Bumblebee Sub Group Annual Report 2021

of the IUCN Wild Bee Specialist Group

Edited by Paul Williams (WBSG Deputy Chair for Bumblebees)

BBSG IN 2021

The BBSG exists to foster the conservation of bumblebees and their habitats around the world. In this eighth report of the BBSG's activities, 2021 has been another unusual year as the pandemic has continued to interfere with field work for many people. But despite the difficulties, there has been progress towards our goal of evaluating the extinction risk of all species of bumblebees worldwide using the IUCN Red List Criteria.

HIMALAYA

Approximately 62 species are currently recognised. No species has yet been assessed for Red List status within the Himalaya. Of the total, approximately 19 species are considered endemic (or near endemic, just crossing into the Qinghai-Tibetan Plateau), so at least 43 need to be assessed beyond the Himalaya (most in East Asia). There are many records in collections and in the literature that could be mobilised if funding were available. More field surveys are urgently needed.

Himalayan Region in 2021
Rifat Raina / Malkiat Saini

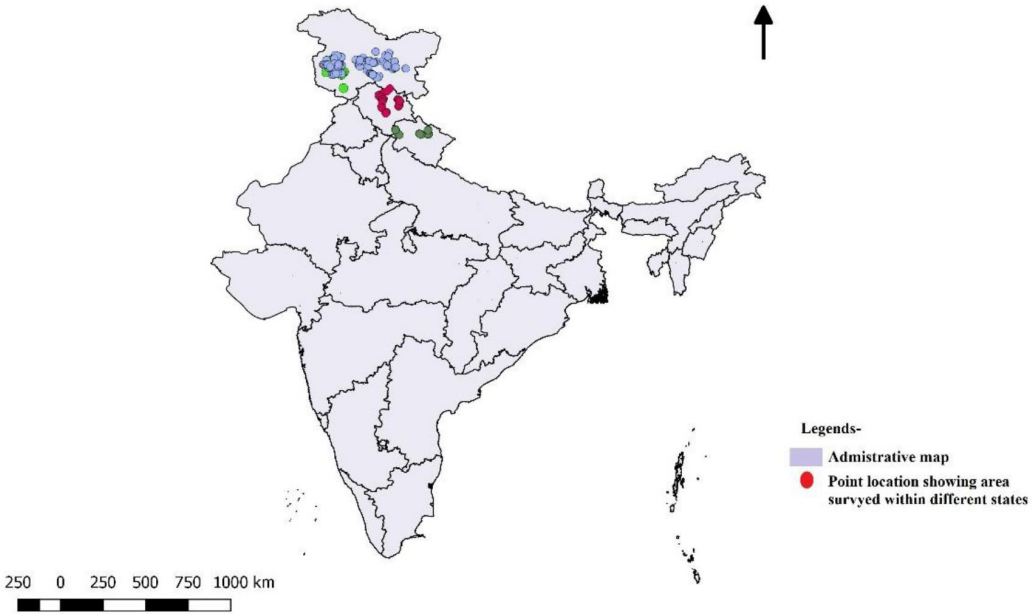
Bumblebees of the Himalaya are of particular interest because this corridor of mountains is one of the most important connections between the large and divergent Oriental and Palearctic bumblebee faunas.

Bumblebee populations are declining in the Himalayan region due to urbanization, tourism, over grazing, deforestation, habitat fragmentation, and excessive use of pesticides. There is now a dire need for rapid assessment of bumblebees in the Himalaya. The number of bumblebee species that have been recorded as endemic will need to be re-assessed.

