

# A trip in voice phytotherapy: TRPA1 ion channel as a target for bioactive compounds in herbal remedies for voice care

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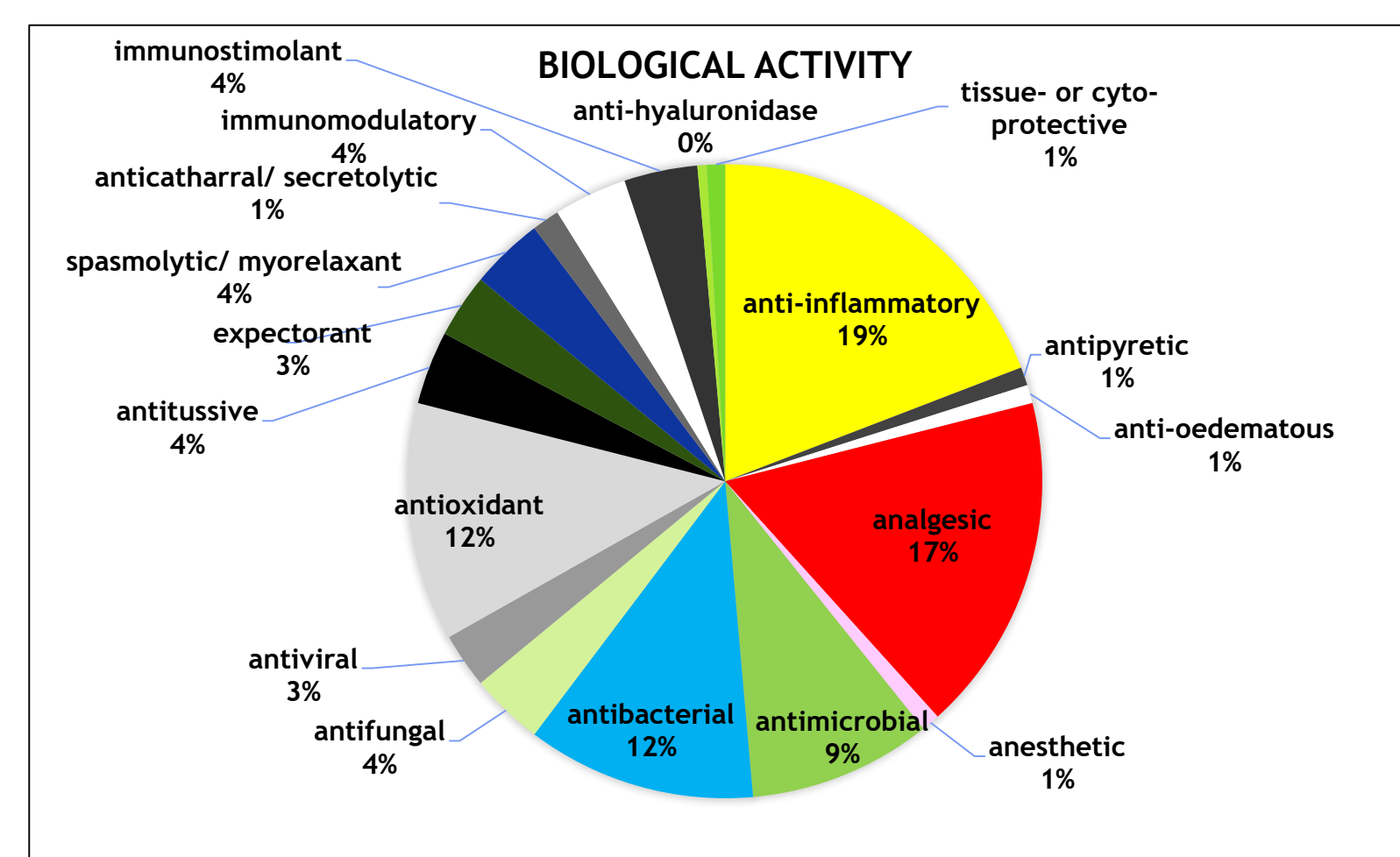
## INTRODUCTION

VOICE is the sound we produce to communicate meanings, ideas and opinions and has a capital importance in human social development. HERBS have been used for voice care since ancient times and many herbal remedies are still in use in several geographical areas and cultures, both as folk medicine and as sources of botanicals used in commercial products. In Europe *Sisymbrium officinale* (L.) Scop (SO, known as erysimum, the "singers'plant") is the most popular herbal remedy for voice care [1], but many other plants are employed in phytopreparations. The mechanisms of action of these botanicals include anti-bacterial, anti-inflammatory, mucolytic and other general activities; nevertheless, mechanisms that could be specifically referred to voice are often unknown, as well as MOLECULAR TARGETS. Recently some of us [2] showed that isopropylisothiocyanate and 2-butylisothiocyanate, the two main isothiocyanates from SO, are strong agonists in vitro of the TRPA1 (Transient Receptor Potential Ankyrin 1) somatosensory receptor, an ion channel involved in the mediation of inflammatory and neurogenic pain [3, 4, 5] suggesting that TRPA1 can be one of the molecular mediator of the therapeutic effects for SO.

