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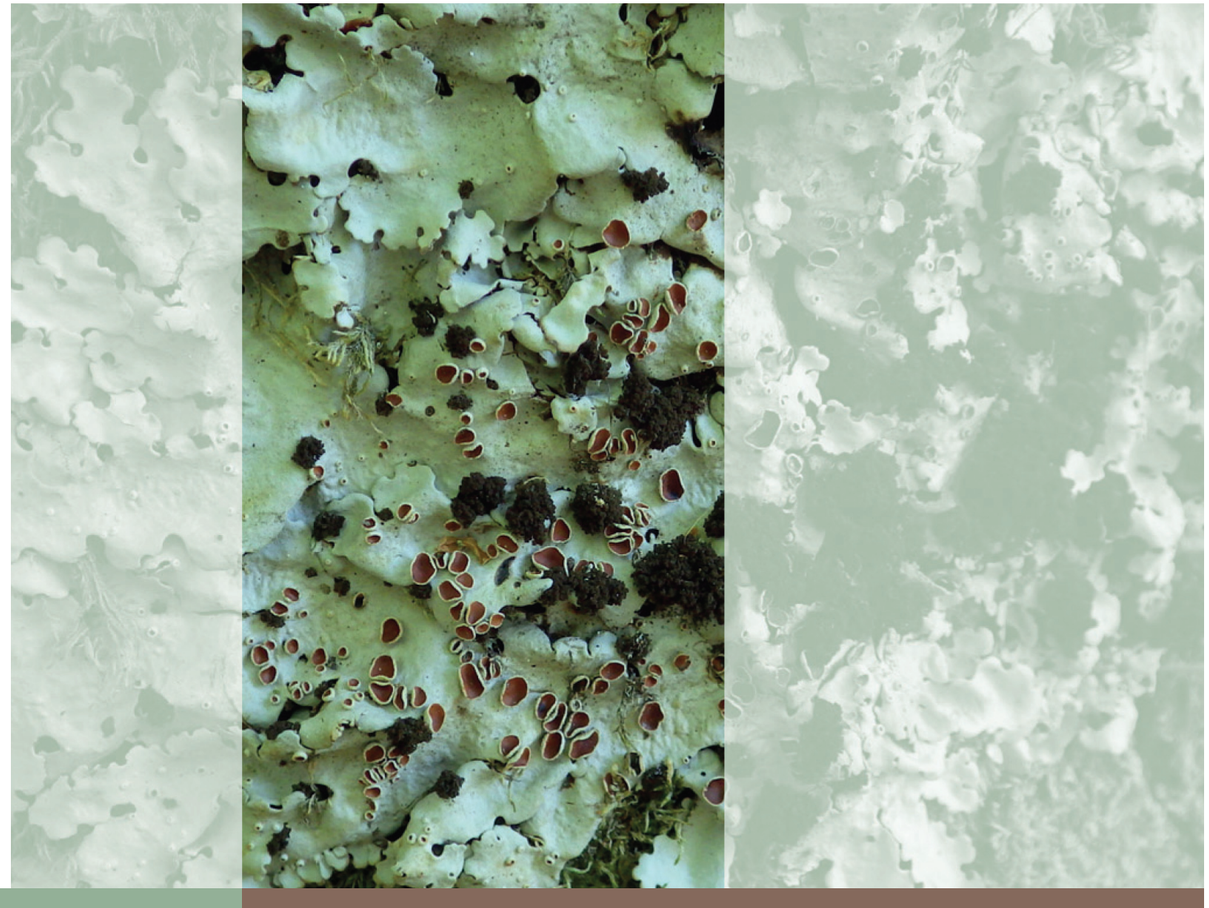

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Laudatio

Pier Luigi Nimis: a life for lichens

There are people who leave their mark in their field. Without doubt, Pier Luigi Nimis (for the registry office, Pierluigi; for friends, Pier; for family members, Pil; for me and a few colleagues, PL) is such a person. On the threshold of retirement but no less active than ever, Pier Luigi is about to begin a new phase of his life, a life dedicated entirely to science and, in particular, to lichenology.

