

INDUSTRIAL TRAINING PROGRAMME

Place of visit	-	Amba
Date	-	03/04/2023
Vegetation	-	Semi evergreen and moist deciduous type of forest
Soil	-	Red fertile
Temperature	-	Average 20 ⁰ C to 30 ⁰ C

Kolhapur is the southern district of Maharashtra state. It is an irregular belt of Deccan plateau lying along east of Sahyadri crest. The hilly terrain, high rainfall and mild climate are the chief natural features, which provide a large area suitable for forest. Amba Ghat is an important place of botanical interest on the main ranges of Sahyadri and thorough investigation is needed to understand the rich vegetation of the district. Amba is a small village situated in the Sahyadri ranges. It is the beginning of Amba Ghat in Shahuwadi taluka of Kolhapur district on Kolhapur-Ratnagiri road. The place is well known for its pleasant climate and it is a favorite tourist spot during rainy season. The forest is rich in algae, fungi, bryophytes and pteridophytes during rainy season, flowering plants and gymnosperm like *Gnetum* are also abundant.

Rajaram College, Kolhapur, Department of Botany, NGO Monera Foundation of India, Sahyadri Mahila Bachat Gat, Sakhi Sanvad Kendra and Shri Shivsamarth Goshala will organize an "Industrial Training Program" and visit to Ambeshwar sacred grove, Amba and Shri Shivsamarth Goshala, Amba, Tal. Shahuwadi, Dist. Kolhapur for B. Sc II and III Botany students on dated 3rd April 2023. The theme has been adopted to inculcate industrial working execution and production amongst students as well as develop skills in the students, which will in the long run help entrepreneurship development. Visiting sacred grooves enhance the knowledge about biodiversity and its conservation strategies among the students. Visit to goshala (shelter for cows) for understanding the need of cow based organic products and their uses and benefits in day to day life. Production of such products as a future prospective. Research students and CHB staff of Botany will participate in the organization of the Training Program. There will be no monetary transaction of any kind in between the participating institutions. Lectures, Product preparation demo, Market demand and supply and industry chain guidance related to Botany and Industry, during the program.

Ambeshwar Devrai/ Amba Ghat:

The *Devrai* word came from two local words; that is, *Dev* means God and *rai* means forest. So it means god's forest is *Devrai*. Such forest patches are considered a sacred forest by locals so they are called sacred groves. The groves thus act as key benchmarks of less disturbed vegetation in a mosaic of other traditional and modern forms of land use. The groves play a role in maintenance of the local ecological balance, conservation of watersheds, and preservation of bioresources. Sustainable use of resources and use of management principles for different landscape elements are frequently linked to culturally distinct sentiments. Hence a visit was organized by our Department to Ambeshwar Devrai to observe the vegetation and collect some specimen for preservation. A visit to the beautiful Ambeshwar devrai was conducted with our past student Mr. Ajinkya Berde, President, Monera foundation. The students enjoyed the scenic beauty, studied the wild flora as well as observed many varieties of butterflies especially Blue Mormon, caterpillars, insects, etc.

Various plants observed at Amba ghat are as follows-

A) Fungi

Sr. No.	Fungi	
1	<i>Tremella</i>	
2	<i>Pyronema</i>	
3	<i>Clavaria</i>	
4	<i>Poria</i>	
5	<i>Fomes</i>	
6	<i>Ganoderma</i>	
7	<i>Thelephora</i>	
8	<i>Lenzites</i>	
9	<i>Schizophyllum</i>	
10	<i>Polyporus squamosus</i>	
11	<i>Trametes</i>	
12	<i>Polystictus</i>	
13	<i>Trichoglossum</i>	
14	<i>Clavulinopsis</i>	
15	<i>Geastrum</i>	
16	<i>Scleroderma</i>	
17	<i>Xylaria polymorpha</i>	
18	<i>Daldinia</i>	
19	<i>Stemonites</i>	

20	<i>Xylaria berteri</i>	
21	<i>Annulohyphoxylon cohaerns</i>	
22	<i>Xylaria badia</i>	
23	<i>Kulkerniella pavettae</i>	<i>Pavetta indica</i>
24	<i>Capnodium</i>	<i>Memecylon umbellatum</i>
25	<i>cercospora</i>	<i>Araesima</i>

