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Rainy Season Weed Species Diversity in Aligarh District (Uttar Pradesh) India

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ABSTRACT

An intensive survey of rainy season weeds of agriculture of Aligarh district (Uttar Pradesh, India) in four major crops yielded 285 species (Dicot 202, Monocot 83) belonging to 189 genera (Dicot 137, Monocot 52) and 56 families (Dicot 49, Monocot 07). Highest number of weeds (189) were collected from sugarcane fields followed by rice fields (163), maize (137) and pearl millet (114). 236 weeds were terrestrial, 23 aquatic, and 82 marshy. Limnophyton obtusifolium is recorded first time in Asia as a weed of rice.

Key words: *Weeds, Agriculture, Rainy season, Paddy, Aligarh,*

INTRODUCTION

Australian Weed Strategy[1] defined a weed as *'a plant that requires some form of action to reduce its harmful effects on the economy, the environment, human health and amenity*'. Crop yield losses caused by weeds exceed the losses caused by fungi, bacteria, viruses or animal pests[7, 9]. Therefore, an effective weed control and management strategy is of critical importance to ensure maximum agricultural output. A comprehensive inventory of weeds is a basic requirement to prepare a sound weed control program. Developed countries like Australia[8], China[10], Russia[6], and United States[3] have made great progress in documentation of weeds at national and state levels. Underdeveloped and developing countries, including India, have yet not reached that level in weed documentation.

Review of literature suggests that documentation of agricultural weeds progressed at more rapid pace in south Indian states, Gujarat, Jammu and Kashmir, West Bengal and Odisha etc. In the state of Uttar Pradesh the study of agricultural weeds is still in an incipient stage as evident from a small number of publications[5, 11, 12, 13, 14]. These publications pertain to eastern part of the state. Weeds flora of western Uttar Pradesh is largely unexplored, therefore, present study was conducted to explore and document the weed flora of Aligarh district.

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MATERIAL AND METHODS

Study area

Aligarh district is situated in central part of Gnaga-Yamuna *doab* in western Uttar Pradesh between latitudes $27^{O}34'$ to $28^{O}11'$ N and longitudes $77^{O}29'$ to $78^{O}38'$ E. The district comprises 05 tehsils (Atrauli, Gabhana, Kahir, Koil and Iglas) and about 1180 villages. Topographically, the district has a shallow basin like appearance due to eastern and western uplands and the central low lying area.

The district is characterized by monsoon type of climate. Major proportion of total rainfall (252.5 mm, 92% of total rainfall) in received in the months of July, August and September. Winter season starts in mid November and continues up to the month of February. The temperature falls to minimum in the month of January with an average of 15 ^{O}C. Cold weather storms may cause a little rainfall in winter season. Summer season starts in the month of March and ends in mid June. The mean maximum temperature may rise to 45 ^{O}C in the months of May and June.

Soil of Aligarh is mostly alluvial. Young alluvium (*Khadar*) occurs in the flood affected areas of the rivers while old alluvium (*bangar/bhangar*) occurs above the flood levels of the rivers and their tributaries. Large areas of *bhangar* lands have become unsuitable for agriculture due to the presence of *reh* soil (soil with white surface incrustation of salts of calcium, magnesium and sodium).

Agricultural profile

About 81% (301000 ha) of the geographical area of Aligarh (369694 ha) is under cultivation. Following *Kharif* (Rainy season) crops are grown in the district: Pigeon pea [*Cajanus cajan* (L.) Millsp.], Pearl millet [*Pennisetum americanum* (L.) Leeke], Maize [*Zea mays* L.], and Rice [*Oryza sativa* L.]), Sugarcane (*Saccharum officinarum* L.), a long term crop, also occupies fields during rainy season [*https://data.gov.in/resources/district-wise-season-wise-crop-production-statistics-1997/download* (Accessed on 23/03/2017)].

Survey work

A total of 100 villages, 20 in each of 05 tehsils of the district were intensively surveyed. Each survey area was visited once in each crop season for two successive crop years. After identification nomenclature was updated following "The Plant List" (http://www.theplantlist.org/), "International Plant Name Index" (https://www.ipni.org/) and "Tropicos" (http://www.tropicos.org/).

