SKILLS AND KNOWLEDGE FOR LICHENOLOGISTS - (Feb 2023)

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To be a proficient lichenologist you need to develop a wide range of knowledge and skills. 4 stages are outlined below, each requiring considerable time and commitment. Learning is not linear, and the stages may need to be re-visited several times. You need to use the teaching resources to the full to meet your own style of learning. This may take the form of formal courses, workshops, field meetings, mentoring, on-line learning and support and takes several years to acquire. The following list of stages and outcomes aims to help you make the most of the support on offer and to identify areas where additional skills/knowledge will be helpful to you.

This document is intended as guidance for a focus on the field identification of lichens which will need to be supported by microscopy as necessary. (It should be recognised that the BLS does not recognise this as a formal accreditation scheme.) It can be used by lichenologists, to give them an idea of the range of "topics" they need to pursue as they become more competent. In addition, it can provide a framework for those planning to deliver courses.

<u>The Beginner stage</u> lichenologist should:

- Be aiming to ID 50 lichens, most likely in your neighbourhood
- Be using a hand lens
- Use basic terminology to describe lichen features visible with a hand lens. (see LABs glossary and Learn the Language terminology, which can be supplied on request)
- Develop identification skills
    - Use FSC identification guides
    - Use "The Dobson" and Dobson spiralbound guides
    - Be aware of the BLS website and resources
- Develop techniques and protocols
    - Use the C and K chemical tests
    - Use a UV lamp/torch
    - Use appropriate collecting and storage techniques and protocols
- Use a lichen checklist to aid systematic recording of features
- Be aware of networking opportunities e.g., local groups/zoom meetings, information on the BLS website etc.
- Understand the concept of lichen symbiosis and how lichens are named
- Be aware of the importance of habitat

The Intermediate stage 1 lichenologist should be developing their knowledge e.g. through attendance at BLS meetings, local group meetings, using the BLS website and Zoom sessions and should:

- Aim to ID up to 100 lichens (possibly focusing on a few geographical areas or habitats)
- Expand their understanding of the terms associated with lichen structure and be able to recognise these structures to facilitate use of the Flora. (LEAF 1 glossary is available on request).
- Use "The Flora" (The Lichens of Great Britain and Ireland) 2nd ed. And the LGBI 3 accounts (as they are posted on the BLS website)
- Expand the range of resources used to ID lichens
- Use a dissecting microscope
- Experience using a compound microscope with guidance
    - Prepare a slide for microscopy e.g. squashes and sections to show spores (video available)
    - Measure dimensions using calibration information provided.
    - Use polarising sheets
    - Use Ink- vinegar technique
    - Be able to recognise some different spore morphologies
- Be familiar with recording procedures using the BLS database and spreadsheets
- Understand the concept of environmental drivers of lichen distribution
- Begin recording lichens of specific lichen habitats (using a field notebook) and particularly in their Vice County
- Recognise acidic and basic rocks
- Recognise acidic and basic barked trees as far as possible and recognising this may change with time
- Make up chemicals e.g. C and K
- Lead "lichen walks" in areas they feel confident in, probably in their local area.
- Recognise that there are "recent" ~~are~~ lichen name changes (see taxon dictionary)

The Intermediate stage 2 lichenologist should be continuing to develop their knowledge and skills by increasing their confidence and competence and should:

- Aim to ID up to 200 lichens
- Identify most of the lichens in Dobson that are present in their local area, using the Flora (and other sources) regularly

- Expand their understanding of the terms associated with lichen structure (see Mark Powell's glossary on BLS website). Be able to recognise these structures and use them in identifying lichens

- Be confident in using a compound microscope (preferably with Kohler illumination and using oil immersion)

- Develop confidence/competence in sectioning apothecia and perithecia and recognising structures

- Develop confidence/competence in staining techniques for spores, sections and ascus tips using a range of chemicals (e.g., Pd, iodine)

- Make up Pd

- Recognise the presence of pycnidia, lichenicolous fungi

- Use more "difficult characters" for ID purposes e.g. pycnidia, conidia, paraphyses characters

- Aim to ID some lichenicolous fungi

- Routinely record lichens from their local area for the BLS database

- Be able to access the grey literature

- Support other beginner and intermediate lichenologists in the field and via zoom, in areas they have become confident in e.g. by leading events

- Assist in carrying out advanced surveys

    - Plan and effectively carry out a lichen survey
    - Write up the findings of a lichen survey in report format
    - Undertake appropriate risk assessments (for guidance see BLS website)
    - Provide recommendations for site management
    - Conduct condition assessment of the lichen feature for SSSIs

<u>Advanced stage</u>. It is recognised that to reach this stage will already have involved extensive study and commitment and that these will be built on with experience. Over time, experience will be gained leading to expertise in particular habitats and groups of lichens. <u>The Advanced stage</u> lichenologist should:

- Develop and demonstrate competence in the identification of specific genera, using the latest Flora information or other appropriate sources (e.g. international sources)

- Develop and demonstrate competence in the identification of Lichenicolous fungi

- Develop and demonstrate competence in the identification of pyrenocarps

- Regularly record lichens in their local area and beyond, entering records into the BLS database
- Show competence in setting up a compound microscope with Kohler illumination (if relevant) and using oil immersion
- Show competence in the diagnostic microscopic identification/interpretation of a wide range of key lichen microscopic structures e.g. paraphyses, spores, ascus tips etc
- Identify lichen communities
- Recognise habitats and key indicator species
- Show a wide knowledge and be able to access and contribute to the 'grey literature'
- Show a wide knowledge and use of the published literature.
- Show familiarity with the conservation status of lichens
- Be familiar with and able to identify, in the field, the lichens of many of the habitats across their region
- Carry out advanced surveys
    - Plan and effectively carry out a lichen survey
    - Write up the findings of a lichen survey in report format
    - Undertake appropriate risk assessments (for guidance see BLS website)
    - Provide recommendations for site management
    - Conduct condition assessment of the lichen feature for SSSIs
- Lead field trips (as confidence develops in identifying lichens) in
    - a wide range of habitats e.g., coastal, upland, woodland, aquatic etc
    - a range of substrates e.g., corticolous, saxicolous etc
    - Develop research skills and links to relevant contacts