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## A HISTORICAL PERSPECTIVE ON VASCULAR PLANTS ENDEMIC TO ITALY

**Abstract** - *A Historical Perspective on Vascular Plants Endemic to Italy.* According to a recent review, Italian endemic vascular flora is made up by 1371 specific and subspecific taxa. Focussing on these taxa, in this paper we analyse the frequency of the names' authorities, the type and frequency of specific/infraspecific epithets, and their change over time. The most represented authorities, accounting for about 20% of the name descriptions, are Salvatore Brullo (1947-), Giovanni Gussone (1787-1866) and Michele Tenore (1780-1861). Geographical epithets are the most represented in the dataset. Despite a very slow increase in taxa description in the period 1929-1964, in the last decades we encountered an exponential increase, highlighting for the general use of new techniques as a tool to describe new species and for the increasing exploration of poorly known areas, but also for the urgent need to reconsider the past, present and future concept of species.

**Key words** - authorities, Corsica, flora, history of botany, Italy, Malta, taxonomy.

**Riassunto** - *Piante vascolari endemiche d'Italia: un punto di vista storico.* In accordo con un recente lavoro, la flora vascolare endemica d'Italia è composta da 1371 taxa specifici e sottospecifici. Focalizzandoci su questi taxa, in questo studio sono stati analizzati il tipo e la frequenza degli epiteti specifici/infraspecifici, ed i loro cambiamenti nel tempo. Gli autori maggiormente rappresentativi, che da soli hanno descritto ca. il 20% dei nomi oggetto di studio, sono Salvatore Brullo (1947-), Giovanni Gussone (1787-1866) and Michele Tenore (1780-1861). Gli epiteti di tipo geografico sono i più frequenti. Nonostante un forte rallentamento nella descrizione di taxa nel periodo 1929-1964, negli ultimi decenni si è avuto un incremento esponenziale, che mette in evidenza l'uso ormai comune di nuove tecniche per la descrizione di nuove specie ed il crescente impegno nell'esplorazione di aree poco conosciute, ma anche la necessità di rivedere i concetti di specie passati, presenti e futuri.

**Parole chiave** - autori, Corsica, flora, storia della botanica, Italia, Malta, tassonomia.

### INTRODUCTION

In a very recent study, we surveyed the taxonomic composition and distribution at regional level of vascular plants endemic to Italy, eventually extending their range to Corsica and/or Malta (Peruzzi *et al.*, 2014). In that work, we evidenced that 1371 specific

and subspecific taxa, about half of them being restricted to Sardinia and/or Sicily, are endemic to Italy. A complete – and continuously updated – list can be found by accessing the Google Drive document “Italian vascular plant endemics” at <https://docs.google.com/spreadsheet/ccc?key=0AijpWnsqul0MdG1hSkk1azBjN3BoLXB4VTAzc3l1Smc#gid=0>. In the present paper we aim to: (i) analyse the frequency of the names' authorities, (ii) analyse the types and frequencies of specific/infraspecific epithets, and (iii) their change over time.

### MATERIALS AND METHODS

The year of valid publication for each accepted basynim was obtained in the following databases: IPNI (2013), the Plant List (The Plant List, 2010), Euro+Med (2006 onwards) and other relevant literature [e.g. Romolini & Souche 2012, for the critical genus *Ophrys* L.]. Aimed at evidencing temporal trends in the description of new endemic taxa, the number of taxa described for each year was used to build a cumulative curve. The epithets were grouped in six categories: ecological, eponymic (dedicated to Italian botanists), eponymic (dedicated to foreign botanists), geographical, morphological and other (if not referable to any of the previous five categories). For each category, a mean year of description was calculated and we looked for statistically significant differences by means of the non-parametric Kruskal-Wallis test.

