

BEE FLORA
of
THE HINDU KUSH-HIMALAYAS
INVENTORY AND MANAGEMENT

Uma Partap



Bee Flora of the Hindu Kush-Himalayas

Inventory and Management

Uma Partap

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Cover Plates

(From Top Right)

Prunus domestica

Callistemon citrinus

Melilotus alba

Bauhinia variegata

Malus domestica

Amaranthus cruentus

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Acknowledgements

The thought of writing a book on Himalayan Bee Flora came to mind while I was carrying out a field survey on bee flora. While capturing honeybees with a camera, sucking nectar, I had a chance to understand the varying degrees of affinity bees maintain with plants. The flowers that look beautiful to us are not always attractive to honeybees. Similarly, some wild shrubs which look unattractive are favourites of bees. I felt sharing this knowledge would be useful to beekeepers.

I felt compelled to write even more so after experiencing under nutrition and malnutrition of honeybees leading to lower honey yields and colony deaths in several mountain villages where project activities were undertaken. So it became clear that the message of the book should be — farmers and extension workers need to assess the bee flora in their area and make contingency plans to supplement them, should it be necessary — even before they begin beekeeping. This is a necessary, but little understood, aspect of beekeeping.

The framework of the publication was prepared and discussed with colleagues in ICIMOD and outside. It also set the scene for fresh surveys, lab work, photography, and writing. The initiative received ready support from other project colleagues and the ICIMOD management, farmers, beekeeping entrepreneurs, and experts in the HKH countries. I would like to name the few ICIMOD staff who provided me with the essential support: Mr. Egbert Pelinck, Director General; Dr. Mahesh Banskota, Deputy Director General; Dr. Tej Partap, the Head of Mountain Farming Systems' Division; Mr. K.K. Shrestha, Coordinator of the Beekeeping Project; Mr. A.N. Shukla, Beekeeping Extensionist; Mr. S.R. Joshi, Beekeeping Field Supervisor; Mrs. Sofy Jomi, Computer Assistant, Beekeeping Project; Mrs. Greta Rana, Senior Editor; Mrs. Anita Pandey, Assistant Editor; Mr. A.K. Thaku, Cartographer, DITS, Mr. Sushil Man Joshi, Desktop Publisher, DITS; and Mr. Govind Joshi, Cartographer, MENRIS. I would also like to express my gratitude to Prof. L.R. Verma, Vice Chancellor of the Dr. Y.S.P. University of Horticulture and Forestry, Solan, Himachal Pradesh, India, and Former Beekeeping Project Coordinator at ICIMOD for introducing me to this fascinating field.

The final presentation of the book is largely due to the *critical reviews and comments* made by the following five experts on the first draft: Dr. Eva Crane, Honorary Life President of the International Bee Research Association (IBRA), U.K.; Dr. Nicola Bradbear, President of Bees for Development, U.K.; Dr. Rafiq Ahmad, Ex. Director of the Honeybee Research Institute, Pakistan Agricultural Research Council (PARC); Dr. Cleofas R. Cervancia, Coordinator of the Bee Programme, University of the Philippines; and Mr. Gopal P. Kafle, an experienced bee expert in Nepal.

It was possible for me to think of and plan the publication only because of the financial support provided by the ICIMOD Beekeeping Project granted by the Federal Chancellory of Austria through Austroproject. I greatly appreciate the opportunity provided by the Austrian Government to share my experiences in this fascinating work.

This work also took the time I otherwise would have spent with my two daughters, Bhoomika and Uttara. They supported me with their patience and became expert field workers by locating honeybees on the flowers for me to photograph. Last of all, I am indebted to my husband for his encouragement; for training me in photography, of which I knew nothing before; and for his constant advice.