RESULTS AND DISCUSSION

A total of 285 weed species (202 dicot and 83 monocot) were collected from four major crops (Table 1). These species belonged to 189 genera (137 dicot and 52 monocot) and 56 families (49 dicot and 7 monocot). Poaceae (48 species), Cyperaceae (22 species), Convolvulaceae and Fabaceae (17 species each), Asteraceae and Euphorbiaceae (15 species) and Scrophulariaceae (13 species) together contribute 147 species (51.6% of total specie) to the weed flora. Cyperaceae and Poaceae contribute 70 species (84.33% of total monocot species) to monocot weed flora. 236 species were terrestrial, 23 aquatic and 82 species grew in marshy habitats, especially rice fields. Among the four crops, sugarcane fields accounted for 189 species, rice fields, maize fields and pearl millet fields for 163, 137 and 114 species respectively. High weed diversity of sugarcane fields may be attributed to high moisture level, long crop duration and tall relatively strong plants which allow many climbing species to survive. All species of *Ipomoea*, except *I. carnea* and *I. triloba* were collected from sugarcane fields. Paddy fields provide a unique kind of habitat as they must be flooded at the time of transplanting and growth. Besides the amphibious species, a good number of hydrophytes grow in paddy fields, and many species which occur in rice-fields do not occur in any other crop. Occurrence of *Limnophyton obtusifolium* (L.) Miq. as a weed of paddy field is a significant new record as this species is reported neither in ' A practical Field Guide to Weeds of Rice in Asia'[2] nor in ' A Global Compendium of Weeds'[8]. This work is a significant contribution towards the accomplishment of the first goal of 'Mission 2030'[4]. This document outlines five approaches to achieve

the first goal (Weed biology and eco-physiology) and the first approach is "Collection, identification and maintenance of weed herbarium and weed seeds".

Table 1: Rainy season weeds of Aligarh district (So: *Saccharum officinarum*, Pa: *Pennisetum americanum*, Zm: *Zea mays*, Os: *Oryza sativa*)

