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Assessment the Seasonal Dynamics of Weed Community of Rammohan College: To Assume the Model of Seasonal Dynamics of Weeds of Kolkata

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Abstract: *The seasonal cycle of plant community is the most important biotic oscillations to mankind. This study built upon previous efforts to develop a comprehensive framework to studying this cycle systematically with the weed communities of Rammohan College.*

We suggest that the seasonal variation of plant community consists of six distinctive phases in sequence each of which results from the interaction between the inherent biological and ecological processes and the progression of climatic conditions and reflects the unique functioning of plant community at different stages of the growing season.

Keywords: *Weeds, Rammohan College, Seasonal Dynamics, Abundance, Kolkata*

I. INTRODUCTION

The dynamics of plant community consists of diurnal and seasonal cycles. These two cycles are the most important biotic oscillations to mankind.

The diurnal photosynthetic cycle is primarily driven by changes in light availability associated with the rotation of the Earth and is thus relatively predictable. The seasonal cycle, however, is more complex (Rannik *et al*,2000). It is a process orchestrated by internal biological mechanisms and driven by systematic changes in a suite of inter dependent environmental factors such as temperature, photoperiod, radiation, moisture, and nutrient availability.

The study of the plant community of Rammohan College at the seasonal time scale can be considered as an extension of plant phenology (Gu *et al*. 2002-2003a;b).

This extension, or “vegetation phenology”, represents the functional aspect of plant phenology while traditional plant phenological studies focus on the structural aspect such as bud break, flowering, leaf coloring and leaf fall. Research on vegetation photosynthetic phenology can enrich the ancient but revived discipline of phenology so that it can become a truly integrative environmental science (Schwartz, 2003).

Sites and Data Used in the Present Study

Rammohan College is located in the heart of the city of Kolkata, West Bengal, India. This area is approximately 300 years old and highly urbanized with little or almost no greenery (22.582952⁰N & 88.370997⁰E). The college has got a small garden, where butterflies frequently visit and sometimes complete their life cycle and a large uninhabited open space where weeds are available in plenty in numbers.

The survey has been carried out for a period of five years (10/12/2017 –13/12/2022), in college working days. The roads inside the college campus were used as fixed transects. Weekly observations were carried out during morning hours (08:00 hrs to 10:00 hrs), plants were collected and preserved for identification. Occurrence and Relative abundance has been recorded and all statistical analysis has performed using SPSS 23.

II. RESULT

TABLE 1 List of Plant Species Found in Rammohan College with their Seasonal Abundance

