BIOTABase – a data base software for biodiversity monitoring



Federal Ministry of Education and Research

Muche, G.^{1,2}, Suwald, A.^{1,3}, Finckh, M.^{1,4}, Schmiedel, U.^{1,5}, Jürgens, N.^{1,6}

¹Biodiversity of Plants, Biocentre Klein Flottbek and Botanical Garden, University of Hamburg, Ohnhorststr. 18, 22609 Hamburg, Germany gerhard.muche@botanik.uni-hamburg.de²; andrzej suwald@botanik.uni-hamburg.de³; mfinckh@botanik.uni-hamburg.de⁴; uschmiedel@botanik.uni-hamburg.de⁵; juergens@botanik.uni-hamburg⁶



1. What is BIOTABase:

BIOTA AFRICA aims at an integrated transdisciplinary approach towards sustainable land use and conservation of biodiversity in Africa. Within the frame of these project the software BIOTABase has been developed. The main goal of BIOTABase is the structured storage of vegetation observations under consideration of soil, climate and land use data.

Perm	Plots 1 Permanent baseline data PN or observation sites PNo		Relevés Time-dependent summarising plot data PNo+Date		Photographs Photographs of plots, vegetation and species
1 n ONd	Habitats Single date records of envirionmental data PNo+Date		Species Observations at species level Collection No PNo+Date+Species name	CN	Collection No →Species name

2010

lar

6

N

A permanent plot in a BIOTA biodiversity observatory in Leliefontein / South Africa

n	Land uses Single date records of land use characteristics PNo+Date	Individuals Observations at individual level	Species name	Taxa Taxa reference list of the study area Species name
	t number of observation site te of observation Place	SubplotID+Date+PlantID ubplotID: PNo+Abscissa+Ordinate antID: Species name+consecutive number Inventory		ecies name: (work)name of species lo, Collection No: collection number Context

Structure of BIOTABase

2. What is BIOTABase able to do:

BIOTABase is able to store vegetation data in combination with environmental information. Vegetation cover values can be stored according to vegetation strata. It is possible to link observations directly to the respective records of the collected specimens. The process of taxonomic identification of specimens can be documented.

BIOTABase facilitates the handling of taxonomic reference lists in order to ease data input and to check nomenclature. Photographs can be administrated and linked to site, relevé and species data. Data input is supported by several tools for quality checks.

5. Screenshots:

The form "Plots" contains time invariable site information related to location and topography. The form "Habitats" stores time dependent abiotic and biotic soil information. The form "Species" retains time dependent species observations. "Releves" uses these data to compile the floristic composition and structure of the relevés.

General data Plot-No. (interim) Date (first visit only) Responsible person Country Administration unit Locality	116 36: obs 22/ ha 16/size 100/reg Namaqualand lowlands/loc Soebatsfontein
14180 20030908 U.Schmiedel VRSA Vamaqualand lowlan Soebatsfontein, Katelklip	Plot-No. Date Responsible Person Fieldbook 14759 20020908 U.Schmiedel 2002 Ute Schmiedel
Latitude Longitude N/S Deg Min Sec,Dec E/W Deg Min Sec,Dec Point accuracy GPS Map Map	
center -30.1887278 17.5439084 S 30 11 19 42 E 17 32 38 07 4m WGS84	
corner 0.0000000 0.0000000 0	
Fieldbook Type of releve/plot Marked Observ. ID Hectare ID Rank ID Size Selection	Name Galenia fruticosa
Aug-Nov 2003 VEG v magn v 22 20 35 100 [m ²]= 10 [m] x 10 [m]	Specimen
Notes Photographs 266/04-06 Photographs	Species composition
	Field number Field name Abundance



3. Special features of BIOTABase

Traditionally, a relevé number relates to a vegetation record at a given moment and a definite place. Hence this number includes two different types of information: the location and the date of the relevé. However, these informations are handled in BIOTABase separately in order to store permanent plots in an adequate way. This has great advantages for the statistical analysis of large datasets and time series. It is relatively easy to handle nested plot data and to compile species inventories according to the spatial hierarchy of the study sites.

