeping this in view, the present study was under taken to reveal weeds of this region. The present study describes the detailed weed diversity in rice and cotton fields and this investigation is helpful to make effective weed management and high yield production. It is also highly helpful to agriculturists, taxonomists and policy makers to make suggestion for farmers in the weed management and for high crop production. The study is a preliminary attempt made to document the weed diversity in rice and cotton fields, further research work is needed to carry for inventory of weeds in other crops and control weeds.

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