Weed species diversity as influenced by sugarcane genotypes, trash mulch and weed management practices at Badeggi, Nigeria

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Abstract

This study was carried out to evaluate weed species composition based on observation and changes in response to trash mulch and weed management practices in two sugarcane genotypes in 2016 and 2017. The treatments consisted of factorial combination of two sugarcane genotypes (Bida local and NCS 001), four sugarcane trash mulch levels (0, 3, 6, 9 t ha^{-1}) and four weed management practices (weedy check, 5 monthly hoe weeding (5 MHW), pre-emergence (PE) application of diuron at 2 kg $a.iha^{-1}$ + Post-Emergence (POE) of 3-maize force at 179.2 gha^{-1} + two hoe weeding (2 HW)] and PE diuron + POE 3-maize force arranged in a split plot design and replicated three times. Weed management practices and trash mulch constitute the main plot while sugarcane genotypes constitute the subplot. Based on the importance value, the results indicated that*Paspalumscrobiculatum*(Linn), *Brachiariadeflexa* (Schumach) C.E, *Eleusineindica*(L.),*Brachiariajubata*(Fig & De Not.), *Seteriabarbata*(Lasr.)Kunth, *Dactylactenumaegyptium*(Linn), *Digitariamilangina*(Wild.), *Kyllingasquamulata* (Thorn.exVahl), *Phyllanthusniruri*(Schum&Thonn), *Commelina.Benghalensis*(L.), *Corchorusolitorius*(L.), *Hyptissuaveolens*(Poit), *Digitarianuda* (Schumach.) and *Cyperusesculentus* (Linn) were the most important weeds insugarcane fields in both years in the study area. The most notable weeds associated with the sugarcane crop were grasses followed by sedges families. Weed control methods in sugarcane should be made towards the control of grasses and sedges species.

Keywords: Sugarcane trash; weed management; species; diversity; sugarcane

Introduction

Sugarcane (*Saccharumofficinarum L.*)accountsfor 75%oftheworld'ssucroseproduction (Da SilvaandBressian,2005). Besides the production of raw sugar of which sugarcane is mainly produced for, sugarcane also represents an importantsource of renewable energy which has recen tly gainedattention because of ethanol production (Smeets*et al.*, 2009).

Weeds pose tough competition to sugarcane crop because of wide spacing, slow germination and initial growth, heavy fertilization and frequent irrigations (Refsell and Hartzler, 2009). Initial slow growth and wider row spacing provide ample opportunity for weeds to occupy the vacant spaces between rows and offer serious crop- weed competition. Apart from the quantitative damages caused by weeds due to competition with water, light and nutrients, weeds also cause a reduction in crop yield. Singh and Tomar (2005) reported yield loss to an extent of 28 -38% in ratoon crop due to weeds, and the most critical period for weed competition was between 30-60 days after ratoon initiation. Weedcan reduce sugarcane tonnage in the field, sucrose recovery in

the mills and shortened ratoon lives. The extent of loss in cane yield caused by weeds is fr 10% to total crop failure depending upon composition and diversity of weeds (Takim a Amodu, 2013).

In order to determine the yield losses of sugarcane in relation to weed species and their densi the weed species abundance should be documented. This information will be useful determining the occurrence and relative importance of weed species in sugarcane cr production system (Firehun and Tamado 2007). It is therefore imperative that if the we population and their reproductioncharacteristic are known, this information could be used guide farmers and estate producer's options in integrated management systems(Firehun a Tamado 2007). No such information is available from this area. Thus, the objectives of this stu were; to determine the phytosociological characters of weeds, and to identify the most import weeds associatedwith sugarcane crop in this area

Materials and Methods

Experimental site

Field trial was conducted at the upland sugarcane experimental fieldat the National Cere Research Institute, Badeggi (lat. 9^0 45' N, long. 06^0 07' E) in the Southern Guinea savanna Nigeria in 2016 and 2017 rainy season. The total rainfall during the experimental period v 1504.1 mm in 2016 and 1045.4 mm in 2017, respectively. The mean air temperature during sugarcane plant cropping season was 35 to 38°C in 2016 and 34 to 36°C in 2017plant cropp seasons.The experiment was initiated in the first week of February in 2016 and 20 respectively.

