पण्डित सुन्दरलाल शर्मा (मुक्त) विश्वविद्यालय छत्तीसगढ़, बिलासपुर
(छ.ग. शासन के अधिनियम क्रमांक 26 सन् 2004 द्वारा स्थापित)
कोनी-बिरकोना मार्ग,बिलासपुर (छ.ग.) 495006
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GREEN AUDIT REPORT

2021-22

Pt. SUNDER LAL SHARMA OPEN UNIVERSITY

BIRKONA ROAD, KONI, BILASPUR

CHHATTISGARH

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Shri Keshan Lal Pradhan
Incharge NAAC Cell
PSSOU, CG Bilaspur

Pt. SUNDER LAL SHARMA OPEN UNIVERSITY

A REPORT

ON

GREEN AUDIT

Audit team:

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Submitted By:

Nature Conservation and Community Development Society, Raipur, C. G.

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1. INTRODUCTION:

The environment where we live within is of utmost concern since it is directly related to the survival. Keeping it healthy is the responsibility of each and every individual. After Earth Summit Rio 1992, the concept of environmental audit was accepted by many countries. Some of the practices like renewable energy, composting, use of CFL are followed by 60%, 50% and 30% of the institutes respectively. Sewage treatment plants are opted by only 20% institutes. It is found that there is meager data available regarding the environmental practices undertaken by the academic institutes. Such data may help in deciding the simple policies to be adapted by the institutes towards a sustainable environment.

2. THE GREEN AUDIT

Green Audit is a process of systematic identification, quantification, recording, reporting and analysis of components of environmental diversity of an institute. It aims to analyze environmental practices within the concerned place, which will have an impact on the eco-friendly atmosphere. Green audit is a valuable means for an institution to determine how and where they are using the most energy or water or other resources; the institution can then consider how to implement changes and make savings. It can create health consciousness and promote environmental awareness, values and ethics. It provides staff and students better understanding of Green impact on campus. If self-enquiry is a natural and necessary outgrowth of a quality education, it could also be stated that institutional self-enquiry is a natural and necessary outgrowth of a quality educational institution. Thus it is imperative that the institution evaluate its own contributions toward a sustainable future. As environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent.

The rapid urbanization and economic development at local, regional and global level has led to several environmental and ecological crises. On this background it becomes essential to adopt the system of the Green Campus for the institutes which will lead for sustainable development and at the same time reduce a sizable amount of atmospheric CO_2 from the environment.

Green Audit is a process of systematic identification, quantification, recording, reporting and analysis of components of environmental diversity of various establishments. It aims to analyze

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environmental practices within and outside of the concerned sites, which will have an impact on the eco-friendly ambience.

Green audit can be a useful tool for an institution to determine how and where they are using the most energy or water or resources; the institution can then consider how to implement changes and make savings. It can also be used to determine the type and volume of waste, which can be used for a recycling project or to improve waste minimization plan. It can create health consciousness and promote environmental awareness, values and ethics. It provides staff and students better understanding of Green impact on campus. If self enquiry is a natural and necessary outgrowth of a quality education, it could also be stated that institutional self enquiry is a natural and necessary outgrowth of a quality educational institution. Thus it is imperative that the college evaluate its own contributions toward a sustainable future. As environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent.

The rapid urbanization and economic development at local, regional and global level has led to several environmental and ecological crises. On this background it becomes essential to adopt the system of the Green Campus for the institutes which will lead for sustainable development and at the same time reduce a sizable amount of atmospheric carbon-di-oxide from the environment. The National Assessment and Accreditation Council, New Delhi (NAAC) has made it mandatory that all Higher Educational Institutions should submit an annual Green Audit Report. Moreover, it is part of Corporate Social Responsibility of the Higher Educational Institutions to ensure that they contribute towards the reduction of global warming through Carbon Footprint reduction measures.

Therefore, the purpose of the present green audit is to identify, quantify, describe and prioritize framework of Environment Sustainability in compliance with the applicable regulations, policies and standards.

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3. OBJECTIVES:

The purpose of the present green audit is to identify, quantify, describe and prioritize framework of Environment Sustainability in compliance with the applicable regulations, policies and standards. The main objectives of carrying out Green Audit are:

- To map the Geographical Location of the institution
- To document the floral and faunal diversity of the institution
- To record the meteorological parameter
- To document the waste disposal system
- To estimate the Energy requirements of the campus

4. METHODOLOGY:

The purpose of the green audit is to ensure that the practices followed in the campus are in accordance with the Green Policy of the country. The methodology includes: collection of data, physical inspection of the campus, observation and review of the documentation and data analysis.

5. THE UNIVERSITY CAMPUS:

Pt. Sunder Lal Sharma open University, sprawling over an area of 56 acre land is located near Bilaspur city in Birkona Road, Koni, at $22^0$14' N lat. and $82^0$14' E long. The area is plain with lateritic red-yellow soil. Pandit Sundarlal Sharma (Open) University (PSSOU) Chhattisgarh, came in to existence on 20th January, 2005. The university has study centers in all the sub-division and block headquarters of tribal belt of the state. This way all sub-divisions and block headquarters will be connected to the university through these study centers and will have facility of wider education, of better library and guidance.