Sl. No.	Species	Family	Crop
1	*Abelmoschus esculentus* (L.) Moench	Malvaceae	Fl
2	*Abrus precatorius* L.	Fabaceae	So
3	*Abutilon indicum* (L.) Sweet	Malvaceae	Pa, So,
4	*Acalypha indica* L.	Euphorbiaceae	Fl
5	*Achyranthes aspera* L.	Amaranthaceae	OS, Zm, Pa, So,
6	*Acrachne racemosa* (B. Heyne ex Roth) Ohwi	Poaceae	Os, Zm, Pa, So
7	*Aerva javanica* (Burm.f.) Juss. ex Schult.	Amaranthaceae	Os, Zm, Pa, So
8	*Aerva lanata* (L.) Juss.	Amaranthaceae	Fl
9	*Aeschynomene indica* L.	Fabaceae	Os, So
10	*Alternanthera paronychioides* A. St.-Hil.	Amaranthaceae	Os, So
11	*Alternanthera pungens* Kunth	Amaranthaceae	Zm. Pa, So
12	*Alternanthera sessilis* (L.) R.Br. ex DC.	Amaranthaceae	Os, Zm, Pa, So,
13	*Alysicarpus bupleurifolius* (L.) DC.	Fabaceae	Os, Zm, So
14	*Alysicarpus monilifer* (L.) DC.	Fabaceae	Os, So
15	*Alysicarpus vaginalis* (L.) DC.	Fabaceae	Os, Zm, Pa, So
16	*Amaranthus spinosus* L.	Amaranthaceae	Os, Zm, Pa, So
17	*Ammannia auriculata* Willd.	Lythraceae	Os, Zm, Pa, So
18	*Ammannia baccifera* L.	Lythraceae	Os, Zm, Pa, So
19	*Anisomeles indica* (L.) Kuntze	Lamiaceae	Os, So
20	*Apluda mutica* L.	Poaceae	Os
21	*Argemone mexicana* L.	Papaveraceae	Pa, So,
22	*Argemone ochroleuca* Sweet	Papaveraceae	Pa, So,
23	*Artemisia scoparia* Waldst. & Kitam.	Asteraceae	Os, So
24	*Arundo donax* L.	Poaceae	Fl
25	*Bacopa monnieri* (L.) Wettst.	Scrophulariaceae	Os, So
26	*Basella alba* L.	Basellaceae	Fl
27	*Bidens pilosa* L.	Asteraceae	Os, Zm, Pa, So
28	*Blepharis maderaspatensis* (L.) B. Heyne ex Roth	Acanthaceae	Os, Pa, So
29	*Boerhavia chinensis* (L.) Rottb.	Nyctaginaceae	Os
30	*Boerhavia diffusa* L.	Nyctaginaceae	Os, Zm, Pa, So
31	*Bolboschoenus maritimus* (L.) Palla	Cyperaceae	Os
32	*Bothriochloa pertusa* (L.) A. Camus	Poaceae	Zm, Pa, So
33	*Brachiaria ramosa* (L.) Stapf	Poaceae	Os, Zm, Pa, So
34	*Brachiaria reptans* (L.) C.A.Gardner & C.E.Hubb.	Poaceae	Os, Zm, Pa, So
35	*Bulbostylis barbata* (Rottb.) C.B. Clarke	Cyperaceae	Os, Zm, Pa, So
36	*Caesalpinia bonduc* (L.) Roxb.	Caesalpiniaceae	Fl
37	*Caesulia axillaris* Roxb.	Asteraceae	Os
38	*Cajanus scarabaeoides* (L.) Thouars	Fabaceae	So
39	*Calotropis procera* subsp. *hamiltonii* (Wight) Ali	Asclepiadaceae	Os, Zm, Pa, So
40	*Cannabis sativa* L.	Cannabaceae	Zm, So
41	*Cardiospermum halicacabum* L.	Sapindaceae	Zm, So
42	*Catharanthus pusillus* (Murray) G. Don	Apocynaceae	Os, So
43	*Cayratia trifolia* (L.) Domin	Vitaceae	Os, So
44	*Celosia argentea* L.	Amaranthaceae	So
45	*Cenchrus ciliaris* L.	Poaceae	Os, Zm, Pa, So
46	*Cenchrus setigerus* Vahl	Poaceae	Os, Zm, Pa, So
47	*Centella asiatica* (L.) Urb.	Apiaceae	Os, So
48	*Chamaecrista pumila* (Lam.) K. Larsen	Caesalpiniaceae	Os, Zm, Pa, So
49	*Chloris barbata* Sw.	Poaceae	Os, Pa, So
50	*Chloris dolichostachya* Lag.	Poaceae	Os, Pa, So
51	*Chloris virgata* Chloris virgata Sw.	Poaceae	Os
52	*Chrozophora plicata* (Vahl) A. Juss. ex Spreng.	Euphorbiaceae	Os
53	*Cissampelos glaberrima* A.St.-Hil.	Menispermaceae	Zm, So
54	*Citrullus colocynthis* (L.) Schrad.	Cucurbitaceae	Zm. So
55	*Cleome gynandra* L.	Cleomaceae	Os, Zm, Pa, So
56	*Cleome viscosa* L.	Cleomaceae	Os, Zm, Pa, So
57	*Clerodendrum indicum* (L.) Kuntze	Verbenaceae	Os
58	*Clerodendrum infortunatum* L.	Verbenaceae	Fl
59	*Clerodendrum phlomidis* L.	Verbenaceae	Fl
60	*Coccinia grandis* (L.) Voigt	Cucurbitaceae	Fl
61	*Cocculus hirsutus* (L.) W. Theob.	Menispermaceae	Pa, So
62	*Coix lacryma-jobi* L.	Poaceae	Fl
63	*Commelina benghalensis* L.	Commelinaceae	Os, Zm, Pa, So
64	*Commelina caroliniana* Walter	Commelinaceae	Os, Zm, Pa, So
65	*Commelina forsskalii* Vahl	Commelinaceae	Os, Zm, Pa, So
66	*Conyza japonica* (Thunb.) Less. ex Less.	Asteraceae	Zm, Pa, So
67	*Corchorus aestuans* L.	Tiliaceae	Os, Zm, Pa, So
68	*Corchorus capsularis* L.	Tiliaceae	Os, So
69	*Corchorus olitorius* L.	Tiliaceae	Zm, Pa, So
70	*Corchorus tridens* L.	Tiliaceae	Fl
71	*Corchorus trilocularis* L.	Tiliaceae	Fl
72	*Crotalaria medicaginea* Lam.	Fabaceae	Zm, Pa, So
73	*Croton bonplandianus* Baill.	Euphorbiaceae	Os, Zm, Pa, So
74	*Cyanotis cristata* (L.) D. Don	Commelinaceae	Os, So
75	*Cyanthillium cinereum* (L.) H.Rob.	Asteraceae	Os, Zm, Pa, So

