

Diagnostic markers for the identification of the tree species *Shorea leprosula* Miq. and *S. parvifolia* Dyer and the geographic origin of *S. leprosula* Miq.

Dissertation

submitted in partial fulfilment of the requirements for the degree of
Doctor of Philosophy (PhD)

At the Department of Forest Genetics and Forest Tree Breeding,
Büsgen Institute, Faculty of Forest Sciences and Forest Ecology,
Georg-August University of Göttingen

By Hani Sitti Nuroniah
born in Bandung, Indonesia

Göttingen, 2009

Bibliographic information published by the Deutsche Nationalbibliothek

The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available in the Internet at <http://dnb.d-nb.de>.

Referee: Prof. Dr. Reiner Finkeldey

Co-referee: Prof. Dr. Ursula Kües

Date of disputation: 30 April 2009

Printed with the generous support from DAAD
(Deutscher Akademischer Austausch Dienst)

Nuroniah, Hani Sitti:

Diagnostic markers for the identification of the tree species *Shorea leprosula* Miq. and *S. parvifolia* Dyer and the geographic origin of *S. leprosula* Miq.

ISBN 978-3-941274-15-0

All Rights Reserved

1. Edition 2009

© Optimus Mostafa Verlag

URL: www.optimus-verlag.de

No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, scanning, or otherwise without the prior written permission of the Publisher. Request to the Publisher for permission should be addressed to service@optimus-verlag.de.

TABLE OF CONTENTS

1. Introduction	1
1.1 Background of the study	1
1.2 Investigated species	2
2. Objectives of the study	4
3. Material and methods	5
3.1 Study area	5
3.2 Methods	7
3.2.1 Conversion of AFLP marker to SCAR markers	7
3.2.2 PCR-RFLP	8
3.2.3 Chloroplast microsatellites	9
3.2.4 Leaf morphological assignment	9
Summary	10
Zusammenfassung	13
Paper I Diagnostic markers for the identification of tree species <i>Shorea leprosula</i> and <i>S. parvifolia</i>	16
Paper II Diagnostic marker for the identification of the geographic origin of <i>Shorea leprosula</i>	38
REFERENCES	64
APPENDICES	73