Review

Peter D. Crittenden: meta-analysis of an exceptional two-decade tenure as senior editor of *The Lichenologist*, the flagship journal of lichenology

Robert Lücking

Botanischer Garten und Botanisches Museum, Freie Universität Berlin, Königin-Luise-Straße 6–8, 14195 Berlin, Germany

Abstract

Peter D. Crittenden served as senior editor of *The Lichenologist*, the flagship journal in the field of lichenological research, for a period of two decades, between 2000 and 2019. A review of the development of the journal and the publication output during this period is provided. The number of papers published during this period (1197) matches that of all papers published under the three previous senior editors, Peter W. James, David L. Hawksworth and Dennis H. Brown, during a much longer period of 42 years from 1958 to 1999. Peter oversaw important editorial changes to the layout and content of the journal: an increased size with a modern cover design, leaving behind the classic mint-coloured cover of more than 40 years; the addition of ‘thematic issues’ and encouragement of large monographs; implementation of substantial changes to the *Code*, such as effective electronic publication and obligate registration of new fungal names; and more recently a new policy to reject so-called ‘single naked species descriptions’. Shortly before Peter took over as senior editor, *The Lichenologist* had received its first impact factor, and Peter managed to continuously increase this measure from around 0.9 to lately up to over 1.5, higher than most other competing journals. The 1197 papers between 2000 and 2019 were published by a total of 1138 different authors, more than half of whom appeared just once as author, whereas a small number participated in numerous (up to 93) papers. There was a continuous increase in the mean number of authors per paper per year, from below 2.5 to around 3.5, the highest numbers ranging between 11 and 30; still, c. 75% of all papers between 2000 and 2019 were single-authored or had up to three authors. Based on affiliations at the time of publication, two thirds of author contributions came from Europe (66%), 13% from North America, 9% from Asia and 7% from Latin America. Likewise, almost half of the study areas were located in Europe and around 10% each in North America, South America and Asia. The countries with the highest number of studies included, in descending order, the United States, Spain, the United Kingdom, Norway and Sweden. North America and Europe were over-represented in terms of author contributions, whereas Africa, Latin America, Australia and Oceania were over-represented in terms of study areas. The 1197 papers analyzed encompassed a broad diversity of topics, classified into 32 categories. Taxonomy of lichenized fungi was the most frequent component, representing the focal point in almost half of all studies, followed by phylogeny and evolution, ecology, and the taxonomy of lichenicolous fungi. Around two thirds of the currently accepted genera of lichenized fungi were treated, with a significant correlation between known species richness and the number of papers in which a genus was treated, underlining the taxonomic representativity of papers published in the journal during the past two decades. Examples of genera that were treated more frequently than expected included commonly studied model organisms, such as *Lobaria*, and those frequently featured in ecological or other non-taxonomic studies, such as *Xanthoria*. Species-rich tropical genera, particularly in the *Graphidaceae*, were generally under-represented. Mean number of authors per paper per volume and total number of country origins of authors per volume were the best predictors of impact factor, followed by diversity of study countries per volume, mean number of study countries per paper per volume, mean number of topics per paper per volume, and proportion of studies with phylogenetic components per volume. Individual papers that contributed to high impact factors included broad-scale revisionary treatments and worldwide keys to species-rich taxa, substantial phylogenetic reclassifications of known taxonomic groups, papers dealing with novel methodological approaches of broad interest, and broad-scale studies related to environmental change and lichen biomonitoring.

Key words: *Graphidaceae*, *Hypogymnia physodes*, lichen microbiome, *Lobaria pulmonaria*, multi-authored papers, *Trypetheliaceae*, *Xanthoria parietina*

(Accepted 18 August 2020)

Introduction

Founded in 1958 by the British Lichen Society (BLS), *The Lichenologist* soon established itself as the flagship journal of...
from taxonomy, systematics and molecular phylogeny, to ecology and biogeography, to applications in biochemistry and biomonitoring. Almost half of these papers appeared under the senior editorship of Peter D. Crittenden, our esteemed colleague and friend honoured with this issue, who took responsibility for the journal in the year 2000 and only recently, after a 20-year tenure, handed over this role to a new tandem, Christopher J. Ellis and Leena Myllys (Ellis & Myllys 2020).

In this paper, the output of The Lichenologist over the past 20 years (2000–2019) is reviewed and analyzed, outlining how the journal has developed over these two decades and paying homage to the extraordinary efforts Peter has put into maintaining and increasing the role of The Lichenologist as the world’s flagship journal in lichenology.

Material and Methods

All publications recorded in the Recent Literature on Lichens database (http://nhm2.uio.no/botanisk/lav/RLL/RLLHTM; Timdal 2010) up to 2019 were downloaded. The records were first sorted according to journal and, after cleaning up the journal data, the number of publications per journal was computed.

In a second step, all papers published in The Lichenologist (2453) were filtered and checked for duplicates, which were removed. The data set was then divided into papers published between 1958 and 1999 (1256) and between 2000 and 2019 (1197). The subset from between 2000 and 2019 was further edited and analyzed as follows (see Supplementary Material S1, available online):

- All authors were checked and standardized.
- For each author and publication, the affiliation country was recorded.
- Titles were checked and corrected where necessary.

Each publication was screened and scored for topic, using the following designations: Allelopathy, Biodeterioration, Biodiversity and Conservation, Biogeography, Biology, Biomonitoring, Biotechnology, Book Review, Chemistry, Culturing, Ecology, Ecophysiology, Editorial, Environment, Fossils, History, Interactions, Lichenicolous, Metabolism, Microbiome, Morphology, Nomenclature, Ontogeny, Photobionts, Phylogenomics, Phylogeny and Evolution, Pollution, Population Genetics, Resources, Symbiosis, and Taxonomy; a paper could have more than one designation.

- Each publication was screened and scored for countries covered.
- Each publication was screened and scored for genera covered; where possible, outdated genus assignments were complemented by current generic classifications (e.g. in Caloplaca s. lat., Lobaria s. lat., Parmelia s. lat. etc.).
- Recorded genera were classified to family level based on Lücking et al. (2017a, b).

The 2-year impact factor (IF) of the journal for the period from 1999 to 2018 was obtained from Scimago (https://www.scimagojr.com/journalsearch.php?q=19312&tip=sid&clean=0). To analyze which parameters potentially contribute to the impact factor, the following were assessed:

- Mean number of authors per paper per year (volume).
- Total number of country origins of authors per year (volume).
- Diversity of topics per year (volume).
- Mean number of topics per paper per year (volume).
- Proportion of non-taxonomic topics per year (volume).
- Diversity of study countries per year (volume).
- Mean number of study countries per paper per year (volume).
- Diversity of genera per year (volume).
- Mean number of genera per paper per year (volume).
- Proportion of studies with phylogenetic components per year (volume).
- Inclusion of a thematic issue per year.

For each IF year, the mean value for the two preceding years of each parameter was computed and then each parameter was plotted against the IF, to calculate the corresponding Spearman rank correlation. To analyze which parameter predominantly contributed to IF in a multiple regression model, three multiple regression models were tested:

- Forward stepwise linear multiple regression.
- Backward stepwise linear multiple regression.
- General non-linear multiple regression with log link function.

To assess the impact of individual publications, citation records of all papers published between 2000 and 2019 were obtained from the Web of Science (http://apps.webofknowledge.com; Salisbury 2019) and, for comparison, also from Google Scholar (https://scholar.google.com; Falagas et al. 2008; Harzing & Alakangas 2016; Martín-Martín et al. 2018) for the 50 most cited papers.