PL and I first met in the summer of 1984 at a Botany practicum that he was teaching for a colleague. For a passionate botanist such as myself, it seemed incredible to have at my disposal a person born to explain the wonders of plants and many other things. I was so impressed by his personality and his knowledge that I requested to start a thesis with him, even though I was only in the first year of my four-year degree programme. Although he predicted a hard and wretched life for me ('Forget about entering university as a researcher, it is extremely tiring and difficult, you'd better not think about it'), we have ended up spending a life together, seeing each other at work almost every day for 39 years. Thus, I can now say that I know PL quite well, and that I am very honoured to write about him on this special occasion.

Biography

PL was born on the 9th of September 1953. He was a born naturalist: fascinated from a young age by insects, he built a remarkable collection of specimens from the surroundings of his small home town of Tarcento in Friuli, NE Italy. He was the first of two boys in a family with well-defined social roles. His father, Carlo, had been an Alpine soldier who survived the Russian expedition of the Second World War, returned on foot, and was a prosperous baker. His mother, Matilde, was a popular teacher who travelled throughout Carnia (a mountainous region in the north of Friuli) by bicycle to reach the outermost villages and taught whole generations of young people. Friuli, where PL was growing up, was still a rural region, with an essentially matriarchal society (his grandmother, Rosa, was central to the family life of his childhood), but this was swept away by the terrible earthquake of 1976 and the subsequent, rapid reconstruction that followed. This seismic event caused the loss of his beloved collection of 10 000 insects. However, this was to be a stroke of luck for Botany, together with the winning, just a few years earlier, of a series of prizes presented by the Institute of Botany, University of Trieste, for young naturalists. In this way, PL came into contact with his first mentor, Prof. Sandro Pignatti, the director of the Institute and a leading figure in the Italian botanical community. Just a few years earlier, Pignatti had moved from Padua to Trieste, to establish the research institute. He had already begun to work on his most famous output, the *Flora of Italy*, and was particularly impressed by the personality of this young student. When PL expressed his desire to immerse himself in the study of botany, his mentor selected the most appropriate readings for him, beginning with *Faust* by Johann Wolfgang von Goethe. As PL forever recalls, this was perhaps the most fortunate choice Pignatti could have made to keep his young student attached to him on a path of continuous intellectual growth.

The Institute of Botany in Trieste was already well structured when PL obtained his degree *magna cum laude*. There were many positions, but all were already occupied by very good researchers. Pignatti, an excellent connoisseur of the academic situation in Italy, suggested that PL should focus on lichens. In Italy, few people were working on them, and not to the level that was needed, and certainly not in Trieste. After a period of field study of plant communities in Alaska (Nimis 1981) and Svalbard (Brossart *et al.* 1984), PL concluded that lichens were actually a fascinating subject. At that point, Pignatti made his second successful move: he put PL in contact with one of the most charismatic figures in lichenology at that time, Prof. Josef Poelt, who had recently moved from Munich, Germany, to Graz in Austria. This was the beginning of a very fruitful partnership, based on deep appreciation and affection (Fig. 1). PL began to explore his region systematically, travelling monthly to Graz to work with Poelt, who gradually introduced him to his numerous correspondents and visitors. PL thus became fully immersed in the crème de la crème of European lichenology. He worked hard and in a short time became the youngest full professor of Systematic Botany in Italy, being appointed to the chair at the age of 33. I can still remember when he told me he had just won this: it was my first day of internship with him. However, his success did not come without some disgruntlement on the part of older colleagues who felt overlooked, and this affected some internal dynamics in Trieste in the following years.

