Green Audit

2018-2019

Prepared by:

Department of Environmental studies
Department of Botany
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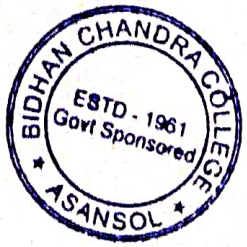

Acknowledgment

Green Audit team shows thanks to the management of Bidhan Chandra College for assigning this important work of Green Audit. We appreciate the co-operation of the team for the completion of the study.

Our special thanks are due to:

Principal of the college – Dr. Falguni Mukhopadhyay

IQAC Member and professor of Chemistry– Dr. Sujit Kumar Bera

IQAC member and Professor of Commerce – Dr. Monoranjan Ghosh

IQAC member and Professor of Physics- Dr. Gautam Mukherjee

IQAC member and Professor of Economics- Dr. Sreemanta Sarkar

Green Audit coordinators –Anwesha Bandopadhyay, Sagarika Mukherjee, Debdyuti Sengupta

Teaching & Supporting Staff of College- Subhrajyoti Chakraborty, Rajib Baneerjee, Subir Dhibar, Shyamal Ghosh

For giving us necessary inputs to carry out this very vital exercise of Green Audit. We are also grateful to other staff members who were actively involved

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Green Audit

Biodiversity Audit

PLANT AUDIT

Flora/Plant audit is a systematic process of identifying and collecting of plant data. Trees play a pivotal role in our ecosystem. Our college is rich in plants covering an area of almost eight acres. We try to conserve our biodiversity by regular tree plantation programs and also try to maintain the existing vegetation. The present study was aimed at determining the vascular plant species richness of an urban green space- the Bidhan Chandra College campus, Asansol.

For this, the species richness data was obtained by both secondary sources and intensive surveys. The data from the primary and secondary sources resulted in the documentation of 812 species belonging to 542 genera under 124 families, of which 534 species (65.8%) exist today. *Leguminosae* and *Poaceae* were the dominant dicotyledonous and monocotyledonous families respectively and an inventory of all the species recorded is provided. Considering the rapidly changing urban land use in the city, much attention should be paid towards the conservation of these green spaces, for which such studies provide baseline data.

Objective

Maintaining existing trees and adding new trees are essential.

Conservation of flora and fauna in our surroundings.

Knowledge about medicinal plants.

Knowledge about economically important plants.

Knowledge about plant-animal interaction.

Knowledge about weather and climatic conditions of the surrounding.

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PLANT DATA COLLECTION BY QUADRAT METHOD

Each square is 25mx25m, the total area of plant vegetation is divided into 50 quadrats, among them, some quadrats are studied because the remaining quadrats contain repetition of previous species.

2

- Swietenia macrophylla
- Annona squamosa
- Syzygiumcumini
- Ixorafinlaysoniana
- Tabernaemontanadivericata
- Nyctanthesarbor-tristis
- Polyalthialongifolia
- Scopariadulsis
- Sidacordifolia
- Croton bonplandianum
- Evolvulusnummularius
- Alternantherasessilis
- Pimentadioica

7

- Sterculiafoetida
- Ficusbenghalensis
- Mangifera indica
- Mimusopselengi
- Acacia auriculiformis
- Sidaacuta
- Oldenlandiacorymbosa

17

- Trophisaspera
- Spondiaspinnata
- Aegle marmelos
- Neolamarckiakadamba
- Croton bonplandianum
- Crozophorarottleri
- Solanum nigrum

25

- Peltophorumpterocarpum
- Psidium guajava
- Nerium oleander
- Ixora coccinea
- Hibiscus rosa-sinensis
- Adenantherapavonina
- Mussaendaerythophylla
- Acalyphawilkesiana
- Kalanchoe pinnata
- Dracenamarginata
- Bauhinia acuminata
- Eucalyptus globulus

30

- Nyctanthesarbortristis
- Curcuma longa
- Ocimumtenuiflorum
- Ocimum sanctum
- Dalbergiasisso
- Kalanchoe pinnata
- Cinnamomumtamala
- Aegle marmelos
- Murrayapaniculata
- Phyllanthusemblica
- Hyophorbelagenicaulis
- Tridaxprocumbens
- Hyophorbelagenicaulis

32

- Pterospermumacerifolium
- Azadirachtaindica
- Polyalthialongifolia
- Mangifera indica
- Tectona grandis
- Hyophorbelagenicaulis
- Acacia auriculiformis
- Tremaorientalis

35

- Adenantherapavonina
- Polyalthialongifolia
- Psidium guajava
- Nymphaea nouchali
- Dalbergiasisso
- Euphorbia hirta
- Alternantherasessilis
- Phyllanthusniruri
- Sidaacuta

38

- Cocos nucifera
- Tectona grandis
- Ficus religiosa
- Artocarpus heterophyllus
- Anisomelesindica

40

- Areca catechu
- Murrayapaniculata
- Rosa sp
- Polyalthialongifolia
- Bauhinia variegate
- Peltophorumpterocarpum

45

- Polyalthialongifolia
- Mangifera indica
- Mimusopselengi
- Codiaeum variegatum
- Dypsislutescens
- Sidacordifolia
- Sidarhombifilia

Sampling Process

A random sampling with Nested quadrat was utilized to study the strata of vegetation. Trees and tree saplings above 5 feet in height were classified as trees during the count. The tree and shrub layers were analysed by quadrat method using the sizes 25 x 25 m and 5 x 5 m respectively and the herbs were analysed by 1 x 1 m Quadrat. Basically, a nested quadrat was placed having a size of 25 x 25m (for trees) within which 5 x 5 m quadrat was placed for analysing the shrubs within which 1m x 1m quadrat was placed for the study of herbaceous plant. A total of 50 sampling plots were studied at each forest type with the 5 x 5 m quadrate being inside the 25 x 25 m quadrat. Photographs of different Specimens were collected for identification.

Density

Density is a numerical strength of a species in relation to a unit area. This parameter gives an idea about the dominance and rarity of a species and is also an indicator of the standing biomass and productivity of the region (Ambashat et al,1995). The percentage of a species with respect to different species in the unit area is called as Relative density. They are calculated as:

Density (D)= Total number of individual of a Species /Total number of quadrat studied

Relative Density (RD) = Density of a Species/Sum of the Densities of all the Species x 100

Frequency:

Frequency is the degree of dispersion in terms of percentage occurrence. In a sampling only the names of the species encountered in the different quadrat are listed. Frequency basically gives us an idea how frequent a species is encountered in the area. The frequency percentage of a species with respect to different species in the unit area is called as Relative Frequency.

Frequency (F%) = Number of Quadrat in which species occurred /Total number of Quadrat Studied x 100

Relative Frequency (RF) = Frequency of a Species /Sum of Frequencies of all Species x 100

Abundance:

Abundance is the total number of individual of a species in a sampling area. It basically gives an idea of the occurrence of a species in the Sampling unit. Relative abundance is the percentage ratio between the Abundance of species with that of sum of abundance of all species in the sampling unit.

Abundance (A) = Number of Individual of a species occurring /Total Number of Quadrat Studied

Relative Abundance (A) = Abundance of a Species/
Sum of Abundances of all Species x 100

Basal area:

Basal area implies the area covered by the tree which is basically calculated by taking a measurement at breast height i.e. 1.37m of a tree trunk above the ground. Basal area indicates the weight, size, volume and provides information regarding the proportion of its dominance in the sampling area. Basal area is calculated as;

Basal area (BA) = $(CBH)2 / 4\Pi$

CBH: Circumference at Breast height.

Diversity indices:

Diversity indices serve as important surrogates for measuring Biodiversity (Sarkar and Margules,2003).

Species Diversity It is the effective number of different species that are represented in a collection of individuals. Species richness and species evenness are the two component of Species diversity. Shannon- Wiener index (1963), incorporates both the parameter and is one of the most widely used index for measuring species diversity in an ecosystem (Ilorkar and Khatri ,2003). Lower the dominance higher is the diversity.

Species Richness:

The number of different species represented in a sampling unit or the habitat per unit area is called as Species Richness. Species richness is simply a count of species, and it does not take into account the abundances of the species or their relative abundance distributions (Colwell,2009).Menhinick"s index (1964) and has been used to understand the Species richness.