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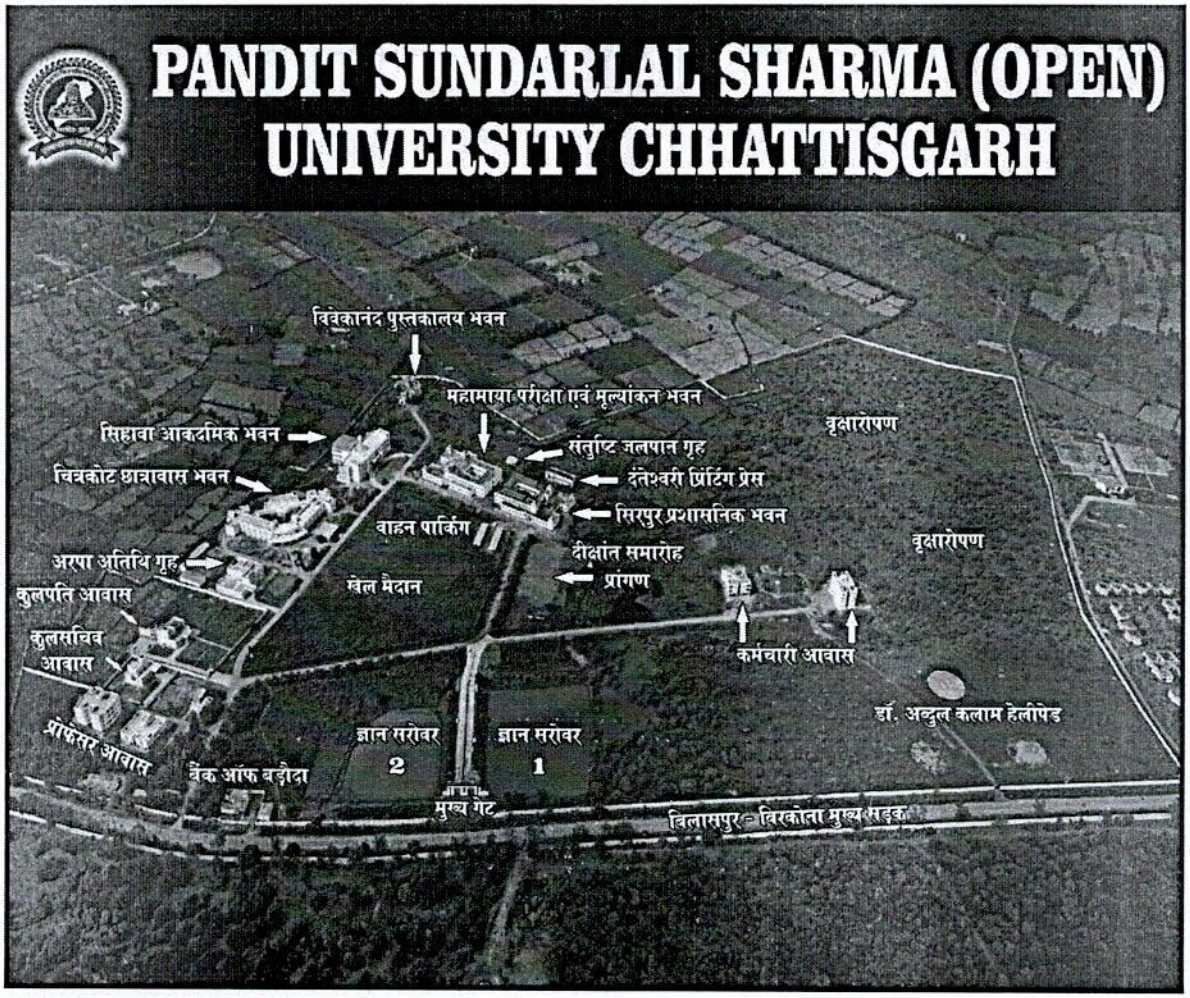

5.1 Climate of the area:

Climate of the area is typical monsoonic, divisible in to three seasons in a year, almost of equal duration. Summer season starts in March goes up to June, rainy season extends from about mid-June to October while the winter season, starting from November ends to February. Summer season is dry and very hot, maximum temperature very often crosses 45^0C. The season is much testing to the survival of the plants. Rainy season also is generally hot, almost 90% of the rain is received during this season. The soil becomes overflooded with low to very amount of soil erosion. Very little amount of this water infiltrates as ground water. The winter season has mild cold with minimum temperate rarely going below 10^0C. As representative climatic data for Bilaspur is being given below for one year.

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Table 1. Mean monthly weather data of bilaspur (c.g.), year – 2019

Month	Temperature °C			Relative Humidity (%)			Sun shine (Hrs/d)	Open pan evaporation (mm/d)	Rainfall (mm)	Rainy days
	Min.	Max.	Avg.	5 am	7 pm	Avg.				
JAN	8.0	26.0	17.0	89.2	65.0	77.1	7.5	2.1	12.2	3
FEB	12.9	29.0	20.9	86.0	48.0	67	8.3	3.0	12.6	4
MAR	16.9	32.9	24.9	74.8	42.2	58.5	8.2	4.2	24.9	4
APR	22.7	39.0	30.8	64	36	50	8.1	6.4	4.8	1
MAY	25.6	42.3	33.9	56.8	31.1	43.9	9.1	8.6	0.8	1
JUN	26.5	40.2	33.3	76.0	46.6	61.3	6.5	7.1	70.2	10
JUL	24.1	32.3	28.2	90.7	72.6	81.6	3.4	3.2	205.3	19
AUG	23.3	30.8	27.0	94.5	78.7	86.6	2.6	2.5	414.5	19
SEP	23.08	30.9	26.9	92.8	81.07	86.9	3.48	3.0	329.4	15.
OCT	20.4	30.4	25.4	93	69.4	81.2	5.9	2.5	50.5	7
NOV	14.8	29.8	22.3	90.1	53.1	71.6	7.3	2.5	0.0	0
DEC	11.3	26.6	18.9	90.2	56.2	73.2	6.4	2.0	4.0	1
TOTAL									**1129.2**	**84**

6. VEGETATION:

Vegetation in the campus consists of both the natural vegetation and planted vegetation. Overall the vegetation can be divided in to trees and other vegetation:

6.1. Trees:

Tree vegetation includes avenue tree like Royal palm, Chhatim, Kachnar, Peltaphorum, Amaltas, Gulmohar, Jharul, Karanj. Medicinally important trees include Bel, Neem, Amla, Laxmitaru. Fruit trees include Sitaphal, Papita, Aam. Baboolis growing extensively over the waste land. The species is hardy, very useful as timber and wood for agricultural implements. Covering the wasteland it is helping substantially in contributing oxygen from the area where no other vegetation can grow, without any care.

