PART VI
Beekeeping Training and Research

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Beekeeping Research and Training in Hindu Kush-Himalayan Region: Future Perspectives

Krishan Kumar Sherstha and L.R. Verma***

*Beekeeping Training and Extension Support Project, HMG, Nepal
**International Centre for Integrated Mountain Development, Kathmandu, Nepal

Introduction

Generally speaking, it may be said that beekeeping with native hive bee "*Apis cerana* F." in many countries of HK-H region is still an old traditional household activity. It is mostly the small and marginal farmers in this region who keep only a few colonies of *A. cerana* in different types of traditional hives, and even today honey is generally harvested by squeezing the whole comb and is sold in pre-used utensils of different types without any quality control standards. This raises an important question as to why beekeeping with *A. cerana* has not developed on modern lines to the extent as it has on commercial scale with the European honeybee, *Apis mellifera* L. despite the fact that beekeeping with this native bee species has been closely linked with the cultural heritage of the rural people of this region.

In Nepal, beekeeping has been a traditional household activity since the time immemorial. There are areas where even with the traditional methods, beekeeping has flourished well. Beekeeping has also been associated with some communities like Chepang in central Nepal. Beekeeping is also carried on elsewhere in Nepal, specially in the mid-hills. However, beekeeping methods still rely on the use of hollow logs

and wall receptacles with fixed combs, thus, the traditional way of beekeeping in Nepal is still a primitive and imperfect one with great potential for improvement. This is also true in case of other countries of the region.

Recently, improved methods of beekeeping have drawn much attention in Nepal. Efforts are being made to develop beekeeping in some districts mainly in the midhills and some in the Terai. The beekeeping training and extension support project of HMG, Nepal and SNV, Nepal, now in its second year, at the cost of Rs. 18 m. is being implemented for six years on doing training, extension and construction activities. Similarly, other institutions like, G.T.Z., U.S.A.I.D., J.O.C.V. and social service organizations are also engaged in aspects of beekeeping development in Nepal.

Favourable Aspects of Beekeeping with Himalayan Hive Bee, *A. cerana*

Himalayan bees have many valuable characteristics of biological and economic importance which have not yet been scientifically explored. Some of them are mentioned here.

1. Bees are gentle to handle, industrious and better adapted to the ecological conditions of south and south-east Asia.

2. Himalayan bees are also less susceptible to *Nosema* disease, do not have serious problems with *Varroa* mite, and are less prone to the attack of predatory wasps.

3. The European honeybee, *A. mellifera* requires chemical treatment of colonies to control diseases, parasites and predators: no such use of chemicals is required in beekeeping with *A. cerana*.

4. A variety of geographic races/populations of *A. cerana* in the entire Himalayan region provide excellent opportunities for the genetic improvement of this native bee species through selective breeding.

5. It may also be safely concluded that Himalayan bees are more suitable to cross-pollinate entomophilous crops grown in small holdings of this region due to its shorter flight range and longer foraging hours than exotic one and also with other natural flora and fauna, they have coexisted together during the entire evolutionary processes.

6. In addition, through the genetic engineering techniques, it may be possible in the future to introduce genes that code for desirable characteristics of *A. cerana* into the populations of *A. mellifera*.

7. *A. cerana* can also co-exist with other native species of honeybees without any adverse ecological consequences.

Some Problems in Beekeeping with *A. cerana*

It is observed that *Apis cerana* has not become very popular with beekeepers because of its several inherent behavioural characteristics. They include frequent swarming and absconding, proneness to robbing, production of large number of laying workers, and lower honey yields per colony, etc. These negative traits of *A. cerana* vary from apiary to apiary and country to country depending on the expertise, experience and knowledge of the beekeeper managing the apiary.

Sacbrood virus disease has been another problem in recent years with *A. cerana* in several countries of the Hindu Kush-Himalayan region including Thailand, Pakistan, Nepal, China, Burma and India. It is revealed that this disease generally has a five-year cycle. After this period, few colonies escape or become resistant to the attack of this disease. In a period of five years, after the incidence of this disease, the normal population of *A. cerana* colonies has been restored in Nepal.

One of the other major constraint in *A. cerana* beekeeping is the lack of information on them. At present, knowledge from *A. mellifera* is often being used on *A. cerana* with little or no success. Hence, it is now well-established that Asian bees need more attention in terms of resources for the generation of technological information on them.

