ETHIRAJ COLLEGE FOR WOMEN (Autonomous) Chennai – 600 008

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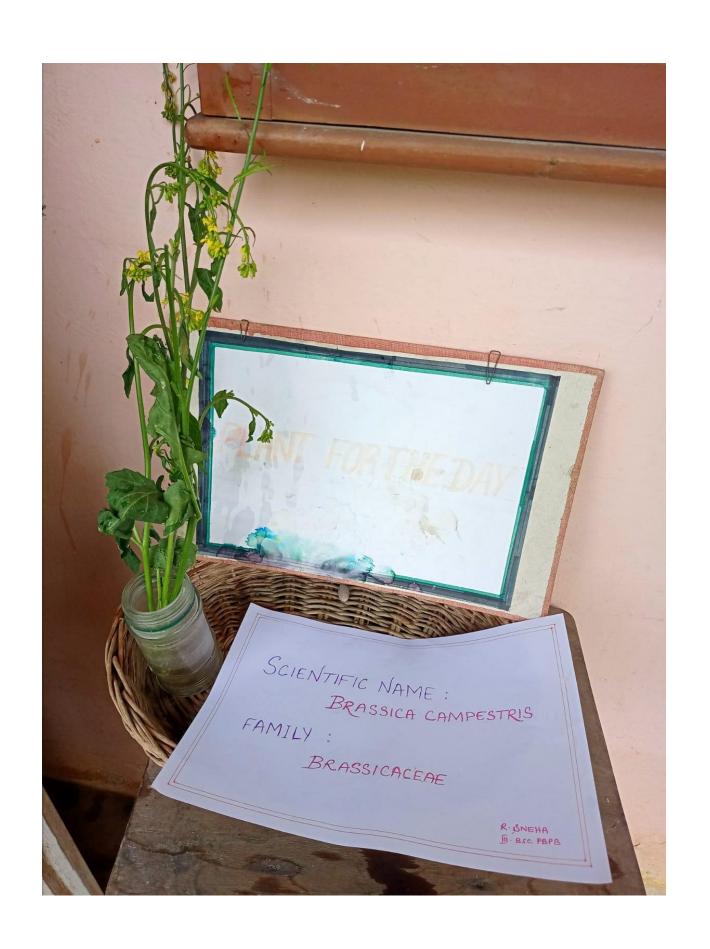
2.3. TEACHING LEARNING PROCESS

