XV OPTIMA Meeting
June, 6-11 2016
MONTPELLIER

DCDB: an updated on-line database of chromosome numbers of tribe *Delphinieae* (Ranunculaceae)

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1999

Simon, J., M. Bosch, J. Molero & C. Blanché (1999). A conspect of chromosome numbers in tribe *Delphinieae* (Ranunculaceae) *Biodiversity Electronic Publications, 1* [on line] http://hdl.handle.net/2445/95875

2016

Bosch, M., J. Simon, J. López-Pujol & C. Blanché (2016). DCDB: an updated on-line database of chromosome numbers of tribe *Delphinieae* (Ranunculaceae) *Dipòsit Digital de la Universitat de Barcelona* [on line] http://hdl.handle.net/2445/98702

Scope

- Accurate extensive literature and internet survey
- Published chromosome counts worldwide (1889-2016)
- Tribe *Delphinieae* Warming

Aconitum L.
Gymnaconitum (Stapf) Wei Wang & Z. D. Chen
Delphinium L. (including *Staphisagria* Spach)
Consolida (DC.) S.F. Gray
Aconitella Spach.

Table structure: 8 fields

n*, *2n (C-Values noted when accepted)

Consensus name	Published name	Plantlist name	Country (or area)	n	2n	Reference	Observations
		ACONITUM					
Aconitum aizuense Nakai*	Aconitum aizuense Nakai	Aconitum aizuense Nakai	Japan		32	Kurita (1959a)	*According Kadota (1984) should be A. japonicum subsp. subcumeatum
Aconitum alboviolaceum Kom.	Aconitum alboviolaceum Kom.	Aconitum alboviolaceum Kom.	Russia		16	Sokolovskaya (1966)	
Aconitum alboviolaceum Kom.	Aconitum alboviolaceum Kom.	Aconitum alboviolaceum Kom.	China		16	Shang & Lee (1984)	
Aconitum alboviolaceum Kom.	Aconitum alboviolaceum Kom.	Aconitum alboviolaceum Kom.	China		16	Yang et al. (1993b)	
Aconitum alboviolaceum Kom.	Aconitum alboviolaceum Kom.	Aconitum alboviolaceum Kom.	China		16	Yang (1996)	
Aconitum albo		m alboviolaceum Ko			16	Yang (1996)	
Aconitum albo		m alboviolaceum Ko			16	Jin et al. (1998)	
Aconitum albo		m alboviolaceum Ko			16	Yuan & Yang (2006)	
Aconitum albo		m alboviolaceum Ko			16	Yuan & Yang (2006)	
Aconitum alboviolaceum Kom.	Aconitum alboviolaceum Kom.	Aconitum alboviolaceum Kom.	China		16	Yuan & Yang (2006)	
Aconitum alboviolaceum Kom.	Aconitum alboviolaceum Kom.	Aconitum alboviolaceum Kom.	Not indicated		16	Kočková (2012)	From C-values
Aconitum alboviolaceum Kom.	Aconitum alboviolaceum Kom.	Aconitum alboviolaceum Kom.	China		16	Hong et al. (2016)	

3-column synonyms listing for quick and easy browsing

Geographic origin of CNR

Relevant notes on taxonomic criteria, type of data, confidence, hybrid origin, studied populations...

635 published names detected
511 consensus names resolved

Independent entries for distinct populations

This make possible to identify the number of populations truly studied (in some cases, a single report in a given table of an standard database means, in fact, up to 60 analysed populations, which is informative of significant chromosome knowledge, for instance on variation levels of karyotype structure

Technical data

- Updated 23/IV/2016 [Yearly updated in the future]
- MsExcel© & MsAccess© Software [Future expansion to web search by Dreamweaver ©]
- Available directly from the Digital Repository of the Universitat de Barcelona
- Complete format: http://hdl.handle.net/2445/98702
- Simultaneously, DCDB will contribute to the resources of CCDB

Results

Numbers

- Total number of reports: 2598
- Increase *vs.* 1999 version: c. 137% added [1097 reports captured in the 1999 version]
- Total number of reported species: 389 [44,5% of tribe] / 467 taxa [46,7% of tribe]

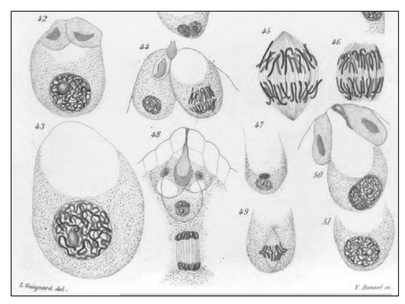
This increase is due both to chromosome research progress (analyzed as counts/year) and an improved information capture system (including checking of populations location through Cyrillic, Japanese and Chinese writing systems). Additionally, recent taxonomic advances, synonimization and new phylogenetic criteria have also been taken in account.

First report

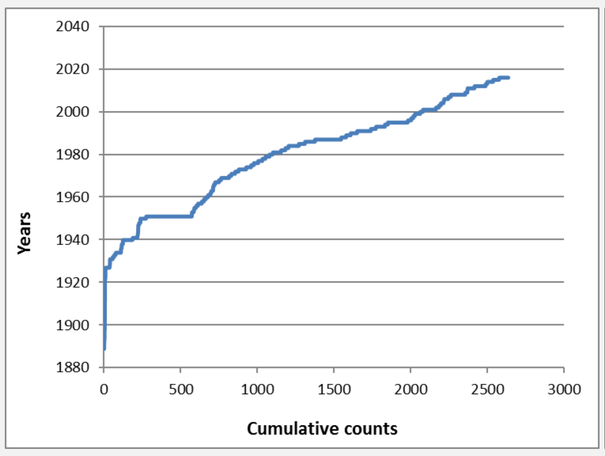
De même encore, il en existe douze, d'après M. Strasburger (3), soit dans les noyaux polliniques, soit dans le noyau primaire du sac embryonnaire de l'*Helleborus fœtidus*. Quant à la copulation des noyaux sexuels chez les Renonculacées (*Aconitum*, *Delphinium*, etc.), il suffira de jeter les yeux sur les figures 50 et 51 pour constater qu'elle s'effectue comme dans les exemples cités en dernier lieu.