DATA COLLECTION

LIST OF TREES

SL NO.	BOTANICAL NAME	FAMILY
1	Swietenia macrophylla	Meliaceae
2	Samaneasaman	Fabaceae
3	Peltophorumpterocarpum	Fabaceae
4	Tectona grandis	Lamiaceae
5	Sterculiafoetida	Malvaceae
6	Dalbergiasisso	Fabaceae
7	Mangifera indica	Anacardiaceae
8	Ficusbenghalensis	Moraceae
9	Syzygiumcumini	Myrtaceae
10	Annona squamosa	Annonaceae
11	Mimusopselengi	Sapotaceae
12	Ficus religiosa	Moraceae
13	Polyalthialongifolia	Annonaceae
14	Adenantherapavonina	Fabaceae
15	Ficus virens	Moraceae

16	Brideliaretusa	Phyllanthaceae
17	Pterospermumacerifolium	Sterculiaceae
18	Elaeocarpusganitrus	Elaeocarpaceae
19	Psidium guajava	Myrtaceae
20	Gardenia jasminoides	Rubiaceae
21	Acacia auriculiformis	Fabaceae
22	Azadirachtaindica	Meliaceae
23	Hyophorbelagenicaulis	Arecaceae
24	Albizialebbeck	Fabaceae
25	Saracaasoca	Fabaceae
26	Phyllanthusemblica	Phyllanthaceae
27	Trophisaspera	Moraceae
28	Artocarpus heterophyllus	Moraceae
29	Aegle marmelos	Rutaceae
30	Areca catechu	Arecaceae
31	Cocos nucifera	Arecaceae
32	Neolamarckiakadamba	Rubiaceae
33	Spondiaspinnata	Anacardiaceae
34	Manilkarajapota	Sapotaceae
35	Magnolia champaca	Magnoliaceae
35	Magnolia champaca	Magnoliaceae
36	Plumeria rubra	Apocynaceae
37	Ficushispida	Moraceae
38	Eucalyptus globulus	Myrtaceae

LIST OF HERBS

SL.NO.	BOTANICAL NAME	FAMILY
1	Acalypha indica	Euphorbiaceae
2	Achyranthes aspera	Amaranthaceae
3	Ageratum conyzoides	Asteraceae
4	Alternantheraphiloxeroides	Amaranthaceae
5	Alternantherasessilis	Amaranthaceae
6	Amaranthusviridis	Amaranthusviridis
7	Andrographispaniculata	Acanthaceae
8	Blumealacera	Asteraceae
9	Catharanthus roseus	Apocynaceae
10	Cleome rutidosperma	Capparidaceae
11	Commelinabenghalensis	Commelinaceae
12	Cynodondactylon	Poaceae
13	Cyperusrotundus	Cyperaceae
14	Ecliptaprostrata	Asteraceae
15	Eleusine indica	Poaceae
16	Eragrostistenella	Poaceae
17	Kyllingamonocephala	Cyperaceae
18	Ocimum sanctum	Lamiaceae
19	Oldenlandiacorymbosa	Rubiaceae
20	Peperomia pellucida	Piperaceae
21	Ruelliatuberosa	Acanthaceae
22	Phyllanthusniruri	Phyllantheceae
23	Euphorbia hirta	Euphorbiaceae
24	Lindenbergiaindica	Scrophulariaceae
25	Scoparia dulcis	Scrophulariaceae

26	Solanum nigrum	Solanaceae
27	Vandelliacrustacea	Scrophulariaceae
28	Vernoniacineria	Asteraceae

LIST OF SHURBS

SL. NO.`	BOTANICAL NAME	FAMILY
1	Ixora coccinea	Rubiaceae
2	Lantana camara	Verbenaceae
3	Sidaacuta	Malvaceae
4	Sidarhombifolia	Malvaceae
5	Sidaacuta	Malvaceae
6	Tabernaemontanadivaricata	Apocynaceae
7	Nerium indicum	Apocynaceae
8	Adhatodavasica	Acanthaceae
9	Hibiscus rosa-sinensis	Malvaceae

PLANT SURVEY

Scientific Name	Local Name	Family	Numbers
Swietenia macrophylla	Mahogany	Meliaceae	13
Samaneasaman	Khirish, Rain Tree	Fabaceae	3
Peltophorumpterocarpum	Radhachura	Fabaceae	12
Tectonagrandis	Shagun	Lamiaceae	2
Sterculiafoetida	Bakshabadam	Malvaceae	3
Dalbergiasisso	Sisso	Fabaceae	5
Mangifera indica	Aam	Anacardiaceae	14

Ficusbenghalensis	Bot	Moraceae	1
Syzygiumcumini	Jam	Myrtaceae	6
Annona squamosa	Aata	Annonaceae	2
Mimusopselengi	Bakul	Sapotaceae	1
Ficus religiosa	Peepul	Moraceae	2
Polyalthialongifolia	Deodar	Annonaceae	12
Codiaeum variegatum	Garden Croton	Euphorbiaceae	8
Dracenamarginata	Dragon tree	Asparagaceae	24
Kalanchoe pinnata	Pathorkuchi	Crassulaceae	5
Acalyphawilkesiana	Curly Acalypha	Euphorbiaceae	4
Ixorafinlaysoniana	Sadarongon	Rubiaceae	1
Tremaorientalis	Chikan, Indian nettle tree	Tiliaceae	7
Tabernaemontanadivericata	Tagor	Apocynaceae	6
Cinnamomumtamala	Tejpata	Lauraceae	1
Cordylinefruticosa	Baby doll Ti plant	Asparagaceae	10
Terminalia catappa	Indian almond	Combretaceae	1
Adenantherapavonina	Raktachandan	Fabaceae	1
Ficus virens	Pakur	Moraceae	1
Brideliaretusa	Kosoi, Gilo, Kuhir	Phyllanthaceae	1
Pterospermumacerifolium	Muchkund, Muskanda	Sterculiaceae	2
Elaeocarpusganitrus	Rudraksha	Elaeocarpaceae	1
Cinnamomumcamphora	Camphor Tree	Lauraceae	1
Mussaendaerythophylla	Mussaenda	Rubiaceae	1
Bauhinia variegata	Raktakanchan	Caesalpiniaceae	1
Thujaorientalis	Mandirjhau	Cupressaceae	15
Hibiscus rosa-sinensis	Jaba	Malvaceae	8
Psidium guajava	Peyara	Myrtaceae	9

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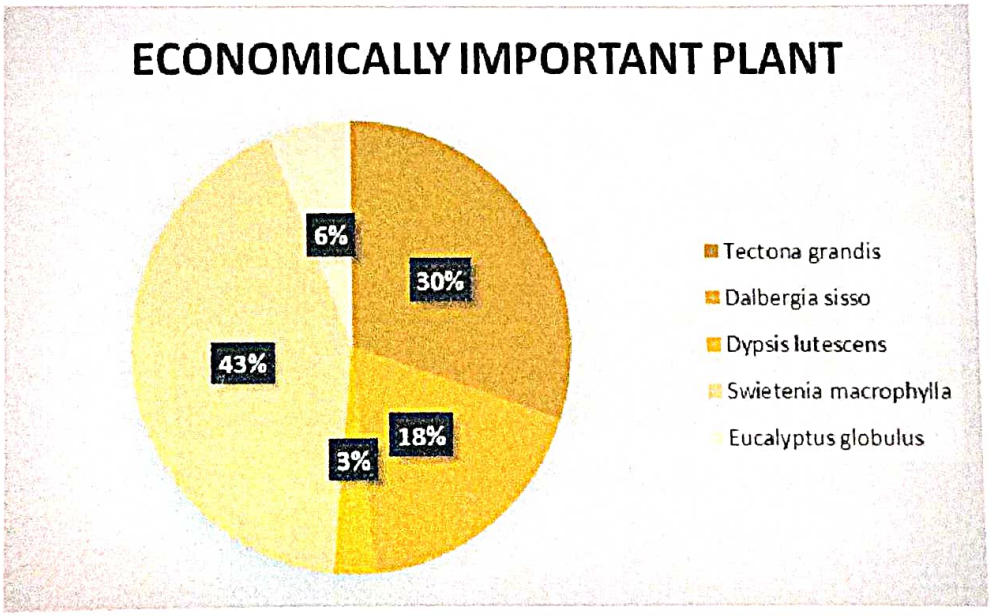
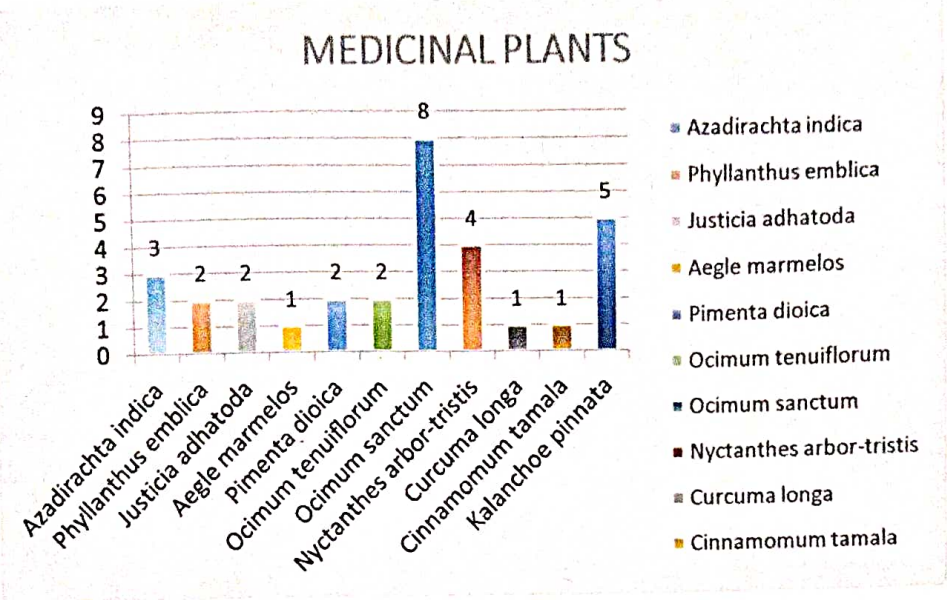
Gardenia jasminoides	Gardenia	Rubiaceae	1
Nerium oleander	Karabi	Apocynaceae	4
Ixora coccinea	Lal rangan	Rubiaceae	5
Acacia auriculiformis	Akashmoni	Fabaceae	10
Azadirachtaindica	Neem	Meliaceae	3
Hyophorbelagenicaulis	Bottle palm	Arecaceae	33
Bauhinia acuminata	Sadakanchan	Fabaceae	3
Albizialebbeck	Sirish	Fabaceae	2
Saracaasoca	Ashoka	Fabaceae	1
Phyllanthusemblica	Amloki	Phyllanthaceae	2
Justiciaadhatoda	Basak	Acanthaceae	2
Combretum indicum	Madhobilata	Combretaceae	1
Trophisaspera	Sheora	Moraceae	3
Artocarpusheterophyllus	Kathal	Moraceae	1
Aegle marmelos	Bel	Rutaceae	1
Areca catechu	Supari	Arecaceae	7
Cocos nucifera	Narkel	Arecaceae	3
Neolamarckiakadamba	Kadam	Rubiaceae	1
Murrayapaniculata	kamini	Rutaceae	3
Spondiaspinnata	Aamra	Anacardiaceae	2
Durantaerecta	Duranta	Verbenaceae	15
Manilkarajapota	Sabeda	Sapotaceae	1
Pimentadioica	Allspice	Myrtaceae	2
Magnolia champaca	Swarnochampa	Magnoliaceae	1
Plumeriarubra	Frangipani	Apocynaceae	3
Rosa sp	Rose	Rosaceae	6
Jasminumsambac	Beli	Oleaceae	1
Ficushispida	Dumur	Moraceae	1