2.3.1 Experiential and Participative Learning

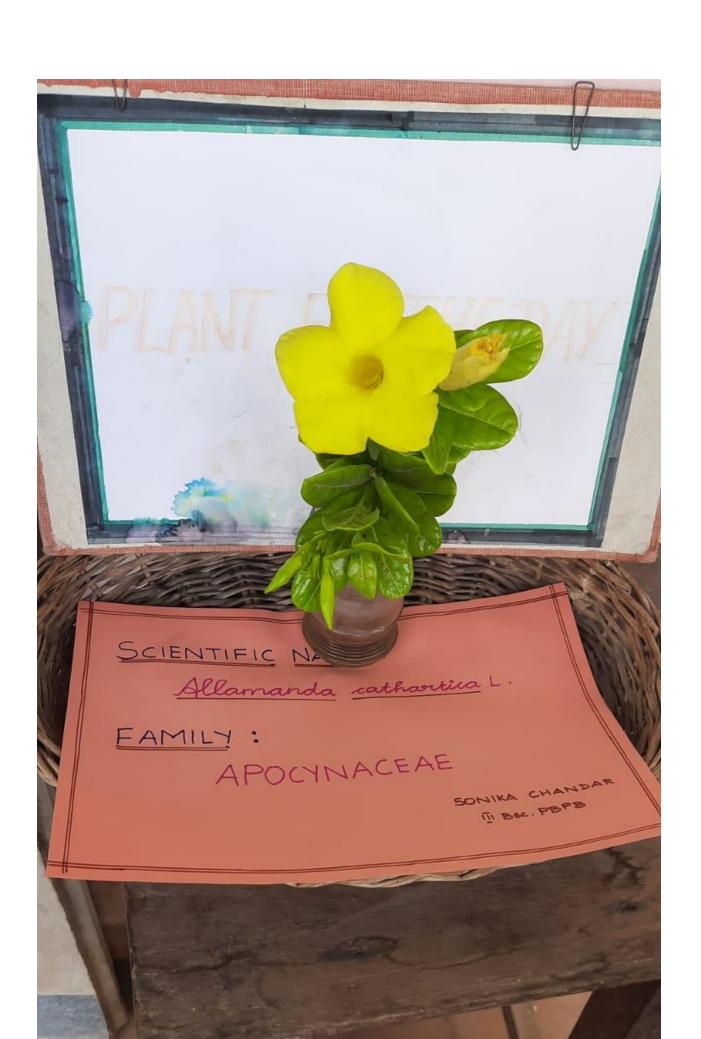
2021 -2022



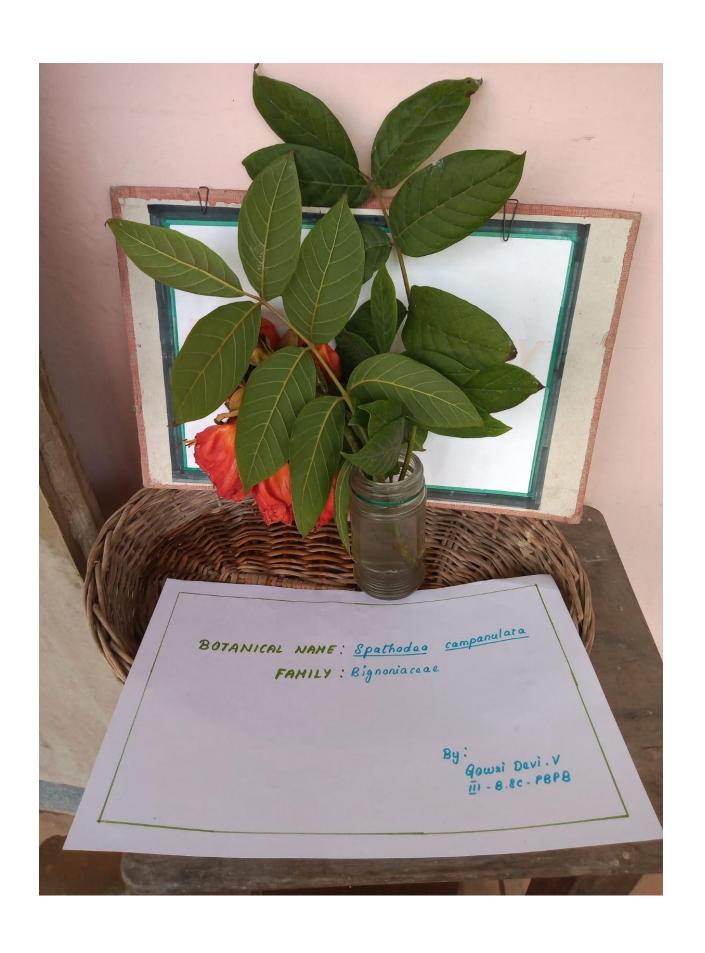






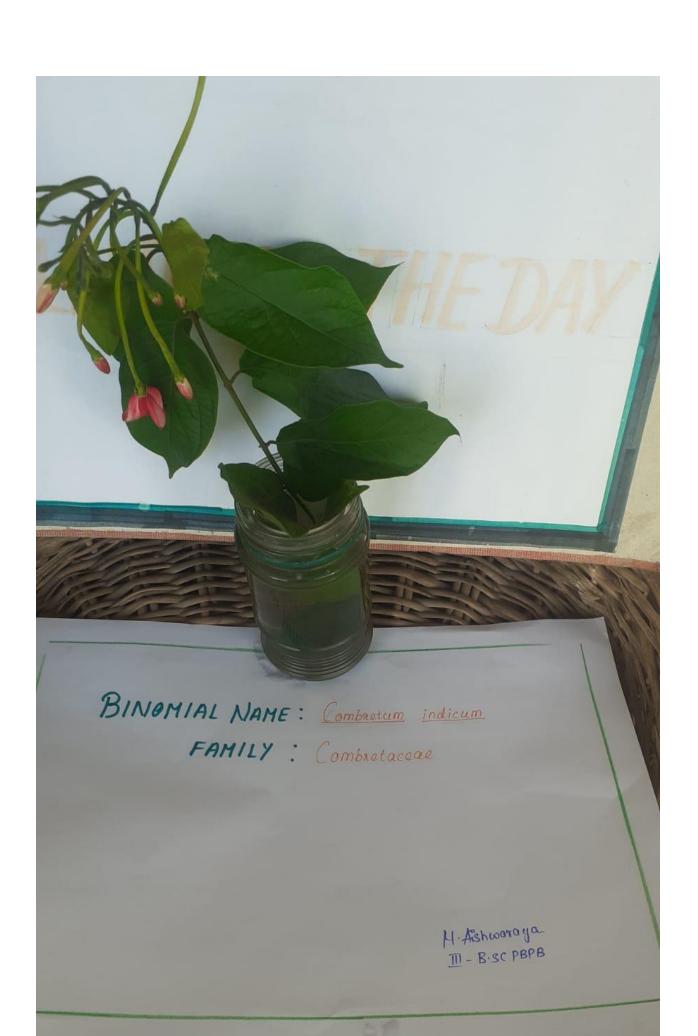


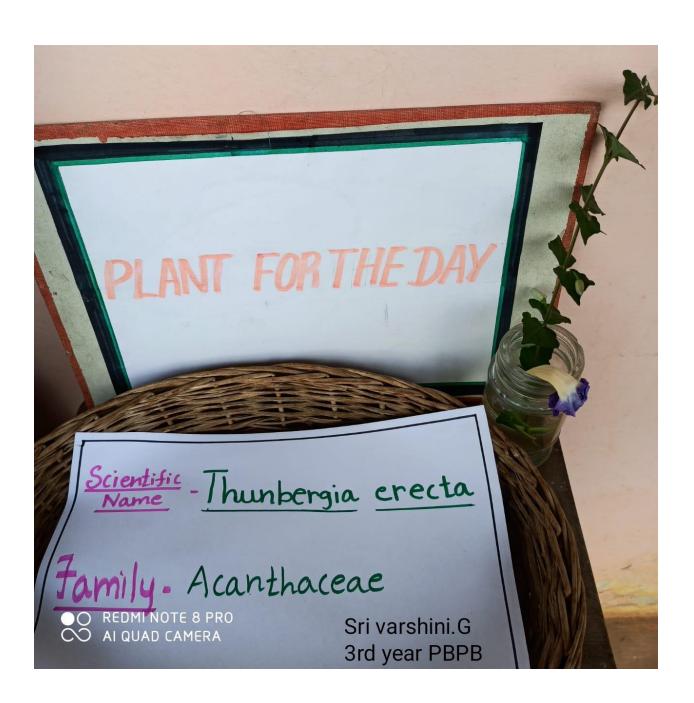














