

**Jagannath Kishore College Purulia**  
**Department of Botany**

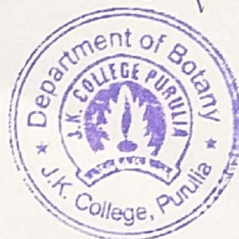
The following Field Report of the Department of Microbiology was submitted to IQAC for its records. The trip was conducted in partial fulfilment of the 3 year Botany (Honours) syllabus of Sidho-Kanho-Birsha University Purulia.

**Paper No.:** XI

**Nature:** Practical (Long Excursion to a Specialized Phytogeographical Region of India)

**Total Marks:** 10

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**D**ARJEELING in Himalaya is situated between the 87°59'-88°53' E and 28°31'-27°13'N in the Eastern Himalaya phytogeographic region of India. It is a frontier district running up between Nepal and Bhutan, and stretching from the plains of Bengal in the south to Sikkim in the north. It is bordered by Bhutan in the east and Nepal in the west. The three hill subdivision of Darjeeling district, Kalimpong, Kurseong and Darjeeling sadar consisting of eight developmental blocks and occupying an area of 2417 km<sup>2</sup> comprise the Darjeeling Himalaya.

The altitudinal range of this hilly regions varies from 130 to 3660 m. Due to their great variation, a wide array of climate zones are available, which favour the luxuriant growth of diversified and rich vegetation. This region is also the abode of many endemic elements and a number of species which have become rare, threatened or endangered. People living in villages and farflung areas depend completely on forest resources for maintaining their day-to-day needs like medicine, food, fuel and household articles.

The major ethnic communities of Darjeeling hills whose descendants continue to live in remote areas are Lepcha, Bhutia and Nepalese. Each of these groups has its own distinct form of worship, culture, language and tradition. All of them are exceedingly generous, light-hearted and law-abiding people bonded together by Nepali language, which is the medium of communication among them. Traditionally, the chief occupation of the people of Darjeeling had been agriculture, agro-forestry, horticulture, animal husbandry, etc. Agriculture practice in these hills are mostly subsistence agriculture, which is characterized by low input, low risk and low yield. The geometric progression in human population has been exerting pressure on traditional practice and leading to the fragmentation of land-holding size. At present, only 13% of the total land is utilized for cropping, which is low compared



**Fig:- Darjeeling**

to other zones. Utilization of land for tea plantation and timber extraction has changed the traditional practices and people have turned to various secondary occupation as tea leaf pluckers, labourers, manson, carpenters, etc.

Also, too much reliance on tourism has forced the people of this region to a marginal role of commission agents, menials, cooks, drivers, etc. The result of all these factors has been devastating for the people of Darjeeling hills. They have been pushed to a marginal existence, while the wealth generates here has been siphoned-off to the plains or translated into consolidation of power in the hands of the government. Thus one of the richest regions of the world in terms of natural resources.

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The directorate of Cinchona and other medicinal plants situated in Mungpoo, Darjeeling district has been doing commercial cultivation of medicinal and aromatic plants like Cinchona, ipecac, Dioscorea, Cintronella, Rauwolfia etc. The area under cultivation of medicinal plants by this Directorate is approximately 6000 acres. Enrichment of the active plantation trials of exotic medicinal and aromatic plants like Vanilla, Pogonatum and Stevia are also being carried out by the Directorate. Efforts are also made in private scale in the cultivation of medicinal plants, especially *Taxus baccata*, for rural upliftment in the Kurseong subdivision, Darjeeling district in 300 acres of the area. Various private institutions are working in the field of conservation of important medicinal plants and alleviation of rural poverty by domestication and marketing of medicinal plants. They have already domesticated plants like *Swertia chirata*, *Piper longum*, *Gloriosa superba*, *Rubiaceae cordifolia*, etc.

During our short stay of some 4-5 days, we made a tour for botanical study from different surroundings of the locality. A short description of the plants observed and examined with the environment is given below –

Plant community is a product of edaphic and climatic factors which are again dependent upon the various conditions. The most potential and decisive factor is the water content of the soil which modifies the edaphic condition. Acidity, physical character and coldness of soil, soluble mineral, salt etc. no doubt play an important part in this direction.