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Table 2: List of trees in the campus

S.N.	Botanical name	Common Name	Family
1.	*Aegle marmelos* L.	Bel	Rutaceae
2.	*Alstonia scholaris L.*	Chhatim	Apocynaceae
3.	*Annona squamosa* L.	Sitaphal	Annonaceae
4.	*Azadirachta indica* A.Juss	Neem	Meliaceae
5.	*Bauhinia purpurea* L.	Kachnar	Leguminosae
6.	*Bombax malabaricum* L.	Semal	Bombaceae
7.	*Carica papaya L.*	Papita	Caricaceae
8.	*Cassia fistula* L.	Amaltas	Leguminosae
9.	*Cordia sebestena*		Boraginaceae
10.	*Delonix regia* Raf.	Gulmohar	Leguminosae
11.	*Eucalyptus lanceolatus L.*	Nilgiri	Myrtaceae
12.	*Ficus benghalensis* L. var. *krishnae*	Bargad	Moraceae
13.	*Ficus religiosa* L.	Peepal	Moraceae
14.	*Lagerstroemia speciosa*	Jharul	Lythraceae
15.	*Mangifera indica* L.	Aam	Anacardiace
16.	*Nyctanthes arbor-tristis* L.	Parijat	Oleaceae
17.	*Peltophorum ferrugineum* Benth.	Peela gulmohar	Caesalpiniaceae
18.	*Phyllanthus emblica* L.	Amla	Euphorbiaceae
19.	*Pongamia pinnata* L.	Karanj	Fabaceae
20.	*Roystonea regia*	Royal palm	Arecacea
21.	*Semaruba glauca* DC.	Laxmitru	Semarubaceae
22.	*Vachellia nilotica* F.	Babool	Mimosaceae

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6.2 Vegetation other than trees:

This group of plants include the shrubs, climbers and herbs. Shrub like Nerium has been planted along the roads, giving beautiful look in flowering. Most of this vegetation is growing in wasteland, contributing oxygen during growing season and a huge amount of biomass.

Table 3: List of non-tree plants

SN	Species
1.	*Acanthospermum hispidum*
2.	*Achyranthes aspera*
3.	*Ageratum conyzoides*
4.	*Alysicarpus vaginalis*
5.	*Aristida sp.*
6.	*Atylosia scarabaeoides*
7.	*Blumea lacera*
8.	*Blumea oxyodonta*
9.	*Borreria hispida*
10.	*Borreria stricta*
11.	*Bothriochloa pertusa*
12.	*Cassia mimosoides*
13.	*Cassia tora*
14.	*Chorcorus olitorius*
15.	*Chrysopogon fulvus*
16.	*Cissampelos pariera*
17.	*Curculigo orchioides*
18.	*Cynodon dactylon*
19.	*Cyperus sp.*
20.	*Dactyloctenium aegyptium*
21.	*Desmodium gangeticum*
22.	*Desmodium triflorum*
23.	*Digitaria sp.*
24.	*Dolichos sp*
25.	*Emilia sonchifolia*

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26.	*Eragrostis nutans*
27.	*Eragrostis unioloides*
28.	*Eragrostis viscose*
29.	*Eulaliopsis sp.*
30.	*Euphorbia hirta*
31.	*Evolvulus alsinoides*
32.	*Evolvulus nummularius*
33.	*Hemidesmus indicus*
34.	*Heteropogon contortus*
35.	*Ionidium suffruticosum*
36.	*Ipomoea carnea*
37.	*Isilema laxum*
38.	*Justicia simplex*
39.	*Nerium oleander*
40.	*Oldenlandia corymbosa*
41.	*Oldenlandia sp.*
42.	*Oplismanus burmanii*
43.	*Paspalidium flavidum*
44.	*Phyllanthus amarus*
45.	*Phyllanthus madaraspatana*
46.	*Plectranthus incanus*
47.	*Rungia repens*
48.	*Salvia sp.*
49.	*Setaria glauca*
50.	*Sida acuta*
51.	*Sida cordata*
52.	*Sida cordifolia*
53.	*Sida rhomboidea*
54.	*Solanum nigrum*
55.	*Solanum surattense*
56.	*Sporobolus diander*
57.	*Tridax procumbens*
58.	*Triumphetta annua*

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59.	*Vandelia brachteata*
60.	*Vandelia crustacia*
61.	*Vernonia cineria*
62.	*Xanthiumstrumerium*
63.	*Zornia gibbosa*

7. ANIMALS:

Animals in the area include Mammals, Birds, Reptiles, Amphibia, Butterflies, Dragon flies and a large variety of other insects.

7.1. Mammals:

Mammals in the area are all wild mammals, most of them are nocturnal, with a few visible during the day time also.

Table 4: List of mammals

S.N.	Local Name	English Name	Zoological Name	Status WL(Protection) Act, 1972 Schedule	Part
1.	Siyar	Jackal	*Canis aureus*	II	II
2.	Gilhari	Squirrel	*Funambulus pennanti*	IV	-
3.	Chamgadad	Fruit bat	*Cynopterus sphinx*	V	-
4.	Chooha	Field rat	*Bandicota benghalensis*	V	-
5.	Neola	Mangoose	*Herpetes edwardsi*	IV	-
6.	Langoor	Common langur	*Semnopithecus entellus*	II	I
7.	Jangali suar	Wid boar	*Sus scrofa*	III	-
8.	Chooha	Common house rat	*Rattus rattus*	V	-

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7.2. Birds

A large variety of bird are visible in the area, some of them are resident birds while some others are seasonal migratory birds. However, it requires special effort to see the birds as most of them are very shy, flying away from human beings, some of them stop for a very short time, flying away to other areas while some others remain hidden within the vegetation.

Table 5: List of Birds

S.N.	Local Name	English Name	Zoological Name	Status Schedule	Part
1.		House crow	Corvrus splendens	V	
2.		Common myna	Acridotheris tristis	IV	
3.		Brahminy myna	Sturnus pagodarum	IV	
4.		Pied myna	Sturnus contra	IV	
5.		Black drongo	Dicrurus paradiseus	IV	
7.		Spotted dove	Streptopelia chinensis	IV	
8.		Blue jay	Coracias benghalensis	IV	
9.		Parakeet	Psittacutla krameri	IV	
10.		Little Green Bee-Eater	Merops orientalis	IV	
11.		Koel, Cuckoo	Eudynamys scolopaicea	IV	
12.		Phakhta	Streptopelia chinensis	IV	
13.		Jangali Kaua	Corvus macrorhynchos	V	
14.		Jangali Tota	Taccocua leschenaultia	IV	
15.		Tania Tota	Psittacula cyanocephala	IV	
16.		Tota	Psittacula krameri	IV	
17.		Neelkanth	Coracias benghalensis	IV	
18		Bater (Grey Quail)	Coturnix coturnix	IV	
19.		Basanti (Indian cuckoo)	Cuculus micropterus	IV	
20.		Kite	Milvus migrans	IV	
21.		Indian Robbin	Saxicoloides fulicata	IV	
22.		Redwhiskered bulbul	Pycnonotus cafer	IV	
23		Bater (Grey Quail)	Coturnix coturnix	IV	

