

# CHAPTER-7

## Weather, Climate and Adaptations of Animals to Climate

MODULE-2

SCIENCE CLASS 7<sup>th</sup>

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# CLIMATE AND ADAPTATION

- The ability of an organism to develop certain features which improve the chances of its survival in the environment in which they live, is known as adaptation.
- Animals are adapted to survive in the conditions in which they live.
- In other words, an adaptation is a trait of an organism that has been favoured by natural selection.

# Types of Adaptations

- Adaptations are of three types:
  - (i) Structural adaptations Adaptation of special body parts of an organism that helps it to survive in its natural habitat, e.g. skin colour, shape, body covering.
  - (ii) Behavioural adaptations Adaptation of special ways in a particular organism that helps it to survive in its natural habitat. It usually occurs in response to some external stimuli, e.g. frogs and bear undergoes hibernation or winter sleep during hard winter season.
  - iii) Physiological adaptations Adaptation of body systems presents in an organism that allows it to perform the certain biochemical reaction, e.g. warm-blooded animals are able to keep the constant body temperature.

- Animals that live in a very cold or hot climate must possess special features to protect themselves against extreme cold or heat.
- The features and habits that help an animal to adapt to their surrounding are a result of the process of evolution.
- According to their habitat animals adapt themselves.
- These animals may be grouped as polar region and tropical rainforest animals.

