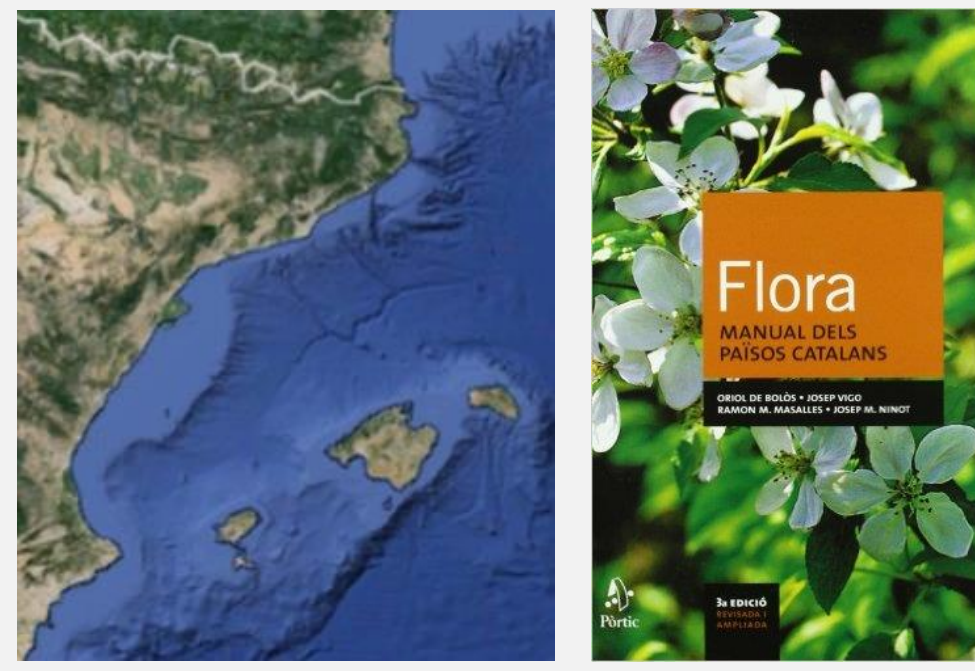


Scope

- CromoCat: Chromosome database of the Catalan Countries
- Wild vascular flora of the Catalan Countries (70.520 km²)
- Taxonomic thesaurus: Bolòs et al. (3rd ed., 2005; 4835 taxa)
- Published chromosome counts (1926-2016)



Territorial Coverage: Catalonia, Valencian Country, Balearic Islands, Aragon Strip, Andorra, North Catalonia (= Flora dels Països Catalans)

Background

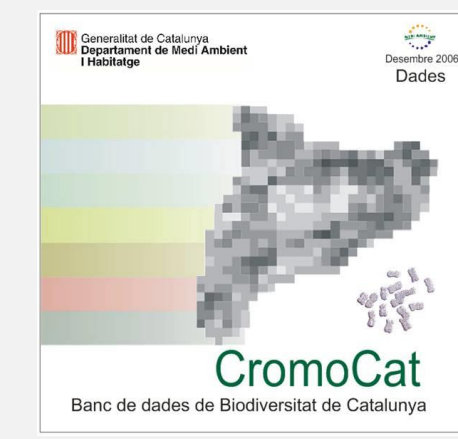
- First design presented at OPTIMA 1998 (Paris)
- Following OPTIMA recommendations (Karyosystematics Commission, 1993)
- Included as an independent module of BDBC (Catalan Biodiversity Database)
- Since 2004 coupled to GenoCat (sister database with molecular diversity data)



1998



2016



Partly supported by Generalitat de Catalunya

Available at <http://biodiver.bio.ub.es/biocat/>

Technical features: Relational database developed on MSAccess . 2 main tables: CRO-IN (chromosome data from catalan populations) and CRO-OUT (from outside populations). Capture procedures including formative activities for advanced students through yearly fellowships

Results

- 57.012 total number of records
- 8.157 bibliographic references.
- 3.135 chromosome number reports from the territories (CRO.IN)
- 34,2 % of the total number of native taxa (species and subspecies)

Oldest Report: 1926

- *Diplotaxis eruroides* (L.) DC (Brassicaceae) n=7, Barcelona [s/rec, s/date]

Homedes Ranquini, Juan (1927). *Estudio del aparato cromosómico en algunas crucíferas de interés farmacéutico según orientaciones modernas*. Lérida. Imp. Mariana, 50 p

