

THE EUROPEAN *BRASSICA* DATABASE

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Abstract

The European database for *Brassica*, abbreviated 'Bras-EDB', was developed by the Centre for Genetic Resources The Netherlands (CGN). The objectives of this database are to support rationalization of *Brassica* germplasm conservation and to improve the access to the *Brassica* germplasm for users. The database focuses on passport data of the genus *Brassica* maintained in European collections. Also characterization data of a restricted number of descriptors are currently included. By September 1997 the database contained 13000 accessions, from 21 collections in 17 countries. The species *B. oleracea* is represented with the highest number of accessions (57%), followed by *B. napus* (17%) and *B. rapa* (16%). The database includes cultivated as well as wild material. Completing, updating and analysing the database are ongoing activities. The database is available on internet at the newly established 'European Information Platform on Crop Genetic Resources' (www.cgiar.org/ecpgr/platform), or on diskette to be requested from the authors.

1. Introduction

Plant genetic resources are the raw material for the improvement of crops. This applies also for *Brassica* crops. *Brassica* is a wide genus with some very important cultivated species (*B. carinata*, *B. juncea*, *B. napus*, *B. nigra*, *B. oleracea*, *B. rapa*). The genus represents a wide range of crops including oilseed, vegetables and fodder crops. In some species, such as *B. rapa* the entire range of crops is present. The genus *Brassica* also includes many wild species (Warwick 1993). As a result of this wide variation of species, crops and applications, the genetic resources of *Brassica* are scattered over many different collections, maintained by various organisations such as genebanks, departments of universities, institutions and breeding companies.

In order to coordinate genetic resources activities, the International Plant Genetic Resources Institute (IPGRI) has promoted the establishment of crop specific databases within the European Cooperative Programme for Crop Genetic Resources Networks (ECP/GR) programmes. Following a decision in 1991 of the ECP/GR *Brassica* Working group (IBPGR, 1993), a European database for *Brassica*, abbreviated 'Bras-EDB' was developed by the Centre for Genetic Resources The Netherlands (CGN).

The objectives of this database are to support rationalization of *Brassica* germplasm conservation and to improve access to *Brassica* germplasm for users. The approach to reach these objectives are to:

- make an inventory of the European *Brassica* germplasm holding;
- trace duplicate accessions;
- trace gaps in the European germplasm holding;
- coordinate activities such as collection missions and seed regeneration programmes.

2. Creation and maintenance of the database

An inventory of *Brassica* material in Europe was made by requesting passport data from European genebanks holding *Brassica* collections. Initially the database focused on cultivated material, but after a decision of the ECP/GR *Brassica* Working Group meeting in 1994 in Lisbon (Gass, *et al.*, 1995), it was decided to include wild accessions as well. The establishment of the database and the methods of transforming the structure, formats and codes into the Bras-EDB format has been described by Hintum and Boukema (1993) and Boukema, *et al.*, (1995). At a ECP/GR meeting on Central Crop Databases in 1996 (Lipman, *et al.*, 1997), it was recommended to standardize passport data and to use a list of multicrop passport descriptors, as developed by IPGRI and FAO. The passport data in the latest version of the Bras-EDB are presented in a format according to these standards. Besides these 'passport descriptors' additional descriptors have been used for information specific to the Bras-EDB.

The transformation of the original received data was rather laborious as can be illustrated by an example of taxonomic classification. Broccoli is called in the Bras-EDB *B. oleracea botrytis italica*. This taxon was received with a wide variety of names including *B. botrytis italica*, *B. oleracea botrytis cymosa*, *B. oleracea botrytis italica*, *B. oleracea* convar. *botrytis* var. *italica*, *B. oleracea italica* and *B. oleracea* var. *italica*, to varying extents completed with author names.

Completing, updating and analysing the database are ongoing and very time consuming activities. An alternative to this 'monotor' approach is the 'snapshot' approach in which once in several years a complete new database is made. This approach has the advantage that a finished database can be created which can be analysed and distributed. The 'monitor' approach has the advantage that it is more up to date, but the analysing can be easily postponed, because updating with new received data will have a higher priority.

3. Content of the Bras-EDB

By September 1997 the database contains 13000 accessions, from 21 collections in 17 countries. The number of accessions per species is given in Table 1. The species *B. oleracea* is represented with the highest number of accessions (57%), followed by *B. napus* (17%) and *B. rapa* (16%). The number of accessions per collection is given in Table 2.