Treatments and experimental design

The treatments consist of factorial combination of two sugarcane genotypes, Chewing cane (B local) and Industrial cane(NCS 001), four cane trash mulching levels, (0, 3, 6, 9 t ha^{-1}) and f weed management practices [(weedy check, 5 monthly hoe weeding (5MHW), Pre-emergence Diuron at 2 kg a.i/ha (PE) + Post-Emergence(POE) metolachlor at 179.2 g/ha + Two l weeding (2 HW) and PE diuron + metolachlor] arranged as a split plot and replicated three tin Herbicides were applied with knapsack (CP3) sprayer at a spray volume of 4l/ha. W management practices and mulching were allocated in the main plot, while sugarcane genoty in the subplot. The gross plot size was 35 m^2 (7 m x 5 m), while the net plot size was 17.5 (3.5 m x 5 m). Each net plot consists of four rows of 5 m long.

Agronomic practices

Prior to cultivation, the vegetative cover of the experimental site was manually cleared, ploug and harrowed with a tractor. Tender healthy young stalks of six months old sugarcane were u as planting material. The stalks were cut into setts each containing three eye buds and horizontally end to end per row. The PE diuronwas applied a day after planting at the rate of kg a.i/ha while the POE metolachlor was applied at five weeks after planting (WAP) at a rat 179.2g a.i/ha. The weeds were identified using the handbook of West African We (Akobundu*et al.*, 2016). Basal application of 120 kg ha^{-1} N fertilizer as urea, 60 kg P ha single superphosphate and 90 kg K ha^{-1} as muriate of potash were split – applied. Half applied at planting while the remaining was applied at 8-10 WAP during the earthing up in f

of band placement. Fertilizers were applied by side banding at about 5 cm away from the seedlings and at about 5 cm deep along the ridge.

Data collection

Weed samples were collected from a (1 x 1 m^2) quadrat placed discreetly in each plot at 9 months after planting (MAP). A total of 96 sugarcane planted crops were sampled. Weed seedlings in each quadrat were pulled out, counted and separated by species.The weeds were identified using the handbook of West African Weeds (Akobundu*et al.*, 2016). Irrespective of trash mulch and weed management practice, the weed phytosociological parameters collected in the two sugarcane genotypes were frequency, density, dominance, and their relative values and importance value index.

Data analysis

The composition of the weed species were analyzed by calculating the importance Value Index (IVI) of each species within each plot as follows:

IVI = [Relative frequency (RF) + Relative density (R.Dn.) + Relative dominance (R.Do.)] (Das, 2011)

Where

$$\text{Relative frequency (RF)} = \frac{\text{Number of occurrence of a species}}{\text{Sum / total of occurrence of all species}} \times 100$$

$$\text{Relative density (R.Dn.)} = \frac{\text{Total number of individuals of a species in all the quadrats}}{\text{Total number of individuals of all the species in all quadrats}} \times 100$$

$$\text{Relative dominance (R.Do)} = \frac{\text{Abundance of a species}}{\text{Sum- total of abundance of all species (£Ai)}} \times 100 = \frac{A}{} \times 100 \quad \text{(Das, 2011)}$$

Where 'A' is the abundance of a species and '(£Ai)' is the sum of abundance of all species

Results and Discussion

In terms of relative frequency, a total of 46 weed species were identified across the fields of sugarcane genotypes (Table 1). The most frequent weed species in NCS 001 with relative frequency above 10 % were *P. scrobiculatum* and *E. indica* (L.) in 2016, and *C. dactylon* (Linn.) and *H. suaveolens* (Poit.) in 2017. On the other hand, in Bida local, the most frequent weed species were *P. scrobiculatum* and *E. indica* (L.) in 2016. However, in 2017, *C. dactylon* Linn.and*H. suaveolens*Poit were observed. Results of this study shows that the high frequency of this species is an indication of their importance as troublesome weeds of sugarcane. The reason is because of their ability to adapt to the local conditions and compete efficiently with the sugarcane crops. In a previous study, Ramirez *et. al* (2017) stated that weed species may exhibit high frequencies only in environments that they are adapted to irrespective of the disturbances in the ecological conditions of the site.