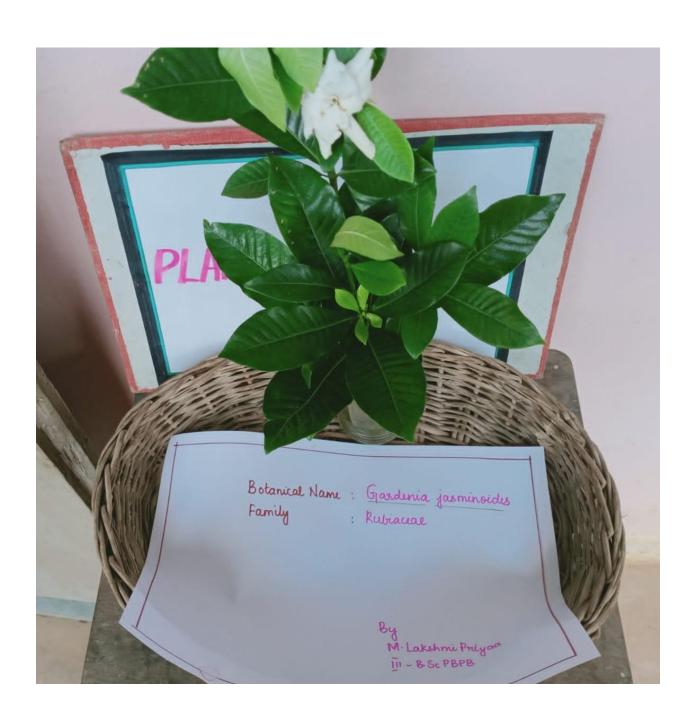




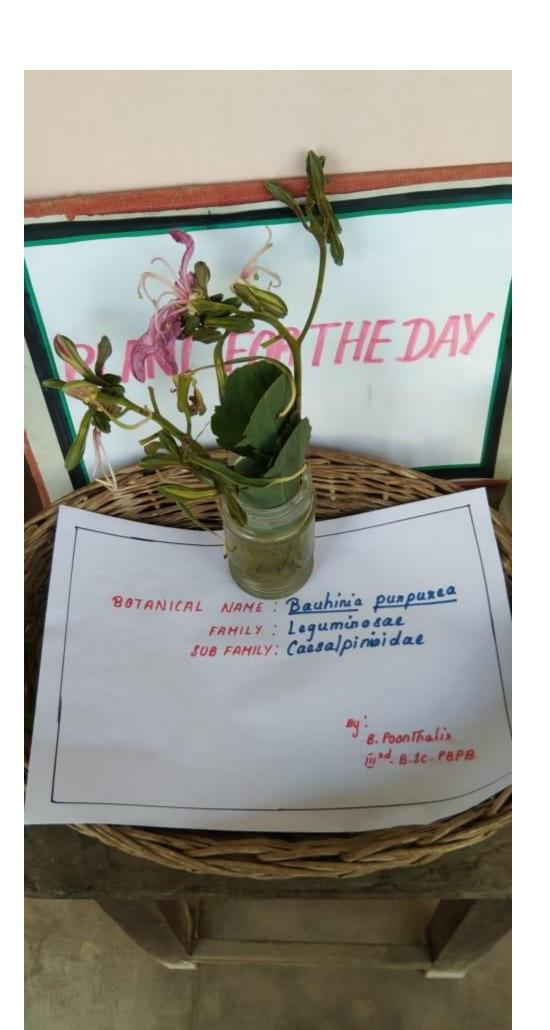






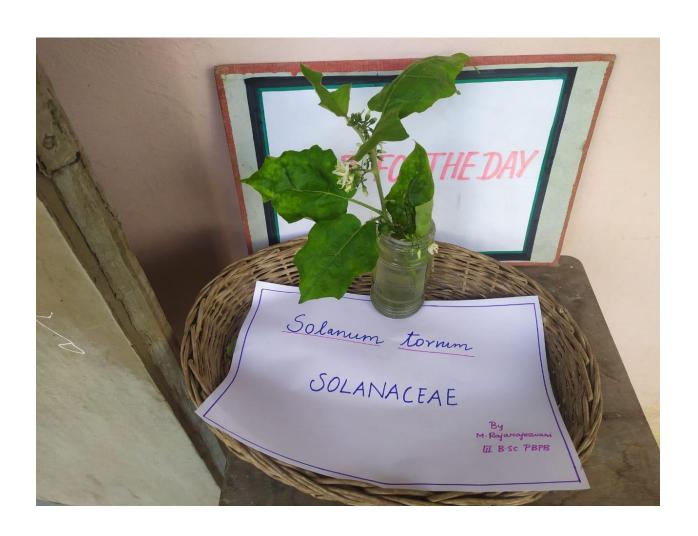




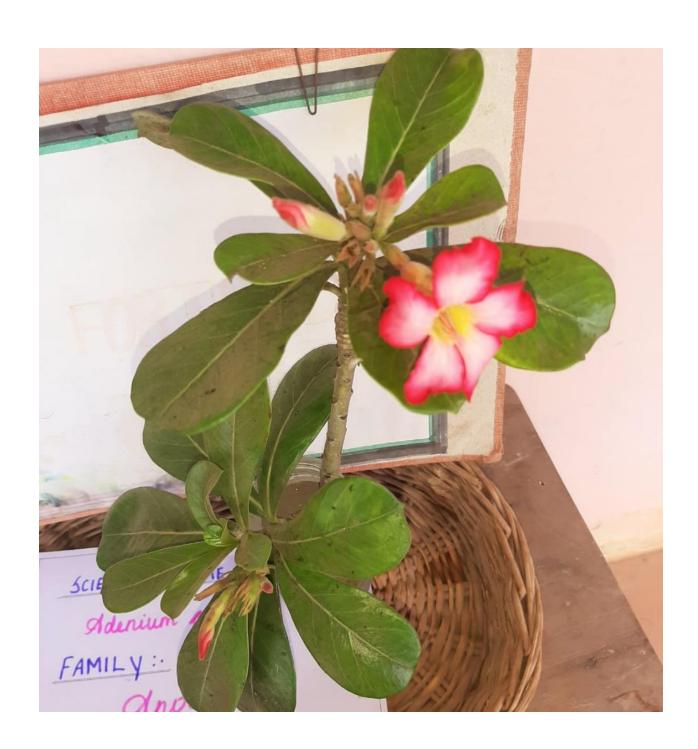




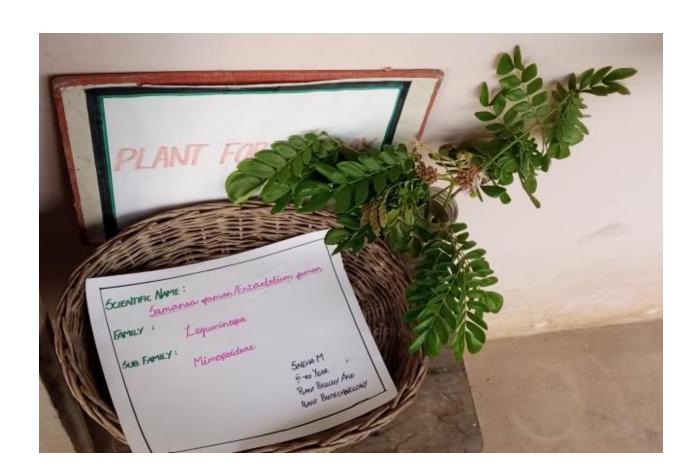














