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## Diversity of Compositae Weeds in Commercial Plantations of Ekiti State Nigeria

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**Abstract:** The occurrence of Compositae weed species in *Cola nitida*, *Eleais guineensis* and *Theobroma cacao* plantations in Ekiti State, Nigeria was examined. Results obtained revealed that the compositae weeds constituted 73, 89 and 75% of the total number of weeds individuals sampled in the *Cola nitida*, *Eleais guineensis* and *Theobroma cacao* plantations respectively. The germination test conducted on the soil samples obtained from the three plantations also confirmed the dominance of the compositae weeds, in terms of density, in the soil seed bank of the commercial plantations. The percent compositions of compositae in the three plantations were 77, 76 and 77%, respectively.

**Key words:** Compositae, weeds, plantations, Nigeria

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### INTRODUCTION

Cantero *et al.* (2000) did stress the importance of phytosociological knowledge of species composition and diversity as well as their variation in space and time. Previous phytosociological studies by Kayode (1999 and 2000) had revealed that Ekiti State is extremely rich in weed species. Consequently Kayode (1999, 2003 and 2005) had in the recent times examined the diversity of compositae weeds in abandoned farmland, existing farmlands and the roadsides of the study area respectively.

The agrarian communities of the study area possessed lots of commercial plantations most especially plantations of *Cola nitida* (vent.) Schott and Endl., *Eleais guineensis* Jacq. and *Theobroma cacao* L. Thus, the present study aimed at providing the phytosociological information on the compositae weeds of the commercial plantations in the study area.

### MATERIALS AND METHODS

Detail description of the study area has been provided by Kayode (1999 and 2002). The state was divided into three zones: Ekiti North, Ekiti South and Ekiti Central, based on the existing geopolitical classification. Two plantations, each of *C. nitida*, *E. guineensis* and *T. cacao* were selected in each zone. In each plantation, a 100×100 m study plot was demarcated at the onset of the rainy season in June 2005. In each plot, a 50×50 cm quadrat was tossed fifty times and the compositae weeds in each quadrat were observed, identified, recorded and ranked based on their frequency of occurrence.

Also at the onset of the dry season in November 2005, five topsoil samples were collected within 20 m from each other from each of the demarcated plot. In each sample, the soil and the litter were carefully removed from 1×1 m quadrat to a depth of 4 cm in clean sacks. Germination experiments were later carried out in an open field using 25×25×10 cm germination boxes. Each box was filled to a depth of 9 cm with flame sterilized potting soil. The samples were thinly spread (2-5 mm) over the soil for maximum light exposure. Five boxes were used for samples from each plot.

Germination boxes were arranged randomly and watering was done twice daily (at 7.00 and 18.00 h GMT). The emergence of compositae was monitored daily for 28 days and seedlings were removed as they germinated. The Index of Similarity (IS) in the occurrence of compositae weed species in the soil samples was determined according to Kayode (1999).

## RESULTS AND DISCUSSION

Fifteen, seventeen and seventeen weed species were obtained from the *C. nitida*, *E. guineensis* and *T. cacao* plantations respectively. Among these species, the compositae constituted 53, 47 and 47, respectively. However, when the densities of the individual weed species were considered, the compositae constituted 73, 89 and 75% of the total number of weeds individuals in *C. nitida*, *E. guineensis* and *T. cacao* plantations respectively. This tends to suggest the dominance of the compositae species in these plantations (Table 1).

*C. odorata*, *B. pilosa* and *S. nodiflora* were the most dominant compositae species in terms of the abundance (Table 2). The indexes of similarity in the frequency of the compositae weeds in the three plantations were 87, 100 and 100%, respectively for *C. nitida*/*E. guineensis*, *C. nitida*/*T. cacao* and *E. guineensis*/*T. cacao* plantations (Table 3). Thus, indicating that the compositae weed species were common to all the three plantations. Kayode (1999) had earlier inferred that areas with similar climatic conditions will enhance the growth of related weed species. The test on the soil seed bank further confirmed the dominance of the three compositae i.e., *C. odorata*, *B. pilosa* and *S. nodiflora* and indeed members of the family compositae in the three plantations. The percent compositions of compositae in the three plantations were 77, 76 and 77%, respectively (Table 4). Compositae species germinated readily and profusely from the soil samples collected from the three plantations.