4. Further special features

BIOTABase connects field observations with herbarium collections. The results of identification processes can be used to update observation records automatically. A controlled update procedure makes it possible to rename either just the corresponding record (with the respective collection number) or all records which share the same field name.

Plots: general data

Soter ur	nit 🖂 Major I	landform 🗔 D	ominant slope gradi	ient 🕌 [%] Relief	intensity [[m/km] Dissection	[class] othe
- Local t	opography —						
Å	w <mark>-</mark>		l	<u>[]]</u>	7		
Altitude	Exposition	Inclination	Slope complexity	Slope shape	Slope position	Notes	
430 [r	n] 90 (*)	8 [*] 14.1 [2	8] complex	 convex linear 	▼ shoulder	-	
Ĺ				,	,		

Plots: topography

Slightly un				Dead wood 0 [%] Soft litter 20 [%] Dung 0 [%] Biotic crust 90 [%] Lichens cover 0 [%] Lichens height 0 [mm]
Fine materi	i i i i i i i i i i i i i i i i i i i	%] cover 99		Mosses cover 0 [%] Mosses height 0 [mm]
Gravel	0.2-2 cm	1		Termite mounds
	2-6 cm	0	all stones-	Other
Stones	6-20 cm	0		r Soil Profile
	20-60 cm 🛛	0	0	Geol. Formation Substrate
Blocks	60-200 cm	0		Lithology
Rock outc	rops >60 cm 🖡	0		Soil type, if defined Soil depth 0 [
Sum	ſ	100		Limitation/Crust
Abiotic Cru	st	10		
Sum	Γ	110		
- Erosion wi	nd			Erosion water

Cover [%]				-
Total Sum 0-5 cm 5	-15 cm15-50 cm 0.5-1	<u>m 1-2 m 2-5 m</u>	n <u>5-10 m 10-20 m >20 m</u>	
0.50 0.50 0.00	0.00 0.50 0.00	0.00 0.00) 0.00 0.00 0.00	
	- Devenieti			
Life form Crnes		on of adult plant—		
Life cycle duration unknown	Growth fo	orm	upright-spreading 🖉	
Safesite	Height [ci	m]	0	

Species records

Species name	Total cover	Sum	0-5cm	5-15cm	15-50cm	0.5-1 m
Amellus microglossus	0.10	0.00				
Aridaria noctiflora ssp. noctiflor	0.10	0.00				
Cephalophyllum inaequale	25.00	25.00	25.00			
Crassula muscosa var. muscos	0.10	0.10		0.10		
Didelta carnosa	7.00	7.00		2.00	5.00	
Dimorphotheca sinuata	0.10	0.10		0.10		
Drosanthemum kantige Blätter	0.01	0.01		0.01		
Ehrharta of brevifolia	0.10	0.10			0.10	
Euphorbia mauritanica	0.10	0.10		0.10		
Felicia merxmuelleri	0.01	0.01	0.01			
Galenia fruticosa	0.50	0.50			0.50	
Galenia sarcophylla	0.10	0.10		0.10		
Gorteria diffusa	0.10	0.10	0.10			
Gras dicker Kolben	0.10	0.10		0.10		
Hebenstretia parviflora	0.10	0.10		0.10		
Helichrysum leontonyx	0.10	0.10	0.10			
Heliophila variabilis	0.01	0.01		0.01		
Hypertelis salsoloides	0.01	0.01		0.01		
Lebeckia multiflora	0.10	0.10			0.10	
Leipoldtia schultzei	0.25	0.25		0.25		
Manulea corymbosa	0.10	0.10	0.10			
Mesembryanthemum guerichia	0.10	0.00				
Meyerophytum meyeri	0.70	0.70		0.70		
Nemesia anisocarpa	0.01	0.01	0.01			
Phyllobolus prasinus (dreckig g	0.50	0.50		0.50		
Rhynchopsidium pumilum	0.10	0.10		0.10		
Ruschia cyathiforme	0.20	0.20			0.20	
Ruschia versicolor	4.00	4.00		4.00		
Ruschia viridifolia	1.50	1.50		1.50		
Tripteris clandestina	0.05	0.05		0.05		
Tripteris hyoseroides	0.01	0.01			0.01	
Zygophyllum cordifolium	0.10	0.10		0.10		