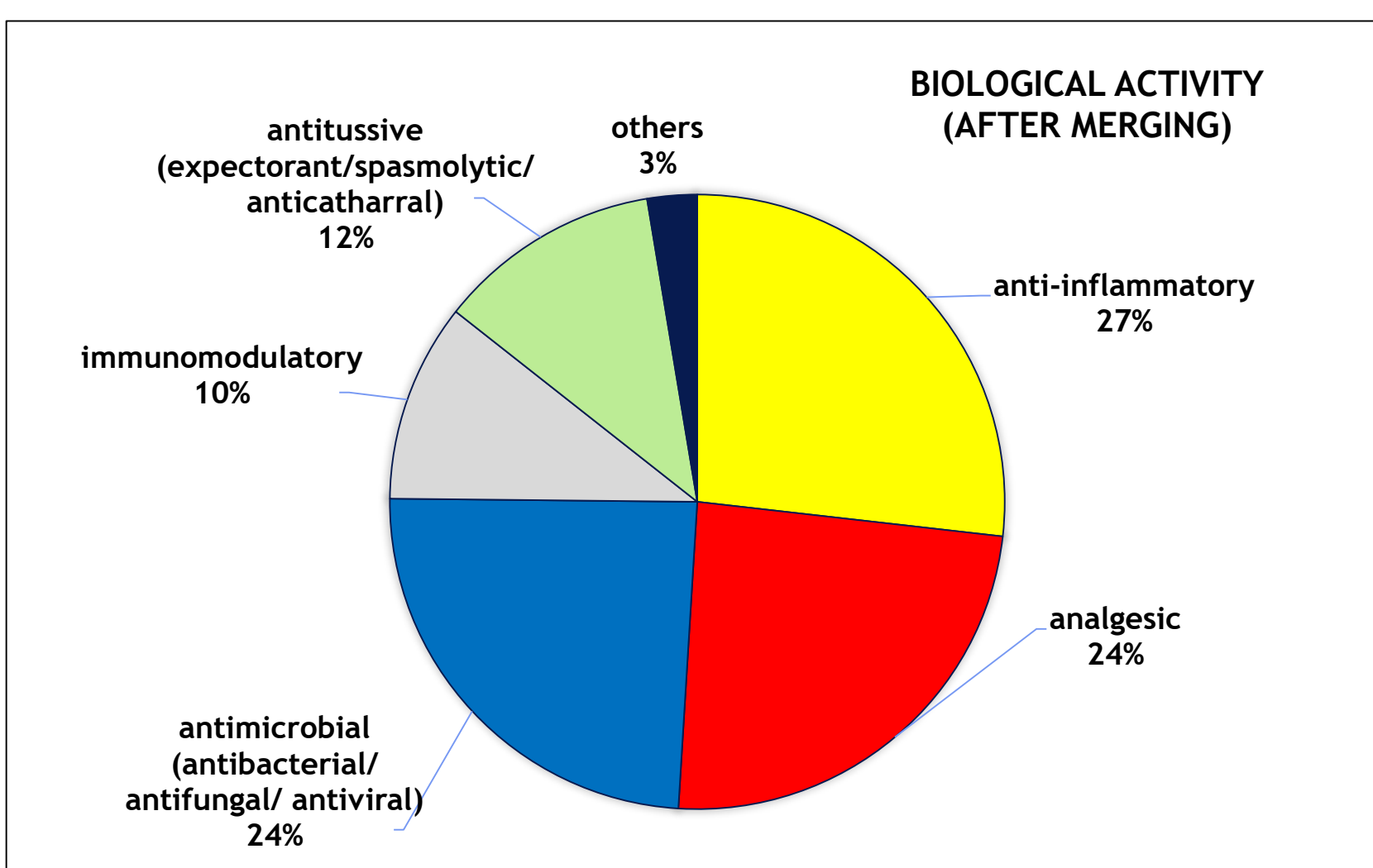
## RESULTS/2

We found sixteen reported biological activities associated to the active principles in the database.

We refined the results by merging similar activities and eliminating those non-specifically related to voice (such as "antioxidant").



