Rayat Shikshan Sanstha's

Annasaheb Awate Arts, Commerce & Hutatma Babu Genu Science College

Manchar, Tal. Ambegaon, Dist. - Pune (410503)

Departmental of Botany

Biodiversity Portal

1. Introduction

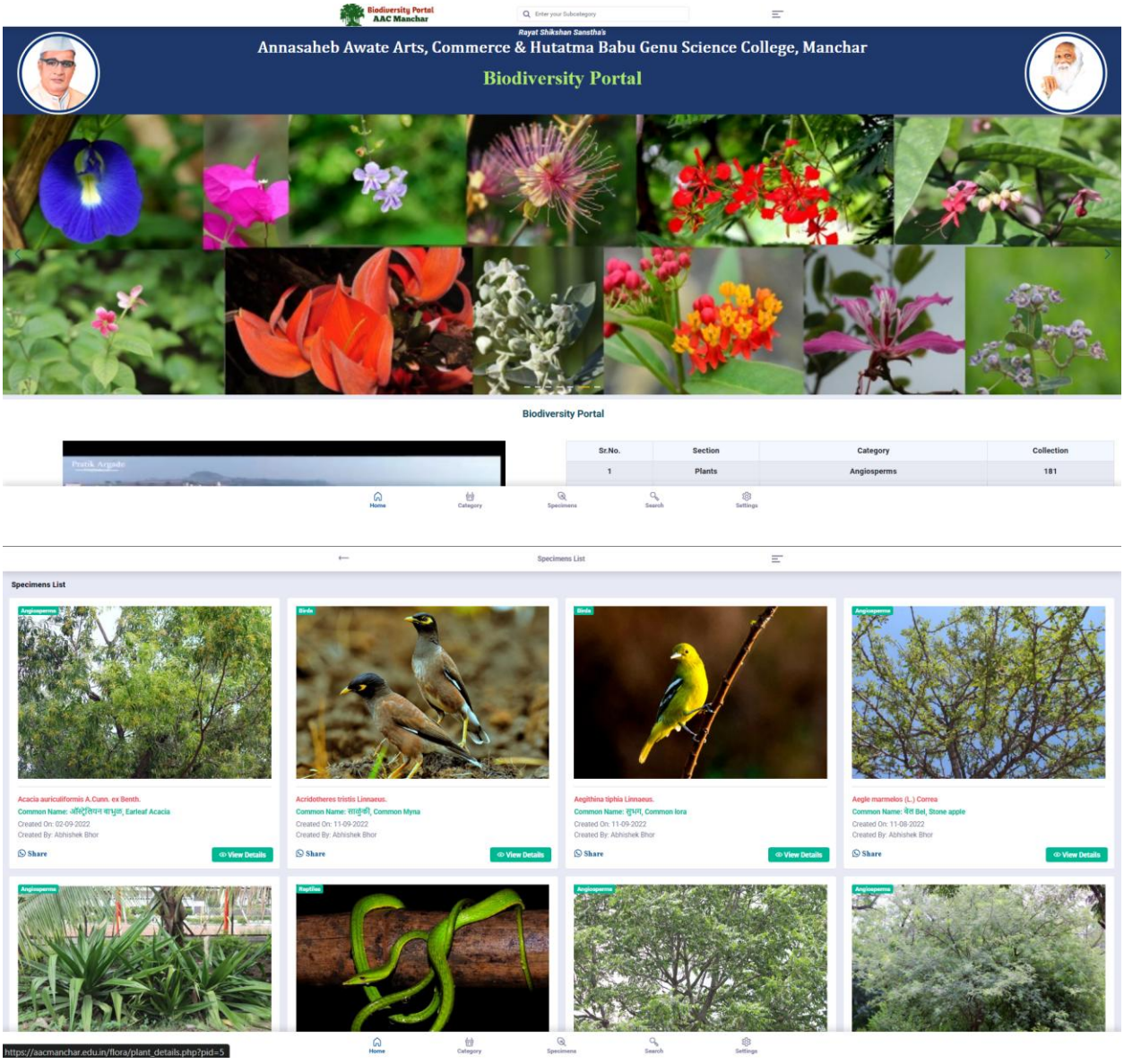
Rayat Shikshan Sanstha's, Annasaheb Awate Arts, Commerce, and Hutatma Babu Genu Science College, Manchar, established in 1966, stands as a prominent educational institution in the northern part of Pune District, Maharashtra, India. The college's establishment was inspired by the life and work of Annasaheb Awate, a dedicated educationist and social activist who devoted his life to the development of the Ambegaon tehsil. The college is affiliated with Savitribai Phule Pune University and has consistently maintained a commitment to academic excellence and holistic student development.