Currently only passport data, such as taxonomic names, cultivar name or other identification, origin etc., are available in the Bras-EDB. However, in the ECP/GR *Brassica* Working Group meeting of 1996 in Rome (Maggioni, *et al.*, *in press*) it was decided that in the future also characterization data will be included. A common format for a minimum descriptor list for characterization data was already agreed upon in the 1994 working group meeting (Gass, *et al.*, 1995).

4. Analysing the database

One of the objectives of the database is to support the rationalization of the *Brassica* germplasm conservation. The identification of duplicate accessions can help genebanks to set priorities for regeneration. Duplicates are traced by matching names or parts of names with similar sounds, or by matching collection- or other numbers. The methods and examples of duplicates traced by matching names were given by van Hintum and Boukema (1993) and by Boukema, *et al.*, (1995). The identification of duplicates is an ongoing, very time consuming activity.

5. Utilization

The Bras-EDB was requested by several genebanks, research institutes and private breeding firms in and outside Europe. Its actual use is difficult to assess, but several rather

large seed request for evaluating disease resistance resulted clearly from searching the Bras-EDB. The database was used intensively for the creation of a *B. oleracea* core collection for the EU project entitled 'The location and exploitation of genes for pest and disease resistance in European gene bank collections of horticultural *Brassica*' (Leckie, *et al.*, 1996). The accessions belonging to this core collection are marked in the Bras-EDB. The method of creating this core collection was described by Boukema, *et al.*, (1997). It is expected that with a better access to the Bras-EDB, utilization of the *Brassica* germplasm maintained in European collections will increase considerable.

6. Access to the Bras-EDB

Since its creation the database has been available on diskette in ASCII or DBF format. Because of the low accessibility to central crop databases, ECP/GR proposed an Internet-based European Information Platform on Crop Genetic Resources (Jiménez Krause and Lipman, 1997). The ECP/GR homepage (www.cgiar.org/ecpgr/) provides the point of entry to this information system. The Bras-EDB, like other central crop databases, makes use of this newly established possibility. The database in DBF format including a full description, decoding tables of addresses, etc. is downloadable from there. In the near future the database will be made on line searchable. For users not having access to the Internet, the database will still be available on diskette and can be requested from the authors.

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Table 1 - Number of accessions in the Bras-EDB per species

<i>Brassica</i> species	number of accessions
<i>B. barrelieri</i>	2
<i>B. bourgeauii</i>	3
<i>B. carinata</i>	290
<i>B. cretica</i>	99
<i>B. elongata</i>	5
<i>B. fruticulosa</i>	4
<i>B. hilarionis</i>	2
<i>B. incana</i>	33
<i>B. inisma</i>	1
<i>B. insularis</i>	20
<i>B. juncea</i>	320
<i>B. macrocarpa</i>	12
<i>B. montana</i>	40
<i>B. napus</i>	2240
<i>B. nigra</i>	261
<i>B. oleracea</i>	7232
<i>B. oleraceaXrapa</i>	1
<i>B. rapa</i>	2038
<i>B. repanda</i>	1
<i>B. rupestris</i>	23
<i>B. sinapistrum</i>	1
<i>B. souliei</i>	2
<i>B. subspontanea</i>	1
<i>B. tournefortii</i>	2
<i>B. villosa</i>	24
<i>Brassica</i> (species not known)	331
<i>Xbrassicoraphanus</i>	12
Total	13000

Table 2 - Number of accessions in the Bras-EDB per data source

Data source	number of accessions
Belgium: RVP, Merelbeke	163
Bulgaria: IPGR, Sadovo	568
Czech Republic: RIFCP, Prague-Ruzyne	1027
France: INRA, Rennes	636
Germany: IPK, Gatersleben	1432
Germany: BGRC, Braunschweig	1150
Greece: GGB, Themi-Thessaloniki	169
Hungary: Inst. Agrobotany, Tapioszele	99
Italy: CNR, Bari	509
The Netherlands: CGN, Wageningen	1130
Poland: IHAR, Radzikow	409
Portugal: ISA, Lisbon	51
Russia: VIR, St. Petersburg	1216
Spain: MBG, Galicia	362
Spain: CRF, Madrid	60
Spain: Univer. Politecnica, Madrid	239
Spain: Univer. Politecnica, Valencia	218
Sweden: NGB, Nordic Gene Bank, Alnarp	345
Switzerland: RAC, Nyon	122
Turkey: AARI, Izmir	240
United Kingdom: HRI, Wellesbourne	2855
Total	13000