

Book Reviews

Jindřich Chrtek · Jan Pergl

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G. Amato, O. Ryder, H. Rosenbaum & R. DeSalle (eds.): CONSERVATION GENETICS IN THE AGE OF GENOMICS. *Columbia University Press, New York, 2009, 248 pp., 21 figs., 9 tables. Price GBP 44.99, USD 70.-, EUR 52.-, ISBN 978-0-231-12832-2*

Genomic information is of utmost importance for our understanding of the evolutionary process and principles in general, and of diverse issues of conservation biology in particular. Featuring a number of high-profile researchers, this volume introduces the use of molecular genetics and genomics in conservation biology and provides a historical perspective on the opportunities and challenges presented by new technologies.

This collection of essays is based on selected papers from two symposia held in San Diego and New York in 2001. The meetings were not planned with each other in mind, but their goals and focus were complementary. Both meetings addressed the role of expanding genetic and genomic technology in the conservation of endangered species. Topics included the impact of databases, sequencing technology, gamete repositories, and genetic modifications in the field of conservation genetics. The essays based on the contributions from these meetings were compiled several years later in the proceedings.

The essays are organized into five sections. Part I, “Perspectives on the Union of Conservation and Genetics,” includes three papers that give the reader an introduction to problems in conservation biology and genetics and a historical perspective on their roles, opportunities and challenges. A new paradigm for connecting ecological, life history, and area-based issues with genetics is essential for conservation biology and genetics to remain viable and useful for conservation. Conservation genetics has seen an expansion of goals and objectives over the past decade. This came about mostly as a result of the infusion of genomic technology into how we examine the genetics of natural and captive populations. Connecting the original goals of conservation genetics with the expanded potential of genomics is an important process, and the chapters on this section attempt to make this connection.

J. Chrtek (✉) · J. Pergl
Institute of Botany, Academy of Sciences of the Czech Republic, CZ-252 43 Průhonice,
Czech Republic
e-mail: chrtek@ibot.cas.cz

Part II, “Conservation Genetics in Action: Assessing the Level and Quality of Genetic Resources in Endangered Species,” focuses on the use of genetics and its application in conservation biology. This section’s five papers give a broad overview of the kinds of studies modern genetics can approach in conservation biology and should provide the reader with a sense of the broad range of conservation genetics questions currently being examined. The current approaches to conservation genetics are a result of continual incorporation of new techniques and theory into the field. In this section several approaches are articulated. Expanding genomic technology has given us a unique and novel view of genome dynamics in particular neutral and adaptive variants. This perspective is of great importance in conservation genetics.

Part III, “Saving Genetic Resources,” has five papers that discuss the role of biological collections in conservation biology. This role has expanded in the past decade because of advances in genomic and reproductive technology, and the included papers cover the range of collection types. This part will provide the reader with some tools to understand the silent biodiversity crisis and how scientists are approaching the storage and utility of biological and genetic resources in collections. By far, the world’s museums and herbaria hold the greatest diversity of life of any kind of collection, and the potential for obtaining genetic resources from these collections is great. The road to the future in collections wanting to preserve genetic resources will involve more careful preservation of tissues in liquid nitrogen repositories. The silent biodiversity crisis concerns the loss of bio-repositories and biological research collections, and the urgency of stripping the loss of this important part of our biodiversity legacy is emphasized.

Part IV, “Genomic Technology Meets Conservation Biology,” has five papers that discuss the promise and pitfalls of expanding technology in conservation. These papers attempt to explain how far the applications of technology to conservation can take the field in the 21st century. Genomic techniques have promised to expand and supplement the field of conservation genomics. The specific ways in which this expansion might be possible are the subjects of this section. Technological advances that can contribute to the expansion of conservation genetics to high-throughput science are described. The increasing trends of producing transgenic animals and plants are examined, with respect to the potential impact on the environment. Attempts at the adult cell cloning of endangered animals are discussed, and the potential importance of the approach to conservation biology is evaluated.

Part V, “Policy, Law, and Philosophy of Conservation Biology in Age of Genomics,” consists of two papers that discuss the role of philosophy and law in conservation thinking and the underlying policy decisions. This final section contains two essays on legal and philosophical issues and conservation genetics. These philosophical discussions address shifting paradigms in conservation genetics, legal issues pertinent to conservation biology in general and endangered species in particular, and non-biological problems created by the new technological infusion into conservation. Subjects such as legal ownership, international law, and bio-repositories are examined. Biology, unlike physics, cannot be reduced to a single set of laws. Consequently, an approach to biology called integrative pluralism is the most reasonable way to view biology in general and conservation issues in particular.

The reader can also find additional information such as glossary and/or detailed descriptions of the utility of modern genetics and genomic approaches to conservation biology at recommended Web sites.