SCIENTIFIC NAME	FAMILY	JAN-FEB	MAR-APR	MAY-JUNE	JULY-AUG	SEP-OCT	NOV-DEC	Comment
<u><i>Solanum nigrum</i> L.</u>	<u>Solanaceae</u>	+	+	-	+	+	+	Annual herb Perennial herb with rhizome
<u><i>Eragrostis tenella</i> (L.) Beauv. ex R. & S.</u>	<u>Poaceae</u>	+	+	+	+	+	+	Perennial herb with rhizome
<u><i>Eleusine indica</i> (L.) Gaertn.</u>	<u>Poaceae</u>	+	+	+	+	+	+	Perennial herb with wiry rhizome
<u><i>Cynodon dactylon</i> (L.) Pers.</u>	<u>Poaceae</u>	+	+	+	+	+	+	Perennial rhizomatous herb
<u><i>Oldenlandia corymbosa</i> L.</u>	<u>Rubiaceae</u>	-	-	-	+	+	+	Annual herb
<u><i>Oldenlandia paniculata</i> L.</u>	<u>Rubiaceae</u>	-	-	-	+	+	+	Annual herb
<u><i>Dactyloctenium aegyptium</i> (L.) Wild.</u>	<u>Poaceae</u>	+	+	+	+	+	+	Perennial herb
<u><i>Ageratum conyzoides</i> L.</u>	<u>Asteraceae</u>	+	-	-	+	+	+	Annual herb
<u><i>Vernonia cineria</i> (L.) H. Rob.</u>	<u>Asteraceae</u>	+	+	+	+	+	+	Perennial herb
<u><i>Blumea lacera</i> (Roxb.) DC.</u>	<u>Asteraceae</u>	+	+	-	-	-	+	Annual herb
<u><i>Lindenbergia indica</i> (L.) Kuntz.</u>	<u>Scrophulariaceae</u>	-	-	-	+	+	+	Annual herb
<u><i>Mazus rugosus</i> Lour.</u>	<u>Scrophulariaceae</u>	-	-	-	+	+	-	Annual tiny herb
<u><i>Vandellia crustacea</i> (L.) Benth.</u>	<u>Scrophulariaceae</u>	-	-	-	+	+	-	Annual herb
<u><i>Lindernia oppositifolia</i> (Retz.) Muk.</u>	<u>Scrophulariaceae</u>	-	-	-	+	+	-	Annual herb
<u><i>Vandellia hirsuta</i> Buch.-Ham. ex Benth.</u>	<u>Scrophulariaceae</u>	-	-	-	+	+	+	Annual prostrate herb
<u><i>Phylla nodiflora</i> (L.) Greene</u>	<u>Verbenaceae</u>	+	+	+	+	+	+	Perennial prostrate herb
<u><i>Rungia parviflora</i> (Retz.) Nees</u>	<u>Acanthaceae</u>	+	+	-	-	-	+	Annual herb
<u><i>Desmodium triflorum</i> (L.) DC.</u>	<u>Fabaceae</u>	+	+	+	+	+	+	Perennial prostrate herb
<u><i>Alternanthera sessilis</i> (L.) R. Br. ex DC.</u>	<u>Amaranthaceae</u>	+	+	+	+	+	+	Perennial herb
<u><i>Alternanthera paronychioides</i> A. St.-Hil.</u>	<u>Amaranthaceae</u>	+	+	+	+	+	+	Perennial herb
<u><i>Alternanthera ficoidea</i> (L.) Sm.</u>	<u>Amaranthaceae</u>	+	+	+	+	+	+	Perennial herb
<u><i>Amaranthus viridis</i> L.</u>	<u>Amaranthaceae</u>	+	-	-	-	+	+	Annual herb
<u><i>Amaranthus spinosus</i> L.</u>	<u>Amaranthaceae</u>	+	+	-	-	+	+	Annual prickly herb
<u><i>Tillanthera filoxeroides</i> (Mart.) Moq.</u>	<u>Amaranthaceae</u>	-	-	+	+	+	-	Annual herb Perennial herb with somewhat woody rootstc
<u><i>Aerva lanata</i> (L.) Juss. ex Schult.</u>	<u>Amaranthaceae</u>	+	+	+	+	+	+	Annual herb
<u><i>Nasturtium indicum</i> Oliv.</u>	<u>Brassicaceae</u>	-	-	-	+	+	+	Annual herb
<u><i>Mecardonia procumbens</i> (Mill.) Small.</u>	<u>Scrophulariaceae</u>	+	+	-	-	-	+	Annual prostrate herb
<u><i>Pilea microphylla</i> (L.) Liebm.</u>	<u>Urticaceae</u>	-	-	-	+	+	-	Tiny annual herb Annual herb with stinging hairs
<u><i>Laportia interrupta</i> (L.) Chew.</u>	<u>Urticaceae</u>	-	-	-	+	+	-	Annual herb
<u><i>Nicotiana plumbaginifolia</i> Viv.</u>	<u>Solanaceae</u>	+	+	-	-	+	-	Annual herb
<u><i>Cyperus rotundus</i> L.</u>	<u>Cyperaceae</u>	+	+	+	+	+	+	Perennial herb with cori
<u><i>Cyperus iria</i> L.</u>	<u>Cyperaceae</u>	-	-	+	+	+	-	Annual herb Perennial rhizomatous herb
<u><i>Kyllinga brevistylis</i> Rottb.</u>	<u>Cyperaceae</u>	+	+	+	+	+	+	Annual/perennial herb Perennial rhizomatous herb
<u><i>Andrographis paniculata</i> (Burm. f.) Nees</u>	<u>Acanthaceae</u>	+	+	-	-	+	+	Annual herb
<u><i>Andropogon aciculatus</i> (Retz.) Trin.</u>	<u>Poaceae</u>	+	+	+	+	+	+	Perennial herb
<u><i>Dentella repens</i> (L.) J. R. Forst & G. Forst.</u>	<u>Rubiaceae</u>	-	-	+	+	+	-	Annual prostrate herb
<u><i>Dentella serpyllifolia</i> Wall. ex Craib.</u>	<u>Rubiaceae</u>	-	-	+	+	+	-	Annual prostrate herb
<u><i>Oplismenus burmannii</i> (Retz.)P. Beauv.</u>	<u>Poaceae</u>	+	+	+	+	+	+	Perennial herb
<u><i>Digitaria ciliaris</i> (Retz.) Koeler</u>	<u>Poaceae</u>	-	-	-	+	+	-	Annual herb
<u><i>Digitaria sanguinalis</i> (L.) Scop.</u>	<u>Poaceae</u>	-	-	-	+	+	-	Annual herb
<u><i>Chloris barbata</i> Sw.</u>	<u>Poaceae</u>	+	-	-	+	+	+	Annual herb
<u><i>Sida rhombifolia</i> L.</u>	<u>Malvaceae</u>	+	+	+	+	+	+	Perennial undershrub