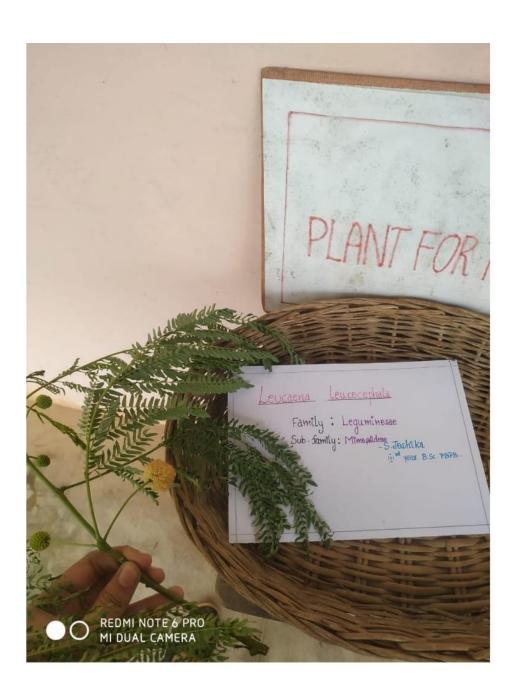


















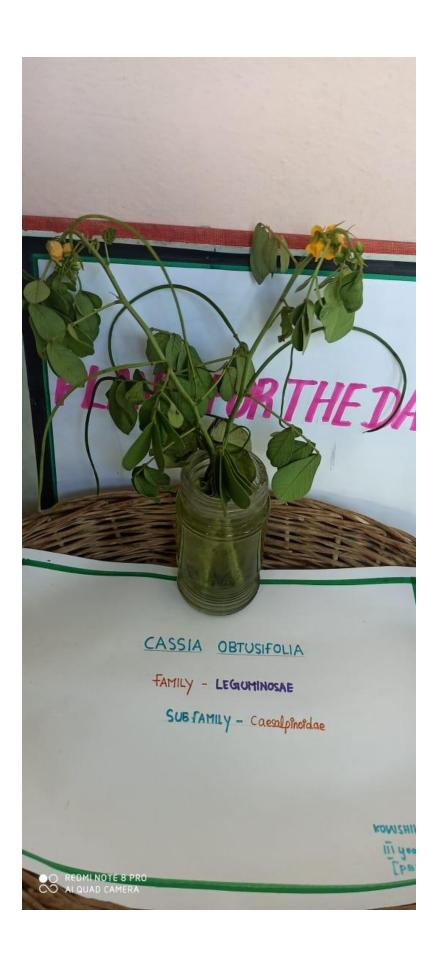
























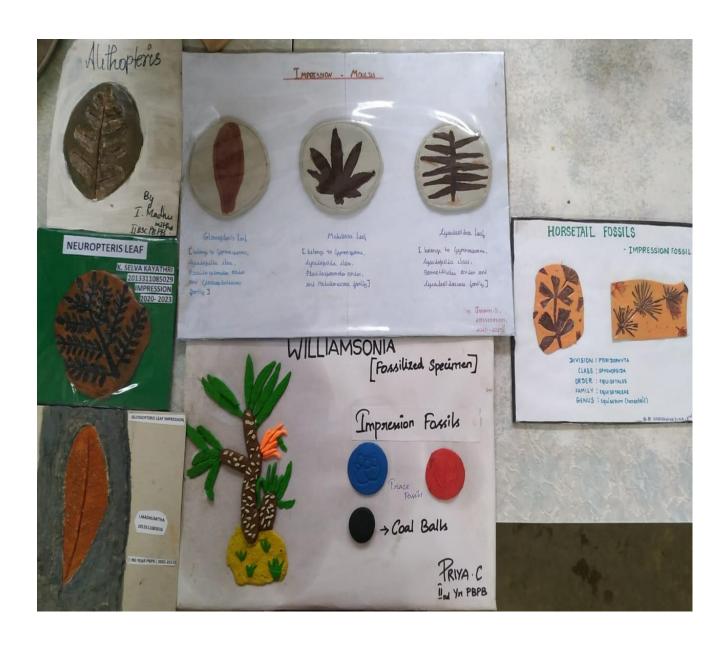
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CLAY MODELS OF GYMNOSPERMS Taxus