Foreword

Beekeeping is one of the many strategies that mountain farmers in the Hindu Kush-Himalayas employ to harness the biological resources of their environment. Of direct benefit is the honey, as a nutritional food item or as one of the few cash income sources. With its high-value, low-volume – low perishability, honey and other beekeeping products are excellent examples of mountain products that should be promoted. Bees play an equally important role in rural mountain development as pollinators of agricultural and horticultural crops. It is, therefore, imperative that bees find adequate bee forage round the year for their survival and optimum utilisation.

Unfortunately, while in the past few decades considerable progress has been made in promoting beekeeping as a cottage industry and occasionally as a substantive agro-enterprise, this has not been matched with a concurrent increase in the availability of bee forage. Presently, beekeeping extension systems in many parts of the Hindu Kush-Himalayas are constrained by the lack of information about assessing and managing the bee flora of different agroecological zones and farming systems of the region. As a result, promotion of beekeeping has not always lived up to the expectations raised.

In this context, and within the overall framework of ICIMOD's programme on 'Promotion of Conservation and Development of *Apis Cerana*', a special effort has been made to gather information about bee flora of different agro-ecological zones of the HKH region, including the multiple management options farmers may have in their use.

The present book is the result of the painstaking work carried out by Dr. Uma Partap, Research Officer, in the project. With its numerous photographs showing habitats and pollen grain forms of most of the plants complementing a detailed text, this book is the first comprehensive compilation of the bee flora of the HKH. I am particularly grateful to Dr. Uma Partap for her hard work in bringing all this information together. The final text has greatly benefited from a review by an eminent panel of beekeeping specialists, mentioned on the next page, to whom I would add my appreciation also.

Finally, I do hope that this book will prove to be of practical utility to scientists, extension workers, and beekeeping entrepreneurs in promoting increased benefits from beekeeping to the rural population of the Hindu Kush-Himalayas.

Egbert Pelinck
Director General

June 1997

Abstract

More than 1,000 plant species, including various agricultural, horticultural, and forage crops; ornamental plants; avenue trees; wild plants; and forest trees are visited by honeybees in different agroecozones of the Hindu Kush-Himalayan region. So far, much of the information about bee plants of the region is related to the amount of nectar and pollen they provide, and it has not been made available from the point of view of practical use by farmers, beekeepers, beekeeping entrepreneurs, and firms *per se*. Bridging this gap, this publication aims to increase awareness about the significance of honey plant resources for beekeeping management; make available a practical guide on honey plant resources; and provide beekeepers of the HKH region with tools for identifying bee flora.

This book is divided into two sections. The first section consists of four chapters. Chapter One provides an introduction to beekeeping and the different species of honeybees found in the region, hive products, and the role of honeybees in crop pollination. The second chapter focusses on bee forage and the status of Himalayan bee flora. Chapter Three deals with the identification and characterisation of bee flora. Chapter Four focusses on bee forage management methods. A list of multipurpose plants has been provided for different agroecosystems of the Hindu Kush-Himalayan region. The second section is the major contribution of this book. It describes 237 promising plant species, including those which provide surplus honey and others which help to build up colony strength and support bee colonies during dearth periods. Plant species of great value to beekeeping as well as for other economic uses are recommended as probable choices for targeted multipurpose plantation work. Morphological features of plants as well as their habitats and utilisation by honeybees are supported with more than 120 coloured plates. In addition to this, a general inventory of bee flora of the HKH region, containing 366 plant species, their ecological habitats, blossoming periods, and nectar and pollen potentials, is also provided. A glossary of 50 important scientific terms has also been added. This is a valuable reference book for bee scientists, beekeepers, farmers, extension workers, and entrepreneurs practising beekeeping in the mountain areas of the HKH and other regions.

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Plate No	Page	Adjusted Size (%)
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13b	82	74
13c	83	76
17b	86	120
17c	86	120
17d	86	120
18b	87	82
18c	87	82
27b	97	88
38b	111	95
41c	117	95
42b	118	76
45b	122	95
52b	128	95
53b	129	95
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