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26.	Jungle myna	*Acridotheres fuscus*	IV
27.	Grey heron	*Aredea ceineria*	IV
29.	Owl	*Bubo bubo*	IV
30.	Cattle egret	*Bubucus ibis*	IV
31.	Blue rock pigeon	*Columba livia*	IV
32.	House crow	*Corvus splendens*	V
33.	Common Hawk-cuckoo	*Cuculus varius*	IV
34.	Grey patridge	*Francolinus pondicerianus*	IV
35.	Grey waigtail	*Motacilla cinerea*	IV
36.	House sparrow	*Passer domesticus*	V
37.	Grey quail	*Perdicula asiatica*	IV
38.	Roseringed parakeet	*Psittacula krameri*	IV
39.	Spotted dove	*Pycnonotus luteolus*	IV
40.	Common kingfisher	*Alcedo atthis*	IV
41.	Pond heron	*Ardeola grayii*	IV
43.	Little cormorant	*Phalacrocorax niger*	IV
45.	Little egret	*Egretta garzetta*	IV
49.	Greater caucal	*Centropus sinensis*	IV
50.	Indian Robin	*Saxicoloides fulicata*	IV
51.	Oriental Magpie Robin	*Copsychus saularis*	IV
53.	White stork	*Cionia ciconia*	IV
54.	Ruddy Kingfisher	*Halcyon coromanda*	IV
56.	Ferruginus Pochard	*Aythya naroca*	IV
58.	Black-headrd Munia	*Lonchura malacca*	IV
59.	Black-hooded Oriole	*Oriolus xanthornus*	IV
60.	White Waigtail	*Motacilla alba*	IV
61.	Common Hoopoe	*Upupa epops*	IV
63.	Purple Sunbird	*Nectarinia asiatica*	IV
64.	Red-wattled Lapwig	*Vanellus indicus*	IV

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7.3. Reptiles:

Table 6: List of Reptiles

S.N.	Local Name	English Name	Zoological Name	Status WL(Protection Act, 1972) Schedule	Part
1.	Dhaman/Indian Rat snake		*Ptyas mucosus*	II	II
2.	Dhondwa/Water sanke		*Enhydris enhydris*	IV	
3.	Nag/Cobra		*Naja naja*	II	II
4.	Common Krait		*Bungarus caeruleus*	IV	
5.	Sita Ki Lath		*Amphiesma stolata*	-	-
6.	Dhondwa		*Xenochrophis piscator*	IV	
7.	Goh, Monitor lizard		*Varanus benghalensis*	I	II
8.	Garden lizard		*Calotes versicolor*	-	-
9.	Brahmini skink		*Mabuya carinata*		

7.4 Amphibia

Table 7: List of Amphibia

S.N.	Local Name		Zoological Name
1.	Mendhak	Bull frog	*Hoplobatrachus tigerinus*
2.	Mendhak	Common toads	*Duttaphrynus melanostictus*
3.	Mendhak	Skipper frog	*Euphlyctis cyanophlyctis*
4.	Mendhak	Small frog	*Microhyla ornata*
5.	Mendhak	Tree frog	*Polypedates maculatus*

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7.4. Butterflies

More than 20 species of butterfly have been recorded from the area. Thierteen of them have been identified clearly as given below:

Table 8: List of Butterflies

SN	Species	SN	Species
1.	*Acraea violae*	*11.*	*Hypolimnos misippus*
2.	*Eurema andersoni*	*12.*	*Junonia lemonias*
3.	*Eurema brigitta*	*13.*	*Junonia orithiya*
4.	*Eurema laeta*	*14.*	*Nepatis hylas*
5.	*Euthalia nais*	*15.*	*Phalanta phalantha*
6.	*Gandeca harina*	*16.*	*Tanaecia lepidea*
7.	*Hypolimnas bolina*	*17.*	*Hypolimnos misippus*
8.	*Acraea violae*	*18.*	*Hypolimnos bolina*
9.	*Eurema laeta*	*19.*	*Phalanta phalanta*
10.	*Euthalia nais*	*20*	*Junonia orithiya*

7.5 Dragonflies

Table 9: List of Dragonflies

SN	Species	SN	Species
1.	*Trithemis aurora*	*5.*	*Potamarcha congener*
2.	*Bradinopiga geminate*	*6.*	
3.	*Diplacodes trivialis*	*7.*	*Orthetrum pruinosum*
4.	*Pantala flavescens*		

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8. PLANTATION IN THE CAMPUS

Mass plantation programmes have been arranged frequently in the campus of the university, on the following dates:

1. 18th July 2017
2. 18th July 2018
3. 13th August 2020
4. 14th August 2020
5. 17th August 2020
6. 22nd August 2020

Tree saplings, planted on these dates have either grown to be visible from a distance or are coming up to reach above the herbaceous growth and in coming years will take the shape of trees. However, the efforts of planting the area with trees will continue. More importance will be given to local tree species, as mentioned below:

1. *Anthocephalus cadamba* (Kadamb)
2. *Azadirachta indica* (Neem)
3. *Cordia macleodii* (Dahiman)
4. *Dalbergia sissoo* (Sisham)
5. *Ficus bengalensis* (Bargad)
6. *Ficus religiosa* (Peepal)
7. *Kigelia pinnata*
8. *Lagerstroemia flos-reginae* (Jharul)
9. *Mangifera indica* (Aam)
10. *Phyllanthus emblica* (Aonla)
11. *Poinciana pulcherrima* (Gulmohar)
12. *Polyalthea longifolia* (Ashok)
13. *Samanea saman* (Siris)
14. *Saraca asoka* (Sita ashok)
15. *Tamarindus indica* (Imli)
16. *Tectona grandis* (Teak)

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17. *Terminalia arjuna* (Arjun)

18. *Terminalia belirica* (Beheda)

9. WATER CONSERVATION IN THE CAMPUS:

Water is being conserved in the campus, mot efficiently. Not a drop is being wasted. The most important step taken to prevent unnecessary loss of water is the installation of 'Automatic Water Level Controller' with each of the water tank. The controller sounds the alarm as soon as the water tank is filled so that the water supply to the tank is stopped. Waste water from the campus is used for irrigation.