A Scientific Career Amongst Lichens (and a Few Plants)

With two masters like Pignatti and Poelt, the scientific activity of PL was initially focused on the floristic exploration of Italy, a country that had effectively been excluded from lichenological research for decades. He immediately understood that Mediterranean Italy was a sort of *terra incognita*, which deserved all his interest: with very few exceptions, no one had ever explored it in any depth. Poelt was an extraordinary inspiration in this regard, guiding and helping him, and also proposing a series of excursions to the island of Sardinia, described as one of the virgin lands of the Mediterranean, rich in many surprises. Indeed, *The Lichens and Lichenicolous Fungi of Sardinia (Italy) – An Annotated List* (Nimis & Poelt 1987) was soon published, collating all their discoveries, and which was later further supplemented by contributions

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Figure 1. A, Josef Poelt and Pier Luigi Nimis during the excursion in Sardinia organized within the framework of the 14th International Botanical Congress (1987); unknown locality and date. B, Pier Luigi Nimis with some students of the 2022 Summer Field Course near Casera Razzo, Eastern Dolomites, Italy. C, at the home of Roberto Bargagli (Castiglione d'Orcia, Siena), with Dennis Brown (Bristol), special guest at the fourth congress of the Italian Lichen Society (October 1991). In colour online.

from participants of an excursion organized by PL within the framework of the 14th International Botanical Congress in Berlin, Germany. For all those who took part, this was an unforgettable experience: so many lichens collected, delicious food enjoyed and music by Rossini (PL's favourite composer) played at full volume in the bus (I was lucky enough to be there, as a handyman…).

From the very beginning, in parallel with his floristic investigations, PL worked on the creation of original identification keys, derived from those available for Central Europe, France and the Scandinavian countries, supplementing them where necessary because it quickly became evident that taxa and data from the Mediterranean region were lacking. PL aimed to provide material in Italian in order to stimulate other researchers to join his work. Even today, I remember working at the photocopier to produce copies of the first identification key to the macrolichens of Italy, that had to be tested in anticipation of the first introductory course in Lichenology (Passo Pura, summer 1986; with Peter James from London and Teuvo Ahti and Orvo Vitikainen from Helsinki as special guests). In the years leading up to this, PL had been in contact with the few other researchers in Italian universities who were working on lichens. To them, but especially to some young novices, he was (and still is) a natural point of contact, having all the necessary qualities: resourcefulness, assertiveness and intellectual charm. Convinced that nothing new could be built within the Italian Botanical Society, PL contemplated the possibility of founding an independent scientific society. This soon became the Italian Lichen Society (SLI). The foundation document dated 7th May 1987, was signed by PL, Prof. Lausi and myself, in the house of a notary (being ill, he received us in bed, as if the traditional roles between notary and testamentaries had been reversed). We were joined by Giulio Scarpa, a lichen enthusiast from Venice, who represented the category of amateurs who were always greatly appreciated by PL. In those early years, PL provided materials, resources, ideas and projects to all with great generosity. For example, he asked Giuliano Lazzarin (Verona) to collate the entire Italian lichen literature of the past centuries to support requests from foreign colleagues. He helped (also financially) the activities of talented amateurs (e.g. Domenico Puntillo, Cosenza) and colleagues, and gave inestimable scientific advice to anyone in need. This enthusiasm spread, the number of followers increased, and hardly a month passed without someone visiting Trieste. The training courses followed one after another, always with new and renowned guests: Poelt and Antonín Vězda (Brno), certainly the most appreciated and respected, David Hawksworth (London), Xavier Llimona (Barcelona), José Maria Egea (Murcia), Eva Barreno (Valencia), Christoph Scheidegger (Bern) and many others.