Highest / Lowest CNRs

- *Silene ciliata* Pourr. (Caryophyllaceae) 2n = c.228
- *Crepis triasii* (Cambess.) Fr. (Compositae) 2n = 8

CN and cytotypes

- 134 different CN and cytotypes recorded

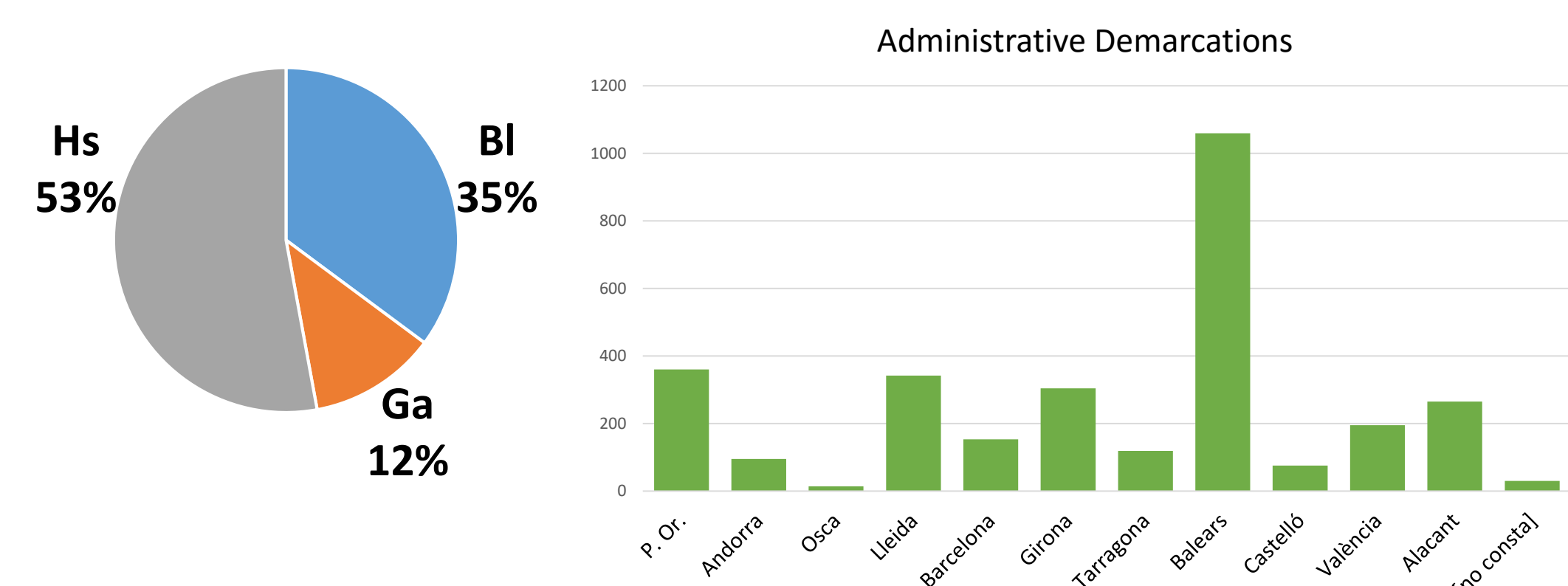
Geographic representation

The geographic distribution of chromosome data gathered by CromoCat is heterogeneous among regions. The distribution by county (= "comarca") reveals that the greatest karyological diversity and intensity of chromosomal exploration corresponds to the Balearic Islands, Pyrenees and Alacant region, followed by the Ebre Delta and Ports Massif. These data also coincide with the concentration of endemic species.

Comarca	Nombre de recomptes a CromoCat
COMARQUES AMB MÉS RECOMPTES	
Ripollès	118
Pallars Sobirà	82
Vall d'Aran	53
Alt Empordà	52
Alt Urgell	44
COMARQUES AMB MENYS RECOMPTES	
Conca de Barberà	2
Alt Penedès	1
Maresme	1
Tarragonès	1
Pla d'Urgell	1

Example: Number of CNR from Catalonia districts ("Comarques"). Highest number of data from Pyrenean area due to intensive research since A.M. Cauwet Research and P. Kupfer's Ph.D.

Küpfer, Ph. (1974). Recherches sur les liens de parenté entre la flore orophile des Alpes et celle des Pyrénées. *Boissiera* 23: 1-322.