There are two small ponds near to the entry to the campus of the University. The ponds maintain clean water, free from pollution. The ponds are able to attract some water birds. They are helpful in recharging the ground water to their nearby places.

Students busy in waste water management

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10. ENERGY EFFICIENCY:

All the electric bulb points are fitted with the LED bulbs consuming least amount of energy.

50 KW capacity Solar energy power plant

Further a 50 KW capacity 'Grid Connected, Solar Power Plant' has been established. The solar power plant is not only fulfilling the electricity requirement of the campus of the University, but excess amount of solar power generated electricity is fed to the grid. Thus the university is functioning, almost entirely on renewable, green energy.

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11. RECOMMENDATIONS

A green audit of an institution is the continued assessment of ecofriendly practices being adopted by the institution on greening the campus to enhance release of oxygen, booster carbon sequestration, increased dependence on renewable or green energy, efficient use of energy, efficient use and conservation of water, eco-friendly management of solid waste, proper management/disposal of liquid waste and provide congenial environment and habitat to wildlife, particularly the birds and butterflies. This has become essential in the present age due to rapid decline in the quality of environment. This can be achieved only with active participation of stakeholders, which should be achieved through running of awareness programmes, regularly. Some suggestions for cleaner environment in the University campus include:

- Environmental Statement Report on green practices followed by different departments should be prepared annually.
- Green audit report should be published in annual report of the university and will be uploaded in the university website.
- Awareness will be created among students, staff and public. This wiil be helpful to encourage students and employees towards sustainable utilization of available resources.
- Focus will be made to assess the consumption of energy, electricity, water as well as disposal of liquid and solid waste, hazardous waste and e-waste.
- Regular inventory of trees in the campus will be made to assess the sequestration of CO_2.

Raipur

Dated: 13-02-2022

(M. L. Naik)

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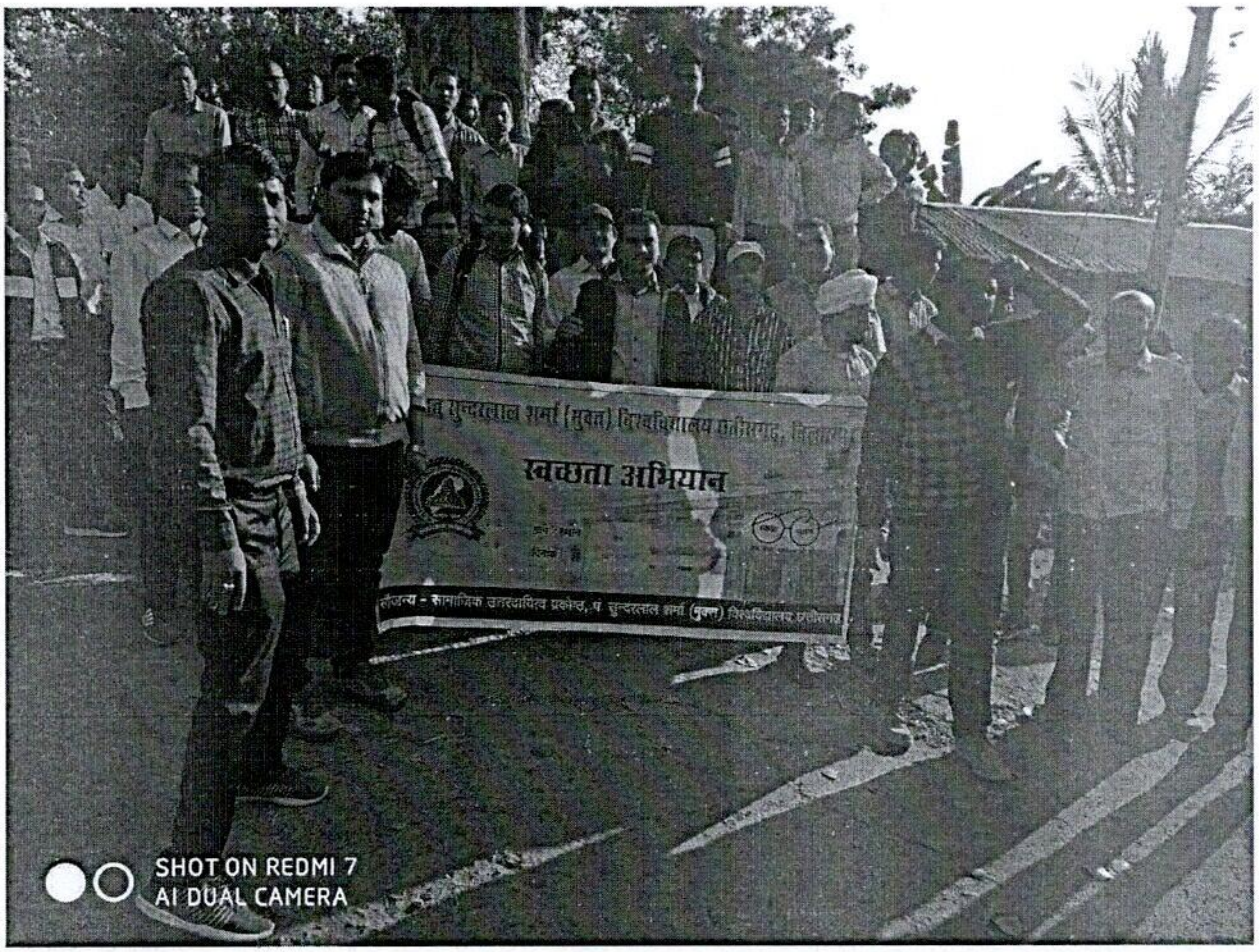