Dypsislutescens	Areca palm	Arecaceae	14
Eucalyptus globulus	Eucalyptus	Myrtaceae	2
Ocimumtenuiflorum	Krishna tulsi	Lamiaceae	8
Ocimum sanctum	Tulsi	Lamiaceae	6
Nymphaea nouchali	Lal shaluk	Nymphaeceae	1
Cleistanthuscollinus	Parashi	Euphorbiaceae	1
Nyctanthesarbor-tristis	Shuili	Oleaceae	4
Curcuma longa	Halud	Zingiberaceae	1

DATA REPRESENTATION





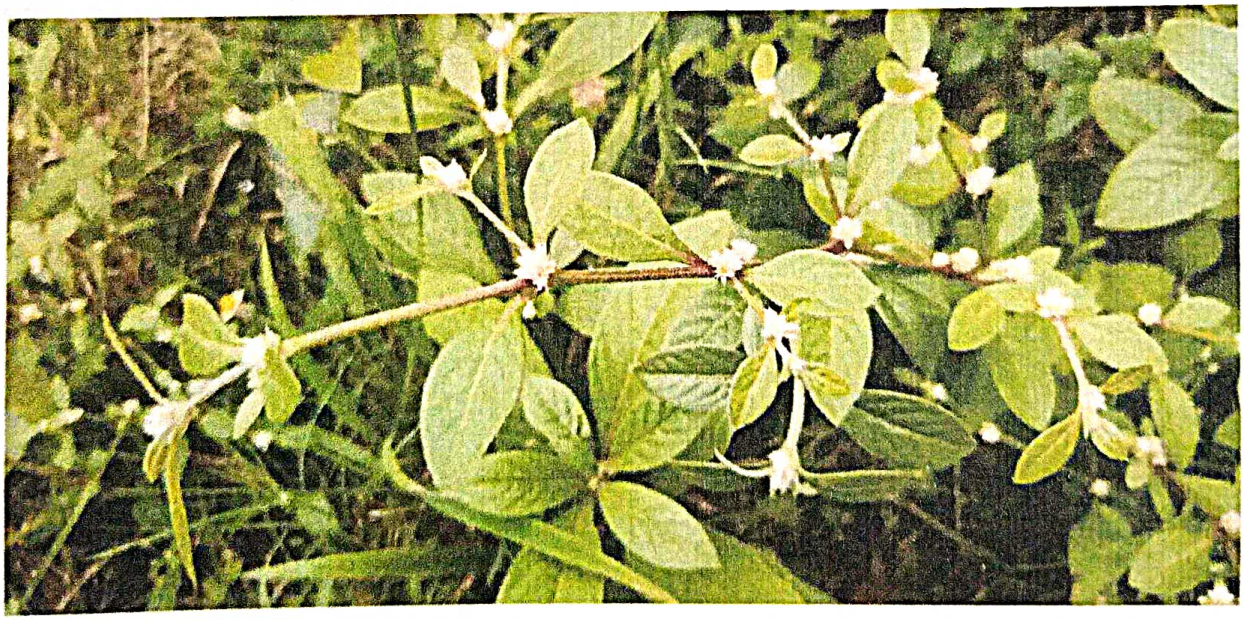
MEMBERS OF OUR GREEN CAMPUS

Sidar hombifolia

Phyllanthus niruri

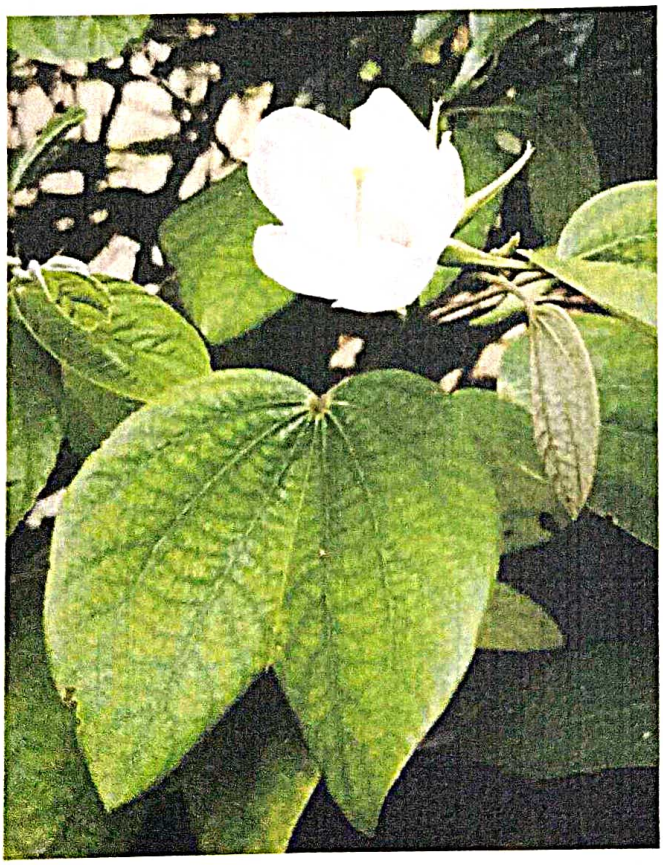
Duranta repens

Gardenia jasminoides



Alternanthe rasessilis

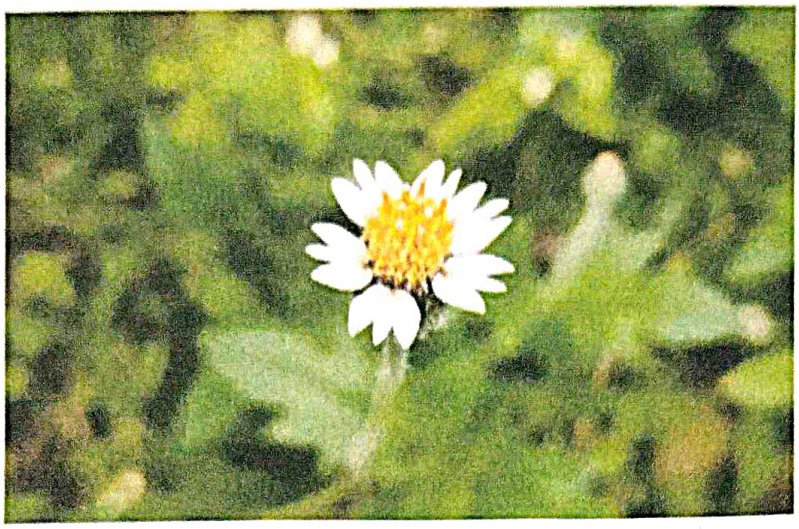
Oldenlandia corymbosa



Bauhinia acuminata

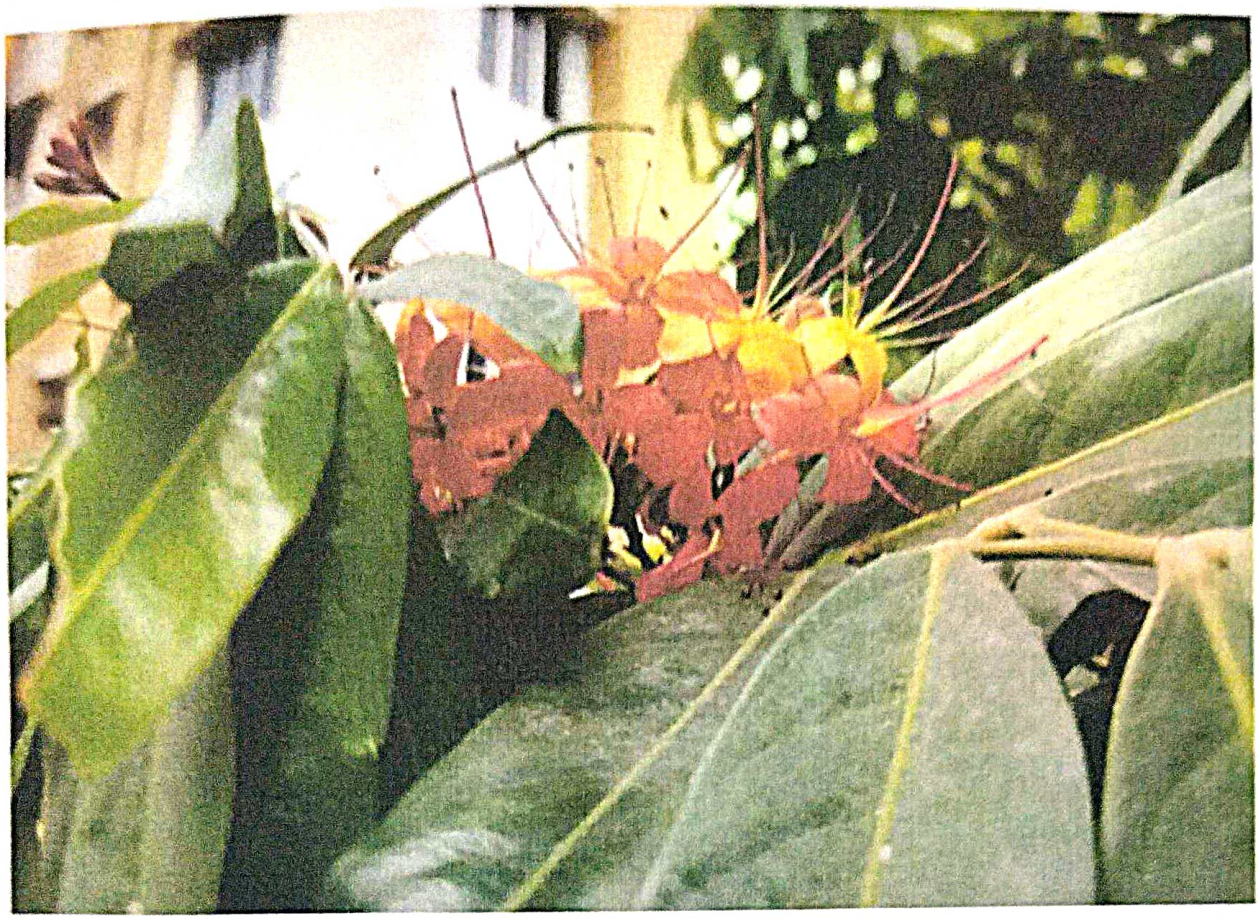
Tabernaemontana divaricate

Murraya paniculata



Tridax procumbens

Ruellia tuberosa



Saraca asoca

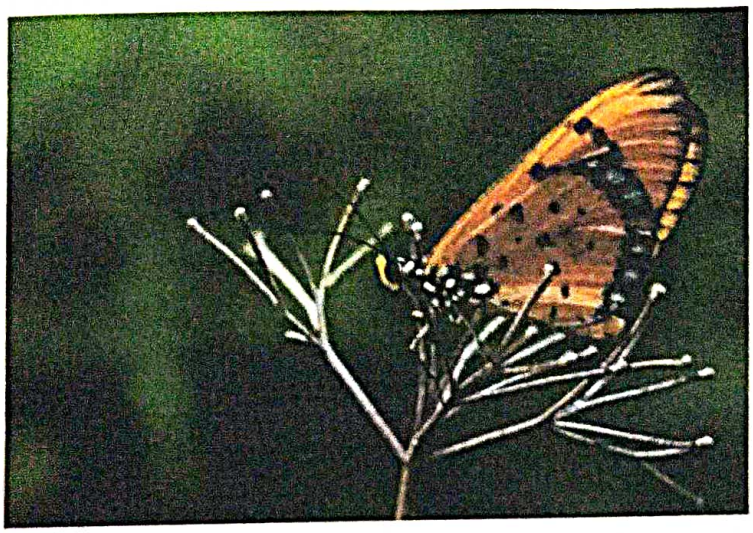
ANIMAL AUDIT

Animals are the beauty of our nature as well as their behavioral responses are a source of inspiration for many. Without them, our nature is like a flower having no fragrance and no colour.

For maintaining a healthy ecological balance on earth, animals and marine species are as important as humans. Each organism on this earth has a unique place in the food chain that helps contribute to the ecosystem in its own special way. The eco-system is all about relationships between different organisms connected through food webs and food chains. Even if a single wildlife species gets extinct from the eco-system, it may disturb the whole food chain ultimately leading to disastrous results.

Consider a simple example of a bee that is vital for the growth of certain crops due to their pollen carrying roles. If bees get reduced in numbers,

the growth of food crops would definitely lower owing to a lack of pollination. Similarly, if a species gets increased in number, again it can have an adverse effect on the ecological balance. As the Nation's growth starts from its educational institutions, where the ecology is thought as a prime factor of development associated with environment. So, a report on faunal diversity of this college was made.



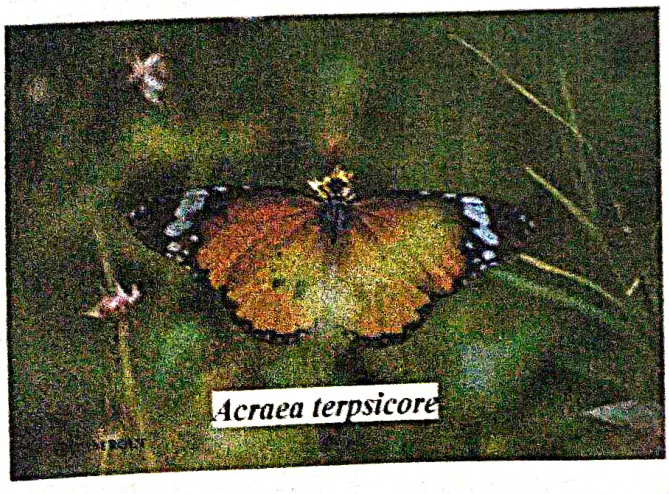
➢ **List of Annelids found in the College Campus**

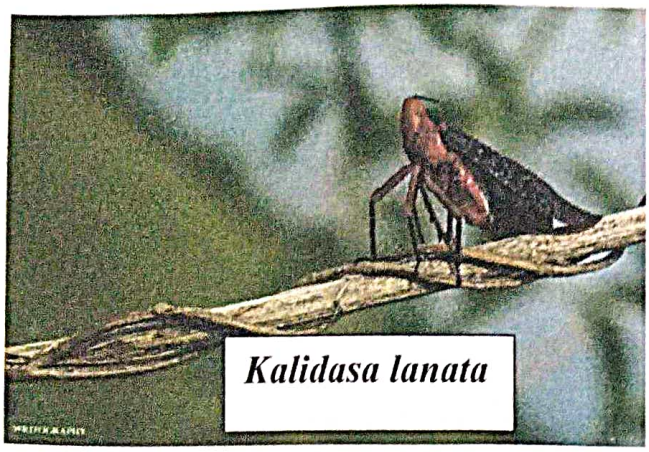
1. *Eiseniafetida* (Common Name: Red Wigglers)
2. *Perionyx excavates*
3. *Phertima sp.*