In terms of relative density, only three species, namely *P. scrobiculatum* Linn.and*K. squamulata*Thorn.ex. Vahl in both genotypes and *B. deflexa*Schumach CE in NCS 001 in 2016 were most densely populated. Furthermore in 2017, *C. dactylon* (Linn.) and *H. suaveolens* (Poit.) in both genotypes, and *D. aegyptium* Linn in NCS001 and *B. diffusa* L. in Bida local were also densely populated. Our finding shows that species of the Poaceae family were highly prevalent in sugarcane field in each year of the study. This finding is in consonance with Ndarubu*et al.*(2006) and Takim*et al.*(2014) who reputed that species of Poaceae family are the most densely populated weeds associated with sugarcane, followed by broadleaved weeds and the sedges being the least.

During the study period, highest dominance was observed in *K. squamulata*Thorn.ex. Vahl in both genotypes and *B. deflexa*Schumach CE in NCS 001 in 2016. In 2017, highest dominance was observed in *P. niruri* (Schum and Thonn), *H. suaveolens* (Poit.) and *D. nuda* in NCS 001 genotypes while*C. dactylon* (Linn.) and *B. deflexa*Schumach in Bida local genotypes. The dominance of this species indicated their power of regeneration, tolerance ability and survivability in sugarcane fields. In Nigeria, Ndarubu*et al.*(2006) earlier reported the scourge of poaceae family on the Nigerian sugar company Bacita fields.

Furthermore, the phytosociological study shows that nine species were most dominant in 2016 in both genotypes namely *P. scrobiculatum, B. deflexa, E. indica, B. jubata, S. barbata, D. aegyptium, D. milangina, K. squamulata and C. esculentus*. In 2017, the weed species with highest important value index in both genotypes were *P. niruri, B. deflexa, C. esculentus, C. benghalensis, D. aegyptium, C. olitorius, H. suaveolens, D. nuda, B. diffusa, S. chamaelea* with *P. scrobiculatum* and *C. dactylon* in NCS 001 genotype only and *C. diffusa* in Bida local only. The high important value of these species indicated their dominance and ecological success was due to their high phenotypic plasticity, more competitive characteristics such as large production of seeds, alternating forms of propagation and a high capacity of spread. Similar observationwere made by Blanco (2014).

Conclusion

This study was able to establish that the most important weeds that were associated with sugarcane crop in the study area were mostly grasses, a few broadleaved and sedges. The most important weed species of sugarcane in both seasons were *P. scrobiculatum, B. deflexa, E. indica, B. jubata, S. barbata, D. aegyptium, D. milangina, K. squamulata* and *C. esculentus*. The weed species with high IVI in sugarcane suggest their adaptation and ability to produce high number of seeds in the soil seed bank. Effective weed management should strategize on the control of growth and reproduction of the grass and sedge weed species infestation.

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Table 1: Weed species composition and their relative frequency under two sugarcane varieties at 9 MAP

