Editorial

Un Viaje A Través De Las Amaryllidaceae: Una Perspectiva Desde Las Américas

A Journey Across The Amaryllidaceae: An Outlook From The Americas

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The family Amaryllidaceae includes species distributed all over the Globe, with centers of higher taxonomic diversity and species richness in South America, Asia, and southern Africa (Stevens, 2001 onwards). The family is divided into three subfamilies and includes ca. 2200 species, of which > 1200 are part of Allioideae, > 1100 belong to Amaryllidoideae, and only ca. 10 species to Agapanthoideae. The family encompasses genera and species of huge economic interest, ornamental species cultivated all over the World, and a rich history in the traditional medicinal practices of indigenous populations around the World (Scarpa *et al*., 2020). Given the degree of canalized evolution and the presence of convergent morphological characters (Meerow, 2010) many taxa were a real challenge to place confidently within traditional classifications until the advent of DNA sequence analyses. As a result, Amaryllidaceae and particularly their South American representatives have been poorly studied. Some reasons for the lack of study can be summarized in 1) the overall difficulty of collecting geophytes in the field and posterior preservation in herbaria, 2) phenology, such as fall or winter flowering periods when collection trips are infrequent or the lack of records of complete individuals due to proteranthy or histeranthy, 3) the lack of unequivocal morphological characters to diagnose certain taxa. The present issue aims to bring together studies including representatives of the family (endemic and cultivated species in the American continent), to recognize patterns among them as a first step towards understanding the evolutionary history and increasing the awareness of Amaryllidaceae.

The published articles cover a diversity of botanical areas as well as different taxonomic levels within Amaryllidaceae. **Meerow** reviews the intricate systematic history of the family in the last three decades. This manuscript highlights the significative contribution of molecular phylogenetics to the current understanding of the family's evolutionary history and classification. In line with the conflictive systematics of the group, **Goyeneche *et al.*** compile the taxonomic history of *Zephyranthes bifida* (Herb.) Nic. García & Meerow (Hippeastreae, Amaryllidoideae). According to their nomenclatural research, this species is associated with 43 legitimate synonyms, three illegitimate names, and two isonyms without nomenclatural status. Moreover, the authors call attention towards within-individual variation of spathe morphology in *Z. bifida*, dismissing the idea that this variation may be indicative of different taxonomic entities. Additionally, **Campos Rocha *et al.*** describe a new species of *Nothoscordum* (Leucocoryneae, Allioideae). The new species is endemic to Brazil and is described based on integrative taxonomy. Furthermore, they provide a detailed description of the habitat and raise the need of preserving the type locality.

Valdes-Ibarra *et al.* focus on the geographic distribution and species richness of subtribe Hippeastrinae (Hippeastreae, Amaryllidoideae) in Mexico. Mexican species of Hippeastrinae exhibit a modern Neotropical pattern of richness and distribution. Species richness and endemism are concentrated in the Neotropical Region and the Mexican Transition Zone. Also, the authors propose that the Sierra Madre Oriental is a local center of diversity for the group.

One of the most explored biological fields in the family has been undoubtedly cytogenetics, especially for the attractiveness of large chromosomes and descriptions of uncommon events in their genomes (e.g., Robertsonian translocations in Amaryllidaceae; Flory, 1977). In this issue, **Gianini Aquino *et al.*** describe cytological variation within *Z. mesochloa* Herb. (Hippeastreae, Amaryllidoideae). The evaluation of eight populations from northern Argentina resulted in the categorization of most of them as diploid ($2n = 2x = 12$ or sometimes 13 with a putative B chromosome) and one as autotetraploid with a discontinuous geographic pattern of cytotype distribution. **Vossler** studies one of the most unexplored fields of the family and goes into the floral interactions among species of Amaryllidaceae and bees. A total of six pollen types belonging to Amaryllidaceae species are identified in the pollen diet of five polylectic bees. We highlight the need for deeper studies of floral biology within the family, which would greatly benefit the understanding of species interactions and reproductive features.

The presence of floral nectaries described within the family, motivated **Gonzalez *et al.*** to inquire about the morphological and anatomical structure of nectaries and androecium in onion (*Allium cepa* L., Allieae, Allioideae). The authors conclude that onion nectaries are a clear example of secondary presentation of nectar. Anatomically, the sterile male line flowers differ from fertile flowers in the lack of pollen production and absence of stamen dehiscence, despite having a normal structural organization. Following morphoanatomical studies, **Acosta *et al.*** focus on the fruits and seeds of *Z. tubispatha* (L'Hér.) Herb. (Hippeastreae, Amaryllidoideae). The authors report new magnitudes for fruits and number of seeds, and detect lipids and proteins as endosperm reserves. Moreover, they describe five seed-seedling transition substages and evaluate how different storage conditions affect germination and subsequent plant survival.

Regarding human uses, **Alcaraz *et al.*** highlight the medicinal potential of the family and update the current knowledge of garlic (*Allium sativum*, Allieae, Allioideae), and confirm its high potential as antimicrobial and antifungal agent, both in isolated components of the bulbs and in different formulations.

Ornamental geophytes are threatened worldwide by several factors, such as climate change, overgrazing of natural habitats, and illegal collection of bulbs (**Rovere & Gonzalez** and references therein). The final paper chosen for this issue is an example of the successful rescue of *Z. gilliesiana* (Herb.) Nic. García (Hippeastreae, Amaryllidoideae) for *ex-situ* conservation, pinpointing that not only conservation via the relocation of bulbs is possible but also that this species can be part of ecological restoration projects. Moreover, **Rovere & Gonzalez** conclude that early plant survival responded to bulb weight, being higher for heavier bulbs.

We hope that the papers compiled in this issue are of great interest to the readers of the BSAB and succeed in attracting the attention towards the addressed topics and the family. As suggested by **Meerow**, there are still few applications of genomic data to clarify phylogenetic relationships within the family; however, related methodologies are promising considering the first available complete genomes in this clade (e.g., Finkers *et al.*, 2021), setting an evolutionary framework and allowing us to answer deeper questions within the field.

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