### RESULTS

The most represented authorities of scientific names in the dataset are summarized in Fig. 1: a total of 24 authorities described at least 15 taxa, having described collectively almost 60% of the total taxa. The species accumulation curve obtained plotting the number of taxa described against time describes a constant

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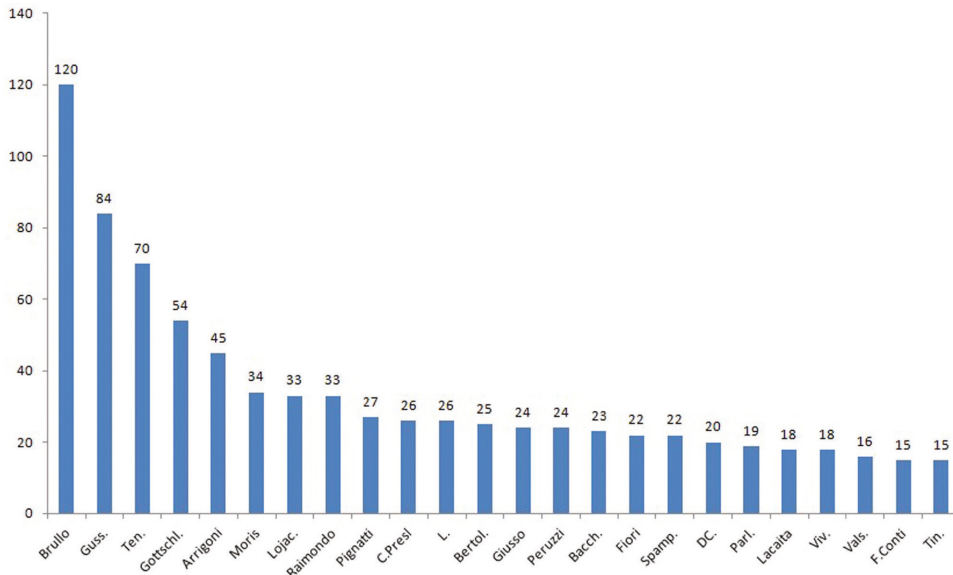


Fig. 1 - Most represented authors (or co-authors) of accepted basionyms in the dataset of Italian endemics. Abbreviations used are according to IPNI (2014).