Weed species	LC	MG	Relative frequency			
			NCS 001		Bida local	
			2016	2017	2016	2017
Paspalumscrobiculatum Linn.	P	G	12.37	4.0	13.89	3.53
Setariapumila(Poir)	A	G	1.03	-	2.39	-
Cynadondactylon (Linn.)	P	S	2.06	10.89	1.15	10.59
Phyllanthusniruri (Schum.&Thonn)	A	S	-	4.0	-	5.88
Commelinadiffusa (Burm.)	P	S	-	-	5.85	-
Kyllingasquamulata (Thorn.exVahl)	A	S	8.25	-	6.89	-
Eragrostistremula (Hochst.ex.Steud)	A	G	-	-	2.39	-
Sacciolepis Africana (Hubb& Snowden)	P	G	3.09	-	2.39	-
Panicumlaxum Sw.	A	G	2.06	-	1.15	-
Brachiariadeflexa (Schumach) C.E	A	G	5.16	2.97	4.59	3.53
Euphorbia hirta (Linn.)	A	B	-	-	3.55	-
Digitariahorizontalis (Willd.)	A	G	4.02	-	8.06	-
Tridaxprocumbens (Linn.)	A	B	2.06	-	1.15	1.18
Eleusineindica(L) Gaertn.	A	G	11.34	-	10.35	-
Ludwigiahyssopifolia (G.Don)	A	B	3.09	-	-	-
Brachiariajubata (Fig&De Not.)	A	G	5.16	-	6.89	-
Cyperusesculentus (Linn.)	P	S	4.02	8.91	4.59	8.24
Seteriabarbata (Lasr.)Kunth	A	G	3.09	-	1.15	-
Imperata cylindrical (Linn.)	P	G	2.06	0.99	3.55	2.35
Commelinabenghalensis (L.)	P	B	5.16	9.90	-	8.24
Trianthemaportulacastrum (Linn.)	A	B	1.03	-	1.15	-
Tephrosia bracteolate (Guill&Perr.)	A	B	2.06	-	1.15	-
Dactylactenumaegyptium (Linn.)	A	G	5.16	9.90	3.55	9.41
Setarialongiseta (P.Beauv.)	A	G	-	-	2.39	-
Corchorusolitorius (L.)	A	B	1.03	6.93	1.15	8.24
Rottboelliacochinchinensis (Lour.)	A	G	1.03	2.0	-	1.17
Cleome hirta(L.)	A	B	2.06	-	1.15	-
Chlorispilosa (Schumach)	A	G	1.03	-	-	-
Setariaverticilillata (Lam.) Kunth	A	G	2.06	-	1.15	-
Cyperusrotundus (Linn.)	P	S	1.03	-	1.15	-
Cleome viscose(L.)	A	B	2.06	-	2.39	-
Digitariamilangina (Wild.)	A	G	4.02	-	1.15	-
Desmodiumtortuosum (Sw.)DC.	A	B	-	-	1.15	-
Sesamumalatum (Thonning)	A	B	-	-	-	1.18
Gomphrenacelosiodes (Mart.)	A	B	-	0.99	-	-
Ipomoea asarifolia (Desr.)Roem	P	B	-	-	1.15	-
Hyptissuaveolens (Poit)	A	B	2.06	12.87	1.15	15.19
Andropogongayanus(Schum.&Thonn)	P	G	1.03	-	1.15	-
Digitarianuda (Schumach.)	A	G	-	5.0	-	5.88
Boerhaviadiffusa (L.)	A	B	-	2.0	-	2.35
Physalisangulata (Linn.)	A	B	-	2.97	-	-
Schwenckia Americana (L.)	P	B	-	2.0	-	3.53
Sebastianachamaelea (L.) Muell.Arg.	P	B	-	8.91	-	7.06
Tephrosialinearis (Wild.) Pers.	A	B	-	2.97	-	1.18
Calopogoniummucunoides (Desv.)	P	B	-	-	-	1.18
Leucasmartinicensis (Jacq.) Ait.f.	A	B	-	2.0	-	-

LC-Life cycle, MG- Morphological group

Table 2: Weed species composition and their relative density under two sugarcane varieties at 9 MAP