Ecological classes into which vegetation of Darjeeling may be divided are mainly xerophytes, mesophytes. Of the xerophytes some are psychrophytes and others are lithophytes. Plants growing in cold soil are called psychrophytes and those growing on rock and stones are called lithophytes. Mesophytes are those which grow on a soil which is neither acid saline nor cold but moderately moist and well ventilated with necessary nutrient salts.

On the contrary, there are some places which are full of loose moist subsoil favouring growth of mesophytes. Therefore both mesophytic and xerophytic plants are found here –

Mesophytes like Oaks, Maples, Birches, Pyrus, Pandanus etc. are found around here, and some xerophytic Conifers like – *Cryptomeria japonica*, *Pinus longifolia*, *Taxus baccata*, some xerophytic Cryptogamic plants like mosses and ferns which are usually epiphytic and abundantly found here.

In November minimum temperature of this place was 7°C and maximum 13°C, whereas min. and max. temperature of Darjeeling was respectively 10°C and 16°C.

I give below some data about Darjeeling which may be useful for the study of the flora of the place.

- **TEMPERATURE :-**

<u>Diurnal</u>	<u>Annual</u>	<u>Average</u>
Min. :- 7°C	Min :- 10°C	13°C
Max.:- 13°C	Max.:- 16°C	13°C

- **RAIN FALL :-**

<u>Diurnal</u>	<u>Annual</u>	<u>Average</u>
Nov. :- 0.8 inches	Max.:- 158.44 inches	126 inches
	Min :- 89.42 inches	

- **MEAN AVERAGE VELOCITY OF WIND PER HOURS :-**

NOV. :-2 km/hrs.

Latitude :-27.036007 N

Longitude :-88.262672 E

• **ALTITUDE OF SOME PLACES :-**

<b><u>PLACES</u></b>	<b><u>ALTITUDE</u></b>
Takdah	About 4000 ft
Tinchuley	About 5,800 ft
Lamahatta	About 5,700 ft
Padmaja Naidu Himalayan zoological Park	About 7,000 ft
Tenzing Rock	About 7,150 ft
Happy Vally Tea Garden	About 6,900 ft
Botanical Garden	About 5,600 ft
Batasia Loop	About 7407 ft
HimaFalls , Bijan bari	About 2,490 ft
Lepchajagat	About 6,956 ft
Jorpokhri	About 7,400 ft
Mane Bhanjyang	About 11,929 ft
Dhotrey	About 8,340 ft
Pashupatinagar	About 7,000 ft
Mirik Lake	About 4,902 ft

• **AIMS AND OBJECTIVE OF BOTANICAL EXCURSION:-**

- The excursion aimed to introduced students to botanical collections, activities and conservation functions.
- Apply knowledge and skills acquired in the lecture laboratory

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- As a training tool for the planning and implementation of direct observation of specimens in their habitat.
  - Explore the possibility of a chance to do ( or collaboration )
  - Strengthen the friendship among student, and between students and lecturers.

## ● **HERBARIUM:-**

Herbarium is a place of depository of plant specimen in dry condition. According H.M Lawrence (1937) “a herbarium is a collection of plant specimen that usually have been dried and pressed , are arranged in sequence of an accepted classification and are available for reference or other scientific study .

In some cases viz. succulents and the specimen unsuitable for pressing are preserved like formaldehyde solutions 4-5% or in formyl acetic acid .

## ● **IMPORTANCE OF HERBARIUM :-**

- i. Discover or confirm the identity of a plant or determine that it is new to science (taxonomy);
- ii. Document the concepts of the specialists who have studied the specimens in the past (taxonomy);
- iii. Provide locality data for planning field trips (taxonomy, systematics, teaching);
- iv. Provide data for floristic studies (taxonomy);
- v. Serve as a repository of new collections (taxonomy and systematics);
- vi. Provide data for revisions and monographs (systematics);
- vii. Verify Latin plant names (nomenclature);
- viii. Serve as a secure repository for “type” specimens (taxonomy);
- ix. Provide infrastructure for obtaining loans, etc., of research material (taxonomy, systematics);
- x. Facilitate and promote the exchange of new material among institutions (taxonomy).