Table 1: Demographic features of weeds in commercial plantations of Ekiti State of Nigeria

Description	Plantations		
	<i>C. nitida</i>	<i>E. guineensis</i>	<i>T. cacao</i>
Total No. of weed species	15	17	17
No. of compositae weed species	8	8	8
Percent description of compositae weed species to the total number of weeds species	53%	47%	47%
Total No. of weed individuals	586	632	641
Total No. of compositae weeds individuals	427	561	483
Percent of compositae weed species to Total No. of weeds individuals	73%	89%	75%

Table 2: Rank order of the occurrence of compositae weeds in commercial plantations of Ekiti State, Nigeria

Rank (in terms of abundance)	Species name
1	<i>Chromolaena odorata</i> (L.) R. King and H. Rob
2	<i>Bidens pilosa</i> L.
3	<i>Synedrella nodiflora</i> (L.) Gaetn.
4	<i>Acanthospermum hispidum</i> DC.
5	<i>Ageranthum conyzoides</i> L.
6	<i>Emilia coccinea</i> (Sims) G. Don
7	<i>Conyza sumatrensis</i> (Retz.) E. Walker
8	<i>Tridax procumbens</i> L.
9	<i>Melanthera scadens</i> (Schumach. and Thonn.) Roberty

Table 3: The Index of Similarity (IS) in the occurrence of compositae weed species in the soil samples

Sample site	IS (%)
<i>C. nitida</i> / <i>E. guineensis</i>	87
<i>C. nitida</i> / <i>T. cacao</i>	100
<i>E. guineensis</i> / <i>T. cacao</i>	100

Table 4: Cumulative germination of weeds from the seed bank of soil samples from commercial plantations of Ekiti State, Nigeria

Days of germination	Species	No. of individuals/plantation		
		<i>C. nitida</i>	<i>E. guineensis</i>	<i>T. cacao</i>
7	<i>Chromolaena odorata</i>	89	96	78
	<i>Bidens pilosa</i>	56	80	62
	<i>Synedrella nodiflora</i>	38	30	26
	Other compositae weeds	28	42	40
	Other weeds	64	38	64
14	<i>Chromolaena odorata</i>	132	153	147
	<i>Bidens pilosa</i>	94	100	98
	<i>Synedrella nodiflora</i>	56	45	32
	Other compositae weeds	30	35	41
	Other weeds	72	71	80
21	<i>Chromolaena odorata</i>	186	202	192
	<i>Bidens pilosa</i>	100	112	103
	<i>Synedrella nodiflora</i>	62	56	48
	Other compositae weeds	37	40	42
	Other weeds	96	98	101
28	<i>Chromolaena odorata</i>	202	233	211
	<i>Bidens pilosa</i>	112	104	106
	<i>Synedrella nodiflora</i>	68	60	54
	Other compositae weeds	42	45	43
	Other weeds	126	141	122
	<b>Cumulative</b>			
	(a) Total No. of compositae weed individuals	424	442	414
	(b) Total No. of weeds individuals	550	583	536
	(c) Percent composition of compositae	77%	76%	77%

The occurrence of the compositae weed species in the seed bank of the commercial plantations might be attributed to their mode of reproduction, which is mainly from seeds that are widely dispersed by wind. Most of these seeds, according to Numata *et al.* (1964) are later buried in the soil due to the continuous accumulation of litter in the plantations. Some of such seeds germinated readily, especially those that occurred in depths ranging between 1 and 3 cm (Etejere and Okoro, 1989), when exposed to favourable light conditions (Kayode, 2005).

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