GREEN AUDIT REPORT
2020-2021

OF

GOVERNMENT AUTONOMOUS COLLEGE, ROURKELA

SUNDARGARH, ODISHA, INDIA
PIN-769004

CONDUCTED BY

IQAC & Green Audit team GACR

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ACKNOWLEDGEMENT

IQAC and Green Audit Assessment Team thanks to the Principal, Govt. Auto. College, Rourkela for assigning the task of Green Audit of this college to us. We appreciate the cooperation that we got from all the faculties and students during the entire process. Our special thanks are due to the Principal Dr. Bijaya Kumar Behera for his warm support and encouragement. From the very beginning till the end of the process.

We are also thankful to the PHD division Panposh, Rourkela for Water Sample Test & helping us in collecting different data and analysing them.

Dr. Sasmita Samal
Co-Ordinator,
Green Audit Team
Government Auto. College, Rourkela.

DISCLAIMER

Green Audit Team has prepared this report on the basic of primary data collected from the different areas of the college. All reasonable care has been taken in its preparation; details contained in this report have been compiled in good faith based on information gathered

Prepared by:

IQAC & Green Audit team GACR

GREEN AUDIT

The intention of organizing Green Audit is to upgrade the environment condition in and around the institutes, colleges, companies and other organizations. It is carried out with the aid of performing tasks like waste management, energy saving and others to turn into a better environmental friendly institute.

GOALS OF GREEN AUDIT

- The objective of carrying out Green Audit is securing the environment and cut down the threats posed to human health.
- To make sure that rules and regulations are taken care of
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- To make sure that rules and regulations are taken care of
- To avoid the interruptions in environment that are more difficult to handle and their correction requires high cost
- To suggest the best protocols for adding to sustainable development

BENEFITS OF GREEN AUDIT

- Would help to prepare plan to project the environment.
- Recognize the cost saving methods through waste minimization and management.
- Point out the prevailing and fourth coming impacts on environment.
- Ensures conformity with the applicable laws.
- Empower the organizations to frame a better environmental performance.
- It portrays a good image of an institution which helps building better relationships with the group of interested parties.
- Promotes the alertness for environmental guidelines and duties.

GREEN AUDIT EXECUTIVE SUMMERY REPORT

1. BRIEF ABOUT COLLEGE

1. Name of the Institution: Government Autonomous College, Rourkela
2. No. of Department:UG-20, PG: 17, MPhil:-03
3. No. of Students: Intake UG-720, PG-624, Total: 3408
4. No. of Faculty Members:- 88
5. No. of Non-Teaching Members: 33
6. Total campus area: 35 acer
7. College building Spread Area: 13 acer
    a) Girls common room: 4
    b) Garbage collection bins:50
    c) Labs:13
    d) Class rooms:70
    e) Boys common room:3

2. ENVIRONMENTAL POLICY OF THE COLLEGE

Government Autonomous College, Rourkela always believes in maintaining its own standard in matter of environment and quality consciousness. It has taken number of initiatives to protect its own environment with a pollution free campus.

Being an environmental conscious college, the administration and the students of the college look after the environment carefully. Every year, during rainy season, tree plantation is carried out and carefully looked after it. GACR owns responsibility to preserve the work carried out on the campus related to the environment.

ENVIRONMENTAL POLICY

Both the teaching and Non-teaching staff of Government Autonomous College, Rourkela are committed for carrying out its activity for sustainable development. This we will achieve through the following :-

i. To sensitize the students and staff regarding the use of water properly
ii. To bring in use the 'Rain Water Harvesting' on the campus.
iii. To maximize the use of ICT and minimize the use of paper. It will help to go towards 'Paperless Office'.
iv. To use the solid waste through vermin-compost on the campus and use it as a fertilizer.
v. To reduce the 'sound pollution in the campus.
vi. To protect and nurture the Flora and Fauna on the campus
vii. To maintain green campus.

3. CONSTITUTION FOR GREEN AUDIT

The Green Audit is carried out as per the environmental policy of the GACR and Green audit checklist. The aim of the audit is to check the existing practices and provide advice for the development of environmental policy and practice in the areas of:

- ✓ Waste Management
  i. Solid waste management ii. E-waste
- ✓ management Water conservation and management
- ✓ Tree plantations
- ✓ Bio-diversity and threatened/ endangered species
- ✓ preservations Energy use and conservations
- ✓ Eco-friendly campus
- ✓ Green environment and clean campus

4. MEMBERS OF GREEN AUDIT TEAMS

Sl. No.	Name of Auditor	Designation
1	Dr. Bijaya Kumar Behera (Chairman)	Principal, GACR
2	Dr. Sasmita Samal (Co-Ordinator)	Asst. Prof, GACR
3	Dr. Kichak Chandra Jena (Member)	Asst. Prof, GACR
4	Dr. Lichta Patro (Member)	Asst. Prof, GACR
5	Mr. Sameer Sourva Prusty (Member)	Asst. Prof, GACR
6	Dr. Smruti Snighdha Mishra (Member)	Asst. Prof, GACR
7	Dr. Biswanath Parija (Member)	Asst. Prof, GACR
8	Dr. Prabhudutta Mohanty (Member)	Faculty, GACR

EXECUTIVE SUMMARY

Government Autonomous College, Rourkela, a premier Educational Institution of western Odisha, made its formal beginning with 51 students, 4 teachers and a Principal on 16th August 1961 under the name of Rourkela Science College and was taken over two years later on 1st July, 1963 by the Govt. of Odisha. The college then housed in a small building provided by the authorities of the Rourkela steel plant in sector-4 of the steel township, started imparting instruction in Arts classes from the Academic session 1969-70.

The college was shifted to its present campus spreading over an area of 35 acres of land at Panposh, located near to the Panposh Railway station on the Howrah Bombay railway line and the intersecting cross road of NH-143 with Biju Express Highway. The college reached new heights in the academic forefront with the opening of P.G. classes in English in the year 1982, Botany in the year 1992 and Odia in the year 2004. To Commensurate with this vertical academic growth the college was accorded Autonomous status in 2002 and was accredited by NAAC with B Grade. The college made tremendous strides with the opening of P.G. classes in the subject of physics, Chemistry, Zoology, Political Science, Economics, Sociology, Education and Psychology from the session 2017-18 and in the subjects of History, Hindi, Mathematics and Statistics in the session 2018-19. Now the college holds its head high as one of the front ranking institutions of Odisha offering P.G. course In 17 subjects and M. Phil. course in three subjects from 2018. It is to be noted here that this is the only College of Sundargarh district providing M.Phil. Courses on three subjects. Besides, offering regular courses both at U.G. (Hons.) and P.G. level, the college too offers verities of Self-financing courses like M. Sc. (Computer Science) and U.G. courses like Mathematics with Computer, Computer Science & Electronics and Tele-communication.

In its long journey of 60 years the college has left indelible marks on the stand of time by producing brilliant luminaries in different fields like science, technology, sports, social service administration, politics.

VISION

To achieve Academic Excellence by giving impetus and adapting to measures for Enhancing Effective Quality Sustenance and Progression on all key facets of Education. Providing a dynamic and conducive Environment for all in order to Inculcate, Infuse, Imbibe, Equip and Disseminate Value Oriented Learning, Creativity, Innovation Social Consciousness to achieve Sustainable Livelihood.

MISSION

- To inculcate Love/Inclination for learning by adapting to Latest Teaching Learning Methods for Enhanced Learning & Creativity.
- To Value and by Introducing & Integrating Skill in the Knowledge Content for gaining Competitive Edge with the view to be Self-Reliant.
- To provide and Equal Platform for Higher Education, Employability & Entrepreneurship for all.
- To promote and support Research Oriented Activities.
- To train Students to be Creative and Competitive to face Real World Challenges of the new millennium.
- To develop a sense spirit-de-corps through Co-curricular, Extra-Curricular and Outreach Activities.
- To promote activities to enhance Societal Consciousness/ Community development, well-being & harmony.

5. GOOD POINTS OBSERVED

1. College has prepared Green Environmental policy and has taken efforts for sustainable development on the college campus. .
2. College has formed the team of faculty and student which works to maintain biodiversity on the campus and also participates in preventing pollution in society through various drives
3. College has a plane to install solar panels in future.
4. College has plane to include environment protection and management as a subject in curriculum.
5. College has conducted Environment Awareness trainings and workshop for faculty and students.
6. College has Vermicomposting facility installed.

6. MAJOR RECOMMENDATIONS

1. College should install solar panel as early as possible.
2. More number of Energy and flow meters to be installed for monitoring of energy and water consumption building wise/department wise.
3. PUC certificate for all the vehicles entering the campus to be made mandatory and to be checked by security.
4. College should maintain the legal register for the applicable environment related regulations and comply with this as per the requirement.
5. Bio-waste: Composting system to be adopted.
6. E-waste management system needs to be adopted.

7. OBJECTIVES OF THE STUDY

The main objective of the green audit is to promote the Environment Management and Conservation in the College Campus. The purpose of the 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 secure the environment and cut down the threats posed to human health by analysing the pattern and extent of resource use on the campus.
- ✓ To establish a baseline data to assess future sustainability by avoiding the interruptions in environment that are more difficult to handle and their corrections requires high cost.
- ✓ To bring out a status report on environmental compliance

8. METHODOLOGY

In order to perform green audit, the methodology included different tools such as preparation of questionnaire, physical inspection of the campus, observation and review of the documentation, interviewing key persons and data analysis, measurements and recommendations. The study covered the following areas to summarise the present status of environment management in the campus

- **Water management**
  - ✓ Raw Water
  - ✓ Drinking Water
  - ✓ Laboratory Waste Water
  - ✓ Sewage Water
  - ✓ Rain Strom Drain Water
- **Energy Conservation**
  - ✓ Petrol
  - ✓ Diesel
  - ✓ LPG
  - ✓ Electricity
  - ✓ Batteries
- **Waste management**
  - ✓ Green area management

9. FOCUS AREA OF STUDY

- ✓ Water management
- ✓ Air Pollution Management
- ✓ Noise Pollution Management
- ✓ Energy use & conservation
- ✓ Waste Management
- ✓ Green Belt area & Bio-diversity
- ✓ Environmental Initiative

WATER MANAGEMENT

Water is a valuable natural resource for all living organisms. It is freely available depending on the climate and topographic features of a region. Although water is natural freely available but portable (drinkable) water is not available freely for human consumption. In our planet 70% area is covered by water but only 3% of it is fresh water. Around 1.1 billion people of the word face water crisis. Water pollution and wastage plays a vital role in water crisis. Water contaminations are taking place at an alarming rate. Drinking or using contaminated water leads to many diseases or death. That is why it is important to ensure that drinking water is safe, clean and free from bacteria and disease. It is also important to conserve protect and manage the water resources availability and usage so that it is sustainably used. Our college examine the quality and usage of water in the college campus. Water auditing is conducted for the evaluation of facilities of raw water intake and determining the facilities for water treatment and reuse. The concerned auditor investigates the relevant method that can be adopted and implemented to balance the demand and supply of water.

USES AND MANAGEMENT

SOURCE OF WATER

SL. No.	Resource	Quantity
1	PWD (water supply)	-----
3	No of Bore-well	02
4	No of Hand pump	04
5	Water reserve tank	61

WATER USERS IN CAMPUS

Sl No.	Person in different section	Strength (No. of person)
1	Staff	120
2	Hostel Boarders	1360
3	Residential Family Members	54
4	Visitors	Approx. 2000
5	Construction Labour	Approx. 300

The visitors of the college vary with respect to different activities conducted in the college campus. During admission and different competitive exam conducted in the college campus. The total number of visitors of the college increases up to 5000 on such day. There are good numbers of visitor inflow to the college for IGNOU and OSOU inquiry and study purpose. Thus, average visitors per day approximately 700.

QUANTITY OF WATER USED IN DIFFERENT SECTIONS OF THE CAMPUS

Sl. No.	Sections	Water Use (Litter/day)
1	Academic building	8000
2	Autonomous building	7000
3	Canteen	4000
4	Urinals and Toilets	80000
5	Departments	65000
6	Laboratories	20000
7	Garden	50000
8	Drinking	12000
9	Hostel	135000
10	Residential Quarters	60000
11	Leakage	50000
12	Construction Work	150000

WATER CONSUMPTION IN DIFFERENT ACTIVITY IN COLLEGE CAMPUS

Activity	Water used per activity (in Litter)	No. of times Activity performed in a day	Average water used Person/Day	No. of people using water	Total water consumption per Day
Hand and face wash	4-6 L	4	16-24L	4000	160000
Drinking Water	0.2-0.4L	6	1.2-2.4L	4000	7.200
Toilet Flush	8-10L	4	32-40L	3714	133704L
Bath	30-40 L	1	30-40 L	1500	52500L
Cooking & Washing In resident	150-250L	2	300-500L	18	7200L
Cooking & Washing Hostel	350-450L	2	700-900L	05	4000L
Cloth Washing	100-200L	1	100-200L	1414	212100L
Total					576704

WATER QUALITY ASSESSMENT REPORT

WATER SAMPLE TEST REPORT OF 'AUTONYMS GOVT. COLLEGE', PANPOSH. P.O. ROURKELA- 04, P.S. RAGHUNATHPALLI, RKL, Dt. SUNDERGARH, ODISHA, PIN – 769004.