<i>Crotalaria pallida</i> Aiton	Fabaceae	+	-	-	+	+	+	Annual herb
<i>Euphorbia hirta</i> L.	Euphorbiaceae	+	+	+	+	+	+	Perennial herb
<i>Euphorbia parviflora</i> L.	Euphorbiaceae	+	-	-	+	+	+	Annual herb
<i>Euphorbia microphylla</i> L.	Euphorbiaceae	+	-	-	-	=	+	Annual prostrate herb
<i>Phyllanthus urinaria</i> L.	Euphorbiaceae	-	-	+	+	+	-	annual herb
<i>Phyllanthus fraternus</i> Webster	Euphorbiaceae	-	-	+	+	+	-	Annual herb
<i>Tribulus terrestris</i> L.	Zygophyllaceae	-	-	+	+	+	+	Prostrate herb
<i>Centella asiatica</i> (L.) Urban	Apiaceae	+	+	+	+	+	+	Perennial herb with runner
<i>Physalis minima</i> L.	Solanaceae	-	-	-	+	+	+	Annual herb
<i>Solanum sisymbriifolium</i> Lam.	Solanaceae	+	+	+	+	+	+	Perennial prickly herb
<i>Evolvulus nummularius</i> (L.) L.	Convolvulaceae	+	+	+	+	+	+	Perennial prostrate herb
<i>Evolvulus alsinoides</i> (L.) L.	Convolvulaceae	-	-	+	+	+	-	Annual prostrate herb
<i>Coldenia procumbens</i> L.	Boraginaceae	+	+	+	+	+	+	Perennial herb
<i>Heliotropium indicum</i> L.	Boraginaceae	-	-	+	+	+	-	Annual herb
<i>Leucas aspera</i> (Willd.) Link	Lamiaceae	-	-	+	+	+	-	Annual aromatic herb
<i>Leucas cephalotes</i> (Roth) Spreng	Lamiaceae	-	-	+	+	+	-	Annual herb
<i>Leonurus japonicus</i> Houtt.	Lamiaceae	+	+	-	-	-	+	Annual herb
<i>Scoparia dulcis</i> L.	Scrophulariaceae	-	-	+	+	+	+	Annual herb
<i>Cleome viscosa</i> L.	Capparidaceae	-	-	+	+	+	-	Annual herb
<i>Cleome rutidosperma</i> DC.	Capparidaceae	+	+	+	+	-	-	Annual herb
<i>Cleome gynandra</i> L.	Capparidaceae	-	-	+	+	+	+	Annual herb
<i>Bulbostylis densa</i> (Wall.) Hand. -Mazz.	Cyperaceae	-	-	+	+	+	-	Annual herb
<i>Brachiara reptans</i> (L.) Gardner & Hubb.	Poaceae	+	+	+	+	+	+	Perennial herb
<i>Brachiaria distachya</i> (L.) Stapf.	Poaceae	+	+	+	+	+	+	Perennial herb
<i>Dichanthium annulatum</i> (Forsk.) Stapf.	Poaceae	-	-	+	+	-	-	Annual herb
<i>Echinochloa stagnina</i> (Retz.) P. Beauv.	Poaceae	-	-	+	+	+	-	Annual herb
<i>Leptochloa chinensis</i> (L.) Nees	Poaceae	-	-	+	+	+	-	Annual herb
<i>Hybanthus enneaspermus</i> (L.) F. Muell.	Violaceae	+	-	-	+	+	+	Annual herb