B) Crustose, Foliose and Fruticose Lichens

C) Bryophytes

Sr. No.	Bryophytes
1	<i>Funaria</i>
2	<i>Cyathodium</i>

D) Pteridophytes:

Sr. No.	Pteridophytes
1	<i>Adiantum</i>
2	<i>Asplenium</i>
3	<i>Microsorium</i>
4	<i>Pleopeltis</i>
5	<i>Cheilanthus</i>
6	<i>Selaginella</i>

E) Angiosperms:

SR.NO.	BOTANICAL NAME	FAMILY	REMARKS
1.	<i>Holigarna grahamii</i> (Wt.) Kurz.	Anacardiaceae	Trees with lanceolate leaves, Flowers small, greenish white, in rusty tomentose, terminal panicles.
2.	<i>Mangifera indica</i> L.	Anacardiaceae	Tall, evergreen trees, leaves oblong-lanceolate, flowers in terminal panicles, drupes large, fleshy, obliquely pyriform, widely cultivated for fruits.
3.	<i>Hydrocotyle sibthorpioides</i> Lam.	Apiaceae	Delicate shrub with tubers. Capsules winged, inflorescence used as vegetables.
4.	<i>Colocasia esculanta</i> (L.) Schott	Araceae	Perennial herbs. Leaves peltate, flower unisexual in spadix. Berries orange yellow.
5.	<i>Wattakaka lanceolata</i> (T.)	Asclepiadaceae	Climbing shrub, stem densely pubescent,

	cooke)Jagtap and singh		leaves silky pubescent, flowers greenish yellow in umbellate cymes.
6.	<i>Tylophora dalzellii</i> Hook. F.	Asclepiadaceae	Small, red or purple flowers in axillary umbellate cymes.
7.	<i>Gynura nitida</i> DC.	Asteraceae	Stout, sparingly pubescent herbs, leaves obovate –lanceolate. Capitulum orange-red, common in waste places.
8.	<i>Elephantopus scaber</i> L.	Asteraceae	Heads with pinkish purple corolla, common in shady places.
9.	<i>Impatiens balsamina</i> L.	Balsaminaceae	Leaves narrowing into short petioles, Flowers pink or rosy, capsule tomentose.
10.	<i>Impatiens oppositifolia</i> L.	Balsaminaceae	Flowers axillary purple, capsules ellipsoid, leaves lanceolate.
11.	<i>Begonia crenata</i> Drynad.	Begoniaceae	Small herbs with pink flowers, common in moist shady places ,stems and petiole are edible.
12.	<i>Trichoderma indicum</i> (L.) Lehm.	Boraginaceae	Hispid herbs, flowers in terminal cymes, fruits pyramidal with four nutlets.
13.	<i>Cynoglossum zeylanicum</i> (Vahl ex Hornem.)Thumb.	Boraginaceae.	Erect woody herb, flowers pale blue, common in open areas.
14.	<i>Terminalia cuneata</i> Roth.	Combretaceae	Large tree with smooth, greenish- white bark, drupes ovoid, dark brown with five wings. Bark and gum used in ayurvedic medicines .
15.	<i>Terminalia paniculata</i> Roth.	Combretaceae	Large trees, fruits rusty to tomentose with 3 wings.
16.	<i>Argyreia elliptica</i> (Roth) Choisy	Convolvulaceae	Large climbing shrub, flowers pink- purple or rose coloured, common twiner on the forest border.
17.	<i>Mukia maderaspatana</i> (L.) Roem.	Cucurbitaceae	Climber with yellow flowers.
18.	<i>Cyperus difformis</i> L.	Cyperaceae	Annual herbs, leaves acuminate, spikelets greenish –brown in terminal umbel.
19.	<i>Eriocaulon minutum</i> Hook.	Eriocaulaceae	Common in swampy wetlands near the