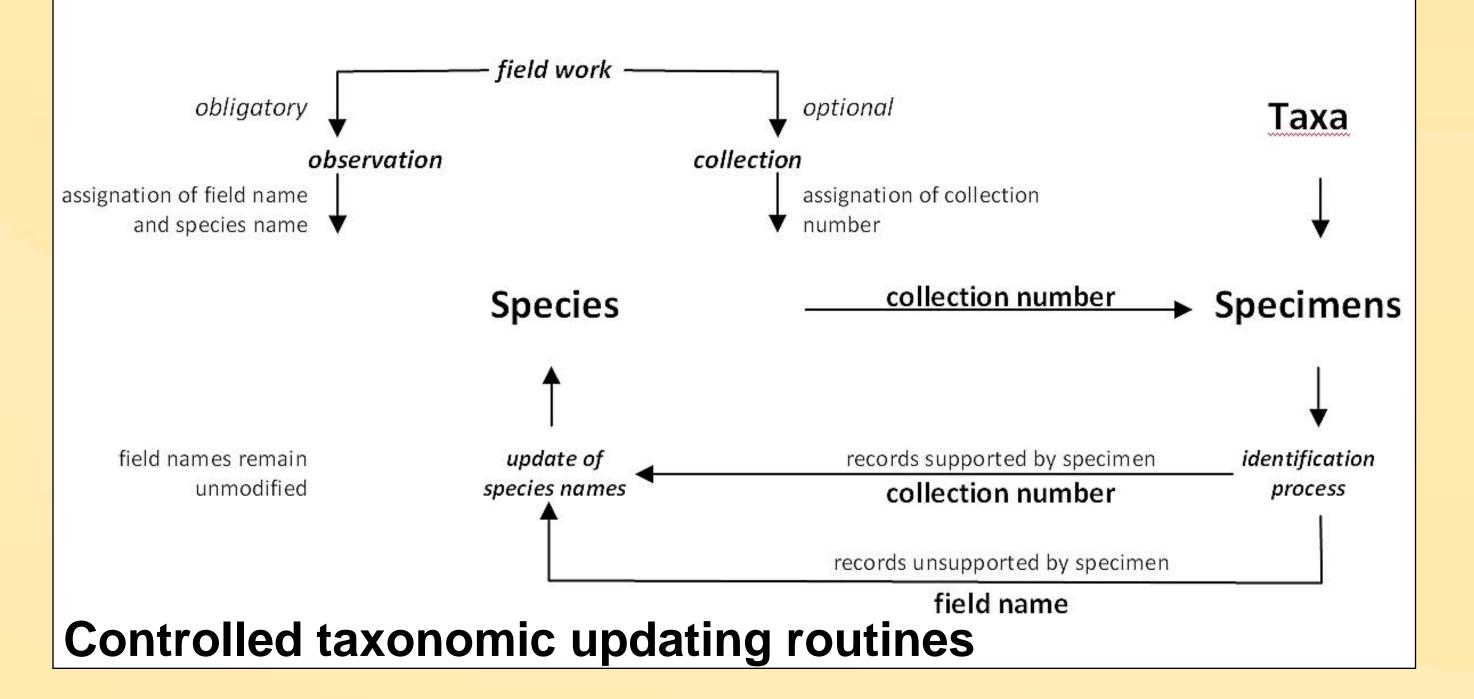
Habitats: Plot soil data

Species composition

6. The following features are of highest importance:

 BIOTABase facilitates merging of the different databases in international cooperation projects.

9th international Meeting on Ve



- BIOTABase offers tools for taxonomic quality control
- BIOTABase allows continuous data updating.
- BIOTABase links field observations with herbarium collections.
- BIOTABase links image documentation with field observations.
- BIOTABase provides data structures for the analysis of times series.

Interfaces:

BIOTABase provides interfaces to: CANOCO, Juice, MS-Office, GIS-Applications, and FAO SOTER.