Preface

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It is a great pleasure for me to present this outstanding monograph by Ercan Özcan and his co-workers Ali Osman Yücel, Levent Sina Erkızan, Münire Nur Gültekin, Sibel Kaygılı, and Sila Yurtsever.

Among larger foraminifera, Paleocene–Eocene orthophragmines, the subject matter of this Atlas, have proved to be one of the most elusive groups to systematize. The non-taxonomic umbrella term orthophragmines, derived from the genus *Orthophragmina* Munier-Chalmas, 1891, a junior synonym of *Discocyclina* Gümbel, 1870, is a practical term for indicating an informal grouping including the members of two independent families, the Discocyclinidae and the Orbitoclypeidae, broadly sharing the same architectural Bauplan of the shell, with an equatorial layer of chamberlets and lateral chamberlets and generally discoidal, lenticular, or subpentagonal tests. Additional qualitative characters are stolons, pillars (piles), ribs, rosettes, etc. In turn, orthophragmines are grouped in a more inclusive grouping, the so-called orbitoidiform or radial foraminifera (e.g., Drooger 1993).

Orthophragmines were widespread in the early Paleogene in the Neo-Tethyan, Pacific and American–Caribbean paleobiogeographic provinces, with some endemic genera. Suprageneric and generic systematics has been achieved only in recent decades. After Paul Brönnimann's pioneering studies in the 1940s, the basis for a novel systematization of Neo-Tethyan orthophragmines was achieved by György Less in the 1980s, and Carles Ferràndez-Cañadell and Josep Serra-Kiel in the 1990s. More recently, Ercan Özcan has extended this systematization to the orthophragmines of the American–Caribbean province, the Arabian Peninsula and the India–Pakistan region.

Based on these studies, the most robust criteria that are now recognized for suprageneric systematics of orthophragmines are the early growth stages of the microspheric

generation and structural characters. In contrast, the embryonal and nepionic features of megalospheric specimens provide the basis for species recognition and their subdivision into chronosubspecies. Orthophragmines provide some of the most fully biometrically documented cases of morphological change within lineages of populations without lineage splitting; in orthophragmines, as in the present Atlas, these lineages are considered as species, whereas (chrono) subspecies are biometry-based subdivisions of species.

The first author of this monumental Atlas, Ercan Özcan, has spent the last three decades studying orthophragmines and other Cretaceous to Miocene larger foraminiferal groups, becoming a worldwide leading specialist in radial foraminifera. In Istanbul, he has built up a school of keen larger foraminiferal young scientists, an incredible feat when paleontology is slowly losing its stance in Western Europe and elsewhere.

The Atlas is the compendium of an enormous work by E. Özcan and his co-workers. It manages to present a difficult subject in a way that even a non-specialist can understand the basics of species or subspecies identification, whereas a specialist will be able to admire the fine nuances in novel systematic details, interpretations, and data. The Atlas provides succinct and precise diagnoses of all the species, and all subspecies are biometrically characterized. For the first time, high-quality photographs illustrate a large number of taxa belonging to five genera of Neo-Tethyan orthophragmines, with precise and standardized enlargement scales, both in equatorial and axial sections. This will be an invaluable step forward for any rock thin section analysis in which the identification of orthophragmines in axial or oblique sections has been generally difficult or neglected or has led to spurious results. The quality of the illustrated material is excellent, based on a large number of painstakingly sectioned specimens and unpublished material.

This Atlas will render an invaluable help to any Paleocene–Eocene larger foraminiferal scholar, student and biostratigrapher, working in academia, industry or exploration geology from Western Europe and North Africa to Southeast Asia.

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It is not only an outstanding scholarly work in micro-paleontology; it is a labor of love for larger foraminifera. This monograph will proudly stand beside the great works of Hans Schaub, Lukas Hottinger, György Less and a few others in any Paleogene larger foraminiferal specialist's library.

On behalf of the larger foraminiferal community, thank you, Ercan and co-workers, for this splendid gift.

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