

# DAVIS EXPEDITION FUND

## REPORT ON EXPEDITION/PROJECT

**Expedition/Project Title:** Cynipid oak gallwasp phylogeography in the Western Himalayas

**Travel Dates:** 19<sup>th</sup>-27<sup>th</sup> August 2008 (preliminary trip)

**Location:** Shimla, Himachal Pradesh state, India

**Group Members:** Katherine Baldock

**Aims:** To investigate the phylogeography and evolution of cynipid oak gallwasps in the Palaearctic by collecting gall samples from trees of *Quercus*, *Lithocarpus* and *Castanopsis* in the Ladakh and Himachal Pradesh regions of Northwestern India.

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### **OUTCOME (not less than 300 words):-**

#### Davis Expedition Committee Report: Preliminary visit Cynipid oak gallwasp phylogeography in the Western Himalayas

The aim of this preliminary visit was to visit the Himalayan Forest Research Institute in Shimla, India to investigate potential field sites for the collection of oak galls containing cynipid gallwasps and to progress the application for collection permits to return samples to the UK for analysis.

##### 1. Outline of visit

I travelled to Shimla in north-west India. Shimla is situated in the foothills of the Western Himalayas at an altitude of 2000m and is located in the south of Himachal Pradesh state. Himachal Pradesh was chosen for this study as several oak species are found in the region. Ladakh, located to the north of Himachal Pradesh, was also considered a potential sampling location.

I spent four days at the Himalayan Forest Research Institute (HFRI) in Shimla. During this time I was able to obtain information regarding oak species distributions and visit potential field sites in the Shimla area. The possibility of obtaining assistance with permit applications was also discussed.

##### 2. The distribution of oak species in Himachal Pradesh

Prior to the trip it had been difficult to determine which oak species were present in Himachal Pradesh and Ladakh. According to scientists at HFRI there are five species of oak in Himachal

Pradesh with possibly a single species, *Quercus baloot*, found in Ladakh. Little information was available regarding the distributions of *Lithocarpus* and *Castanopsis* species in these regions.

Details of the five oak species are as follows:

(i) *Quercus leucotrichophora* (= *Quercus incana*); common names: Ban oak, grey oak, white oak

This is the most common oak species in and around Shimla.

Altitudinal range in Himachal Pradesh: 1200-2400m

(ii) *Quercus dilatata* (= *Quercus floribunda*); common names: Green oak, Holly oak, Moru oak

Altitudinal range in Himachal Pradesh: 2100-2700m

(iii) *Quercus semecarpifolia*; common names: Kharsu oak, brown oak

This species is found in small patches at high altitudes.

Altitudinal range in Himachal Pradesh: 2400-3700m

(iv) *Quercus baloot*

I have been told that this is a synonym for *Quercus ilex* (common names: Holly oak, Holm oak), however the distribution for *Q. ilex* is described as being southern Europe and northwestern Africa.

In Himachal Pradesh *Q. baloot* is found in a very small area in the dry zone of Kanawar beyond the reach of monsoon rains in Killoa, Kailash and Chini ranges up to 2100m.

*Quercus baloot* is found in cold deserts and is therefore likely to be found in Ladakh.

Altitudinal range in Himachal Pradesh: 900-2700m

(v) *Quercus glauca*

This species can be found in the southeast of Himachal Pradesh state towards Haryana state.

### 3. Field sampling

I spent two days investigating potential sampling locations in Shimla and the surrounding region.

Details of these locations and the oak species present are given in Table 1.

Table 1. Locations at which oak species were sampled

Location	GPS coordinates	Altitude	Oak species present
Chakkar Forest, Shimla	31.18461, 77.16797	2020m	<i>Q. leucotrichophora</i>
Catchment Forest	31.10169, 77.26236	2490m	<i>Q. leucotrichophora</i>
Himalayan Nature Park, Kufri	31.09761, 77.26250	2640m	<i>Q. dilatata</i> , <i>Q. semecarpifolia</i>

*Quercus leucotrichophora*, *Q. dilatata* and *Q. semecarpifolia* were examined for galls at these three locations. Galls induced by mites were found on leaves of all three species however galls induced by cynipid gallwasps were not seen. This could have been because it was too early for galls to have formed or because cynipid gallwasps were not present in these locations. Since cynipid-induced galls are present on oak trees at this time of year in Europe it was thought likely that galls would be visible if gallwasps occur in this region. Cynipid gallwasps can have patchy distributions so it is possible that they are present in the oak forests in Himachal Pradesh, just not in the locations that I visited. Future trips to collect cynipid gallwasps in this region will need to ensure that sampling sites encompass a large geographical range in order to increase the chances of encountering these species.

#### 4. Permit applications

Permission to remove biological specimens from India requires collaboration with a host institution. The possibility of setting up a collaboration with the HFRI was discussed prior to my departure from the UK and it was hoped that this could be achieved during my visit. It was not possible to arrange a collaboration during my trip or upon my return to the UK. However the HFRI expressed an interest in becoming involved in longer term studies in the future.

#### 5. Conclusions

During my preliminary visit to India I was successful in obtaining further information regarding the distributions of oak species in the Himachal Pradesh and Ladakh regions of India. Initial surveys of three oak species in and around Shimla did not find galls induced by cynipid gallwasps, however this does not mean that these species are absent from the Himachal Pradesh region as a whole. Despite extensive efforts I was not able to obtain permits for collecting gallwasp specimens for this project. Therefore I will not be able to progress with plans for a longer collection trip as planned.

#### 6. Acknowledgements

I am grateful to the Davis Expedition Committee for providing funding for this preliminary trip to India. I would like to thank the Himalayan Forest Research Institute for hosting my visit, Dr Ranjeet Singh and Dr Pawan Rana for organising and assisting with field visits and Dr Mohinder Pal for his kind hospitality and discussions. I would also like to thank Dr Graham Stone and Dr James Nicholls of the University of Edinburgh for help with preparation for this trip.