

**FLORA  
of  
SINGAPORE**

**Volume 7**



# FLORA OF SINGAPORE

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# FLORA of SINGAPORE

**Volume 7**

**POALES**

TYPHACEAE (J. Leong-Škorničková)  
XYRIDACEAE (J. Leong-Škorničková)  
ERIOCAULACEAE (J.P.C. Tan)  
MAYACACEAE (M.A. Niissalo & J. Leong-Škorničková)  
CYPERACEAE (D. Simpson)  
FLAGELLARIACEAE (J. Leong-Škorničková)  
POACEAE (J.-F. Veldkamp et al.)

**Edited by**

D.J. Middleton, J. Leong-Škorničková & S. Lindsay



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Front cover: *Cyperus pedunculatus* (R.Br.) J.Kern

Back cover: *Flagellaria indica* L. (upper left); *Xyris complanata* R.Br. (lower right);

*Scrotochloa urceolata* (Roxb.) Judz. (lower left)

Spine: spikelet of *Eragrostis uniolooides* (Retz.) Nees ex Steud.

All painted by Waiwai Hove. Funding for the artwork is made possible by a generous donation from Mr Tan Jiew Hoe through the Garden City Fund, a registered charity and Institution of Public Character established by the National Parks Board Singapore. For more information, visit [www.gardencityfund.org](http://www.gardencityfund.org).

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## INTRODUCTION

Volume 7 of the Flora of Singapore includes only one order of plants – the Poales. The order has 16 families of which only five are native in Singapore and two are naturalised. Of the five native families, Poaceae and Cyperaceae are large and found throughout the world in a wide range of habitats, Eriocaulaceae is primarily tropical but with some species in temperate regions, Xyridaceae is also chiefly tropical but extends into the temperate southern hemisphere and Flagellariaceae is a tropical and subtropical Old World family. The two introduced and naturalised families are Mayacaceae, which is native to tropical and subtropical America and Angola, and Typhaceae, which is a largely temperate family. Chong et al. (Checkl. Vasc. Pl. Fl. Singapore (2009) 13, 117, 262) suggested that *Ananas comosus* (L.) Merr. in the Bromeliaceae was casual in Singapore but we have not found evidence that it is and hence the species and family are omitted from this volume. Almost all species of Poales in Singapore are herbaceous, with just a few species of bamboo attaining any great size, while Flagellariaceae are lianas capable of smothering other vegetation.

Globally, the Poales has about 1073 genera and about 23,500 species (Stevens (2001 onwards), Angiosperm Phylogeny Website, accessed 23 July 2019, with amendments based on the Flora of Singapore accounts). In Singapore there are 84 genera, of which 16 are known only from introduced species, and 238 species, of which 46 are casual or naturalised introduced species. At 19% of the total, this is a particularly high percentage of introduced species compared to many other orders and is primarily due to very large numbers of introduced grass species.

The limits of the order Poales have been rather fluid with fairly recent publications continuing to recognise a smaller Poales by excluding Mayacaceae, Xyridaceae and Eriocaulaceae which are placed in the separate order Xyridales (Kubitzki, Fam. Gen. Vasc. Pl. 4, 1998) or in a broader Commelinales (Judd et al., Pl. Syst. (1999) 204). The relationships between the families within the Poales are still rather fluid but the delimitation of each of the families found in Singapore is fairly uncontroversial.

The Poales includes arguably the world's most important family of plants: the Poaceae. Countless generations of peoples throughout the world have relied on many and varied species of grasses as their staple food: rice, wheat, maize, oats, barley and rye to name but a few. The most economically important non-staple grass is sugar cane. Many other species have more local food uses, including bamboo shoots. Different species are grown as fodder crops for animals, and bamboos are used as fencing and in construction. With such great reliance on a single plant family for basic survival, grasses have often attained deep cultural and spiritual significance in many and disparate civilisations. Due to the importance of grasses for food, fodder and landscaping in Singapore, particularly large numbers of introduced and naturalising species are found in this family which may have an impact on the native grass species. The other large family in the order, the Cyperaceae, is much more limited in its culinary importance but is frequently used in basketry and matting. Due to their preference for damper habitats, particularly for wetlands, a habitat that was frequently drained for land use and mosquito control in Singapore, many species of Cyperaceae have become nationally extinct or are assessed as threatened in Singapore. Around a third of all native species are presumed nationally extinct and a further third are assessed as threatened in Singapore. Xyridaceae and Eriocaulaceae have

similar habitat preferences and are similarly impacted. The introduced Mayacaceae appears to be spreading quickly in Singapore and needs to be monitored as it has been reported as invasive in other countries.

The accounts of the families in the Poales have relied on a combination of expertise in Singapore Botanic Gardens, along with collaboration from the Royal Botanic Gardens Kew, the Forest Research Institute Malaysia, and Naturalis in Leiden.

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