

## Rediscovery of the original material of Osbeck's *Lichen chinensis* and the re-instatement of the name *Parmotrema perlatum* (Parmeliaceae)

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**Abstract:** HAWKSWORTH, D. L. 2004. Rediscovery of the original material of Osbeck's *Lichen chinensis* and the re-instatement of the name *Parmotrema perlatum* (Parmeliaceae). – *Herzogia* 17: 37–44.

The original material on which the designation *Lichen chinensis* was based has been rediscovered in Linnaeus' herbarium and proves to belong to the species now called *Parmotrema tinctorum*. The name *Lichen perlatus* is shown not to be illegitimate and is re-instated as *P. perlatum* for the species incorrectly referred to as *P. chinense* by some recent authors. *Lichen chinensis* is regarded as not validly published, and so is not to be taken up for *P. tinctorum*.

**Zusammenfassung:** HAWKSWORTH, D. L. 2004. Die Wiederentdeckung des Originalmaterials von Osbeck's *Lichen chinensis* und die Wiedereinführung des Namens *Parmotrema perlatum* (Parmeliaceae). – *Herzogia* 17: 37–44.

Das Originalmaterial von *Lichen chinensis* wurde im Herbarium von Linnaeus wiederentdeckt und erwies sich als zu einer Art gehörig, die heute *Parmotrema tinctorum* genannt wird. Es wird gezeigt, dass der Name *Lichen perlatus* nicht ungültig ist und als *P. perlatum* wieder eingesetzt wird für die Art, die unrichtigerweise als *P. chinense* von einigen Autoren geführt wurde. *Lichen chinensis* wurde nicht gültig publiziert und ist daher kein älterer Name für *P. tinctorum*.

**Key words:** Lichens, Linnaeus, nomenclature, *Parmelia*, *Parmotrema chinense*, *P. tinctorum*, typification.

### Introduction

The lichen *Parmotrema perlatum* (Huds.) M.Choisy 1952 (syn. *Parmelia perlata* (Huds.) Ach. 1803, *Lichen perlatus* Huds. 1762) is one of the most conspicuous and well-known members of its genus in temperate regions, occurring in Africa, North and South America, Asia (Japan), Australasia, Europe, and Atlantic and Pacific islands (HALE 1965). Further, it has come to be widely used as one of the key indicator species in scales devised to reflect ambient sulphur dioxide levels in the air since HAWKSWORTH & ROSE (1970). The name was well-established through the world's literature, to the extent that citations of its usage cover almost five pages in ZAHLBRUCKNER (1929: 253–257).

In common with many early lichen names, the typification and nomenclature of *Lichen perlatus* required restudy to fix its application. HALE (1961) meticulously undertook this task, selecting a specimen from the collections of Dillenius in OXF as lectotype for HUDSON's name. The matter remained closed until HALE & AHITI (1986) came across *Lichen chinensis* Osbeck 1757. These authors did not locate any material of Osbeck's, nor mention HANSEN & MAULE's (1973) study on Osbeck's collections (see below), typified his name by the Dillenian specimen previously selected as the type for Hudson's name, and transferred the epithet into *Parmotrema*. Although Osbeck's name had not been used in the literature between 1757 and 1986, it was commended for use from that date for the species by then almost universally referred to as *Parmelia perlata* or *Parmotrema perlatum*.

In 1986 the “International Code of Botanical Nomenclature”, the *Code*, did not permit the conservation of names in the rank of species other than those of “major economic importance”. This provision was not extended to all species names where conservation would promote nomenclatural stability until the Tokyo *Code* of 1993. At that time, proposals to grant specially protected nomenclatural status to names in current use were also under discussion (GREUTER 1991), and as “*perlata*” would have fallen into that category the name change advocated by HALE & AHTI (1986) was not universally adopted (e.g. PURVIS & JAMES 1992). However, no formal nomenclatural proposal was published, and the epithet “*chinense*” slowly started to be taken up in checklists and regional studies from the mid-1990s (e.g. NIMIS 1993, SANTESSON 1993).

As a part of on-going studies on the systematics of the parmelioid lichens, the nomenclatural standing and application of the designations *Lichen chinensis* and *L. perlatus* were revisited, and it emerged that the name change proposed by HALE & AHTI (1986) was unsound. The results of this re-investigation are presented here.