Beekeeping with *A. cerana* versus *A. mellifera* in Hindu Kush-Himalayan Regions

One of the reasons that beekeeping with *A. cerana* has not made much progress is due to the fact that several national and international agencies are focussing their attention on the introduction and acclimatization of *A. mellifera* at the cost of *A. cerana* in Asia. Such attempts date back to the beginning of this century and it is only after 1960 that some success in beekeeping with exotic *A. mellifera* has been achieved particularly in the plains of the Punjab (India) and NWFP in Pakistan where this exotic species of honeybee is now well-acclimatized and produces more honey than *A. cerana*. However, from other parts of Asia, the introduction of *A. mellifera* has become controversial subject. It is being argued that introduction of this exotic species may prove a risky project in the long run because of different climatic conditions, flora, mating competition with native *A. cerana*, hazards of diseases, parasites and predators etc. There is no doubt that native bees are best adapted to the specific climate and environment and the future of beekeeping in this region of Asia possibly lies in *A. cerana*.

In the Hindu Kush-Himalayan region there are still many countries where *A. mellifera* has not yet been introduced and attempts are being made to improve beekeeping with *A. cerana* through techni-

cal and financial assistance from different national and international agencies. However, such efforts have not yielded satisfactory results. One of the obvious reasons for the failure of these projects has been the transfer and application of the western bee management technology and expertise to improve beekeeping with *A. cerana* in this region. This native bee species certainly requires different beekeeping management practices and equipment because of its different body size, nest building techniques, colony cycle, temperature regulation, foraging, colony defence and other behavioural characteristics. Some attempts have been made in India and China to improve the traditional methods of beekeeping with *A. cerana* and in certain parts of these countries *A. cerana* matches *A. mellifera* in honey production. This justifies the use and potential of Asian bees.

Need for an International Beekeeping Centre in Asia

1) In the developed countries, beekeeping is a well-established industry while in the developing countries of this region, it is still a small traditional household activity and its full potentials are yet to be realized.

2) Because of the ideal climatic conditions, multiplicity of bee flora throughout the year, and close link of beekeeping with the cultural heritage of rural communities, this region offers untapped potential for beekeeping development.

3) The productivity level of several agricultural and horticultural crops and the quality of seeds and fruits are improved by cross-pollination. This aspect is still little known and scientifically neglected in developing countries of the Hindu Kush-Himalayan region.

4) The introduction of European honeybee, *Apis mellifera*, into several parts of Asia may prove a risky project in the long run as this may lead to the extinction of the Asiatic honeybee, *Apis cerana,* as has already happened in Japan and thus irreversibly damage the fauna of the Hindu Kush-Himalayan region. On the other hand, the native Asiatic honeybee, *Apis cerana* has many valuable characters of economic and biological importance which still remain scientifically unexplored.

5) *Apis mellifera* also requires chemical treatment of colonies to control several diseases, parasites and predators; no such use of chemicals is required in beekeeping with the Asiatic *Apis cerana*.

6) An increasing interest even among the western bee scientists and beekeepers in Asiatic *Apis cerana* is found now because of the recent problem of *Varroa* mite (a bee parasite) on European *Apis mellifera* and also the danger of the spread of Africanized bees to the northern hemisphere.

7) Any scientifically sound information obtained about Asiatic *A. cerana* could potentially be of great importance to beekeeping even in developed countries. New technologies in molecular biology will present opportunities to introduce genes that code for desirable characteristics of *A. cerana* into the population of *A. mellifera*.

8) Frequent absconding and swarming habits, robbing behaviour, production of large numbers of laying workers and lower honey yields are some of the problems and the constraints with Asian bees. It is possible to overcome these through applied research in the area of selective breeding and bee management practices.

9) *Apis dorsata* and *Apis florea* are the basis for most of the commercial forest honey sold in several countries of Hindu Kush-Himalayan Region and these are also important pollinators of several cultivated crops. Hence, there is a great need to improve beekeeping with these wild species of honeybees on scientific lines.

10) Many countries of south and southeast Asia do not possess the basic infrastructure, skilled manpower, extension and training facilities or applied research programmes for the advancement of apiculture.