Jan Zima

Institute of Vertebrate Biology, Academy of Sciences of the Czech Republic, Květná 8, 603 65 Brno, Czech Republic

R.J. Bailey: ECOSYSTEM GEOGRAPHY. From Ecoregions to Sites; Springer Verlag, Second edition. NY, Dordrecht, Heidelberg, London, 2009, 251 pp., 142 illustrations. Price GBP 89.95, USD 146.-, EUR 101.-, ISBN 978-0-387-89515-4

The author's spatial outline subdivides the Earth into a hierarchy of increasingly finer-scale ecosystems that can serve as a consistent framework for ecological analysis and management. The system consists of a hierarchy of ecosystem units and associated mapping criteria. Establishing these units involves identifying the environmental factors controlling the area distribution of ecosystems and drawing boundaries where they the ecosystems change significantly. Macroscale units and/or ecoregions, the top level of distinction, are delineated as major climate zones. Mesoscale units are determined by landform and the microscale level looks at individual sites controlled by topographically determined topoclimate and soil moisture regimes.

Over the last thirty years biodiversity has increasingly been mapped over territorial units emphasizing ecology (ecoregions). An ecoregion is "a relatively large unit of land or water containing a geographically distinct assemblage of species, natural communities, and environmental conditions". Several standard methods of classifying ecoregions have been developed, with climate, altitude, and predominant vegetation being important criteria. Bailey's classification, one of the most widely adopted, is a hierarchical system with four levels: domains, divisions, provinces and sections. Domains are the highest geographic levels, e.g., polar domain, dry domain, or humid tropical domain. They are split into smaller divisions using the combined criteria of climate and vegetation and the divisions are split into smaller provinces that are usually defined by their major plant formations (the relationship to European schools of vegetation and/or biogeocenoses classifications was transferred to the American continent by V. Krajina, who immigrated after World War II to Vancouver). Provinces are divided into sections, which are defined by the geomorphological features, i.e., landforms present.

The first edition of this book published in 1996 described the patterns of ecosystem distribution at multiple scales in terms of the mechanisms that cause them, and treated the connections between these patterns, conservation, and management. It was written at a time when some published materials on ecosystem geography were available, and none had systematically elaborated the principles underlying the mapping of ecosystems in a form accessible to advanced students and practitioners. This second edition builds on the previous one, incorporating new information and

explaining more clearly concepts presented in the first edition. New sections are present: how ecoregion boundaries were determined, ecoregion redistribution under climate change, ecosystem processes (such as fire regimes), empirical versus genetic approaches to classification, and human modification to ecosystems, such as through the introduction of invasive species.

Ecoregions are defined by their shared biotic and abiotic characteristics and by this way they represent practical units on which to base nature protection areas and land-use planning. The hierarchical nature of the presented ecoregion classification allows for conservation management to be planned and implemented at a variety of geographical levels. The book has been updated throughout with new text and figures and with new literature reviewed. More examples drawn from outside the North American environment, particularly at the meso- and microscale are included. A discussion of alternative mapping systems and their relation to the system presented in this book are also given. Ecosystem Geography is richly illustrated with a number of new diagrams, photographs, and tables. The second edition also includes two color maps showing the ecoregions of the oceans and continents. I believe students of landscape ecology and conservation planning on a regional scale will use this book frequently.

Pavel Kovář

Department of Ecology, Faculty of Science, Charles University in Prague, Benátská 2, CZ-128 01 Praha, Czech Republic

R. Geiger, R.H. Aron a& P. Todhunter: THE CLIMATE Near the Ground; *Rowman & Littlefield Publishers, Inc., Lanham, Maryland, 2009, 623 pp. Price GBP 80.-, EUR 90.-, ISBN 978-0-7425-5560-0*

The seventh edition of “THE CLIMATE Near the Ground” is the newest version of Geiger’s original book from 1927. Rudolf Geiger (1894–1981) established the Meteorological Department at the Forestry Experimental Station in Munich and became Professor Emeritus at the University of Munich. During his career he focused on showing that temperature and moisture of air, soil and vegetation are interdependent. He specialized in the air layer 1.5 m near the ground and his research has many practical applications and is used in the commercial aspects of forest climatology. This work is an attempt to develop a clear and vivid textbook for those who are just taking up the study of microclimatology, and to illustrate the application of these principles to as wide an array of subfields as possible.

In the last three editions, Robert Aron from Central Michigan University and Paul Todhunter from University of North Dakota have supplemented Geiger’s original book with new facts from polar climates and updated the discussion about water, fire, edge, urban, and mountain climatology. Unfortunately, they did not include or deeply analyze new facts from micrometeorological theory, instrumentations, modeling approaches, remote sensing and digital elevation models because they wanted to retain the book’s qualitative and practical approach. More details about the interrelationship between plants and the environment can be found in Jones

(1992). Deep knowledge of theoretical climatology is included for example in Munn (1966) or Arya (1988).

Geiger's Book, sometimes referred to as *The Bible of Climatology*, currently has eight chapters with more than 500 pages, including 80 pages of references, subject and author index, and appendix listing unit conversions from SI system to cgs system. The book contains many graphs and pictures that very usefully present results of included studies. The only thing missing is some kind of summary at the end of each chapter, but it does not decrease the quality of the content.