Cleanlyness campaign by the students

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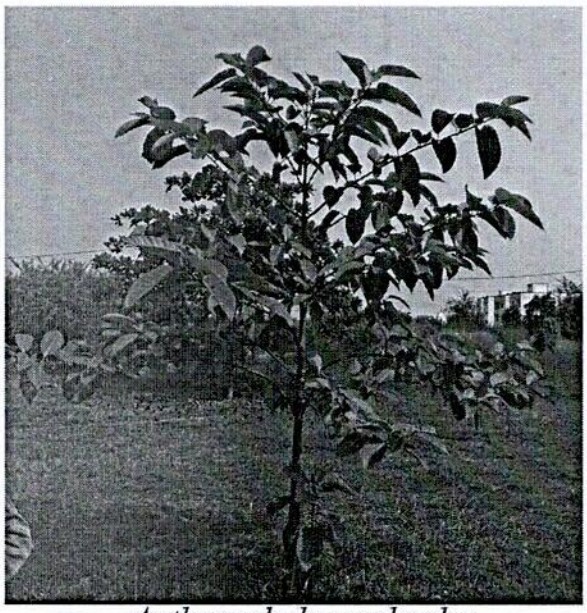
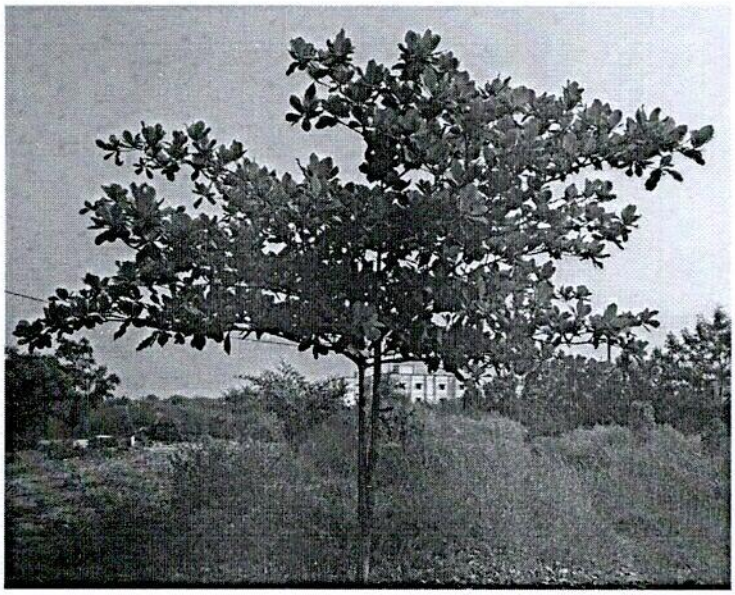
TREES IN THE CAMPUS

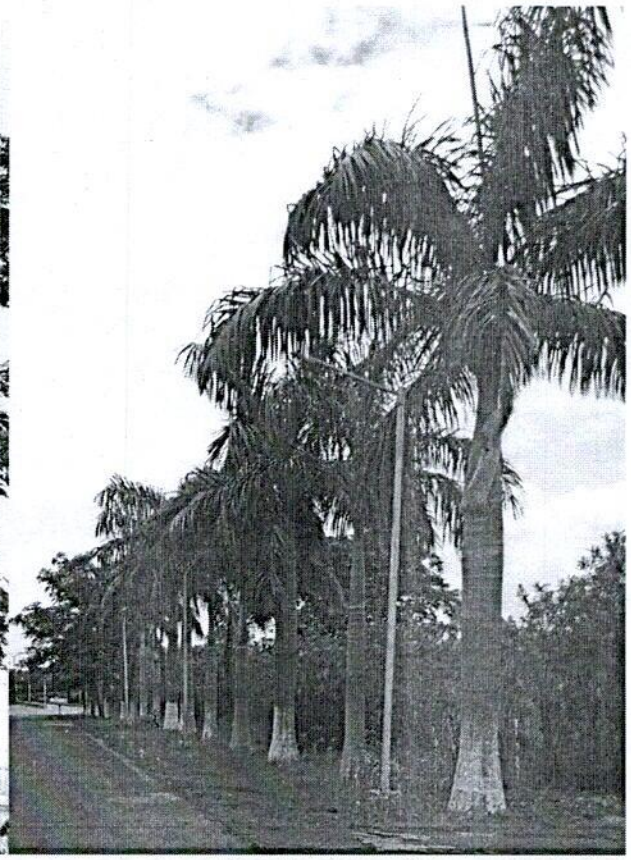


Anthocephalus cadamba



Terminalia catappa

Albizzia lebeck



Roystonia regia

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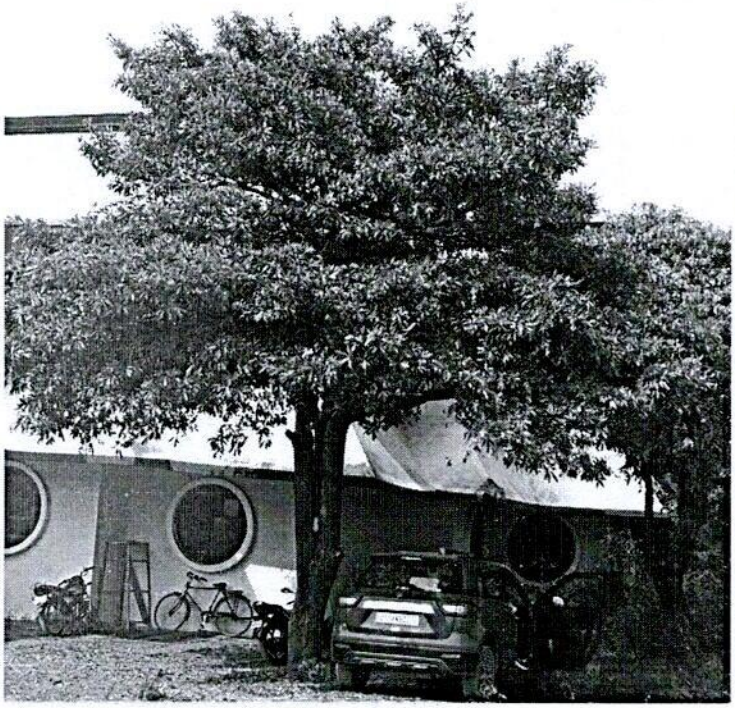
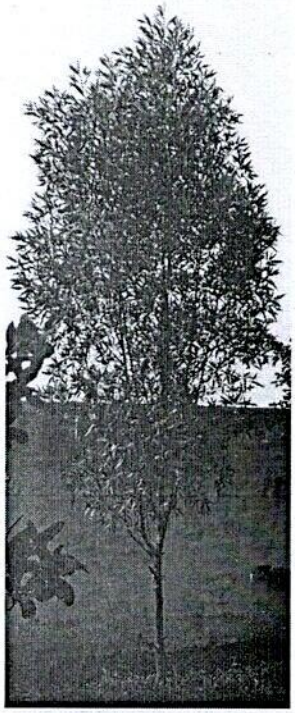
TREES IN THE CAMPUS