Results and Discussion

General development of the journal

The Lichenologist started out in November 1958 with the first issue of Volume 1, with Peter W. James as senior editor and privately published by the British Lichen Society. Volume 1 was...
published with five issues between 1958 and November 1961. All issues maintained a basic cover layout, although the first three issues experimented with colour until arriving at the classic mint green with issue 3 that would be in use until the year 2000 (Fig. 2). The 3-year span for a single volume continued with Volume 4 (1968–1970) and 5 (1971–1973), and it was only with Volume 6 (1974) that consecutively numbered volumes became synchronized with calendar years.

Beginning with the first issue of Volume 4 in 1968, the journal maintained a consistent cover layout for 32 years until the year 2000.
2000 (Fig. 2). During this period, Peter James continued as editor until 1977 (Volume 9), in that year in tandem with David L. Hawksworth. Hawksworth then took over in 1978 (Volume 10) and stayed on until 1988 (Volume 20), in that year in tandem with Dennis H. Brown who continued as editor until 2000 (Volume 32). During Brown’s tenure, a major change was the switch to six annual issues in 1995 (Volume 27); in previous calendar year-based volumes, the number of issues had oscillated between mostly three and later four, rarely two. In 1997, the journal started to be indexed, resulting in the first 2-year impact factor in 1999.

In 2000, with Volume 32, Peter D. Crittenden started as senior editor of the journal, the first two issues in tandem with Dennis Brown and from issue 3 onwards as sole editor, continuing in this role until 2019 (Volume 51). Lasting 20 years, Peter’s tenure as senior editor has substantially surpassed that of all of his predecessors; indeed, the number of papers published under Peter’s editorial supervision (1197) almost matches that of all papers published under his three predecessors combined (1256). Peter can look back on a very successful period which has seen substantial developments in scientific research on lichens, but also significant changes in matters of publication. The first task that Peter took on was modernizing the layout and printing of the journal, adopting a larger page size and an entirely new cover layout with Volume 33 in 2001. The new layout combined an elegant design, playing with colour coordination between the graphic layout of the background and a selected lichen photograph, with a changed cover each volume (Fig. 2).

During his tenure, Peter witnessed major changes in the way taxa, and specifically fungi including lichens, are validly described: the new option of effective publication through electronic media and the discontinuation of an obligate Latin diagnosis (with the option to use either English or Latin), both starting on 1 January 2012, and obligate registration of new fungal names, which commenced on 1 January 2013 (McNeill et al. 2012). To this, the Code added the obligate registration of newly designed types, such as lectotypes, neotypes and epitypes, with a starting point of 1 January 2019 (Turland et al. 2018). Peter managed to implement these changes smoothly.

Peter’s tenure also saw the rise of molecular phylogeny as the predominant approach to lichenological studies in the past two decades. At the beginning of his editorship, on average less than 10% of the papers per year included molecular methods, and this proportion has grown to sometimes over 50% in the past few years (see below). Witnessing these developments, Peter also actively implemented changes to the scope of manuscripts published by the journal. Individual issues of the journal were dedicated to thematic topics bundling papers on a particular subject and thus generating a higher level of attention by readers. Thus far, this covered Graphidaceae (41(4), 2009), Thelotremataceae (42(2), 2010), Parmeliaceae (43(6), 2011), and Trypetheliaceae (48(6), 2016). Other thematic issues not specifically labelled included one on Physciaceae (33(1), 2001) and a set of papers from Session II of the 5th Symposium of the International Association for Lichenology in Tartu, Estonia, in 2004, ‘Quality and Quantity: maintaining biological diversity in space and time’ (38(4), 2006). Another strategy has been to encourage longer, more comprehensive papers: between 2000 and 2019, the mean number of pages per paper per year increased from mostly under 9 to largely over 11, with three of the four highest paper length averages in the past four years (Fig. 3). The highest page numbers for individual publications during this period were 220 (Aptroot & Lücking 2016), 90 (Lücking et al. 2009), 70 (Kistenich et al. 2019), 63 (Diederich & Etayo 2000) and 61 (Moncada et al. 2013). However, lengthy contributions had occasionally also been published prior to 2000, the five highest page numbers of individual papers being comparable to those listed above, namely 115 (Hawksworth et al. 1980), 89 (Hawksworth 1969), 81 (Hawksworth 1972) and 71 for two papers (Gilbert 1980; Lücking et al. 1998).

From 2016 (Volume 48) onwards, so-called ‘single naked species descriptions’ (SNSD) were no longer admitted for editorial reasons, a measure also adopted by several other journals specializing in lichen and fungal taxonomy. It forced authors to develop different publication models, enhancing alpha-taxonomy by elements with broader impact, such as incorporating molecular data or improved taxonomic or natural history context, and generating a more inclusive framework especially through the addition of updated identification keys. The latter in particular has been a useful by-product of this policy, although it shows tendencies towards inflation when adding a new key each time a new species is published in the same genus. Following the model by Lumbsch et al. (2011), multi-authored papers compiling individual new species descriptions have become a new outlet allowing for rapid cataloguing of unrecognized taxa (Aptroot et al. 2016; Lücking et al. 2016a; Sheard et al. 2017).

While the change in editorial policy to no longer accept SNSD might be seen as controversial, it was justified by the notion that a scientific journal is primarily a reading source and not a taxonomic encyclopedia. The attractiveness, and hence impact, of a journal lies in provoking immediate curiosity in a broad readership, whereas SNSD are largely of technical interest to a smaller community of specialists. This does not mean that journals should block the description of new species; on the contrary! After all, new species discoveries are the single most important component of cataloguing our planet’s diversity and laborious contributions by taxonomists, in particular non-professionals, are at the core. Nevertheless, blended with other publication models such as those mentioned above, The Lichenologist has generated its higher impact and has aimed to receive more immediate attention also from non-specialists. It is worthwhile noting that even before the new measure was implemented, the proportion of species established through SNSD had already declined.
The main difference is that since 2016, single descriptions require an enhanced component. Indeed, most new species were established as part of broader treatments, even prior to the new policy. Between 2000 and 2019, a total of 2069 new species were described in *The Lichenologist*, out of a total of 2988 since the first issue in 1958, which corresponds to 69% of all newly described species in 32% of the time. Thus, the rate of new species descriptions increased from 22 per year between 1958 and 1999 to 103 per year between 2000 and 2019. Of the 2069 species established in the past two decades under Peter’s tenure as senior editor, only 227 (11%) were described in single species descriptions, corresponding to 19% of all papers, whereas 89% were established using other publication models. Notably, between 2000 and 2015, before introducing the new policy of editorial rejection of SNSD, a mean of 96 new species had been published per year in the journal, whereas between 2016 and 2019, this figure increased to 135 new species per year. It thus appears that authors have not only accepted and successfully implemented this new measure, but also had followed its spirit long before the measure was introduced.

In 1999, just before Peter took over as senior editor, *The Lichenologist* started to receive annual 2-year impact factors (IF). During the first ten years until 2009, the IF largely oscillated between 0.8 and 1.0, with a single drop to 0.696 in 2005 and a single peak at 1.315 in 2008. Since then, Peter managed a continuous increase, with values constantly over 1.1 and two times (2014, 2017) up to 1.594 and 1.587 (Fig. 5). These values are distinctly above those of journals with similar specialized scope that frequently publish about lichens, such as *Herzogia*, *Mycotaxon*, *Nova Hedwigia* and *Phytotaxa*, with the exception of *The Bryologist*, which has seen a similarly successful tenure in its senior editorship by James (’Jim’) D. Lawrey since 2012 (Lücking et al. 2019). The flourishing development of both journals in parallel is not by accident; indeed, Peter and Jim have developed a successful collaboration aimed at increasing the quality of both journals during the past two decades, aided by Jim having served as an associate editor for *The Lichenologist* since 2005 (Lücking et al. 2019).

