# ~ SUMMARY AND CONCLUSION ~

For any particular avian species, the reproductive pattern in its natural environment is usually precisely defined and of limited duration. Its temporal organization is species specific, and is such that it allows the production of young at the most propitious season of the year for their survival (Lofts, 1975) as well as timed at such period of the year when there is minimum stress on adults, as reproduction is a energetically expensive phenomenon. There is substantial published work and various facets of avian reproduction with respect to gonadal development and metabolism in liver, emphasized on different metabolic changes occurring in the above-mentioned tissues during the sojourn. However, the information's regarding the energetics associated with the preparatory processes with the onset of breeding and after cessation of breeding activities are meagre. Hence it was deemed worthwhile to investigate the anabolic and catabolic changes occurring in the three tissues *viz.* liver, intestine and kidney over the reproductive cycle.

Carbohydrates are the primary source of dietary energy and preferred by the body as a source of instant energy, followed by lipids and proteins. In the present investigation, a study of certain marker enzymes involved in carbohydrate metabolism along with the metabolic profiles of lipids and proteins have been investigated over the reproductive cycle of the two species of birds. It is a well-established fact that lipids and proteins release energy by getting

degraded and the energy retention is more in fats compared to proteins.

The two species selected for the present study, Bank myna *Acridotheres ginginianus* and Brahminy myna *Sturnus pagodarum,* belong to same family sturnidae. An attempt has been made to unveil the species specific energy requisites during reproduction as, though, these species are closely related, show difference in their breeding and feeding habits. Bank myna is a colonial hole nester while Brahminy myna is solitary hole nester, both the species are omnivore but the former feeds on everything available including food wastes from restaurants and hand cart vendors whereas, the later species is a selective omnivore feeding exclusively on fruits, berries, nectar, insects etc.

For the sake of practical convenience and discussion, the reproductive cycle of the birds were divided into pre-breeding, breeding, post-breeding and non-breeding phases (Padate, 1990). Present investigation has been carried out in continuation of the work done by Padate (1990), where the gross biochemical parameters (total lipid, total and esterified cholesterol, proteins, glycogen and ascorbic acid) along with the body weight in Bank myna and Brahminy myna were reported and Sapna (2002) reported the gonadal hormones and influence of the same in liver, intestine and kidney of the above mentioned species. The present work may be considered as an extension of these reports. The enzymatic parameters studied in the

present work are glycogen phosphorylase, G-6-Pase, succinate dehydrogenase, ATPase, acid phosphatase and alkaline phosphatase along with glycogen, total protein, total lipid and cholesterol.

From the results of the present investigation following proposition can be made. As expected, different pathways of carbohydrate metabolism are in an active state during breeding season contributing to energy economy of the bird, it is also related to the demand of nesting and feeding habits with the involvement of various tissues. Liver and kidney are involved in release of glucose, liver mainly by glycogenolysis and kidney by getting gluconeogenically active. Whereas the intestine is actively involved in secretion, digestion and absorption of the carbohydrate, fat and protein rich food. The type of food consumed during different phases of reproduction, was also found to be influencing the metabolism, fulfilling the energy requisite of the birds. The present study reports species specific and sex specific differences over the reproductive cycle. The solitary nester exhibited heightened energy expenditure as compared to the colonial breeder. The present observations may deduce that the post-breeding activities of Bank myna are more costly in terms of energy than the breeding activities as breeding in a colony is advantageous in terms of energy conservation. In Brahminy myna involvement of both the partner is equal as evinced by variations in various enzymes and metabolites are concerned, whereas in the colonial nester it is felt that the female is more responsible for raising young.

The above conclusion may be abridged, as there are shifts in energy economics over the various phases of reproductive cycle, with species-specific divergence conditioned on type of food consumed (carbohydrates, proteins and fats) and diverse breeding strategies while sex-specific variation occur on sharing of breeding activities by the sexes.