SCIENTIFIC NAME	FAMILY	JAN-FEB	MAR-APR	MAY-JUNE	JULY-AUG	SEP-OCT	NOV-DEC	Comment
<i>Solanum nigrum</i> L.	Solanaceae	+	+	-	+	+	+	Annual herb
<i>Eragrostis tenella</i> (L.) Beauv. ex R. & S.	Poaceae	+	+	+	+	+	+	Perennial herb with rhizome
<i>Eleusine indica</i> (L.) Gaertn.	Poaceae	+	+	+	+	+	+	Perennial herb with rhizome
<i>Cynodon dactylon</i> (L.) Pers.	Poaceae	+	+	+	+	+	+	Perennial herb with wiry rhizome
<i>Oldenlandia corymbosa</i> L.	Rubiaceae	-	-	-	+	+	+	Annual herb
<i>Oldenlandia paniculata</i> L.	Rubiaceae	-	-	-	+	+	+	Annual herb
<i>Dactyloctenium aegyptium</i> (L.) Wild.	Poaceae	+	+	+	+	+	+	Perennial rhizomatous herb
<i>Ageratum conyzoides</i> L.	Asteraceae	+	-	-	+	+	+	Annual herb
<i>Vernonia cineria</i> (L.) H. Rob.	Asteraceae	+	+	+	+	+	+	Perennial herb
<i>Blumea lacera</i> (Roxb.) DC.	Asteraceae	+	+	-	-	-	+	Annual herb
<i>Lindenbergia indica</i> (L.) Kuntz.	Scrophulariaceae	-	-	-	+	+	+	Annual herb
<i>Mazus rugosus</i> Lour.	Scrophulariaceae	-	-	-	+	+	-	Annual tiny herb
<i>Vandellia crustacea</i> (L.) Benth.	Scrophulariaceae	-	-	-	+	+	-	Annual herb
<i>Lindernia oppositifolia</i> (Retz.) Muk.	Scrophulariaceae	-	-	-	+	+	-	Annual herb
<i>Vandellia hirsuta</i> Buch.-Ham. ex Benth.	Scrophulariaceae	-	-	-	+	+	+	Annual prostrate herb
<i>Phylla nodiflora</i> (L.) Greene	Verbenaceae	+	+	+	+	+	+	Perennial prostrate herb
<i>Rungia parviflora</i> (Retz.) Nees	Acanthaceae	+	+	-	-	-	+	Annual herb
<i>Desmodium triflorum</i> (L.) DC.	Fabaceae	+	+	+	+	+	+	Perennial prostrate herb
<i>Alternanthera sessilis</i> (L.) R. Br. ex DC.	Amaranthaceae	+	+	+	+	+	+	Perennial herb