76	*Cynodon dactylon* (L.) Pers.	Poaceae	Os, Zm, Pa, So
77	*Cynoglossum zeylanicum* (Vahl) Brand	Boraginaceae	So
78	*Cyperus alopecuroides* Rottb.	Cyperaceae	Os
79	*Cyperus compressus* L.	Cyperaceae	Os, Zm, Pa, So
80	*Cyperus cuspidatus* Kunth	Cyperaceae	Os, Zm, Pa, So
81	*Cyperus difformis* L.	Cyperaceae	Os
82	*Cyperus dubius* Rottb.	Cyperaceae	Zm, So
83	*Cyperus iria* L.	Cyperaceae	Os, Zm, So
84	*Cyperus michelianus* (L.) Delile	Cyperaceae	Os, Zm, Pa, So
85	*Cyperus pangorei* Rottb.	Cyperaceae	Os
86	*Cyperus rotundus* L.	Cyperaceae	Os, Zm, Pa, So
87	*Cyperus squarrosus* L.	Cyperaceae	Os,Pa
88	*Cyperus tenuispica* Steud.	Cyperaceae	Os, So
89	*Dactyloctenium aegyptium* (L.) Willd.	Poaceae	Os, Zm, Pa, So
90	*Datura innoxia* Mill.	Solanaceae	Zm, Pa, So
91	*Datura metel* L.	Solanaceae	So
92	*Desmodium gangeticum* (L.) DC.	Fabaceae	Os, Zm, So
93	*Desmodium triflorum* (L.) DC.	Fabaceae	Zm, Pa, So
94	*Desmostachya bipinnata* (L.) Stapf	Poaceae	Fl
95	*Dichanthium annulatum* (Forssk.) Stapf	Poaceae	Os, Zm, Pa, So
96	*Dicliptera paniculata* (Forssk.) I. Darbysh.	Acanthaceae	Zm, So
97	*Digitaria ciliaris* (Retz.) Koeler	Poaceae	Os, Zm, Pa, So
98	*Digitaria setigera* Roth	Poaceae	Fl
99	*Diplachne fusca* (L.) P. Beauv. ex Roem. & Schult.	Poaceae	Os
100	*Dysphania ambrosioides* (L.) Mosyakin & Clemants	Chenopodiaceae	Os, Zm, Pa, So
101	*Echinochloa colona* (L.) Link	Poaceae	Os, Zm, Pa, So
102	*Echinochloa crus-galli* (L.) P. Beauv.	Poaceae	Os, Zm, Pa, So
103	*Eclipta prostrata* (L.) L. Mant.	Asteraceae	Os, Zm, Pa, So
104	*Eleocharis atropurpurea* (Retz.) J.Presl & C.Presl	Cyperaceae	Os
105	*Eleocharis palustris* (L.) Roem. & Schult.	Cyperaceae	Os
106	*Eleusine indica* (L.) Gaertn.	Poaceae	Os, Zm, Pa, So
107	*Elytraria acaulis* (L.f.) Lindau	Acanthaceae	Fl
108	*Emilia sonchifolia* (L.) DC. ex DC.	Asteraceae	Fl
109	*Eragrostiella bifaria* (Vahl) Bor	Poaceae	Fl
110	*Eragrostis amabilis* (L.) Wight & Arn.	Poaceae	Os, Pa, So
111	*Eragrostis ciliaris* (L.) R. Br.	Poaceae	Zm, Pa, So
112	*Eragrostis minor* Host	Poaceae	So
113	*Eragrostis pilosa* (L.) P. Beauv.	Poaceae	Os, Zm, So
114	*Eragrostis tremula* Hochst. ex Steud.	Poaceae	Os
115	*Erigeron canadensis* L.	Asteraceae	Os, Zm, Pa, So
116	*Eriochloa procera* (Retz.) C.E.Hubb.	Poaceae	Os, Zm, Pa, So
117	*Euphorbia chamaesyce* L.	Euphorbiaceae	Os, Zm, Pa, So
