



## Obituary

## Elias Landolt (July 21, 1926–April 1, 2013)



Elias Landolt was born in Zurich, the second of six siblings, whose father was the mayor of Zurich. He read biology at the Swiss Federal Institute of Technology (SFIT) from 1945 through 1949. He received his PhD in 1953, and then left for postdoctoral study at Stanford University, during which he started his life-long work on the family Lemnaceae. In 1955 he returned to Switzerland, where he passed his habilitation, which involved presenting a comprehensive thesis different from the PhD manuscript, and giving a lecture before the Faculty Board. In 1964 he became Associate Professor with tenure, and three years later was promoted to full Professor. From 1966 to his retirement in 1993, he was Director of the Geobotanical Institute at SFIT Zurich.

Elias was an outstanding scholar of the first rank. His publications were always based on large data sets meticulously assessed and discussed in the wider context of the published literature. The high quality of his research brought him wide recognition in the scientific world, in Switzerland, and abroad. His publications include about 200 works, both original scientific papers dealing with specific plant groups, as well as more comprehensive floristic/biosystematics books. For instance, his monograph of Lemnaceae remains the basic reference for any scientist working on the family. But the spectrum of his scientific interest was much broader than a single family and included large works dealing with plants of Switzerland and in particular those of his home area of Zurich. One of the latter is his *Flora of Zurich* (2001), a volume of over 1400 pages resulting from his personal field mapping carried out from 1984 through 1998 (see comments below). In this work, floristic changes due to the development of the city over the last 150 years were assessed.

Elias was very concerned about the endangerment of biodiversity by human activity and used his immense knowledge in the service of conservation and sustainability. Nearly to the end of his life, he was actively engaged in consulting several organizations about these issues. His strong engagement in environmental problems attracted many students who obtained Master's and PhD degrees under his direction. He led his graduates with

tolerance and support, even if he did not always share their opinions.

Elias' personal attributes, in addition to his uncompromising honesty in scientific work, included extreme modesty and a keen sense of humour. Although he took his science very seriously, he did not take himself too seriously (see anecdote below).

Each of us knew and interacted with Elias Landolt at different times and to different degrees. Krystyna Urbanska was a long-time colleague, friend, and collaborator on cytological studies of duckweeds as well as research on several other plant groups, while the other three of us collaborated with him on studies of duckweeds at various times during the past 25 years. Each of us has particular remembrances of him, several of which are shared below.

**Krystyna M. Urbanska** provided the majority of information contained in the preceding paragraphs, and in addition, provides insight into Elias' basic humility by the following anecdote:

"Elias used to come over to the Institute very early in the morning, long before anybody else arrived. At that time there were only three professors at the Institute: Elias, a second colleague, and myself. One day, Elias came up to my room laughing and told me the following story: In the early morning, he was quietly working when the telephone rang and a VERY IMPORTANT- sounding fellow from a publishing house in Paris asked if the second colleague was there. Elias replied that he did not know. The fellow asked then when this colleague normally arrives. Elias again indicated that he did not know. The caller then exclaimed, "You, the janitor, don't you know when he arrives?" After my colleague eventually arrived and called Paris, there apparently was panic in the publishing house, followed by a hand-written letter of apology. Elias thought it was all quite amusing. Besides his main love of Science, Elias was an accomplished cellist with a preference for Baroque music, especially concerts by Georg Philipp Telemann. He often went to the famous Zurich Concert Hall where his family had permanent tickets. Also, when we were in the field, and interesting architecture or a piece of art was to be seen nearby, he always suggested we take a brief break to have a look."