➢ List of Arthropods found in the College Campus

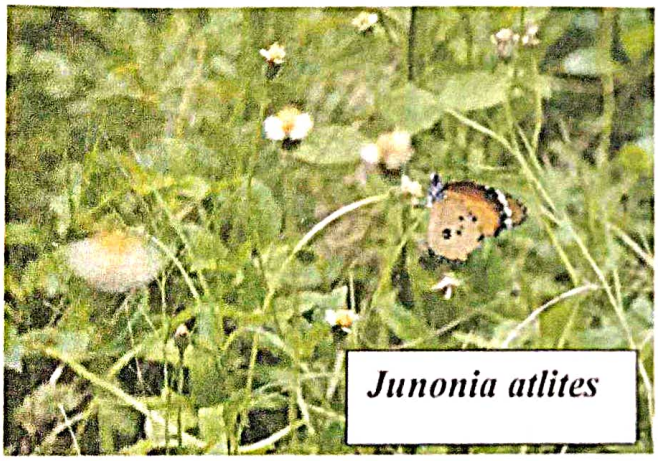
1. *Rhysida* sp. (Common Name: Common Centiped)
2. *Scolopendra* sp.
3. *Periplaneta* sp.
4. Family: Scutelleridae (Common Name: Jewel Bug)
5. Family: Coccinellidae (Common Name: Lady Bird Beetles)
6. *Culex* sp.
7. *Aedes* sp.
8. Chironomous Larva
9. *Musca domesticus*
10. Family: Scutelleridae
11. Millipeds
12. *Apis*sp.
13. *Cyclops sp.*
14. *Mantis sp.*
15. *Macrotermes*
16. *Papiliodemodocus (Lime Butterfly)*
17. *Junoniaatlites (Grey Pansy)*
18. *Appiasolferna (Black veined albatross)*
19. *Euremahecabe (Common grass yellow butterfly)*
20. *Diplacodestrivialis (Ground skimmer butterfly)*
21. *Acraea terpsicore (Tawny Coaster)*
22. *Kalidasalanata*
23. *Tutubing kalabaw*
24. *Ceriagrioncoromandelianum*
25. *Crocothemis servilia*