118	*Euphorbia heterophylla* L.	Euphorbiaceae	Os, Zm, Pa, So
119	*Euphorbia heyneana* Spreng.	Euphorbiaceae	So
120	*Euphorbia hirta* L.	Euphorbiaceae	Os, Zm, Pa, So
121	*Euphorbia indica* Lam.	Euphorbiaceae	Zm, Pa, So
122	*Euphorbia thymifolia* L.	Euphorbiaceae	So
123	*Evolvulus alsinoides* (L.) L.	Convolvulaceae	Fl
124	*Evolvulus nummularius* (L.) L.	Convolvulaceae	Pa, So
125	*Fimbristylis dichotoma* (L.) Vahl	Cyperaceae	Os, Zm, So
126	*Fimbristylis tenera* Schult.	Cyperaceae	Os, So
127	*Gisekia pharnaceoides* L.	Molluginaceae (Gisekiaceae)	Os, Zm, So
128	*Glinus lotoides* L.	Molluginaceae	Os, So
129	*Glinus oppositifolius* (L.) Aug.	Molluginaceae	Os, Zm
130	*Gomphrena celosioides* Mart.	Amaranthaceae	Os, Zm, Pa, So
131	*Gonostegia pentandra* (Roxb.) Miq.	Urticaceae	Os
132	*Gossypium hirsutum* L.	Malvaceae	So
133	*Grangea maderaspatana* (L.) Poir.	Asteraceae	Os, Zm, Pa, So
134	*Heliotropium indicum* L.	Boraginaceae	Fl
135	*Heliotropium marifolium* J.Koenig ex Retz.	Boraginaceae	Fl
136	*Heliotropium strigosum* Willd.	Boraginaceae	So
137	*Hemarthria compressa* (L.f.) R.Br.	Poaceae	Os
138	*Hemigraphis hirta* (Vahl) T. Anderson	Acanthaceae	Fl
139	*Hibiscus lobatus* (Murray) Kuntze	Malvaceae	Z, Pa, So
140	*Hibiscus vitifolius* L.	Malvaceae	So
141	*Hybanthus enneaspermus* (L.) F. Muell.	Violaceae	Zm, Pa
142	*Hygrophila auriculata* (Schumach.) Heine	Acanthaceae	Os
143	*Hygrophila polysperma* (Roxb.) T. Anderson	Acanthaceae	Os
144	*Hygroryza aristata* (Retz.) Nees ex Wight & Arn.	Poaceae	Os
145	*Hyptis suaveolens* (L.) Poit.	Lamiaceae	Fl
146	*Ichnocarpus frutescens* (L.) W.T.Aiton	Apocynaceae	Fl
147	*Imperata cylindrica* (L.) Raeusch.	Poaceae	Os, Zm, Pa, So
148	*Indigofera linifolia* (L.f.) Retz.	Fabaceae	Fl
149	*Indigofera linnaei* Ali	Fabaceae	Os, Zm, Pa, So
150	*Indigofera tinctoria* L.	Fabaceae	Os, Zm, Pa, So
151	*Ipomoea aquatica* Forssk.	Convolvulaceae	Os, So
152	*Ipomoea carnea* Jacq.	Convolvulaceae	Fl
153	*Ipomoea coptica* (L.) Roth ex Roem. & Schult.	Convolvulaceae	Os, So
154	*Ipomoea dichroa* Choisy	Convolvulaceae	So
155	*Ipomoea eriocarpa* R. Br.	Convolvulaceae	So
156	*Ipomoea nil* (L.) *Roth*	Convolvulaceae	So
157	*Ipomoea obscura* (L.) Ker Gawl.	Convolvulaceae	So
158	*Ipomoea pes-tigridis* L.	Convolvulaceae	So
159	*Ipomoea quamoclit* L.	Convolvulaceae	So