<u>Alternanthera paronychioides</u> A. St.-Hil.	<u>Amaranthaceae</u>	+	+	+	+	+	+	Perennial herb
<u>Alternanthera ficoidea</u> (L.) Sm.	<u>Amaranthaceae</u>	+	+	+	+	+	+	Perennial herb
<u>Amaranthus viridis</u> L.	<u>Amaranthaceae</u>	+	-	-	-	+	+	Annual herb
<u>Amaranthus spinosus</u> L.	<u>Amaranthaceae</u>	+	+	-	-	+	+	Annual prickly herb
<u>Tillanthera filoxeroides</u> (Mart.) Moq.	<u>Amaranthaceae</u>	-	-	+	+	+	-	Annual herb
<u>Aerva lanata</u> (L.) Juss. ex Schult.	<u>Amaranthaceae</u>	+	+	+	+	+	+	Perennial herb with somewhat woody rootstock
<u>Nasturtium indicum</u> Oliv.	<u>Brassicaceae</u>	-	-	-	+	+	+	Annual herb
<u>Mecardonia procumbens</u> (Mill.) Small.	<u>Scrophulariaceae</u>	+	+	-	-	-	+	Annual prostrate herb
<u>Pilea microphylla</u> (L.) Liebm.	<u>Urticaceae</u>	-	-	-	+	+	-	Tiny annual herb
<u>Laportia interrupta</u> (L.) Chew.	<u>Urticaceae</u>	-	-	-	+	+	-	Annual herb with stinging hairs
<u>Nicotiana plumbaginifolia</u> Viv.	<u>Solanaceae</u>	+	+	-	-	+	-	Annual herb
<u>Cyperus rotundus</u> L.	<u>Cyperaceae</u>	+	+	+	+	+	+	Perennial herb with corm
<u>Cyperus iria</u> L.	<u>Cyperaceae</u>	-	-	+	+	+	-	Annual herb
<u>Kyllinga brevistylis</u> Roth.	<u>Cyperaceae</u>	+	+	+	+	+	+	Perennial rhizomatous herb
<u>Andrographis paniculata</u> (Burm. f.) Nees	<u>Acanthaceae</u>	+	+	-	-	+	+	Annual/perennial herb
<u>Andropogon aciculatus</u> (Retz.) Trin.	<u>Poaceae</u>	+	+	+	+	+	+	Perennial rhizomatous herb
<u>Dentella repens</u> (L.) J. R. Forst & G. Forst.	<u>Rubiaceae</u>	-	-	+	+	+	-	Annual prostrate herb
<u>Dentella serpyllifolia</u> Wall. ex Craib.	<u>Rubiaceae</u>	-	-	+	+	+	-	Annual prostrate herb
<u>Oplismenus burmannii</u> (Retz.) P. Beauv.	<u>Poaceae</u>	+	+	+	+	+	+	Perennial herb
<u>Digitaria ciliaris</u> (Retz.) Koeler	<u>Poaceae</u>	-	-	-	+	+	-	Annual herb
<u>Digitaria sanguinalis</u> (L.) Scop.	<u>Poaceae</u>	-	-	-	+	+	-	Annual herb
<u>Chloris barbata</u> Sw.	<u>Poaceae</u>	+	-	-	+	+	+	Annual herb
<u>Sida rhombifolia</u> L.	<u>Malvaceae</u>	+	+	+	+	+	+	Perennial undershrub
<u>Sida acuta</u> Burm.f.	<u>Malvaceae</u>	+	+	+	+	+	+	Perennial undershrub
<u>Sida cordifolia</u> L.	<u>Malvaceae</u>	+	+	+	+	+	+	Perennial undershrub
<u>Crotalaria pallida</u> Aiton	<u>Fabaceae</u>	+	-	-	+	+	+	Annual herb
<u>Euphorbia hirta</u> L.	<u>Euphorbiaceae</u>	+	+	+	+	+	+	Perennial herb
<u>Euphorbia parviflora</u> L.	<u>Euphorbiaceae</u>	+	-	-	+	+	+	Annual herb
<u>Euphorbia microphylla</u> L.	<u>Euphorbiaceae</u>	+	-	-	-	=	+	Annual prostrate herb
<u>Phyllanthus urinaria</u> L.	<u>Euphorbiaceae</u>	-	-	+	+	+	-	annual herb
<u>Phyllanthus fraternus</u> Webster	<u>Euphorbiaceae</u>	-	-	+	+	+	-	Annual herb
<u>Tribulus terrestris</u> L.	<u>Zygophyllaceae</u>	-	-	+	+	+	+	Prostrate herb
<u>Centella asiatica</u> (L.) Urban	<u>Apiaceae</u>	+	+	+	+	+	+	Perennial herb with runner
<u>Physalis minima</u> L.	<u>Solanaceae</u>	-	-	-	+	+	+	Annual herb
<u>Solanum sisymbirifolium</u> Lam.	<u>Solanaceae</u>	+	+	+	+	+	+	Perennial prickly herb
<u>Evolvulus nummularius</u> (L.) L.	<u>Convolvulaceae</u>	+	+	+	+	+	+	Perennial prostrate herb
<u>Evolvulus alsinoides</u> (L.) L.	<u>Convolvulaceae</u>	-	-	+	+	+	-	Annual prostrate herb
<u>Coldenia procumbens</u> L.	<u>Boraginaceae</u>	+	+	+	+	+	+	Perennial herb
<u>Heliotropium indicum</u> L.	<u>Boraginaceae</u>	-	-	+	+	+	-	Annual herb
<u>Leucas aspera</u> (Willd.) Link	<u>Lamiaceae</u>	-	-	+	+	+	-	Annual aromatic herb
<u>Leucas cephalotes</u> (Roth) Spreng	<u>Lamiaceae</u>	-	-	+	+	+	-	Annual herb
<u>Leonurus japonicus</u> Houtt.	<u>Lamiaceae</u>	+	+	-	-	-	+	Annual herb

