Flora of the Canary Islands – revised checklist to a classic arena of botany

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The Canary Islands are a popular location for botanical collections that resulted in a series of seminal works, including the description and documentation of many endemic plant species (Fig. 1, 2, 3) in herbaria. Viera y Clavijo, Christ, Webb, Berthelot, Sventenius, Pitard, Kunkel, or Bramwell, to name but a few, majorly contributed to the knowledge about the flora of the Canary Islands. Alexander von Humboldt's botanical description of Tenerife during his stay in 1799 also motivated Charles Darwin to explore the island. Unfortunately, Darwin was not allowed to set foot on land during his voyage with the Beagle due to quarantine restrictions. In recent years, a number of data bases containing detailed information about the plants of the Canary Islands emerged. This botanical legacy evokes the expectation that detailed information about the flora of the archipelago is available, with high agreement about taxa and status between different sources. To test this expectation, we elaborated an extensive floral checklist for the Canary Islands, documented which taxa are accepted in global taxonomic reference systems, and additionally checked their coverage in databases that are a common sources in biogeographical and ecological research.

To do so, we compiled information on the occurrence of species and infraspecies (subspecies and varieties) on the seven major Canary Islands (namely El Hierro, La Palma, La Gomera, Tenerife, Gran Canaria, Fuerteventura, and Lanzarote) from published floras and plant species lists and complemented these with scientific literature. As a taxonomic backbone of the resulting list, we used Kew's Plants of the World Online (POWO 2021). Coverage of all listed taxa in World Flora Online (WFO) and The Catalogue of Life was also documented. As supplementary information, we checked for the data coverage, deficiencies, and related fundamental restrictions of all taxa in the databases GBIF (Global Biodiversity Information Facility) and TRY (Plant Trait Database), which are commonly used in ecological and biogeographic research.

For the Canary Islands, we deduced 2812 taxa in total (1781 native, 1031 non-native), of which 2416 (1452 native, 964 non-native) are species and 396 are infraspecific taxa (329 native, 67 non-native). The underlying checklist is available in the Supplementary Materials of Beierkuhnlein et al. (2021) and openly accessible. The number of taxa, species and infraspecies differed between islands (Fig. 4) and was highest for Tenerife that has a pronounced topography and diverse

Fig. 1. *Echium webbii* Coincy. Species of the genus *Echium* in the Canary Islands are an example for adaptive radiation.
Photo Carl Beierkuhnlein

Fig. 2. *Echium bethencourtii* A. Santos
Photo Carl Beierkuhnlein

Fig. 3. *Echium thyrsiflorum* Masson ex Link, also known under its synonym *Echium gentianoides* Webb ex Coincy. Photo Carl Beierkuhnlein

climatic conditions. Surprisingly, we found a considerable proportion of taxa that have been recorded in scientific papers but are missing from current floras and data bases. Furthermore, we identified taxa with deviating status (e.g., surely native, probably non-native) between taxonomic databases. And still, new species are being detected and described. Data coverage of the Canary Island flora in different databases is far from being complete.

Despite the fact that the Canary Islands are a popular natural laboratory of botanical, evolutionary and biogeographical research, the documentation of the flora of the Canary Islands is work in progress. Updating such an important data source is a prerequisite for macroecological and biogeographical studies. Our new checklist reflects the current state of knowledge and can function as a basis for further amendments.

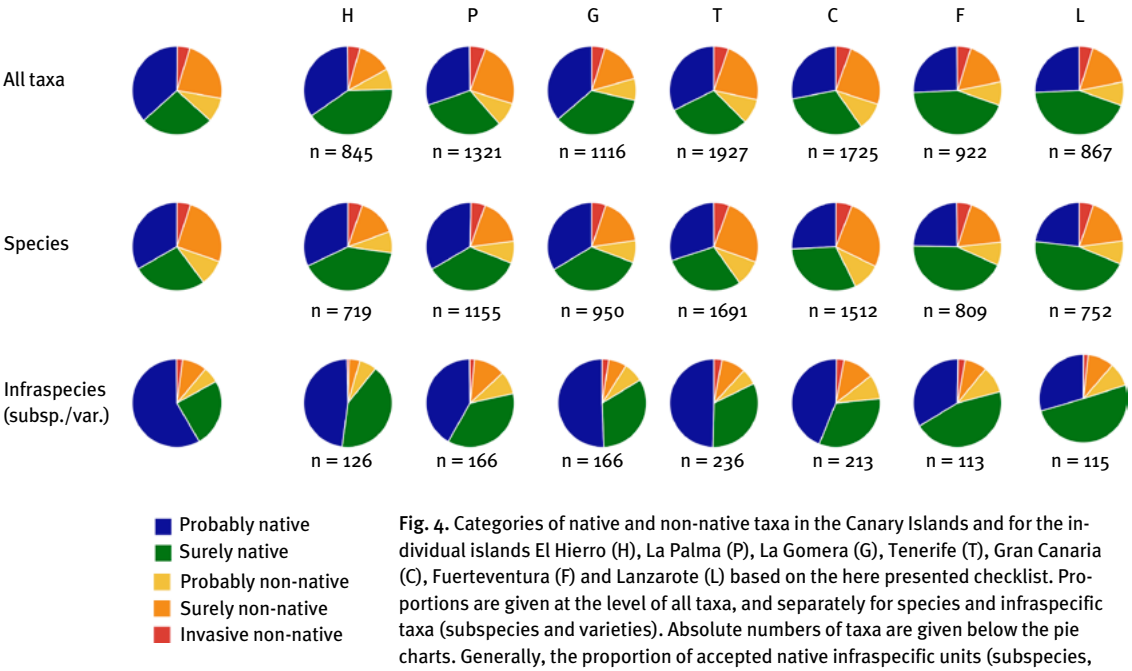

Fig. 4. Categories of native and non-native taxa in the Canary Islands and for the individual islands El Hierro (H), La Palma (P), La Gomera (G), Tenerife (T), Gran Canaria (C), Fuerteventura (F) and Lanzarote (L) based on the here presented checklist. Proportions are given at the level of all taxa, and separately for species and infraspecific taxa (subspecies and varieties). Absolute numbers of taxa are given below the pie charts. Generally, the proportion of accepted native infraspecific units (subspecies, varieties) is higher compared with the accepted species.

References

Beierkuhnlein C, Walentowitz A & Welss W (2021) FloCan – A Revised Checklist for the Flora of the Canary Islands. Diversity 13(10): 480. https://doi.org/10.3390/d13100480

POWO (2021) Plants of the World Online (Kew). Available online: http://www.plantsoftheworldonline.org/ (accessed on 5 June 2021)