Lab.let.no.226 Dt.15.09.21

1. Sample Collected by: Spectro RKL. (Mob: 7978505648)
2. Date of Collection : 01-09- 21.
3. Source : Different Water Sources(3 nos)
4. Date of Test : 02- 09- 21.

Owner: Principal Govt. Autonyms College.

5. Water Quality Parameters :

Water Quality Parameters with measuring unit.	Sample No. I Hand-Pump (T.W-1) Nr. SF. Dept.	Sample No. II Hand-Pump (T.W-2) Nr. Oriya Dept.	Sample No. III PHED supply Water Sample	BIS (IS:10500 of 2012) Standard (Maximum Limit)
i) Odour : Ophthalmic sense	Odourless	Odourless	Odourless	Odourless
ii) Colour : Hazen Unit.	19.29	21.35	09.25	15
iii) Turbidity in NTU :	8.22	10.14	4.85	5.00 NTU
iv) Electrical Conductivity in us/cm. :	482	485	129	3000
v) Sulphate (as SO_4^{-2}) in mg/l	18.40	2.35	3.15	400
vi) Total Dissolved solid in mg/l :	290	298	78	2000
vii) Chloride (as Cl^-) in mg/l :	14.2	37.4	10.2	1000
viii) Fluoride (as F^-) in mg/l :	0.18	0.13	0.08	1.5
ix) Nitrate (as NO_3) in mg/l:	6.22	1.14	1.7	45
x) Total dissolved Iron (as Fe^{+2}) in mg/l :	1.72	1.86	0.09	0.30
xi) pH at room temp:	6.72at26.5° C	6.95 at 26.5° C	6.96 at 26.5° C	6.5 to 8.5 at 25° C
xii) Alkalynity as mg/l, of $CaCO_3$:	50.4	56.9	36	600
xiii) Total Hardness as mg/l, of $CaCO_3$:	60	229	60	600
xiv) Ammonia Nitrogen in mg/l, (NH_3 as N)	0.08	0.11	0.05	0.5
xv) Calcium as 'Ca' in mg/l,	9.6	53.5	14.4	200
xvi)ResidualChlorine as'Cl'in mg/l	0.00	0.00	1.0	0.20
xvii) Microbiological Assay Total Coliform Bacteria :	Nil	Nil	Nil	Nil

Remarks : With respect to the above test results, water quality is indicated by the actual datas, as per BIS norms, IS;10500 of 2012, the water is potable & suitable for drinking purpose.

Kallol Dey 15/9/21

Asst. Analyst (Chemist)
P.H.Head Works. Laboratory,
Panposh, Rourkela :769004

Letter No. 226 Dt. 15/09/2021

To,

The Principal Government Autonyms College,

At. Panposh, ROURKELA-4

P.O. Rourkela-769004.

Kind Attn: Sri Prabhudutta Mohanty, prof. Computer Science, Government Autonyms College.Rourkela

Sub: Water sample test Report of Different Sources. Govt. Autonyms College Campus.

Sir,

Please find enclosed in tabulated form the water supply sample test report as collected and tested on 1st September. 2021 from different Tube well sources of drinking water as well as piped water as supplied by PHED Rourkela.

With respect to the attached test report data sheet, the parameters like COLOUR, DISSOLVED IRON CONTENT and TURBIDITY of the tube well water is slightly high. All the water samples are potable and suitable for drinking.

Yours faithfully,

Kallol Dey 15/9/21

Kallol Dey
Asst. Analyst (Chemist)
PH Divn. Rourkela

Memo No. 227 Dt. 15/09/2021

Copy submitted to the Executive Engg. PH Divn. Rourkela/A.E.E. PH Sub-Division Rourkela for information

Kallol Dey
Asst. Analyst (Chemist)
PH Divn. Rourkela

MAJOR OBSERVATIONS IN REGARD OF WATER USAGES AND CONSERVATION PLAN

1. At present waste water is not recycled or reused in any form in the college premises
2. Drip irrigation and sprinklers are used for watering the garden. The garden is also watered with water pipe, two times a day for 02 hours each time.
3. College does not have any vehicle and hence there is no water usage for vehicle maintenance
4. The rain water is drained by storm water drain and released to Nallha inside the boundary of the college at low terrain

RECOMMENDATIONS

College administration may consider theses on top priority:-

1. To establish and implement the Water Conservation and Management Plan as per Environment Protection Act 1986
2. The water Conservation Awareness Program to be conducted on World Water Day on 22nd March every year
3. Display boards for switching off the taps to be put on at appropriate place
4. To eliminate the spillage and over usage of water in washbasins, urinals and toiler push taps are highly recommended.
5. Automatic Leak detection systems for conservation of water.
6. Rain Water Harvesting as per the guidelines of Central Ground Water Board shall be done.
7. 80 % of total quantum of ground water extracted shall be recharged to ground either by Artificial Recharge Structures within the college premises
8. Water meters to be installed on Dug Well as well as Bore Well water extraction system
9. Special Internal Water Audit to be conducted quarterly and should be headed by HOD Chemistry Department

AIR POLLUTION MANAGEMENT

PERIODIC AWARENESS PROGRAMME FOR STAFF, STUDENTS AND SOCIETY

The College has been continuously conducting awareness programmes for staff, students and society for protecting and maintaining environment. The awareness is also done by arranging programmes, rallies on various issues related to environment and health. The college students and faculty members are involved in the activities through NSS/NCC, but audit team could not find any display board for conservation of Environment in the college premises.

Every day there are 200 Two wheelers and 50 four wheelers are coming in college premises but there is no system observed to check for PUC certificate, Vehicle Exhaust Gas Analysis and Vehicular movement noise and vibration pollution. The air pollution at the time of ignition off and on is more than it is in riding mode.

RECOMMENDATIONS

The College may consider these on top priority:-

1. World Environment Day to be celebrated in college premises every year on 5th June and whole college students and staff shall get involved and take OATH for ENVIRONMENT CONSERVATION not only in college but also in every span of life.
2. Chemistry and Botany Department shall monitor the Ambient Air Quality as per the guidelines of "Air (Prevention and Control of Pollution) Act 1981
3. Exhaust gases shall be monitored, analysed and check regularly
4. Parking zone of college shall be neat & clean.
5. Use of bicycle in campus to be promoted.

NOISE POLLUTION MANAGEMENT

A) SILENCE ZONES IN THE COLLEGE

Various display boards have been placed in the library and other places for awareness to maintain silence in the college.

B) NOISE CONTROL IN THE COLLEGE

The college adopts no honking policy and prevents use of any honk and noise in campus.

Certain areas like library, class room are declared as Silence zone and noise pollution is kept to minimum on college campus.

C) DG SET FOR POWER BACK-UP

The college had DG set as power backup and used whenever there is power cut-off due to load shading or maintenance of electricity in college campus. It is observed that acoustication is not done on DG Set for noise pollution reduction. The exhausted gases are not monitored, tested and analyzed to know the pollution load.

RECOMMENDATIONS

The College administration may consider on top priority

1. Noise Level Monitoring shall be done as per the guideline of "Noise Pollution (Regulation and Control) Rules 2000
2. Vehicular exhausts shall be examined regularly in the collage as per Central Motor Vehicle Act 1988
3. Vehicular movement shall be restricted by putting boundary limit and beyond that limit bicycles usage shall be promoted to all students and staff

ENERGY USE AND CONSERVATION

This indicator addresses energy consumption, energy sources, energy monitoring, lighting, appliance, natural gas and vehicles. Energy use is clearly an important aspect of campus sustainability and thus requires no explanation for its inclusion in the assessment.

OBSERVATIONS

Following Energy Sources are used in the college

- ✓ Electrical
- ✓ Diesel
- ✓ Petrol
- ✓ LPG

RECOMMENDATIONS

The College administration may consider on top priority

1. To use Common or public Vehicle instead individual vehicle to conserve fossil fuel
2. Energy Consumption for each building should be estimated to design the energy conservation plan.
3. Instead of out-sourcing the Annual Maintenance of Electrical Equipment college concern department staff shall take that responsibility
4. Energy saving awareness shall be done by displaying the boards at appropriate place
5. Encourage natural ventilation and illumination by alteration in the building structures whenever going for new constructions

GREEN BELT AREA & BIO-DIVERSITY

The Green Belt Area is meant for conservation of nature and aesthetic value of the college premises. The Green Area in the college includes the plants, greenery and sustainability of the campus to ensure that the buildings conform to green standards This also helps in ensuring that the Environmental Policy is enacted, enforced and reviewed using various environmental awareness programmes.

OBSERVATIONS

Campus is located in the vicinity of approximately 80 types (species) flora and fauna. Various tree plantation programs are being organized during the month of July and August at college campus and surrounding villages through NSS unit. This program helps in encouraging eco-friendly environment which provides pure oxygen within the institute and awareness among villagers. The plantation program includes various types of indigenous species of ornamental and medicinal. Instead of maintaining biodiversity the similar species planted is observed for example "NEEM". The dominant species in green belt are Neem, Indian Blackberry Tree, Flame Tree, Mango Tree, Jack Fruit Tree, Teak and Spanish cherry Plant.

No. of trees planted in campus

Types of trees planted which are environment friendly are enlisted below:

Neem, Indian Blackberry Tree, Flame Tree, Mango, Jack Fruit, Teak, Guava, Almond, Cashew, Exotic Flora, Asoka and Spanish cherry Plant..

RECOMMENDATIONS

The Management of College may consider on top priority that

- ✓ Total 33% area is to be reserved for plantation
- ✓ The Biodiversity is to be maintained while considering the plantation in future
- ✓ The selection of trees species to be based on environmental conservation and carbon sequestration value
- ✓ Artificial nests and water ponds are recommended to attract different birds in their migrating and breeding season
- ✓ Watering schedule to be planned according the season
- ✓ Drip irrigation is strongly recommended to conserve the water
- ✓ Reuse of the water shall be done instead of use of fresh water
- ✓ Special Tree Plantation shall be celebrated every year on environment day and also competitions for bird species identification and knowing the tree values in terms of medicinal and environment conservation

ENVIORNMENTAL AWARENESS INITIATIVE

GACR conducts regular trainings to staff and faculties regarding use of bicycles, controlled use of paper, plantation target and implementation. Display of environment protection banners, posters like save water, save energy at prominent places, waste disposal bins for wet and dry waste disposal bins for wet and dry waste disposal are some of the initiatives taken.

OVERALL RECOMMENDATIONS

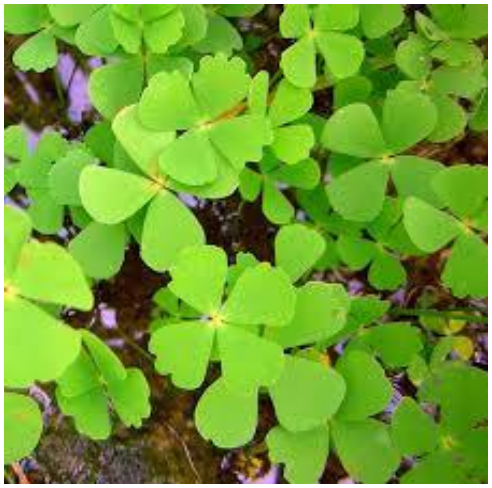
1. Lab waste water quantity is not measured and drained to municipal drainage system.
2. Planning of chemical consumption and purchase to be ensured
3. Composting of bio degradable waste to be scientifically done
4. Septic tank sewage water analysis is to be done
5. Plan for green belt development to be prepared
6. Drinking water analysis shall be done as per IS 10500
7. Rain water Harvesting (RWH) is to be done technically
8. Reduction of wood policy
9. Department wise electrical load consumption is to be done
10. Energy used by each appliance is to be estimated
11. List of equipment/instrument and their consumption of (energy/water) is to be estimated.
12. Awareness for energy and water conservation among students and staff by displaying boards.
13. Automatic leak detections in water flowing pipeline
14. Water usage reduction techniques to be used
15. Tree plantation shall be done to maintain biodiversity as well as artificial nesting shall be installed.
16. D. G. stack monitoring/Exhaust gas analysis shall be done.
17. Awareness among students and staff about green environment shall be done use tools like display boards

Plant Diversity

A survey was carried out to find plant diversity in the college campus of Government Autonomous College, Rourkela. The survey was focused on the diversity of plants on the basis of their classification and economic importance.