Geographic distribution of CRO-IN records, arranged by OPTIMA territories (left) and by main administrative demarcations (Provinces, Departments, States, etc.) (right)

Polyploid distribution is also heterogeneous, and higher in Balearic Islands, where the polyploid element accounts for at least 26.2% of the endemic flora and contrasts with the low estimates of polyploid evolution reported from oceanic archipelagos (Rosselló & Castro, 2008)

Taxonomic representation

Top genera

The genera with more counts from Catalan populations are

- *Campanula* (Campanulaceae) [175 reports]
- *Bromus* (Poaceae) [129 reports]

Data explained by the amount of information included in Ph.D.

GENERA	Total counts	FAMILIES	Total counts
<i>Campanula</i>	175	COMPOSITAE	388
<i>Bromus</i>	129	POACEAE	261
<i>Limonium</i>	116	LABIATAE	224
<i>Teucrium</i>	76	APIACEAE	222
<i>Asplenium</i>	74	FABACEAE	207
<i>Euphorbia</i>	72	CAMPANULACEAE	182
<i>Bupleurum</i>	60	BRASSICACEAE	160
<i>Ranunculus</i>	51	CARYOPHYLLACEAE	153
<i>Veronica</i>	50	SCROPHULARIACEAE	126
Others	2242	PLUMBAGINACEAE	116
		Other	1006

Top families

The families with more counts from Catalan populations are

- Compositae [388 species with chromosome data]
- Poaceae [261 species with chromosome data]

Derived & Related projects

Experience and analysis of data collected are open opportunities to extend research towards in depth/monographic cytogenetic studies. Some examples:

- Origin of auto/allopolyploids

Lopez-Pujol, J., M. Bosch, J. Simon & C. Blanche (2004). Allozyme diversity in the tetraploid endemic *Thymus loscosii* (Lamiaceae). *Ann. Bot.* 93: 323-332.

- Chromosome evolution/mutation under Botanical Garden management

Rosselló, J.A. (2012). Conservació ex situ i genètica de la conservació: vers la recerca d'un nou Grial?. III Jornades de Conservació de Flora (Lleida): 69

- Chromosomal characteristics of endemic floras

Rosselló, J.A. & M. Castro (2008). Karyological Evolution of the Angiosperm Endemic Flora of the Balearic Islands. *Taxon* 57 (1): 259-273

- Design of specialized chromosome databases

CromoPar - Simon, J., D. Franco, V. Fernández, J. Daviña, A. Honfi, M. Soloaga, C. Blanché, A. Rovira & J. Molero. (2000). Proyecto CromoPar: estado actual de conocimientos de la diversidad cromosómica de la Flora paraguaya [<http://www.ub.es/botanica/cromopar/nfc2.htm>] **DCDB** - Bosch, M., J. Simon, J. López-Pujol & C. Blanché (2016) - DCDB: an updated on-line database of chromosome numbers of tribe *Delphinieae* (Ranunculaceae) [<http://hdl.handle.net/2445/98702>]

Further steps

- To launch a research program to fill chromosome data for taxa of the Catalan vascular flora karyologically unknown
Combining chromosome reports from Catalan and foreign populations, only 215 taxa (4,44%) still remain karyologically unknown. This limited pack identifies the needs for further research where 3 main groups (c. 1/3 each) can be recognized: a) complex genera, 74 taxa (*Alchemilla*, *Hieracium* and *Rubus*); b) taxonomically unresolved, 40 taxa (but waiting for a revised thesaurus of the Catalan flora, ongoing) and c) 83 taxa truly not counted (or count not captured by CromoCat), some of them endemic.
- To improve friendly browsing experience with CromoCat, including a) a new searchable interface outside BDBC and b) data incorporation to CCDB
- To better exploit information contained in CromoCat and production of a *Chromosome Atlas of the Flora of Catalan Countries*.

Additional information

- Simon, J., M. Margelí & C. Blanché (2001) CROMOCAT: The Chromosome Database of the Catalan Countries. *Bocconea* 13: 281-297
- Simon, J. & C. Blanché (2011) CromoCat y GenoCat: dos bases de datos genéticas con estrategias diferentes I *Encuentro Nacional de Conservación Genética en Plantas* : 19 (Las Palmas, Gran Canaria)
- Simon, J., Massó, S. & Blanché, C (2011). Proyecto CromoCat: 10 anys (1999-2009) *Actes del Col·loqui de Botànica Pirenaico-Cantàbrica*, Institut d'Estudis Andorrans, Ordino: 411-424.