WORK PLAN:

- Collection of reference papers and books.
- Survey of field and fix the spot for collection of moths.
- Visit to Bombay Natural History Society, Mumbai and ZSI, Pune.
- Preparation of different light traps and insect collection traps
- Collection and preservation of moth.
- Identification of moths with the help of identification keys and literature.
- Visit to different sites for the collection of nocturnal moths in different seasons
  1. Early winter
  2. Late winter
  3. Spring
  4. Summer
  5. Early monsoon
  6. Late monsoon.
- Photographs of adult moths, host plants, collection sites in field or laboratories.
- Correlate the collected data.
- Data analysis and calculation.
- Thesis writing and submission of thesis.
METHODOLOGY

1. Site Selection for Moth Collection:

The study was carried out in Baramati which is a taluka place of Pune district, Maharashtra, India. It is located at 18.15° N 74.58° E in the rain shadow area and therefore receives only around 400-500 mm of average rainfall in the monsoon. In Baramati region water for irrigation is provided by ‘Veer Dam’. Two sites were selected for moth collection. The site one is Kambleshwar village located at the south side of Baramati, this is an irrigated area with agricultural ecosystem. The second site is of Nimbodi village located at the north side of Baramati and is a forest area with the natural ecosystem.

![Map of Pune District, Maharashtra, India](https://www.google.co.in/search?q=baramati+map)

2. Collection Method:

Two different types of traps were used for moth collection. They are mentioned as below:

i. Light Trap:
A mercury light trap method is used for the collection of moth. This is most common method of collecting nocturnal moths that hide or rest during the day in places where they are unlikely seen. Large number of moths caught at night using a light trap. White cloth screen (3 x 3.5) was hanging between two poles and extended forward over the ground slightly away from the direct source of mercury light placed. Specimens are collected with the help of mercury light trap, (160 W) from Site I (south side) and Site II (north side) in Baramati region. Some specimens are collected from a street lamp lights and on flowers during night by battery traps. Specimens are preserved in research laboratory.

ii. Net Trap:
Arial net are used to collect the moths in air. The net should be light weight, made of a fine, Soft, durable material. Arial net is useful for collecting flying or sitting moths.

3. Preservation Method:

Preservation of moths includes killing, relaxing, spreading and pinning,labeling and mounting methods.

i. Killing Method:

Moth specimens are kept in killing jar with closely fitted lid and use a volatile chemical such as ethyl acetate absorbed onto cotton. The small specimens are killed by using the same toxicant. Ultimately, if they will not be damaged, they may be killed with the help of chloroform.

ii. Relaxation:

After killing process, moths are still relaxed to minimized broken body parts. Relaxation process on moths is carried out in a relaxing jar. A relaxing jar, like a killing jar, should have a wide mouth and a tightly fitted lid. Place an absorbent layer in the bottom of the jar. Prepare the material with water and add a little ethyl acetate to inhibit fungus growth. Place a protective layer over the absorbent layer and place moths that need 24 hrs for relaxation.

iii. Pinning and Spreading:

The pinning process starts after relaxation process. Pinning is started by inserting the half part of the pin into the center of thorax region of moth. After pinning step, the moth specimen is placed into a spreading board, with wings of moth touch to the board. The small pins are used for spreading the wings at a 90° angle on the body. The forewing and hind wing spread on spreading board with the help of pins. The preservation and labeling process carried out after spreading process.
iv. Preservation and labeling:

After spreading process, collected moth is preserved into oven at 37°C for 24 hrs. The specimen is labeled which contain the location from where the specimen was obtained, the date when it was obtained, environment and the name of the collector. Use a permanent ink pen or pencil to write the labels.

v. Mounting:
Store the preserved moth specimens into mounting board. Use the naphthalene balls for the storage process.

4. Identification:
Moths are identified by identification key and available literature.

5. Study the seasonal variations, diversity and frequency of moth:
Calculate the diversity of moth. Determine the abundance and frequency of moth population in Baramati region, Pune, Maharastra.

6. Conclusion

- The moths are good indicators of a healthy environment and healthy ecosystems.
- Moths are indicating a wide range of other invertebrates, which comprise over two-thirds of all species.
- Moths have been mostly used by ecologists and researchers as model organisms to study the impact of habitat loss, fragmentation and climate change.
- Present study helps to investigate many areas of biological research, including such diverse fields as navigation, pest control, mimicry, evolution, genetics, population dynamics and biodiversity conservation.
- Moth study will help the local farmers to know which type of moths affects the crops.