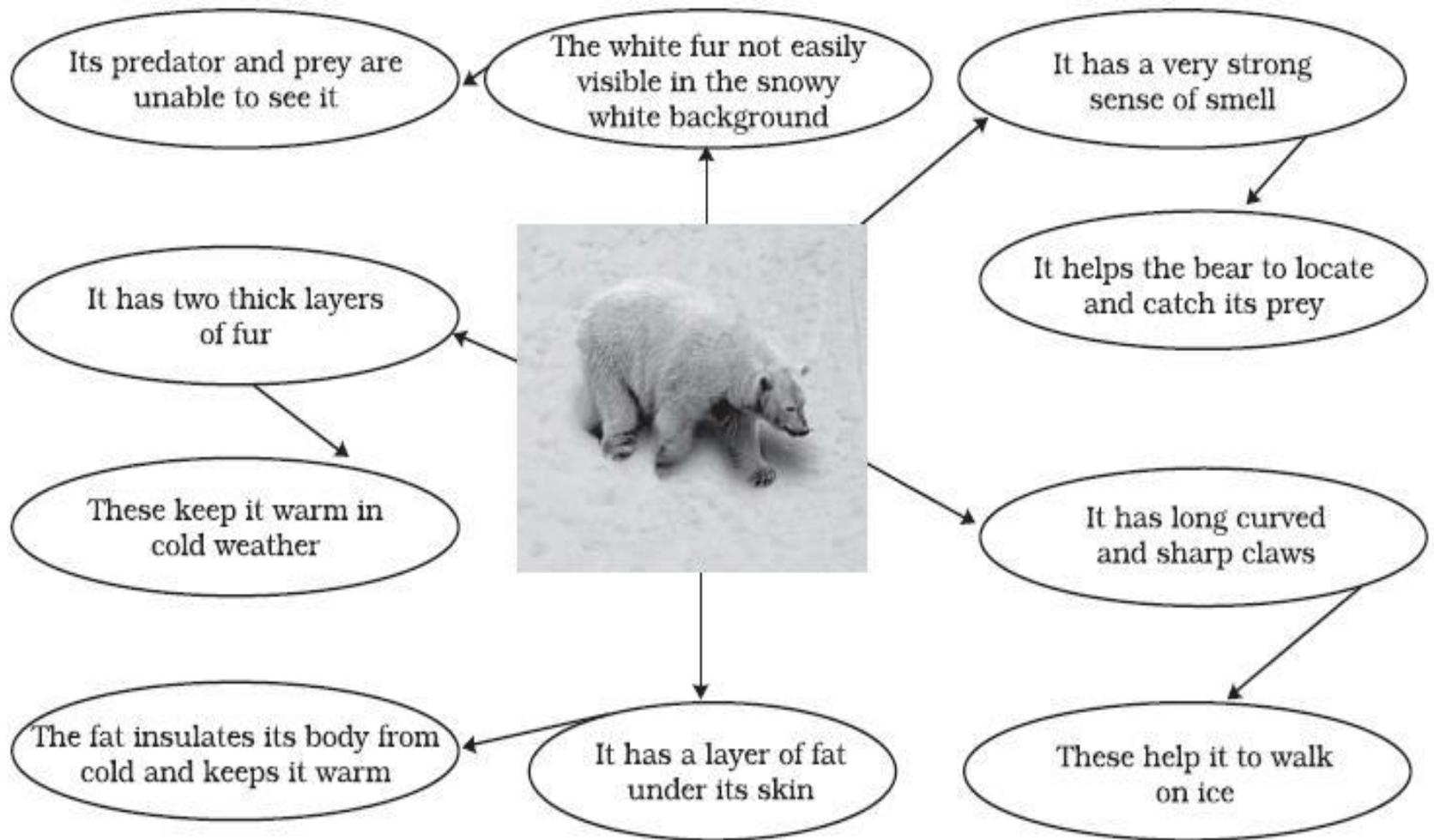
# The Polar Regions

- The polar regions as the name suggest are situated near the poles, i.e. north pole and south pole. The countries that belong to the polar regions are Canada, Greenland, Iceland, Norway, Sweden, Finland, Alaska in USA and Siberian region of Russia.
- Polar regions shows extremely colder climate which is covered with snow and remain cold for most part of the year. In this region, the sun does not set for six months and even does not rise for other six months. The temperature goes down below  $-37^{\circ}\text{C}$ , during winters in polar regions. The ground remains frozen most of the year and water becomes available only during the short summer when snow melts. Mosses and short lived flowering plants grow in these regions.
- Animals living in these regions are adapted in different ways to cope with the conditions of temperature, light and moisture and also according to the availability of food in that region. Polar bears and penguins are the animals that live in polar region. Besides these whales, seals are the other animals are also found in polar regions. Some fishes, foxes, musk oxen, reindeer and birds also live in polar regions.

# Adaptations in Polar Bear

Polar bear is a large and white bear that lives in the north polar region of the earth. The polar bear mainly feeds on fishes and seal and can survive in the extremely cold climate of polar regions due to the following adaptations:

- Their body is covered by a two thick coat of white fur.
- Beneath the fur is a thick coat of fat which insulates the body
- A polar bear is a good swimmer which has wide and large paws.
- It has long curved and sharp claws.
- They have a strong sense of smell.
- The thick layer of fat beneath the skin also stores food in winter when food is scarce. This stored food (fat) also helps the mother polar bear to survive in the winter when they undergo hibernation beneath the snow with their newborn cubs.



**Fig. 7.3** Adaptations of polar bear

# Adaptations in Penguins

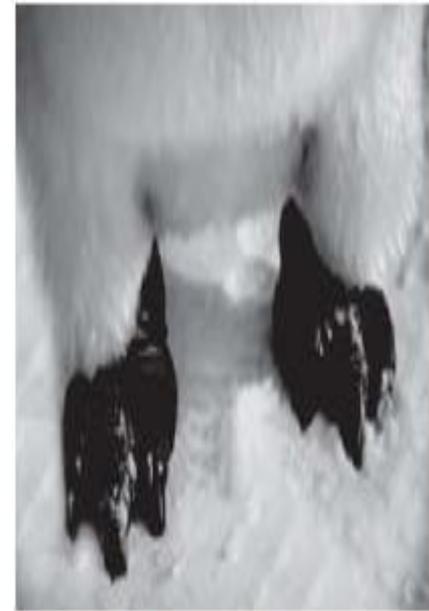
Another well-known animal living in the polar regions is the penguin which can survive due to the following adaptations:

- These are black and white in colour which merges well with the white background of ice and snow.
- They have thick skin and a thick layer of fat below their skin which protects them from extreme cold.
- They possess a streamlined body, flipper-like wings and webbed feet which make it a good swimmer. This adaptation helps penguin to catch fish as prey.
- They live together in large numbers and huddle together to keep themselves warm.



**Fig. 7.4** *Penguins huddled together*

- Like polar bears, penguins are also good swimmers.
- streamlined bodies and their feet have webs
- Other animals living in the polar regions are many types of fishes, musk oxen, reindeers, foxes, seals, whales, and birds.



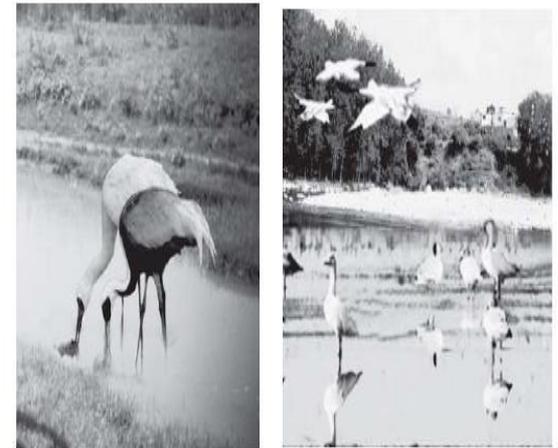
*Fig. 7.5 Feet of penguin*

# Migration

- Migration is the seasonal journey taken by different animals or birds to escape the extreme climatic condition and the search of food, e.g. Siberian cranes migrates towards warmer region in the autumn by travelling several thousands of kilometres.
- They are seen in the Bharatpur, Rajasthan and Sultanpur, Haryana and sometimes in wetland of North-East and other parts of India.
- Migratory birds sometimes travel as much as 15000 km to escape the extreme climatic condition of their habitat.