CLAY MODELS OF FOSSIL TYPES





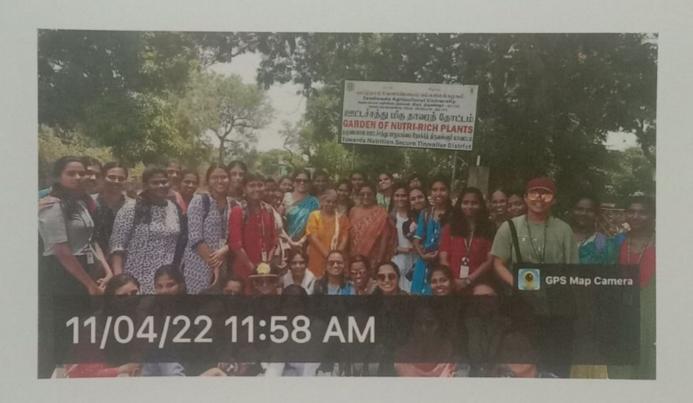
ETHIRAJ COLLEGE FOR WOMEN

III year N & D, FSM

Batch: 2019 - 2022

FIELD TRIP TO KVK FOR

FRUITS AND VEGETABLE PRESEVATION



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Reg. no. 1913311079033

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ACKNOWLEDGEMENT

Motivation comes by taking action. The action taken has always played a key role for success.

I express my sincere thanks to Dr. Savitha mam and Stella mam, Ethiraj College for Women provided us the opportunity to learn and explore on food preservation.

I express my deep sense of gratitude to Dr. Shanthi mam, professor and the program coordinator at Krishi Vigyan Kendra. I also thank T.L. Preethi mam, coordinator at NutriGarden.

I also thank the HOD and the Principal mam for allowing us to get the exposure on Fruits and vegetable preservation.

PLACE OF VISIT

We went to Krishi Vigyan Kendra, Tiruvallur for educational field trip on 11th April 2022. KVK is funded by ICAR (Indian Council of Medical Research), functioning under TNAU (Tamil Nadu Agriculture University).

Krishi Vigyan Kendra focus at technology assessment, refinement and demonstration of products to cater to the needs of farming community, extension personnel and other stakeholders in the district. They are organizing frontline demonstration to establish production potential of various crops on the farmer's field. Training of farmer's to update the knowledge and skill in modern agricultural technology.

KVK support the initiatives of public, private and voluntary sector and they work towards improving the agricultural economy of the district. They increase the self employment opportunities among the rural communities. They produce and supply good quality seeds and plant materials, livestock, poultry, fisheries, and various bio- products to the MSME's. Newly released crop varieties, implements and technologies released by the university to farmer by conducting OFT's (on-farm testing) and FLD's (frontline demonstration) and imparting training to farming community. They serve as a bridge between the university and the farming community.





OBSERVATION:

A) NutriGarden visit

T.L. Preethi mam, coordinator for NutriGarden explained us about the different types of plants that are harvested and which posses high nutritive value.

NutriGarden indicates the garden of Nutri-rich plants.

Mam let us know about the different types of seeds and crops that were planted. They are doing organic farming without the usage of chemical fertilizers.

Preethi mam took us on a tour of NutriGarden, showed us all the different types of unknown plants, which had great nutritive value.



Mam introduced us to a new plant called as "Thavasi keerai" can be consumed as raw after washing, very good for health.

Some of the plants that we saw were – West Indian Cherry (rich in Vitamin C), Papaya, Custard apple, Banana, Karonda, Pomegranate etc.,

Also, we saw white pumpkin, bottle guard, ladies finger plants, figs plant, how mustard emerged from plant. It was nice to see the development of these plants from the root stage itself.

Mam explained us about different types of plant, methods of sowing seeds and irrigation and informed us all the necessary details regarding gardening.

Encouraged us to do terrace gardening, informed us about the importance if gardening, maintenance and watering plants regularly according to the needs.

















B) Food Preservation

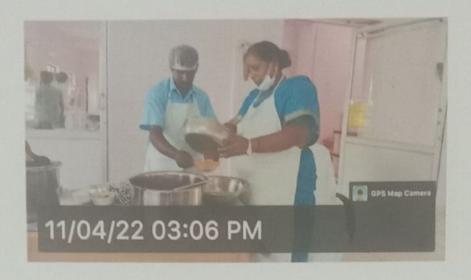
Dr. Shanthi mam, explained us about Fruits and vegetables preservation in detail. She demonstrated us on the making of jam, jelly, pickle, and squash.

They greeted us with a welcome snack, gave us black chenna sundal, a nutritious snack and tea.

In the beginning, mam demonstrated about procedure of jam making, it was a mixed fruit jam. Fruits added were papaya, guava, grapes and banana. Mostly all fruit jams contain papaya because if it's high pulp and high pectin content. It was then transferred hot into bowls without air spaces as it may lead to contamination.



Secondly, mam made jelly with guava extract. She boiled guava in water so that the seeds of guava pop-out automatically and the extract was measured and filtered and further process of adding sugar, citric acid was done and transferred hot into bowls to let the jelly extract settle.