1889

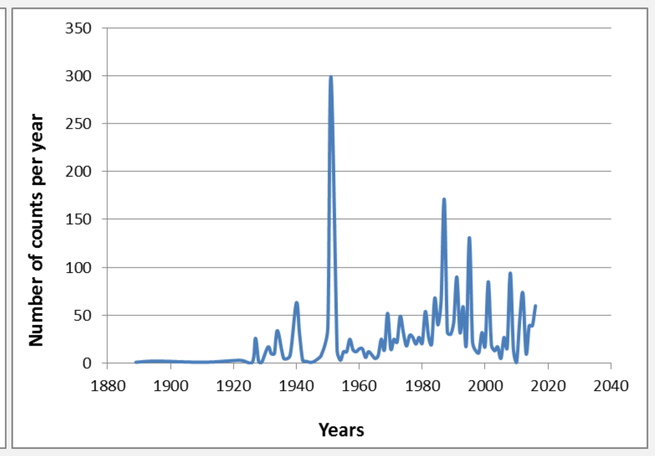
Delphinium ajacis L. [*n* = 12]
Guignard, L. (1889)
Étude sur les phénomènes morphologiques de la fécondation. *Bull. Soc. Bot. France* 36: 100-146.



Knowledge evolution

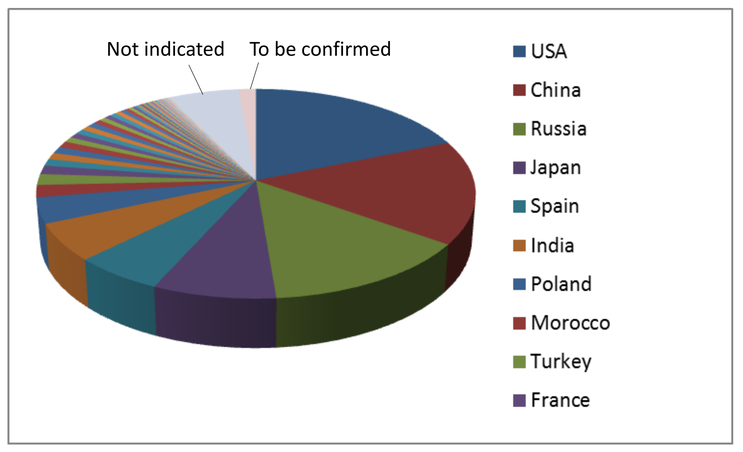


Cumulative number of chromosome counts published on Tribe *Delphinieae* (1889-2016) from data stored in DCDB



Number of chromosome counts published/year on *Delphinieae*
Peaks point out significant contributions

Geographic origin of counts in *Delphinieae*



Top-10 countries with more CNR of Tribe *Delphinieae* from data stored in DCDB

Top studied species

Aconitum septentrionale
117 counts

Delphinium elatum
67 counts

Delphinium hansenii
66 counts

Consolida ajacis
49 counts

Basic numbers and chromosome numbers in the tribe *Delphinieae*

GENUS	BASIC NUMBER (*x*)	CHROMOSOME NUMBER (2*n*)
Aconitum	6*, 8 , 9*, 10*, 13*	12, 16, 17, 18, 20, 24, 26, 28, 30, 32, 34, 40, 46, 48, 52, 64
Gymnaconitum	8	16
Delphinium	8, 9*, 10*	16, 18, 20, 24, 32, 48
Consolida	7*, 8, 9*, 10*	14, 16, 18, 20, 24
Aconitella	6*, 8, 9*	12, 16, 18

* uncommon

Tribe diversity

- The main basic number *x* = 8 is found at 2*x*, 3*x*, 4*x*, 5*x*, 6*x*, and 8*x* ploidy levels, whereas *x* = 9 is much rarer
- Polyploidy is more frequent in perennial taxa (*Aconitum* and *Delphinium s.str.*)
- Dysploidy (both increasing and decreasing) takes more importance in annuals and should be considered as a source of new evolutionary opportunities
- B-chromosomes have been only found in *Aconitum* (17 species)
- The most frequent counts are *2n* = 16 and 32 but counts of 2*n* = 12, 14, 17, 18, 20, 24, 26, 28, 30, 34, 40, 46, 48, 52, and 64 have also been recorded.

Intraspecific diversity

- In 20 species more than one different chromosome number has been reported
- The most frequent case is sharing 2*n* = 16 and *2n* = 18
- The species with more different chromosome numbers is *Aconitum palmatum* (2*n* = 30, 32, 46, 48 and 52)
- 81 species showed different ploidy levels
- Some rare numbers, especially in perennials, are coming from anomalous, experimental or ornamental plants and some other deviating counts are doubtful or coming from very old literature

The *Delphinieae* Chromosome Database (DCDB) provides the most complete current available information on chromosome numbers of *Delphinieae,* yearly updated and easily available by a system searchable through both the UB Repository and international platforms as CCDB (Rice et al., 2015), to be useful for general building of cytotaxonomical databases and for specific research ongoing projects of systematics of *Ranunculaceae*.