- These birds fly high where the wind flow is helpful and cold conditions allow them to disperse the heat generated by their flight muscles.
- These birds have a built in sense of direction and know in which direction they have to travel.
- Some birds use landmarks to guide them.
- Some birds are guided by the sun during daytime and by stars during night.
- Some birds can use the magnetic field of the earth to find the direction.

*Fig. 7.6 Migratory birds  
in their habitat/ Migratory  
birds in flight*



# The Tropical Region

- The tropical region lies near both the sides of equator line on the earth.
- These regions are hot but get plenty of rainfall. Therefore, this region is humid.
- Even in coldest month, the temperature is generally higher than about 15°C.
- During hot summers, the temperature may cross 40°C.
- Days and nights are almost equal in length throughout the year.
- These regions are rich in vegetation and large diversity in animals is also seen in this region.

# The Tropical rainforests

- In India, tropical rainforests are found in Western Ghats and Assam, other countries of the world like South, East Asia, Central America, Malaysia, Indonesia, Brazil, Republic of Congo, Kenya, Uganda, Nigeria and Central Africa also have tropical rainforest.
- The major type of animals living in the rainforest are monkeys, apes, gorillas, tigers, elephants, leopards, lizards, snakes, birds and insects.
- Since, there are large number of animals found in these regions. There is an intense competition for food and shelter among these animals. So, the animals are adapted in such a way that they eat different kinds of food and live in different kinds of places to overcome competition for food and shelter respectively.
- The adaptations in different animals living in tropical rainforests can be discussed as follows:

# Adaptations in Red-eyed Frog

- The red-eyed frog lives on trees in tropical rainforest.
- They have sticky pads on their feet that help them to climb trees.
- It does not live in water and has a green back and a creamy underside.
- It is a nocturnal.
- The bulging eye of frog protects it from its predator.
- The sudden opening of big and bright-red eyes frightens the predator for a while and in the meantime the frog gets time to jump to a safe place.
- The green colour of the frog helps it to hide within the green leaves of the tree and helps it to protect from predators.



*Fig. 7.7 Red-eyed frog*

# Adaptations in Monkey

- The monkeys living in tropical rainforests have long tails for grasping branches.
- Their hands and feet are adapted in such a way that they can easily hold the branches of trees.
- The eyesight of monkeys is very good
- Monkeys eat fruits, seeds, leaves, root and insects as their food which is present in abundance in tropical rainforest.



*Fig. 7.8 A new world monkey*

# Adaptation in Toucan

- Toucan is a bird, which is found in tropical rainforest and which possesses a long strong and large beak. It is a colourful bird which possesses a strange beak. It lives most of the time in the holes of big trees.
- The long and large beak helps Toucan to reach the fruits attached to the ends of even thin branches of tree .
- These possess feet that are adapted for grasping the branches of trees firmly.
- Toucan can change the colour of its feather.



*Fig. 7.9 Toucan*

# Adaptations in Lion-Tailed Macaque

- It is also called as beard ape and lives in the rainforest of Western Ghats in India.
- It has silver-white mane which surrounds the head from the cheeks down to its chin which is the specific characteristic.
- It is called lion-tailed.
- They spend most of their time feeding in the upper canopy of trees.
- They also can eat insects present under the bark of the tree. It spends a major part of its life on the tree.
- It is a good climber.



*Fig. 7.10 Lion-tailed macaque*

# Adaptations in Lion and Tiger

These are also called as big cats and are carnivore. These have following adaptations to survive in tropical rainforest:

- They have thick skin and skin colour helps to camouflage.
- They have strong sense of smell which helps them to locate their prey.
- They also develop sensitive hearing capacity to find its prey.
- They have eyes in front of their head which enable them to have a correct idea of the location of their prey. They have good eyesight.
- Their strong legs help them to run fast and long, sharp and strong claws in front of their legs help them to catch and tear their prey.

# Adaptations in Elephant

Elephant is a well-known animal of Indian tropical rainforest. Its adaptations can be discussed as follows:

- The elephant has a long trunk .
- The elephant possesses tusks that are used in tearing the bark of trees.
- The elephant has large ears that help it to hear even very soft sounds and can sense the danger. It also helps the elephant to keep it cool in the tropical forest.
- The feet of the elephant is large and round which help it to provide good stability .



*Fig. 7.11 An Indian elephant*