Photographs of a few arthropods at B.C.College campus

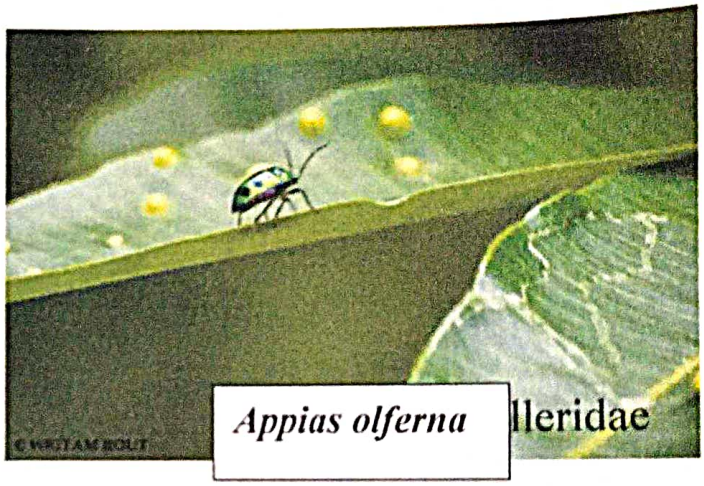




Kalidasa lanata

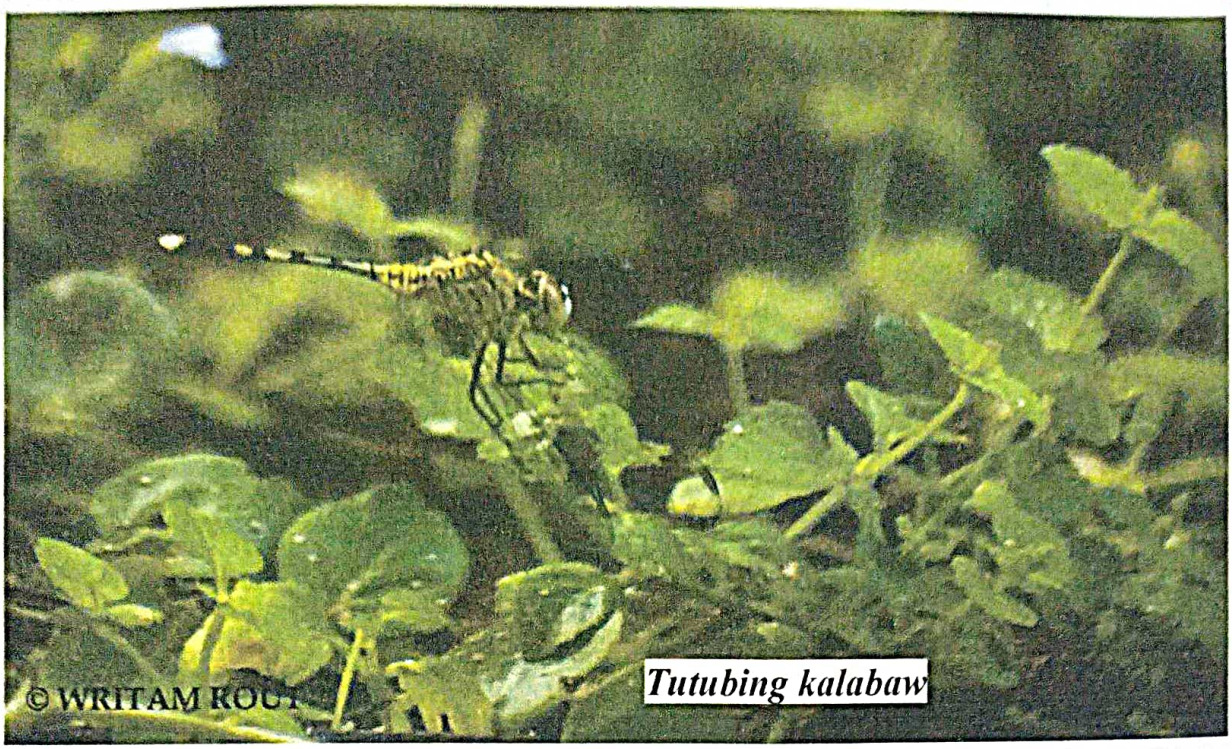


Junonia atlites

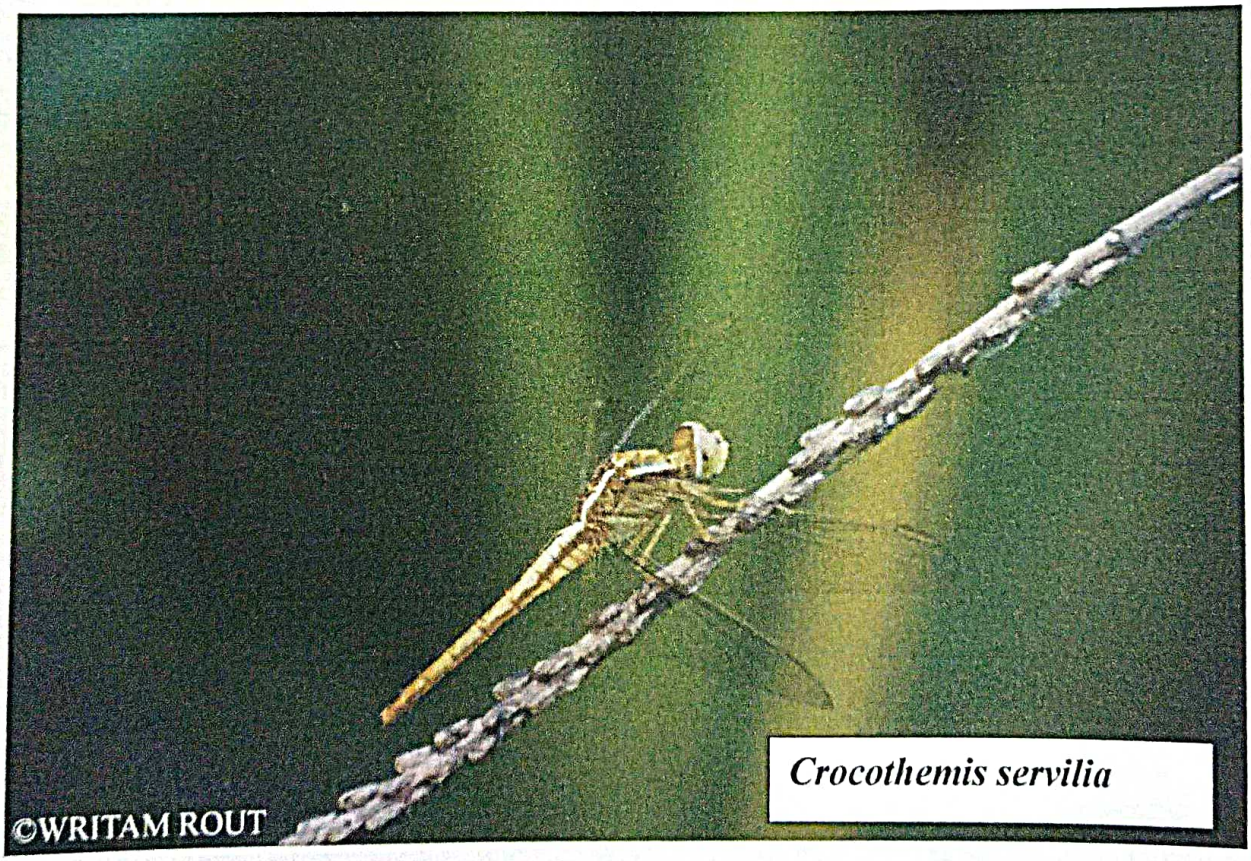


Appias olferna

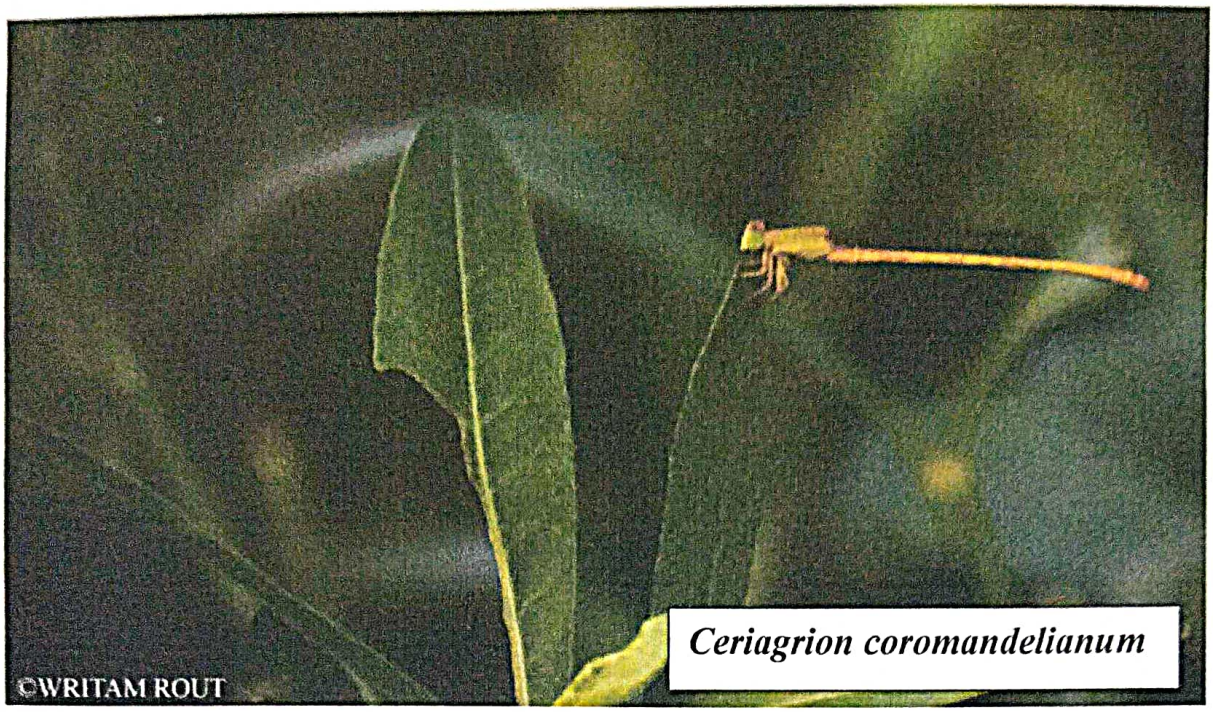
lleridae



