

### APPLICATION OF LICHENOMETRY TO METEORITE STUDIES.

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**Introduction:** The lichen colonisation of a large, weathered, ordinary chondrite that had been surface exposed in Wiltshire, UK, for numerous decades, was studied. As the terrestrial provenance of the meteorite was unclear, it was proposed that an examination of the lichens present on the surface may offer confirmation of the geographical location at which it was reported, at least at the continent level. Additionally using the technique of lichenometry [1] information about the time of exposure at the location was sought. Lichen growths on meteorites exposed to the natural environment are not uncommon; they are considered by some to adversely affect the appearance of the specimen. A study of the lichens on the Ella Island (Greenland) meteorite demonstrated early colonisation of a fall [2]. Unfortunately the meteorite studied in the work reported here remained in storage for 20 years after removal from the exposed location. Nevertheless the lichens were in sufficiently good state of preservation to allow identification. The community is described and discussed.

**Results:** Eight species of lichen have been named on the meteorite with some degree of certainty. These include the most conspicuous species and were determined by simple inspection as *Diploicia canescens* (rare), *Lecanora albescens* (rare), *L. campestris* (occasional), *L. dispersa* (occasional), *L. muralis* (occasional), *Phaeophyscia orbicularis* (occasional), *Physcia adscendens* (rare) and *Verrucaria fuscella* (rare). One small thallus was present that strongly resembles *Caloplaca arcis* (rare). Large colonies of a fertile *Caloplaca* species (frequent) was provisionally identified as *Caloplaca holocarpa* sens. str as was *Amandinea punctata* (occasional). Large areas of sterile crust, forming a background to the more distinctive lichens were present in some quantity on the meteorite and included *Lecania erysibe* (abundant) and possibly *Caloplaca chlorina* (abundant). A tentative identification was of *Verrucaria muralis* (rare). Two thalli of *Lecanora campestris* measured 6.0 x 3.2 cm and 4.3 x 3.5 cm. respectively. Two thalli of *L. muralis* measured 3.6 x 2.0 cm and 2.2 x 1.5 cm. A single thallus of *Diploicia canescens* measured 1.7 cm in diameter.

**Discussion:** The meteorite had not acquired any of the specialist lichens associated with the sarsen stones of Wiltshire, nor specialised iron species. The meteorite flora is reminiscent of that of ironstones and iron-rich sandstones (gravestones) and some types of brick: no species associated with a non-UK origin were identified. The community is consistent with exposure at a poorly eutrophic site where nutrients from bird droppings is low. All species were considered pioneers of bare rock thus a time of decades of environmental exposure at the Wiltshire location is not inconsistent by comparison to similar colonies on dated gravestones. Study of further meteorite finds exhibiting lichen colonisation may produce a useful dataset allowing conclusions to be reached about exposure time on Earth, location and climatic conditions endured.

**References:** [1] Winchester V. 1998. *Botanical Journal of the Linnean Society* 96: 57-68. [2] Hansen E.S. and Graff-Petersen P. 1986. *Lichenologist* 18: 71-78.