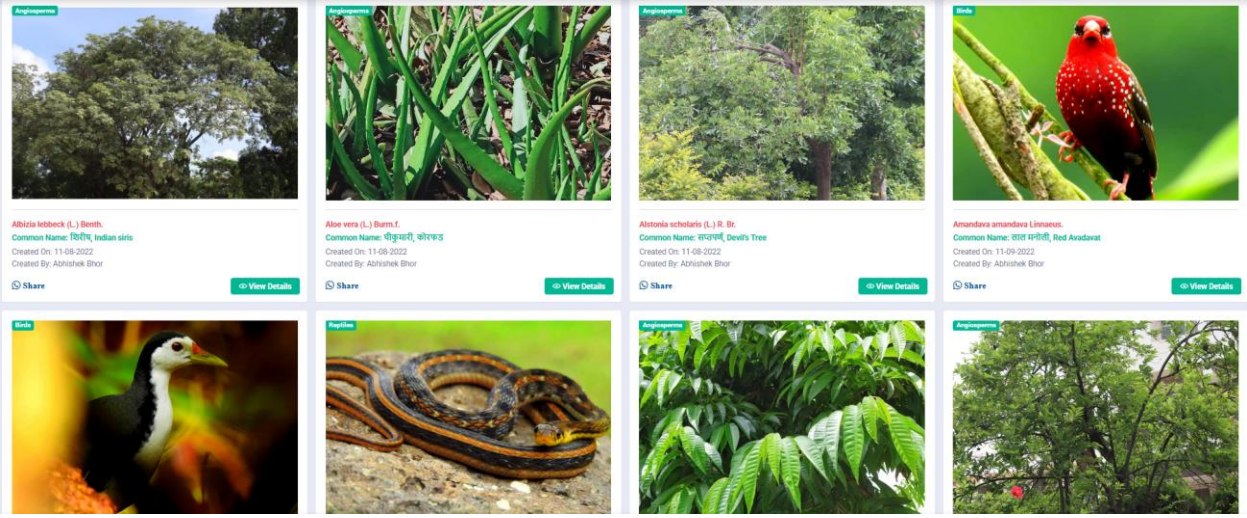
The college is situated in the foothills of the Western Ghats, a region known for its rich biodiversity. The campus spans 105 acres, with 55 acres dedicated to college infrastructure and the remaining 50 acres reserved for social forestry initiatives. The college actively engages in tree plantation programs, contributing significantly to the green cover and biodiversity of the campus. This commitment to environmental stewardship was recognized by the Government of Maharashtra with the 'Vanashree' award in 1989. The college has also received the SPPU Pune's 2017 Best College Award and holds an "A" grade from NAAC. The college's efforts have enriched the biodiversity of flora and fauna in the Bhimashankar valley.

India is one of the world's mega-biodiversity hotspots, characterized by a vast array of plant and animal life. Biodiversity, encompassing genetic, species, and ecosystem diversity, provides essential variability and value to biological resources. However, biodiversity is under threat from various factors, including deforestation, habitat loss, and other anthropogenic activities. The loss of biodiversity has far-reaching ecological and economic consequences.