11) The *mellifera* technology of the west is not transferable and applicable for the development of beekeeping in this region because of the different ecological and socio-economic conditions existing here.

Resolutions at International Fora in Favour of Regional Centre for Beekeeping in Asia

The following international conferences/workshops have already passed resolutions in favour of establishing a regional centre for beekeeping in Asia.

1) Advanced course and workshops on beekeeping with *Apis cerana* in tropical and sub-tropical Asia organized by the International Development Research Centre (IDRC) Canada held in Kuala Lumpur, Malaysia in February, 1988.

2) F.A.O. of the United Nations workshop on parasatic bee mites and their control held in Pulawy, Poland in September, 1987.

3) International conference on Beekeeping (Apiculture) organized by International Federation of Beekeeper's Association (APIMONDIA) held in Warsaw, Poland in August 1987.

4) Second International conference on Apiculture in Tropical climates organized by International Bee Research Association, in New Delhi in 1980.

Resolutions of the Fourth International Conference on Apiculture in Cairo, 1988

RESOLUTION ON ASIAN BEES

In order to generate and deliver improved beekeeping technology with Asiatic species of honeybees, there is a strong need for a Regional Research and Training Centre in south and southeast Asia. It is recommended that an International Centre for Beekeeping Research and Training should be established in Kathmandu, Nepal.

An Ideal Place for Beekeeping with Asian Bees: Nepal

Nepal is very rich in ecological resources and is one of the ideal places for the proposed regional centre for beekeeping in the Hindu Kush-Himalayan region:

- Nepal is one of the few countries in this region, Asia, which has not yet introduced beekeeping with European honeybee *Apis mellifera* L.
- The varied physiographic conditions and abundance of bee flora makes beekeeping operations possible throughout the year.
- Bilateral beekeeping and extension support project already in operation between the Nepal Government and Government of the Netherlands provides the basic infrastructure for the development of a regional centre in beekeeping.
- Network of national and international agencies like Royal Botanical Garden, Gokarna Safari Park, Tribhuvan University and ICIMOD offer an environment ideal for the proposed centre.
- There is a strong continuing commitment on the part of the Government of Nepal to beekeeping development programme which falls directly under His Majesty the King of Nepal's directive programme.
- Beekeeping in Nepal is an old traditional occupation closely linked with the cultural heritage of rural people.

One important point in favour of establishing the proposed regional centre for beekeeping in Nepal, is the existence of ICIMOD there. The primary objective of the ICIMOD is to "promote economically and environmentally sound development in the eight developing countries of the Hindu Kush-Himalaya and to improve the well-being of the local population." These countries are Afghanistan, Bangladesh, Burma, China, India, Nepal and Pakistan.

Mandate and Objectives of the Proposed Regional Centre

1. The overall objective will be to generate and deliver improved beekeeping management technology through research and training primarily on Asiatic species of honeybees.
2. To assist different Government agencies, beekeeping communities and commercial enterprises to create a cadre of beekeeping experts by training them in both practical and scientific aspects of beekeeping.
3. To provide information and advisory services and also to act as co-ordinating centre for international co-operation in beekeeping.
4. To assist different developing countries of this region.

Organization

The proposed centre will have three major programmes in beekeeping.

i) Research
ii) Training
iii) International co-operation

Research may be carried out in the following basic and applied areas primarily on Asiatic species of honeybees.

a) Bee biology
b) Bee pathology
c) Bee botany and pollination
d) Beekeeping technology and equipment
e) Beekeeping economics and marketing hive products
f) Apitherapy, etc.

Training courses both in practical and scientific aspects of beekeeping will be offered for the benefit of beekeepers, beekeeping instructors, beekeeping extension personel from the department of agriculture, forestry and rural development representing different beekeeping communities or associations, commercial enterprises and government departments from the entire region of the Hindu Kush-Himalaya.

An international cooperation programme will deal with technology sharing and technology transfer for the advancement of beekeeping in this region. It will organize regional training programmes, workshops, seminars, conferences and monitoring tours. It will also act as information dissemination centre by publishing extension literature for the popularization and promotion of beekeeping. It will also render beekeeping advisory services to individual participating countries and on regional basis also.

All the above programmes will be carried out by keeping continuing contacts with national and international agencies.