Proceedings of the 1st Central European Diatom Meeting 2007
Kusber, W.-H. & Jahn, R. (ed.)
Botanic Garden and Botanical Museum Berlin-Dahlem, Freie Universität Berlin
ISBN 978-3-921800-63-8, © BGBM, Berlin 2007.
doi:10.3372/cediatom.120 (available via http://dx.doi.org/)

AlgaTerra Information System: Types data and data types

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INTRODUCTION

AlgaTerra is an information system for micro algal biodiversity (Jahn & Kusber 2007) which has been online since 2004. The database is a concept based implementation of the Berlin Model, developed at the BGBM, Berlin. The basic data have been researched within a joint project of five German research groups between 2001 and 2005 (R. Jahn, BGBM, Freie Universität Berlin; D. Lazarus, Museum für Naturkunde, Humboldt Universität zu Berlin; L. K. Medlin, R. M. Crawford, AWI, Bremerhaven; T. Friedl, EPSAG, Göttingen, W. Reisser, Universität Leipzig).

AlgaTerra contains currently more than 24 650 algal names, data for 6780 algal types, and 4520 facts. Figures of identified algal concepts, morphological information, descriptions, molecular data and bibliographic data are also available (Table 1). Currently, AlgaTerra is serving GBIF International as type-data-provider and we are continually indexing and adding information on newly published names and types (Kusber & Jahn 2006-). When these original data are geo-referenced, the locus typicus can be viewed via Google Earth in the GBIF portal (since October 2006).

In the pilot phase of AlgaTerra, nomenclatural types of C.G. Ehrenberg (e.g. Jahn & Kusber 2004), and F. Hustedt (Simonsen 1987) have been included. Currently, types of G. Krasske (see Lange-Bertalot et al. 1996), O. Müller (Jahn 2002, Cocquyt et al. 2007), B.J. Cholnoky (Cocquyt et al. 2007) and the Lange-Bertalot group (e.g. Lange-Bertalot et al. 1996) are being databased and listed to facilitate access to AlgaTerra types.

MATERIAL & METHODS

For the work in the Ehrenberg Collection see Jahn & Kusber (2004). Data from published sources (Farr et al. 1979, Greuter et al. 1993, McNeill et al. 2006, Simonsen 1987) as well as from Internet sources (Silva 1997-, IPNI 2004) have been cross-checked for data evaluation.

RESULTS AND DISCUSSION

Integration of AlgaTerra into an International Data Network

The database AlgaTerra provides names, types and factual information. In 2007 several changes in the database were performed to ease better data exchange (see also Güntsch et al. 2007, Kirchhoff et al. 2007). Checking AlgaTerra data and AlgaeBase names in the new data portal of GBIF (2007) it has become obvious that (beside technical problems of data transfer) the contents have to be calibrated in detail (Table 1). One problem is the time lag between publication of new contents on paper (requirement for nomenclatural novelties according to the rules of the ICBN, McNeill et al. 2006) and databasing (see example 1). Since different databases and portals have different foci on data, co-operation is needed were conflicting unit information occurs in different data sources (see example 2), on

the other hand different records are provided because of different opinions in the scientific discourse (e.g. example 3).

Table 1. Data in the AlgaTerra database (Jahn & Kusber 2007), representation of AlgaTerra data in data portals (see also Güntsch et al. 2007, Kirchhoff et al. 2007), and co-operation with other data base and portal projects.

Types of data in AlgaTerra	Units in AlgaTerra*	Data Portals	Current and planned co-operations
Scientific names	24650	[GBIF, if not in their names backbone]	Index Nominum Algarum (Silva 1997-); AlgaeBase (Guiry & Guiry 2007).
Authors of scientific algal names	2240		The International Plant Names Index (2004).
References	5910		
Concepts of names	27500		AlgaeBase (Guiry & Guiry 2007).
Nomenclatural types and original material (illustrated)	6780 (1090)	BioCASE, GBIF, GBIF-D, GBIF-D Botanik	Index nominum algarum (Silva 1997-); AlgaeBase (Guiry & Guiry 2007); Digital specimen images at the Herbarium Berolinense (Röpert 2000-).
Specimen data: Images of identified algae (including Geo-reference and voucher information)	1488 (100)	BioCASE, GBIF, GBIF-D Botanik	
Observational data: environmental data (including Geo-reference)	300 (143)	BioCASE, GBIF, GBIF-D Botanik	
Morphology facts	438		
Molecular facts	540		DNA bank network
Micro algal videos	23	BioCASE, GBIF, GBIF-D, GBIF-D Botanik	

* Number of unit records as of 30 September 2007.

Data evaluation: Examples and their treatment in AlgaTerra

Example 1

***Pseudohimantidium pacificum* Hust. & Krasske** in Arch. Hydrobiol. 38: 272, pl. 5: fig. 8. 1941.

Lectotype designated by: R. Simonsen 1987: p. 265: BRM LA/51, (published as “holotype” in Simonsen, but in Krasske 1941: p. 272 there is no type designated).

