Paterson, Trevor

Subject: FW: Mapping Lucid Characters to Prometheus

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From: Paterson, Trevor [mailto:T.Paterson@NAPIER.AC.UK]
Sent: 17 March 2004 12:55
To: TDWG-SDD@LISTSERV.NHM.KU.EDU
Subject: Mapping Lucid Characters to Prometheus

Hi Kevin

looking over the character lists you use for keys I would say that they can all be expressed by decomposing into a number of atomic statements (our angiosperm ontology has not yet included some of the structures and states required, but this is not a problem as the terminology is readily expandable) - i have briefly outlined the sort of mapping that is done in the table below,
(note - i am not a botanist...so there may be some gaffs ;-).

The approach that we are proposing is that the descriptions are collected as atomic statements, and more traditional 'characters' can be discovered by analysis of this data (many characters are apparently a collection of atomic scores/states)

Our taxonomists find this quite a departure from how they compose and record their characters at the moment (they recognize/discover and define a set of characters by looking at the variation that exists in their specimen, then create a scoring sheet/proforma that allows them to pick one of these alternative characters) - our system might be tweaked to allow them to work in a more character oriented manner if they precompose sets of statements as part of the proforma specification, and then score these alternates as present or absent.

a major advantage of our system can be seen from some of your simple characters - eg growth habit: you have split this into two alternatives 1. Epiphytic or lithophytic habit vs 2. (not epiphytic or lithophytic) whilst this might make sense for a key, and is a DELTA-like representation, we would argue that if the ACTUAL growth habit was scored for each specimen as epiphytic, lithophytic, terrestrial, aquatic (or concatenations of these) far more accurate information would be recorded. For example, this would allow the same specimen description to be divided into other character sets if desired (someone else may think that a key would work better if the alternates were soildwelling or lithophytic vs epiphytic, another person might want the alternates separately....if the description data had been recorded in the orginal two-alternate-character division, this data reuse would not be possible.
I hope this shows some of the salient features of our model...and how we think it would beneft working taxonomists.

LUCID CHARACTERS	STRUCTURE	PROPERTY/ STATEGROUP	STATES	
Salt tolerance • plants tolerating high salt levels (halophytes) • plants not salt tolerant	Entire Plant	Ecological Adaptations	Halophytic (there are a list of alternate states that could be scored, or NOT-halophytic is allowed)	
General habit • tree • shrub • climber (woody or herbaceous) • herb • grass- or sedge-like plant	Entire Plant	Habit	Tree, Shrub, Herb etc.are scorable (or the negative)	
	Entire Plant	Architecture	Climbing, Bushy, creeper, Twining etc	We can collect more specific data by scoring more states for

				additional properties
Epiphytic or lithophytic habit • plants growing in soil (not epiphytic or lithophytic) • plants growing on other plants or on bare rock surfaces (epiphytic or • lithophytic)	Entire Plant	Preferred Substrate	Epiphytic, Aquatic, Lithophytic, Terrestrial	
Habit (aquatic herbs only) • free-floating • rooted in substrate with leaves all or mostly submerged • rooted in substrate with leaves mostly floating on the water surface • rooted in substrate with leaves mostly emergent above the water surface	Root	Root attachment	free-floating, substrate-attached	we don't have appropriate terms etc for thes states in our ontology as yet - but they could be added
	Leaf	Aquatic Position	floating, submerged, emergent	
Seasonal longevity • annual, biennial or ephemeral • perennial	Entire Plant	Lifespan	Annual, Biennial, ephemeral, perrenial	
Seasonality of leaves (woody plants) • evergreen • deciduous or semi-deciduous	Leaf	Lifespan	deciduous, semi d., evergreen	
Structures for spreading vegetatively • none (plants not spreading vegetatively) • underground bulbs, corms or tubers etc • rhizomes, stolons or root-suckers • detached aerial stem parts, or proliferous flowerheads	Entire Plant	sex and reproduction	vegetative	list of alternatives, or use NOT
	Bulb	Presence	present, absent	
	Corm	Presence	present, absent	
	Tuber	Presence	present, absent	
	Rhizome	Presence	present, absent	
	Stolon	Presence	present, absent	
	Root-sucker	Presence	present, absent	
	detached aerial stem parts	Presence	present, absent	
	bulbils	Presence	present, absent	
	inflorescence	Type	proliferous	we can identify 'types' of structures, ith associated sets of states, (aerial stem parts migh be a type of stem)
Chlorophyll in stems or leaves • present (plants green or grey-green) • absent (plants	Leaf-Cholorphyll	Presence	present, absent	uses our structure hierarchy to identify which chlorophyll we are describing
	Stem-Chlorophyll	Presence	present, absent	

colourless, white or yellowish)	Entire Plant	Colour	specify any colour	
Nutritional strategy • neither carnivorous nor parasitic (normal plants) • partially or totally parasitic on other plants • carnivorous	Entire Plant	Habit-Lifestyle	carnivorous, parasite, partial parasite, etc	any combination of states including NOT can be allowed
Trap structures (carnivorous plants only) • submerged or underground bladders • pitcher-traps • sticky glands or glandular hairs on leaves and/or stems • trap like irritable leaf blade segments	We haven't had to address trap yet but we have anumber of ways in which the terminology can be expanded to represent this information.... • we don't have 'trap' as a structure in our ontology yet - we could add trap structure in various structural contexts, and allow scoring presence or absence. • we can add the presence of hairs or glandular hairs anywhere - and again score presence/absence • we would have to add some stes to the ontology - e.g irritable			

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