Bryophyta

Moss Plant (Funaria hygrometrica)
F- Funariaceae

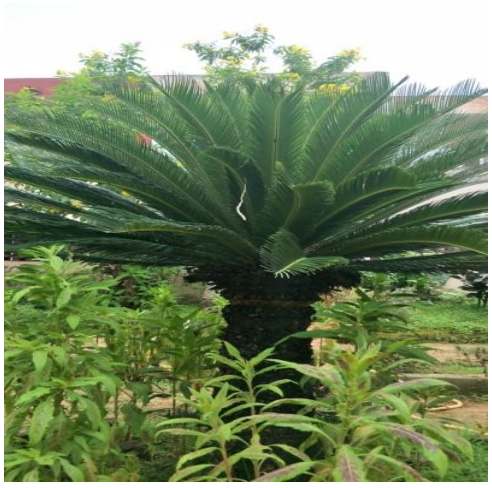


WATER FERN (Marsilea quadrifolia)
F- Marsileaceae

Pteridophyta

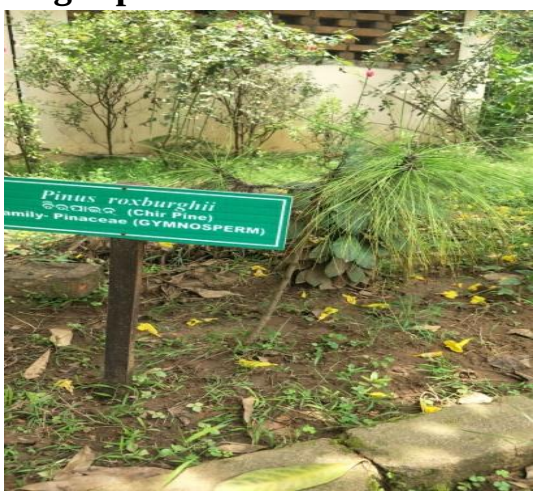
FERN (Dryopteris)
F- Dryopteridaceae

Gymnosperm

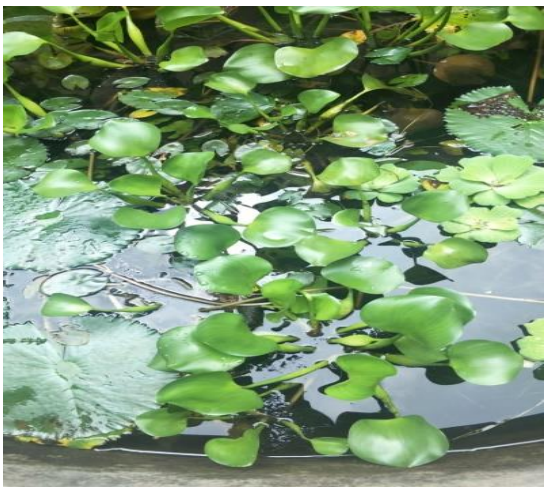


Sago Palm (Cycas cirnialis)
F- Cycadaceae

Angiosperms



Chir Pine (Pinus Roxburghii)
F- Pinaceae



Water Hyacinth (*Eichhornia sps)*

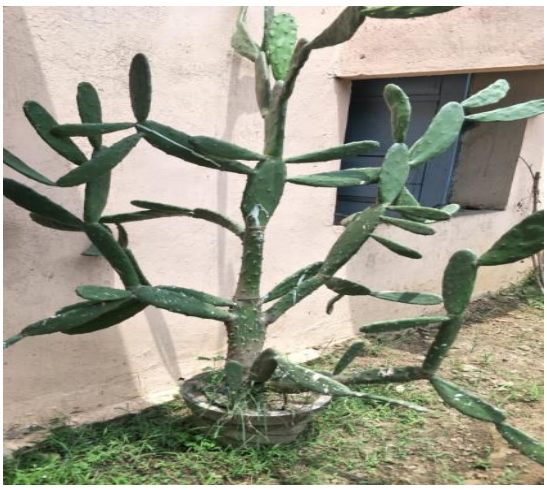
Hydrophyte

Water Lily (*Nymphaea Pubescens*)

Water thymes (*Hydrilla verticillata)*

Water Lettuce (*Pistia cuneata*)

Xerophyte



Prickly Pear (*Opuntia ficus-indica*)

Mesophytes
(Medicinal plants)

1. ASHWAGANDHA (*Withania somnifera*)
F-Solanaceae

Parts used: Root, leaves

Uses: Rheumatism, Removes functional obstruction of body, Ulcer, Nerves disorder, Useful for

Sexual & general weakness, Improves vitality, Premature ageing, Emaciation, Debility, Memory loss, Thirst, Dehydration, Constipation, Chronic fatigue.

2. ALOEVERA (*Aloe barbadensis*)
F-Liliaceae

Parts used: Leaves

Uses: Gastroenteritis, Skin, Constipation, Irregular Menstruation, Piles, Worms, Rheumatism, Jaundice, Acne & liver ailments, Healing of skin wound, Scald, Sunburn, Sores, Shingles, Psoriasis, Warts. Conjunctivitis, Sties, Allergic reactions, Vaginal infections, Insect bites.

3. ATIKAPUDI (Boerhavia diffusa)
F – Nyctaginaceae

Parts used – Root, Leaves

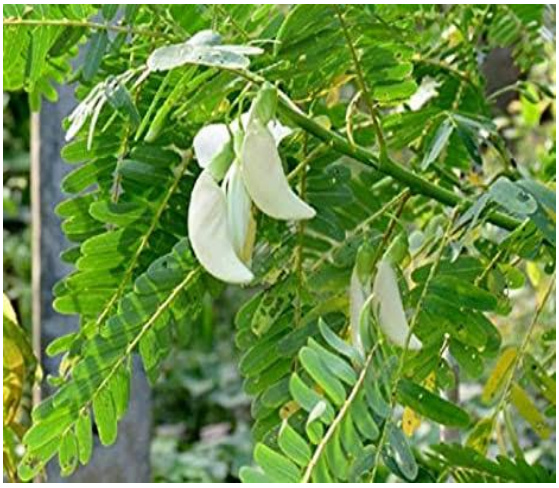
Uses- Asthma, Protect eyesight, Lower Blood Sugar, Joint & abdominal pain, Anemia, Heart

diseases, Biliousness, Leucorrhoea, Dyspepsia, Tumors, Spleen enlargement, Scabies, Gonorrhea, Hepatitis, Jaundice, Urinary track disorders, Kidney Stones, Cystitis.

4. ARAKH (White) (*Calotropis procera*)
F – Apocynaceae

Parts used: Root, Latex, Flower, Leaves

Uses: Bronchitis, Asthma, Leprosy, Eczema, Elephantiasis, Hair fall, Toothaches, Intermittent fever, Joint swellings & pain, Paralysis, Eye tonic, Deafness, Skin diseases.



5. AGASTI (*Sesbania grandiflora*)
F-Fabaceae

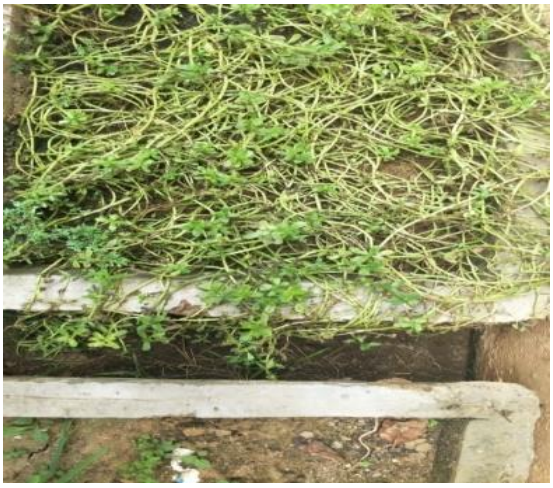
Parts used: Bark, Leaves, Bark, Gums

Uses: Diuretic, Emetic, Laxative, Remedy for Bruises, Catarrh, Dysentery, Eyes, Headache, Smallpox, Sore throat, Liver disorders, Anti-biotic, Anti-helminthes, Anti-tumor, as contraceptive, Fever, Inflammation, Smallpox, Ulcers in mouth, Worms, Biliousness, Gout, Itchiness, Leprosy, Epileptic fits.

6. AMARPOI (*Kalanchoe pinnata*)
F - Crassulaceae

Parts used – Whole plant

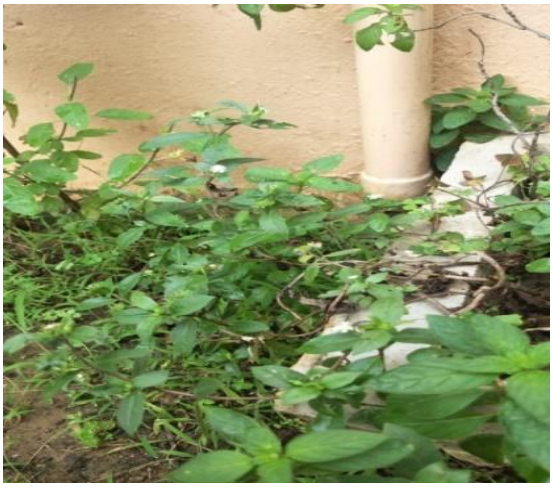
Uses – Infections, Rheumatism, Inflammation, Hypertension, Kidney stones, Tumor, Wound healing, Anti-biotic, Fevers, Cancer, Headache, Epilepsy, Insect bites, Ulcers, Boils, Burns, Toothache, earaches, Eye infections, Hemorrhagia, Scalds, Diarrhea, Dysentery, Vomiting.



7. BRAHMI (*Bacopa monnieri*)
F-scrophulariaceae

Parts used: Whole Plant

Uses: Nervous disorder, Mental diseases, Constipation, promote Urination, Cough, Bronchitis, Vomiting, Blood Purifier, Rheumatism, Improve Memory.



8. BHRINGRAJ (*Eclipta alba*)
F-Asteraceae

Parts used: Whole Plants

Uses: Worms, Ulcer, Skin disorders, Enlarged Spleen, Fever, Indigestion, Headache, Filaria, Hypertension, Cough, Asthma, Eye & Earache, Epigastric pain, Nausea, Vomiting, Toothache, Bleeding, Itching, Hepatitis, Diphtheria, Diarrhoea, Haemoptysis.

9. BISALYAKARANI (*Tridax procumbens)*
F- Asteraceae

Parts used – Whole Plant

Uses – Antiviral, Antibiotic, Wounds, Anti-inflammatory, Bleeding, Diabetes, Typhoid, Cough, Asthma, Epilepsy, Diarrhea, Stomach troubles, Dysentery, As Insecticide.

11. BAJRAMULI (*Sida Cordifolia*)
F - Malvaceae

Parts used – whole plant

Uses – Rheumatism, Heart problems, Elephantiasis, Fever, Cold, Obesity, Hemiplegic, Nervous & Urinary disorders, Ear, Nose, & Mouth diseases, Cystitis, Gonorrhea, Leucorrhoea, Dysentery, Bleeding Piles, Wound healing, Paralysis, Colic pain, Sexual strength.

10. BASANGA (*Justicia adhatoda*)
F-Acanthaceae

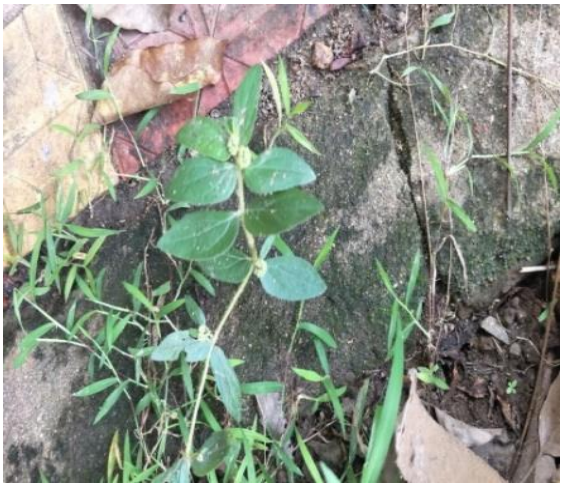
Parts used: Leaves

Uses: Asthma, Cough, Fever, Vomiting, Indigestion, Wound, as expectorant, Soften thick, sputum, Bronchitis.

12. CHIREITA (*Andrographis paniculata*)
F-Acanthaceae

Parts used: Whole Plant except root

Uses: Severe Worms, Dysentery, General Weakness, Intestinal worms, stomach ulcers Stomach liver Diseases, Snake Bite, excessive gas formation, Indigestion.



13. CHITAKUTI (*Euphorbia hirta*)
F –Euphorbiaceae

Parts used – Leaves

Uses – Cough, Cold, Bronchitis, Asthma, Diarrhea, Promote formation and flow of breast milk, Hair growth, Skin Disorders, Gonorrhoea, Venereal diseases, Impotency, Premature ejaculation

15. DURLAVA (*Ocimum basilicum*)
F – Lamiaceae

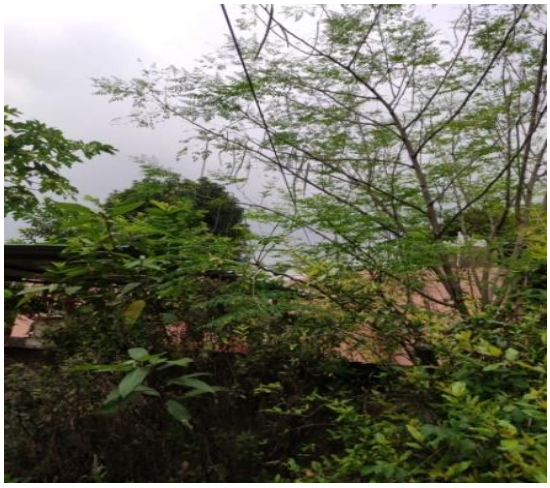
Parts used – Whole plant

Uses – Antimicrobial, Antiemetic, Sedative, Blood pressure, Lower cholesterol, Blood sugar, Anti-inflammation, Antispasmodic, High Vitamin & minerals, as carminative.