### Osbeck’s specimens

Pehr Osbeck (1723–1805) was a Swedish clergyman and botanist, and served as the ship’s chaplain of the Svenska Ostindiska Kompaniet on the voyage of the “Prins Carl” to the Far East (including China) in the years 1750–52 (STAFLEU & COWAN 1981). He was not a pupil of Carl Linnaeus according to STAFLEU (1971), but he was according to BRETSCHNEIDER (1898) and PETERSON & PETERSON (1967). HANSEN & MAULE (1973) stated that he studied theology and natural history in Uppsala during the years 1745–50 “at the feet of Linnaeus”. Whether he was strictly a pupil or not, according to Osbeck’s own autobiography (OSBECK 1960) Linnaeus clearly influenced him, almost leading him astray from the Church. He does not appear to have produced a dissertation under Linnaeus (KIGER et al. 1999), and the explanation of this apparent discrepancy is presumably that he majored in theology rather than medicine. In any event, Osbeck obtained holy orders in 1750, and left the same year on the voyage of the “Prins Carl”, having been given a recommendation for the position by Linnaeus (HANSEN & MAULE 1973).

Details of the voyage are provided in HANSEN & MAULE (1973). The “Prins Carl” anchored in Canton from 24 August 1751 to 4 January 1752. “Canton” is the city now named Guangzhou in Guangdong Province at the head of the Zhujiang Kou estuary which has Hong Kong and Macau at its mouth. Collecting specimens in the area was evidently hazardous, and Osbeck had stones, dirt and verbal abuse thrown at him as he endeavoured to secure samples around Canton “where brigands from all China come together”. In any event, Osbeck evidently held Linnaeus in the highest regard, to the extent that on the day after he returned from his voyage, on 27 June 1752, he wrote to Linnaeus who was then busy working on the text of “Species Plantarum” (LINNAEUS 1753). He also appears to have organized a Chinese tea set decorated with *Linnaea borealis* as a gift for Linnaeus. Linnaeus asked Osbeck for specimens, especially for an *Osbeckia*, as Linnaeus had promised before the expedition to name a new genus after Osbeck on the assumption he would have material of new genera; he did, and Linnaeus did (*Osbeckia chinensis* L., Melastomataceae). Linnaeus clearly also held Osbeck in esteem as well, writing “You sir, have everywhere travelled with the light of science: you have named every thing so precisely, . . .” (transl. FORSTER 1771: 127). There was an extensive correspondence between the two, and Osbeck sent Linnaeus a “booklet” of Chinese specimens between 9 and 18 July 1752. This booklet is preserved with the collections of Linnaeus in the rooms of

the Linnean Society of London (LINN), and its contents have been described by HANSEN & MAULE (1973). However, some specimens are missing from the alphabetical series of numbering in the booklet, and some of these were evidently incorporated into Linnaeus' own collection. Only a single unnamed lichen collection was represented in the booklet, on page "T" according to HANSEN & MAULE (1973), and those authors considered that this was the collection now on sheet LINN 1273.152 which has a "T" added after Osbeck's name (fig. 2B).

Material from the "Prins Carl" voyage was also dispersed to several other herbaria apart from LINN, notably C, E, H, LD, S and UPS (STAFLEU & COWAN 1981).

## Nomenclature

### *Lichen chinensis*

Linnaeus described many of Osbeck's plants as new to science in "Species Plantarum", but no lichen. In consequence, in the diaries of his voyage, Osbeck introduced names for some of the lichens found during his travels, some were given phrase names, such as *Lichen pulverulentus viridis & albus* from Indonesia (Java), and others binomials, including *Lichen chinensis* from hills of an island near Canton (OSBECK 1757). Interestingly, although Linnaeus included references with page numbers to some species mentioned in Osbeck's work in later editions of "Species Plantarum" (e.g. *Daphne indica* L.; PETERMANN 1840), he does not seem to have taken up names which were only published in Osbeck's book, apparently not treating that as a source of what would now be termed validly published names – perhaps because the binomial system was not consistently employed by Osbeck. In this context, it should also be remembered that because a designation has two words does not automatically mean that it should be regarded as a specific name, as made clear in Art. 23.6. Because of this uncertainty, and there are other lichen names in the work yet to be investigated, there could be a case for adding Osbeck's book to the list of suppressed works in Appendix V of the *Code* under the provisions of Art. 32.7, at least for names applying to lichens.