These were truly years of great enthusiasm. PL's floristic research eventually extended to archeological sites, so common in Italy and rich in allochthonous stones and marbles, with further interests in the ecology of lichen communities and their relationships with the substratum. He also contributed to restoration policy, proposing that, in some cases, this should address and preserve the biodiversity as well as the monument itself. Results in this field culminated in two monographs, *Flora e vegetazione lichenica delle aree archeologiche del Lazio* (Nimis *et al.* 1987) and *Licheni e conservazione dei monumenti* (Nimis *et al.* 1992), plus a series of contributions which appeared in specialized journals and textbooks. In the meantime, PL also focused on biomonitoring, mainly as the result of an invitation to Klaus Ammann (Bern, Switzerland) to present the so-called 'Swiss Index of Air Purity (IAP) method' (subsequently called the 'Ammann method' in Italy) in a well-attended introductory course that he organized in Pordenone. Within a few months, thanks also to the commitment of Dr Simonetta Olivieri from the Environmental Protection Agency of Veneto Region, who had attended the Pordenone course, PL received a commission to carry out the first pilot study to test the applicability of the 'Ammann method' in Italy.

This led, just one year later, to the biomonitoring of the whole Veneto Region. Already in that pilot study, published as a monograph (Nimis *et al.* 1989), PL made a significant change from the outset, defining a fixed sampling area, whereas the Swiss method had provided a mobile grid extended to half the circumference of the sampled tree trunk. In this simple way, he transformed the index into a biodiversity value, with important consequences for the further development of the methodology. Thanks to his great organizing abilities, PL quickly built a solid team of professionals capable of leading training courses, with significant input also from regional environmental agencies that effectively participated and often funded the research. After the nuclear accident at Chernobyl in 1986, he also led programmes to map and monitor levels of radioactive caesium in macrofungi, mosses and forest plants (this activity will be recognized as standard by the Japan Atomic Energy Agency when facing the consequences of the nuclear accident at Fukushima Dai-ichi in 2012). It was literally an explosion of activities in the field of environmental biomonitoring, which was also brought into schools with a forward-looking cultural policy. These were the years when the SLI reached its highest membership (more than 600), and in which PL gained perhaps his greatest notoriety (which never diminished in the following years), especially after a concise, pivotal article, published in *Nature*, demonstrated a correlation between lung cancer and air pollution by mapping human mortality and lichen biodiversity in the Veneto Region (Cislaghi & Nimis 1997). As a consequence of this rich experience, PL became the promoter of standard protocols that set some methodologically very important, fixed points. These perhaps were a little before their time, given that some important open questions still deserved further research. In the field of bioindication, significant changes were introduced within a few years, largely as a result of a NATO Advanced Research Workshop, held in Wales in 2000. At this meeting, an international group of researchers working on lichens and air pollution gathered and published the pivotal work *Monitoring with Lichens – Monitoring Lichens*, of which PL was co-editor (Nimis *et al.* 2002). A decade later, this led to the drafting of a CEN protocol to measure the biodiversity of epiphytic lichens that is now the accepted international standard. In the field of bioaccumulation, additions and corrections were even more consistent, and exactly 20 more years were necessary to eventually develop a shared protocol, albeit only at the national level (Giordani *et al.* 2019).

From the glorious years of the rebirth of Italian lichenology, of which he was undoubtedly the architect, to the present day, PL has always continued to work on identification keys. All the monographs cited above contain one or more keys, because the correct attribution of the scientific name to a certain taxon opens a whole world of knowledge and reveals the enormous amount of information accumulated during decades if not centuries of biological research (Nimis & Martellos 2003). Simultaneously working on regional, national and supra-national checklists, PL also started to deal with biodiversity database management and dissemination, and with the integration of all this information, on the basis of a robust citizen science approach. In these activities, PL found a solid contributor in one of his long-time collaborators, Stefano Martellos (Trieste), and was eventually helped by a number of other young, devoted collaborators. Starting from the checklist of Italian lichens, thanks to European projects (KeyToNature, Open Discovery Space, VIBRANT, SiiT, CSMON Life), PL and Martellos developed the Dryades website (Martellos *et al.* 2023), which provides access to interactive identification tools for plants, fungi and animals, archives of digital images (mainly from Andrea Moro, Trieste, with 235 000 photographs, and F. Schumm, Wangen im Allgäu, Germany, with 45 000) and important databases on the biodiversity of Italy. Additionally, a project for georeferencing all lichen samples collected in Italy from 13 mainly modern herbaria was started, and completed in the first half of 2022. These herbaria are now searchable online, and dot-maps of herbarium samples are visible in the taxon pages of ITALIC v. 7.0. The Dryades website, which has indirectly given maximum popularity to our Department of Life Sciences on the web, without doubt represents an *unicum* for originality, power of analysis and synthesis of information, and is a fundamental reference point for the accuracy and completeness of the gathered data: the identification of a lichen (and many other taxonomic groups) has become much easier and more feasible than it was a decade ago, and is accessible to anyone, not just trained people. In the near future, PL plans the publication of a Flora of the Lichens of Italy, which is already in an advanced stage of completion. This will be the natural conclusion of a cycle that began more than 40 years ago, when a passionate young man was received by a mentor, Pignatti, who was about to write his Flora d'Italia: if this is not 'imprinting'…