	F.		temporary water bodies and on hill slopes, erect herb.
20.	<i>Bridelia retusa</i> (L.) Spreng.	Euphorbiaceae.	Moderate sized, deciduous, fruits drupes purple-black.
21.	<i>Exacum lawii</i> Cl.	Gentianaceae	Small erect herb with slender stem, flower bluish purple frequent in grasses at higher altitudes.
22.	<i>Rhynchosolossum notonianum</i> (Wall.)Burt.	Gesneriaceae	Blue-purple coloured flowers .
23.	<i>Nothapodytes nimmoniana</i> (Grah.) Mabb	Icacinaceae	Flowers strongly foul scented.
24.	<i>Actinodaphne angustifolia</i> Nees	Lauraceae	Moderate evergreen tree, flowers yellow, berries red.
25.	<i>Leea kinica</i> (Burm.f.)Merr	Leeaceae (Dinda.)	Shrubs with two to three pinnate leaves , flowers in branched paniculate cymes, berries globose purple-black.
26.	<i>Utricularia strialuta</i> Smith.	Lentibulariaceae	Herbs, corolla pink to white, growing on accumulated soil on rocky substratum, among mosses on tree trunks and on dripping rocks.
27.	<i>Glorisa superba</i> L.	Liliaceae	Flowers large yellow red. Stamens exerted capsules dark green. Colchicine extracted from seeds and tubers (Kal-lawi)
28.	<i>Memecylon umbellatum</i> Burm.	Melastomaceae	Small trees, green glabrous leaves, berries globose, purple-black. Berries edible.
29.	<i>Ensete superbum</i> (Roxb.)Cheesm.	Musaceae	Perennial herbs, with large oblong leaves, inflorescence stout spike. Fruit oblong common on steep rocky hill slopes.
30.	<i>Habenaria crinifera</i> Lindl.	Orchidaceae	Epiphytic herb with white flowers, which are fragrant .
31.	<i>Habenaria longiconiculata</i> Grah.	Orchidaceae	Robust herb. Leaves clustered at base, flower white spur very long.
32.	<i>Scutia myrtina</i> (Burm.f.)Kurz.	Rhamnaceae	Shrubs armed with recurved thorns, flowers yellowish green. Common at higher altitudes.

33.	<i>Pavetta crassicaulis</i> Brecek.	Rubiaceae	Bushy shrub with white flowers, fruits globose black and smooth.
34.	<i>Mussaenda belilla</i> Buck. Ham.	Rubiaceae	Rambling, hairy shrubs. Corolla bright orange, one sepal enlarged leaf like and pale yellow in colour.
35.	<i>Striga asiatica</i> (L.)O. Ktze. Rev.	Scrophulariaceae	Root parasites with sulphur yellow flowers.
36.	<i>Smilax zeylanica</i> L.	Smilacaceae	Perennial twining armed shrubs. Size and shape of leaves variable. Roots and fruits used in the treatment of sorosis.
37.	<i>Solanum virginianum</i> L.	Solanaceae	Woody herb with faint purple flowers leaves and stem clothed in prickles. Plants used in Ayurvedic medicines.
38.	<i>Grewia asiatica</i> L.	Tiliaceae	Small trees with yellowish flowers. Fruits edible used for preparation of sherbet.
39.	<i>Boehmeria macrophylla</i> Hornem.	Ulmaceae	Large shrubs, with wrinkled leaves common in the forest borders. Plants with stinging hairs.
40.	<i>Clerodendrum serratum</i> (L.) Moon.	Verbenaceae	Large inflorescence with blue flowers.
41.	<i>Clerodendrum viscosum</i> Vent.	Verbenaceae	Large inflorescence with white flowers.
42.	<i>Tectona ghrandes</i> L.	Verbenaceae	Large, deciduous trees, flowers minute, corolla white in tomentose panicles, planted on large scale for wood.
43.	<i>Costus speciosus</i> (Koen.)J.Smith	Zingiberaceae	Large flowers with dark red coloured calyx and bract.
44.	<i>Habenaria longicorniculata</i>		
45.	<i>Hebenaria marginata</i>		
46.	<i>Peristylus densus</i>		
47.	<i>Peristylis gooderiodes</i>		
48.	<i>Gnetum ula</i>		

Visit To Shivsamarth Goshala:

In second session our students visited Shivsamarth Kokan Kapila Goshala, situated near the ambeshwar devrai. Mr. Sunil Gadre gave the important information about Kokan kapila cows and their beneficial aspect regarding how to prepare:

Goark, soap, oil, Shampoo, Hair oil, Sugandhi Dhoop, Agnihotra Dhoop, Aarogyavardhak Tup, Govari, Massage Oil, Face Pack, Phenel, Dantamanjan, Gokhur Khat, Compost Khat, Gandul Khat, Gandul Beej, Jivamrut, Vermiwash, etc.