<i>Scoparia dulcis</i> L.	Scrophulariaceae	-	-	+	+	+	+	Annual herb
<i>Cleome viscosa</i> L.	Capparidaceae	-	-	+	+	+	-	Annual herb
<i>Cleome ruidosperma</i> DC.	Capparidaceae	+	+	+	+	-	-	Annual herb
<i>Cleome gynandra</i> L.	Capparidaceae	-	-	+	+	+	+	Annual herb
<i>Bulbostylis densa</i> (Wall.) Hand. - Mazz.	Cyperaceae	-	-	+	+	+	-	Annual herb
<i>Brachiaria reptans</i> (L.) Gardner & Hubb.	Poaceae	+	+	+	+	+	+	Perennial herb
<i>Brachiaria distachya</i> (L.) Stapf.	Poaceae	+	+	+	+	+	+	Perennial herb
<i>Dichanthium annulatum</i> (Forsk.) Stapf.	Poaceae	-	-	+	+	-	-	Annual herb
<i>Echinochloa stagnina</i> (Retz.) P. Beauv.	Poaceae	-	-	+	+	+	-	Annual herb
<i>Leptochloa chinensis</i> (L.) Nees	Poaceae	-	-	+	+	+	-	Annual herb
<i>Hybanthus enneaspermus</i> (L.) F. Muell.	Violaceae	+	-	-	+	+	+	Annual herb

Table 2
Variance explained by principal components (6 components)

	Jan-Feb	Mar-Apr	May-June	July-Aug	Sep-Oct	Nov-Dec
Individual	0.57	0.25	0.09	0.05	0.04	0.00
Cumulative	0.57	0.82	0.91	0.96	1.00	1.00

Table 3
Principal components (6 data points in rows, 6 components in columns):

	PC1	PC2	PC3	PC4	PC5	PC6
January-February	-5.21	1.08	-2.25	1.50	-1.31	0.00
March-April	-5.46	-1.63	-0.77	-1.28	1.91	0.00
May-June	2.00	-6.01	1.07	-0.19	-1.10	-0.00
July-August	5.99	0.46	-0.13	2.04	1.42	-0.00
September-October	5.40	2.79	-1.43	-2.05	-0.64	0.00
November-December	-2.73	3.32	3.51	-0.02	-0.29	-0.00

Table 4
Abundance and Seasonal Dynamics

	Jan-Feb	Mar-Apr	May-June	July-Aug	Sep-Oct	Nov-Dec
<i>Solanum nigrum</i>	-0.04	0.25	-0.12	0.04	0.30	0.12
<i>Oldenlandia</i>	0.12	0.20	0.17	-0.00	0.10	-0.89