**Authorship of publications between 2000 and 2019**

A total of 1138 different authors was recorded for the 1197 papers published in the journal during Peter’s tenure as senior editor between 2000 and 2019. Of these, 637 (57%) appeared only once as author, while ten had 33 or more publications and, of these, three had between 65 and 93 (Fig. 6).

The mean number of authors per paper per year has continuously increased during the past two decades, remaining below 2.5
at the beginning of the millennium but then growing to around 3.5 (Fig. 7). For comparison, prior to 2000, the mean number of authors was 1.6. The peak in 2016 was caused by one paper with 30 authors on the phylogeny of Trypetheliaceae (Lücking et al. 2016b), thus far the record for the journal, and this was bolstered by two papers with 15 authors each, one on new species in Trypetheliaceae (Lücking et al. 2016a) and one on lichen diversity and air pollution in the Niagara Escarpment World Biosphere Reserve in North America (McMullin et al. 2016). The paper with the second highest number of authors (20) was published by Stofer et al. (2006), analyzing the richness of lichen functional groups in relation to land use intensity across Europe.

There have been 264 single-authored papers (22%), 634 papers with two or three authors (53%), 216 papers with four or five authors (19%), 92 papers with six to ten authors (7.5%), and six papers with more than ten authors (0.5%). By far the most frequent number was between one and three authors, representing 75% of all papers (Fig. 8). For comparison, prior to 2000, 59% of all papers were single-authored and 97% of all papers had between one and three authors. Thus, authorship in The Lichenologist during the past two decades has followed a general trend towards multi-authored papers (Wuchty et al. 2007; Nabout et al. 2015; Logan 2016; Teixeira da Silva & Dobrászki 2016), although this development was not as pronounced as it was in scientific journals in general, which as of 2019 showed a mean of 6.0 authors with papers frequently having over 100 authors (Aboukhalil 2014).

The overwhelming majority of author contributions between 2000 and 2019, based on affiliation at the time of publication, came from Europe (66%), particularly Western Europe (57%), followed by North America (13%), Asia (9%), Latin America (7%), in particular South America (6%), and Australia (4%). Few author contributions came from Africa (Fig. 9). This reflects an ongoing issue in mycology in general, although geographical balance is much improved compared to historical times (Lücking 2020).

Peter’s tenure as senior editor of The Lichenologist during the past two decades saw the passing of some of the greatest lichenologists of the 20th century, with tributes published in the journal (Fig. 10). These included: William Louis Culberson (1929–2003), a pioneer in the chemotaxonomy of lichens (Elix & Nash 2003); Oliver Lathe Gilbert (1936–2005), past president of the British Lichen Society and editor of the British Lichen Society Bulletin (Purvis 2005); Natsurang Homchantara (1957–2006), the first trained lichenologist in Thailand, who received her PhD with Brian Coppins in the UK in 1999 and passed away at the young age of 49 (Boonpragob 2010); Antonín Vězda (1920–2008), arguably one of the leading lichen taxonomists of all time (Farkas et al. 2010); John Walter Thomson (1913–2009), a pioneer in North American contemporary lichenology (Ahti 2009); Nina Sergeevna Golubkova (1932–2009), leading Russian lichenologist (Biazrov et al. 2010); Syo Kurokawa (1926–2010), Japanese lichenologist and world expert in Parmeliaceae and Physciaceae, who developed the TNS herbarium into a world-class collection (Kashiwadani 2011); Dharani Dhar Awasthi (1922–2011), known as the ‘Father of Indian Lichenology’ (Singh 2013); Aino (Marjatta) Henssen (1925–2011), who single-handedly redefined the importance of anatomy and ontogeny in lichen fungi for taxonomy and systematics (Lumbsch & Döring 2012); Rolf Santesson (1916–2013), a pioneer in the modern taxonomy of foliicolous lichens and ahead of his time envisioning a phylogenetic classification of lichen fungi (Tibell & Moberg 2014); Peter Willfrid James (1930–2014), a prominent figure in British lichenology, founding member and past president of the BLS, and first editor of The Lichenologist (Wolsey et al. 2015); Jack Rodney Laundon (1934–2016), also a founding member and past president.
of the BLS, astute in questions of nomenclature (Seaward & Hawksworth 2017); and Otto Ludwig Lange (1927–2017), one of the foremost authorities on ecophysiological studies in lichens (Green 2019). Some of these well-remembered colleagues published their last or only scientific papers in *The Lichenologist* (Homchantara & Coppins 2002; Gilbert 2004; Vězda in Lücking et al. 2005; James 2010; Lange in Bader et al. 2010; Laundon 2010).

Several other esteemed colleagues passed away during this period, also recipients of the prestigious IAL Acharius Medal like most of those mentioned above. These included Elisabeth Tschermak-Woess (1917–2001), F. J. Georges A. Clauzade (1914–2002), Siegfried Huneck (1928–2011), Christian Leuckert (1930–2011), Margalith Galun (1927–2012), Erast Parmasto (1928–2012), Vernon Ahmadjian (1930–2012), Hildur Krog (1922–2014), David John Galloway (1942–2014), and Hans-Voldemar Trass (1928–2017). While some of these were prolific contributors to the journal, others rarely, if ever, authored papers in *The Lichenologist*. Both Huneck and Galloway published among their last papers in the journal (Hauck & Huneck 2007; Galloway 2014). David Galloway was especially close to the journal, being author of a total of 44 papers, owing to his tenure in various positions, including Head of the Lichen/Bryophyte Division at the British Museum (Natural History) in London between 1973 and 1994, being an associate editor of *The Lichenologist* between 1987 and 1996, and vice president of the British Lichen Society between 1993 and 1994. It was Peter Crittenden who took over David’s slot as associate editor in 1997, before becoming senior editor three years later.

### Geographical focus of publications between 2000 and 2019

At a regional scale, the overwhelming majority of studies published in *The Lichenologist* between 2000 and 2019 were performed in Europe (49%), particularly in Western Europe (38%). Notably, the geographical region with the second highest number of studies was South America (11%), followed by North America and Asia (9% each). In the latter case, a higher proportion of studies related to South-East Asia (6%) compared to mostly temperate Asia (3%). The eastern austral region (Papua New Guinea, Solomon Islands, Australia, New Zealand) and Africa contributed 6.5% and 4.5% of the studies, respectively (Fig. 11). Other regions had a share of between 0.6% and 2.2%.

In terms of individual countries, most studies between 2000 and 2019 were performed in the continental United States, followed by Spain, the United Kingdom, Norway, Sweden, Australia, Canada, Germany, Russia and France (Table 1). Largely tropical, Asian or Southern Hemisphere countries with a comparatively high number of contributions included Brazil, Chile, India, China, Costa Rica, Japan and Mexico. This reflects a trend that commenced in the second half of the 20th century in the geographical diversification of mycological and lichenological expertise (Lücking 2020).

Geographical origin of author contributions correlated rather well with geographical focus of the individual study areas (Fig. 12). However, a slight shift could be observed for North American and Western European authors showing more frequent involvement in studies outside these regions, whereas for most other geographical regions, corresponding authorships were underrepresented. This was particularly obvious for Africa but to a certain extent also for Central and South America, and Australia (Fig. 12). Some studied regions had no contributing authors, which by default applied to the Arctic and Antarctica, but was also notable for the Caribbean and Oceania. In particular cases, these gaps were caused by authors having their origin in a particular region but at the time of publication were affiliated elsewhere.
for instance by doing a Ph.D. abroad, such as the Puerto Rican lichenologist Joel A. Mercado-Díaz who is currently affiliated with the University of Chicago and The Field Museum (Aptroot et al. 2016, 2018; Lücking et al. 2016b; Moncada et al. 2018).

