

# Tracking biogeographical change from its footprints in botanical literature

Quentin Groom<sup>1</sup>, Sabrina Eckert<sup>2</sup>, Anton Güntsch<sup>2</sup>, Patricia Kelbert<sup>2</sup> & Guido Sautter<sup>3</sup>

1. National Botanic Garden of Belgium, Meise, Belgium
2. Botanic Garden & Botanical Museum Berlin-Dahlem, Berlin, Germany
3. Karlsruhe Institute of Technology, Karlsruhe, Germany

Contact  
 Quentin Groom  
 ORCID: 0000-0002-0596-5376  
 National Botanic Garden of Belgium  
 quentin.groom@br.fgov.be

## Introduction

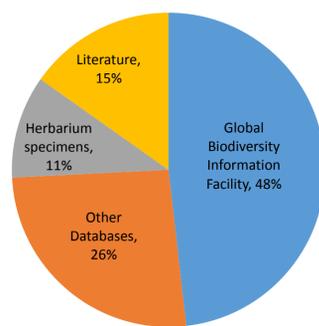
Hidden away in the vast corpus of botanical literature are data on the distributions of practically all described plants. Nevertheless, with the exception of a few rare species, it is extremely difficult to find accurate, global distribution maps. Furthermore, even though we know some species are expanding their range, while others are declining, we lack the data to quantify these changes.

Here we examine published distributional information to determine its value as a source of biogeographical information.

Using the GoldenGATE Editor we are marking-up treatments and extracting data from as many sources as possible to create the best possible distribution maps of our model species (see separate poster by Patricia Kelbert for details).

The contribution of different record sources to all those gathered so far. 'Herbarium specimens' are those that have been transcribed and georeferenced for the purposes of this project. 'Literature records' are only those transcribed for this project. 'Other databases' and GBIF contain a mixture of literature records, specimens and observations. So far we have doubled the number of observations available from GBIF.

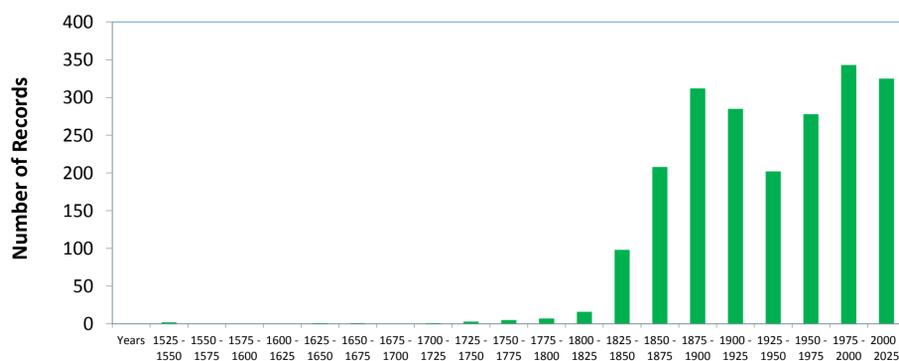
As the project progresses the proportion of literature and herbarium sourced records will increase.



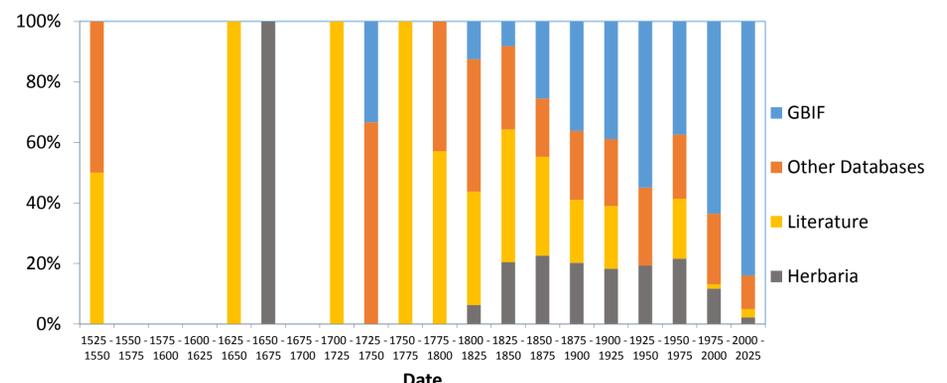
The distribution of *Chenopodium vulvaria* L. observations in Europe, from 1548 to 2012. Points are plotted on a Mollweide equal area projection. Date class are by quantiles due to the shortage of records in the earliest period. It will require some sophisticated analysis to disentangle the true distribution from the bias caused by differences in recorder effort. However the decline of *C. vulvaria* in northern Europe is already evident.

## *Chenopodium vulvaria* L.

*Chenopodium vulvaria* L., a small annual weed commonly associated with man-made disturbance. Its conspicuous smell of rotten fish explains its common name of stinking goosefoot. It is easily identified and unlikely to be confused with any other plant. *C. vulvaria* is now a rare plant in parts of northern Europe and on the red-lists of several countries. In contrast it is an alien weed in California and south-eastern Australia.



The increase in all records of *C. vulvaria* with time. Even though the amount of biological recording has increased in the 20th century there has been no corresponding increase in the number *C. vulvaria* records.



The changing proportions of records derived from the different sources. Literature records are most important for dates before the 20th century. GBIF becomes increasingly important for recent dates. Herbaria are significant sources of 19th century records, but their importance has declined.

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