In response to the global concern over biodiversity loss, Annasaheb Awate College has initiated a 'Biodiversity Audit' of its campus. This initiative aims to document the existing diversity of plants and animals and to assess the college's efforts in nature conservation. The college has developed a "Biodiversity Portal" (https://aacmanchar.edu.in/flora/home.php) to digitally compile and disseminate information about the flora and fauna of the campus. This portal, maintained by the Department of Botany, serves as a valuable resource for students, researchers, and the community. The portal contains information on 190 plant species (180 Angiosperms, 7 Gymnosperms, and 2 Pteridophytes) and 94 animal species (45 Birds, 12 Mammals, 22 Reptiles, and 15 Butterflies).

The information is also available in a published reference book. The portal is updated annually with data on newly discovered organisms.





2. Objectives

The Biodiversity Portal has the following key objectives:

- **Documentation and Cataloging of Biodiversity:** To systematically document and catalog the flora and fauna found on the Annasaheb Awate College campus. This involves identifying, classifying, and recording all plant and animal species present.
- **Creation of a Digital Repository:** To establish a comprehensive and easily accessible digital repository of biodiversity information. This repository serves as a centralized database for storing and managing data related to the campus's biodiversity.
- **Development of an Educational Resource:** To create a valuable educational resource for students, researchers, and the wider community. The portal provides information on the campus's biodiversity, promoting learning and understanding.
- **Promotion of Biodiversity Awareness:** To raise awareness about the importance of biodiversity conservation and the ecological significance of the campus. The portal aims to educate users about the value of biodiversity and the need to protect it.
- **Facilitation of Research:** To facilitate research on the campus's biodiversity by providing readily available and organized data. The portal supports scientific investigations and contributes to the advancement of knowledge.
- **Enabling Continuous Monitoring:** To establish a system for the continuous monitoring and updating of biodiversity data. The portal is designed to be a dynamic resource that reflects the changing biodiversity of the campus.
- **Promotion of Conservation Efforts:** To promote conservation efforts by highlighting the campus's biodiversity richness and the need for its protection. The portal encourages actions aimed at preserving and managing the campus's natural heritage.
- **Encouragement of Community Engagement:** To engage the local community in biodiversity conservation initiatives. The portal serves as a platform for fostering collaboration and participation in conservation activities.

- **Yearly Updates:** To ensure the portal remains current and relevant by incorporating data on newly discovered organisms each year.
- **Publication of a Reference Book:** To provide a tangible and accessible resource in the form of a published reference book, complementing the digital portal.

3. Methodology

The development and ongoing maintenance of the Biodiversity Portal involve a systematic and scientific methodology:

- **Biodiversity Surveys:**
  - **Flora Surveys:** The Department of Botany conducts regular surveys to identify, classify, and document plant species on the college campus. This includes recording species names (scientific and common), distribution, abundance, phenology, and ecological interactions.
  - **Fauna Surveys:** Similarly, surveys are conducted to identify and document animal species, including birds, mammals, reptiles, and butterflies. These surveys involve observation, identification (using field guides and expert consultation), and recording data on species presence, abundance, behavior, and habitat use.
  - **Photographic Documentation:** High-quality photographs of plant and animal species are captured during the surveys. These photographs serve as visual records for identification, documentation, and educational purposes.
- **Data Management:**
  - **Data Collection:** Data collected during the surveys is recorded using standardized formats, ensuring accuracy and consistency.
  - **Database Development:** A relational database is used to store and manage the biodiversity data. This database is designed to facilitate efficient data entry, retrieval, and analysis. The database includes fields for species names, taxonomic information, habitat details, distribution data, photographs, and other relevant information.
- **Portal Development and Maintenance:**
  - **Web Portal Development:** A user-friendly web portal is developed to provide public access to the biodiversity database. The portal is designed to be informative, interactive, and easy to navigate.
  - **Portal Features:** The portal includes features such as:
    - Searchable database: Users can search for specific species or groups of organisms.
    - Species profiles: Detailed information on each species, including photographs, descriptions, distribution maps, and ecological notes.
    - Interactive maps: Maps showing the distribution of species across the campus.
    - Educational resources: Articles, videos, and other materials to promote biodiversity awareness.
  - **Regular Updates:** The portal is regularly updated with new data collected from ongoing surveys, ensuring that the information remains current and accurate.

