Italian balustrade at Cliveden hosts Italian lichens?

Cliveden in Buckinghamshire was once the glittering hub of society, renowned for hosting exclusive parties and later becoming infamously associated with the Profumo Affair. The magnificent house and gardens, overlooking the River Thames, are now owned by the National Trust, though the house is run as a private hotel. Two separate balustrades are present along the south side of the house; the most spectacular is the early seventeenth century Borghese Balustrade which was purchased by Lord Astor in the late nineteenth century from the Villa Borghese Gardens in Rome.

Even such habitats as paved terraces and balustrades may host interesting organisms, which should be considered during restoration of the stonework. For instance, *Papillifera papillaris* is a small Mediterranean land snail, called the "Cliveden snail" because in 2008 it was discovered living in the Borghese Balustrade (*http://www.guardian.co.uk/environment/2010/aug/26/tiny-mediterranean-snail-discovered*), presumably imported from the Mediterranean Basin while hiding in the nooks and crannies of the stonework. The Cliveden snail is thought to feed on lichens.

Because extensive restoration work is being undertaken on the terrace and balustrades of Cliveden, the first author was asked to examine the stonework in case any notable lichens needed special consideration during the works. The balustrades were visited in February and March 2012.

The examination of the lichen communities of the Borghese Balustrade is still in process, but an interesting community has been discovered there which includes *Bagliettoa calciseda*, *Caloplaca ochracea*, *C. variabilis*, *Collema tenax* var. *tenax*, *Lecanora pruinosa*, *Placynthium nigrum* and *Rinodina bishoffii*. This older balustrade, carved from extremely hard travertine and imported from Italy, hosts large lichen thalli completely covering the stone. The lichen communities are formed here of old lichens and, with the absence of pioneer species, they have the ancient appearance of those present on old limestone chest tombs. Here is a nice project for the future, to attempt to confirm (or otherwise) the hypothesis that the thalli of some outstanding lichen species were imported from Italy on the balustrade units. The balustrade was situated in Rome for more than two centuries, thus we suppose it was covered in Mediterranean lichens at the time of transfer to England. Perhaps lichenometry or phylogeography of particular taxa could shed some light. For instance the abundance of *Caloplaca ochracea* seems unusual for the Home Counties and raises further suspicions that the community may not be indigenous.

The more recent balustrade of the terrace is the one that will receive most attention from the restorers and, although the lichen community appears to be much more recently colonised than that on the Borghese Balustrade, it is actually richer in species. Notable lichens include *Lecanora pruinosa* and *Verrucaria ochrostoma* which are both present in good quantity on the horizontal surface of the balustrade rail. This community is dominated by *Aspicilia calcarea*, *A. contorta*, *Caloplaca dichroa* and

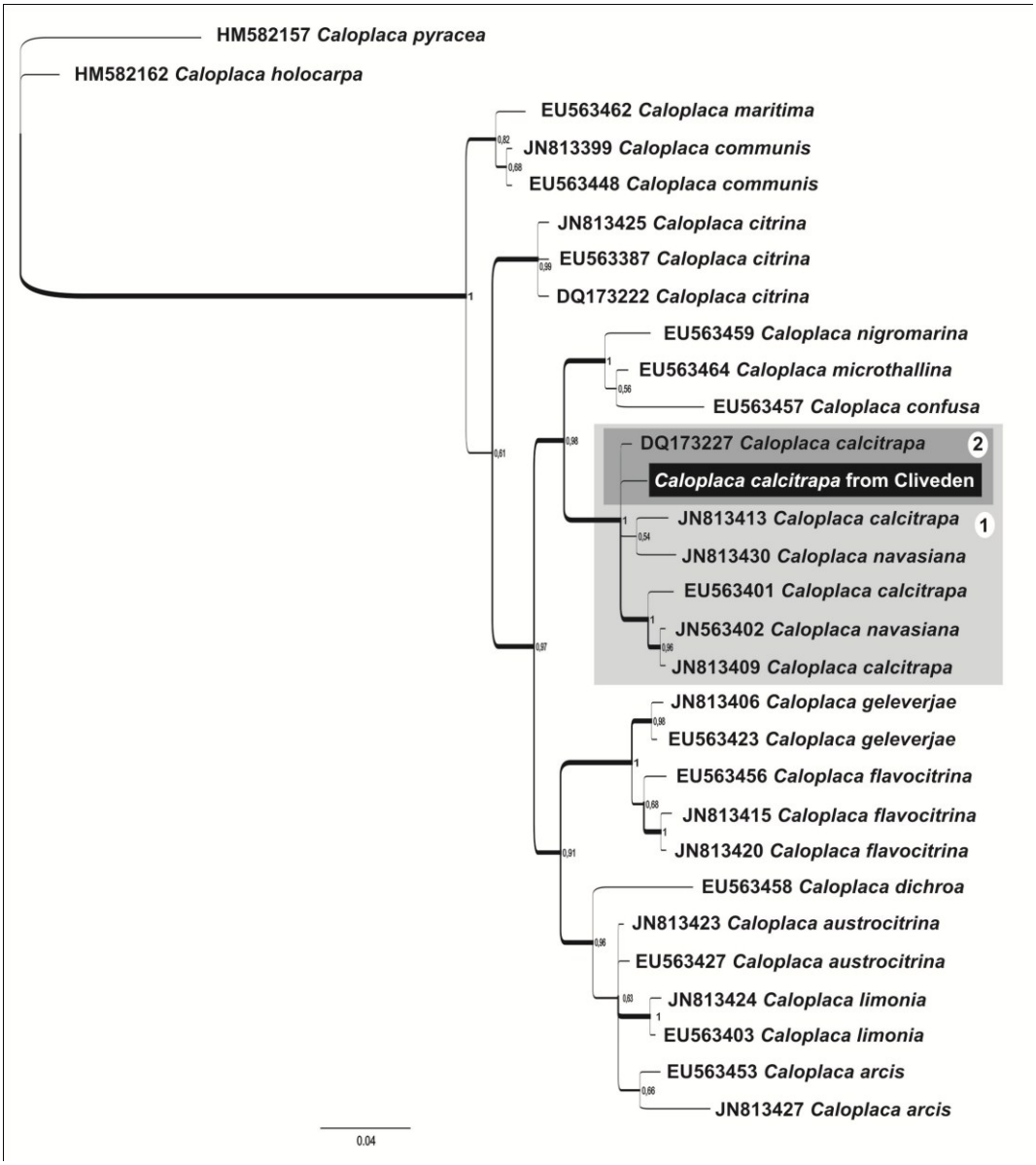
Verrucaria nigrescens with other species such as *Bagliettoa calciseda*, *Caloplaca variabilis*, *Solenopsora candicans*, *Toninia aromatica* and *Verrucaria fuscella* in smaller quantities.