## ● **IMPORTANT HERBARIA:-**

Lanjow and staffcu (1952, 1964) made an index of world Herbaria – about 850 institution including 50 most important herbaria. The name of some important Herbaria along with acronames (given in bracket) are given bellow-

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**Botanical gardens of world-**

1. Botanic Garden of Padua, Italy (1545)
2. Botanic Garden of Heidelberg, Germany (1595)
3. Royal Botanic Garden, Scotland (1607)
4. Jardim Botânico do Rio de Janeiro, Brazil (1808)
5. Royal Botanic Garden, London (1841)
6. Missouri Botanic Garden, U.S.A. (1859)

**Botanical Gardens of India-**

1. Indian botanic Garden, Sibpur, Kolkata (1787)
2. The Mysore State Botanic Garden, Bangalore, Karnataka (1856)
3. Lloyd Botanic Garden, Darjeeling, W.B (1878)
4. National Botanic Garden, Lucknow (1946)

● **ITINERY :-**

<b>DAY</b>	<b>DATE</b>	<b>PLACE</b>
<b>DAY-1</b>	14 Nov, 2018	Purulia to Burdwan and then towards NJP
<b>DAY-2</b>	15 Nov, 2018	NJP to darjeeling
<b>DAY-3</b>	16 Nov, 2018	Takdah, Tinchuley, Lamahata
<b>DAY-4</b>	17 Nov, 2018	Padmaja Naidu Hymalayanazoolyical park, Tenzing rock, Happy Valley Tea Garden
<b>DAY-5</b>	18 Nov, 2018	Batasia loop, BijanbariHima falls, Lapchajagat, Jorpokhri, Manebhanjyang, Dhotrey
<b>DAY-6</b>	19 Nov, 2018	Botanical Garden, Mirik, Pashupatinagar, Nepal

## • DETAILED ITINERY :-

### Day 1

We started our journey from Purulia in early winter on 14 Nov. 2018. We travelled by the local train (Bokaro-Asansol Memu) from Purulia to Burdwan. Our train left at 2:00 pm. from Purulia station and we reached Burdwan at 7:00 pm. Then we went to New Jalpaiguri through Uttar Banga Express. The train was left from Burdwan station at 9:35 pm.

### Day 2

We reached the NJP station at 7:00 am. Then we went to Darjeeling from NJP through Tata Sumo. The distance about from NJP to Darjeeling was 38 kms. Finally, we reached Darjeeling on 15 Nov.2018 at 3:00 pm.

### Day 3

#### 1. Takdah:

Morning visit to Takdah, it is small village about 28 km. from Darjeeling and located at altitude of 400 ft. It once used to be a military cantonment during British day of early 1900s when several British Banglows came up here for of the officers. Some of them still exsist. We will visit several attractions at Takdah. The first one of the wide range of orchids, I can also see the Himalayan orchid here. Cactus house, several herbs, medicinal plants are also present here.



**Fig:- Takdah**



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## **2. Tinchuley:**

Tinchuley is a small hamlet which is about 3 km. from Takdah out of several attractions here. Tinchuley is famous for two things, wonderful views of the snow peak of Kanchanjunga and orange orchids.

However we did not stop at Tinchuley. There is a new road which has been built from Tinchuley which passes through Peshoke Tea Gardens. This is a wonderful drive as we pass through vast stretches of gardens in all directions on the mountain slope. We stop at the Peshoke Tea Garden view point. The road winds all the way down mostly through the tea gardens and meets Peshoke road below.



**Fig: Tinchuley**

## **3. Lamahatta:**

On Peshoke road we will turn left towards Lamahatta, a relatively new Eco Tourism place which has come up and offers simple homestays for tourists. I will see prominent signs on the road as we approach Lamahatta. It will take over an hour from Tinchuley to reach Lamahatta. Lamahatta is another place for the lovely view of Kanchanjunga. However one of the key attractions here is the landscape Road side Garden. This is a sprawling manicured garden on the road side with many flowering plantations, hedges, pathways, seating, gazebo for prayers or meditation and even a watch tower to take a panoramic view. At the backdrop of the garden is a forest of dhupi and Pine trees. There is a trail through the forest that leads to a lake. Take some time out to roam around in the garden and enjoy the flora and the views. Lots of Buddhist Prayer flags are fluttering on one side of the garden.