160	*Ipomoea sepiaria* Koenig ex Roxb.	Convolvulaceae	So
161	*Ipomoea triloba* L.	Convolvulaceae	Fl
162	*Ischaemum rugosum* Salisb.	Poaceae	Os, Fl
163	*Justicia japonica* Thunb.	Acanthaceae	Os, Zm, So
164	*Justicia quinqueangularis* K. D. Koenig ex Roxb.	Acanthaceae	Os, Zm. So
165	*Kyllinga brevifolia* Rottb.	Cyperaceae	Os, Zm, Pa, So
166	*Laggera aurita (*L. f.) Sch.-Bip. ex Clarke	Asteraceae	Os, Zm, So
167	*Lantana camara* L.	Verbenaceae	Fl
168	*Launaea procumbens* (Roxb.) Ramayya & Rajagopal	Asteraceae	Os, Zm, Pa, So
169	*Leptochloa panicea* (Retz.) Ohwi	Poaceae	Os, Zm, So
170	*Leucas aspera* (Willd.) Link	Lamiaceae	Zm, Pa, So
171	*Leucas cephalotes* (Roth) Spreng.	Lamiaceae	Zm, Pa, So
172	*Limnophila indica* (L.) Druce	Scrophulariaceae	Os
173	*Limnophyton obtusifolium* (L.) Miq.	Alismataceae	Os
174	*Lindenbergia indica* Vatke	Scrophulariaceae	Zm, Pa, So
175	*Lindernia antipoda* (L.) Alston	Scrophulariaceae	Os, Zm, So
176	*Lindernia ciliata (Colsm.) Pennell*	Scrophulariaceae)	Os, Pa, So
177	*Lindernia crustacea* (L.) F.Muell.	Scrophulariaceae	Os, So
178	*Lindernia multiflora* (Roxb.) Mukerjee	Scrophulariaceae	Os, So
179	*Lindernia procumbens* (Krock.) Philcox	Scrophulariaceae	Os, So
180	Ludwigia adscendens (L.) H. Hara	Onagraceae	Os
181	*Ludwigia octovalvis* (Jacq.) P.H.Raven	Onagraceae	Os
182	*Ludwigia perennis* L.	Onagraceae	Os
183	*Malvastrum coromandelianum* (L.) Garcke	Malvaceae	Os, Zm, Pa, So
184	*Martynia annua* L.	Martyniaceae	Zm, Pa, So
185	*Mazus pumilus* (Burm.f.) Steenis	Scrophulariaceae	Os, Zm, Pa, So
186	*Mecardonia procumbens* (Mill.) Small	Scrophulariaceae	Os, Zm, So
187	*Melochia corchorifolia* L.	Sterculiaceae	Os, So
188	*Merremia aegyptia* (L.) Urb.	Convolvulaceae	Fl
189	*Merremia dissecta* (Jacq.) Hallier f.	Convolvulaceae	Fl
190	*Merremia hederacea* (Burm. f.) Hallier f.	Convolvulaceae	So
191	*Mimosa pudica* L.	Mimosaceae	Os, So
192	*Mirabilis jalapa* L.	Nyctaginaceae	Fl
193	*Mollugo nudicaulis* Lam.	Molluginaceae	Os, Zm
194	*Mollugo pentaphylla* L.	Molluginaceae	Zm
195	*Monochoria vaginalis* (Burm.f.) C.Presl	Pontederiaceae	Os
196	*Mukia maderaspatana* (L.) M.Roem.	Cucurbitaceae	Pa, So
197	*Murdannia nudiflora* (L.) Brenan	Commelinaceae	Pa, So
198	*Nymphaea nouchali* Burm. f.	Nymphaeaceae	Os
199	*Nymphoides hydrophylla* (Lour.) Kuntze	Menyanthaceae	Os
200	*Ocimum americanum* L.	Lamiaceae	Zm, Pa, So
