

JAMES RENNIE BEQUEST

REPORT ON EXPEDITION/PROJECT/CONFERENCE

**Expedition/Project/
Conference Title:** Asian Gallwasp Project

March 13, 2011 to April 17th 2011

Travel Dates:

Taiwan and Yunnan, China

Location:

Jack Hearn

Group member(s):

Aims:

1. To collect oak galls on previously under sampled host genera in eastern Asia
 2. To rear adults from these galls for molecular work in Edinburgh
 3. To test an 'out of Asia hypothesis' for the origin of oak gallwasps
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OUTCOME (not less than 300 words):-

The expedition goal was to sample the virtually unexplored Cynipini gallwasp diversity east of the Himalayas in sub-tropical and tropical regions on *Fagaceae* species focussing on the *Lithocarpus* and *Castanopsis* oak genera. The significant funding towards my transport costs from the James Rennie Bequest enabled me, as part of a team from Edinburgh and Taiwan, to collect many unknown galls from many of species, plus some very unfamiliar *Quercus* species, in Taiwan and southern Yunnan, China over five weeks from March to April 2011. As well as collecting I was responsible for education, in charge of training our local assistants to correctly rear galls and to store and sort emergents into gallwasps and parasitoid wasps. The newly discovered oak gallwasp diversity can be incorporated into a molecular phylogeny of the oak gallwasps to discover the geographical and host origins of this most speciose gallwasp tribe.

We began in Taiwan; our host was Chang-Ti Tang a PhD student studying gallwasps in the lab of insect gall specialist Dr Man-Miao Yang of National Chung Hsing University, Taichung. Chang-Ti had prepared an extensive itinerary visiting much of the island and greatly varying altitudes, the importance of which we all came to realise. New gall morpho-types were found from the first day onwards; this was the easy part. Just identifying the numerous host tree species was difficult, as the UK has only two oak species and not many other tree species to confuse them



Large new gall type on the Taiwanese endemic *Lithocarpus dodonaeifolius*.

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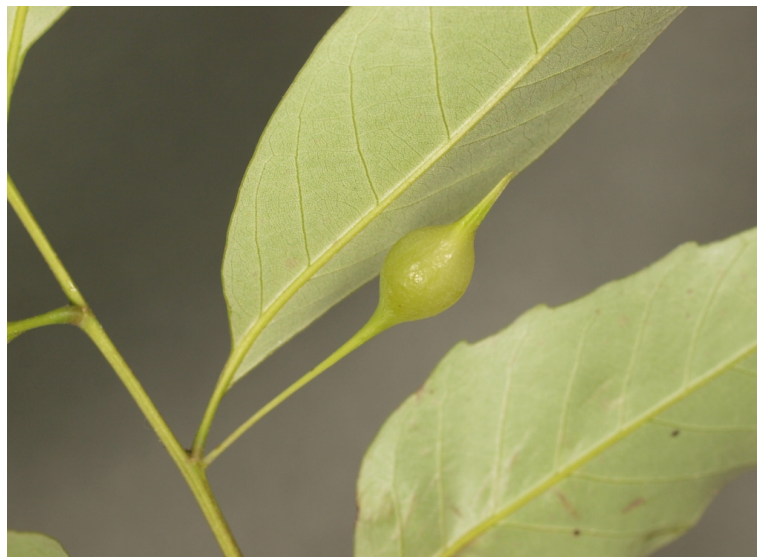
with. Our initial guesswork must have been very trying for Chang-Ti, but he didn't lose patience and we slowly improved to at least genus level identification. For me the tree species diversity, and large brightly coloured arthropods of all kinds, was awe-inspiring throughout the expedition.

We collected all over the interior of Taiwan. It is extremely steep, undeveloped and covered in pristine forests that are oak dominated and heavily species stratified from 700 to over 3000 metres. Needless to say the scenery around each site was invariably stunning. Days were long as collecting was followed by recording, photographing and 'potting up' of the galls for adult gallwasp rearings in the evenings. However, the food and tea were excellent, the Hornet larvae omelette was a particular treat for us Hymenopterists. Taiwan was a great success with 127 rearings set-up and adults beginning to emerge as we left, although galls on *Castanopsis* and *Lithocarpus* were less diverse, both in number and morphology, than on *Quercus* species.

After an energetic overnight stop in Hong Kong we flew to Yunnan's southernmost county, Xishuangbanna, for a further 2 ½ weeks on April 1st. This area of China borders Laos and Burma and is known for its varied South East Asian culture and ethnic groups and. There was a greater sense of adventure, and some apprehension for this leg of the expedition. Professor Chuck Cannon of Xishuangbanna Tropical Botanical Gardens (XTBG) in Menglun hosted us. There were permit issues and public holidays to sit through for the first few days at XTBG where there are few Fagaceae due to the relatively low altitude (700m). To pass the time we planned collecting excursions and ate a lot of the local Dai peoples famous street barbecue.

Mr Liu, a PhD student at XTBG, took us to the first collecting site a tea plantation with residual forest in Menghai an hours drive from XTBG. We saw many beautiful ancient tea plantations on the way and extensive stands of rubber plantations. The rubber has replaced large areas of primary forest in Xishuangbanna over the last 30 years and pristine forest is now largely restricted to nature reserves. The site was productive and we found some large galls on *Castanopsis* and *Lithocarpus* species. It was an excellent days collecting after a slightly frustrating initial wait in XTBG. At the end of the day the tea farmer invited us into his home for to taste his Pu'er tea, which was much appreciated and we all bought some. The galls were taken back to XTBG for rearing by Warin another PhD student at XTBG.

The next excursion was a three-day trip northwest to Lancang County with Mr Li an expert on local flora from the XTBG herbarium. The trip was highly successful for *Castanopsis* galls as we were there at just the right time for emerging adults. Again some spectacular new morphotypes were found and Mr Li's field identification of the host tree



Spectacular new gall type on *Castanopsis echinocarpa*, in China; adult gallwasps emerged April 2011.

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species proved invaluable. I was privileged to see a very rare and habitat-threatened *Fagaceae* species, *Trigonobalanus doichengensis*; unfortunately there were no galls. After this trip we were able to spend one more day in the field in the Menghai region consolidating our findings, Mr Li's skills helped us find more sites and galls on our second visit there. Adult gallwasps began to emerge from the 90 rearings while we were in China and continue to do so.

As of writing over 10 new gallwasps species have emerged from *Quercus* and *Castanopsis* galls from both Taiwan and China. We are waiting to receive them in Edinburgh for molecular analysis; Chang Ti and leading gallwasp taxonomist George Melika will describe type specimens. The *Lithocarpus* gallwasps are taking longer to emerge and galls are still in rearing.

The expedition has been a great success both scientifically and personally and I would like to thank the James Rennie Bequest for supporting my role in it. I was left with a greater respect and interest for the host tree species and changes in their community structure that occur with altitude. We would love to return to China to collect in primary rainforest at altitudes over 2000m in southern Yunnan where *Lithocarpus* species dominate and to northern Yunnan for temperate species of *Castanopsis* and *Quercus*. We made many friends and potential collaborators in both Taiwan and China we hope can help us achieve these aims in the future.

Jack Hearn
May 2011