Preface

The researches on physiological processes of medical plants during developments and in response to environmental cues are of great significance. *Catharanthus roseus* is a tropic plant and has been widely cultured all around the world due to their anti-cancer activity of vinblastine and vincristine. It is well known that it can normally grow under high temperature conditions over 40℃ and is characteristic of strong tolerance to abiotic stress.

Our tutor, Prof. Zu yuangang, has been developing ecophysiological studies on medical plants, including *Camptotheca acuminata*, *Acanthopanax senticosus* etc from 1992. These results provided detailed insight into the physiologically responsive processes of medical plants under different cultured conditions. Regulation rules and mechanisms focusing on primary and secondary metabolisms were also demonstrated and give instruction to efficient cultivation of them. From 2000, we were organized into one group focusing on physiological ecology of *C. roseus* to provide technical instructions for *C. roseus* planters. Under the elaborate instruction of Prof. Zu, we were engaged in this research work for more than 3 years, partly in Hainan and obtained some original results, some parts of which were collected into this book. In these results, the theory and methods of plant physiology, as well as proteomics, were conducted in *C. roseus* to investigate and reveal the physiological processes and mechanisms during development and in response to environmental cues. The physiological processes include alkaloid metabolisms, photosynthetic and respiratory response, soluble sugar and phytohormones variations induced by light, temperature, water and biotic molecules. Their biological functions and interactions were also discussed.

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