The designation *Lichen chinensis* was introduced by OSBECK (1757: 221) in the account of the collections he made on 13<sup>1</sup> September 1751 in Canton. No description was provided, and the only text to appear after this "name" is "eller *Lichenoides glaucum perlatum subtus nigrum & cirrhosum*. Dill. Musc. 147. t. 20. f. 39." (fig. 1). "Eller" is Swedish for "or", and is given as that in FORSTER's (1771: 365) translation of Osbeck's work. No other usage of "eller" linked to an earlier scientific name appears elsewhere in the work. Osbeck's intent was therefore to say that **either** the material he collected was a new taxon, *Lichen chinensis*, **or** it was that represented in the figure of Dillenius. As he was not confident that the taxa were the same, the mention of the Dillenian phrase does not constitute a description or diagnosis but merely a reference to a possible earlier account of what he thought might have been the same species. That doubt was evident is clear from the previous entry on the same page (i.e. "*Jungermannia chinensis*. Dill. Musc. 64. f.4."; fig. 1) and others elsewhere in the book (e.g. "*Lichen marinus* Chus. Hist. p. ccl" from Java; p. 272), which have no expression of doubt. If the designation *Lichen chinensis* is accepted as a species name and not subject to the provisions of Art. 23.6, because of the expression of doubt it was not validly published in that place [GREUTER et al. 2000; Art. 32.1(c)]. That is, *Lichen chinensis* is not a "name" in the sense of the *Code* (Art. 6.3) as it never appears to have been validly published, and for this reason it is termed as a

1 FORSTER (1771: 347) gives the date as 12 September 1751, but this was presumably a typographical error.

*Polypodium cristatum.*  
 - - Barometz.  
*Iungermannia chinensis.* Dill. musc. 64. f. 4.  
*Lichen chinensis* eller *Lichenoides glaucum per-*  
*latum subtus nigrum & cirrhosum.* Dill. musc. 147.  
 t. 20. f. 39.  
*Agaricus (chinensis) stipite albo, spithameo;*  
*pileo lutescente.*

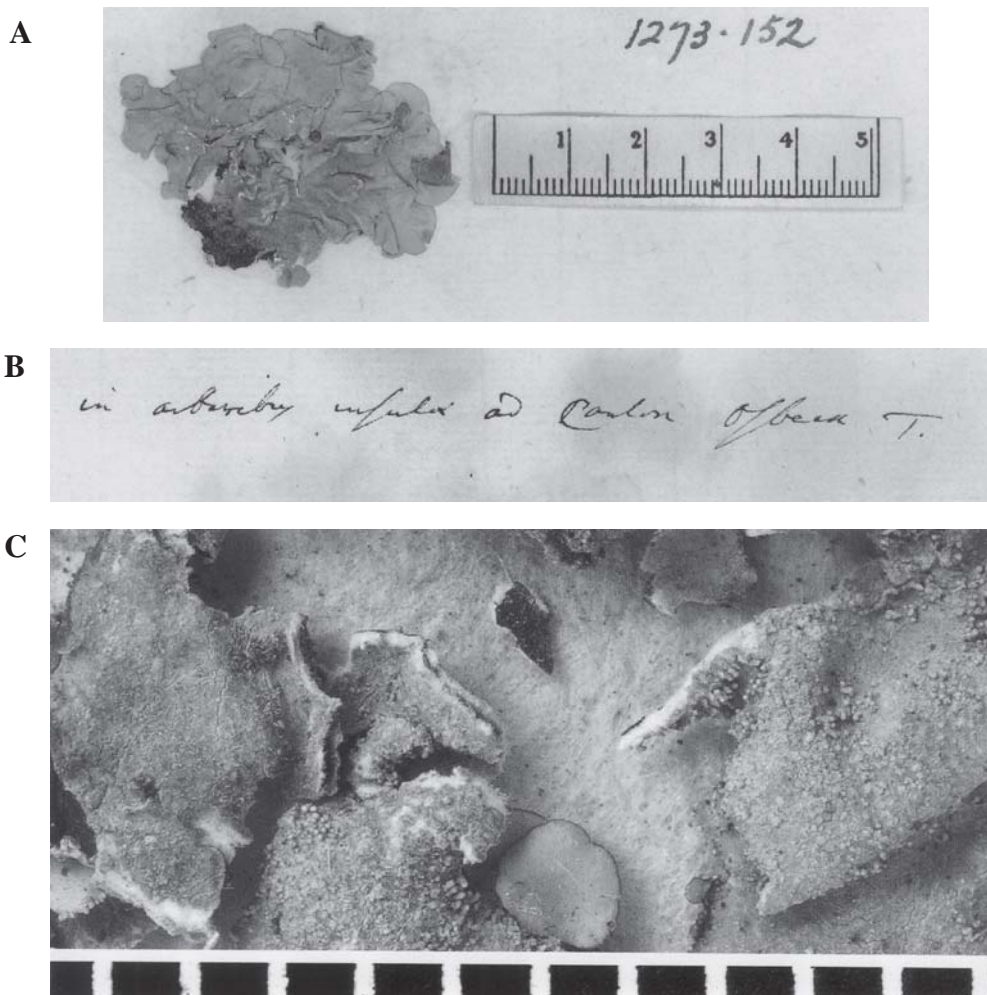
Fig. 1: Original introduction of the designation *Lichen chinensis* (OSBECK 1757: 221).