	Jan-Feb	Mar-Apr	May-June	July-Aug	Sep-Oct	Nov-Dec
corymbosa						
Oldenlandia paniculata	0.12	0.20	0.17	-0.00	0.10	-0.00
Ageratum conyzoides	0.05	0.25	-0.03	0.23	-0.17	0.23
Blumea lacera	-0.18	0.09	0.04	0.03	0.06	-0.18
Lindenbergia indica	0.12	0.20	0.17	-0.00	0.10	0.08
Mazus rugosus	0.17	0.11	-0.14	-0.00	0.17	0.02
Vandellia crustacea	0.17	0.11	-0.14	-0.00	0.17	0.02
Lindernia oppositifolia	0.17	0.11	-0.14	-0.00	0.17	0.02
Vandellia hirsuta	0.12	0.20	0.17	-0.00	0.10	0.08
Rungia parviflora	-0.18	0.09	0.04	0.03	0.06	0.00
Amaranthus viridis	-0.03	0.22	-0.01	-0.08	-0.45	-0.06
Amaranthus spinosus	-0.12	0.18	-0.09	-0.29	-0.07	0.04
Tillanthera filoxeroides	0.18	-0.09	-0.04	-0.03	-0.06	-0.00
Nasturtium indicum	0.12	0.20	0.17	-0.00	0.10	0.08
Mecardonia procumbens	0.08	0.14	-0.17	-0.43	-0.17	-0.06
Pilea microphylla	0.17	0.11	-0.14	-0.00	0.17	0.02
Laportia interrupta	0.17	0.11	-0.14	-0.00	0.17	0.02
Nicotiana plumbaginifolia	-0.07	0.07	-0.38	-0.27	-0.01	-0.10
Cyperus iria	0.18	-0.09	-0.04	-0.03	-0.06	-0.00
Andrographis paniculata	-0.12	0.18	-0.09	-0.29	-0.07	0.04
Dentella repens	0.18	-0.09	-0.04	-0.03	-0.06	-0.00
Dentella serpyllifolia	0.18	-0.09	-0.04	-0.03	-0.06	-0.00
Digitaria ciliaris	0.17	0.11	-0.14	-0.00	0.17	0.02
Digitaria sanguinalis	0.17	0.11	-0.14	-0.00	0.17	0.02
Chloris barbata	0.05	0.25	-0.03	0.23	-0.17	0.03

	Jan-Feb	Mar-Apr	May-June	July-Aug	Sep-Oct	Nov-Dec
<i>Crotalaria pallida</i>	0.08	0.13	-0.33	0.22	-0.11	-0.08
<i>Euphorbia parviflora</i>	0.05	0.25	-0.03	0.23	-0.17	0.03
<i>Euphorbia microphylla</i>	-0.10	0.04	-0.26	0.30	-0.35	-0.16
<i>Phyllanthus urinaria</i>	0.18	-0.09	-0.04	-0.03	-0.06	-0.00
<i>Phyllanthus fraternus</i>	0.18	-0.09	-0.04	-0.03	-0.06	-0.00
<i>Tribulus terrestris</i>	0.15	0.02	0.28	-0.03	-0.13	0.02
<i>Physalis minima</i>	0.12	0.20	0.17	-0.00	0.10	0.08
<i>Evolvulus alsinoides</i>	0.18	-0.09	-0.04	-0.03	-0.06	-0.00
<i>Heliotropium indicum</i>	0.18	-0.09	-0.04	-0.03	-0.06	-0.00
<i>Leucas aspera</i>	0.18	-0.09	-0.04	-0.03	-0.06	-0.00
<i>Leucas cephalotes</i>	0.18	-0.09	-0.04	-0.03	-0.06	-0.00
<i>Leonurus japonicus</i>	-0.18	0.09	0.04	0.03	0.06	0.00
<i>Scoparia dulcis</i>	0.15	0.02	0.28	-0.03	-0.13	0.02
<i>Cleome viscosa</i>	0.18	-0.09	-0.04	-0.03	-0.06	-0.00
<i>Cleome rutidosperma</i>	-0.04	-0.20	-0.19	0.33	0.20	-0.12
<i>Cleome gynandra</i>	0.15	0.02	0.28	-0.03	-0.13	0.02
<i>Bulbostylis densa</i>	0.18	-0.09	-0.04	-0.03	-0.06	-0.00
<i>Dichanthium annulatum</i>	0.12	-0.18	0.09	0.29	0.07	-0.04
<i>Echinochloa stagnina</i>	0.18	-0.09	-0.04	-0.03	-0.06	-0.00
<i>Leptochloa chinensis</i>	0.18	-0.09	-0.04	-0.03	-0.06	-0.00
<i>Hybanthus enneaspermus</i>	0.05	0.25	-0.03	0.23	-0.17	0.03