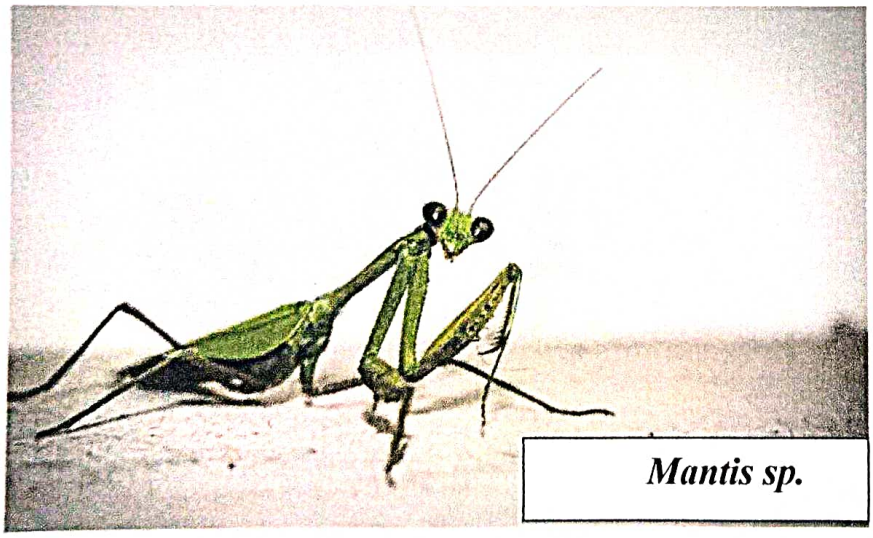
Tutubing kalabaw



Crocothemis servilia



Ceriagrion coromandelianum



Mantis sp.

List of Molluscs found in the College Campus

1. *Pila sp*
2. *Achatina sp.*

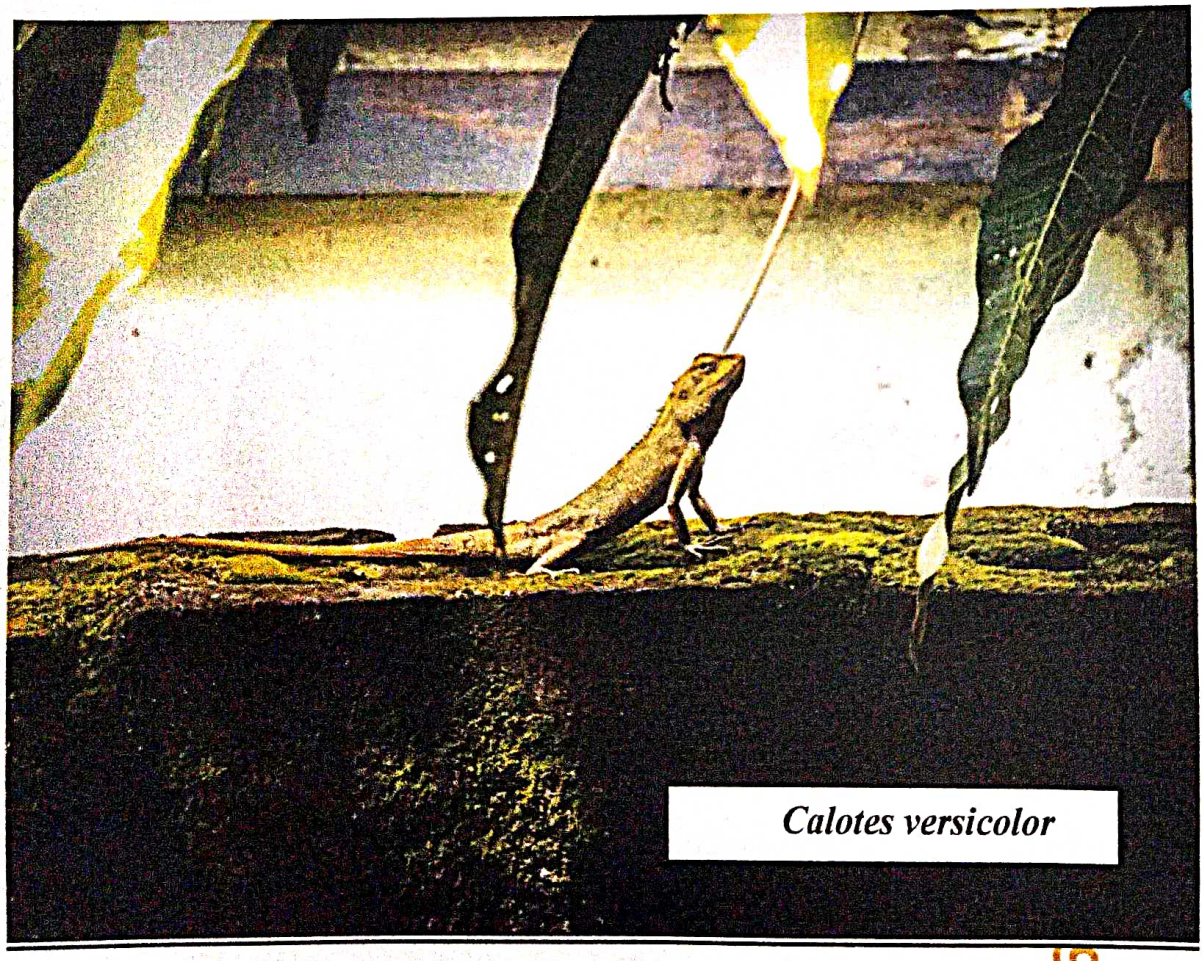
List of Amphibia Found in the college Campus:

