

Expression pattern of floral scent genes in different flowering stages of *Chrysanthemum* cultivars

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Among the various volatile organic compounds (VOCs) emitted by the plant, floral scent plays a key role in attracting pollinators for reproduction and mediates ecological interactions. Floral scent is an important trait and industry drives the competition for flowers with novel scents. *Chrysanthemum* is one of the well-known ornamental plants and is a popular cut flower across the world. Floral scent and the genes responsible for the floral scent emission are poorly studied in *chrysanthemum*. In the present study, floral scent and the expression pattern of floral scent genes were analyzed in two *chrysanthemum* cultivars 'Golden Egg' and 'Gaya Glory'. Initially, intensity of the floral scent in five developing stages of flower including 'budding (B), bud developing (BD), initial blooming (IB), almost open (AO) and open flower (OF)' was analyzed using electronic nose (E-nose) with six metal oxide sensors. Based on the distance analysis, different stages of flower showed different relative intensity of scent according to the sensory evaluation. Although the scent pattern differed by stage, scent intensity was strongest in the OF stage in the completely opened flower in both the cultivars. Further, expression pattern of six genes in the floral scent pathway including *FDS*, *IDI*, *ISPH*, *TPS2*, *TPS5* and *TPS6* was observed in all the five stages of the flower in both the cultivars. The expression pattern of all the six genes differed by stage and the terpene synthase genes *TPS2*, *TPS5* and *TPS6* showed good expression levels in the 5th flower stage compared to other stages. This study provides a preliminary data for understanding the regulation of floral scent in *chrysanthemum*.

Key words: *Chrysanthemum*, E-nose, *FDS*, floral scent, *IDI*, *ISPH*, *terpene synthase*