14. CURRY LEAF (*Murraya Koenigii*)
F - Rutaceae

Parts used– Leaves, Barks, Roots

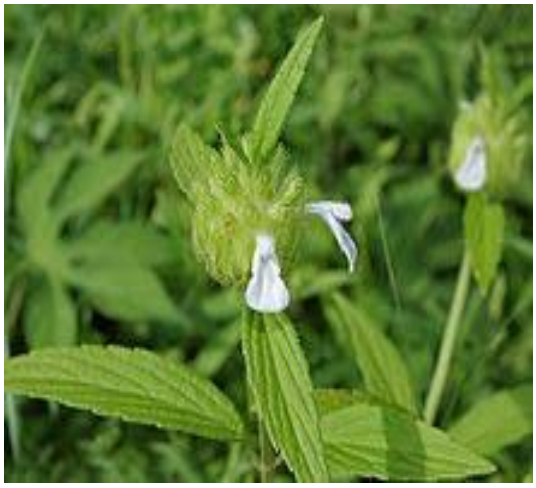
Uses – As stimulant, Eruptions, Bites of poisonous animals, Dysentery, Vomiting, Anti-bacterial, Anti-fungal, Diabetes, Anti-oxidant, Anti inflammation.



16. DRUMSTICK (*Moringa oleifera*)
F - Moringaceae

Parts used – Root, bark, Leaf, flowers, seed & gum

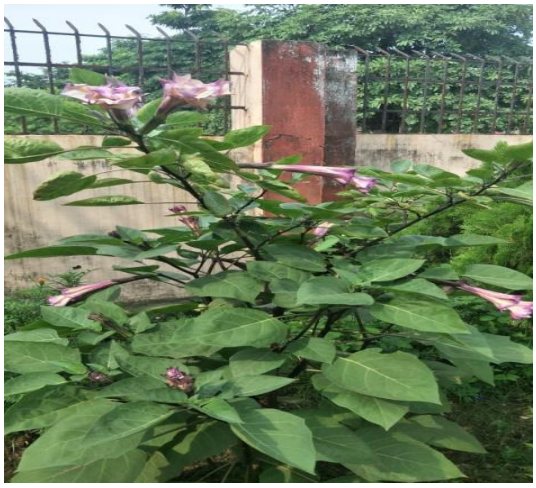
Use – Teeth & eye disease, Leprosy, fever, constipation, weakness, worms, scurvy, Acne, low blood pressure, cough & cold, venereal disease, dermal & internal infection, cancer, Scabies, Appetizer.



17. DATURA (*Datura metel*)
F-Solanaceae

Parts used: Whole Plant

Medicinal Uses: Inflammation of Breast caused by excessive formation of Milk, Bronchitis, Asthma, Controls Saliva, Hydrophobia, impotence, chronic pain, Fever, Skin diseases.



19. GAYASA (*Leucas Linifolia*)
F – Lamiaceae

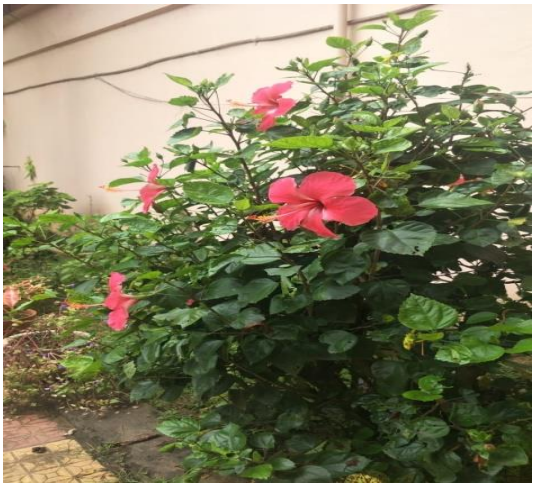
Parts used – Leaves

Uses – As Sedative, Sores, wounds, Dermatosis, Nervous Disorders, as Vermifuge and stomachic, snakebite.

18. GANGASIULI (*Nyctanthes arbor-tristis*)
F – Oleraceae

Parts used – Leaves, Seed

Uses – Diabetes, Rheumatism, Anti-inflammation, Anthelmintic, Piles, Gout, Dry cough, Ringworm, Intestinal worms, Gynecological troubles, Chronic fever.



20. HIBISCUS (*Hibiscus rosa-sinensis*)
F - Malvaceae

Parts used – Whole Plant

Uses – Hair loss, Hypertension, Cough, Induce Abortion, Headache, Lower Cholesterol, Liver disorders, As Aphrodisiac and bilious disorders.

21. KANAK CHAMPA (*Belamcanda chinensis)* F -Iridaceae

Parts used- Rhizome

Uses – Asthma, Throat troubles, Swollen Liver, Spleen, Gonorrhea, Malaria, Cancer, Cough, Bronchitis, Mumps, Wheezing, Fever, Inflammation, snake bites, Anti-bacterial & Anti-fungal, Liver problems.

23. LIME (*Citrus lemon*)
F-Rutaceae

Parts used: Fruit, Leaves, Flowers

Uses: Indigestion, Cough, Bile, Rheumatism, Stomach disorder, Malaria, Skin, Jaundice, Cold, Fever, Eye diseases, Headache, High Blood pressure & Infections, Stomatitis, Inflammation, Scurvy.

22. LEMON GRASS (*Cymbopogon citratus)*
F-Poaceae

Parts used: Leaves

Uses: Cough, Colds, Fever, Anti-poison, Indigestion, Spleen, Tiredness, Headache, Worms, Vomiting, Skin, Urinary, Flatulence, Flavouring agent, Cancer, Nasal congestion, Anti-fungal and antimicrobial, as insecticide.

24. PUDINA (*Mentha arvensis*)
F - Lamiaceae

Parts used: Whole plant

Uses-Flatulence, Vomiting, Diarrhoea, Nausea, Headache & pains, Stimulant, Acne, Itching, Inflammations, Cold, Flu, Fever, Biliousness, Colic, Antibacterial, Thirst, Sore throat, Stomach pain, Swellings, Indigestion, Rheumatism, Toothache, Arthritis, As flavour & Culinary uses.

25. PEPPERMINT *(Mentha piperita)*
F – Lamiaceae

Parts used – Whole plant

Uses – Colic, Flatulence, Indigestion, Diarrhea, Vomiting, Biliary tract disorder, liver & gall bladder problems, treatment of muscle & nerves, Aches, Respiratory catarrhs, Nausea, Headache, Cold, Relieve menstrual cramps, Chickenpox, Neuralgia, Myalgia

26. PALUA (*Maranta arundinacea)*
F – Marantaceae

Parts used – Rhizome

Uses – Irritations of alimentary canal, Fever, Inflammation, Diarrhea, Gastroenteritis, Wounds, Scorpion Bites, Vegetable Poisons, Small-pox, Stomach disorders.

27. PEDIPEDICA– (*Abutilon indicum*)
F - Malvaceae

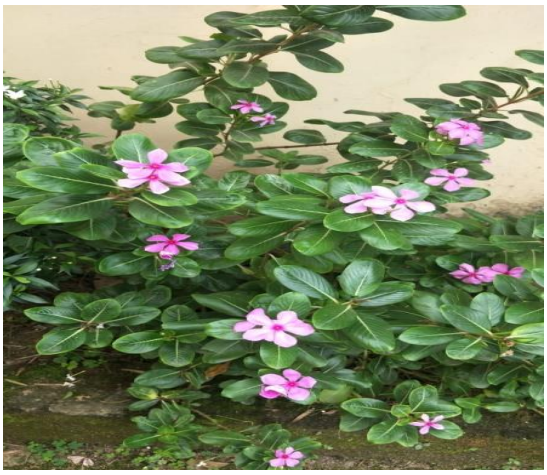
Parts used – Whole plant

Uses – Jaundice, Diabetes, Thirst, Painful menses, Diarrhea, Worms, Ulcers, Cold, High Fever, Mumps, Cough, Bronchitis, Leprosy, Gonorrhea, Headache, for quick pregnancy.

28. STEVIA *(Stevia rebaudiana)*
F- Asteraceae

Parts used: Leaves

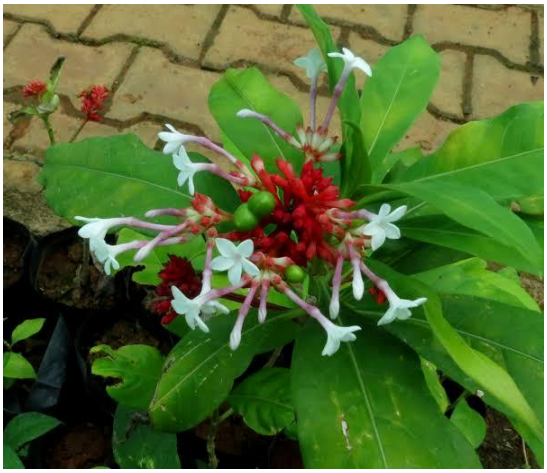
Uses: Diabetes, High Blood Pressure, Obesity, Indigestion, Throat infection, Wounds, Cold, Teeth, Osteoporosis, Eczema, Dermatitis.



29. SADABAHAR (*Vinca rosea*)
F-Apocynaceae

Parts used: Leaves

Uses: Cancer, Hypotension, Diabetes, Wasp stings, Tumour, Toothache, Memory loss, Malaria, Leukemia, Hodgkin's diseases, Nausea, Hair loss, sore throat, Pain.



30. SARPAGANDHA (*Rouvolfia serpentina*)
F-Apocynaceae

Parts used: Roots & leaves

Uses: Sedative, Hypnotic, Fever, Snake bite, Hypertension, Epilepsy, Poisons, Eczema, Hysteria, Insomnia, Insanity, Mental illness, Traumas, Weakness, Worms.

31. TOUCH-ME-NOT (*Mimosa pudica*)
F-Mimosaceae

Parts used: Whole plant

Uses:- Diarrhoea, Amoebic dysentery, Bleeding piles, Gynecological disorders, skin diseases, Bronchitis, General weakness, Impotence, wounds, Ulcers, Fistula, Scrofula, Conjunctivitis, Edema, Rheumatism, Myalgia.

32. THALKUDI (*Centella asiatica*)
F-Apiaceae

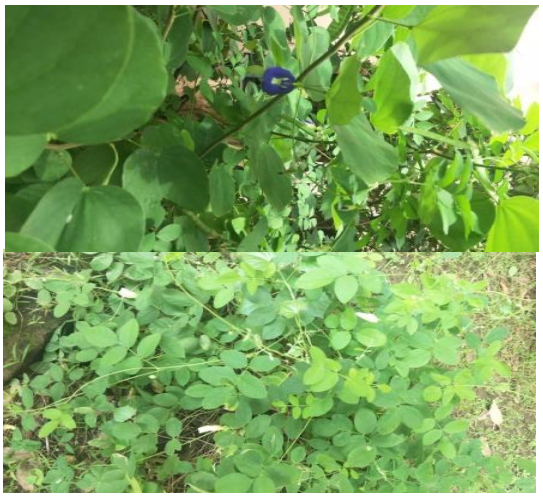
Parts used: Whole Plant

Uses: Leprosy, Growth of Skin, Hair & Nails, Nervous disease & weakness, memory, Cough, Fever, Asthma, Bile, Inflammation, Burns, Wounds, Scars, Ulcers, Infections, Post-surgical recovers, Psoriasis, Wound healing.

33. TULSI (*Ocimum sanctum*)
F-Lamiaceae

Parts used: & Seeds

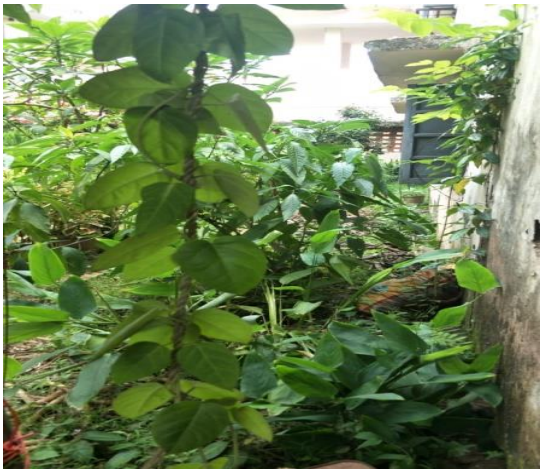
Uses: Bronchitis, Catarrh, Digestive Complaints, Skin diseases, Cold, Cough, Bronchial asthma, Bleeding disorders, Anti-bacteria, Heart disease, Earache, Headache, Insect bites, Diarrhoea, Dysentery, Arthritis, Blood pressure, Inflammations, Cancer, Anti fertility.



34. APARAJITA (*Clitoria ternatea*)
F – Fabaceae

Parts used – whole plant

Uses – Skin diseases, Guinea worm infestation, Appetizer, Gout, Jaundice, Piles, Headache, Arthritis, Wounds, Nervous disorder, Blood purifier, Haemorrhagic disorders, Smallpox, Cold, Cough, Asthma, Dysuria, semen debility, Increase physical strength.