**Topic orientation of publications between 2000 and 2019**

By far the most frequently covered topic in the 1197 papers published in *The Lichenologist* between 2000 and 2019 was taxonomy (44%), mostly alpha taxonomy but also new higher taxa and systematic rearrangements. Around 17% of the topics referred to a molecular phylogenetic component, mostly tree-based phylogenetics (15.5%), often accompanying taxonomic studies. The other two most frequent topics were lichenicolous fungi (4.7%) and ecology (8%). Overall, 32 topics could be distinguished, with many papers encompassing more than one (1.37 on average). Even with a dominance in taxonomy and systematics, the topics covered by the journal during the past two decades have been quite diverse (Fig. 13).

Over the past two decades, individual papers have highlighted advances in molecular approaches. A study of *Parmeliopsis ambigua* and *P. hyperopta* was among the first to employ the fungal ITS for species delimitation and to demonstrate the applicability of chemotaxonomy (Tehler & Källersjö 2001). Orock et al. (2012) tested the performance of blast-based identifications on lichens from Cameroon, while Redchenko et al. (2012) obtained

---

**Fig. 10.** Renowned lichenologists who passed away during the past two decades, with tributes published in *The Lichenologist*. Upper row, from left to right: William L. Culberson (1929–2003), Oliver L. Gilbert (1936–2005), Natsurang Homchantara (1957–2006), Antonín Vězda (1920–2008). Middle row, from left to right: John W. Thomson (1913–2009), Nina S. Golubkova (1932–2009), Syo Kurokawa (1926–2010), Dharani Dhar Awasthi (1922–2011), Aino Henssen (1925–2011). Lower row, from left to right: Rolf Santesson (1916–2013), Peter W. James (1930–2014), Jack R. Laundon (1934–2016), Otto L. Lange (1927–2017). Pictures taken from the original tributes (see text) and adjusted for greyscale and contrast. Photograph credits: see references cited in the text, with specific credits to J. Kocourková, T. Ahti, O. Blum, R. Honegger and H. Hertel. Reprinted with permission.
ITS data from a 151-year-old herbarium specimen. In the same year, Bates et al. (2012) published the first study on the eukaryote lichen microbiome using 454 pyrosequencing. More recently, Ludwig et al. (2017) presented one of the few studies on mating-type loci in lichen fungi, in the enigmatic species *Knightiella (Icmadophila) splachnirima*, a temperate eastern austral endemic (Ludwig 2016), and Dal Grande et al. (2018) sequenced the genome of *Lasallia hispanica*. Evidence for the formation of genetically identical, yet phenotypically discrete morphs was reported for the South American genus *Endocena* (Fryday et al. 2017).

A still largely neglected, yet apparently growing, field of study is integrative taxonomy, in which phenotypic features are analyzed using quantitative, often multivariate methods, ideally within a phylogenetic framework. During Peter Crittenden’s tenure as senior editor, *The Lichenologist* published quite a number of papers using this approach, covering taxa in Parmeliaceae, Physciaceae and Teloschistaceae (Arup & Åkelius 2009; Truong et al. 2009; Lendemer & Hodkinson 2010; Arup & Berlin 2011; Resl et al. 2016). Among the many monographic revisions appearing during this period, one on the genus *Dirina* (Tehler et al. 2013) stands out. One of many highlights regarding lichenicolous fungi was a paper on the new species *Tremella cetrariellae* (Millanes et al. 2015). The only two papers on fossil lichens, encompassing lobariori and

---

**Table 1.** The 30 countries where the highest number of publications in *The Lichenologist* were focused, from 2000 to 2019.

| Country         | Number | Country       | Number |
|-----------------|--------|---------------|--------|
| USA             | 191    | India         | 59     |
| Spain           | 175    | New Zealand   | 58     |
| United Kingdom  | 138    | Finland       | 57     |
| Norway          | 123    | Argentina     | 51     |
| Sweden          | 115    | China         | 51     |
| Australia       | 107    | Czech Republic| 47     |
| Canada          | 90     | Switzerland   | 47     |
| Germany         | 87     | Poland        | 37     |
| Russia          | 83     | Turkey        | 36     |
| France          | 76     | Costa Rica    | 34     |
| Brazil          | 69     | Japan         | 34     |
| Italy           | 69     | Antarctica    | 33     |
| Austria         | 68     | Greece        | 32     |
| Portugal        | 65     | Mexico        | 30     |
| Chile           | 63     | Netherlands   | 30     |

**Fig. 11.** Geographical focus of studies published in *The Lichenologist* from 2000 to 2019. Regions with a higher number of contributions are in orange, others in purple. The total is substantially higher than the total number of papers, since many papers encompass more than one geographical region. Purple and orange are represented by darker and lighter shades, respectively. In colour online.
Fig. 12. Comparison of the geographical origin of author contributions based on affiliation at the time of publication with the geographical focus of studies published in *The Lichenologist* from 2000 to 2019, expressed as percentage of the total. The total is substantially higher than the total number of papers, since many papers encompass more than one geographical region, in terms of both authors and study areas. In colour online.

Fig. 13. Diversity and relative proportion of topics covered by studies published in *The Lichenologist* between 2000 and 2019. The total is higher than the total number of papers, since many papers encompass more than one topic. In colour online.
Parmeloid lichens, were published during the first year of Peter’s tenure (Peterson 2000; Poinar et al. 2000); these fossils play an important role in time-calibrating phylogenetic trees. 

Among the numerous and diverse papers on biological aspects of lichens, notable contributions included a study on the discrimination of lichen taxa using element concentrations (Bennett 2008) and an essay on the evolutionary implications of asexual reproduction in lichens (Tripp 2016). Perhaps the most understated contribution was a laborious analysis of lichen microbionts in Lobaria retigera, Parmelia omphalodes and Umbilicaria esculetina (Jiang et al. 2017), published as a Short Communication but easily amounting to a standard paper. In an extensive review on the ecology of soil crust lichens, Green et al. (2018) pointed out the remarkable convergence in so-called ‘window lichens’, beautifully elaborated in an earlier paper by Vogel (1955).

A curious occurrence was the publication of two subsequent papers, with taxonomically different content but inadvertently exactly the same title, ‘New species and records of Lepraria’ (Stereocaulaceae, lichenized Ascomycota) from South America (Flakus & Kukwa 2007; Flakus et al. 2011).

**Table 2.** Genera treated in *The Lichenologist* between 2000 and 2019 occurring in 15 or more papers with a non-taxonomic focus, indicating the proportion relative to all publications treating the genus, as well as the corresponding predominant species if applicable.

| Genus          | Proportion of non-taxonomic vs all papers | Predominant species treated |
|----------------|------------------------------------------|-----------------------------|
| Evernia        | 96%                                      | prunastri                   |
| Phaeophyscia   | 95%                                      |                             |
| Platismatia    | 94%                                      | glauca                      |
| Xanthoria      | 90%                                      | parietina                   |
| Lecidella      | 90%                                      |                             |
| Physcia        | 89%                                      |                             |
| Pseudevernia   | 88%                                      | furfuracea                  |
| Lobaria        | 85%                                      | pulmonaria                  |
| Ramalina       | 85%                                      |                             |
| Hypogymnia     | 83%                                      | physodes                    |

**Fig. 14.** Correlation between the number of species currently accepted in a genus and the number of publications where the genus was treated in *The Lichenologist* from 2000 to 2019. Selected genera more or less frequently treated than expected based on species richness are highlighted in purple. Purple and orange are represented by darker and lighter shades, respectively. In colour online.

