

B.Sc. Zoology Part III

MIGRATION IN BIRDS

MIGRATION

- ✓ The word migration has been derived from the Latin word “*migrare*” which means movement from one spatial unit to another.
- ✓ Any position occupied by an organism at a moment in time is considered as the spatial unit.
- ✓ Migration is viewed as an annual trek of an individual or group between a specific breeding and a non-breeding places in order to avail the benefit of the favourable condition.
- ✓ According to Cahn (1935) migration can be defined as, “a periodic passing of animals from one place to another.”
- ✓ In birds the migration means a two way journey- from a breeding and nesting place (called home) to a feeding and resting place (called new place) and back journey from the new place to the home.
- ✓ The movement occurs during the particular period of the year and the birds usually follow the same route.

KINDS OF MIGRATION

Migration is broadly divided into following 3 kinds.

1. Return migration:- Migration to a previously known place which has been visited earlier is called return migration.

2. Exploratory migration:- Migration to a completely unknown space which has not been visited earlier is called exploratory migration. Although ability to return to the known place is retained but is not exploited.

3. Removal migration:- Migration to a comparable spatial unit which is not followed by a reversal to the original spatial unit is called removal migration.

Depending upon the plane of movement of the migrants, migration is divided into 3 types:-

1. Horizontal migration:-

Migration occurring on a path perpendicular to the gravitational force of the earth is called horizontal migration. Depending upon the directions of path, horizontal migration is further divided into following two kinds:-

(a) Latitudinal migration:-

- ✓ Horizontal migration occurring from north to south or vice-versa is called latitudinal migration.
- ✓ Usually it occurs from north to south and it occurs from south to north in few cases only.
- ✓ Cuckoo breeds in India and spends the summer at South-East Africa.
- ✓ Thus it covers a distance of about 7250 km.
- ✓ Ruff breeds at Siberia and travels to Great Britain, Africa, India and Srilanka covering a distance of about 9650 km.

(b) Longitudinal migration:-

- ✓ It takes place in East- West direction.
- ✓ They starting moves from towards the Atlantic coast to avoid the Continental winter.
- ✓ The Pentagonal plover visits the Folkland Island and South Pentagonia in September and October for breeding.

2. Vertical migration:-

- ✓ Migration occurring in a plane parallel to the gravitational pull of the earth is called vertical migration.

3. Altitudinal migration:-

- ✓ This involves both horizontal and vertical components.
- ✓ Birds fly up and down over mountain and hills.
- ✓ Generally migration occurs at relatively low altitudes.
- ✓ Small passerine birds fly at a height 60 meters.
- ✓ Some birds have been found to fly at an altitudes of 4000 meters.
- ✓ A no. of birds in India migrate from planes to the slopes of Himalayas ascending thousands of feet above sea level during summer and return to the planes on commence of winter.
- ✓ These movements in birds are included under altitudinal migration.

Migration is also divided into two types on the basis of time of flight which occurs during migration:-

1. Diurnal migration:-

- ✓ Many large birds fly in day.
- ✓ These are crows, swallows, robin, hawks, cranes, pelicans etc.
- ✓ These may stop to forage in suitable places.
- ✓ However swallows and swifts capture their insect food in the air during flight.
- ✓ Diurnal migratory birds usually travel in flock which may be well organized.

2. Nocturnal migration:-

- ✓ Majority of small sized birds like sparrows, warblers, thrushes etc. prefer to fly at night, under the protection cover of darkness to escape their enemies.
- ✓ They feed and rest during day.
- ✓ However some birds like Geese and Ducks fly by day and night while migrating.

On the basis of reasons of migration, migration is categorized into following 3 types:-

1. Climatic migration:-

- ✓ It occurs in response to change in the climate of the environment.
- ✓ North-South migration of many ducks and geese is a good example of climatic migration.

2. Alimential migration:-

- ✓ It occurs due to shortage of water food.
- ✓ It may occur at any time in a year.

3. Gamatic migration:-

- ✓ It occurs in a need to certain environment for successful completion of the some parts of the reproductive process.
- ✓ Majority of the birds perform this type of migration.

On the basis of seasons during which birds migrate they are categorized into following types:-

1. Summer visitors:-

- ✓ These birds arrive in spring from the south to breed and leave for the south in autumn. e.g., Swifts, Swallows, Nightingales, Cuckoos etc.

2. Winter visitors:-

- ✓ These birds migrate Southward and South-West in winter and go back to North in spring. e.g., Field fare, Snow bunting, Red wig etc.

3. Birds of passage:-

- ✓ Some birds are seen for a short time twice in a year on their way to colder or warmer countries in spring and autumn e.g., Sand pipers, Spines etc.

PROBLEMS OF NAVIGATION (WAY FINDING)

- ✓ Migratory birds use land marks like mountains, hills, rivers, valleys etc. for identification of route.

- ✓ Birds navigates through responses to the earth's magnetic field.
- ✓ Birds may be guided by position of sun in day and by moon and stars during night.
- ✓ Birds learn by experience and guide themselves.
- ✓ Migration is the inherent nature of the birds which as a result of hereditary accumulation reaches the offspring.

CAUSES OF MIGRATION

The obvious stimulus of migration in birds is still unknown. Various factors causing migration put forward by different workers include followings:-

1. Environmental stimulus for migration:-

- ✓ It is believed that decline in temperature and food availability might trigger off migration.
- ✓ With less hours of light during autumn in temperate and Northern hemisphere, the time for food gathering is lessened. It initiates autumnal migration.
- ✓ Similarly increasing day length causing elevated temperature in Southern hemisphere during spring acts as initiator of migration.
- ✓ However, the sensitivity of migratory birds to changes in the weather is species specific.

2. Physiological stimulus for migration:-

- ✓ Scientists are busy today to assess the role of endocrine glands such as pituitary, gonad, thyroid, adrenal and pineal in migration.
- ✓ The pituitary regulates the development of gonads and influences all metabolic processes by way of its action on thyroid gland.
- ✓ It has been demonstrated in a passerine migrant that thyroid hormones may play an important role in the initiation of migratory deposition.
- ✓ Gonadal hormones are also responsible for the deposition of fat in many migratory birds.

ADVANTAGES OF MIGRATION

- ✓ Migratory birds avail the facility of better breeding and feeding ground.
- ✓ As a result of arrival at warm places from cold places, the birds get longer day time to search their food.
- ✓ By migration birds escape unfavourable conditions.