“designation” here. The designation never seems to have been considered worthy of mention by Linnaeus in any of his writings (PETERMANN 1840), although he had two copies of Osbeck’s book in his personal library which is now in LINN (pers. observ.), nor by his pupil ACHARIUS (1814). Linnaeus did not annotate his own copy of Osbeck’s diaries, although his son did note later identifications on the plates (SAVAGE 1940), which did not include any lichens. It is therefore not so surprising that the designation was also ignored by ZAHLBRUCKNER (1929), and that the only subsequent mentions of *Lichen chinensis* between 1757 and 1986 seem to be in historical accounts of the botanical exploration of China (e.g. BRETSCHNEIDER 1881, 1898).

Sheet LINN 1273.152 (fig. 2A) bears a single specimen with the wording “in arboris insulae ad Canton. Osbeck T.” on the reverse of the sheet in Linnaeus’ hand (fig. 2B). In addition there is a sheet with six specimens, LINN 1273.154 which has “Osbeck” written on the reverse side, also in Linnaeus’s hand (SAVAGE 1945). All seven specimens appear to represent the same species, a *Parmotrema* with rounded lobes 6–7 mm broad, a broad naked area with no rhizines towards the margins, no marginal cilia, no soredia, and densely fine-isidiate towards the centre of the thallus (fig. 2C). The medulla of 1273.152 and the second specimen on the left up from the base on sheet 1273.154 were both tested with C (sodium hypochlorite) and PD (*para*-phenylenediamine in 95 % ethanol) and reacted C+ blood red (scarlet) and PD-. Examination of minute fragments of lobes by thin-layer chromatography using Solvent System A (CULBERSON & AMMANN 1979) revealed that atranorin and lecanoric acid were present (P. K. Divakar, pers. comm.). The chemical characters and morphological features leave no doubt that the material all represents the single species now known as *Parmotrema tinctorum* (Despr. ex Nyl.) Hale 1974<sup>2</sup>, one of the commonest parmelioid lichens in the region (THROWER 1988, WEI 1991). No further Osbeck lichen material could be located in C (U. Søchting, pers. comm.), E (B. J. Coppins, pers. comm.), H (T. Ahti, pers. comm.), or S (A. Tehler, pers. comm.), and no replies were received from LD or UPS.

Osbeck reported collecting a number of other lichens during his travels, but apparently only one other came from near Canton, “*Lichen (Euphorbiae) foliaceus, pulverulentus*” found on 6

<sup>2</sup> Often cited as “(Nyl.) Hale”, but NYLANDER (1872: 547) attributed the name *Parmelia tinctorum* to Despreaux, and the taxon is typified by material from the Canary Islands almost certainly collected by him (HALE 1965). However, as the diagnosis was evidently written by Nylander, this is a case where “ex” is appropriate under Art. 46.4 of the Code and this form was correctly used by LOUWHOFF & ELIX (1999).



**Fig. 2:** Original material of *Lichen chinensis* (LINN sheet 1273.152). **A** – Entire specimen (scale in cm); **B** – reverse of the sheet with the annotation “in arboribus insulae ad Canton. Osbeck T.” in Linnaeus’ hand; and **C** – detail of the surface of the lobe showing fine coralloid isidia (scale in mm). Photographs © Linnean Society of London.

October 1751 along the riverside (OSBECK 1757: 233) on “the French Island”<sup>3</sup> (FORSTER 1771: 377). However, in view of the superficial similarity between the specimen in LINN and the Dillenian drawings, there can be little doubt that this represented what he later termed *Lichen chinensis*. Had Osbeck’s designation been validly published, the localized specimen LINN 1273.152 would therefore be regarded as the holotype, and those on sheet 1273.154 as most probably isotypes as they may well have come from the same tree.

The figure in DILLENIUS (1742) referred to by Osbeck is actually a composite, plate 20 fig. 39 comprising five elements labelled as “A” through “E” which represent several different parmelioid lichens. These were studied by CROMBIE (1880) and HALE (1961), and are a mixture of at least

<sup>3</sup> An island in the river Canton, said to be called “Som-fo-ang”.



three species, named by Hale as: *Parmelia* sp. (A), *P. perlata* (B), *P. cfr. pseudoborreri* (actually probably *Punctelia borreri* s. str.) (C), *P. epiclada* (D), and *P. cfr. perlata* (E). HALE & AHTI (1986) selected B as “lectotype”, but did not explain why they decided to lectotypify the name at all, and why it was necessary to select a specimen which was already the type of another name (*Lichen perlatus*, see below); in any event the decision was unfortunate as changing the name of such a common lichen would inevitably be disruptive.

