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Alpine Plant Life: Functional Plant Ecology of High Mountain Ecosystems. By Christian Körner

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Stepping out across the treeless tundra under the evening sun of the Yukon midsummer, I am struck as always by the swaths of brilliant, colorful flowers. My admiring gaze draws me down on my knees beside a little rosette of alpine bluebell (*Campanula lasiocarpa*), where I admire the sheer hugeness of a single, sky-blue flower that almost completely obscures the parent plant below. I marvel at how such reproductive extravagance is even possible on this alpine ridge amidst a life dominated by cold, ice, and snow. Apparently, Dr Christian Körner has also pondered this phenomenon during his years of research on alpine vegetation. His recently revised book, *Alpine Plant Life* (3rd edition, 2021), evaluates the empirical evidence regarding the relative size or allometry of alpine flowers, and not only vindicates my intuition that these flowers really are remarkably large, but gives me a much deeper understanding of how and why such patterns can arise. Clearly an admirer of the natural beauty and fortitude of tundra plants, Körner presents a book with enough depth and charm to transform an informative compendium of knowledge into an unfolding treatise on the wonders and mysteries of alpine plant life.

Alpine Plant Life is an authoritative description of the adaptations and biological processes that support life beyond the limit of tree growth. Körner delves deeply into how such processes occur within the strict limitations of severe alpine and arctic tundra environments, identifying and illustrating many mysteries along the way. His exploration of the importance of microclimate in supporting plant life on the tundra helps to unravel what seems to be a miracle of plant life and transforms it into understandable mechanisms that simply exist at scales we often ignore. The book abounds with detailed scientific illustrations of how alpine plants have capitalized on and adapted to the constraints of life in cold environments. Examples draw heavily from Körner's professional intimacy with life in the European Alps, but also pull from the global scientific literature to highlight examples from tundra vegetation on every continent. The book is well illustrated with scientific figures and carefully selected photos of alpine plants that capture an amazing diversity of life around the world. Although not all of the scientific figures allow full interpretation of the information they present, the curious reader can follow up using the detailed bibliographies that accompany each chapter. In our modern age of easy digital access only to recent work, it is valuable to see reproductions of seminal scientific ideas and figures produced a century or more ago. The long arm of human interest in alpine plants clearly extends deeply into the past, and Körner does homage to the many thinkers who laid the groundwork for our current scientific understanding of these systems.

Each chapter in the book develops a comprehensive assessment of the dominant mechanisms supporting the characteristic patterns of tundra plant life. A major theme involves linking our understanding of the physical environment to physiological and life history processes that support the formation of a dynamic flora thriving in Earth's arctic and alpine regions. Körner draws on his authoritative knowledge of the links between climate, plant physiology, and biogeography to highlight processes driving repeatable patterns in plant growth among alpine areas in Europe, Asia, Australia, and the Americas. Chapters are well organized around themes of physical environment (climate and soils); biogeography (treelines and alpine vegetation); physiological processes related to water, nutrients, carbon, and plant growth; plant productivity and reproduction; and global environmental change. Key concepts are highlighted with bold text, and though no glossary is provided, these can be used as guides to quick skimming through the text to locate specific ideas. Unresolved questions or areas where further research is needed are identified throughout the text; these may be useful in guiding future students to direct their investigations in areas where they are most needed.

For me, the greatest appeal of this book is its strong anchoring in our shared cultural history of scientific research on alpine systems and its more personal, respectful attention towards alpine plants. Throughout, *Alpine Plant Life* grounds its summaries of scientific understanding in descriptions of the scientific method as it emerged over the past century as a cultural process, from pattern description to hypotheses and investigations of potential underlying mechanisms. At the same time, Körner's writing expresses a deep sympathy for and understanding of the contradictions that shape the life of alpine plants, such as opposing effects of plant associations that lead to competition versus facilitation, trade-offs between growth strategies and life spans, and compromises between plant size and sensitivity to physical damage. The book seems to be the authentic expression of a scientific mind well honed for meticulous, rational investigation of physical phenomena that is motivated by a deep respect and appreciation for the natural world. As such, the picture it presents of plants in alpine environments should appeal equally to scientific students of alpine systems and nature lovers who simply enjoy experiencing those environments, which, for some of us, speak to different parts of our own nature.

In summary, whether you spend time studying, recreating, or living in tundra environments, *Alpine Plant Life* will almost certainly enrich your understanding of and connection to these systems. Perhaps it will even entice you to spend more time there. Furthermore, the book contains important messages about how we as humans are affecting the patterns and processes of alpine plant life. From land use change to global warming, human beings are affecting many of the processes that shape alpine biodiversity and its resilience to future disturbance. In this context, Körner's book provides a valuable reference that points to how we may consider modifying our interactions to support the long-term integrity of life at the edges of the earth. In connecting us to our wonder and understanding of alpine plants, it provides motivation and tools for improving our responsible stewardship of life beyond the treeline.