Weed species	LC	MG	Relative density			
			NCS 001		Bida local	
			2016	2017	2016	2017
Paspalumscrobiculatum Linn.	P	G	22.27	2.89	20.83	1.13
Setariapumila(Poir)	A	G	0.80	-	5.25	-
Cynadondactylon (Linn.)	P	S	0.37	15.96	0.49	21.09
Phyllanthusniruri (Schum.&Thonn)	A	S	-	7.23	-	2.89
Commelinadiffusa (Burm.)	P	S	-	-	1.35	-
Kyllingasquamulata (Thorn.exVahl)	A	S	19.99	-	19.73	-
Eragrostistremula (Hochst.ex.Steud)	A	G	-	-	1.35	-
Sacciolepis Africana (Hubb& Snowden)	P	G	1.79	-	1.59	-
Panicumlaxum Sw.	A	G	1.67	-	0.67	-
Brachiariadeflexa (Schumach) C.E	A	G	11.73	3.57	5.76	4.67
Euphorbia hirta (Linn.)	A	B	-	-	0.43	-
Digitariahorizontalis (Willd.)	A	G	1.48	-	8.89	-
Tridaxprocumbens (Linn.)	A	B	0.31	-	0.18	0.16
Eleusineindica(L) Gaertn.	A	G	9.49	-	9.29	-
Ludwigiahyssopifolia (G.Don)	A	B	0.25	-	-	-
Brachiariajubata (Fig&De Not.)	A	G	7.04	-	4.29	-
Cyperusesculentus (Linn.)	P	S	1.67	5.60	3.37	9.18
Seteriabarbata (Lasr.)Kunth	A	G	5.38	-	2.61	-
Imperata cylindrical (Linn.)	P	G	1.36	0.51	1.35	2.09
Commelinabenghalensis (L.)	P	B	1.60	3.74	-	7.09
Trianthemaportulacastrum (Linn.)	A	B	0.12	-	0.55	-
Tephrosia bracteolate (Guill&Perr.)	A	B	0.25	-	0.06	-
Dactylactenumaegyptium (Linn.)	A	G	3.27	13.24	6.62	3.54
Setarialongiseta (P.Beauv.)	A	G	-	-	2.51	-
Corchorusolitorius (L.)	A	B	0.12	4.41	0.12	3.06
Rottboelliacochinchinensis (Lour.)	A	G	0.56	0.51	-	0.16
Cleome hirta(L.)	A	B	0.43	-	0.18	-
Chlorispilosa (Schumach)	A	G	0.80	-	-	-
Setariaverticillillata (Lam.) Kunth	A	G	0.56	-	0.25	-
Cyperusrotundus (Linn.)	P	S	0.12	-	0.18	-
Cleome viscose(L.)	A	B	0.56	-	0.31	-
Digitariamilangina (Wild.)	A	G	5.13	-	0.55	-
Desmodiumtortuosum (Sw.)DC.	A	B	-	-	0.18	-
Sesamumalatum (Thonning)	A	B	-	-	-	0.33
Gomphrenacelosiodes (Mart.)	A	B	-	0.51	-	-
Ipomoea asarifolia (Desr.)Roem	P	B	-	-	0.12	-
Hyptissuaveolens (Poit)	A	B	0.19	25.81	0.12	15.62
Andropogongayanus(Schum.&Thonn)	P	G	0.68	-	0.40	-
Digitarianuda (Schumach.)	A	G	-	8.32	-	8.05
Boerhaviadiffusa (L.)	A	B	-	2.38	-	16.43
Physalisangulata (Linn.)	A	B	-	0.51	-	-
Schwenckia Americana (L.)	P	B	-	0.51	-	1.61
Sebastianachamaelea (L.) Muell.Arg.	P	B	-	2.55	-	2.42
Tephrosialinearis (Wild.) Pers.	A	B	-	1.63	-	0.16
Calopogoniummucunoides (Desv.)	P	B	-	-	-	0.33
Leucasmartinicensis (Jacq.) Ait.f.	A	B	-	0.34	-	-

LC-Life cycle, MG- Morphological group

Table 3: Weed species composition and their relative dominance under two sugarcane varieties at 9 MAP

