

Medicinal and Aromatic Plants of the World

Mohamed Neffati

Hanen Najjaa

Ákos Máthé *Editors*

# Medicinal and Aromatic Plants of the World - Africa Volume 3



Springer

## Medicinal and Aromatic Plants of the World

Series Editor: Ákos Máthé

Mohamed Neffati · Hanen Najjaa · Ákos Máthé *Editors*

### Medicinal and Aromatic Plants of the World - Africa Volume 3

This volume in the series is devoted to Africa, a continent that possesses a vast treasure of medicinal plants and has produced some exclusive materials for the world market. This book is expected to strengthen the medicinal plant sector in African countries by providing comprehensive information on medicinal and aromatic plants available to policy-makers and entrepreneurs to frame effective policies and create an environment conducive to the growth of the plant-based medicine industry, bringing economic benefit to African nations from the rising world demand for medicinal plants. It will help health organizations to improve the health of their people by using their own resources and a less expensive system of medicine, which is accepted by African society. It could also lead scientific communities to increase R&D activities in the field.

Life Sciences

ISBN 978-94-024-1119-5



9

789402 411195

► [springer.com](http://springer.com)



# Medicinal and Aromatic Plants of the World

Volume 3

## Series Editor

Ákos Máthé

University of West Hungary

Faculty of Agriculture and Food Science

Mosonmagyaróvár, Hungary

Springer

Volume 3

Series Editor  
Akos Máté  
University of West Hungary  
Faculty of Agriculture and Food Sciences  
Mosonmagyaróvár, Hungary

Mohamed Neffati • Hanen Najjaa

Ákos Máthé

Editors

# Medicinal and Aromatic Plants of the World - Africa Volume 3



Springer

*Editors*

Mohamed Neffati  
Arid Zone Research Institute  
Médénine, Tunisia

Ákos Máthé  
Faculty of Agriculture and Food Science  
University of West Hungary  
Mosonmagyaróvár, Hungary

Hanen Najjaa  
Min of Agriculture, Range Ecology  
Laboratory  
Arid Zone Research Institute  
Médénine, Tunisia

ISSN 2352-6831

Medicinal and Aromatic Plants of the World

ISBN 978-94-024-1119-5

DOI 10.1007/978-94-024-1120-1

ISSN 2352-684X (electronic)

ISBN 978-94-024-1120-1 (eBook)

Library of Congress Control Number: 2017944445

© Springer Science+Business Media B.V. 2017

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, express or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Printed on acid-free paper

This Springer imprint is published by Springer Nature

The registered company is Springer Science+Business Media B.V.

The registered company address is: Van Godewijkstraat 30, 3311 GX Dordrecht, The Netherlands

# Foreword

The utilization of medicinal and aromatic plants (MAPs) dates back to the beginnings of mankind. This fact is increasingly true in the case of Africa, a continent that is considered to be the cradle of mankind.

The rich and diverse flora of Africa has been basis/home for the evolution of African traditional medicine. This holistic discipline incorporates the use of natural plant resources (in the form of indigenous herbalism) as well as African spirituality. In the course of millennia, through the ages, the use of MAPs has also seen extreme development, so that to date, the most sophisticated medicines are already available on the African continent as well. Nonetheless, healing with medicinal plants has retained its central place in the life of the masses. Beyond traditions, this can be attributed to the fact that synthetic medicines are still simply not affordable for many.

Scientific progress has brought about a progress also in the use of traditional medicinal plants. This means that the medicinal and aromatic plants historically used by the practitioners of traditional African medicine (diviners, midwives, herbalists) are being gradually subjected to scientific investigations. Modern pharmacy wants to isolate and utilize their active principles in the form of modern preparation forms that – in turn – can be rendered accessible to consumers already on a global scale.

As a result of this briefly (schematically) described process, the MAP resources – formerly used only by the local people – must come up to cover global demands. Obviously, this is not possible without farther protection, sustainable management and, as an ultimate option, cultivation.

In view of the intensive R+D activities into African MAPs, the special literature abounds in publications. Although even the present pace of research is not considered as sufficient by many, from handbooks to clinical research papers, the number of both comprehensive and specific publications related to MAPs is imposing.

Volume 3 distinguishes itself from most available volumes on African MAPs by avoiding the semblance of completeness. Squeezing all knowledge into one volume would be absolutely impossible.

Starting out from an overview of the status of MAPs in Africa, two introductory chapters offer most comprehensive, valuable reviews of most important African MAPs, as well as their traditional uses. The chapters to follow are compilations of up-to-date information on selected characteristic African MAP species (e.g. African cherry, bird plum), geographic regions (East and North Africa, Mauritius, sub-Saharan Africa, Morocco, Nigeria, Tunisia) or MAPs growing under special ecological conditions (arid and desert zones) and in cultivation, in Nigeria. In most contributions the utilization, botanical, phytochemical as well as pharmacological properties/traditional medicinal uses, of relevant species will be discussed.