**Fig:-Lamahatta**

## Day-4

### 1. Padmaja Naidu Himalayan Zoological Park:

Morning visit to Parmaja Naidu Himalayan Zoological park, & is also called Darjeeling Zoo. It is a 65.56 acre zoo in the two of Darjeeling. The zoo was opened in 1958 & located at altitude of 7000 ft. or 2134 meter. It is the largest high altitude zoo in India.

The zoo was a great place to visit, such amazingly is the place maintained with such a variety of animals such as Siberian tiger, red panda, Tiberian wolf, Snow Leopard etc. It is really worthwhile to spend time in here. The animals are distinctly organized & placed according to their types e.g-herbivore, birds, reptiles etc. At the all round of the zoo we observed manly types of plant such as Magnolia, Pine, Tooni, Dud helo, Wild Orchid etc. The place is clean, & is full of greens that is sure to soothe the eyes.



Fig:- .Padmaja Naidu Himalayan Zooligal Park

There is also a museum which is is another attraction inside the zoo. Walking can cause a bit tiredness since the area is vast, but it is alright when one is visiting such a beautiful place.

### 2. Himalayan Mountaieering Institute:

At the top of Birch Hill (locally known as jawaiJar Parbat), we will find the world famous Himalay,Ul Mountaineering Institute (HMI). jawaharlal Nehru, the first Prime Minister of India, laid the institute's foundation stone in November 1954, and the legendary Tenzing Norgay Sherpa was **HMI** 's first Director of field Timing. Tenzing Norgay's grave is located on the hill's summit, making a visit to the institute and its surroundings a pilgrimage for all climbing enthusiasts.

The Institute is comprised of a museum 011 mountain lore, a well-equipped school for mountaineers, a hostel for students and Swiss-style houses for the Sherpa trainers. The mountaineering museum itself boasts a collection of historic climbing equipment, specimens of Himalayan flora and fauna, and a relief model of the Himalayas showing the principal peaks. A separate Everest Museum tells the story of expeditions to the world's highest peak.



Fig:-Himalayan Mountaieering Institute

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## **2. Tenzing Rock:**

Tenzing Rock is a popular tourist spot . It is one of the only natural rock climbing sites in Darjeeling. This rock is situated just next to the road where people can climb the rock with help of only a rope around peoples waist. There are thick ropes dangling from the top of the rock, which are to be taken hold of by a person while climbing the rock surface while using the various footholds situated on the rock surface Professional guides are there to help us. This gigantic rock is named after the mountaineer Tenzing Norgay who climbed the Mount Everest in 1953. People can feel the thrill and adventure of rock climbing. Not tough but not so easy also.



**Fig:- Tenzing Rock**

## **3. Happy Valley Tea Estate:-**

Happy Valley Tea Estate is a tea garden in Darjeeling established in 1854, it is Darjeeling's second oldest tea estate. Spread over 177 hectares (440 acres), it is situated at a height of 2,100 meters (6,900 ft) above sea level, 3 kilometers (1.9 mi) north of Darjeeling, and employs more than 1500 people .We can find tea plantation every part of Darjeeling. In garden a belt lush green greenery can found feel fresh nenergized our self. A temporary tea market also find and we buy tea leaf from here.



**Fig:- Happy Valley Tea Estate**

## Day-5

### 1. Batasia Loop:-

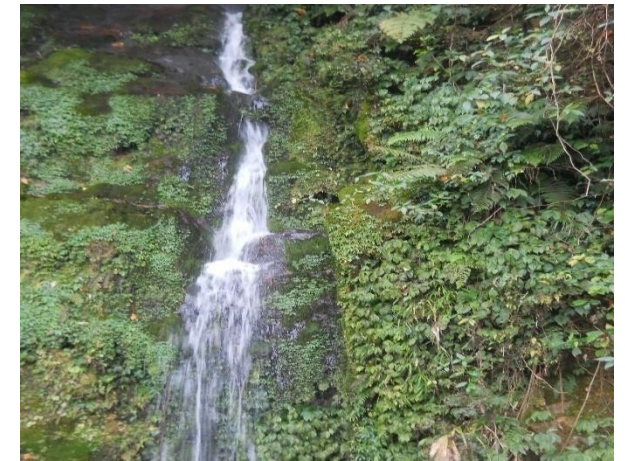
The heritage train makes a 360 degree turn at this gigantic railway loop almost 5 kilometres from town. Built to help the steam train negotiate the steep terrain, Batasia Loop is strategically located to offer a panoramic view of the mountains beyond. Within the loop lies a war memorial that commemorates the brave souls who sacrificed their lives in India's various wars since 1947. Adjacent to the memorial is a local market where visitors can buy purses, bags and other decorative items.