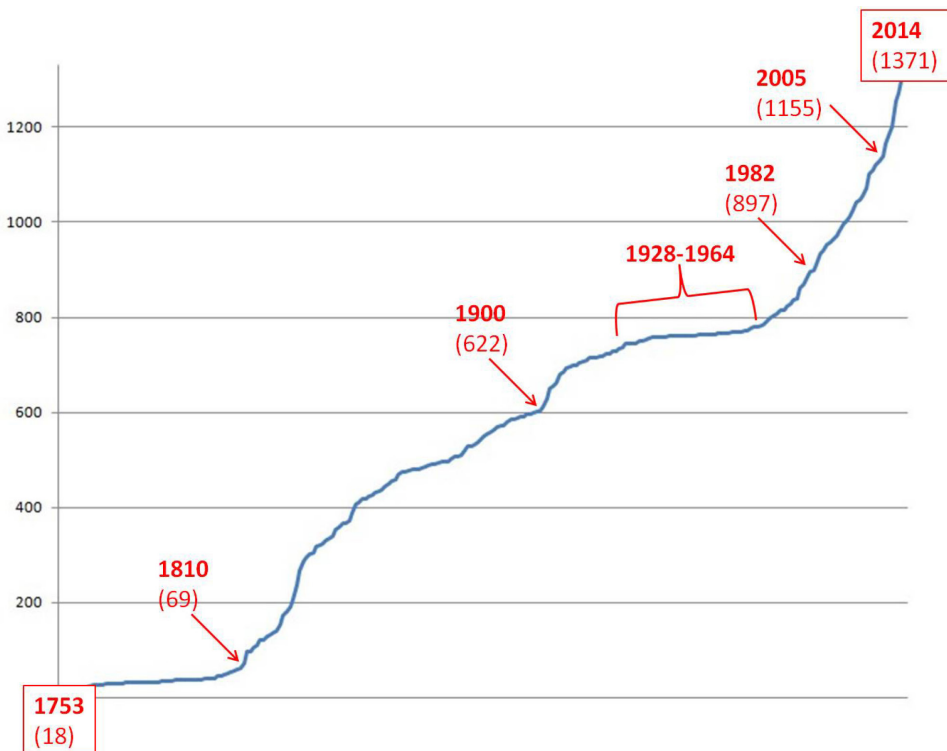


Fig. 2 - Cumulative curve of accepted basionyms in the dataset of Italian endemics, obtained plotting the number of taxa against years.

increase between 1810 and 1928. The description of new endemic taxa was very slow between 1929 and 1964, while from 1965 descriptions increased exponentially (Fig. 2).

To have an idea on how the plant names were chosen during time, an analysis of the specific and subspecific epithets revealed that they can be referred to six main

categories, summarized in Table 3. The geographical epithets are the most represented in the database (e.g. 27 *siculus/a/um*, 23 *corsicus/a/um*, 20 *nebrodensis/e*, 18 *sardous/a*, 16 *italicus/a/um*, 12 *aetnensis/e* [+ 4 *aethnensis* + 1 *etnense*], 12 *brutius/a/um*, 11 *calabricus/a/um* [+ 9 *calabrus/a/um*], 6 *apenninus/a/um* [+ 1 *appennina*, + 1 *apenninicola*], and others), followed by epithets given

after some morphological peculiarity of the taxon (e.g. 3 *lucidus/a/um*, 3 *pallidus/a/um*, 2 *minus/a/um* etc.), by epithets dedicated to Italian (e.g. 17 to G. Moris, 13 to G. Gussone, 11 to M. Tenore and others) or foreign (e.g. 4 to E. Revelière, 3 to A. Mueller and to E. Requièn, and others) botanists, by epithets of other kind (e.g. 3 *dubius/a/um* etc.) and, finally, by epithets coined after some ecological feature of the taxon (e.g. 7 *rupes-tris/e*, 5 *maritima/us/um* etc.). According to mean year of description for each major epithet category, it is evident that in recent years geographical epithets dominate together with those dedicated to Italian botanists, while at the dawn of taxonomic studies morphological and ecological epithets were much more used than today (Table 1).

Tab. 1 - Main categories of specific and subspecific epithets used for naming Italian endemics.

The differences in mean year of description among major categories of epithets is statistically significant (non-parametric Kruskal-Wallis test,  $df = 5$ ,  $p = 0.000$ ).

	N° species and subspecies	Mean year of description
Geographical	567	1940.85
Morphological	325	1863.00
Eponymic (dedicated to Italian botanists)	253	1930.27
Eponymic (dedicated to foreign botanists)	84	1911.88
Other	77	1912.76
Ecological	63	1887.14

## DISCUSSION

Most of the endemic species were described for the endemic-rich area of southern peninsular Italy, Sicily, and Sardinia. The three most representative authorities are botanists from these areas: Salvatore Brullo (1947-), Giovanni Gussone (1787-1866) and Michele Tenore (1780-1861), followed by others.

The reduced rate of description of new species observed from 1928 to 1964 is likely due to a) the out-

break of the Second World War, and b) a generalized decrease of classical taxonomic researches, paralleling the birth and diffusion of new and more appealing techniques in the middle of the XX century (Lücking, 2008). On the other hand, the near-exponential increase of endemics description in the last 30-40 years seems to be linked to a) the later diffusion and generalized use of the new techniques as a tool to describe new species, and b) the botanical exploration of poorly known areas. However, it also urges the scientific community to reconsider the past, present and future concept of species, especially in the plant kingdom, a long-standing problem in biology (see e.g. Monsch, 2005; Hey, 2006; Rieseberg *et al.*, 2006; Wheeler & Valdecasas, 2007; Hausdorf, 2011).

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