

3. Results and discussion

The bee flora for Apis species recorded in different months of the year is given in the Table.

Most of the bee attracting plants provided nectar and pollen for the honey bees. But some plants were visited either for pollen or for nectar only. Early in spring (January-February) the bees worked mainly on Cruciferous crops. During late February to April, citrus species, shisham, curry leaf plant, pumpkin, litchi, mango, roses and bottle brush provided abundant nectar and pollen. Berseem came into bloom in late March and attracted sufficient bees for nectar and pollen upto June.

Late in June through August there was comparatively less bee forage. Bees collected nectar from cucurbits, sunflower, bhindi, cotton and pollen from maize and bajra, sown as early fodder grain crop. After the rainy season, i.e., during September and October, cotton, arhar, toria, maize and sunflower provided both nectar and pollen. Towards the onset of winter (November-December), sarson, toria, rocket salad were found to be the major bee attracting plants.

In shivalik hills, there were two main nectar flow periods, viz., March-May and September-November. Brassica species was the major source of nectar during the first while cotton, bottle brush and basuti were quiet significant during the latter flows. There was no definite dearth period for the honey bees in the area. Although late June to August there was comparatively less bee forage, yet honey bees continued their activity on maize, cotton, marigold, chrysanthemum and sunflower to overcome this hot and humid spell. A short dearth period during September was terminated when sarson flowers become available in October. Thus there was no serious gap in the sequence flowering of bee flora in Shivalik hills.

4. Future Scope

Assessment of bio resources including honey plant resources and their utilization pattern for hilly and plain area of North-West Himalayas. Floral maps should be prepared for whole of the Himalayan region. Detailed ecological and biochemical studies should be conducted on excellent nectar sources. Assessment of bio resources including honey plant resources and their utilization pattern for hilly and plain area of North-West Himalayas. For double-fold benefit, area based scientific beekeeping should be encouraged among the farmers. Need based research activities should be taken up.

References

- [1] Crane, E. and Walker, P. 1984. Pollination Directory for World crops. *IBRA. London, 183 pp.*
- [2] Deodikar, G.B. and Suryanarayana, M.C. 1972. Crop yield and bee pollination. **Indian Bee J. 34: 53-63.**
- [3] Mattu, V.K. 1982. Morphometric and behavioural studies on Indian honeybee (*Apis cerana* F.). *Ph. D. Thesis. Himachal Pradesh University, Shimla, India.*

- [4] McGregor, S.A. 1976. Insect pollination of cultivated crop plants. *USDA/ARC Agric. Washington, DC handbook, 496 pp.*
- [5] Suryanarayana, M.C. 1978. Bee plants of India, *Carvia callosa*. **Indian Bee J. 40: 7-10.**

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