Weed species	LC	MG	Relative dominance			
			NCS 001		Bida local	
			2016	2017	2016	2017
Paspalumscrobiculatum Linn.	P	G	9.17	4.63	6.64	1.69
Setariapumila(Poir)	A	G	4.25	-	9.85	-
Cynadondactylon (Linn.)	P	S	0.96	9.30	1.88	10.66
Phyllanthusniruri (Schum.&Thonn)	A	S	-	11.53	-	2.61
Commelinadiffusa (Burm.)	P	S	-	-	1.03	-
Kyllingasquamulata (Thorn.exVahl)	A	S	12.28	-	12.59	-
Eragrostistremula (Hochst.ex.Steud)	A	G	-	-	2.58	-
Sacciolepis Africana (Hubb& Snowden)	P	G	3.08	-	3.05	-
Panicumlaxum Sw.	A	G	4.31	-	2.58	-
Brachiariadeflexa (Schumach) C.E	A	G	11.09	7.62	5.51	7.11
Euphorbia hirta (Linn.)	A	B	-	-	0.55	-
Digitariahorizontalis (Willd.)	A	G	1.91	-	4.86	-
Tridaxprocumbens (Linn.)	A	B	0.79	-	0.70	0.73
Eleusineindica(L) Gaertn.	A	G	4.46	-	3.91	-
Ludwigiahyssopifolia (G.Don)	A	B	0.42	-	-	-
Brachiariajubata (Fig&De Not.)	A	G	6.25	-	2.74	-
Cyperusesculentus (Linn.)	P	S	2.15	3.99	3.23	5.91
Seteriabarbata (Lasr.)Kunth	A	G	7.55	-	9.62	-
Imperata cylindrical (Linn.)	P	G	3.51	3.37	1.72	4.72
Commelinabenghalensis (L.)	P	B	1.66	2.39	-	4.66
Trianthemaportulacastrum (Linn.)	A	B	0.64	-	2.11	-
Tephrosia bracteolate (Guill&Perr.)	A	B	0.64	-	0.24	-
Dactylactenumaegyptium (Linn.)	A	G	3.38	8.44	8.44	1.99
Setarialongiseta (P.Beauv.)	A	G	-	-	4.81	-
Corchorusolitorius (L.)	A	B	0.64	4.04	0.47	1.97
Rottboelliacochinchinensis (Lour.)	A	G	2.87	1.63	-	0.73
Cleome hirta(L.)	A	B	1.12	-	0.70	-
Chlorispilosa (Schumach)	A	G	4.25	-	-	-
Setariaverticilillata (Lam.) Kunth	A	G	1.44	-	0.94	-
Cyperusrotundus (Linn.)	P	S	0.64	-	0.70	-
Cleome viscose(L.)	A	B	1.44	-	0.59	-
Digitariamilangina (Wild.)	A	G	5.34	-	2.21	-
Desmodiumtortuosum (Sw.)DC.	A	B	-	-	0.70	-
Sesamumalatum (Thonning)	A	B	-	-	-	1.45
Gomphrenacelosiodes (Mart.)	A	B	-	3.27	-	-
Ipomoea asarifolia (Desr.)Roem	P	B	-	-	0.47	-
Hyptissuaveolens (Poit)	A	B	0.49	12.73	0.47	5.18
Andropogongayanus(Schum.&Thonn)	P	G	3.51	-	4.42	-
Digitarianuda (Schumach.)	A	G	-	10.67	-	7.36
Boerhaviadiffusa (L.)	A	B	-	7.62	-	36.99
Physalisangulata (Linn.)	A	B	-	1.09	-	-
Schwenckia Americana (L.)	P	B	-	1.63	-	2.52
Sebastianachamaelea (L.) Muell.Arg.	P	B	-	1.82	-	1.81
Tephrosialinearis (Wild.) Pers.	A	B	-	3.27	-	0.73
Calopogoniummucunoides (Desv.)	P	B	-	-	-	1.45
Leucasmartinicensis (Jacq.) Ait.f.	A	B	-	1.09	-	-

LC-Life cycle, MG- Morphological group

Table 4: Weed species composition and their IVI under two sugarcane varieties at 9 MAP