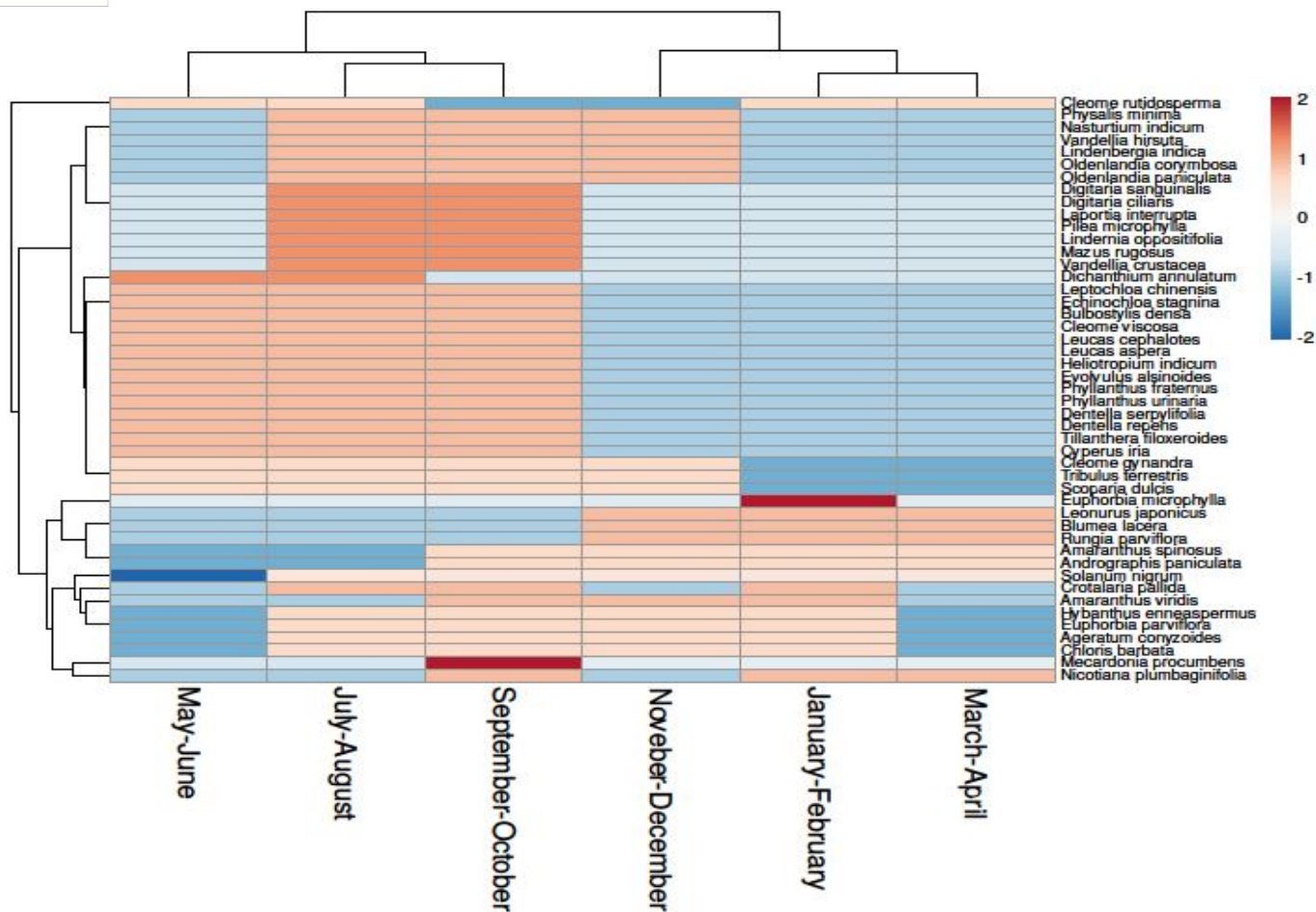


Figure 1

III. DISCUSSION

The seasonal dynamics of weeds of Rammohan College may be a reflection of weed dynamics of Kolkata. The Heat Map (Fig1) is showing abundance from High (+2) to Low/Absent (-2) range. *Euphorbia microphylla* and *Mecardonia procumbance* are two dominant weeds of Rammohan College. In Table 2 we found that, individual variance is highest in Jan-February whereas cumulative variance is highest in August September. In Table 3, we found, the number of componants of community is highest in post monsoon (July-August) whereas lowest in winter (January-February). In Table 4, we found, the actual dynamics of composition of plants in different seasons. The Table 1 shows the list of plant species found in Rammohan College (A representative of weed flora of Kolkata).

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