35. ANANTAMULA (*Hemidesmus indicus*)
F – Asclepiadaceae

Parts used – Root

Uses –Blood purifier, Nutritional disorders, Syphilis, Chronic rheumatism, Urinary diseases, Stimulates flow of bile, Remove toxins, Venereal diseases, Thrush, Gonorrhoeal neuralgia, Rheumatoid, Arthritis.

36. BETEL *(Piper betle)*
F- Piperaceae

Parts used: Leaves, Stem, Roots.

Uses: Energy Booster, Cough, Asthma, Stimulant, Carminative, Expectorant, Aphrodisiac, Headache, Arthritis, Toothache, Indigestion, Constipation, Diarrhea, Joint pain, Diphtheria, Bronchitis, Pneumonia, Skin diseases, Fever, Impotency, Colic.

37. GULUCHI (*Tinospora cordifolia*)
F-Menispermaceae

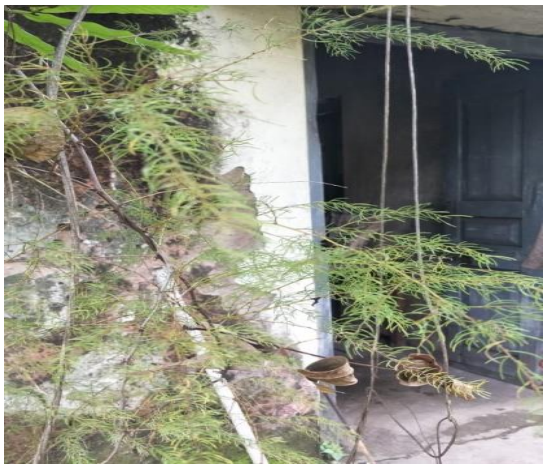
Parts Used: Stem, Bark & Leaves

Uses: Blood pressure, Cough, Diabetes, Cancer, Bile, Anti-periodic disorder, Tuberculosis, Liver, Skin diseases, Urinary disorders, Fever, Rheumatism, Dyspepsia, Constipation, Leprosy, General debility, Jaundice, AIDS.

39. ASOKA (*Saraca asoca*)
F- Caesalpiniaceae

Parts used: Leaves, Flowers, Seeds, Bark.

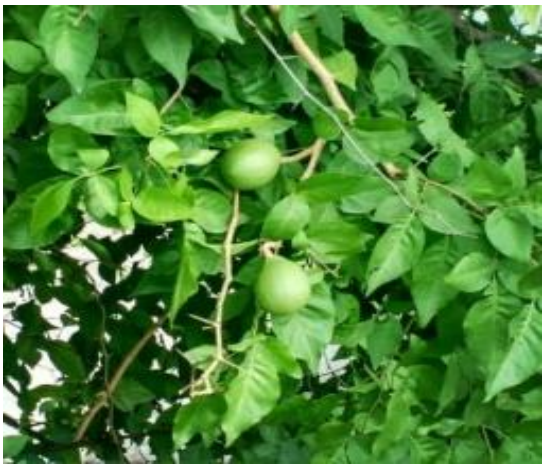
Uses: Useful for Menstrual problem, Uterine bleeding, Haemorrhagic dysentery, Diabetes, Piles, Dyspepsia, Indigestion, Burning sensation, Stimulate uterus, Blood disorders, Fractures, Tumours, Bites.



38. SHATAVARI (*Asparagus racemosus*)
F-Liliaceae

Parts used: Rhizome

Uses: Piles, Excessive menstruation, Skin, Aphrodisiac, Malaria, Typhoid, Nerve weakness, Blindness, Polio, Feeds, Acidity, Vigour, Ureteral stones, Cardiac debility, Cough, Arthritis, Increase breast milk, Diarrhea, Piles.



40. BAEL (*Aegle Marmelos*)
F-Rutaceae

Parts used: Fruits, Bark, Leaves, Roots

Uses: Chronic Diarrhoea & Dysentery, improve appetite & digestion, Diabetics, Polio, Cold, Cough, Fever, Constipation, Peptic Ulcer, Dyspepsia, Ophthalmic, Abdomen pain, Urinary troubles, Burning sensation.

41. CINNAMON (*Cinnamomum verum*)
F-Lauraceae

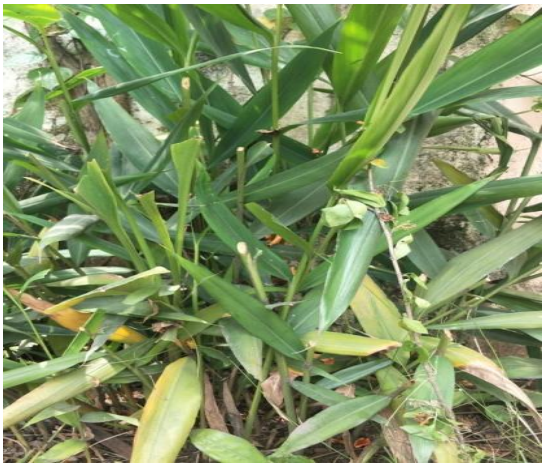
Parts used: Bark, Oil Extract.

Uses: Diarrhoea, Nausea, Stimulant and carminative, Digestion, vomiting, Improve Brain function, as condiment, Lowers glucose level.

43. POMEGRANATE (*Punica granatum*)
F-Punicaceae

Parts used: Fruit, Leaves, Bark, Flower, Seed.

Uses: Diarrhoea, Dysentery, Tapeworm, Intestinal Parasites, Hemorrhages, Breast Cancer, Dyspepsia, Leprosy, Bronchitis, Hypotension.



42. LABANG (*Syzygium aromaticum*)
F – Myrtaceae

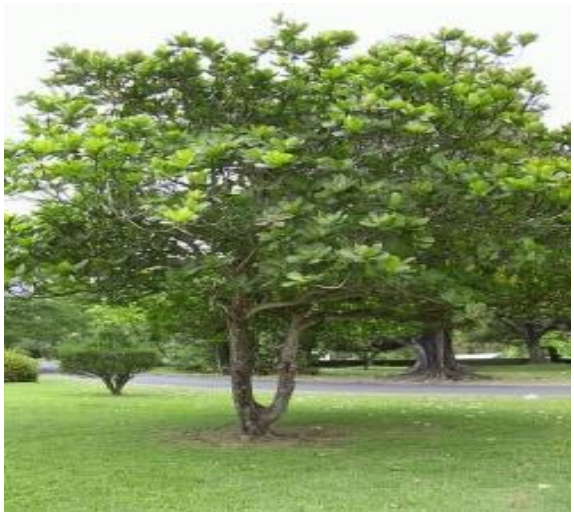
Parts used: Dried flower bud, Oil extract.

Uses: Carminative, Antispasmodic, Antibacterial, Rubefacient, Appetizer, Rejuvenating, Galacto purifier, Agalactia, Dental caries, Tuberculosis.

44. SANDAL WOOD WHITE (*Santalum album)*
F-Santalaceae

Parts Used: Wood, Root, Seed, Oil extract

Uses: Cystitis, Gonorrhea, Cough, Burning sensation, Jaundice, Skin disorder, Toothache, Headache due to High Blood Pressure, Acne, Improve semen quality, Diabetes, Piles, Cosmetics, Dysuria, Tuberculosis, Vomiting.



45. PESTABADAM (*Terminalia catappa*)
F-Combretaceae

Parts used: Leaves, Kernel, Bark

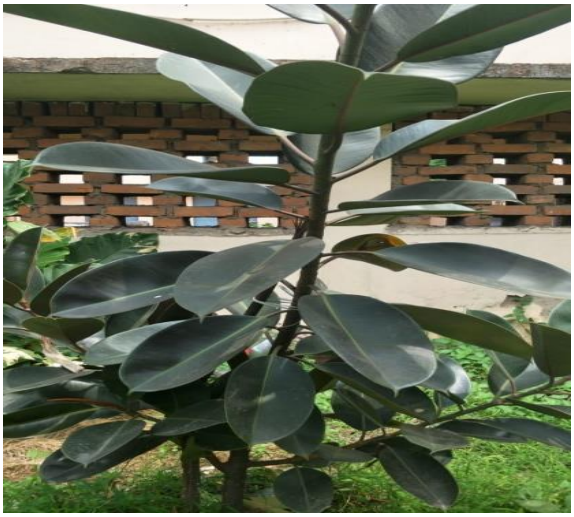
Uses: Cough, Tuberculosis, Dyspepsia, Worms, Mammary pain, Gonorrhea, Rheumatism, Headache, Colic, Scabies, Sexual dysfunction, Diarrhea, Dysentery, Biliousness, Flatulence, Liver disease, Leprosy

46. AJWAIN (Trachyspermum ammi)
F- Apiaceae

Parts used – Seeds

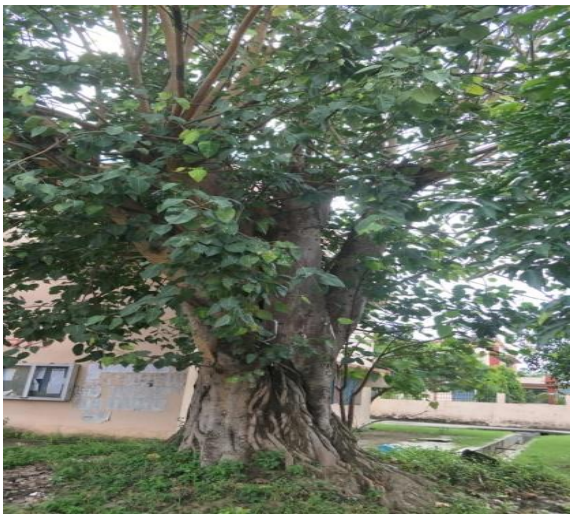
Uses - Indigestion, gas, bloating, peptic ulcers.

Rubber

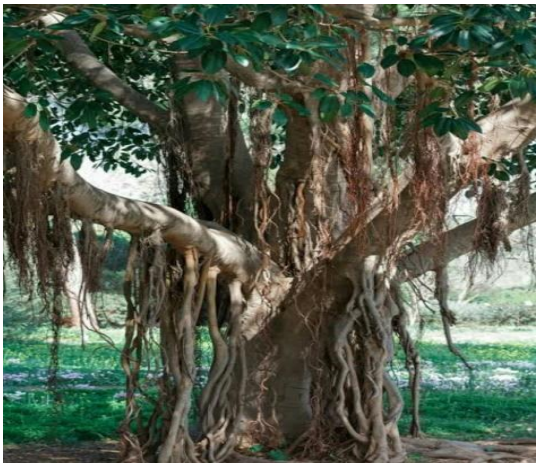


RUBBER (Hevea brasiliensis)
F-Euphorbiaceae

Shelter



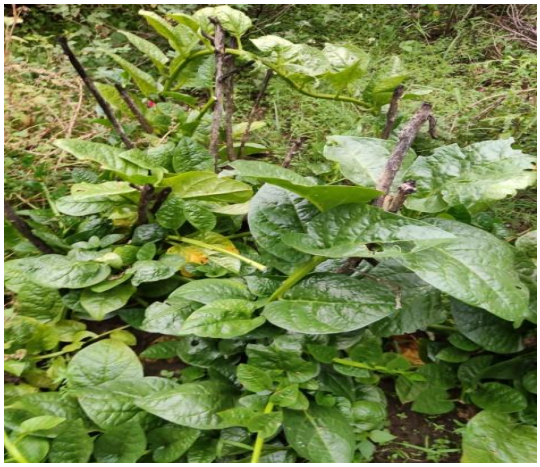
Peepal tree (Ficus religiosa)
F- Moraceae



Banyan Tree (Ficus Benghalensis)
F- Moraceae

Lady's Finger *(Abelmoschus esculentus)*

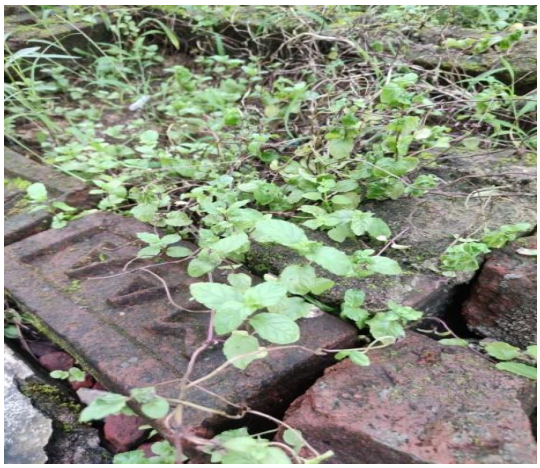
Kitchen Garden



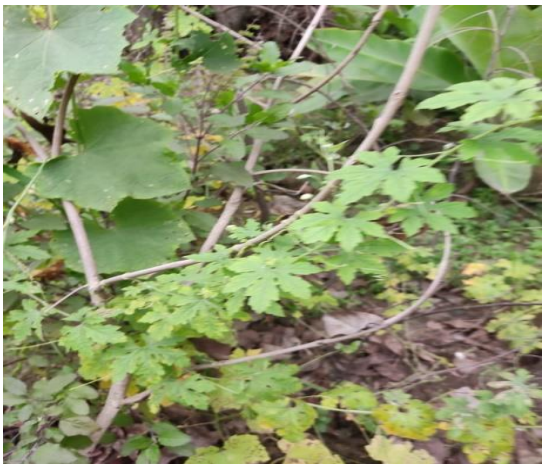
Vine spinach *(Basella alba)*

Eggplant *(Solanum melongena)*

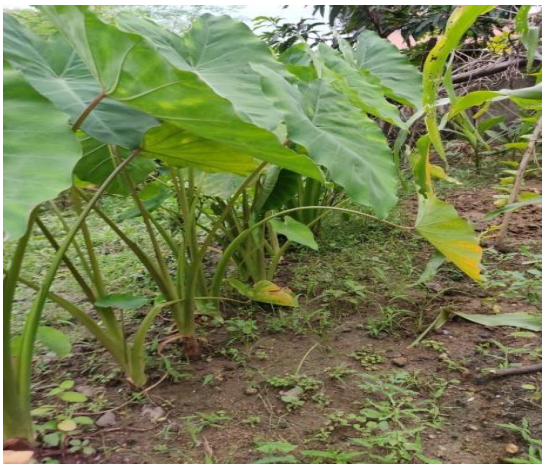
Papaya (*Carica papaya*)