New survey of Himalayan bumblebees

During 2021, three extensive surveys were undertaken by two different groups under the leadership of Rifat Raina. Sample collection was made with the help of project-team members Ajaz Parey, B. Malik, and Aishish Mehra in Uttarakhand, Himachal Pradesh, and in the two Union Territories of Jammu and Kashmir and Ladakh (from 15/04/2021 to 17/10/2021 and from 01/07/2021 to 01/09/2021), exploring targeted habitats in localities covering 20 districts. A total of 4414 bumblebee specimens were collected at different elevations ranging from 900–5000 m asl. The Union Territory of Jammu and Kashmir contributed the largest samples (1583 specimens), followed by Himachal Pradesh (1251 specimens), Ladakh (999 specimens), and Uttrakhand (580). However, no bumblebees were encountered at Changla Pass at 5360 m. GPS handsets were used to record the coordinates of different habitats within the study sites (map below). The extraordinary adaptation (morphological and behavioural) of bumblebees allows them to survive in harsh situations, such as the low temperatures at high elevations, where other insects are noticeably scarce.

The collected samples were processed by Ms Purnima Pathak JPF for detailed analysis. So far, a total of 1775 specimens of bumblebees have been examined and identified to 17 species (*B. albopleuralis*, *B. asiaticus*, *B. ferganicus*, *B. festivus*, *B. flavescens, B. haemorrhoidalis, B. himalayanus*, *B. jacobsoni*, *B. kashmirensis*, *B. keriensis*, *B. melanurus*, *B. miniatus*, *B. pressus*, *B. rufofasciatus*, *B. semenovianus*, *B. simillimus*, *B. tunicatus*). The rest of the collection is now being identified. Current distribution status has been recorded and updated for the assessment of species distributions in the Himalaya. The identification of bumblebees is not straightforward because of mimicry and colour variation, so proper care must be taken during collection and preservation.



Map showing the new survey localities in the Indian Himalayan Region for 2021.

Pollination, crops, and medicinal plants

The distribution status of Himalayan bumblebees is being updated along with comparative inventories of the bumblebee species prevalent in the different mountain systems, together with their food plants. The greatest diversity of bumblebee species was observed between elevations of 2500-4000 m. A process to scan the pollen of some of the more important species of bumblebees has been initiated in order to link foodplants with the particular bumblebee species to establish their feeding relationships.

Bumblebees are valuable pollinators, which are needed to sustain the diversity of the medicinal, crop and wild flowering plants in the Himalaya. Because of their role as pollinators, bumblebees are considered as beneficial insects that greatly increase the crop yield and so are called farmer's friends. Several studies have revealed that the Himalaya are rich in medicinal plants. The current study is providing information on bumblebees for their conservation and for helping to maintain the diversity of medicinal plants in the Himalaya. Bumblebees are known to pollinate some important plants used to make medicine for curing diseases in the northwestern Himalaya, including *Dactylorhiza hatagirea, Podophyllum hexandrum, Polygonatum multiflorum, Fritillaria roylei, Picrorhiza kurrooa* and *Aconitum violaceum*. Ten species of bumblebees have been noted as potential pollinators of medicinal, aromatic, ornamental, and agricultural plants in the Himalaya. These species are *B. asiaticus*, *B. jacobsoni*, *B. rufofasciatus*, *B. haemorrhoidalis*, *B. simillimus*, *B. tunicatus*, *B. keriensis*, *B. miniatus*, *B. albopleuralis* and *B. melanurus*.

Public outreach

During 2021, 27 awareness programmes or outreach activities were carried out at the village level to enhance bumblebee populations in the Indian Himalayan region, especially in Uttarakhand, Himachal Pradesh, Ladakh, and Jammu and Kashmir. Pamphlets of advice for improving pollination practices for farmers and growers have been distributed to local communities and to the general public. The benefits of bumblebee pollination and of

conservation strategies were also demonstrated to the local communities during awareness programmes.

Bumblebee populations are declining each year due to gradual changes in climate and anthropogenic activities. The conservation of bumblebees and the maintenance of crops in the Himalayan region requires much more attention.

Kaza (Himachal Pradesh) 3800 m.

Valley of Flowers (Uttarakhand) 4300 m.

Awareness programme at Leh (Ladakh).

Pansilla Pass (Ladakh) 4400 m.

Bombus tunicatus.

Bombus semenovianus. (Photos by Rifat Raina.)

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