201	*Oldenlandia corymbosa* L.	Rubiaceae	Os, Zm, Pa, So
202	*Oligochaeta ramosa* Wagenitz Veröff.	Asteraceae	Os, Pa, So
203	*Operculina turpethum* (L.) Silva Manso	Convolvulaceae	Fl
204	*Oplismenus burmanni* (Retz.) P. Beauv.	Poaceae	Zm, Pa, So
205	*Oplismenus compositus* (L.) P. Beauv.	Poaceae	Zm
206	*Oryza rufipogon* Griff.	Poaceae	Os
207	*Oxalis corniculata* L.	Oxalidaceae	Os, Zm, Pa, So
208	*Oxystelma esculentum* (L. f.) Sm.	Asclepiadaceae	So
209	*Parthenium hysterophorus* L.	Asteraceae	Os, Zm, Pa, So
210	*Paspalidium flavidum* (Retz.) A. Camus	Poaceae	Os, Zm, Pa
211	*Paspalum paspalodes* (Michx.) Scribn.	Poaceae	Os
212	*Paspalum scrobiculatum* L.	Poaceae	Os
213	*Pedalium murex* L.	Pedaliaceae	Fl
214	*Pennisetum glaucum* (L.) R.Br.	Poaceae	Zm, So
215	*Pergularia daemia* (Forssk.) Chiov.	Asclepiadaceae	Fl
216	*Perotis indica* (L.) Kuntze	Poaceae	Fl
217	*Persicaria lapathifolia* (L.) Delarbre	Polygonaceae	Os
218	*Phyla nodiflora* (L.) Greene	Verbenaceae	Os, Zm, Pa, So
219	*Phyllanthus debilis* Klein ex Willd.	Euphorbiaceae	So
220	*Phyllanthus fraternus* G. L. Webster	Euphorbiaceae	Zm, Pa, So
221	*Phyllanthus maderaspatensis* L.	Euphorbiaceae	So
222	*Phyllanthus urinaria* L.	Euphorbiaceae	Os, Zm, Pa, So
223	*Phyllanthus virgatus* G. Forst.	Euphorbiaceae	Fl
224	*Physalis angulata* L.	Solanaceae	So
225	*Physalis minima* L.	Solanaceae	So
226	*Plumbago zeylanica* L.	Plumbaginaceae	Zm, Pa, So
227	*Pluchea lanceolata* (DC.) C. B. Clarke	Asteracea	Zm, Pa, So
228	*Polycarpaea corymbosa* (L.) Lam.	Caryophyllaceae	So
229	*Polygala chinensis* L.	Polygalaceae	Fl
230	*Polygonum plebeium* R.Br.	Polygonaceae	Os, Zm, Pa, So
231	*Portulaca oleracea* L.	Portulacaceae	Zm, Pa, So
232	*Portulaca pilosa* L.	Portulacaceae	Zm, Pa, So
233	*Portulaca quadrifida* L.	Portulacaceae	Zm, Pa, So
234	*Pupalia lappacea* (L.) Juss.	Amaranthaceae	Os, Zm, Pa, So
235	*Pycreus pumilus* (L.) Nees	Cyperaceae	Os, Zm, So
236	*Pycreus sanguinolentus* (Vahl) Nees	Cyperaceae	Zm, Pa, So
237	*Rhynchosia minima* (L.) DC.	Fabaceae	Zm, Pa, So
238	*Ricinus communis* L.	Euphorbiaceae	Fl
239	*Ruellia tuberosa* L.	Acanthaceae	Fl
240	*Saccharum ravennae* (L.) L.	Poaceae	Fl
241	*Saccharum spontaneum* L.	Poaceae	Fl
242	*Sagittaria guayanensis* subsp. *lappula* (D. Don) Bogin	Alismataceae	Os
243	*Schoenoplectiella articulata* (L.) Lye	Cyperaceae	Zm, So