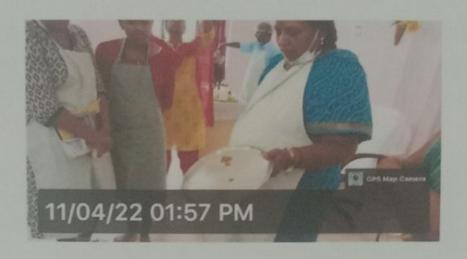
Third, mam made squash. By boiling water, adding sugar and citric acid and after cooling added the fruit juice to it.

Fourth, mam made pickle with tomato. Tomato (Bangalore tomato or Nattu thakkali) should be used.

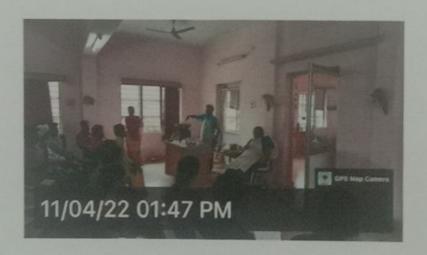
She took ripened tomato, cut into pieces and mixed turmeric and salt, left it for the osmosis to take place so there is a control on the water activity so that the bacteria destroys. Then took it to the stove and did the further process.

Mam made all this live in front of us and showed all the steps to us, the consistency level and made us understand clearly. She also volunteered students from our class while making these products.





Along with us, the farmer's were also present in the class and learnt all these procedures. As KVK is responsible to serve the farming community by teaching them all the new technologies and these preservative methods, so that they can create more self employment workers.



We had lunch there, which was provided by KVK.

It was a nutritious and a balanced meal. After lunch they gave us lemon ginger juice, as it's good for digestion and a perfect hydration drink for summer.

Shanthi mam explained us about all the necessary details related to fruits and vegetables preservation, discussed how to retain all the nutrients especially the vitamins and minerals during preservation.



We have learned about the different methods of preservation and informed us about the amount of loss of nutrients by adding more preservatives.

Mam made all these products naturally by adding minimal amount of colour and essence for taste.

Mam shared her experience in the field and taught us the tips and methods that take place in preserving foods.

Before leaving, we tasted all the products (Jam, Jelly, Squash and Pickle). All the products were delicious!!

INTRODUCTION

Fruits are rich source of water, carbohydrates, vitamins, minerals and dietary fiber which constitutes an important part of our daily diet. The fruits are highly perishable and has been estimated that 20-30% is lost due to spoilage. The principle cause of spoilage are the growth of spoilage micro organisms, bio-chemical changes (enzymes), chemical reactions, structural changes and conditions of storage of fruits.

To prevent the post harvest losses preservation methods had to be adopted. Also the increasing urbanization, purchasing power, changing food habits, there is an increasing demand for preserved fruit products in the domestic market. Hence the principles of various preservation methods are outlined briefly,

1. Preservation by Salt

Salt at a concentration of 18 to 20% is sufficient to preserve fruit and vegetable product and inhibits the growth of micro-organisms.

Eg: Pickling of vegetables, brine solution for canning.

2. Preparation by Sugar

Sugar containing 66% or more sugar do not spoil the fruit products. Sugar acts as preservative by osmosis and prevents the growth of micro organism.

3. Preservation by chemicals

Preservative in the form of chemicals will kill (or) inhibit the growth of microorganisms. Few preservatives are permitted in prescribed low level.

- a) Sodium Benzoate
- b) Potassium metabisulphate.

4. Preservation by drying and dehydration

Moisture content of fruit and vegetables can be removed and the spoilage microbes are killed by the sun drying or by mechanical drying.

Eg: Dried fruits and vegetables

Fruit powders

5. Preservation of fermentation

Foods are preserved by alcohol (or) organic acids formed by microbial action and also by spices with oil.

Eg: Alcoholic beverage

Vinegar

Fermented pickles

6. Preservation by cooling and freezing

Reduces the rate of bio-chemical activity of microbes and preserves the fruit and vegetables. Refrigeration or chilling 0-5° C, Freezing -18 - 40° C

7. Preserve by canning

Canning is the application of heat to the fruit and vegetables in the sugar / brine solutions in the specified cans, preserves the product, inhibits the microbes and improves the shelf life.

MIXED FRUIT JAM

Ingredients:

Fruit pulp

1 kg

Sugar

3/4 kg

Citric acid - 1 tsp

Essence (strawberry or

Mixed fruit essence) - 1 tsp Colour (Rasberry red) - 1/4 tsp

(Fruits: Grapes, Guava, Papaya, Mango, Banana, Apple etc.)
Method:

- · Select the fruits and wash it thoroughly.
- · Remove the unwanted portions.
- Grind it in mixie to make it as a pulp.
- · Measure it in a vessel and boil it.
- · Add sugar & citric acid and stir well.
- When the pulp becomes thick consistency, slow down the fire, add colour, essence and preservative.
- Mix well and switch off the stove, bottle it in a sterilized condition.

GRAPE CRUSH

Ingredients:

Grape juice - 1 litre
Sugar - 2 kg
Water - 1 litre
Citric acid - 4 tsp
Grape essence - 3 tsp
Sodium benzoate - 1 ½ tsp

Method:

- Select the fruit and wash it thoroughly.
- · Remove the unwanted-portions
- Without adding water, cook the fruit
- · Crush it nicely
- Filter the juice
- · Measure the juice and keep it aside
- Boil water, sugar, citric acid and Tilter it and cool it.
- Mix with the juice, then add flavors and preservative and bottle it in a sterilized condition.