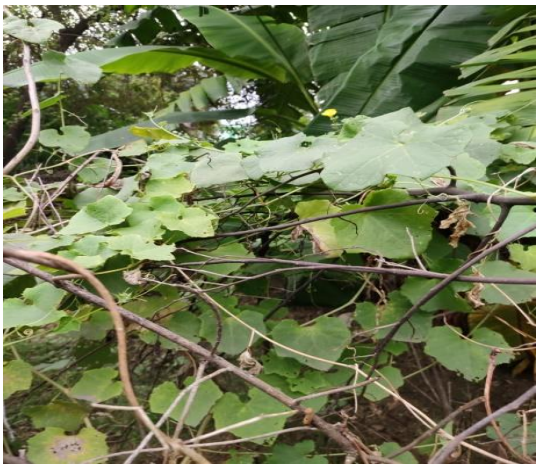
Amaranthus *(Amaranthus oleraceous)*



Bitter Gourd *(Momordica charantia)*

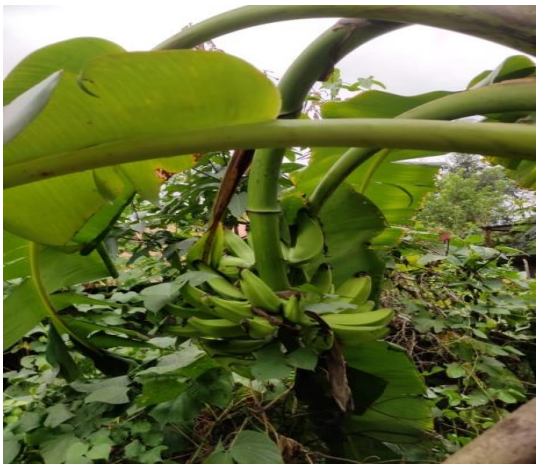


Elephant ear taro (*Colocasia esculenta)*

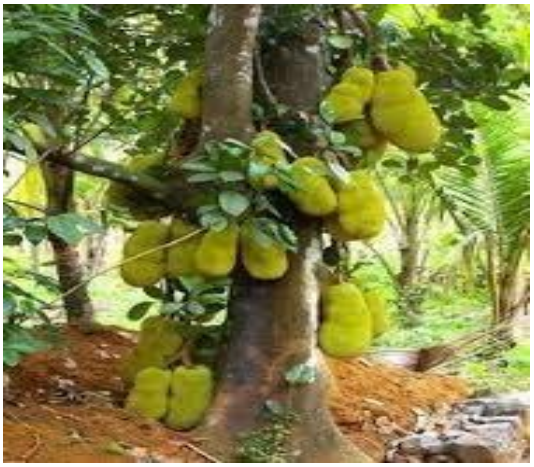


Pumpkin (*Cucurbita maxima)*

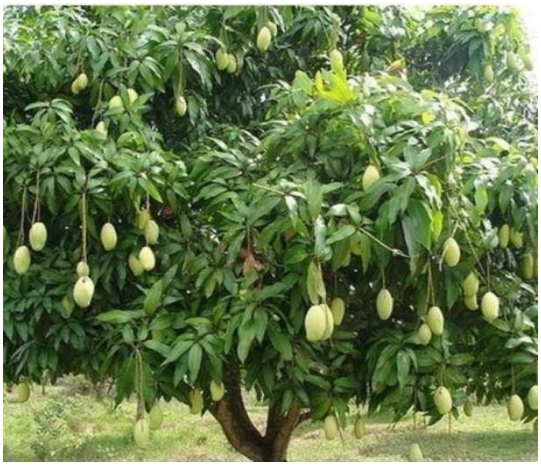
Guava (*Psidiuim guajava)*



Banana (*Musa paradisica*)



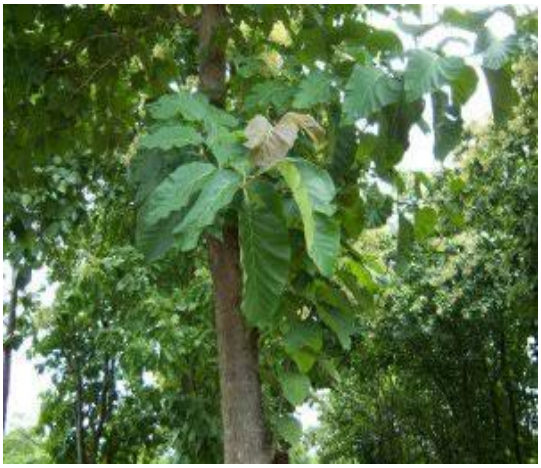
Jackfruit (*Artocarpus heterophyllus)*



Mango (*Mangifera Indica)*

Fennel *(Foeniculum vulgare)*

Wood



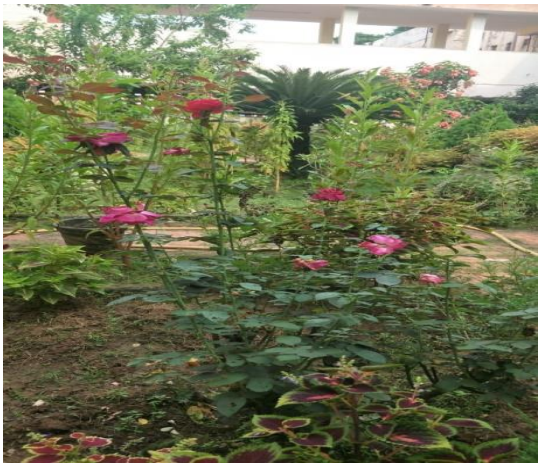
Teak Tree *(Tectona grandis)*

Epiphyte

Vanda *(Vanda roxburghii)*

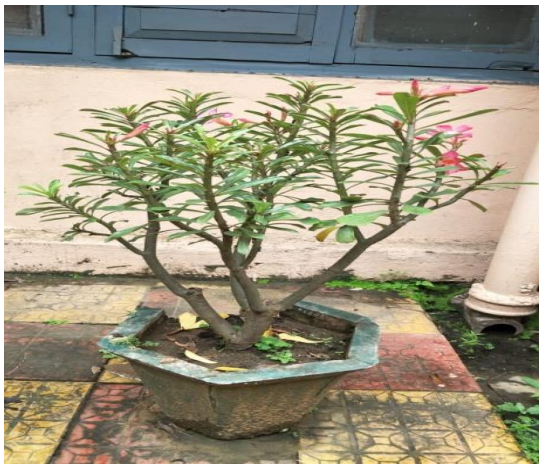
Ornamental

Garden Balsam (*Impatiens balsamina*)

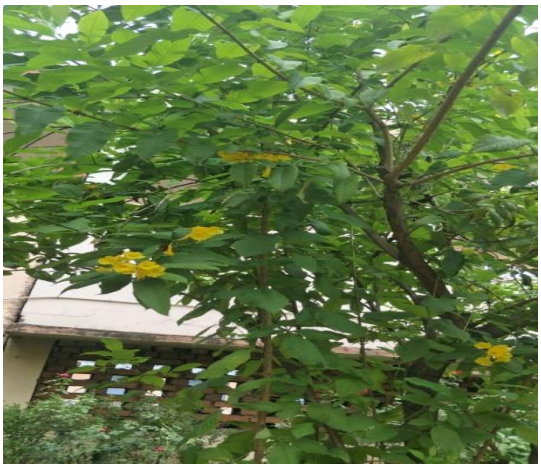


Rose (*Rosa indica*)

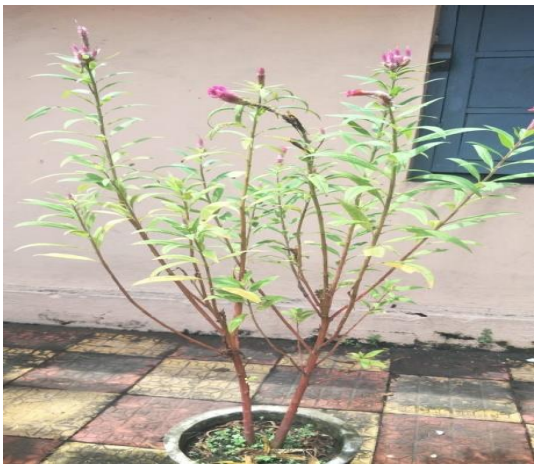
Jungle Flame Ixora (*Ixora coccinea*)



Adenium*(Adenium obesum)*



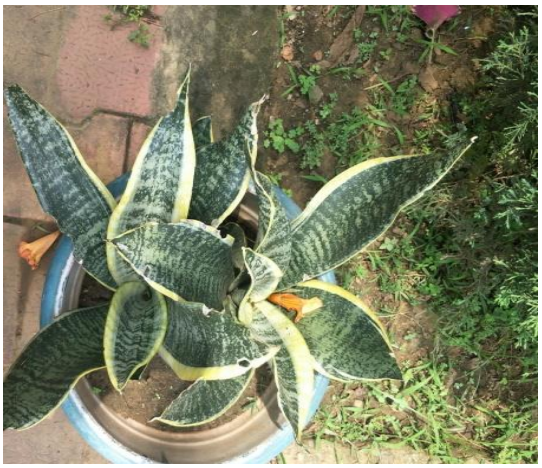
Tecoma (*Tecoma stans*)



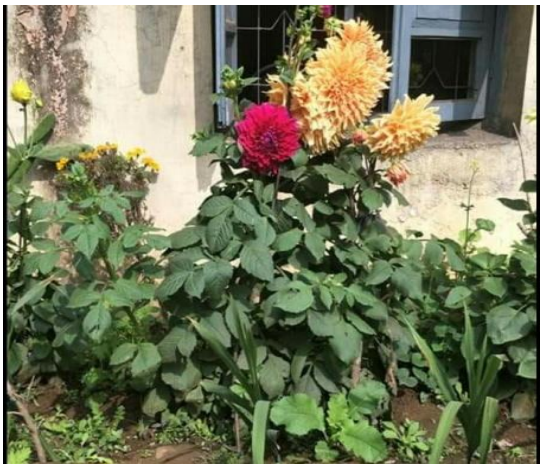
Cockscomb (*Celosia argentia*)

Jasmine (*Jasminium sambac*)

Areca Palm (*Dypsis lutescens*)



Snake Plant (*Dracaena trifasciata)*



Dahlia (*Dahlia pinn)*

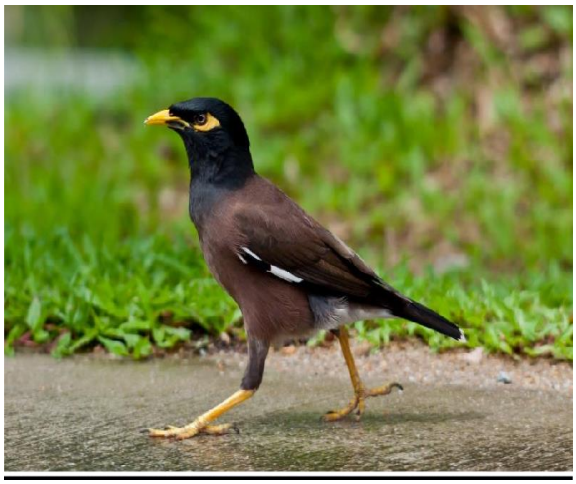
Roheao (*Rhoeo discolor*)

Chrysanthemum
(Chrysanthemum indicum)

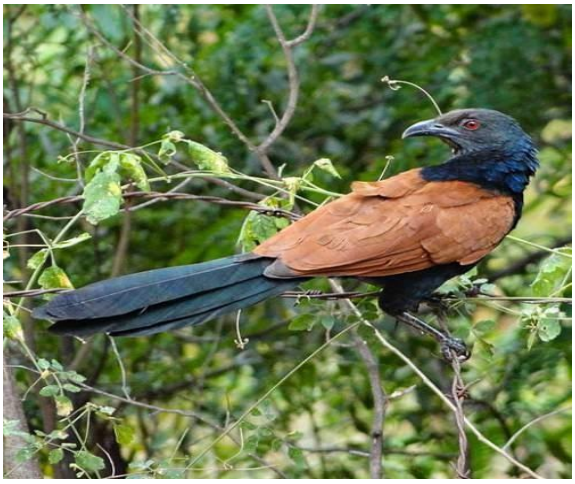
Marigold (*Tagetics erecta)*

Bird Diversity

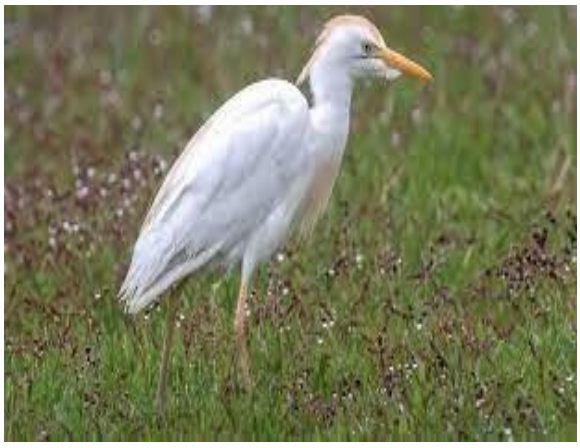
A survey was carried out to find the animal diversity in the campus of Government Autonomous College, Rourkela. The survey focused on the diversity of birds, butterfly, reptiles and Amphibia.