1. *Bufo sp.*
2. *Rana sp.*

List of Reptiles found in the College Campus

1. *Vipera sp.*
2. *Fowleapiscaletor*
3. *Calotes versicolor*
4. *Chamaeleozeylanicus*
5. *Amphiesmastolatum*
6. *Oligodonarnensis*
7. *Ahaetullanasuta*
8. *Hemidactylus*

Photographs of Reptile at B.C.College campus

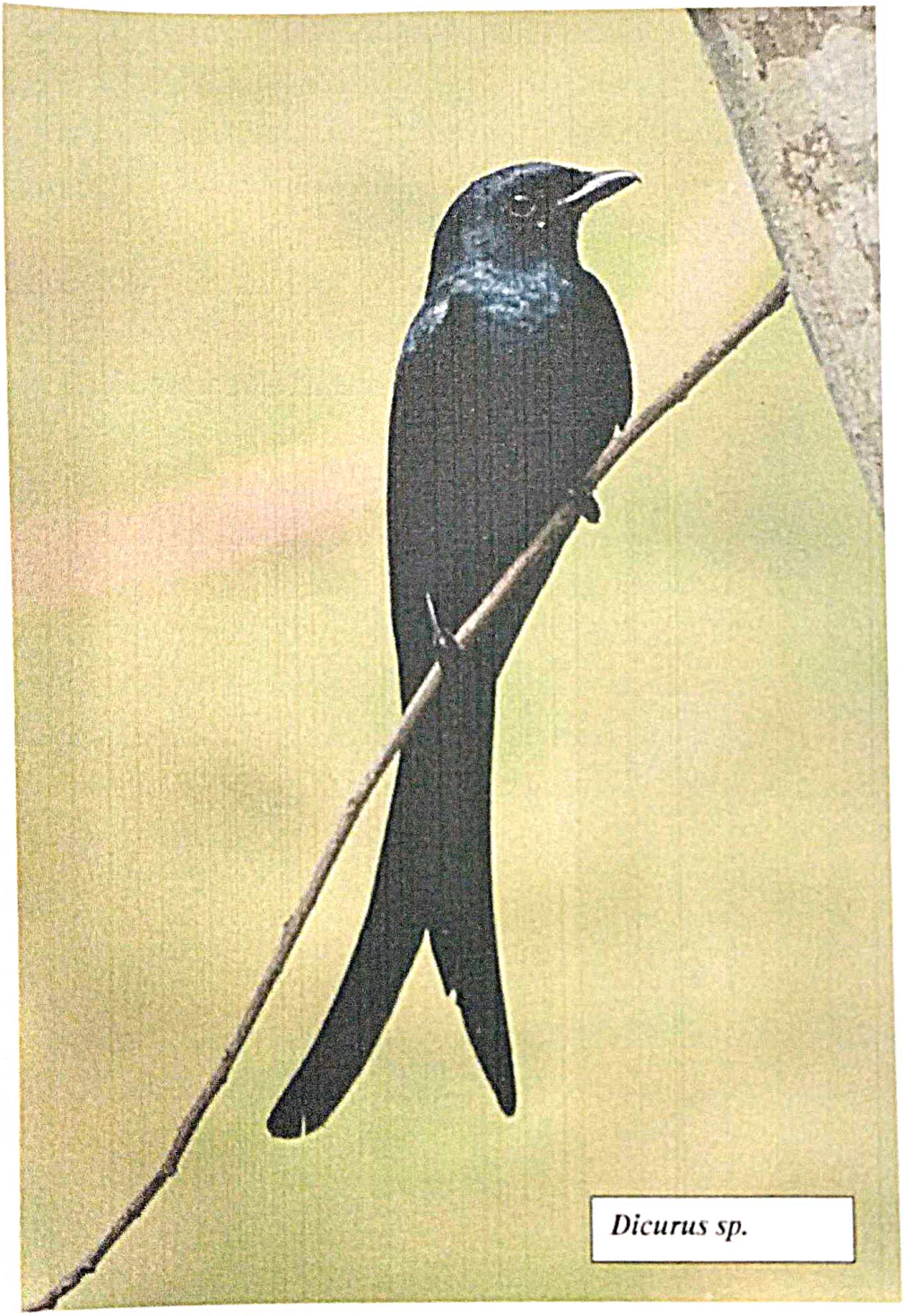


Calotes versicolor

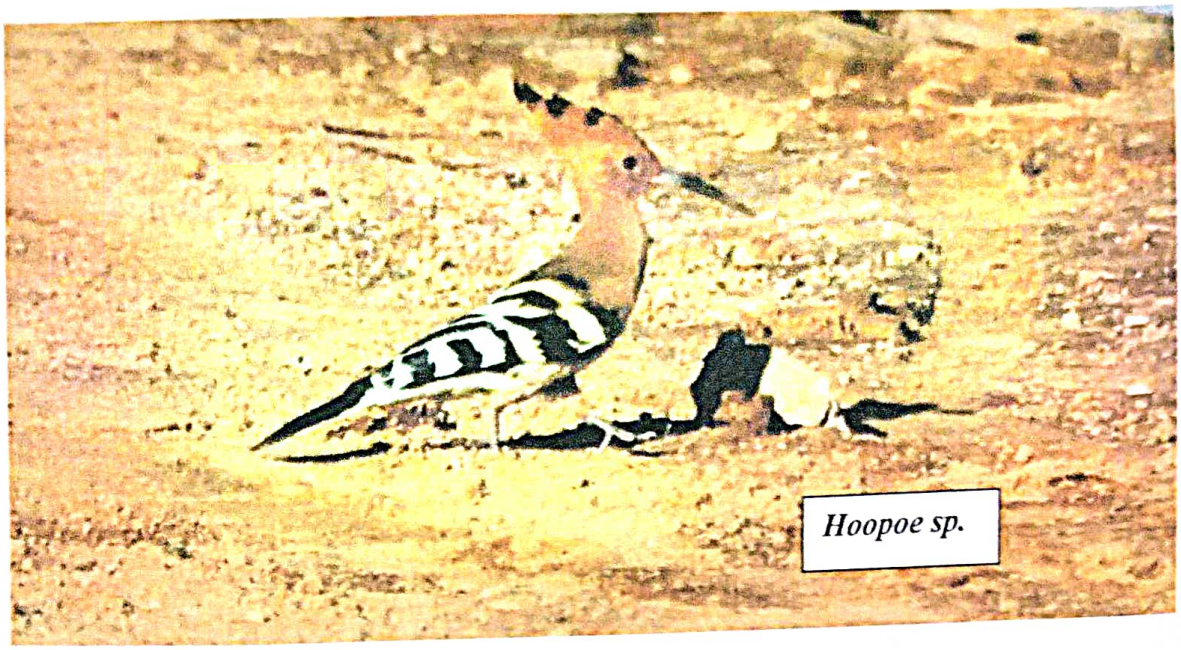
List of Aves found in the College Campus

1. *Columba sp.*
2. *Pycnonotus sp.*
3. *Psittacula sp.*
4. *Passer sp.*
5. *Corvus sp.*
6. *Eudynamys sp.*
7. *Centropus*
8. *Acridotheres*
9. *Spilopelia*
10. *Turdoides*
11. *Cinnyris*
12. *Bubo*
13. *Dicurus*
14. *Upupa*
15. *Copsychus*
16. *Hoopoe*

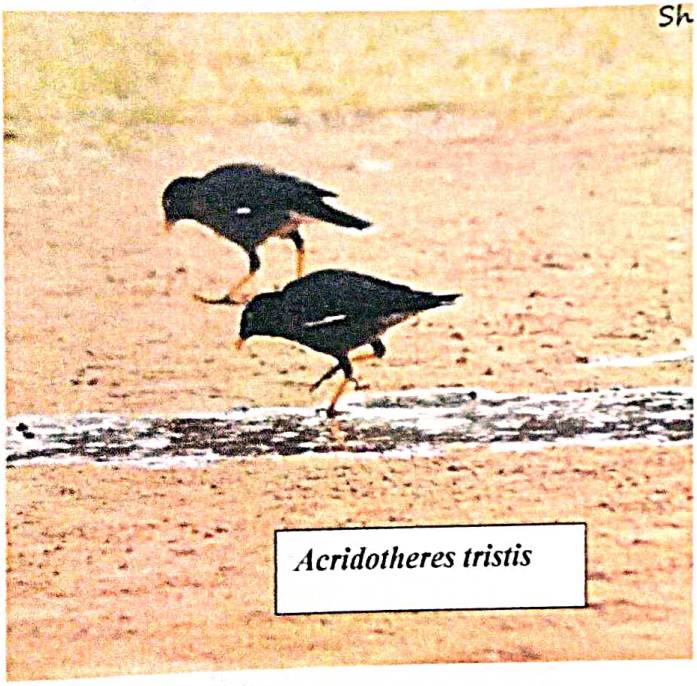
Photographs of a few birds at B.C.College campus



Dicurus sp.

