

## Editorial

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Between 16–21 August 2004, 250 lichenologists gathered in Tartu, Estonia for the Fifth Symposium of the International Association for Lichenology (IAL5). The meeting comprised six principal lecture sessions and associated posters. This issue of *The Lichenologist* presents papers deriving from contributions to Session 3: Genes, Physiology and Structure. This session probably had the broadest scope of all those comprising the symposium because it essentially encompassed all aspects of the general biology of the lichen thallus. The response to this topic from prospective authors and presenters was excellent and the final programme included fourteen oral presentations and sixteen posters; of this total of thirty contributions, eight are published here. Inevitably, several of the oral and poster presentations were already submitted to, or destined for, alternative journals or were considered too preliminary to warrant publication at this stage. In particular, there were several excellent “molecular” contributions dealing with such topics as breeding systems, genetic diversity, microbial diversity within thalli, and the genetic control of secondary metabolite production, but none were available or offered as papers to this volume.

The first two papers published here deal with aspects of thallus structure and development. William Saunders describes how transparent plastic coverslips can be used as artificial substrata to study colonization and thallus development; remarkably in the case of tropical foliicolous lichens, the complete life cycle from spore to spore was observed in the space of 21 months. This is followed by an anatomical investigation of Antarctic endolithic lichen communities by Asunción de los Ríos and co-workers in which exami-

nation and analysis of sections of colonized granite provided evidence of fungal-algal interactions, cell-turnover, microbial community composition and biogeochemical processes. Six papers then follow on physiological and ecophysiological topics. Richard Beckett *et al.* review evidence for the occurrence and function of reactive oxygen species (ROS) in lichens. Extracellular ROS production is particularly prominent in the Suborder *Peltigerineae*, possibly involving laccase activity, which might function in defence against pathogens. Then Markus Hauk and Alexander Paul summarize research suggesting that manganese inhibits the growth of epiphytic lichens. Such evidence comes principally from coniferous forests where low soil pH increases Mn solubility and, ultimately, its availability in bark and stemflow. Next, Ana Pintado and co-workers present a comparative ecophysiological study of the soil crust lichen *Diploschistes diacapsis* on north and south facing slopes in the semi-desert environments of the Tabernas badlands in south-east Spain. Net CO<sub>2</sub>-exchange rates were higher on south-facing slopes, but were sustained for shorter periods, compared to rates and duration on north facing slopes thus confirming physiological differentiation between sun and shade habitats reported in lichens previously. In the sixth paper, Milos Barták *et al.* use a novel application of chlorophyll fluorescence imaging to show how chlorophyll fluorescence varies spatially over the surface of a single thallus of *Xanthoria elegans* under field conditions and how this spatial pattern changes during the progress of desiccation. Mauro Tretiach *et al.* then report on the ontogeny of isidium development in *Pseudevernia furfuracea* and on the effect of isidia on net CO<sub>2</sub>-exchange rates.

Isidia cut from the surface of thalli had photosynthetic and dark respiration rates on a unit mass basis twice those of intact non-isidiate thallus lobes which can partly be explained by the abundance of actively growing tissue and photobiont cells in isidia. The final contribution is a Short Communication from Simona Rinino *et al.* presenting a new histochemical method for locating metal ions in thalli illustrated with sections of *Pseudevernia furfuracea* in which the distribution of various metal ions is revealed by coloured reactions.

We would like to thank the IAL5 Local Organizing Committee [Tiina Randlane (Secretary), Andres Saag (Vice-Secretary), Inga Jüriado, Kersti Loolaid, Piret Lõhmus, Lauri Saag and Ave Suija] for their tremendous hard work in the planning and running

this most successful, productive and enjoyable symposium. During the meeting we were all taken with Estonian hospitality and culture such that many no doubt will look forward to an opportunity to return to Estonia in the future. Last but not least we thank all the presenters of papers and posters to Session 3 for their co-operation in making it every bit as good as the conference as a whole and especially to the authors of the eight papers published here for making this a very stimulating and special issue of the journal.

**Peter D. Crittenden (Convener)**

**Richard P. Beckett (Chairperson,  
lectures)**

**Dianne Fahselt (Chairperson, posters)**