244	*Schoenoplectiella roylei* (Nees) Lye	Cyperaceae	Zm
245	*Scoparia dulcis* L.	Scrophulariaceae	Os, Zm, Pa, So
246	*Senna obtusifolia* (L.) H. S. Irwin & Barneby	Caesalpiniaceae	Zm, Pa
247	*Senna occidentalis* (L.) Link	Caesalpiniaceae	Zm, Pa
248	*Senna sophera* (L.) Roxb.	Caesalpiniaceae	Zm, Pa
249	*Senna tora* (L.) Roxb.	Caesalpiniaceae	Os, Zm, Pa
250	*Sesamum indicum* L.	Pedaliaceae	Zm, Pa, So
251	*Sesbania bispinosa* (Jacq.) W.Wight	Fabaceae	Fl
252	*Seseli diffusum* (Roxb. ex Sm.) Santapau & Wagh	Apiaceae	Os, So
253	*Setaria verticillata* (L.) P.Beauv.	Poaceae	Os, Zm, Pa, So
254	*Sida acuta* Burm.f.	Malvaceae	Os, Zm, Pa, So
255	*Sida cordata* (Burm.f.) Borss.	Malvaceae	Os, Zm, Pa, So
256	*Sida rhombifolia* L.	Malvaceae	Os, Zm, Pa, So
257	*Solanum americanum* Mill.	Solanaceae	Os, Zm, Pa, So
258	*Solanum torvum* Sw.	Solanaceae	So
259	*Solanum virginianum* L.	Solanaceae	Os, Zm, Pa, So
260	*Sorghum halepense* (L.) Pers.	Poaceae	Os, Zm, Pa, So
261	*Spermacoce articularis* L. f.	Rubiaceae	Os, Zm, Pa, So
262	*Spermacoce pusilla* Wall.	Rubiaceae	Os, Zm, Pa, So
263	*Sphenoclea zeylanica* Gaertn.	Sphenocleaceae	Fl
264	*Spirodela polyrrhiza* (L.) Schleid.	Lemnaceae	Os
265	*Sporobolus diandrus* (Retz.) P.Beauv.	Poaceae	Pa, So
266	*Striga angustifolia* (D. Don) C.J. Saldanha	Scrophulariaceae	Os, Zm, So
267	*Telosma cordata* (Burm. f.) Merr.	Asclepiadaceae	Fl
268	*Tephrosia purpurea* (L.)	Fabaceae	Zm, Pa, So
269	*Teramnus labialis* (L. f.) Spreng.	Fabaceae	Zm, Pa, So
270	*Trianthema portulacastrum* L.	Aizoaceae	Os, Zm, Pa, So
271	*Tribulus terrestris* L.	Zygophyllaceae	Zm, Pa, So
272	*Trichodesma indicum* (L.) Lehm.	Boraginaceae	Fl
273	*Trichosanthes cucumerina* L.	Cucurbitaceae	Fl
274	*Tridax procumbens* L.	Asteraceae	Os, Zm, Pa, So
275	*Triumfetta rhomboidea* Jacq.	Tiliaceae	Os, Zm, Pa, So
276	*Typha domingensis* Pers.	Typhaceae	Os
277	*Typha elephantina* Roxb.	Typhaceae	Os
278	*Urena lobata* L.	Malvaceae	Os, Zm, Pa, So
279	*Urochloa panicoides* P. Beauv.	Poaceae	Os, Zm, Pa, So
280	*Utricularia stellaris* L. f.	Lentibulariaceae	Os
281	*Withania somnifera* (L.) Dunal	Solanaceae	Os, Zm, Pa, So
282	*Wolffia arrhiza* (L.) Horkel ex Wimmer	Lemnaceae	Os
283	*Xanthium strumarium* L.	Asteraceae	Os, Zm, Pa, So
284	*Zaleya govindia* (Buch.-Ham. ex G. Don) N.C.Nair	Aizoaceae	Os, Zm, Pa, So
285	*Zornia gibbosa* Span.	Fabaceae	Os, Zm, So

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