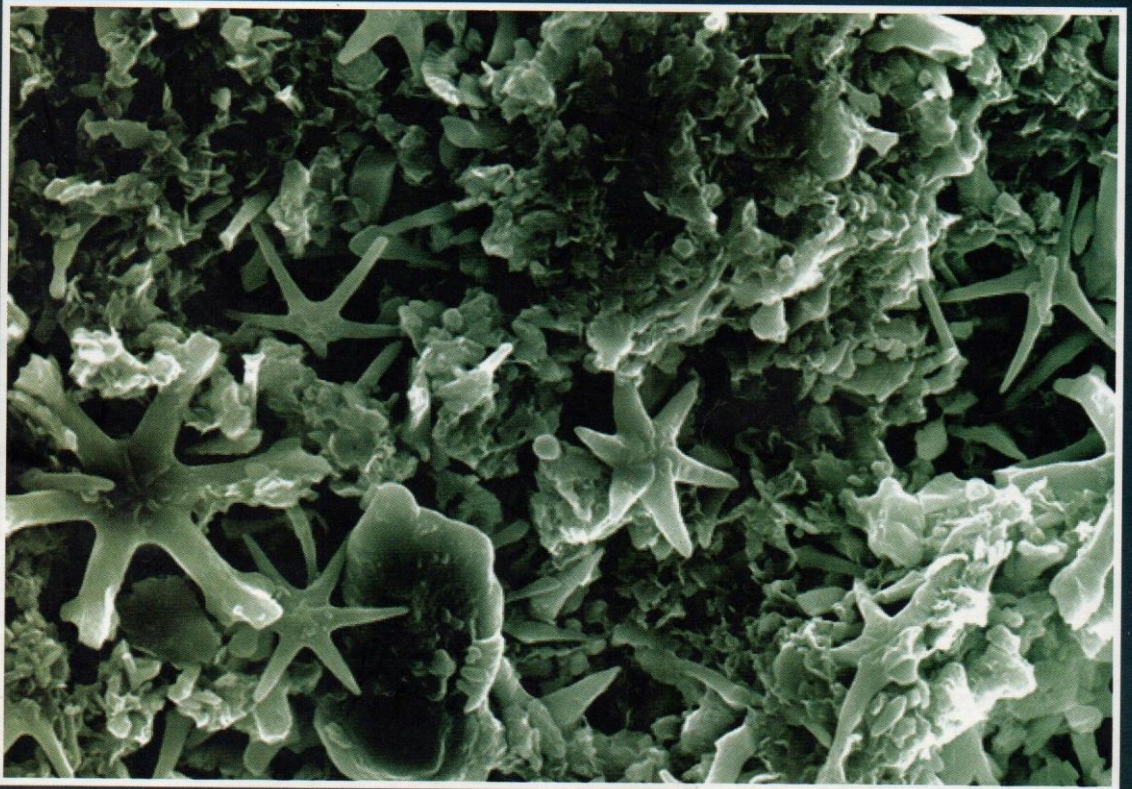


Dr. Ir. Vijaya Isnaniawardhani, MT.

BIOSTRATIGRAPHY

Basics And Biostratigraphic Zones



BIOSTRATIGRAPHIC

BASICS AND BIOSTRATIGRAPHIC ZONES

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Editor: Prof. Dr. Ir. Hendarmawan, M.Sc.

Layout: Asep S. Muslim

Desain Sampul: Dino Octavianto

Diterbitkan pertama kali oleh:

Penerbit Pustaka Reka Cipta

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Rekening No. 8100091462 BCA Kacapem Moh. Toha Bandung
a.n. Isbandi Basyar

Rekening No. 1141-01-004789-50-6 BRI KCP Buah Batu
a.n. Isbandi Basyar

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Cetakan I: Juni 2015

ISBN 978-602-1311-15-8

Perpustakaan Nasional: Katalog Dalam Terbitan (KDT)

Dr. Ir. Vijaya Isnaniawardhani, M.T.

Biostratigraphy: Basics and Biostratigraphic Zones/Penulis: Dr. Ir.
Vijaya Isnaniawardhani, M.T., Editor, Prof. Dr. Ir. Hendarmawan,
M.Sc.