This pooling allowed to highlight that anti-inflammatory, analgesic and antimicrobial are the most important biological activities in the Herbs for Voice database. These three activities are correlated with the most common pathologies of voice and upper airways, as cold, hoarseness and laryngitis. The anti-inflammatory, analgesic and antimicrobial resulted to be the most important biological activities in the Herbs for Voice database, accounting for 27, 25 and 25% of the total activity respectively.

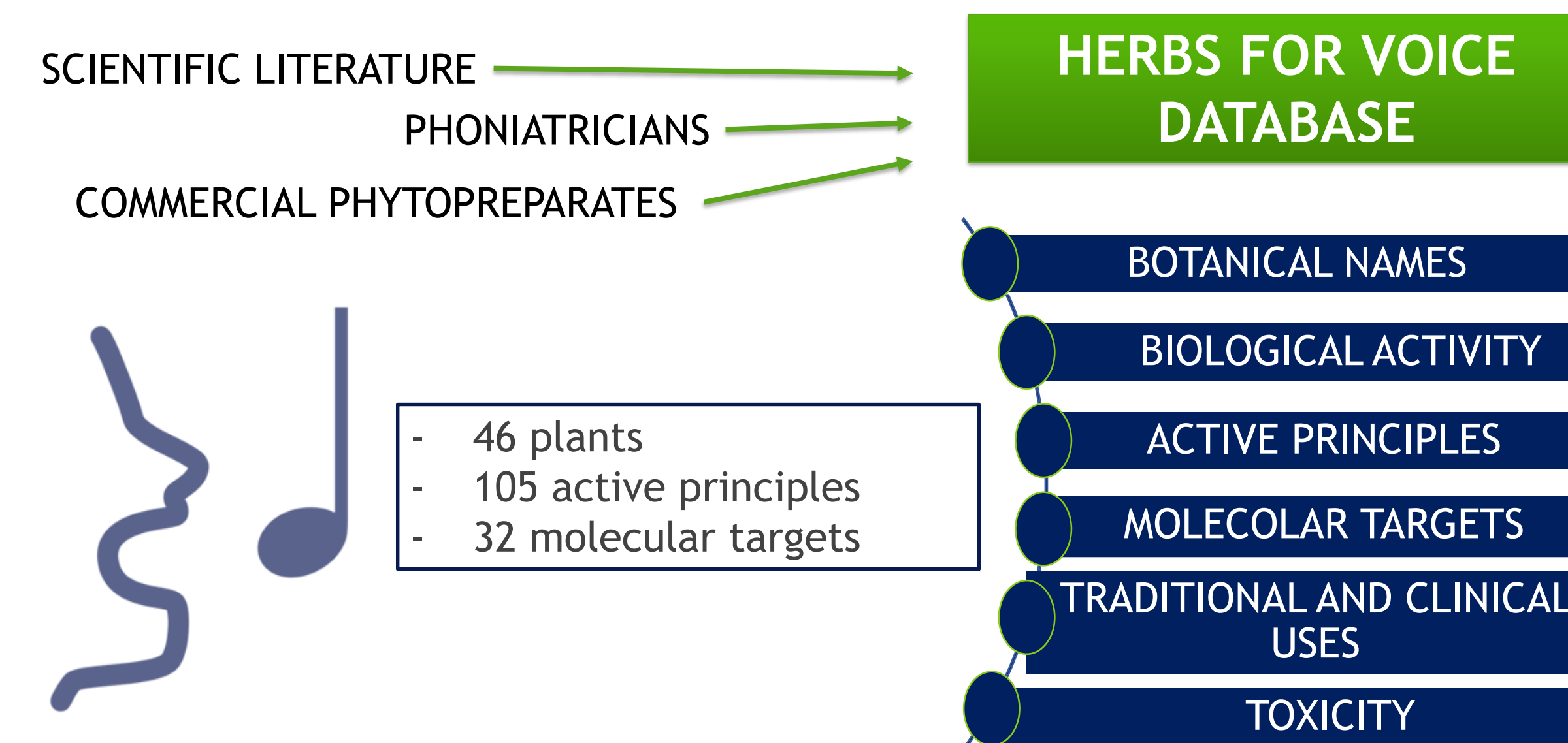


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## METHOD

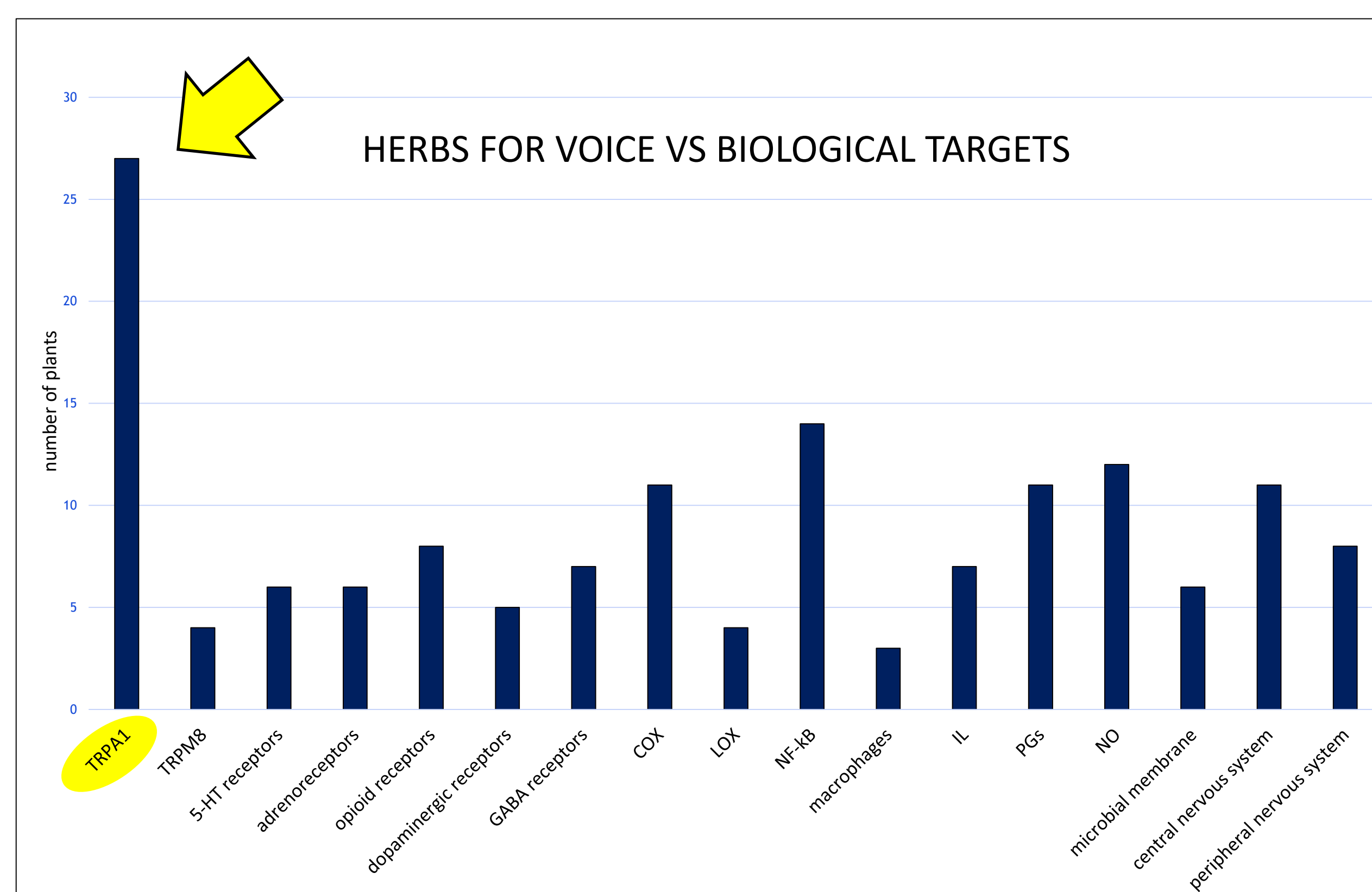
We collected information on plants used for voice impairment from several different geographical areas, using both literature data and a pool of contributors chosen in an international network of artistic phoniatriicians and vocalists.