JELLY

Ingredients:

Guava - 6 nos
Sugar - 250 gms
Citric acid - 1 tsp
Method:

" Select the guava.

- Clean and remove the unwanted portion.
- . Cut the guava and boil.
- " Drain and measure the water.
- In one portion of guava water, add ¼th of sugar and 1 teaspoon citric acid.
- Mix all together and boil.

When the jetty becomes in sheet consistency, remove from the fire and bottle.

LEMON GINGER SYRUP

Ingredients:

Lemon juice - 1 litre
Grated ginger - 250 gm
Water - 1 litre
Sugar - 2.5 kg
Lemon essence - 2 tsp

KMS - 3.2 gm(3.4 tsp)

Method:

- Mix the grated ginger in the lemon juice for an hour.
- · For making the syrup, boil the water and sugar and cool it.
- · Filter the juice and mix with the syrup.
- · Add essence and KMS finally .Bottle it in a sterifized condition.

LEMON- BARLEY BEVERAGE

Ingredients:

 Lemon juice
 1 kg

 Barley powder
 40 gm

 Water
 1 litre

 Sugar
 450 gm

 KMS
 2.5 gm

Method:

- Extract the lemon juice through juice extractor and filter through muslin cloth.
- · Barley powder is well dissolved in water and boile it for 3 minutes.
- · Add the sugar to the barley water and warm it.
- · Filter the contents and cool it.
- Extracted lime juice is added to the prepared barley water along with preservative.
- The lime barley beverage is stored in well sterifized bottle.

PAPAYA - MANGO SQUASH

Ingredients:

Рарауа рµІр - ½ kg

Mango pulp - ½ kg

Sugar - 1.80 kg

Citric acid - 25 gm

Water - Hit

Potassium meta bi sulphate- 2.5 KMS / fitre of squash

Method:

- Wash and peel ripe papaya.
- Scoop out to flesh and pulp it
- Peel the riped mango.
- Scoop out the flesh and pulp it.
- Blend the pulp by mixie.
- Mix sugar, water and citric acid, bring it to boil and filter.
- Cool the sugar syrup.
- Mix the sugar syrup with blended mango- papaya pulp.
- Bottle it and store it in cool place.

ONION HOT CHUTNEY

Ingredients:

Onion 1 kg Garlic 50 gm Ginger 1 piece Tamarind 100 gm Salt 100 gm Turmeric powder 5 gm -Chilli powder 75 gm Mustard powder 5 tsp Fenugreek powder 2 tsp Refined (or) gingerly oil 250 gm Asafoetida for taste Vinegar 6 tsp Sodium Benzoyate 1/4 tsp

Method:

- · Peel and chop the onion.
- Fry the onion and add salt.
- When the onion becomes transparency, add tamarind paste. Cook well.
- When the oil leaves the side of the pan (or) oil comes out of the onion, add the
- Finally add the preservative and bottle it in a sterilized condition.

MINT CHUTNEY

Ingredients:

2 small bundles Mint

Tamarind : 50 g

Black gram : 50 g

Red gram : 50 g

Red chilli : 10 nos

Cumin seeds : 3 g

Fenugreek : 5 g

Coriander seeds : 50 g

Salt : to taste

Gingerly oil : 250 g

Method:

- Roast all the grams and chillies in small quantity of oil
- Fry the cumin seeds, fenugreek seeds, coriander seeds and mint separately
- · Grind the fried mint and tamarind.
- · Add all the grams, coriander seeds and salt
- · The mixture is seasoned with gingely oil

TOMATO PICKLE

Ingredients:

Tomato 1 kg Tamarind 250 gm Chilli powder 80 gm Mustard powder 30 gm Fenugreek powder 10 gm Turmeric powder 10 gm Gingely oil 250 gm 100 gm Salt Sodium Benzoate 1/4 tsp

Method: -

- Select and wash the Tomatoes.
- Cut the fruit into small pieces.
- Season the tomato pieces with oil and add salt
- When the tomato pieces become soft, add the tamarind paste.
- When the oil leaves the sides of the pan (or) oil comes out from the cooked tomato pieces.
- Add the spices and preservative and bottle it in a sterilized condition.

GARLIC PICKLE

Ingredients:

Garlic 1 kg Salt 125 gm Chilli powder 75 gm Jaggery 100 gm Cumin powder 3 tsp Turmeric powder 1 tsp Tamarind 1/4 kg Mustard powder 2 tsp Asafoetida 2 tsp Fenugreek powder 2 tsp Gingely oil 500 ml

Method:

- · Cook the peeled garlic with turmeric powder
- · Drain the water
- · Fry the cooked garlic in a shallow pan.
- Add tamarind paste and salt.
- When the oil comes out of the garlic, add the spices and bottle it in a sterilized condition.

MIXED VEGETABLE PICKLE

Ingredients:

Vegetables - 1 kg

(Drum stick, green chilli, peas, clustered beans, raw mango, lemon, knolkhol)

Chilli powder 75 gm Roasted mustard powder 30 gm Roasted fenugreek powder 15 gm Turmeric powder 15 gm Salt 150 gm Lemon 5 nos Tamarind 250 gm Asafoctida 1 tsp 750 gm Gingely oil Vinegar 6 tsp

Method:

- · Wash and clean the vegetables.
- Cut the vegetables evenly.
- Blanch the vegetables.
- Mix the turmeric powder, salt and lemon juice.
- Season the vegetables in the pan, and then add the tamarind paste.
- Finally add the spices, vinegar and preservative and bottle it in a sterilized condition.

