

P. J. Frosch · J. D. Johansen · I. R. White (Eds.)
Fragrances: Beneficial and Adverse Effects

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FRAGRANCES

Beneficial and Adverse Effects

With Foreword by H. Möller

With 33 Figures (Some in Colour)
and 42 Tables



Springer

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Foreword

Satellite symposia of a commercial nature are frequent additions to scientific meetings. The organisers of the Jadassohn Centenary Congress (a joint meeting of the European Society of Contact Dermatitis and the American Contact Dermatitis Society, London, October 1996) chose to start their meeting with a thematic symposium independent of any drug or cosmetic promotion. Doing this, and taking "Fragrances" as a theme, was motivated by the need for informed debate on an important medical and environmental issue without the bias that sponsorship brings.

That time is now remote when perfumes were applied exclusively as such on the skin in order to attain a specific odour for the purpose of increasing the powers of attraction and self-esteem, in many cases also with the aim of covering a malodour. The next stage of the evolution of fragrance use was their addition to skin care products such as cleansers and emollients. Today, fragrance use is ubiquitous and they are present in a multitude of products not primarily designed for skin contact. Because of these many uses contact may occur from airborne perfumes and by daily social interaction. Consequently, in modern society nobody can avoid exposure to fragrances.

The present volume demonstrates that the reported adverse effects of fragrance compounds are relatively few in relation to the vast amounts used. However, irritant and allergic skin reactions do occur and many of these are not reported to manufacturers and physicians. Nevertheless, those reactions investigated by dermatologists and diagnosed by patch testing constitute a very substantial part of all contact allergies seen in dermatological practice. In females, contact allergy to fragrances is usually second in frequency after nickel allergy; in males, in many laboratories fragrance has become number 1!

The above leads to a need for a much increased understanding of the biology and chemistry of fragrance materials. Also required are improved methods to diagnose skin disease induced by fragrances: irritant and photo-toxic reactions, contact and photocontact allergy as well as contact urticaria. The medical community and the fragrance industry are very interested in the prevention of skin damage caused by fragrance compounds. Therefore,

predictive testing of fragrance materials, a politically somewhat debated issue, is covered in the present volume.

Being comprehensive, the symposium also discussed the beneficial effects of fragrances, primarily as psychosocial means of interpersonal communication. Also, we learnt of the importance of fragrance signals in the insect kingdom.

Quite clearly, this book covers an essential area of dermatology. It certainly needs no scented cover to attract readers!

Malmö 1997

HALVOR MÖLLER

President, European Society of Contact Dermatitis

Preface

We all agree that the use of fragrances enriches our lives. Who does not like the marvellous bouquet of fragrances emanating from fresh flowers? Youth and beauty are associated with a refreshing odour but death and decay with a bad smell.

Man's use of perfumes can be traced back to ancient times. Beautiful glass flasks bear witness that the Romans produced a large variety of scented materials. Oils extracted from fruits and plants were used for baths and emollients; fine perfumes were kept in valuable flacons.

The art of perfumery has come a long way since. Nowadays it is a world-wide multibillion dollar business. Fragrances are ubiquitous. Advertising has created a fascinating world where dreams come true and youth, power and sexual success are directly linked to specific products. Famous designers have developed their own lines of after shave, perfume, body lotion, and deodorant. Today, it is rare to find a person who does not regularly use any perfumed article. There are now "special" fragrances for children.

The editors of this volume observe the side effects of fragrances in use. The well-known "Berloque Dermatitis" resulting from phototoxic furocoumarins in oil of bergamot presents with an acute inflammatory reaction and an often longstanding hyperpigmentation. Although this complication is now uncommon due to purification methods by manufacturers, dermatologists continue to diagnose allergic contact dermatitis to fragrances. Fragrances are the most frequent single cause of cosmetic allergy according to recent studies. Allergic reactions to the "fragrance mix" – a screening tool used for patch testing – are among the leading contact allergens, in most studies only surpassed by nickel in women. Dermatological patients in a patch test clinic show a frequency of positive reactions to the fragrance mix in the range of 5% to 11%. In the general population this figure may be 1%–2% according to a Danish study. Although not all of these reactions are clinically meaningful, adverse reactions to scented materials are by no means rare. They often cause considerable discomfort, require medical attention and are a burden for the highly sensitised patient. Individuals may react after airborne contact and may have to avoid elevators or shopping areas where perfumery is on display.

There are publications regarding the chemistry and methods of producing perfumes. They are primarily directed towards cosmetic manufacturers. This book is intended to fill the painful gap with regard to clinical aspects. For the first time a series of chapters by renowned experts covers important research areas in the field of fragrances, with molecular aspects of sensitization, frequency and clinical picture, diagnostic methods, and new and old sensitizers discussed. Special emphasis is placed on safety aspects regarding absorption in humans and various in vivo and in vitro techniques for predicting the irritating, sensitizing and phototoxic potential of fragrance materials. The musk fragrances have caused considerable concern regarding accumulation in animal tissue and the environment. The producers and their self-monitoring institutions (RIFM, IFRA) have also contributed. It becomes clear that their effort has been substantial: guidelines for safe use have been suggested based on numerous animal and human studies. Some compounds have been banned because of the high risk of sensitization or neurotoxic hazards; others now cause fewer adverse effects after purification or concentration limits have been followed.

There is no doubt that progress has been made in improving the safety standards of fragrances. However, the figures on adverse effects reported by dermatologists worldwide suggest that the safety procedures employed so far are not sufficient. Some fragrances are produced in thousands of tons each year and they are applied by millions of people, often for many years. Materials with a very low potential for adverse effects escape the laboratory screening methods available today. A close surveillance system with full cooperation of manufacturers, dermatologists, pharmacologists, toxicologists, epidemiologists and consumer agencies is overdue. Only a combined effort will lead to a decrease of the “fragrance problem”. A good example of successful cooperation between dermatologists and manufacturers is the story of “pigmented cosmetic dermatitis” in Japan. In the 1960s an epidemic occurred among women who presented with bizarre hyperpigmentations of the face. Ingredients of cosmetics were finally discovered as the culprit: coal-tar-derived dyes and various fragrances. On the basis of extensive patch test studies, Nakayama and colleagues developed the “allergen control system” (ACS) for the production of safer cosmetics. After major cosmetic companies in Japan avoided or reduced the concentration of these chemicals the number of patients suffering from this disfiguring condition sharply declined.

Legislation is still very “generous” about fragrances as important ingredients of cosmetics. We need global regulations for materials which are distributed worldwide in large quantities. It can no longer be tolerated that some manufacturers sell their perfume as an artful creation but as a “black box” regarding the constituents and safety data. Some of them do not even respect the safety recommendations of their own industry.

To increase the safety standard of fragrance compounds and provide more transparency in the data was the consensus of a 1-day symposium held in London, October 9, 1996, on the occasion of the Jadassohn Centenary Congress of the European Society of Contact Dermatitis. During the preparation of this symposium the organizers came to realize that the role of fragrances is under intensive research in other biological areas such as neurophysiological mechanisms and psychological aspects – finally, structures have been identified in human body secretions which might be a key for the attractiveness of sexual partners. The saying “I cannot stand the smell of him” might have a real biological odoriferous basis!

A new fascinating research area is the use of fragrances in the control of insects as a “biological weapon” in vineyards and other agricultural areas. The basis for this is the discovery of fragrances as an important communication tool among insects, bees and many other animals. It is therefore a pleasure to the editors that a few papers deal with effects which definitely can be termed “beneficial”.

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