Scientific name: Acridotheres tristis
Common Name: Common myna



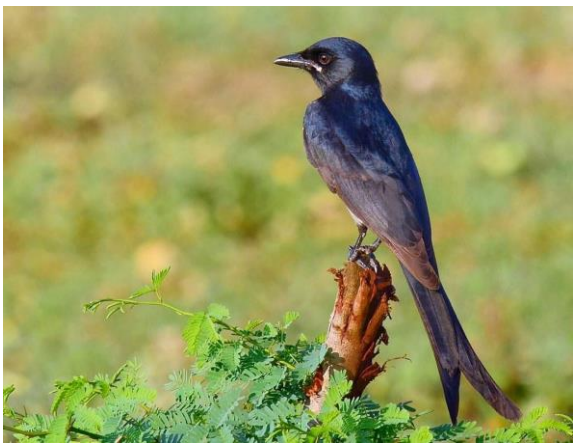
Scientific name: Centropus sinensis
Common Name: Greater coucal



Scientific name: *Bubu usibis*
Common Name: Cattle egret

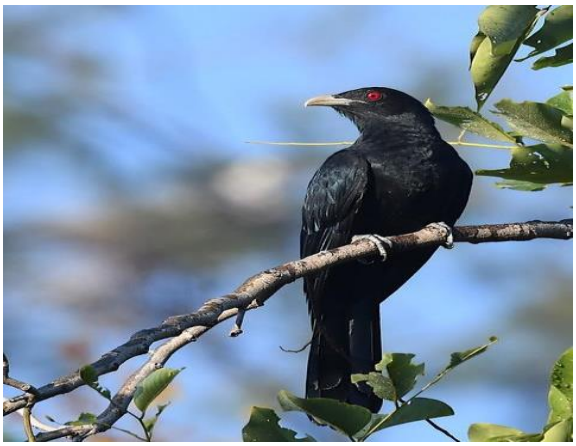
Scientific name: *Columba livia*
Common Name: Blue rock pegion

Scientific name: Corvus splendens
Common Name: House crow

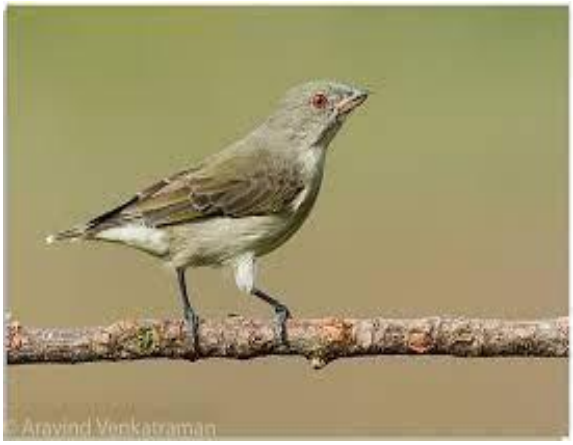


Scientific name: Dicrurus macrocercus
Common Name: Black drongo

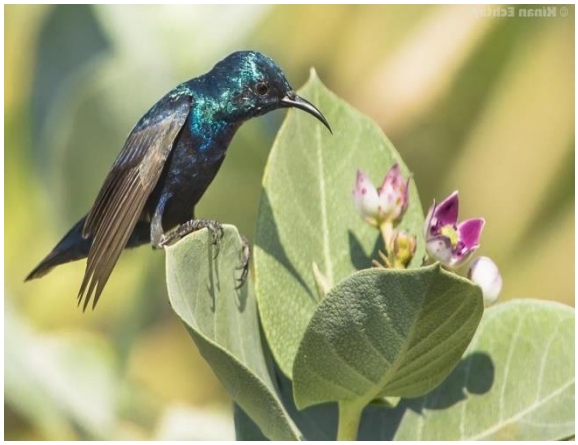
Scientific name: *Cuculus canorus*
Common Name: Indian cuckoo



Scientific name: Eudynamys scolopacea
Common Name: Asian koel

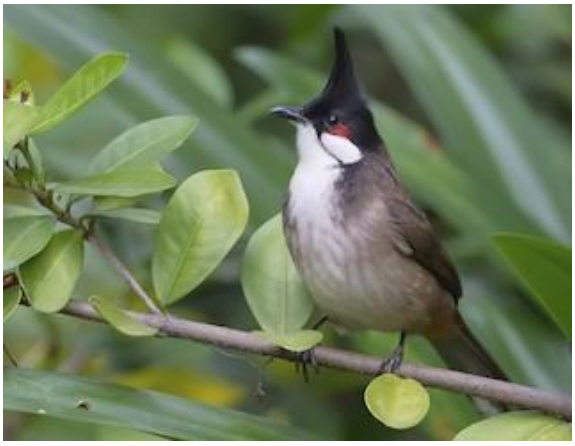


Scientific name: *Diceum agile*
Common Name: Thick-billed flowercatcher

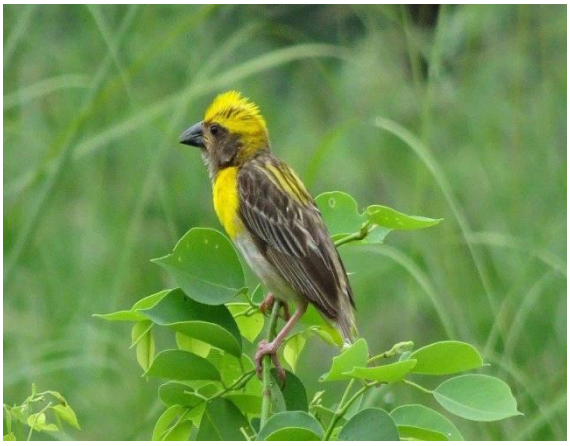


Scientific name: Nectarinia asiatica
Common Name: Purple sunbird

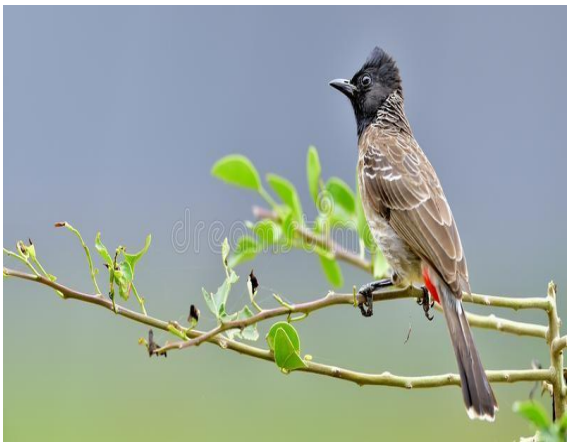
Scientific name: Passer domesticus
Common Name: House sparrow



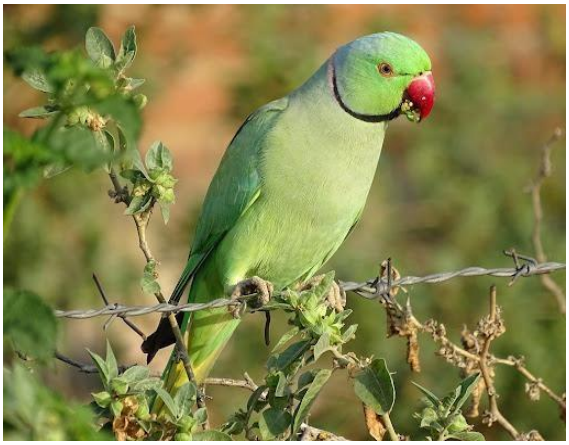
Scientific name: Pycnonotus jocosus
Common Name: Red-whiskered bulbul



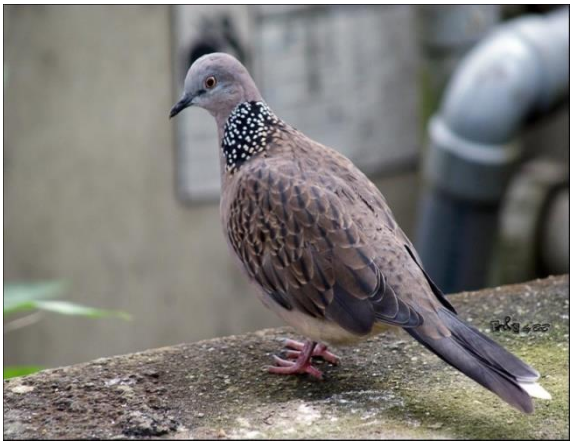
Scientific name: Ploceus philippinus
Common Name: Baya weaver



Scientific name: Pycnonotus cafer
Common Name: Red-vented bulbul

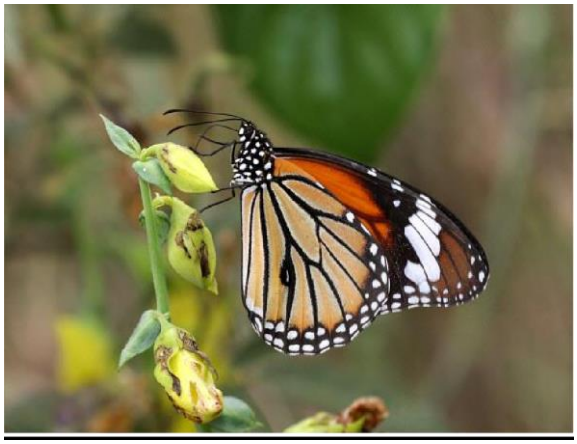


Scientific name: Psittacula krameri
Common Name: Rose-ringed parakeet



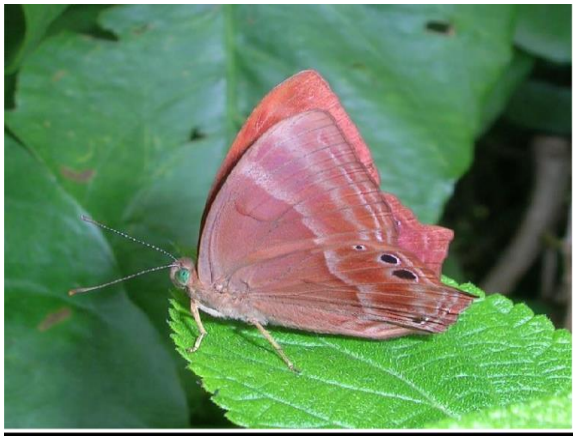
Scientific name: Streptopelia chinensis
Common Name: Spotted dove