MANGO PICKLE IN OIL (AVAKKAI)

Ingredients:

Mango - 50 nos Chilli powder - 1 kg

Mustard powder		1 kg
Fenugreck	-	14 kg
Gingely oil	-	1 kg
Garlie		1/4 kg
Cumin seeds	-	50 gm
Salt		1 kg
11.11		

Method

- Wash the green mangoes and wipe it in clean cloth.
- Cut the mangoes into four halves.
- Sun dry the mustard for 10-15 days and powder it.
- Dry roast the fenugreek and cumin seeds separately in a hot pan.
- Thoroughly mix the redchilli powder, mustard powder, salt, fenugreek powder and cumin powder.
- Separate the mangoes into equal parts.
- Dip the mangoes into masala mix and place it porcelains jars. In the same pattern dip the garlic (or) whole bengal gram into chilli powder mix and place it in the jar;
- Mix thoroughly and keep it under sun rays. The procedure is followed for 10 days.
- Pickles were stored in porcelain jars (or) sterilized wide mouthed bottles.
- Close the lid and keep it air tight.
- Pickles can be stored and used for long duration period.

LEMON PICKLE

Ingredients:

Lemon ' : 10 nos

Turmeric powder : 3 g

Salt : to taste

Mustard powder : 10 g

Cumin seed powder : 10 g

Chilli powder : 75 g

Method:

- Cut the fruits in to small pieces add salt and turmeric powder
- Keep it inside for 3-5 days
- · Dry it for one day

- Season the powdered mustard, fenugreek, cumin seeds with oil and keep it for cool
- · Add the cooled mixture in to the pickle and mix thoroughly
- · Pack it in the container.

GARLIC PICKLE

Ingredients:

Garlic - 1 kg

Salt - 125 gm

Coriander powder - 30 gm

Chilli powder - 12.5 gm

Jaggery - 100 gm

Turmeric powder - I tbsp

Lemon juice/Tamarind - 200 ml

Cumin powder - 3 tbsp

Musterd powder - 2 tbsp

Fenugreek powder - 2 tbsp

Gingely oil - 500 ml

Asafetida - 2 thsp

Method:

- Peel gartic
- · Heat the kadai
- · Add oil and fry gartic
- · Add all the spicy powders
- Mix lemon juice/ tamarind paste
- Then add Jaggery and fenugreek powder.

AMLA PICKLE

Ingredients:

Amla pieces - Ikg

Turmeric powder - 10 gm Chili powder - 40 gm

Fenugreek - 10 gm

Azofotida - 10 gm

Salt - 40 gm

Gingely oil - 350 ml

Mustard - 1 tsp

Method

- Wash and steam the selected amla
- · Remove the seeds
- · Fry in pan with oil and salt
- Added the ingredients with constant mixing
- Added the hot oil and mixed well
- Stored in sterilized containers

PAPAYA PICKLE

Ingredients:

Peeled papaya pieces - 1 kg

Salt - 100 gm

Red chilli powder - 10 gm

Cumin, black pepper (powdered) each 10 g

Citric acid - 10 gm

Mustard powder - 5 gm

Asafoetida - As required

Fenugreek powder - / 5 gm

FLOW CHART FOR PROCESSING OF PAPAYA PICKLE

(Mature, green papaya)

Washing Pecling Removal of seeds Cutting into pieces Boiling (to soften) Removal of pieces from boiling water (or) steaming to papaya cut pieces Mixing with salt Drying in shade for few minutes Mixing spices Addition of citric acid Filling in jars Keeping for a week

Storage (If needed seasoned oil is poured on pickles)

TOMATO KETCHUP

Ingredients:		
Tomato juice	:	2.5 kg
Sugar	:	150 g
Salt	:	25 g
Onion (chopped)	:	30 g
Garlic (chopped)	:	3 g
Clove (heads removed)		1.5 g
Cinnamon		1.5 g
Cardamom	3	0.5 g
Black pepper		0.5 g
Cumin		0.5 g
Red chilli powder		1.0 g
Vinegar	2	125 (or)
Glacial acetic acid		5 ml
Sodium benzoate		1.0 g

Method:

0

- · Weigh all the ingredients listed
- · At first 1/3 of the sugar to the juice and start boiling
- · Place the spices in a muslin cloth bag and tie loosely
- Immerse it in the tomato juice
- Continue cooking till the juice volume is reduced to 1/3 of the original volume
- Remove the spice bag and squeeze to get spice extract
- Stop heating, add vinegar, salt and remaining sugar
- Mix well and heat again to bring it to boiling point and then stop
- Dissolve sodium benzoate (preservative) in a little cooked sauce.
- Add it to the product and mix thoroughly
- Fill that product into the sterilized narrow mouthed bottles up to the brim and seal it air tight using crown corks

CONCLUSION:

It was a very good experience for us. We got great insights from Krishi Vigyan Kendra teachers.

At NutriGarden, came to know about the different types of plants and their nutritive value.

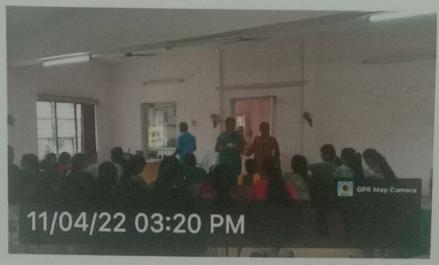
In food preservation, we got to know about the procedure for preparing Jam, Jelly, Squash and Pickle.

Mam also told detailed information on preservation of food especially fruits and vegetables.

In food preservation mam ensured that we understood clearly and we gained confidence in making these products at home.

We gained knowledge and skill about NutriGarden - Nutrient rich plants and food preservation.

Had wonderful time in exploring and learning new skills and information.



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