**Taxonomic diversity recorded in publications between 2000 and 2019**

Retroactively applying revised genus concepts, a total of 835 genera were treated in the 1197 papers published in *The Lichenologist* between 2000 and 2019. Of these, 749 corresponded to lichenized taxa and the remainder to lichenicolous (78) or non-lichenized taxa (8). Among the lichenized genera, 642 matched genera accepted in the most recent classification of lichenized fungi (Lücking et al. 2017a, b). Another 107 names represented either outdated genus names (97) or genera newly established since 2017 (10). Among the 78 lichenicolous genera, 69 corresponded to genera accepted in the most recent classification (Diederich et al. 2018), whereas seven genus names were outdated and two have been newly established since that classification was published.

Therefore, the 1197 papers published under Peter’s tenure as senior editor of the journal can be considered broadly representative of the diversity of lichen fungi, with over 60% of the currently accepted genera treated, whereas only 17% of the currently accepted genera of lichenicolous fungi were covered. The hypothesis that the known species richness per genus, with reference to Lücking et al. (2017a, b), was a good predictor of the number of times a given genus was treated in a study was supported by the data (Fig. 14), giving a good and statistically highly significant non-parametric correlation (R\textsubscript{Spearman} = 0.66, P < 0.0000). However, a number of genera were treated more often than expected based on their species richness, including *Xanthoria, Pseudevernia, Parmelia, Parmeliopsis, Platismatia, Evernia,*
Melanelia, Lobaria, Cetraria and Hypogymnia. Other genera appeared less often than expected: Ocellularia, Xanthoparmelia, Fissurina, Phaco graphical, Cora, Polyblasta, Hypotrachyna, Phyllopsora, Rhabdodiscus and Thelidium. The latter includes predominantly tropical genera that are generally under-represented in publications.

Papers with a taxonomic or systematic focus on lichenized fungi encompassed 647 genera, whereas studies with an emphasis on non-taxonomic topics, such as ecology, biogeography, and biomonitoring, included 428. Some genera appeared frequently and predominantly in non-taxonomic works based on single, common and widespread species (Table 2), which explains the over-representation of these genera in the published papers, even if some are not notably rich in species.

Contribution of parameters to Impact Factor

Six of the 11 tested parameters showed a statistically significant rank correlation with IF (Fig. 15). The strongest correlation was observed for mean number of authors per paper per volume, followed by total number of country origins of authors per volume, both highly significant ($P < 0.001$). Four further parameters exhibited a significant correlation ($P < 0.05$), namely diversity of study countries per volume, mean number of study countries per paper per volume, mean number of topics per paper per volume, and proportion of studies with phylogenetic components per volume (Fig. 15). The five remaining parameters, viz. diversity of topics per volume, proportion of non-taxonomic topics per volume, diversity of genera per volume, mean number of genera
per paper per volume, inclusion of a thematic issue in volume, did not show statistically significant correlations with IF. In particular, taxonomic diversity did not affect the IF.

Both forward stepwise and backward stepwise multiple regression revealed mean number of authors per paper per volume as the single, statistically significant component contributing to IF, with $R = 0.93$, beta = 2.43, $P = 0.0072$ for forward stepwise and $R = 0.79$, beta = 0.79, $P = 0.0002$ for backward stepwise multiple regression. Generalized non-linear multiple regression also resulted in mean number of authors per paper per volume being the most significant component (Wald statistic = 12.79, $P = 0.0003$), but further identified two additional parameters as statistically significant components: total number of country origins of authors per volume (Wald statistic = 7.42, $P = 0.0064$) and diversity of topics per volume (Wald statistic = 4.08, $P = 0.0434$).

Thus, mean number of authors per paper per volume and total number of country origins of authors per volume appear to be the most important parameters influencing the IF, suggesting that papers with multiple authors of diverse geographical origin have higher short-term citation rates, an observation also found in other studies (Tahamtan et al. 2016). The multiple regression approach indicates that it is indeed authorship and not the underlying content that causes this effect. International teamwork has been shown to positively affect the IF (Didegah & Thelwall 2013), probably also because a diverse composition of authors

| Author(s) | Year | Number of authors | Topic(s) | Citations WoS | Citations GS | IF WoS | IF GS |
|-----------|------|-------------------|----------|---------------|--------------|--------|------|
| Gauslaa 2014 | 2014 | 1 | Ecology/Ecophysiology | 62 | 91 | 15.50 | 22.75 |
| Lucking et al. 2009 | 2009 | 3 | Taxonomy (global key) | 107 | 176 | 14.59 | 24.00 |
| *Aptroot & Lucking 2016 | 2016 | 2 | Taxonomy (global key) | 33 | 47 | 12.38 | 17.63 |
| Rivas Plata et al. 2010 | 2010 | 6 | Taxonomy (global key) | 73 | 104 | 10.95 | 15.60 |
| van Herk et al. 2002 | 2002 | 3 | Biomonitoring | 128 | 297 | 10.67 | 24.75 |
| *Moncada et al. 2013 | 2013 | 3 | Taxonomy/Phylogeny and Evolution | 49 | 86 | 10.50 | 18.43 |
| Helms et al. 2001 | 2001 | 4 | Photoautotrophs/Phylogeny and Evolution | 126 | 169 | 9.95 | 13.34 |
| Meyer & Printzen 2000 | 2000 | 2 | Chemistry | 124 | 171 | 9.30 | 12.83 |
| Vondrák et al. 2009 | 2009 | 4 | Taxonomy/Phylogeny and Evolution | 67 | 104 | 9.14 | 14.18 |
| van Herk 2001 | 2001 | 1 | Biomonitoring/Pollution | 115 | 210 | 9.08 | 16.58 |
| Ekman et al. 2014 | 2014 | 4 | Taxonomy/Phylogeny and Evolution | 34 | 48 | 8.50 | 12.00 |
| *Aptroot 2012 | 2012 | 1 | Taxonomy (global key) | 45 | 79 | 8.44 | 14.81 |
| van Herk et al. 2003 | 2003 | 3 | Biomonitoring/Pollution | 89 | 165 | 7.85 | 14.56 |
| Wolseley et al. 2006 | 2006 | 4 | Biomonitoring/Pollution | 68 | 125 | 7.29 | 13.39 |
| *Lucking et al. 2016b | 2016 | 30 | Taxonomy/Phylogeny and Evolution | 19 | 19 | 7.13 | 7.13 |
| Molina et al. 2004 | 2004 | 5 | Taxonomy/Phylogeny and Evolution | 75 | 102 | 7.03 | 9.56 |
| Dal Grande et al. 2018 | 2018 | 6 | Phylogenomics | 9 | 10 | 6.75 | 7.50 |
| Ertz et al. 2018 | 2018 | 4 | Taxonomy/Phylogeny and Evolution | 9 | 9 | 6.75 | 6.75 |
| *Bates et al. 2012 | 2012 | 6 | Microbiome | 35 | 56 | 6.56 | 10.50 |
| Stöfer et al. 2006 | 2006 | 20 | Ecology/Environment | 60 | 81 | 6.43 | 8.68 |
| Gauslaa & Solhaug 2000 | 2000 | 2 | Ecology | 81 | 115 | 6.08 | 8.63 |
| Arup 2006 | 2006 | 1 | Taxonomy/Phylogeny and Evolution | 56 | 89 | 6.00 | 9.54 |
| Saag et al. 2009 | 2009 | 3 | Taxonomy | 44 | 88 | 6.00 | 12.00 |
| Molina et al. 2011 | 2011 | 7 | Taxonomy/Phylogeny and Evolution | 36 | 49 | 6.00 | 8.17 |
| Malíček et al. 2017 | 2017 | 4 | Taxonomy/Phylogeny and Evolution | 12 | 18 | 6.00 | 9.00 |
| Molins et al. 2018 | 2018 | 5 | Photoautotrophs/Phylogeny and Evolution | 8 | 6 | 6.00 | 4.50 |
| Lauonis et al. 2019 | 2019 | 5 | Taxonomy/Phylogeny and Evolution | 4 | 6 | 6.00 | 9.00 |
| Baniya et al. 2010 | 2010 | 4 | Ecology | 39 | 87 | 5.85 | 13.05 |
| Crespo et al. 2011 | 2011 | 3 | Taxonomy/Phylogeny and Evolution | 35 | 50 | 5.83 | 8.33 |
| Myllys et al. 2011 | 2011 | 6 | Taxonomy/Phylogeny and Evolution | 35 | 51 | 5.83 | 8.50 |
increase immediate distribution of a paper through multiple networking.