Central to Pier Luigi's professional life has been to always involve the most knowledgeable people in a constant exchange of information, requests for review, collaborations and other activities. It began with his first significant floristic work, the *Checklist of the Lichens of Sardinia*, which saw the contribution of 11 specialists, continued with the first edition of the *Lichens of Italy* (Nimis 1993), with 39 specialists, and then with the second edition (Nimis 2016), with 73 specialists. The acknowledgements in these publications underline how PL has always worked in an atmosphere of great collaboration and continuous exchange of up-to-date information with colleagues worldwide; helped also by his amazing knowledge of languages, a 'sleeping box' in Venice, generously offered for long or short visits, and a motorbike launched at high speed for last-minute trips across the country.

Floristic Field Trips and the Establishment of the TSB Lichen Herbarium

Field trips have always been central to PL's working life. Over the years, he has made excursions to many parts of the world, acquiring an excellent knowledge of floras and biomes, especially at higher latitudes. This life in the field began when studying the cacuminal plant vegetation of the Mediterranean mountains for his master's thesis, which was published as part of a monograph (Pignatti *et al.* 1980). It continued with a series of field trips to Alaska and the Yukon as part of a collaboration with Prof. Lazlo Orlóci (London, Canada), whom he visited to deepen his knowledge of the multivariate analysis techniques that Orlóci was introducing to quantitative ecology. During these field trips, later also conducted with Duilio Lausi (Trieste), vascular plants as well as mosses and lichens were sampled in order to study the ecology of plant communities, with a focus on invasive plants along the roadsides of track routes. The exploration of the Yukon Territory was the source of countless anecdotes, told with incredible verve by the two botanists to the delight of their audience, and not too different from those of Disney's Uncle Scrooge (of whom PL has always been an avid fan). In this period, another topic that intrigued PL and was to fully develop in the following years, was quantitative phytogeography (Nimis & Crovello 1991). PL proposed an innovative approach (Nimis 1989), derived from the

'Equiformal Progressive Areas' of Eric Hultén (1937). This approach was soon extended to the data sets collected in Yukon (Lausi & Nimis 1991), Siberia and Europe, and, later, to a series of case studies centred on the main European forest types, from oak to beech forests, demonstrating the relevant function of some peri-Mediterranean refugia during the last glacial period (Nimis & Bolognini 1990; Bolognini & Nimis 1991). Other adventurous field trips included those to the Altai Mountains and the Lake Baikal region, the latter also with my participation, organized with the leading expert on the Siberian flora, Prof. Malishev (Novosibirsk), and some of his collaborators including Tatiana Makryi (and sons) and Nicolaj Friesen (Fig. 2). PL also participated in several field trips to the Sonoran Desert, organized by Prof. T. H. Nash (Tempe, Arizona). Only the tropical and equatorial belts were significantly neglected, with the exception of Thailand, which was visited on the occasion of the 2012 IAL Congress, with a subsequent invitation to a lichenological congress several years later and culminating with the publication of a lichen identification key (Nimis *et al.* 2017). Nevertheless, his most intensive floristic explorations were always dedicated to Italy. In the years immediately following the founding of the SLI (see above), PL organized excursions open to a significant number of neo-adepts and colleagues (including Poelt and Vězda as regular guests). These field trips typically took place during a week in spring, to study the flora of a small area (usually an island or a valley), as a contribution to the knowledge of the flora of Italy. In view of the obvious under-reporting of entire Italian regions, PL (together with myself) organized a series of extensive