Isolectotype: designated by: R. Simonsen 1987: p. 265: BRM LA/52 (published as “isotype”).

Isolectotype (designated here): KASSEL D III 412 (“Typenpräparat” according to Lange-Bertalot et al. (1996).

Comment: This designation was already made in the AlgaTerra database (Jahn & Kusber 2007), but a database can not be a place of type designation because it is “nomenclatural novelty” in the sense of Art. 29 (McNeill et al. 2006), hence this designation is here redone.

Comment on holotypes of Hustedt at BRM and Krasske at KASSEL: Hustedt and Krasske mostly indicated the sample in their works, but did not cite types. On the other hand, they marked individuals on slides being original material. Simonsen (1987) and Lange-Bertalot et al. (1996) indicated slides as “holotypes” if there was only one marked slide in the collection. But this is external and interpreted information, not published by Hustedt and Krasske.

Example 2

***Karayevia clevei* var. *rostrata* (Hust.) Bukht.**, Diat. Ukraine, 43. 1999.

≡ *Karayevia clevei* var. *rostrata* (Hust.) J.C.Kingston in Diatom Res. 15: 410. 2000, nom. illeg.

≡ *Achnanthes clevei* var. *rostrata* Hust. in Pascher, Süsswasserflora 10, 204, fig. 295. 1930.

Comment: This taxon is currently (30 September 2007) accepted as *Achnanthes clevei* var. *rostrata* Hust. in Guiry & Guiry (2007) with reference to Krammer & Lange-Bertalot (2004). In that volume, *Karayevia clevei* var. *rostrata* (Hust.) Bukht. has been provisionally accepted

(Lange-Bertalot 2004, p. 434). Silva (1997-) markes *Karayevia clevei* var. *rostrata* (Hust.) J.C. Kingston as invalid, whereas Jahn & Kusber (2007) accept *Karayevia clevei* var. *rostrata* (Hust.) Bukht. as well as *Karayevia clevei* (Grunow) Bukht. 1999. Because of the validation of *Karayevia clevei* in Bukhtiyarova (1999), Kingston's name was valid but illegitimate. For the time being, there is no automatic synchronization of the leading databases. Therefore the workflow is as such: (1) databasing new information, (2) informing IPNI (2004) about a lacking author name in their standard list, (3) informing Silva (1997-) about a lacking name having priority, (4) informing Guiry & Guiry (2007) about the taxonomic view of AlgaTerra. AlgaeBase (Guiry & Guiry 2007), as a names backbone for GBIF (2007), will add the names relation for searchability of both names, independent of the fact whether they accept this taxonomic view or not.

Example 3
***Ceratoneis* Ehrenb.** in Ber. Bekanntm. Verh. Königl. Preuss. Akad. Wiss. B: p. 157. 1839.
Type of the genus is:
Ceratoneis closterium Ehrenb. in Ber. Bekanntm. Verh. Königl. Preuss. Akad. Wiss. Berlin 1839: 157. 1839.
≡ *Nitzschia closterium* (Ehrenb.) W.Sm., Syn. Brit. Diat. 1, p. 42. 1853.
≡ *Cylindrotheca closterium* (Ehrenb.) Reimann & J.C.Lewin in J. Roy. Microscop. Soc. London 83: 288. 1964.
Lectotype: BHUPM Taxonomical Preparation No. 540032-3 in BHUPM, published as fig. 5 in Jahn & Kusber 2005: 299.
Comment: Recently it was proposed (Medlin & Mann 2007) to conserve the genus *Cylindrotheca* Rabenh. against *Ceratoneis* Ehrenb. Even though Ehrenberg's taxon was misinterpreted by several authors (see clarification in Bixby & Jahn 2005, Jahn & Kusber 2005) the taxonomic treatment since Ehrenberg was far from being consistent. *Ceratoneis closterium* has been regarded as a *Cylindrotheca* by several authors (e.g. Hasle & Syvertsen 1995), but also *Nitzschia closterium* is still in use (Krammer & Lange-Bertalot 1997) whereas *Ceratoneis closterium* is already part of a standard list for the German implementation of the European WRRL (Mischke & Behrendt 2007).

We are aware that results which seem to cause nomenclatural instability may be disturbing the scientific community but only transiently. Proposals for the conservation of current common views will certainly lead to decisions which are in conflict with the original author's findings and, additionally, may be inadmissible in some years, when new taxonomic results will have extended our knowledge. Conservation of names and types is a tool to prevent from substantial nomenclatural instability in some problematic cases but it should not be used also to undermine the rules of the ICBN.

ACKNOWLEDGEMENTS

The AlgaTerra project was financed by the German Federal Ministry of Education and Research, BMBF (project, grant 01 LC 0026). Databasing of new algal names and types have been supported by "Freunde des Botanischen Gartens und Botanischen Museums e.V." in 2007. Data Cleaning to increase the quality and availability of networked data resources has been implemented within the EU 6th-framework project SYNTHESYS (RII3-CT-2003-506117).

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