The contribution of individual papers to the highest achieved impact factors in 2014 and 2017 was further investigated by recording the citation numbers for all papers between 2012 and 2019 (see also Table 3). In colour online.

2013 and between 2015 and 2016 in recording the citation numbers for all papers between 2012 and 2017 was further investigated by the 30 most frequently cited papers published in Fig. 16.

Correlation between impact factors in 2014 and 2017 was further investigated by the 30 most frequently cited papers published in Fig. 16. The data also showed a strong and highly significant correlation between citation counts derived from Web of Science and Google Scholar, with the latter being consistently higher (Fig. 16). While Web of Science only counts indexed journals and hence underestimates real citations, Google Scholar probably overestimates citations due to inaccuracies in the algorithms that catalogue scientific publications and the references listed therein (Falagas et al. 2008; Fagan 2017). Thus, the true citation count is somewhere in between.

Conclusions
The present meta-analysis is the first of its kind in terms of scope and detail performed for any scientific journal for a prolonged period of time, in this case documenting the scientific output and impact of lichenological research published in The Lichenologist during the past two decades. The data illustrate why The Lichenologist has become the flagship journal of lichenology, with this status reinforced under Peter D. Crittenden’s tenure as senior editor. Peter has not only modernized the journal in both layout and content, but has also successfully implemented adjustments necessary in a changing publication landscape, with a shifted focus towards broader-impact papers, discouraging so-called ‘least publishable units’, in particular ‘single naked species descriptions’ (SNSD), in favour of publication models that incorporate individual findings into more inclusive studies. While Peter has paid attention to impact factor as one important measure to increase the prominence of the journal, he has never lost sight of the fact that The Lichenologist is first and foremost an outlet to publish high quality research in all fields of lichenology and that taxonomy remains the core of lichenological research. It is therefore no surprise that lichenologists across the world continue to consider The Lichenologist as their first choice for publishing.

Acknowledgements. Einar Timdal kindly assisted with downloading data from the Recent Literature on Lichens database, and Paul Kirk provided data on new species published in The Lichenologist, as a subset from Index Fungorum. Without knowing the underlying purpose, Peter Crittenden provided a high resolution cover for Volume 37. Christopher Ellis and Leena Myllys are thanked for providing the opportunity to perform this meta-analysis, on the occasion of this special issue dedicated to Peter, and Brian Coppins and Christopher Ellis provided valuable comments on an earlier version.
References