Figure 2. A, field trip in Calabria, Aspromonte Massif, Pietra Impiccata (12 July 1988), organized by Michele Codogno and Domenico Puntillo, University of Calabria: from left to right, J. Hughes, Domenico Puntillo, Arianna Ciccarelli, Giuliano Lazzarin, an unidentified person, Miris Castello, Mauro Tretiach, Pier Luigi Nimis, Liliana Bernardo, Josef Poelt, R. Leon (?), Einar Timdal, Roman Türk, G. Renobales, Leopoldo G. Sancho. B, field trip in Burjatya (Siberia), Tunkinsky range, springs of the Tubota River (6 July 1997): from left to right, Mauro Tretiach, Marcello Moretti, Andrea Moro, Leonid Malishev (from behind), Pier Luigi Nimis, Tatiana Makryi with her two sons, Masha and Igor. C, Pier Luigi Nimis plays a lichenological version of Hamlet during the excursion to Vesuvius, Naples (24 October 1999), on the occasion of the annual meeting of the Italian Lichen Society. In colour online.

sampling campaigns which were carried out in the company of fellow colleagues (Josef Hafellner, Graz; Hannes Hertel, Münich; Claude Roux, Marseille; Antonín Vězda, Brno). Thus Sardinia, Campania, the entire Adriatic side of Italy and the Tuscan-Emilian Apennines were all investigated. Later, we visited the Western Alps with three successive sampling campaigns, but these data have remained largely unpublished, although the contacts made, as well as the knowledge gained, were used by PL in another important project, the *Checklist of Lichens and Lichenicolous Fungi of the Alps*, carried out in collaboration with lichenologists from all Alpine countries (Nimis *et al.* 2018). On all these occasions, PL was always an excellent travel companion, ever able to endure inconveniences with a smile on his face (and a lit cigarette in his hand), willing to crack jokes to defuse the most critical situations, to take on the worst difficulties to reach potentially interesting lichen spots, but also to leave the more trivial logistical aspects to others (in all these years he has never helped me change a flat tyre…). Also, over the years, he has increasingly seized the opportunity to combine scientific and artistic explorations, obviously helped by the great offerings available in Italy, and the sound suggestions of Andrea Moro (who has a master's degree in art history). Whereas in the past accommodation might have been (and often was) a shabby highway motel, in recent years he has come to prefer more comfortable bed and breakfast accommodation in historic centres that are worth a visit. Nevertheless, his legendary frugality with food remains the same!

All this activity of collecting specimens was naturally connected with his outstanding work in identification, gradually expanding the lichenological herbarium of the University of Trieste (TSB). This herbarium was created from nothing, with the first specimen (a *Candelaria concolor* (Dicks.) Stein. collected near Tarcento) dated 1978. Now TSB includes more than 44 000 specimens identified to species level. There are only a small number from exchanges or *exsiccata* and a remarkable collection of lichens collected by Paolo Modenesi, Genua at the Italian base in Antarctica that is preserved separately (ELA - TSB; resp. Lucia Muggia), because those specimens were received in the framework of the National Program of Research in Antarctica; their study led to a profound revision of the lichen flora of that continent, see Castello & Nimis (1995*a*, *b*). All the data from the TSB herbarium were entered into the database first by PL, secondly by one of his collaborators, Elena Pittao (Trieste), and are now available online thanks to the integration of the data set into the 'ITALIC' system (see above). Only in the last few years has PL's activity of collecting and identifying slowed down, eventually almost coming to a standstill due to eye problems.