**Fig:-Batasia Loop**

### 2. Bijanbari, Hima falls:-

Bijanbari is a quite a popular town lying in the eastern part of Darjeeling. It is a town with rich and varied agricultural produce which is its specialty. This beautiful and scenic town is also popular due to its proximity to Sandakphu. Located at a distance of 30 kilometers from Darjeeling, Bijanbari sits at an elevation of 2,500 feet. The Chota Rangeet flows through Bijanbari making it fertile which also helps the extensive tea plantations in this sleepy town. The route through which we reach Bijanbari through Ghoom is full of waterfalls, swiftly flowing mountain streams and tea gardens. Hima waterfall was very nice. We saw the waterfall that all our eyes were so for a while. The Hima Falls which is a popular picnic spot is nearby. Here we observed several plants such as pteridophyte, Bryophyte, Angiosperm etc. Visitors cross the bridge over the stream and enjoy themselves in the lap of nature.



**Fig:-Bijanbari, Hima falls**

### **3.Lepchajagat:-**

Lepchajagat, meaning the place for Lepchas is a beautiful hill station within the forest. It is located near Ghoom. From Ghoom it takes around 45 minutes to reach this place. It is all about dense forested area full of pines, oaks and rhododendrons. And all that is combined with magnificent views of sunrise on Mt Kanchenjunga .kanchenjunga Peaks, wonderful birds and serene tranquility. But we could not see Sunrise on mountain Kanchenjunga because the sky was cloudy at that time.



**Fig:- Lepchajagat**

### **4.Jorpokhri:-**

Jorpokhri is a tiny place on a hilltop and located in Darjeeling district. From Darjeeling town, it is about 19kms and can be reached from the road to Mirik. Located at an altitude of 7,400 ft, the main feature of Jorpokhi is its twin lakes after which the place has been named. 'Jor' means two and 'pokhri' stands for a lake or water tank. The boundary of natural lake has been concretized with seating arrangements so that the visitors can enjoy the water area. There is a huge model of a snake and a fountain in the middle of the tank. We often see also a large number of white swans swimming in the waters or strolling around in the nearby area. Jorpokhri, however is not only about the lakes. There is a lovely forest around full of dhupi and pines. Just walk around and feel the lovely Himalayan serenity. Jorpokhri is part of Senchal forest and is a nature reserve.



**Fig:- Jorpokhri**

## **5. Manebhanjyang:-**

Manebhanjan is a tiny hamlet that is located at a distance of approximately 26 km from Darjeeling. It is located on the border shared by India with Nepal and it is nestled at a height of 7054 feet. It is also well known as the starting point for the well-known trek to Sandakphu as well as Singalila National Park. The major source of income for people in this small and cozy village is tourism. In fact, Manebhanjan is one place where we will still get to see

Land Rovers in use. The vehicles were in use during the British period and are ideal when it comes to climbing the gravel-filled roads that dot the trail to Sandakphu. There are only a few of them remaining now. The main point for which we will be attracted to this hill station is its status as the starting point for the Sandakphu trek. The village also has a small playground where football tournaments are organized in case of special occasions. There is also a rather colorful monastery that is located slightly higher up and is located in a scenic setting – among pine trees. When we are coming to Manebhanjyang from Darjeeling we will pass through Jorpokhri.



**Fig:-Manebhanjyang**

## **6. Dhotrey:-**

Dhotrey also spelled Dhotrey is a scenically blessed sleepy settlement at an altitude of 8340ft. situated within the buffer zone of Singalila National Park. This place is only 11km. from Darjeeling. In the early days Forest Department used timber log with a 5km. long ropeway. Through we can not find any trace of that ropeway now. Amidst Singalila National Park this magnificent trail will soothe us with its scenic beauty and chirping song of birds. Breathtaking view of majestic Kanchenjunga is one of the best features of Dhotrey. Dhotrey has a medicinal plant conservation site in it. Which was named Dhotrey Medicinal Plant Conservation Area. We went there to observe many different medicinal plants which had a great medicinal value. A list of medicinal plants which we observed are given below-



