CONCLUSIONS
The nature of comb building activity of two wild honeybee species *A. dorsata* and *A. florea*, and the domesticated species *A. cerana* including their nest sites, support, density, orientation, dimension, growth and development was studied during 1994-98 at Bangalore conditions.

All the three species built their nest on both arboreal and terrestrial nest site at considerable height from the ground level. Honeybees showed more or less equal preference to both arboreal and terrestrial nest sites. However, the respective number of nest sites of each species varied from one place to another and is related to availability of nest sites. Generally the nests of *A. dorsata* were noticed relatively at a greater height from the ground than *A. florea* and *A. cerana*. The plane of comb at the attachment of majority of nests of all the three species were found oriented towards North-South, North-West and North-East directions. Unlike *A. cerana* and *A. florea* the nests of *A. dorsata* were found in aggregations on terrestrial as well as on arboreal nest sites.

Comparatively the comb of *A. dorsata* was bigger than that of *A. florea* and *A. cerana*. However there was no significant difference in the comb size between *A. florea* and *A. cerana*. 
Majority of nests built by three honeybee species were ‘U’ shaped and symmetrical. Generally the comb cells of all the three species were hexagonal in shape, but showed variation with respect of cell diameter, depth and wall thickness. Comparatively the cells of the comb at attachment were bigger than rest of the cells. However there was no significant difference in the size of worker and drone cells except in A. florea, where the drone cells were significantly bigger than worker cells.

Comb building after initiation was continuous in all the three species of honeybee until comb reached optimum size. The rate of comb building activity showed variation from one nest site to another nest site of three honeybee species. Generally the comb size decreased with increase in the height of the nest site from the ground level particularly in case of A. dorsata. Comb built on the remnant support showed faster growth rate especially in A. dorsata. There was no significant difference in the rate of comb growth between arboreal and terrestrial colonies.

The present study provided comprehensive information on many aspects of nest building activity of indigenous honeybee species. However detailed information on some aspects of comb building activity could not be obtained due to practical problems such as non-availability of sufficient number of nest sites coupled with inaccessibility of available sites of a particular species of honeybee. Further, the size of the population of bees engaged in
the comb construction could not be determined as it involves marking of adult bees and also excessive handling of bees usually results in absconding behaviour. The physico-chemical and mechanical properties of the comb at different age of the comb were not determined due to non-availability of facilities.

There is a need for further research particularly on physico-chemical and mechanical properties in all the three species of honeybee. Physico-chemical characteristic features of comb are important to understand the nature of comb of all the three species. It also helps to understand the nature of wax of each species of honeybee. Further, physico-chemical nature of the wax are helpful in determining its quality, application and uses in different industries. The mechanical properties of the comb at different ages are of great practical importance in determining the strength of the comb as the comb is required to bear considerable load fairly for a long duration. Weak comb usually results in breakage and eventually loss of colony.

Considering the practical and technical constraints of the study, the results obtained on comb building activity are of great practical importance in understanding the pattern of comb building activity as well as the nature of nest sites, density, orientation, structure and architecture of the comb of three Indian honeybee species. Results are also immensely helpful in understanding the nature and pattern of comb growth in the three native honeybee
species. Information on the growth of the comb is of great practical importance in harvesting and production of bees wax for commercial use. Further, results indicate that the wax secretion in *A. dorsata* is far greater and faster than the other two species. Hence *A. dorsata* is commercially more important as substantial amount of wax could be obtained in a short time. Results of the study further suggest that beekeepers and farmers can selectively stimulate either greater honey production or wax production depending upon the requirement.