

精油的科学

THE SCIENCE OF
ESSENTIAL OILS

王亮 / 著



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序

美国国立卫生研究院下属的癌症研究所把芳香疗法定义为使用植物精油提升身体、精神和情感健康的一种辅助医疗方式。芳香植物在人类社会中已有数千年的使用历史，其药用价值在印度、埃及和中国等古老文明中均有记载。东方人通常直接使用芳香或药用植物治疗疾病，而植物精油的提取和使用则起源于欧洲，到中世纪时期臻于成熟。法国化学家雷内·盖特弗塞在研究了不同精油对疾病功效的基础上，于20世纪初建立了芳香疗法的基本体系。到20世纪末期，芳香疗法被正式纳入辅助和替代疗法的范畴，逐渐被西方社会接受和认可。相关数据表明有约38%的成年人曾经寻求辅助和替代疗法缓解压力、焦虑以及疼痛等症状，市场份额高达339亿美元。鉴于该领域的旺盛需求，美国国立卫生研究院于1998年成立了辅助和整合健康研究院，每年投入约1亿美元的经费专门从事替代医学方面的研究，大力促进了芳香疗法在科学框架内的发展，提升了其在公共领域的认知度。

目前，芳香疗法主要通过香薰、口服及按摩三种途径实现精油和人体的相互作用。在这三种作用方式中，香薰法最有效也最为常见。香薰精油通过嗅觉系统实现与人体相互作用，从而达到缓解心理和精神障碍的功效。嗅觉是人类最重要的感官感受之一。鼻子无法辨识气味就像耳朵听不到声音或是眼睛看不见东西一样，会对我们的生活和健康造成严重影响。在人类进化史上，嗅觉扮演了举足轻重的角色。西班牙自然科学博物馆的研究人员于2011年发现人类祖先嗅觉敏感度的提升不仅增强了部落成员的辨识能力，还有

效提升了群体间的相互协作意识,使得人类祖先在早期激烈的进化竞争中超越尼安德人,成就了现代人类文明的繁荣昌盛。人类对气味的感知主要归因于嗅神经系统和鼻三叉神经系统的相互作用,而起决定作用的则是位于大脑内部的嗅球。嗅球是由上万个嗅细胞的神经纤维缠集在一起形成的球状体,可以快速识别精油中的复杂成分并形成对气味的综合认识,最后将信息转化为神经信号传导至海马体和杏仁核区域。因此嗅觉和记忆之间有着极其亲密的联系,并会对人的情感产生一定影响。

芳香疗法的核心是植物精油。精油源自植物的次级代谢产物,是植物中醇类、醛类、酸类、酚类、丙酮类以及萜烯类等化学物质的浓缩,具有多种生物活性。本书中所说的精油是指纯天然的植物提取物,而非人工合成的香精。大量的临床案例和实验研究证实,芳香疗法在杀菌消炎、缓解压力、心理干预以及改善精神障碍等方面具有良好效果。本书共分九个部分八十五小节,从芳香感知的原理到现代精油贸易,从传统的蒸馏法到先进的超临界二氧化碳提取都有涉及。此外,本书从生活和临床两方面入手,用数据和实例说话,深入浅出地介绍了精油的各方面功能。最后,简要介绍了一些具有特色的精油品种以及精油在香水工业中的应用。本书力求在科普性和趣味性之间寻求平衡,让读者在获取知识的同时,不会觉得内容过于枯燥乏味。本书各章节间既相互独立,也存在一定联系,读者朋友们可以根据个人喜好选择相应篇章阅读。

芳香疗法从欧洲传入日本、马来西亚和中国等国家后受到了芳香爱好者的的大力支持。借助于完备的职业芳疗师培训机制以及发达的医疗服务体系,大众普遍认识到芳香疗法的功能和价值。由于我国的芳香疗法正处于起步阶段,专业人士匮乏且市场参差不齐,导致很多人对芳香疗法不了解或是认识不全面。植物精油是芳香疗法的基础,但是因为历史等客观原因,人们对精油的认知有偏颇,缺乏全面系统的了解。市面上从科学和临床实证角度介绍精油的

书籍相对匮乏,相关资料主要依赖于翻译和进口,且更新速度缓慢,无法满足读者的需求。这也是我国芳香疗法的认知度和接受度偏低的原因之一。本书作者从事健康科学研究十余年,对植物和各类精油的性质和功效具有较深入的了解。在参阅大量文献和专业书籍的基础上,结合当前精油的热点问题,撰写了这本《精油的科学》,希望读者朋友对植物精油有一个科学和系统的了解,也希望能够为芳香疗法的推广贡献一份微薄之力,从而实现芳疗为大众健康服务的目的。

王亮 博士
澳大利亚 悉尼
2018年8月

Preface

The Cancer Institute, a division of the National Institutes of Health (NIH), defines aromatherapy as a form of paramedical treatment that uses botanical essential oils to enhance physical, mental and emotional health. Aromatic plants have been used for thousands of years in human society, and their medicinal values are recorded in ancient civilizations such as India, Egypt and China, etc. Orientals usually use aromatic or medicinal plants directly to treat diseases. However, the extraction and use of plant essential oils originated in Europe and became mature during the Middle Ages. The French chemist Rene-Maurice Gattefosse established a basic system of aromatherapy at the beginning of the 20th century through studying the efficacy of different essential oils on the disease. By the end of the 20th century, aromatherapy was formally incorporated into the category of complementary and alternative therapies and was gradually accepted by Western societies. Relevant data indicate that about 38% of adult Americans have sought alternative therapies to relieve symptoms such as stress, anxiety and pain, etc., with a market share of around USD 33.9 billion. In view of the strong demand in this area, NIH established National Center for Complementary and Integrative Health (NCCIH) in 1998 and invested about 100 million U.S. dollars every year to specialize in alternative medicine research. NCCIH strongly promotes

aromatherapy within the scientific framework and increases its awareness in the public domain.