**Fig:-Dhotrey**

<b><u>Plant name</u></b>	<b><u>Family</u></b>	<b><u>Local name</u></b>	<b><u>Part used</u></b>	<b><u>Uses with active principles</u></b>
<i>Aconitum ferox</i>	Ranunculaceae	Bikhumma	Rhizome	Plant is considered bitter tonic and febrifuge, antidiabetic. It is used in malaria and other fevers, abdominal pains, diarrhoea and indigestion particularly for children. Roots contain pseudoaconitine, bikhaconine, indaconitine, bikhaconitine, chasmaconitine, acetyl bikhaconine.
<i>Aconitum heterophyllum</i>	Ranunculaceae	Aatish	Rhizome	Used as bitter tonic and antidote for snakebite. Roots contain alkaloids atidine, hetisine, heterophyllisine, heterophylline, atisine, heterophyllidine and benzoylheteratisine.
<i>Acorus calamus</i>	Araceae	Bojo	Rhizome	Used for the treatment of epilepsy and other mental ailments, intermittent fever, chronic diarrhoea, asthma, cough, sore throat, colic pains and as a brain tonic. Essential oil contains two isomeric substances- $\alpha$ and $\beta$ asarone. Roots yield acoric acid and coline
<i>Adhatoda vasica</i>	Acanthaceae	Basak	Leaves and roots	Fresh leaf paste is given in dysentery, cough, fever, bronchial congestions, gout and muscular sprains. Fresh root paste is applied on abdomen and vagina just minutes before childbirth for easy delivery. Leaves contain very small quantity of an essential oil, a crystalline acid and an alkaloid, vasicine.
<i>Allium wallichii</i>	Liliaceae	Dung-dunge	Whole plant	It is used for the preparation of scented food items, also helps in digestion.
<i>Aloe barbadensis</i>	Liliaceae	Gheukumari	Whole plant	It used as stomachic, tonic, purgative, and anthelmintic. Leaf-juice is put on head in high fever to reduce body temperature. Leaves contain barbaloin, aloe-emodin. Other constituents of plant are aloesin and aloesone.
<i>Artemisia vulgaris</i>	Asteraceae	Titepati	Leaves	It is used to treat nose bleeding, nervous and spasmodic affections, asthma and diseases of the brain. Chief constituents of its essential oil are camphor, 1:8-cineole and borneol along with a little quantity of $\beta$ -tujone, $\beta$ -pinene.

<i>Astilberi vularis</i>	Saxifragaceae	BuroOkhoti	Root	Used against stomach ailments. Powdered root is taken with curd to cure jaundice. It is also taken with honey to control excessive bleeding in ladies.
<i>Berginia ciliata</i>	Saxifragaceae	Pakhanbed	Rhizome and root	Dried rhizome is astringent, given in ulcers, tuberculosis, cough and spleen enlargement. Root paste is applied on burns and cuts. Roots contain (+)Afzelachin, Bergenin and $\beta$ -sitosterol.
<i>Centellaasi atica</i>	Apiaceae	Brahmi	Whole plant	Used to treat leprosy, fever, asthma, bronchitis, and in the preparation of brain tonic. Plant contains brahmoside, brahminoside, brahmic acid, iso-brahmic acid, betulic and various amino acids.
<i>Costuss peciosus</i>	Zingiberaceae	Betlauree	Rhizome and root	Used in gout, jaundice, anaemia, bronchitis, fever, rheumatism; as stimulant, anthelmintic, antiinflammatory.; Rhizome decoction is given in urinary stones. Tubers contain diosgenin, sitosterol, $\beta$ -sitosterol- $\beta$ -D-glucoside, dioscin, gracillin and quinones.
<i>Curcuma aromatica</i>	Zingiberaceae	Fatcheng	Rhizome	It is used as an appetizer, tonic, carminative and applied to bruises and sprains. Rhizome-powder is anthelmintic. Rhizome-oil is useful in the treatment of early stages of cervix cancer. Rhizome essential oil contains l- $\beta$ -curc umenes, d-camphor, d-camphene, p-methoxycinnamic acid.
<i>Curcuma caesia</i>	Zingiberaceae	Kalohaldi	Rhizome	It is stomachic, diuretic, aromatic, stimulant, carminative and used to cure sprain & bruises, cough, asthma, and allergic eruption. Dry rhizomes yield 1.6% essential oil containing 76.6% d-camphor, camphene and bornylene.
<i>Hedychium spicatum</i>	Zingiberaceae	Sara	Rhizome	It is used to treat liver disorders, vomiting, and stomach ailments. Rhizomes contain sitosterol and its glucoside. Essential oil contains cineole, $\gamma$ -terpinene, limonene, $\beta$ -phellanderene and $\beta$ -terpineol.
<i>Kaempferia rotunda</i>	Zingiberaceae	Bhuichampa	Tuber	It is used to cure swellings, fracture, mumps and wounds. Tubers contain crotepoxide and $\beta$ -sitosterol.