The Academic World

Despite being a scientist of great standing on the national and international scene, PL has always shunned the pursuit of academic power. He never accepted offices in the Italian Botanical Society, the oldest scientific association in the country, because he disagreed with some mechanisms that prevailed in its community in the decades between 1990 and 2010. Nevertheless, he could not avoid participating in commissions and, in some cases, taking dissenting positions when, in his opinion, the scientific excellence and originality of the candidates were not honoured.

As an educator with great intellectual charm, PL had numerous young collaborators who, thanks also to his scientific influence, established themselves as independent researchers, even if the hiring freeze in the Italian university system, which lasted for more than a decade, certainly slowed down this process. In the hope of not offending anyone, I mention here the names of Vicente Calatayud (Valencia), Palmira Carvalho (Lisboa), Miris Castello (Trieste), Guido Incerti (Udine), Paolo Giordani (Genoa), Stefano Martellos (Trieste), Juri Nascimbene (Bologna) as well as myself. Others have chosen (or had to go along) other paths in life (among others, Gloria Bolognini, Trieste). Still others consider him the ideal partner for a critical exchange of ideas; for example, Martin Grube (Graz), Thorsten Lumbsch (Chicago) and Sonia Ravera (Palermo).

Those lucky enough to work with PL have had to endure the smoke of countless cigarettes, which is why, as director of our department, I recently had an altercation with him, interrupting an unhealthy behaviour but, unfortunately, also interpersonal communication. All people working with him have certainly appreciated his strong rationality, the conciseness of his language, and his ability (in my opinion a rare and unique gift) to find the best balance between maximum degree of approximation and set objectives. Not surprisingly, his works are a pleasure to read. It is no coincidence that for years PL has offered a course on scientific writing, always highly appreciated by the students. More generally, PL has been an exceptional teacher, very informal with the students and always able to find connections with reality to interest them, even in the most difficult subjects. The connection between theory and practice is particularly fortunate because his lessons, such as those in systematic botany, are always followed by a laboratory class where the 'show and demonstrate' becomes an essential means of committing to memory the theoretical concept explained in the preceding lesson. A further example is his willingness to maintain the summer field course in the Alps, even if the number of participants has forced him to double the length of the stay; this just a step away from retirement.

Over the years, PL has been the coordinator of a degree programme in Biology (1988–1994), the director of a department (1996–2001), coordinator of a Ph.D. course (2009–2011), president of scientific societies, from SLI (1987–1993) to IAL (2000–2004) (Fig. 3), leaving extremely positive and enthusiastic memories, especially from the latter two roles. In these roles, he has always demonstrated great management skills and proved to be a true pioneer of his time. The Department of Biology of the University of Trieste (at that time a unit exclusively dedicated to research with around 30 researchers), headed by him for two successive mandates, was the first unit of the university to be equipped with a website and an online publication archive developed in-house (much more agile and easier than the 'professional' one in use today!).

In the last 20 years, however, the organizational and responsibility aspects of his working life have interested him less and less, so that he has turned down offers of great prestige, such as the Directorship of the Botanical Garden of Berlin. This was a great opportunity both for him and for that institution, but PL preferred to decline it, knowing that he would rather be left in peace at his headquarters in Trieste to continue his scientific work. Personally, I have wondered if it was right to stop asking him on the organizational front, at least at the local level, because as a result the department and the university have lost the contribution of a truly exceptional person in terms of academic ability and ease in human relationships. However, PL has undoubtedly earned his research time, as evidenced by an outstanding scientific output (more than 300 papers and books; a list is available at