Scientific name: Turdoides striata
Common Name :Jungle babbler

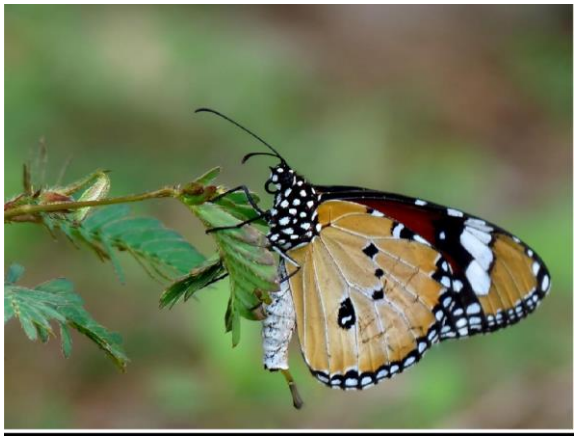


Scientific name: *Danaus genutia*
Common Name : Striped tiger

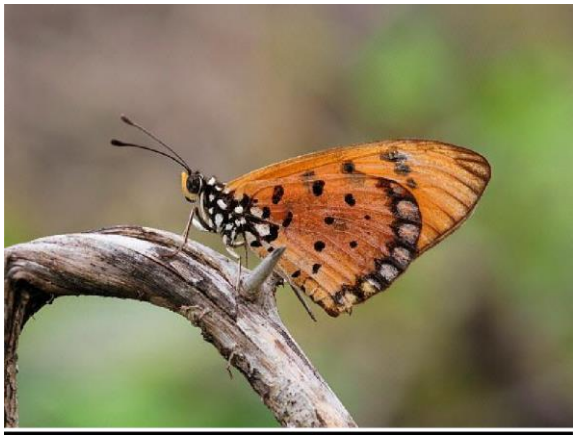
Butterflies



Scientific name: Abisara echerius
Common Name : Plum Judy

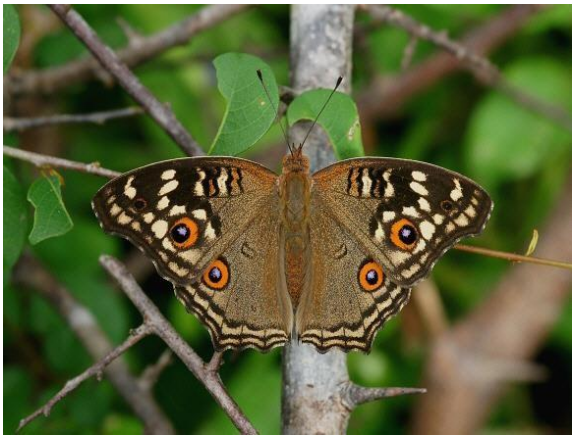


Scientific name: Danaus chrysippus
Common Name : Plain Tiger

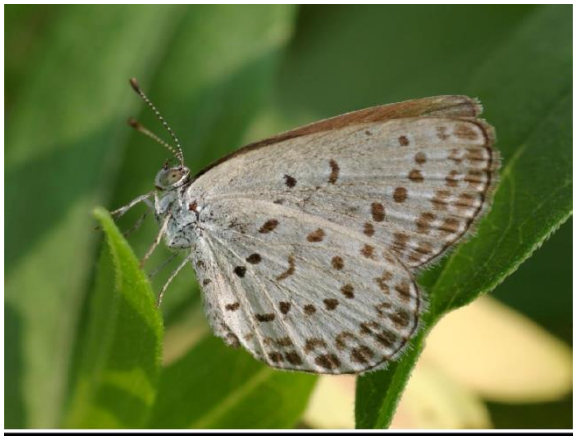


Scientific name: *Acraeaviolae*
Common Name : TawnyCoster

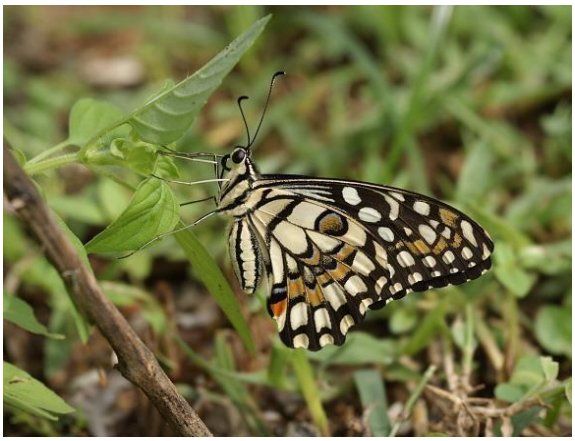
Scientific name: *Euploea core*
Common Name : Common Crow



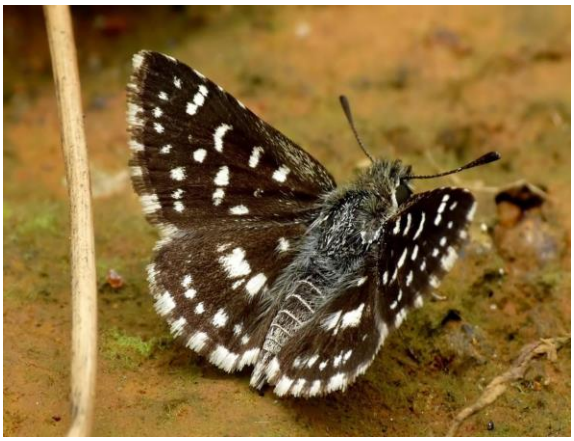
Scientific name: Junonia lemonias
Common Name : Lemon Pansy



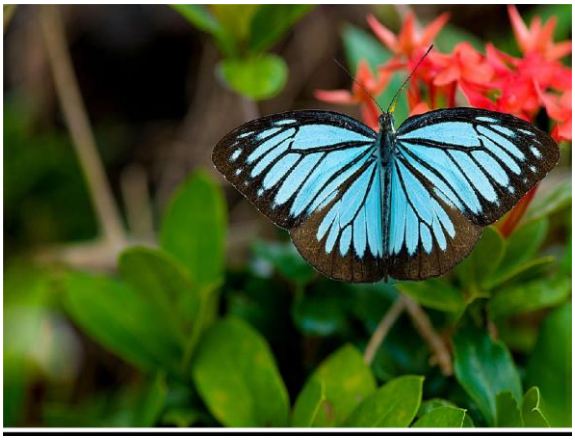
Scientific name: Pseudozizeeria maha
Common Name : Pale Grass Blue



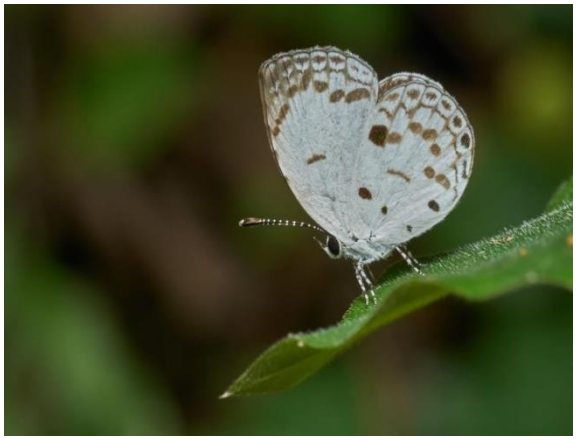
Scientific name: Papilio demoleus
Common Name : Lime Butterfly



Scientific name: *Spialia galba*
Common Name : Indian Skipper

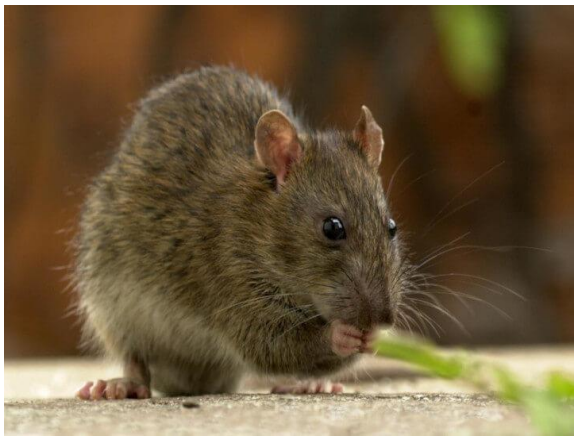


Scientific name: Pareronia valeria
Common Name : Common Wanderer



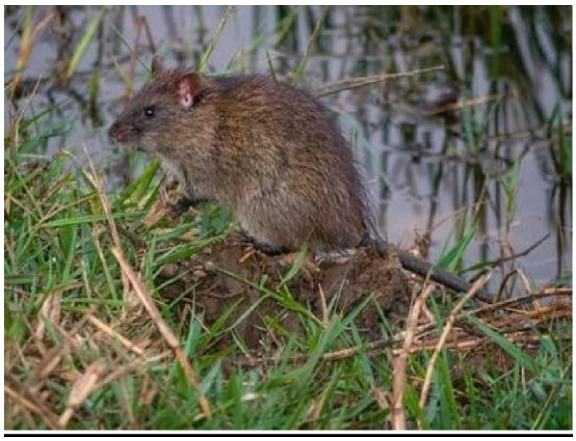
Scientific name: Neopithecops zalmora
Common Name : Quaker

Scientific name: Athyma perius
Common Name: Common sergent



Scientific name: Rattus rattus
Common Name : House Rat

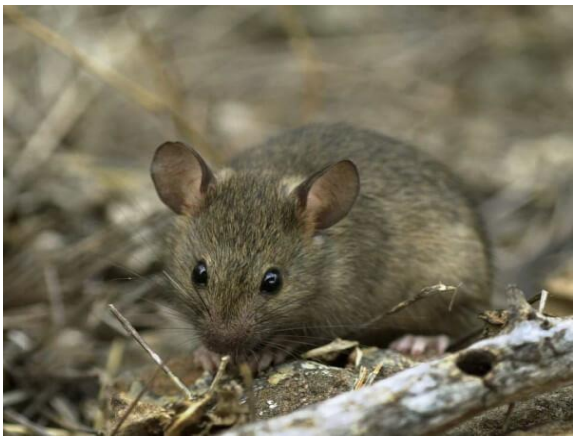
Mammals



Scientific name: Bandicota bengalensis
Common Name : Lesser Bandicoot-rat

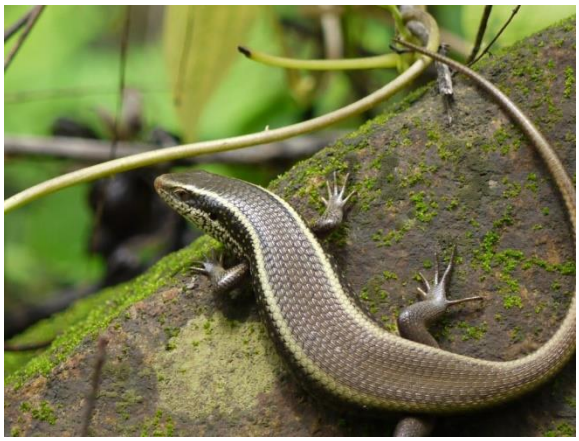
Reptiles

Scientific name: Calotes versicolor
Common Name : Indian Garden Lizard

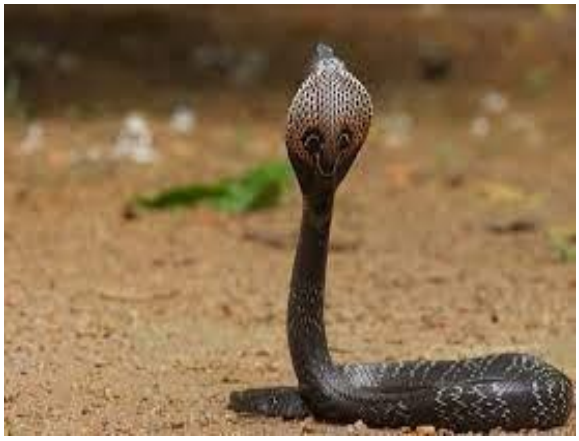


Scientific name: Mus musculus
Common Name : House Mouse

Scientific name: Hemidactylus brookii
Common Name : House Gecko

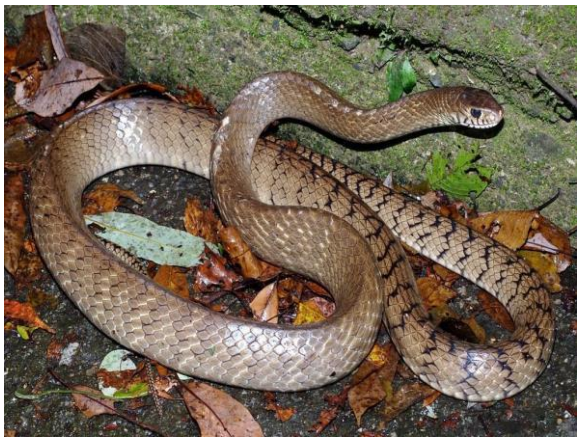


Scientific name: Eutropis carinata
Common Name : Keeled Indian Mabuya



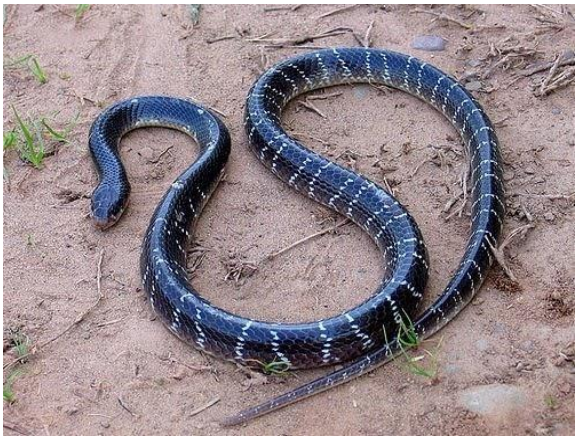
Scientific name: Naja naja
Common Name : Indian Cobra

Amphibians

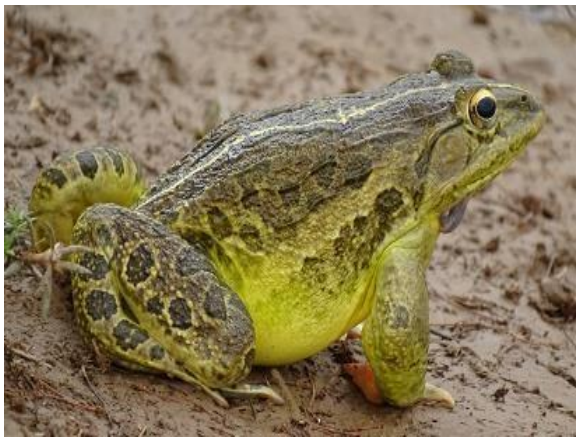


Scientific name: Ptyas mucosus
Common Name : Rat snake

Scientific name: Duttaphrynus melanostictus
Common Name : Asian Toad



Scientific name: Bungarus caeruleus
Common Name : Common krait



Scientific name: Hoplobatrachus tigerinus
Common Name : Indian Bull Frog