<i>Kalanchoe pinnata</i>	Crassulaceae	Patharkuchi	Leaves	Leaves are applied on wounds, bruises, swellings, and insect bites. Leaves contain P-coumeric, ferulic, syringic, caffeic and p-hydrobenzoic acids, $\beta$ -amyrin and sitosterol.
<i>Nardostachysjata mansi</i>	Valerianaceae	Jatamansi	Rhizome	It is used as a substitute for valerian. It is used as a tonic, stimulant, antispasmodic, diuretic, and antifatulent. Oil is good for hair growth. Plant essential oil contains an alcohol, a sesquiterpene ketone (jatamansone), jatamansic acid, etc.
<i>Ocimum basilicum</i>	Lamiaceae	Tulsi	Leaves and seeds	Leaf juice is used against cold & cough. Seeds are used in dysentery, gonorrhoea. Essential oil contains cineole, eugenol, limonene, ocimene, geranial, citronellol, $\alpha$ -terpineol, estragole.

## Day-6

### 1. Botanical Garden:-

During our Botanical excursion, we visited the **Lloyd Botanic Garden** (Latitude: 27.0399, Longitude: 88.2636) situated in the Darjeeling district of West Bengal on 19<sup>th</sup> November, 2018. The Lloyd Botanic Garden was established in the year 1878. This land was donated by Mr. William Lloyd, then resident of Darjeeling. It was established as a branch of Royal Botanic Garden, Calcutta by Dr. T. Anderson, then superintendent of RBC. The garden with an area of 10 acres is situated at an elevation of 6000ft. The land was laid out as a beautiful botanic garden under the guidance of late Sir George King. The indigenous plants in the garden represent more or less the characteristic flora of Sikkim Himalayas. The garden is extremely vivid and vast, and has four



**Fig:-Botanical Garden**

different entry and exit points throughout the area. It is quite rich in terms of vegetation and harbors many indigenous as well as exotic plants of the world. A herbarium, an orchidarium, a conservatory, a succulent house, a cactus house, a herbal garden, a rock garden, and a student garden are distributed within its vast landscape.

## 2. Mirik:-

The Mirik hill is 49km. from Darjeeling & 52km. from Siliguri & located at altitude of 1700meter. It consists of 1.25km. long lake which is fed by perinial streams. The rich forest with Cryptomeria japonica trees covers the sloves on the west. A 3.5km. Zig-Zag foot walk takes us along the lake. A foot bridge confide the garden on the East with woods on the West. About 2km. from Mirik, one can see beautiful Orange Orchids. Cardamom groves can be seen anywhere near the marshy land.



Fig:- Mirik

## 3. Pashupatinagar :-

When we reached near to border at one of the corner road called Simana view point. I was as thrilled as I had never put my foot steps in other country till date. When we reached near the Indian-Nepal border, we straight way went to west Bengal police Pashupati check post, we had shown ID card and did entry in the register on behalf of all of us.

Taxi is allowed only till border and after that one can reached to market by short walk. Note that only Indians and Nepalese are allowed to cross over the border aera.

We started to walk towards shops in pashupati market and they were full of jacket, electronic item, perfume, cosmetics etc. cosmetic and perfume were as to cheap price.



Fig:- Pashupatinagar

At the Orchid centre, Takdah



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**A visit to the Lloyd Botanic Garden,  
Darjeeling**



**At the Orchidarium Lloyd Botanic Garden,  
Darjeeling**