Aromatherapy is one of the major fields in complementary and integrative therapies. At present, aromatherapy mainly uses inhalation, oral administration and massage to achieve the interaction between essential oils and the human body. Of these three modes of action, inhalation is the most effective and common method. Essential oils interact with the human body through the olfactory system so as to relieve psychological and mental disorders. The sense of smell is one of the most important sensory experiences of humans. If a person can't smell, it is just like the ears can't hear the sound or the eyes can't see things. It will cause serious impact on people's lives and health. In the history of human evolution, the sense of smell plays a pivotal role. Researchers at the Natural Science Museum in Spain discovered in 2011 that the increase in the olfactory sensitivity of human ancestors not only enhanced the recognition ability of tribal members, but also effectively promoted the mutual cooperation consciousness among groups, making human ancestors surpass the early and fierce evolutionary competition with the Neanderthal man and achieve the prosperity of modern human civilization. Human perception of odor is mainly attributed to the interaction between the olfactory nervous system and the nasal trigeminal nervous system. The olfactory bulb located inside the brain plays a decisive role. The olfactory bulb is a spheroid formed by the tangling of nerve fibers of tens of thousands of olfactory cells. It can quickly identify the complex components in the essential oil and form a comprehensive understanding of the odor. Finally, it converts the information into nerve signals to the hippocampus and

the amygdala regions. Therefore, there is an extremely close connection between the sense of smell and memory, and it will have an impact on people's emotions.

The core of aromatherapy is plant essential oils, which are derived from the secondary metabolites of plants. They are the concentration of alcohols, aldehydes, acids, phenols, acetones, and terpenes in plants with a variety of biological activities. The essential oils mentioned in this book refer to pure natural plant extracts, not synthetic flavors. A large number of clinical cases and experimental studies have confirmed that aromatherapy has a good effect in bactericide, anti-inflammation, stress relief, psychological intervention and mental disorders. This book is divided into nine chapters and eighty-five sections, ranging from the principle of aromatic perception to the modern essential oil trade, from the traditional distillation method to the advanced extraction of supercritical carbon dioxide, etc. In addition, part of the book focuses on clinical applications of essential oils through data and examples and explains essential oil functions in a simple and easy way. Finally, characteristics of the essential oil varieties and the use of essential oils in perfumes are presented. This book strives to seek a balance between readability and technicality, so that when readers gain knowledge, they will enjoy the reading. Although there are certain links between sections, the chapters of this book are independent of each other. Readers and friends can choose the appropriate chapter to read according to personal preferences.

After aromatherapy was introduced from Europe to Japan, China and Malaysia, it was strongly supported by enthusiasts. With the help of a comprehensive training system for professional

aromatherapists and a well-developed medical service system, the general public recognizes the function and value of aromatherapy. As China's aromatherapy is in its infancy, there is a lack of professionals and uneven markets. Many people do not understand what the aromatherapy is and its benefits. Due to historical and other objective reasons, people's perception of essential oils is biased and lacks a comprehensive and systematic understanding. Currently, there are relatively few books on essential oils in the market, illustrating aromatherapy from the perspective of scientific and clinical demonstrations. The relevant information mainly relies on translated and imported books, which is rather slow to update and cannot meet the needs of readers. This is also one of the reasons for the low awareness and acceptance of aromatherapy in China. Dr. Wang has engaged in health science research for more than ten years and has in-depth knowledge of the nature and efficacy of plants and various types of essential oils. On the basis of a large number of scientific literature and professional books, combined with the current hot issues of essential oils, Dr. Wang wrote this book *The Science of Essential Oils*, hoping that the readers could have a scientific and systematic understanding of essential oils.

Liang Wang, PhD

Sydney, Australia

August 2018

作者简介

王亮,博士,2017年入选江苏省创新创业人才引进计划(双创计划),澳大利亚新南威尔士大学访问学者,美国微生物学会会员,澳大利亚微生物学会终身会员,澳大利亚精油制造商协会会员,中国生物工程学会专业会员,江苏省生物信息学专委会委员。毕业于澳大利亚西澳大学病理和医学检验学院并荣获哲学博士学位。澳大利亚和加拿大生物医学领域博士后。澳大利亚优一健康科技有限公司总经理。主要研究方向为病原微生物和传染性疾病、生物大分子结构和功能、糖尿病、植物提取物以及生物信息学等。

About the author

Dr. Liang Wang was selected into Entrepreneurial and Innovative Talent Scheme of Jiangsu Province in 2017. He holds memberships at American Society for Microbiology, Chinese Society of Biotechnology, Australian Society for Microbiology, and Essential Oils Producers Association of Australia. Dr. Wang graduated from the School of Pathology and Laboratory Medicine at the University of Western Australia and was awarded the Doctor of Philosophy degree. He was also a visiting scholar of the University of New South Wales. His main research interests focus on bioinformatics, pathogenic microbiology and infectious diseases, structures and functions of biomacromolecules, diabetes mellitus, and essential oils. Dr. Wang was also trained as post-doctoral researcher at Canada and Australia, and worked as a Manager in Youi Healthcare Pty. Ltd.

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