

## EDIT Workpackage 5 – Model 3 Detail

This model depicts the work of a Paleobotanist working in the Natural History Museum of Hungary (HNHM). Her work focuses on the fossil records of plants, largely gathered from the Mecsek mountain range of southern Hungary.

In comparison with some other disciplines, Paleobotany is a science with relatively few practitioners. It was estimated that for the taxonomists specific region of study, the Jurassic flora, there are perhaps 50 scientists world-wide.

The following table describes the individual steps of the process model in detail.

Activity	Collect Specimens	<p>Specimens are collected from the field by the taxonomist herself, largely from the Mecsek mountain region of Hungary. Approximately 80% of specimens are collected from this region. Most of the others are collected from Poland, but these have to remain with Polish institutes and are not studied in Hungary. Collections are undertaken for about 2 weeks of every year, and have been taking place since 1989.</p> <p>Collections take place largely in disused open cast mines. For this, annual permission is required from the company maintaining the site, and there is typically no problem obtaining such permission. No other collection restrictions, such as CITES, exist regarding the fossils. Initially the taxonomist was accompanied in the collection by a guide, but that is no longer necessary.</p> <p>Funding can be received either from the Museum, or from a grant from OTKA, the Hungarian Scientific Research Fund.</p>
Activity	Broad identification and catalogue	New specimens are first given a preliminary visual examination and the broad taxonomic group is established. The specimens are then stored according to this category, though separately from fully identified specimens.
Activity	Select a sub-group and identify	A group of specimens from the partially identified collection is selected for study
Fork	Path 1	
Activity	Examine Specimens	The specimens are examined using the light microscope, electron microscope, and other methods, and results recorded in a comparison table
Action	Prepare specimens for microscope examination	Specimens are mounted on to a microscope slide for examination. A section of the fossil itself can be used, or, if available, a section of the leaf cuticle. The cuticle is the waxy surface of the leaf that bears the imprint of leaf structures and can be preserved on the surface of the fossil. In some cases the fossil itself will be dissolves away using acid to reveal the cuticle.
Action	Perform microscope analysis	Slides are examined using standard light microscopy, fluorescence microscopy or with the SEM. The taxonomist performs all specimen mounting and examination herself.
Decision	Slides adequate?	The image is assessed for capturing. If it is unsuitable

		the analysis continues, if suitable progress to image capture.
Action	Capture microscope image	The image is captured to computer
Decision	Image suitable?	The image assessed for it's suitability as a permanent record. If suitable, it is saved to directory.
Action	Store images in database	The 'database' is a standard Windows directory, organised by the location of sample, and date of collection.
Decision	Other examinations required?	
Action	Arrange for other examinations	
Fork	Path 2	
Action	Search literature	<p>Because of the relative paucity of paleobotanical literature in the Hungarian institutes, most of the literature searching takes place online or in foreign institutes. Elsevier.com displays abstracts for the papers it publishes. The taxonomist takes advantage of any foreign trips for research, key locations being the NHM in Stockholm and the Polish Botanical Institute.</p> <p>In addition to this, the small size of the paleobotanical community means it is possible to circulate reprints to all interested parties upon publication, a common practise in this field. These reprints are another useful source of information.</p>
Action	Visit other institutes and examine specimens	The weight and size of fossil specimens means that posting out from requests can be prohibitively expensive. Much examination of specimens takes place at the institute housing the collection therefore. The taxonomist takes advantage of any expeditions and trips to achieve this.
Join	Path 1 and 2 merge	
datastore	Literature	This 'datastore' represents the body of literature accessed by the taxonomist as part of her research. It does not represent a physical or electronic database. It's presence in the diagram is to illustrate that a body of information is collated and subsequently contributes to a number of actions and activities.
Action	Compare specimens	Compare the specimens and the captured images of the new and researched specimens
document	Comparison table	Document detailing the measurements taken from examination
Decision	Taxonomic review justified?	Does all of the information collated indicate that a review of the current taxonomic theories would be justified? If so, proceed to developing a new theory, if not, continue examining specimens
Activity	Develop theory	The process by which a decision is reached on whether the specimens under study indicate a review of the current taxonomic theories.
Action	Review measurements	Review all the measurements taken and compiled into the comparison table during examination
Action	Compare images	Compare light, fluorescence, and electron microscopy images
Action	Consult colleagues	Informal consultation with colleagues in own and other institutes, to ask their opinion of the new theory.
Decision	Theory complete?	Is the taxonomic theory justified by the evidence?

Decision	Publish paper?	Does the emerging theory warrant publication? If so, publish, if not continue with further examination of specimens.
Activity	Publish Paper	Producing and compiling a paper and arranging for publication in a suitable journal
Fork		Producing the separate sections of a paper is seen as a parallel activity
Action	Prepare illustrations	Images used in the final paper may differ from those previously produced, in order to highlight certain features or to satisfy editorial guidelines
Action	Prepare other examinations	Prepare the other examinations that may form part of a final paper, such as organic chemistry analysis. The environment in which the specimen was discovered can also yield information that can be used in discussion, for example, the composition of the surrounding stone can yield information about the existing environmental conditions when the specimen was alive. Though this information cannot directly influence taxonomic decisions, it can provide useful accompanying information for discussion.  These examinations are generally performed by other scientists.
Action	Write description	Prepare the taxonomic description, fully describing in text the main distinguishing features of each taxonomic group.
Action	Prepare comparison tables	Prepare a table illustrating the major distinguishing features of the taxonomic groups under review
Action	Acknowledgements and references	Compile a list of all references cited in the paper and prepare the acknowledgements, using MS Word
Join		The parallel paths merge
Action	Compile paper	Put all the sections of the paper together in a suitable format for publication, using MS Word and according to the editorial guidelines of the journal
Action	Send to colleagues for review	The taxonomist sends the paper to colleagues for informal review
Action	Revise paper	Incorporate colleague's comments into the paper if necessary. This step also reflects reviewing the paper if it is returned by the journal for further editing
Action	Send to journal	Send the paper to the editorial board for pre-publication review
Decision	Accepted or returned	The journal will review the paper and most likely return it for revision prior to publication. Occasionally papers are published without return, but this is uncommon
Fork		Parallel activity
Action	Add slides to collection	Label the slides and store them in the HNHM paleobotanical specimens collection. The cataloguing for this collection is a traditional file card system stored in cabinets on site. A computerised system does exist but it is not commonly used by the taxonomist, as they currently lack the resources to transfer the information onto computer.
Action	Send out reprint to colleagues	It is common practise within paeleobotany to send reprints of any published papers to interested colleagues. This provides the scientists with a valuable source of information for research.
Join		Parallel paths merge
Decision	More sub-groups	If there more sub-groups remaining go back to

	remaining?	selecting a sub-group for a new round of examination and identification.
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