Goshala, a Sanskrit word ("Go" means cow and "Shala" means a shelter place: Go + Shala = shelter for cows), means the abode or sanctuary for cows, calves and oxen.

Konkan Kapila is a pure Indian breed of cattle mainly found in Maharashtra's Konkan Province, Thane , Raigad , Ratnagiri , Sindhudurg and Palghar districts. Konkan Kapila is a Cutak and medium sized cow breed. The head is medium in size and tapered compared to the body. The eyes of this breed are black, the ears are medium sized, alert and pointed. There are two medium-sized black horns on the sides of the eyes, the horns are slightly inwardly curved and pointed. Legs are thick, strong and suitable for walking in mountainous areas. The hooves are medium, thick and black. The tail of this breed is medium long and the black tail is sleek. The fodder requirement of this breed is moderate and it does not require much maintenance. The work is done when these cattle are left to graze freely. It is a medium height, buttki variety and is suitable for agricultural work. At the same time, if a little care is taken, the need for milk is eliminated.

Visit to goshala (shelter for cows) for understanding the need of cow based organic products and their uses and benefits in day to day life. Production of such products as a future prospective.

Visit to Sahyagiri Mahila Bachat Gat, Sakhi Sanvad Kendra, Amba:

In third session students visited Sahyagiri Bachat Gat Amba, Mrs. Sayali Rajendra Lad Sahyagiri Mahila Bachat Gat, Sakhi Sanvad Kendra, Amba, gave us the important information about food processing including making of Pickles, Muramba, Jam, Kairy Chunda, Fried masala peanuts etc.

1. Mango Pickle:

Ingredients: Raw mangoes, Chili powder, Mustard seeds, Cumin seeds, Jaggery or sugar, Turmeric powder, spices, salt.

Preparation: Take 1 kg pieces of raw mangoes and add salt and turmeric powder in it, mix it well and store it overnight, on next day add warm cooking oil with

2 Kgs. raw Green Mangoes

1 liter Mustard Oil

400 gms. Salt

300 gms. Fenugreek/Methi Seeds

300 gms. Aniseed/Saunf

100 gms. Nigella/Kalonji/Onion Seeds

100 gms. Degi Chilli Powder or Anyother Red Chilli Powder

50 gms. Coarsely Ground Black Pepper

50 gms. Turmeric Powder

Wipe the raw mangoes with wet cloth then cut them into pieces as shown. Then mix all the spices in one bowl. Take a jar in which you will be keeping the pickle. Make a layer of mixed spices (Masala) at the bottom of jar then add Mango pieces layer to it and then again add masala layer and keep doing this untill the jar is filled. Add Oil on the top of all layers and let it reach till the bottom of jar, Close the lid and keep the jar in sun for 10 to 15 days, and keep shaking the jar daily (don't open the jar in this time).

The Pickle will mature in 10 to 15 days and will be ready to eat. It has a shelf life of one year.

The pickle is ready and will look like this. This can be enjoyed with chapatis, paratha, rice or with any other dish.



2. Guava Jam:

Guava Jam is an easy homemade no preservative recipe. This jam recipe preserves its fresh flavor with nothing but sugar, salt, and lime followed by proper storage. Once ready, you will be surprised to see the jars emptied sooner than you anticipated. That addictive it is.

Ingredients

5 Guava

2 cups Sugar , quantity varies based on sweetness of guava

3 tablespoon Lemon juice

Salt , to taste

1. To begin making the Guava Jam recipe, wash and wipe Guava. Cut into small pieces.
2. Take them in a thick pan, add 4 cups water and boil till guava is fully soft and mushy. Mash the cooked guava nicely and sieve to remove the seeds from it.
3. Add lemon juice, sugar, salt to the extracted pulp and mix well.
4. Keep the pan on the flame. Let the flame be on medium. Bring mixture to full boil stirring frequently in between. As it thickens, stir consistently and reduce the flame. Make sure not to overcook. Jam will thicken as it cools.
5. When the jam has reached a thick sauce consistency, turn off the flame. Cool for about 10 minutes and pour into clean sterilized glass bottles.
6. Guava jam is ready. After some time it will nicely thicken. Refrigerate/store in a cool dry place



3. Karvand Pickles:

Ingredients for the Karvand Pickle

Karvanda	½ cup
Achar masala/ pickle masala	2 tbsp
Mustard seed / Rai	¼ tsp
Turmeric / Haldi powder	¼ tsp
Jaggery / Gul	1 tsp
Asafetida / Hing	⅛ tsp
Oil	1 tbsp

Prepping for the Karvand pickle

Wash the Karvand and add them to water along with salt and let them soak for the next 2 hours. After 2 hours drain them and dry them.