- **Reference Book Publication:**
  - The data from the biodiversity database is compiled into a comprehensive reference book "Flora and Fauna of Annasaheb Awate College, Manchar." The reference book is published and making it available to students, researchers, and the wider community.
- **Collaboration and Expertise:**
  - **Expert Consultation:** Experts in botany, zoology, ecology, and taxonomy are consulted to ensure the accuracy and validity of the data.
  - **Student Involvement:** Students are actively involved in the surveys, data collection, and portal maintenance, providing them with valuable hands-on experience and promoting their interest in biodiversity.
- **Technology and Tools:**
  - **GIS Integration:** Geographic Information System (GIS) software is used to map the distribution of species and analyze spatial patterns of biodiversity.
  - **Software and Hardware:** Appropriate software and hardware are used for data management, database development, web portal development, and image processing.

4. Outcomes

The development and implementation of the Biodiversity Portal have resulted in several significant outcomes:

- **Comprehensive Biodiversity Documentation:** The portal provides a comprehensive record of the flora and fauna present on the Annasaheb Awate College campus. This documentation serves as a baseline for future studies and monitoring.
- **Accessible Biodiversity Information:** The portal makes biodiversity information easily accessible to a wide audience, including students, researchers, and the general public. This accessibility promotes awareness and understanding of biodiversity.
- **Enhanced Educational Resource:** The portal serves as a valuable educational resource, supporting teaching and learning about biodiversity, ecology, and conservation. It provides students with opportunities for hands-on learning and research.
- **Increased Biodiversity Awareness:** The portal has contributed to increased awareness of the importance of biodiversity and the need for its conservation. It highlights the ecological significance of the campus and the role of the college in protecting it.
- **Facilitated Research:** The portal facilitates research on the campus's biodiversity by providing researchers with organized and readily available data. This can lead to new discoveries and insights into the ecology of the region.
- **Support for Conservation Planning:** The data in the portal can be used to inform conservation planning and management decisions for the campus. It provides a scientific basis for protecting and enhancing the campus's biodiversity.
- **Community Engagement:** The portal promotes community engagement in biodiversity conservation by providing a platform for sharing information and encouraging participation in conservation activities.

- **Published Reference Material:** The publication of a reference book ensures that the information is available in a tangible format, catering to different user preferences and needs.
- **Dynamic and Updated Information:** The annual updating of the portal ensures that the information remains current and reflects the latest findings on the campus's biodiversity.
- **Spatial Understanding of Biodiversity:** The integration of GIS provides a spatial understanding of biodiversity patterns, allowing users to visualize the distribution of species across the campus.
- **Student Empowerment:** The involvement of students in the project empowers them to become active participants in biodiversity research and conservation.
- **Recognition and Awards:** The college's efforts in biodiversity conservation, as evidenced by the portal and other initiatives, have been recognized through awards and accolades, enhancing the college's reputation.
- **Long-Term Monitoring Framework:** The portal establishes a framework for long-term monitoring of the campus's biodiversity, enabling the tracking of changes over time and the assessment of the effectiveness of conservation efforts.
- **Data-Driven Decision Making:** The portal provides data that can be used to inform decision-making related to campus management, land use planning, and conservation initiatives.

5. Detailed Species Inventory

The Biodiversity Portal documents a diverse array of flora and fauna on the Annasaheb Awate College campus. The following provides a summary of the species inventory:

5.1 Flora:

The campus supports a variety of plant life, comprising 190 species.