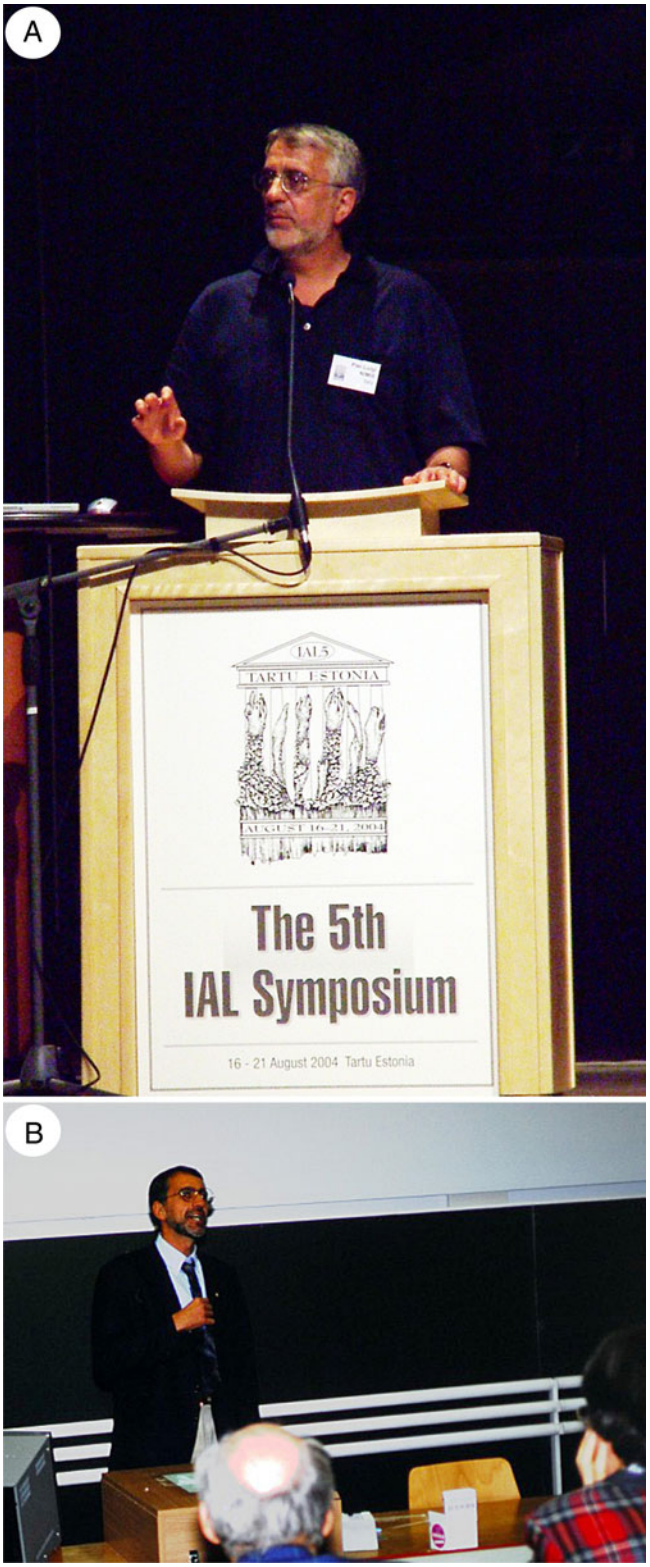

Figure 3. A, Pier Luigi Nimis giving a lecture at the 5th Symposium of the International Association for Lichenology in Tartu (Estonia, 2004). B, Pier Luigi Nimis never wore a tie, with one notable exception: at the 60th birthday celebration of his mentor Josef Poelt. In colour online.

https://arts.units.it/) and important awards. He received the OPTIMA Silver Medal (best book on the phytotaxonomy of the Mediterranean area) in 1993, the International Ferrari-Soave Prize for Biology from the Academy of Sciences of Turin in 2009, and the Acharius Medal from the IAL in 2014. To date, two genera (*Nimisia* and *Nimisiostella*) and four species (*Rinodina nimisii* Giralt & H. Mayrhofer, *Sarcogyne nimisii* K. Knudsen, Kocourk. & Hodková, *Sphaerellothecium nimisii* Brackel & Puntillo and *Topelia nimisiana* Tretiach & Vězda) have been named after him. I am confident that this list of taxa will be significantly expanded with the contributions in this volume, which are a small but heartfelt tribute to a scientist who has truly given a great deal, to science and to all of us.

Thank you, PL!

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