STUDY MATERIAL

VIVEKANANDA COLLEGE

THAKURPUKUR

NAAC ACCREDITED GRADE—'A'

Subject: Zoology
Topic: MIGRATION IN BIRDS

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Migration is the annual, regular, seasonal to and fro journey by many species of birds from their breeding grounds to wintering quarters.

Sometimes, journeys are not termed as ‘true navigation’ because they are irregular or in only one direction.

PURPOSE OF MIGRATION

To obtain the advantage of the favourable conditions offered in more northerly regions only during the summer.

STATISTICS

- More than two-thirds of species breeding in northern US move south for the winter, making trips of upto 6000 kms each way
- Five billion birds migrate from Palearctic every year
- Some shore birds migrate for more than 10,000 kms in each direction between breeding grounds in Arctic and wintering areas in the southern hemisphere
- Five thousand million land birds migrate from Europe to Africa each autumn, half succeed in returning next spring
- Over a hundred species of migratory birds fly to India both in summers and winters

TYPES OF MIGRATION

- Short distance migration – Move only a short distance, as from higher to lower elevations on a mountainside
- Medium distance migration – Some species may cover distances that span from one to several states
- Long distance migration – Birds that typically have ranges that extend from the United States and Canada in the summer to Mexico and further south in the winter
- Local migration – Movements of birds within different parts of the same geographical region
- Altitudinal migration – In winter, high elevation birds are forced to descend to lower levels by exigencies of the weather and descending snow line. With the return of spring, they reascend to breed in the higher hills
- Latitudinal migration – This is observed in most migrants where they travel from circumpolar region to the tropical or subtropical belt
- Longitudinal migration – The migrants move from east to west and vice versa

STIMULATION FOR MIGRATION

- Resource factors – availability of food
- Reproductive factors – development of gonads
- Climatic factors – photoperiod or poor weather

ORIENTATION AND NAVIGATION

Orientation is the ability to determine the direction irrespective of destination and ability to move in a given compass direction.

Navigation is the directed movement of birds that need to return to a particular location. It involves the ability of a bird to locate its position.

GUIDING FACTORS IN NAVIGATION

- Landmark or topographic cues – Topographic cues can give long range guidance in daylight.
- Auditory or sound vibration cues – Involve nocturnal call notes while flying, frog calls, water of rivers, breaking surfs and infrasound that birds hear during flight.
- Olfactory cues – Some birds use their olfactory sense to detect or select food source and recognize site location.
- Sun compass – The birds possess a ‘time sense’ or ‘internal clock’ which allows them to take account of the motion of the sun across the sky.
- Star compass – Many nocturnal migrants use the stars for orientation during migration.
- Polarized light – Birds can perceive polarized light and use that ability for foraging and orientation.
- Magnetic cues – The hypothesis that migrating birds could use the earth’s magnetic field for orientation was first proposed by von Middendorff in 1859.

ROLES OF HORMONES IN MIGRATION

Light might stimulate release of gonadotropin-releasing hormone (GnRH) from the hypothalamus, resulting in the eventual release of gonadal steroids in to the blood, which would then induce the release of prolactin indirectly and thus cause fattening and Zugunruhe associated with the spring migration. It is thought that the hypothalamic control of prolactin and corticosteroid release could be the key to induction of physiological and behavioral premigratory events. Thyroid hormones have been claimed to be causative factors of migratory behavior and increased thyroid activity coincides with migratory behavior. Leptin is proposed as a modulator of departure decisions, as it could be a reliable indicator of fat content and migratory readiness.

METHODS TO STUDY MIGRATION

Scientific studies have used techniques including:

- Bird banding
- Radio transmitter
- Aural recording
- Radar tracking
- Low powered telescope
- Satellite tracking