- **Angiosperms (180 species):** Angiosperms, or flowering plants, are the dominant plant group on the campus. They exhibit a wide range of forms, including trees, shrubs, herbs, and climbers. Some notable examples include:
  - *Mangifera indica* (Mango): A common fruit-bearing tree.
  - *Azadirachta indica* (Neem): A medicinal tree with various uses.
  - *Ficus religiosa* (Peepal): A large, sacred tree with ecological and cultural significance.
  - *Tectona grandis* (Teak): A valuable timber tree.
  - *Cocos nucifera* (Coconut): An important palm species.
  - Various species of the Poaceae (Grass) family.
  - A diverse collection of medicinal plants used in traditional medicine.
- **Gymnosperms (7 species):** Gymnosperms are non-flowering seed plants. The campus hosts a smaller number of gymnosperm species, such as:
  - *Pinus roxburghii* (Chir Pine): A coniferous tree.
  - *Cupressus macrocarpa* (Monterey Cypress)
  - *Thuja orientalis* (Oriental Arborvitae)
- **Pteridophytes (2 species):** Pteridophytes are vascular plants that reproduce via spores, such

as ferns and fern allies. Examples on campus include:
    - *Nephrolepis exaltata* (Sword Fern)
    - *Adiantum capillus-veneris* (Maidenhair Fern)

5.2 Fauna:

The campus also provides habitat for a variety of animal species, totaling 94.

- **Birds (45 species):** The campus avifauna is diverse, including resident and migratory birds. Some examples include:
    - *Bubulcus ibis* (Cattle Egret)
    - A variety of songbirds, raptors, and waterbirds.
- **Mammals (12 species):** Mammal species found on the campus include:
    - *Felis chaus* (Jungle Cat)
    - Various species of rodents, bats, and other small mammals.
- **Reptiles (22 species):** The reptile diversity includes:
    - *Varanus bengalensis* (Bengal Monitor)
    - *Eryx johnii* (Red Sand Boa)
    - Lizards and snakes.
- **Butterflies (15 species):** The butterfly fauna adds to the campus's biodiversity:
    - *Hypolimnas bolina* (Great Eggfly)
    - *Tirumala limniace* (Blue Tiger)
    - Various other colorful butterfly species.

6. Significance of the Biodiversity Portal

The Biodiversity Portal holds significant value for several reasons:

- **Conservation of Biodiversity:** By documenting and raising awareness about the campus's biodiversity, the portal contributes to its conservation. It provides a scientific basis for protecting the campus's natural heritage and promoting sustainable practices.
- **Education and Research:** The portal serves as a valuable resource for education and research. It provides students and researchers with access to organized and reliable data, supporting their studies and investigations.
- **Environmental Awareness:** The portal plays a crucial role in promoting environmental awareness among the campus community and the wider public. It educates people about the importance of biodiversity and the need to protect it.
- **Long-Term Monitoring:** The portal establishes a framework for long-term monitoring of the campus's biodiversity. This allows for the tracking of changes over time and the assessment of the effectiveness of conservation efforts.
- **Data-Driven Decision Making:** The data in the portal can be used to inform decision-making related to campus management, land use planning, and conservation initiatives. It provides a scientific basis for making informed choices that benefit both people and nature.
- **Community Engagement:** The portal promotes community engagement in biodiversity

conservation by providing a platform for sharing information and encouraging participation in conservation activities.

- **Replication and Inspiration:** The Biodiversity Portal at Annasaheb Awate College can serve as a model for other educational institutions and organizations seeking to document and conserve their biodiversity. It can inspire similar initiatives and contribute to a broader movement for biodiversity conservation.
- **Preservation of Natural Heritage:** The portal contributes to the preservation of the natural heritage of the region, ensuring that future generations can appreciate and benefit from its biodiversity.
- **Promotion of Citizen Science:** The portal can potentially involve citizen scientists in data collection and monitoring, further expanding its reach and impact.

The Biodiversity Portal at Annasaheb Awate Arts, Commerce, and Hutatma Babu Genu Science College, Manchar, is a valuable initiative that documents, preserves, and disseminates information about the campus's rich biodiversity. The portal serves as a comprehensive digital repository, an educational resource, and a tool for promoting biodiversity awareness and conservation. It is a testament to the college's commitment to environmental stewardship and its dedication to providing a holistic education that encompasses both academic excellence and social responsibility. The portal's ongoing development and maintenance, along with the publication of a reference book, ensure that it remains a dynamic and valuable resource for students, researchers, and the wider community. The college's efforts can serve as a model for other institutions seeking to document and conserve their natural heritage.