Aboukhalil R (2014) The rising trend in authorship. Winnower 2, e141832.
Ahlt T (2009) A tribute to John Walter Thomson (1913–2009). Lichenologist 41, 561–563.
Aptroot A (2012) A world key to the species of Anarthrothecium and Pyrena. Lichenologist 44, 5–53.
Aptroot A and Lücking R (2016) A revisionary synopsis of the Trypetheliaceae (Ascomycota: Trypetheliales). Lichenologist 48, 763–982.
Aptroot A, Ertz D, Etayo J, Gueidan C, Mercado-Díaz JA, Schumm F and Weerakoong G (2016) Forty-six new species of Trypetheliaceae from the tropics. Lichenologist 48, 609–638.
Aptroot A, Simpan HJM, Mercado-Díaz JA, Mendonça CO, Feuerstein SC, Cunha-Dias IPR, Pereira TA and Cáceres MES (2018) Eight new species of Pyrenula from the Neotropics, with a key to 3-septate Pyrgillus species. Lichenologist 50, 77–87.
Arup U (2006) A new taxonomy of the Caloplaca citrina group in the Nordic countries, except Iceland. Lichenologist 38, 1–20.
Arup U and Åkellius E (2009) A taxonomic revision of Caloplaca heridella and C. furfaracea. Lichenologist 41, 465–480.
Arup U and Berlin ES (2011) A taxonomic study of Melanelixia fuliginosa in Europe. Lichenologist 43, 89–97.
Bader MY, Zotz G and Lange OL (2010) How to minimize the sampling effort for obtaining reliable estimates of diel and annual CO2 budgets in lichens. Lichenologist 42, 97–111.
Baniya CB, Solhøy T, Gauslaa Y and Palmer MW (2010) The elevation gradient of lichen species richness in Nepal. Lichenologist 42, 83–96.
Bates ST, Donna BL, Lauber CL, Walters WA, Knight R and Fierer N (2012) A preliminary survey of lichen associated eukaryotes using pyrosequencing. Lichenologist 44, 137–146.
Bennett JP (2008) Discrimination of lichen genera and species using element concentrations. Lichenologist 40, 135–151.
Biazrov LG, Zhurbenko MP and Seaward MRD (2010) A tribute to Nina Sergeevna Golubkova (1932–2009). Lichenologist 42, 227–229.
Boonpragob K (2010) A tribute to Natsurarng Homchantara (1957–2006). Lichenologist 42, 129–130.
Crespo A, Divakar PK and Hawksworth DL (2011) Generic concepts in Parmeliaceae, and the phylogenetic value of characters used in their circumscription. Lichenologist 43, 511–535.
Dal Grande F, Meiser A, Tzovaras BG, Otto J, Ebersberger I and Schmitt I (2018) The draft genome of the lichen-forming fungus Lasallia hispanica (Frey) Sancho & A. Crespo. Lichenologist 50, 329–340.
Didegah F and Thelwall M (2013) Which factors help authors produce the highest impact research? Collaboration, journal and document properties. Journal of Information 7, 861–873.
Dieiderich P, Lawrey JD and Ertz D (2018) The 2018 classification and checklist of lichenicolous fungi, with 2800 non-lichenized, obligately lichenicolous taxa. Bryologist 121, 340–425.
Ekman S, Wedin M, Lindblom L and Jörgensen PM (2014) Extended phylogeny and a revised generic classification of the Parmeliaceae (Peltigerales, Ascomycota). Lichenologist 46, 627–656.
Elix JA and Nash TH, III (2003) A tribute to William Louis Cubberston. Lichenologist 35, 93–95.
Ellis C and Myllyl L (2020) Editorial. Lichenologist 52, 1.
Ertz D, Sanderson N, Lubeck A and Kukwa M (2018) Two new species of Arthonia from old-growth European forests, Arthothoriana and Inoderma sorediata, and a new genus for Schismatocystis nivem. Lichenologist 50, 161–172.
Fagan JC (2017) An evidence-based review of academic web search engines, 2014–2016: implications for librarians’ practice and research agenda. Information Technology and Libraries 36, 7–47.
Falagas ME, Pitsouni EI, Malietzis GA and Pappas G (2008) Comparison of PubMed, Scopus, Web of Science, and Google Scholar: strengths and weaknesses. FASEB Journal 22, 338–342.
Farkas E, Lücking R and Wirth V (2010) A tribute to Antonín Vězda (1920–2008). Lichenologist 42, 1–5.
Flaksu A and Kukwa M (2007) New species and records of Lepraria (Stereocaulaceae, lichenized Ascomycota) from South America. Lichenologist 39, 463–474.
Flaksu A, Rodriguez P and Kukwa M (2011) New species and records of Lepraria (Stereocaulaceae, lichenized Ascomycota) from South America. Lichenologist 43, 57–66.
Fryday A, Schmitt I and Pérez-Ortega S (2017) The genus Endocena (Icmadophilaceae): DNA evidence suggests the same fungus forms different morphologies. Lichenologist 49, 347–363.
Galloway DJ (2014) John Lightfoot (1735–1788) and the lichens of Flora Scotica (1777). Lichenologist 46, 247–260.
Gauslaa Y (2014) Rain, dew, and humid air as drivers of morphology, function and spatial distribution in epiphytic lichens. Lichenologist 46, 1–16.
Gauslaa Y and Solhaug KA (2000) High-light-intensity damage to the foliose lichen Lobaria pulmonaria within a natural forest: the applicability of chlorophyll fluorescence methods. Lichenologist 32, 271–289.
Gilbert OL (1980) A lichen flora of Northumberland. Lichenologist 12, 325–395.
Gilbert OL (2004) The phenology of Sarcoscyphus campestre observed over three years. Lichenologist 36, 159–161.
Green TGA (2019) A tribute to Otto Ludwig Lange (1927–2017). Lichenologist 51, 1–5.
Green TGA, Pintado A, Raggio J and Sancho LG (2018) The lifestyle of lichens in soil crusts. Lichenologist 50, 397–410.
Harzing AW and Alakangas S (2016) Google Scholar, Scopus and the Web of Science: a longitudinal and cross-disciplinary comparison. Scientometrics 106, 786–804.
Hauck M and Huneck S (2007) The putative role of fumarprotocetraric acid in the manganese tolerance of the lichen Lecanora conizaeoides. Lichenologist 39, 301–304.
Hawksworth DL (1969) The lichen flora of Derbyshire. Lichenologist 4, 105–193.
Hawksworth DL (1972) Regional studies in Alectoris (Lichenes) II. The British species. Lichenologist 5, 181–261.
Hawksworth DL, James PJW and Coppins BJ (1980) Checklist of British lichen-forming, lichenicolous and allied fungi. Lichenologist 12, 1–115.
Helms G, Friedl T, Rambold G and Mayrhofer H (2001) Identification of photobionts from the lichen family Physciaceae using algal-specific ITS rDNA sequencing. Lichenologist 33, 73–86.
Hommantcha N and Coppins BJ (2002) New species of the lichen family Thelotrema in SE Asia. Lichenologist 34, 113–140.
James PW (2010) [Review] Nordic Lichen Flora Vol. 3. Cyanolichens. By P. M. Jørgensen, T. Tønsberg and O. Vitikainen. The Nordic Lichen Society, Museum of Evolution, Uppsala University, Uppsala. 219 pages. 2007. Lichenologist 42, 767–768.
Jiang DF, Wang HY, Si HL, Zhao L, Liu CP and Zhang H (2017) Isolation and culture of lichen bacteriobions. Lichenologist 49, 175–181.
Kashiwadani H (2011) A tribute to Syo Kurokawa (1926–2010). Lichenologist 43, 191–192.
Kistenich S, Bendiksy M, Ekman S, Cáceres MES and Timdal E (2019) Towards an integrative taxonomy of Phyllophora (Ramalinaceae). Lichenologist 51, 323–392.
Laundon JR (2010) Lecanora antiqua, a new saxicolous species from Great Britain, and the nomenclature and authorship of L. albescens, L. conferta and L. muralis. Lichenologist 42, 631–636.
Launis A, Pykälä J, van den Boom P, Sérusiaux E and Myllyl L (2019) Four new epiphytic species in the Micarea prasina group from Europe. Lichenologist 51, 7–25.
Lendemer JC and Hodkinson BP (2010) A new perspective on Punctella subruedica (Parmeliaceae) in North America: previously rejected morphological characters corroborate molecular phylogenetic evidence and provide insight into an old problem. Lichenologist 42, 403–421.
Logan JM (2016) Historical changes in co-author numbers in ecology. *Frontiers in Ecology and the Environment* 14, 297–299.

Lücking R (2020) Three challenges to contemporary taxonomy from a lichen-mycological perspective. *Mega taxa* 1, 78–103.

Lücking R, Sérusiaux E, Maia LC and Pereira ECG (1998) A revision of the names of foliicolous lichenized fungi published by Batista and co-workers between 1960 and 1975. *Lichenologist* 30, 121–191.

Lücking R, Sérusiaux E and Vézda A (2005) Phylology and systematics of the lichen family *Gomphillaceae* (Ostropales) inferred from cladistic analysis of plastotype data. *Lichenologist* 37, 123–170.

Lücking R, Archer AW and Aptroot A (2009) A world-wide key to the genus *Graphis* (Ostropales: *Graphidaceae*). *Lichenologist* 41, 363–452.

Lücking R, Nelsen MP, Aptroot A, Benatti MN, Binh NQ, Gueidan C, Gutierrez MC, Jungholt P, Lumbsch HT, Marcelli MP, et al. (2016a) A pot-pourri of new species of *Trypetheliaceae* resulting from molecular phylogenetic studies. *Lichenologist* 48, 639–660.

Lücking R, Nelsen MP, Aptroot A, Barillas de Klee R, Bawingan PA, Benatti MN, Binh NQ, Bungartz F, Cáceres MES, Canzé LS, et al. (2016b) A phylogenetic framework for reassessing generic concepts and species delimitation in the lichenized family *Trypetheliaceae* (*Ascomycota: Dothideomycetes*). *Lichenologist* 48, 739–762.

Lücking R, Hodkinson BP and Leavitt SD (2017a) (‘2016’) The 2016 classification of lichenized fungi in the *Ascomycota* and *Basidiomycota* – an approach to the thousands of genera. *Bryologist* 119, 361–416.

Lücking R, Hodkinson BP and Leavitt SD (2017b) Corrections and amendments to the 2016 classification of lichenized fungi in the *Ascomycota* and *Basidiomycota*. *Bryologist* 120, 58–69.

Lücking R, Dal Forno M and Will-Wolf S (2019) James Donald (‘Jim’) Lawrey: a tribute to a unique career in lichenology. *Plant and Fungal Systematics* 64, 117–135.

Ludwig LR (2016) The biogeography of *Knightiella splachnirima*. *Australasian Lichenology* 78, 46–51.

Ludwig LR, Summerfield TC and Singh G (2017) Characterization of the mating-type locus (MAT) reveals a heterothallic mating system in *Knightiella splachnirima*. *Lichenologist* 49, 373–385.

Lumbsch HT and Döring H (2012) A tribute to Aimé Marjatta Hennsen (1925–2011). *Lichenologist* 44, 1–4.

Lumbsch HT, Ahl T, Altermann S, Amo de Paz G, Aptroot A, Arup U, Barenas Peña A, Bawingan PA, Benatti MN, Betancourt L, et al. (2011) One hundred new species of lichenized fungi: a signature of undiscovered global diversity. *Phytotaxa* 18, 1–127.

Maléck J, Berger F, Palice Z and Vondrák J (2017) Corticolous sorediate *Lecanora* species (*Lecanoraceae*, lichenized *Ascomycota*). *Bryologist* 120, 58–69.