However, Osbeck had not seen any original material of Dillenius, and was merely referring to the plate to give a general impression of the lichen he had found. Had Osbeck’s designation been validly published, it would in any case have been incorrect to use the term “lectotype” for a particular specimen he had not examined in OXF. They could have selected the actual figure as lectotype, but instead detailed the specimen. For any that wish to assume that the name was validly published, the 1986 typification should be set aside because “original material [has been] rediscovered” [Art. 9.17(a)] and further as it was in “serious conflict with the protologue”, notably with the species epithet “*chinensis*” as the selected material was not from China, and “another element is available that is not in conflict with the protologue” [Art. 9.17(b)]. The choice of an epithet is to be taken as an indication of the intent of an author (Rec. 9A.3). This debate is, however, merely of academic interest because of the doubt expressed by Osbeck’s use of “eller”, and the existence of original material from China (including what would clearly be the holotype).

Were “eller” to be interpreted as meaning “equal to” rather than “or”, a view taken by some Swedish-speaking lichenologists (Ahti, pers. comm.), this would not affect the retypification by Osbeck’s original material, but would mean that *Lichen chinensis* was validly published and so a “name” in the sense of the *Code*. The result would be that a proposal to formally reject the name *Lichen chinensis* would have to be made in order to safeguard the well-known *Parmotrema tinctorum*, a step which I would consider unnecessary.

### ***Lichen perlatus***

This name was introduced by HUDSON (1762: 448), had an independent two-line description, and was consequently definitely validly published. The Dillenian polynomial *Lichenoides glaucum perlatum, subtus nigrum et cirrhosum* was listed as one of two earlier names given as synonyms by Hudson, the other being one of Morison’s (HALE 1961). As Osbeck, Hudson mentioned “f. 39” after the Dillenian polynomial but with no further specification as to a precise element of fig. 39. HALE (1961) designated B as “lectotype”, i.e. the species called *Parmotrema* (or *Parmelia*) *perlatum* by most authors since the mid-nineteenth century, as no original material of Hudson’s could be located. It is not certain if Hudson studied the Dillenian specimen, but he could well have done in which case the “lectotype” can be presumed to be the specimen in OXF and not merely the illustration; if not the specimen would be better referred to as an “epitype”. In any event, Hale’s choice can be commended and accepted as in accord with widespread usage. The earlier rejection as a “nomen confusum” by DU RIETZ (1924: 80) because the name had been applied to different species followed a procedure in Codes up to the Leningrad Congress of 1975, but is not acceptable under the current Code, whereby rejection can only be effected through a formal proposal for rejection under Art. 56.2; this procedure has never been advocated for *Lichen perlatus*.

Hudson’s name, unlike that of Osbeck, was taken up by Linnaeus and used in several of his post-1762 publications (PETERMANN 1840, RICHTER 1840). However, HALE & AHTI (1986)

considered Hudson's name as illegitimate under the then Art. 63.1 as the protologue "included the type of a name which ought to have been adopted", viz. *Lichen chinensis*. However, this provision relates only to names which were "nomenclaturally superfluous when published" (VOSS et al. 1983), a wording retained unchanged in the current *Code*, but now renumbered as Art. 52.1 (GREUTER et al. 2000). Even if *Lichen chinensis* had been validly published, in 1762 the designation had not been typified by the Dillenian specimen in OXF, and so Hudson's name was legitimate when published. There appears to be no obstacle whatsoever to the acceptance and use of the name *Lichen perlatus* under the *Code*.

## Conclusions

The above nomenclatural considerations lead to the following conclusions:

- 1 – The designation *Lichen chinensis* was not validly published and referred to the species now known as *Parmotrema tinctorum*.
- 2 – The name *Lichen perlatus* is legitimate and must be reinstated as the basionym of the species now to be known again as *Parmotrema perlatum* (Huds.) M.Choisy 1952 and not *P. chinense* "(Osbeck)" Hale & Ahti 1986.
- 3 – The name *Parmotrema tinctorum* can remain in use as it is not threatened by the earlier *Lichen chinensis* as long as that designation is agreed as being not validly published.
- 4 – Consideration should be given to adding Osbeck's book to the list of suppressed works in the *Code* as binomial nomenclature was not consistently employed.

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