Method for making the Karvand pickle

In a bowl add the achar masala along with the gud / jaggery and the turmeric powder and the dried Karvand and mix it well and keep aside. In a kadai add the oil and once the oil is hot add the rai / mustards seeds, and once they sizzle then add the hing and wait for the oil to come down to room temperature. And once the oil is at room temperature add it to the bowl in which you have the Karvand. And mix it well by pressing the gud down.

If you pour hot oil in the karondo bowl then the achar masala will turn dark red and won't be very appealing. Once mixed remove it in a serving bowl and keep it aside for 3 days before eating. Do not keep in the refrigerator.

Karvand Chatany:



Ingredients used in Karvand Chutney

- Karvand (cranberry) cut into halves - 250 grams.
- Green chillies - 4 numbers.
- Saunf powder - 1 tea spoon.
- Fenugreek powder - 1/4 tea spoon.
- Asafoetida - 1 pinch.
- Garam masala - 1 pinch.
- Red chili powder - 1 tea spoon.
- Mustard oil - 1/4 cup.
- Kalonji seeds - 1/4 tea spoon.
- Cumin seeds - 1/2 tea spoon.
- Ajwain seeds - 1/4 tea spoon.
- Salt - to taste.

Method:

Wash, dry and cut the Karvand into two halves. Remove the seeds and keep aside.

In a mixing bowl, add in the cut Karvand pieces, green chillies, saunf powder, fenugreek powder, hing, garam masala, asafoetida, red chili powder and mix well.

In a pan, heat some mustard oil until it comes to a smoking point. Switch off the flame and add kalonji seeds, cumin seeds, ajwain seeds and allow it to sizzle.

Add salt to the Karvand pieces and mix well.

Once the oil mixture cools down, pour it over the Karvand pieces and mix well.

Cover and rest it for few hours before serving.

4. Popcorn:

for masala popcorn:

2 tbsp oil

1 tbsp butter

½ cup popcorn

¼ tsp turmeric

½ tsp chilli powder

½ tsp garam masala

¼ tsp chaat masala

¼ tsp salt

In a large kadai heat 2 tbsp oil and 1 tbsp butter, add ½ cup popcorn and roast on low flame. roast until the popcorn starts to puff a little, add ¼ tsp turmeric, ½ tsp chilli powder, ½ tsp garam masala, ¼ tsp chaat masala and ¼ tsp salt. mix until the spices turn aromatic.

immediately close the lid and keep the flame on low, wait until all the popcorn starts to pop up.

finally, masala popcorn is ready, you can add more butter if you prefer.

5. Masala Peanut:

Ingredients:

½ cup gram flour / besan

2 tbsp rice flour

2 tbsp corn flour

¼ tsp turmeric / haldi

1 tsp kashmiri red chilli powder

½ tsp ginger garlic paste

pinch baking soda (optional)

½ tsp salt

2 cup 350 grams peanuts / groundnuts

2 tsp oil

3 tbsp water

oil for deep frying

½ tsp chaat masala (optional)

firstly, in a large mixing bowl take ½ cup besan, 2 tbsp rice flour and 2 tbsp corn flour, also add ¼ tsp turmeric, 1 tsp chilli powder, ½ tsp ginger garlic paste, pinch baking soda and ½ tsp salt.

mix well making sure all the spices are combined well, further, add 2 cup skinned peanuts and 2 tsp oil, mix well, oil helps to coat peanuts with masala, further, add 2 tbsp of water and mix well.

add 1-2 tbsp of more water in batches till the peanuts are coated well with besan, furthermore, add a tsp of rice flour and give a mix. this helps to separate peanuts, deep fry in hot oil or bake at 180-degree celsius for 20 minutes, stir occasionally and fry on low to medium flame, sprinkle ¼ tsp chaat masala and mix well. this helps to enhance the flavour.