Molina MC, Crespo A, Blanco O, Lumbsch HT and Hawksworth DL (2004) Phylogenetic relationships and species concepts in *Parmelia* s. str. (*Parmeliaceae*) inferred from nuclear ITS rDNA and β-tubulin sequences. *Lichenologist* 36, 37–54.

Molina MC, Divakar PK, Millanes AM, Sanchez E, Rath DP, Hawksworth DL and Crespo A (2011) *Parmelia sulcata* (*Ascomycota: Parmeliaceae*), a sympatric monophyletic species complex. *Lichenologist* 43, 585–601.

Molins A, Moya P, García-Breijo FJ, José RA and Barreno E (2018) A multi-tool approach to assess microalgal diversity in lichens: isolation, Sanger sequencing, ITS and ultrastructural correlations. *Lichenologist* 50, 123–138.

Moncada B, Lücking R and Betancourt-Macauze L (2013) Phylogeny of the *Lobariaceae* (lichenized *Ascomycota: Pertusigerales*), with a reappraisal of the genus *Lobarrella*. *Lichenologist* 45, 203–263.

Moncada B, Mercado-Diaz JA and Lücking R (2018) The identity of *Sticta damicornis* (*Ascomycota: Lobariaceae*): a presumably widespread taxon is a Caribbean endemic. *Lichenologist* 50, 591–597.

Myllä L, Velmala S, Holien H, Halonen P, Wang LS and Goward T (2011) Phylogeny of the genus *Bryoria*. *Lichenologist* 43, 617–638.

Nabot JC, Parreira MR, Teresa FB, Carneiro FM, Cunha HF, Ondei LS, Caramori SS and Soares TN (2015) Publish (in a group) or perish (alone): the trend from single- to multi-authorship in biological papers. *Scientometrics* 102, 357–364.

Orock EA, Leavitt SD, Fonge BA, St. Clair LL and Lumbsch HT (2012) DNA-based identification of lichen-forming fungi: can publicly available sequence databases aid in lichen diversity inventories of Mount Cameroon (West Africa)? *Lichenologist* 44, 833–839.

Petersen EB (2000) An overlooked fossil lichen (*Lobariae*). *Lichenologist* 32, 263–269.

Poinar GO, Peterson EB and Platt JL (2000) Fossil *Parmelia* in New World amber. *Lichenologist* 32, 263–269.

Porvus OW (2005) A tribute to Oliver Lathe Gilbert. *Lichenologist* 37, 467–475.

Redchenko O, Vondrák J and Koinar J (2012) The oldest sequenced fungal herbarium sample. *Lichenologist* 44, 715–718.

Resl P, Mayrhofer H, Clayden SR, Spribille T, Thor G, Tønsberg T and Tripp EA (2016) Multiple authorship in scientific manuscripts: ethical challenges, ghost and guest/gift authorship, and the culture of citations: a comprehensive review of the literature. *Science and Engineering Ethics* 20, 13–33.

Rivas Plata E, Lücking R, Sigman HJM, Mangold A, Kalb K and Lumbsch HT (2010) A world-wide key to the thelotremoid *Graphidaceae*, excluding the *Ocellularia-Myrismotrema-Stegobolus clade*. *Lichenologist* 42, 139–185.

Saag L, Saag A and Randlane T (2009) World survey of the genus *Lepraria* (*Stictaceae*, lichenized *Ascomycota*). *Lichenologist* 41, 25–60.

Salisbury L (2019) Inspcct on two platforms: Elsevier’s Engineering Village and Clarivate Analytics’ Web of Science. *The Charleston Advisor* 20, 5–13.

Seaward MRD and Hawksworth DL (2017) A tribute to Jack Laundon (1934–2016). *Lichenologist* 49, 297–299.

Sheard JW (2016) Morphological, chemical and species delimitation analyses provide new taxonomic insights into two groups of *Rinodina*. *Lichenologist* 48, 469–488.

Singh KP (2013) A tribute to Dhrarn Dhar Awaithi (1922–2011). *Lichenologist* 45, 1–2.

Stofr S, Bergamini A, Aragon G, Carvalho P, Coppens BJ, Davey S, Dietrich M, Farkas E, Kárkkäinen K, Keller G, et al. (2006) Species richness of lichen functional groups in relation to land use intensity. *Lichenologist* 38, 331–353.

Tahamtan I, Afshar AS and Ahamdزادeh K (2016) Factors affecting number of citations: a comprehensive review of the literature. *Sientometrics* 107, 1195–1225.

Tehler A and Källersjö M (2001) *Parellipsis ambigua* and *P. hyperopta* (*Parmeliaceae*): species or chemotypes? *Lichenologist* 33, 403–408.

Tehler A, Ertz D and Irestedt M (2013) The genus *Dirinia* (*Roccellaceae*, *Arthoniales*) revisited. *Lichenologist* 45, 427–476.

Teixeira da Silva JA and Dobranszki J (2016) Multiple authorship in scientific manuscripts: ethical challenges, guest and host/gift authorship, and the cultural/disciplinary perspective. *Science and Engineering Ethics* 22, 1457–1472.

Tibell L and Moberg R (2014) A tribute to Rolf Santesson (1916–2013). *Lichenologist* 46, 135–139.

Timdal E (2010) Recent literature on lichens: web services and further developments. *Bibliotheca Lichenologica* 105, 43–45.

Tripp EA (2016) Is asexual reproduction an evolutionary dead end in lichens? *Lichenologist* 48, 559–580.
Truong C, Naciri Y and Clerc P (2009) Multivariate analysis of anatomical characters confirms the differentiation of two morphologically close species, Melanohalea olivacea (L.) O. Blanco et al. and M. septentrionalis (Lynge) O. Blanco et al. Lichenologist 41, 649–661.

Turland NJ, Wiersema JH, Barrie FR, Greuter W, Hawksworth DL, Herendeen PS, Knapp S, Kubera WH, Li DZ, Marhold K, et al. (2018) International Code of Nomenclature for Algae, Fungi, and Plants (Shenzhen Code) adopted by the Nineteenth International Botanical Congress Shenzhen, China, July 2017. [Regnum Vegetabile Vol. 159]. Oberreifenberg: Koeltz Botanical Books.

van Herk CM (2001) Bark pH and susceptibility to toxic air pollutants as independent causes of changes in epiphytic lichen composition in space and time. Lichenologist 33, 419–442.

van Herk CM, Aptroot A and van Dobben HF (2002) Long-term monitoring in the Netherlands suggests that lichens respond to global warming. Lichenologist 34, 141–154.

van Herk CM, Mathiessen-Spiekman EAM and de Zwart D (2003) Long distance nitrogen air pollution effects on lichens in Europe. Lichenologist 35, 347–359.

Vogel S (1955) “Niedere Fensterpflanzen” in dersüdafrikanischen Wüste. Eine ökologische Schilderung. Beiträge zur Biologie der Pflanzen 31, 45–135.

Vondrák J, Říha P, Arup U and Sochting U (2009) The taxonomy of the Caloplaca citrina group (Teloschistaceae) in the Black Sea region; with contributions to the cryptic species concept in lichenology. Lichenologist 41, 571–604.

Wolseley PA, James PW, Theobald MR and Sutton MA (2006) Detecting changes in epiphytic lichen communities at sites affected by atmospheric ammonia from agricultural sources. Lichenologist 38, 161–176.

Wolseley PA, Jørgensen PM, Kantvilas G and Thüs H (2015) A tribute to Peter James (1930–2014). Lichenologist 47, 83–92.

Wuchty S, Jones BF and Uzzi B (2007) The increasing dominance of teams in production of knowledge. Science 316, 1036–1039.