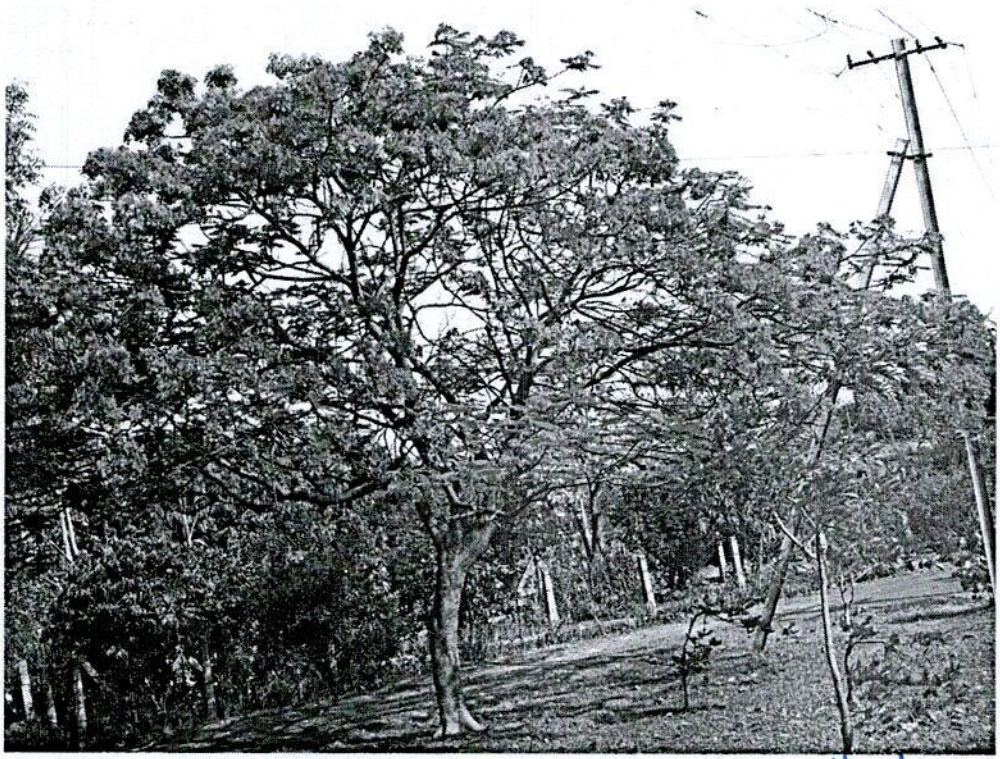


Alstonia scholaris

Simarouba glauca



Conocarpus lancifolius



Delonix regia

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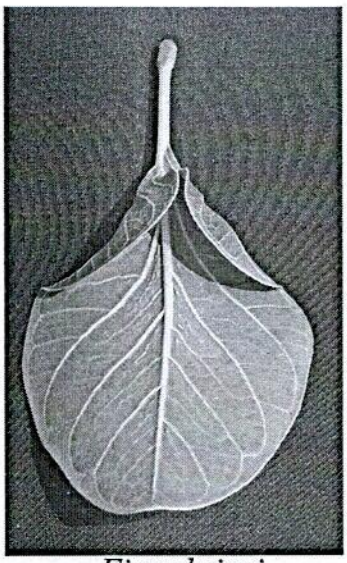
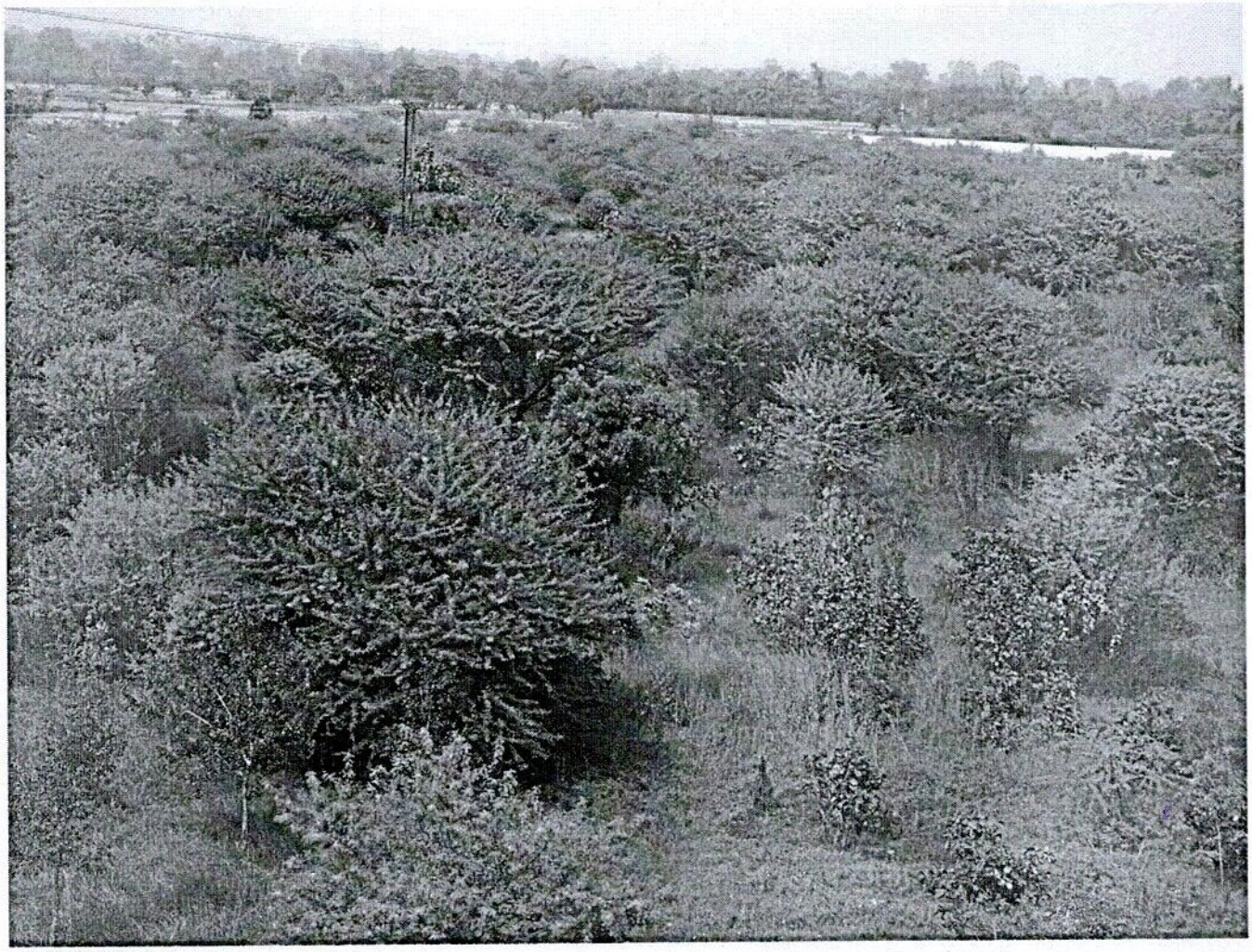
PLANTS IN THE CAMPUS