			IVI			
			NCS 001		Bida local	
Weed species	LC	MG	2016	2017	2016	2017
Paspalumscrobiculatum Linn.	P	G	42.81	11.47	41.26	6.35
Setariapumila(Poir)	A	G	5.98	-	17.29	-
Cynadondactylon (Linn.)	P	S	3.02	36.15	3.52	42.24
Phyllanthusniruri (Schum.&Thonn)	A	S	-	22.52	-	11.39
Commelinadiffusa (Burm.)	P	S	-	-	8.13	-
Kyllingasquamulata (Thorn.exVahl)	A	S	39.51	-	39.22	-
Eragrostistremula (Hochst.ex.Steud)	A	G	-	-	6.23	-
Sacciolepis Africana (Hubb& Snowden)	P	G	7.96	-	6.94	-
Panicumlaxum Sw.	A	G	8.03	-	4.40	-
Brachiariadeflexa (Schumach) C.E	A	G	26.98	14.16	15.87	15.21
Euphorbia hirta (Linn.)	A	B	-	-	4.42	-
Digitariahorizontalis (Willd.)	A	G	7.52	-	21.79	-
Tridaxprocumbens (Linn.)	A	B	3.17	-	2.04	2.06
Eleusineindica(L) Gaertn.	A	G	25.29	-	23.45	-
Ludwigiahyssopifolia (G.Don)	A	B	3.76	-	-	-
Brachiariajubata (Fig&De Not.)	A	G	17.45	-	13.92	-
Cyperusesculentus (Linn.)	P	S	7.94	18.51	11.19	23.32
Seteriabarbata (Lasr.)Kunth	A	G	15.02	-	13.28	-
Imperata cylindrical (Linn.)	P	G	6.93	4.77	6.52	9.16
Commelinabenghalensis (L.)	P	B	8.42	16.03	-	19.88
Trianthemaportulacastrum (Linn.)	A	B	1.79	-	3.81	-
Tephrosia bracteolate (Guill&Perr.)	A	B	2.95	-	1.45	-
Dactylactenumaegyptium (Linn.)	A	G	11.80	31.58	18.51	14.95
Setarialongiseta (P.Beauv.)	A	G	-	-	9.26	-
Corchorusolitorius (L.)	A	B	1.79	15.39	1.74	13.26
Rottboelliacochinchinensis (Lour.)	A	G	4.46	4.12	-	2.06
Cleome hirta(L.)	A	B	3.61	-	2.04	-
Chlorispilosa (Schumach)	A	G	5.98	-	-	-
Setariaverticilillata (Lam.) Kunth	A	G	4.05	-	2.33	-
Cyperusrotundus (Linn.)	P	S	1.79	-	2.04	-
Cleome viscose(L.)	A	B	4.05	-	3.19	-
Digitariamilangina (Wild.)	A	G	13.59	-	3.81	-
Desmodiumtortuosum (Sw.)DC.	A	B	-	-	2.04	-
Sesamumalatum (Thonning)	A	B	-	-	-	2.95
Gomphrenacelosiodes (Mart.)	A	B	-	4.77	-	-
Ipomoea asarifolia (Desr.)Roem	P	B	-	-	1.74	-
Hyptissuaveolens (Poit)	A	B	2.73	51.41	1.74	35.99
Andropogongayanus(Schum.&Thonn)	P	G	5.22	-	6.47	-
Digitarianuda (Schumach.)	A	G	-	23.94	-	21.19
Boerhaviadiffusa (L.)	A	B	-	11.98	-	55.78
Physalisangulata (Linn.)	A	B	-	4.57	-	-
Schwenckia Americana (L.)	P	B	-	4.12	-	7.56
Sebastianachamaelea (L.) Muell.Arg.	P	B	-	13.27	-	11.29
Tephrosialinearis (Wild.) Pers.	A	B	-	7.77	-	2.06
Calopogoniummucunoides (Desv.)	P	B	-	-	-	2.95
Leucasmartinicensis (Jacq.) Ait.f.	A	B	-	3.41	-	-

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