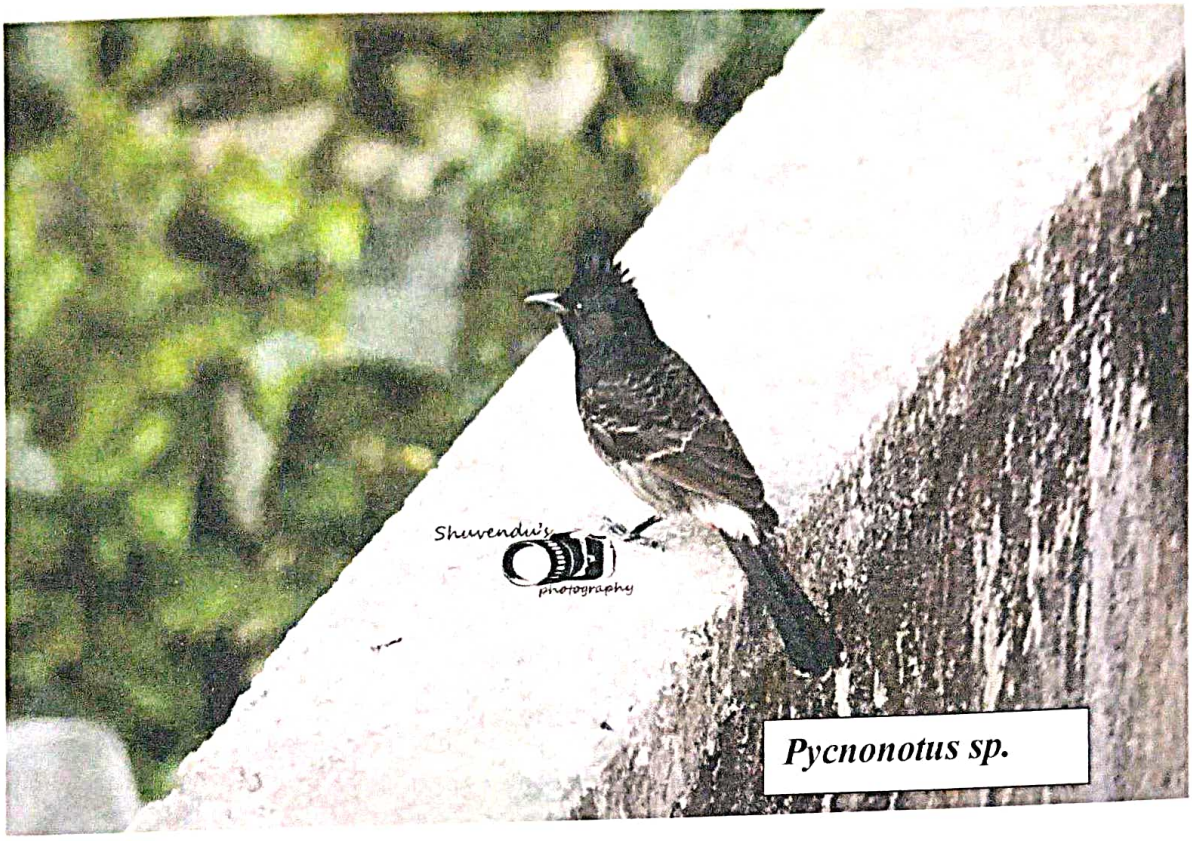


Hoopoe sp.

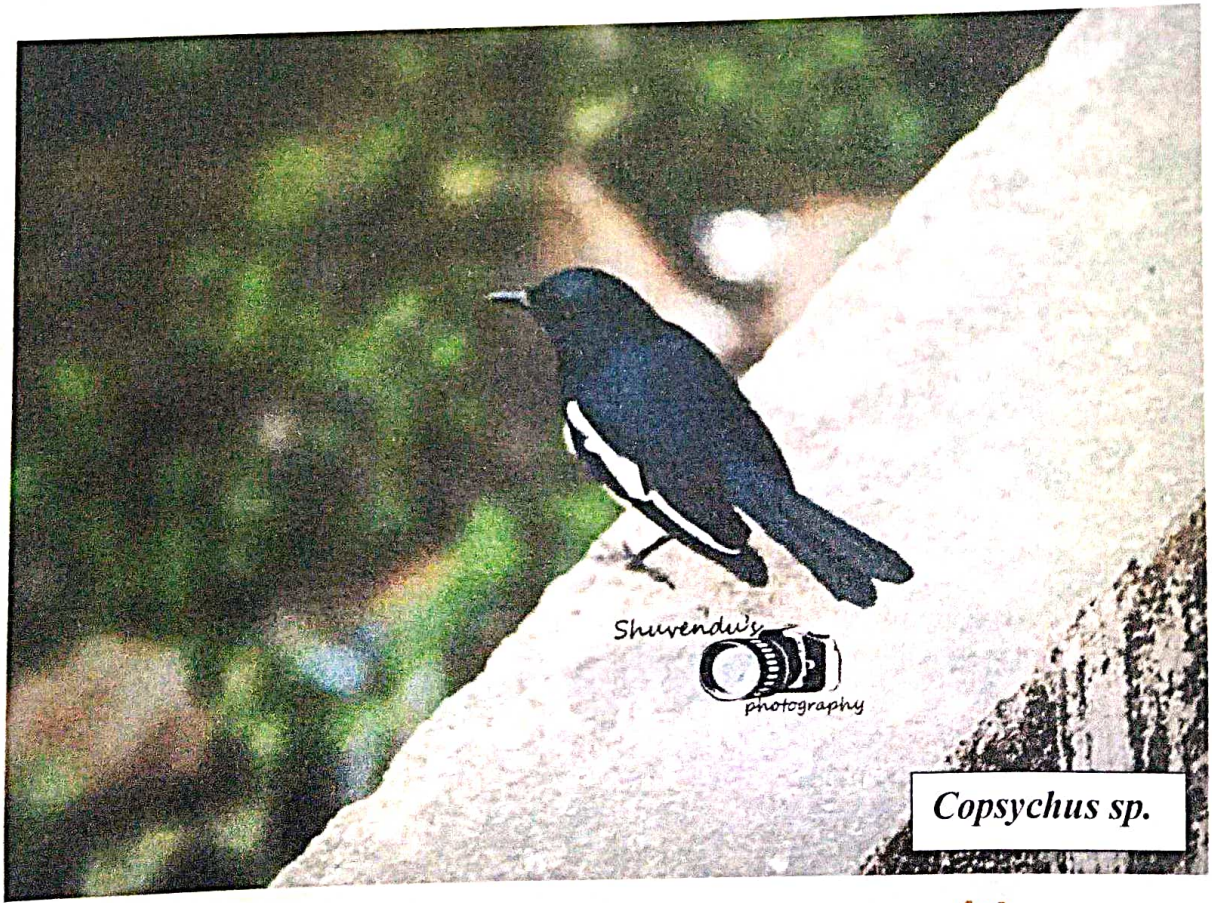


Acridotheres tristis

Acridotheres ginginianus



Pycnonotus sp.



Copsychus sp.

List of Mammals found in the College Campus

1. *Canis sp.*
2. *Felis sp.*
3. *Funumbulus sp.*
4. *Rattus norvegicus*
5. *Sorex sp.*

Funumbulus sp.

The campus of Bidhan Chandra College is rich in faunal biodiversity. The arthropod biodiversity as well as avian biodiversity of this campus is very high which is due to abundance of a lot of trees within the campus. The interaction of the flora and fauna within the campus are depicted in most of the pictures attached with this report.

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