**Daniel J. Crawford** first met Elias at an international meeting, organized by Krystyna Urbanska, in Zurich in 1986 and offers the following:

"The meeting Krystyna organized in Zurich was memorable because everything occurred exactly on schedule with a first-rate group of speakers, and the magnificent field trip to the Alps, led by Elias. Elias also gave a very insightful, synthetic paper on ecogeographic differentiation in Lemnaceae. Several years later, at another meeting, Krystyna suggested that Elias and I should consider collaborating on electrophoretic studies of duckweeds. Elias

then financed a trip to Zurich in May of 1991, where we discussed such a project. I recall a walk up to a restaurant where we met Krystyna for dinner, and along the way he continually jotted down observations about species in a small notebook; he was gathering data for his Flora! I returned with 48 tubes of *Spirodela* on agar. It was apparent from the initial results that even with the few characters available on these very reduced organisms, the taxa Elias had so perceptively recognized were highly divergent at allozyme loci. Furthermore, species about which he expressed some question were in several instances quite similar genetically. Elias financed some early work in my lab, which facilitated a successful NSF grant application by Don Les and me to continue work on the duckweeds. The impressive thing about collaborating with Elias was that, despite knowing more than anyone else about duckweeds, he was not at all concerned about whether new data would support or call into question his published ideas; in the truest and purest spirit of science, he just wanted his hypotheses to be tested. However, he really didn't have much to worry about, as his ideas have been largely upheld by all forms of "new" data."

**Klaus Appenroth** was actively involved in duckweed research with Elias up to the time of his death, and offers the following:

"I met Elias Landolt more than 10 years ago visiting his place at the ETH Zurich. He was already retired for 10 years. In that time my own duckweed collection consisted of approximately 20 clones. Thus, I was first surprised to see more than 1000 clones in Zurich and then even more when he offered me any of his clones that I wanted. He had started to collect duckweeds in the middle of the 1950s and his extreme care in developing the systematics of this plant family made the collection so valuable: more than 1000 clones with defined species! In the following years he shared not only duckweeds with me but in the same way his knowledge. We must have exchanged hundreds of e-mails. He was also very much interested in results obtained with new methods and always ready to update his own opinion. He was interested in duckweeds until his very last days. Two weeks before he passed away he invited me to come with freshly collected samples from India to see whether the missing species *Wolffia microscopica* was there. In his very last week he re-investigated the morphology of *Spirodela intermedia*. His knowledge we will miss but his contribution to sciences will help to boost the field of duckweed research and application in the next few years. The **2nd International Conference on Duckweed Research and Application**" at the Rutgers University, NJ will therefore be dedicated to Elias Landolt."

**Donald H. Les** collaborated extensively with Elias, Dan Crawford, and Rebecca Kimball on phylogenetic studies of duckweeds. He led the effort that produced the first molecular phylogeny for the family:

"I met Elias only once, during a brief visit to Zürich, Switzerland in 1995. I recently had joined forces with Dan Crawford and Elias to conduct some collaborative research on duckweeds and was quite excited at the thought of finally meeting the master taxonomist whom I had long admired for his brilliant legacy of research on those tiny plants. After some short, polite introductions, I was surprised that Elias chose not to begin our conversation on the topic of duckweeds. Instead, he eagerly produced a thick volume of raw text for his forthcoming "*Flora der Stadt Zürich*" and proudly handed it to me for inspection. I began flipping through page after page where hundreds of maps of Zürich showed specific distribution points and coordinates for countless plant species throughout the city area. The amount of work necessary to produce such an extensive database was unfathomable and I was nearly speechless as I continued to peruse the manuscript. "Good grief, Elias", I blurted out. "How many herbaria did you have to visit in order to assemble such a massive amount of distributional data?" Elias responded initially with a blank stare. Then he replied, "Oh, those are not herbarium records. Each morning I walked along a different route from my house and kept a notebook where I recorded the location of each new plant species that I passed on my way to work." He said it in a way that would make you think that *everyone* does this on their way to work each morning. I know that we talked about duckweeds after that, but I was so intimidated by then that I hardly remember any of our subsequent conversation. I do remember that Elias was a gentleman in every respect and for being such a magnificent scholar, never once was anything but humble regarding the work he had carried out. Dan and I did a lot of genetic work on duckweeds to test a plethora of hypotheses that Elias had developed over the years using living cultures, a microscope and his ultra-keen eye. He pretty much got most of it right, with one exception – the distinctness of the genus *Landoltia*, which we named to honor this great scientist."

We all feel most fortunate to have known and collaborated with this outstanding scientist and marvellous person. He will be missed dearly.

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