Caloplaca calcitrapa growing on the terrace balustrade, Cliveden

An unfamiliar specimen of *Caloplaca* with yellow bullate areoles was collected (February 2012) from the newer balustrade and this was found to have thick-walled, "sand-clock" type spores. Arup (2006) states that this type of spore is unique to *Caloplaca dichroa* in northern Europe, but these spores also occur in *C. calcitrapa*, a species restricted to the Mediterranean Basin (Navarro-Rosinés *et al.* 2000). The specimen from Cliveden fits well the description of *C. calcitrapa* but we were sceptical and wanted to confirm placement of the English lichen by molecular fingerprinting. Our first attempt at genetic sequencing failed, perhaps due to the small amount of scraped material or by strong contamination with the glue Copydex. We suspected that there may be further species of *Caloplaca* in Europe which have thick-walled spores and so we wavered with the identification. A second, more richly fertile specimen was recently collected and this was confirmed as *C. calcitrapa* by reference to the ITS sequence (see below); unfortunately the specimen has been almost destroyed by removing parts for sequencing.

We are left to speculate whether *C. calcitrapa*, like the little snail, was imported to Cliveden from the Borghese Gardens in Rome or whether it is an overlooked member of our native mycota. If it was imported, it appears to have disappeared

from the Borghese Balustrade but spread to the terrace balustrade some fifty metres to the north where it occurs in three colonies.



Bayesian phylogeny of the *Caloplaca citrina* group showing placement of the English specimen of *Caloplaca* from the Cliveden balustrade. Groups highlighted in grey are: (1) *Caloplaca calcitrapa* s. lat. containing also specimens without "sand-clock" spores and specimens without yellow areolated thallus (*C. navasiana*); (2) *C. calcitrapa* s. str. including the type of *C. calcitrapa* from the Mediterranean France and the specimen from England. For the methods of molecular analysis ask the authors.

References
Arup, U. (2006). A new taxonomy of the *Caloplaca citrina* group in the Nordic countries, except Iceland. *Lichenologist* **38:** 1-120.
Navarro-Rosinés, P., Gaya, E. & Roux, C. (2000) *Caloplaca calcitrapa* sp. nov. (Teloschistaceae) un nuevo liquen saxícolo-calcícola mediterráneo. *Bulletin de la Société linnéenne de Provence* **51:** 145–152.

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BLS Summer Vacation Scholarship report – a New Zealand lichen study

Introduction and background
I spent the Southern Hemisphere summer 2008/09 with a voluntary lichenological internship at Landcare Research in Dunedin, New Zealand, supervised by David Galloway. During that time, I made the observation that the usually sexually reproducing species *Icmadophila splachnirima* (formerly *Knightiella splachnirima*) can also form marginal soralia. Interestingly, almost all strongly sorediate specimens lacked mature apothecia but were densely covered with apothecium initials, which were apparently arrested at an early developmental stage. In contrast, fertile specimens were mostly esorediate. Further study showed that the sterile and sorediate form prevail in rather exposed and dry micro-habitats, while the fertile and mainly esorediate form is dominant in sheltered and constantly moist sites, though both forms grow in very close spatial proximity, just a few meters or even less than 1 m apart. A continuous range of intermediates was observed as well, including rare specimens with mature apothecia and pronounced marginal soralia. I therefore conclude that only one species exhibiting two reproductive modes is involved, and not a species-pair. Because the two reproductive modes are apparently related to contrasting micro-climatic conditions, I hypothesize, that the switch from sexual to vegetative reproduction might be a stress response to adverse growth conditions.

David advised me to publish this observation, so I prepared a short publication (Ludwig 2011) while finishing my biology degree in Germany. He also applied successfully for the BLS Summer Vacation Scholarship on my behalf, to give me the opportunity to continue my studies on *I. splachnirima* in NZ. This award allowed me to travel back to Dunedin after my graduation in November 2010. A comprehensive and illustrated report of my work in NZ was submitted to the BLS Council last May, and this is a condensed form for the *BLS Bulletin*.