## RESULTS/3

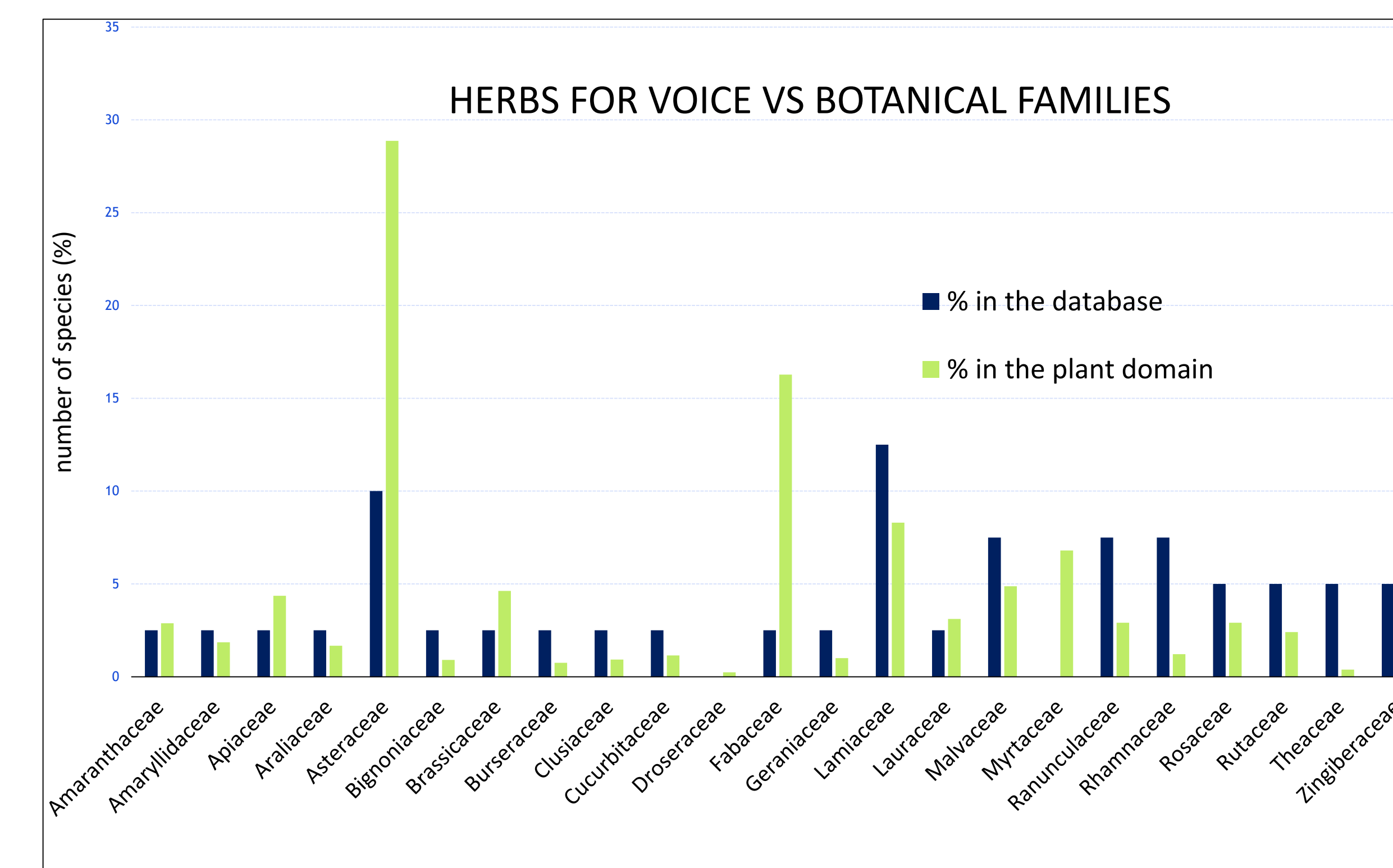
The most represented molecular target is the somatosensory TRPA1 (Transient Receptor Potential Ankyrin type 1) ion channel. Agonists of this ion channel have been identified in 27 over 44 plants, corresponding to 61,3% of the plants in the database. Also TRPM8 (Transient Receptor Potential Melastatin type 8), involved in the perception of coolness, was identified among the molecular targets.

TRPA1 is a well-known mediator of irritation, itch, inflammatory and neurogenic pain. TRPA1 is also involved in airways irritations pathways and diseases [21].



## RESULTS/1

In the database, herbs owing to the Lamiaceae family (which are often rich in aroma and chemesthetic compounds) are the most represented.



## CONCLUSIONS

Our finding reinforces the hypothesis that somatosensory TRP ion channels could be involved in relevant MECHANISMS OF ACTION of these traditional remedies used in phytotherapy, such as erysimum, ginger, eucalyptus, cinnamon and many more.

The database opens new perspectives for the rational study of VOICE PHYTOPHARMACOLOGY AND THERAPY and for the design of more effective commercial phytopreparates.

The Herbs for Voice Database represent a starting point for collecting more informations from the traditional medicine of all countries in order to allow further analysis with statistical significance, using the approach of PARTICIPATORY SCIENCE.

Such studies can also give interesting data about the use and care of voice in different geographical areas and populations, with interesting CULTURAL AND ANTHROPOLOGICAL ASPECTS.

We are looking for:  
-EXPERT CONTRIBUTORS (botanics, phytotherapists, phoniatriicians) to enlarge the database;  
-FUNDING AND COLLABORATION for research projects and organize experts' meetings.

## ACKNOWLEDGEMENTS:

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