It is unhidden hope of the author's collective that the volume will serve as a useful and updated complement to what has already been achieved in summarizing and publishing basic knowledge on African medicinal and aromatic plants.

Médenine, Tunisia  
 Mosonmagyaróvár, Hungary  
 Médenine, Tunisia

Mohamed Neffati  
 Ákos Máthé  
 Hanen Najjaa



# Contents

|   |     |
|---|-----|
| <b>Introduction to Medicinal and Aromatic Plants in Africa</b> .....  | 1   |
| Ákos Máthé, Mohamed Neffati, and Hanen Najjaa   |     |
| <b>A Review of African Medicinal and Aromatic Plants</b> .....  | 19  |
| Ben-Erik Van Wyk  |     |
| <b>Traditional Use of Medicinal and Aromatic Plants in Africa</b> .....   | 61  |
| Olufunke O. Fajinmi, Olaoluwa O. Olarewaju, and J. Van Staden   |     |
| <b>Medicinal and Aromatic Plants of the World – Africa</b> .....  | 77  |
| Ossy M. J. Kasilo, Mawuli Kofi-Tsekpo, and Francis Gachathi   |     |
| <b>Some Important Aromatic and Medicinal Plants of Morocco</b> .....  | 91  |
| Saadia Zrira  |     |
| <b><i>Prunus africana</i> (Hook. f.) Kalkman (the African Cherry)</b> .....   | 127 |
| Mélissa Rousseau, Claire Delvaux, Ezekiel Edward Mwakalukwa,<br>Lawrence Mbwambo, Marie Caroline Momo Solefack, Harisoa Bako<br>Ravaomanalina, Coert J. Geldenhuys, Ntamwira Niranda Seintsheng,<br>Nils Bourland, and Hans Beekman |     |
| <b>Bird Plum; <i>Berberia discolor</i> (Klotzsch) Hemsl.: A Review<br/>of Its Ethnobotany, Phytochemistry and Pharmacology</b> .....  | 143 |
| Ahmad Cheikhoussef and Alfred Maroyi  |     |
| <b>Aromatic and Medicinal Plants of Tunisian Arid and Desert Zone<br/>Used in Traditional Medicine, for Drug Discovery<br/>and Biotechnological Applications</b> .....  | 157 |
| Hanen Najjaa, Abdelkarim Ben Arfa, Ákos Máthé, and Mohamed Neffati  |     |
| <b>Promising Indigenous and Endemic Medicinal Plants<br/>from Mauritius</b> .....   | 231 |
| Mohamad Fawzi Mahomoodally and Muhammad Zakariyyah Aumeeruddy   |     |

|  |     |
|--|-----|
| <b>Some Wild Herbaceous Plants of Nigeria: A Biological, Pharmacognostic and Phytochemical Review</b> .....                              | 249 |
| Sunday E. Atawodi, Mubarak L. Liman, Olufunsho D. Olowoniyi, and Godwin O. Adejo   |     |
| <b>Phytochemical, Pharmacological and Therapeutic Potentials of Some Wild Nigerian Medicinal Trees</b> .....                             | 283 |
| Sunday E. Atawodi, Olufunsho D. Olowoniyi, Godwin O. Adejo, and Mubarak L. Liman   |     |
| <b>Biological, Pharmacognostic and Phytochemical Review of Some Cultivated Medicinal Plants of Nigeria</b> .....                         | 311 |
| Sunday E. Atawodi, Godwin O. Adejo, Olufunsho D. Olowoniyi, and Mubarak L. Liman   |     |
| <b>The Halophytic Genus <i>Zygophyllum</i> and <i>Nitraria</i> from North Africa: A Phytochemical and Pharmacological Overview</b> ..... | 345 |
| Soumaya Bourgou, Wided Megdiche, and Riadh Ksouri  |     |
| <b><i>In vivo</i> Anticandida Activity of Three Traditionally Used Medicinal Plants in East Africa</b> .....                             | 357 |
| D.P. Kisangau, K.M. Hosea, H.V.M. Lyaruu, C.C. Josep, Z.H. Mbwambo, and P.J. Masimba   |     |
| <b>Wild Edible <i>Allium</i> Species from Arid Zones of Tunisia: New Perspectives of Natural Compounds</b> .....                         | 375 |
| Hanan Najjaa, Abelkarim Ben Arfa, and Mohamed Neffati  |     |
| <b>Utilization of Pteridophytes as Herbal Medicines in Sub-Saharan Africa</b> .....  | 383 |
| Alfred Maroyi  |     |
| <b>Index</b> .....   | 409 |