

# Progress Report



**PARASITE PREVALENCE AND LOADS ACROSS  
ELEVATIONS IN *APIS LABORIOSA* FROM ANNAPURNA  
CONSERVATION AREA, NEPAL**

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## Introduction:

*Apis laboriosa* (Himalayan Cliff Bee), as other honey bees, plays a vital role in pollinating mountain crops and wild flora, which are declining in Nepal due to climate change, insecticides and parasites, among others. Parasitism in honey bees is impacted by geographic and temporal variations in various factors. We proposed to study the effects of elevations and seasons in parasite loads and prevalence of five parasites in *A. laboriosa* from the Annapurna Conservation Area, Nepal.



Picture 1: *A. laboriosa* foraging near the cattle-shed. We have found many bees hovering near cow dung.

## Work completed

### *Field Campaigns:*

Two out of three proposed field visits have been successfully completed. We collected *A. laboriosa* from Bhurjungkhola (28°20'43.7" N, 83 ° 58'48.1"; 1,287 m asl; N=4), Kyumi (28°28'23.4" N, 83 ° 49'13.3"; 1,302 m asl; N=17) and Chhomrong (28°24'56.2" N, 83 ° 49'09.3"; 2,222 m asl; N=22) in May 2019 and from Chhomrong (N=25) in August 2019. We were unable to capture bees from low-elevation sites, both in Bhurjungkhola and Kyumi, during our second field visit. Of the total bees collected at each site, samples for dissection were stored in cooler with an ice pack and those for PCR analysis were stored in 99% ethanol. These samples have been stored at -20°C prior to further analyses.





Picture 2: A local field guide providing information on *A. laboriosa* hives to the Field Assistants



Picture 3: Field assistants processing the samples immediately after collection

We also recorded the distribution of *Apis laboriosa* along the Trail from New Bridge to Annapurna Base Camp during our first field visit on May. We were able to record 5 nesting sites along the proposed route of which 3 were active sites: (Chhomrong Bhir, Kuli Bhir and Kroja Bhir) and 2 remnant of nests: (Dovan Bhir and Mutque Bhir). Altitude of the nesting sites ranged from 1200 to 2700 m asl.

#### **Lab analyses:**

A total of 22 samples representing both seasons and altitudes have been submitted to the Research Institute of Bioscience and Biotechnology, Kathmandu, Nepal for PCR detection of *Acarapis woodii*, *Nosema cerana* and *Crithidia spp.* For screening of conopid fly larva and *N. cerana* spores, dissection will begin on January 2020.



Picture 4: *A. laboriosa* hives at Kuli Bhir (1,603 m asl)



Picture 5: *A. laboriosa* hives. Black hives represent occupied ones and lighter hives are not occupied ones

### ***Outreach:***

As proposed, the symposium on “Pollinators for sustainable livelihoods” was successfully organized (in 19<sup>th</sup> October 2019) as part of the 4<sup>th</sup> International Conference on Mountains in the Changing World (18<sup>th</sup>-19<sup>th</sup> October 2019). A total of five talks (one invited and four research works) presented information about pollinators were delivered to an audience of >25 from different institutes/organizations and countries.



*Picture 6: Participants and speakers at the symposium on "Pollinators for sustainable livelihoods"*

### **Future Plan**

We plan for our third field visit on February 2019 given the weather conditions. Data from PCR analysis and dissection of samples collected so far will be received within February. In addition to collecting bee samples and information about location of bee hives, we will also conduct a focus group discussion with the local people to gather more information about the status of *A. laboriosa*. We will also conduct other outreach program/s targeting local people and school students.