Edisi I, Bandung: Pustaka Reka Cipta, 2015

xiv + 208 hlm.; 16,0 x 24,0 cm

ISBN 978-602-1311-15-8

PREFACE

Reference book of “Biostratigraphy: Basics and Biostratigraphic Zones” is published as a part of Module and Online Course Launching Program Series in Padjadjaran University; and integrated to program of International Higher Education Accreditation for Geology. Hopefully this reference provides a useful part of the basic background that students need to advance into the geologic fields.

This reference book provides concept and analysis of biostratigraphic studies. Topic I to III introduced concept of fossils (include major applications of fossils studies to earth sciences research, samples, analysis methods, macrofossils, microfossils and trace fossils). Introduction and type of biostratigraphic units are stressed in Topic IV. Topic V reviewed biostratigraphic zonations (foraminifera, nannofossils and palynomorph), followed by application to correlation (Topic VI) as well as interpretation of depositional environment (Topic VII). Topic VIII and IX concerned the problems and new discoveries in biostratigraphic studies. Within these topics are reviewing and summarizing of publication that conducted by funding from Padjadjaran University research grants as well as four months of research in Japan by the grant from Higher Education Directorate, Nations Education Ministry.

The deep appreciation is extended to Rector of Padjadjaran University and Head of Institute of Learning Development and Quality Assurance (Lembaga Pengembangan Pembelajaran dan Penjaminan Mutu/LP3M) for encouragement and supporting in writing this book. The author is intended to Prof. Dr. Ir. Hendarmawan, M.Sc. as editor for reading of the manuscript and giving the valuable suggestions. Thanks also to colleagues and staff at Geology Faculty for assistance during preparation.

Bandung, Mei 2015

Vijaya Isnaniawardhani

Marker species *Discoaster asymmetricus* Gartner, *Discoaster surculus* Martini & Bramlette, *Discoaster brouweri* Bramlette & Riedel, *Discoaster variabilis* Martini & Bramlette *Discoaster pentaradiatus* Bramlette & Riedel; from: Mimin K. Adisaputra and M. Hendrizan, 2008. Hiatus Pada Kala Eosen-Miosen Tengah di Tiggian Roo, Samudera Hindia, Selatan Jawa Timur, Berdasarkan Biostratigrafi Nanoplankton. *Jurnal Geologi Kelautan*, 2008. Vol. 6 No. 3, p. 154-166.

***Hastigerina siphonifera* d'Orbigny, *Globorotalia tumida* (Brady); from: Mimin K. Adisaputra, 1992. Late Neogene Planktonic Foraminifera of The Makassar Basin. *Bull. Mar. Geol. Inst.*, Vol. 7, No. 1, p. 15-23.**

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TOPIC 1

INTRODUCTION

1.1. What's biostratigraphy?

Biostratigraphy is stratigraphy based on paleontologic aspect of rocks, or stratigraphy with paleontologic methods. The concept of biostratigraphy is based on the observation that organism have undergone successive changes throughout geologic time. Thus, any unit of strata can be dated and characterized by its fossil content. Biostratigraphy is referred as a sub-discipline of sedimentary geology that relies on the zonation of biota, both in time and space, in order to establish the relative stratigraphic position (i.e. older, younger, same age) of sedimentary rocks between different geographic localities ⁽⁴⁾.

The characterization, separation, differentiation and correlation of rocks unit on the basis of the description and study of their fossils content are called biostratigraphy. This term was proposed by Dollo, in 1904 in a wider sense for the entire research filed in which paleontology exercises a significant influence upon historical geology ^{(1), (2)}.

Stratigraphy based on the paleontologic characteristics of sedimentary rocks is also referred to as stratigraphic paleontology. It is defined as the study of fossils and of their distribution in various geologic formations, emphasizing the stratigraphic relation (time and sequence) of the sediment rocks in which they are contained ^{(1), (2)}.

1.2. Biostratigraphy as a component of stratigraphy

The succession of rocks exposed at the surface of the Earth can be arranged into a stratigraphic column, with the oldest rocks at the base and the youngest one at the top. Although the absolute age has been determined from radioactive studies, it is customary to use the name of stratigraphic units, mostly distinguished on the basis of differences in