Pennisetum pedicillatum

Nerium oleander



Ficus krisni



***Vachellia nilotica* (Babool) A hardy, useful species, covering emoty spaces**

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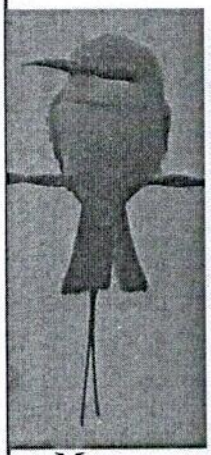
ANIMALS IN THE CAMPUS

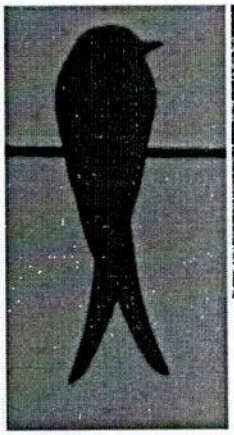
Ardeola grayii

Trombidium

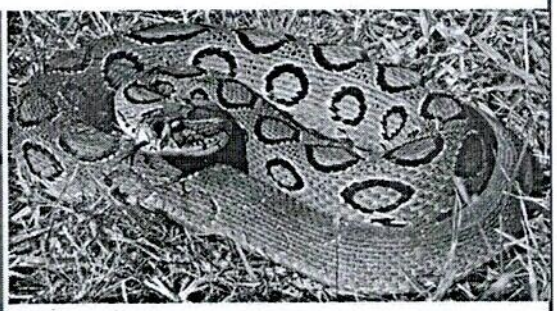


Merops orientalis

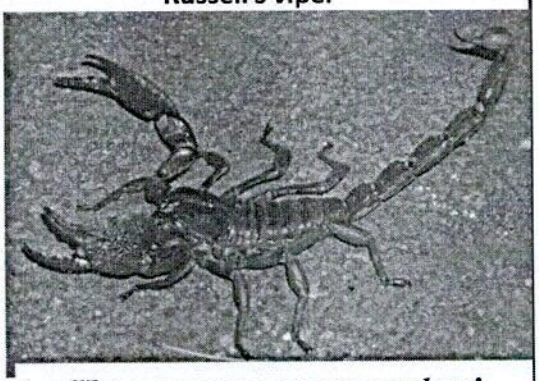
Bubulcus ibis



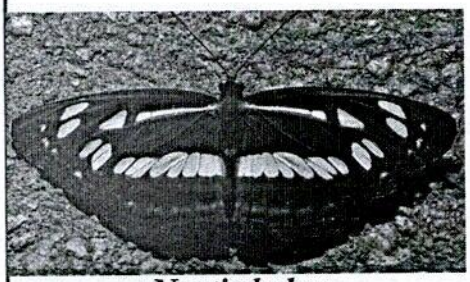
Dicrurus paradiseus



Russell's viper

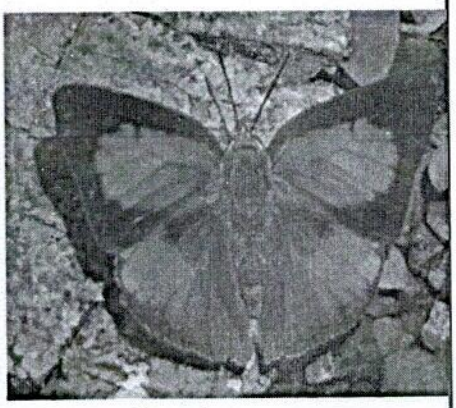


Heterometrus swammardemi

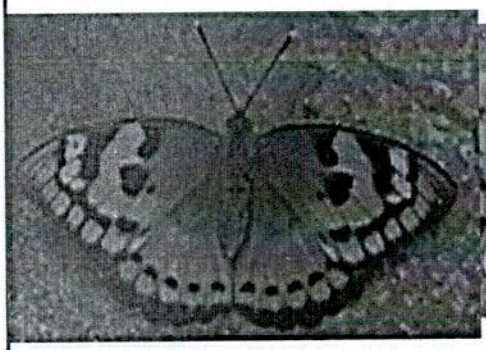


Neptis hylas

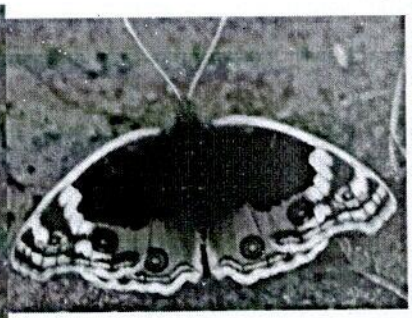
Catopsilia pyranthe



Curetis acuta



Euthalia nais



Junonia orithiya
(blue Pansy)

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