The first four chapters – “Earth's surface energy budget”, “The air layer over level ground without vegetation”, “Influence of the underlying surface on the adjacent air layer” and “Further analysis of the energy balance” – involve basic physical principles of climatology (temperature stratification in space and time, optical phenomena and acoustics, influence of wind, soil moisture and temperature, climate near the water surface, snow and ice surfaces, energy balance of the Earth and atmosphere etc.). The next two chapters describe relationships between microclimate and different plant communities: “The effect of low plant cover on the surface air layer” (meadows, grain fields, gardens, vineyards) and “Forest climatology” (climate in the forest clearings, stand edge, effect of the snow, rain and dew in the forest). The seventh chapter is “The influence of topography on the microclimate” (the climate of various slopes, local winds, hills and high mountains, special microclima of polar regions and caves). The last chapter called “Interrelations of animals and humans to the climate” includes animal behavior and its artificial protection against low temperature and wind, and also covers urban climate and humans.

I would recommend the book to all biology students and young scientists as a basic textbook to understand the relationships among plants, animals and climate. However, the book is relevant also for scientists specialized in climatology, for university teachers of botany and climatology and other people interested in the topic.

References

- Arya SP (1988) *Introduction to micrometeorology*. Academic Press, San Diego
 Jones HG (1992) *Plants and the microclimate – A quantitative approach to the environmental plant physiology*. Cambridge University Press, Cambridge
 Munn RE (1966) *Descriptive micrometeorology*. Academic Press, New York

Jana Zmeškalová

Institute of Botany, Academy of Sciences of the Czech Republic, CZ-252 43 Průhonice, Czech Republic

T. Hilleman: ENVIRONMENTAL BIOLOGY. The Conditions of Life: Environmental Selection, Extinction, Creation, Adaptation and Overpopulation; Science Publishers, Enfield (NH), Jersey, Plymouth, 2009, 366 pp. Price GBP 56.50, USD 92.-, EUR 64.-, ISBN 978-1-57808-576-7

The book is written as fluent text, without diagrams or photo illustrations, but subdivided into short divisions (366 pages, 46 chapters). At first glance, it is not highly attractive.

However, a more thorough glance shows a surprising level of subject synthesis drawing on many disciplines and very suitable clear writing style. (To keep things simple, potentially unfamiliar terms are commented on in parentheses. Alternative definitions of basic terms are underlined and continuously repeated portions of the overview are printed as bold type throughout the remaining text.).

Environmental biology is the study of the conditions of life (or conditions of existence) and the impact of these conditions upon and within the life it contains. It addresses environmental and other biological aspects of evolution that have been largely ignored. The less utilized definition of evolution suggests the above-mentioned approach: Evolution is genetic success in response to environmental conditions. Other places in the book also indicate this distinction: The degree in severity of extinction seems to parallel the degree of habitat destruction (p. 46). Extinction is primarily due to the destruction of a population's environment; it is nearly impossible to find any extinction without an environmental connection (p. 63). Environmental creation includes and follows environmental extinction events (p. 65). The environment is the gatekeeper for genetic success (p. 69). The driving force of evolution may well be the product of early developmental organism interactions between environmental variation and genetic variation, in a changing, isolated environment. The creation of a changing, isolated environment must occur to initiate this life-changing phenomenon (p. 79).

Two key terms are enlightened from a variety of viewpoints throughout the book: "conditions of life" and "natural selection". They are treated hierarchically across organizational levels used for the nature analyses: (macro)ecological, facilitative for speciation including genetic and biochemical mechanisms. Attributes of ecosystems in confrontation with threats of humanity are discussed in the latest cluster of chapters. In general, they are weakly ordered and can be classified into logical groups: Beyond ancient history, The atmosphere, Milankovitch cycle(s), Climate, Major environmental extinction events – Fire down below, Constant extinction, Ecological succession, Extinction event significance, Environmental extinction and environmental creation, Environmental creation significance, The rest of the story – Environmentally and genetically determined evolution, Genetic perspective, Genotype and phenotype, Alleles, Mutation, Phenotype and environment, Genetic constraint, Genetic variation – Environmental adaptation, A foundation of modern evolutionary biology, Difficulties on theory, Environmentally-determined evolution?, Macroevolution and microevolution, Philosophy of genetic mechanisms – Biochemistry of genetic mechanisms, Primary production, Respiration, Ecosystem energy flow, Biodiversity, Habitat diversity – Overpopulation, Humanity, Do the math, The ongoing losses, A choice. In the conclusions we may find two inspirational chapters of questions (addressing the environment, evolution, human population and resources). The references do not contain numerous titles and they are declared in the briefest form (e.g., without the year of edition). The book ends with an index with the most frequent and substantial terms.

Hilleman's *Environmental Biology* is not trivial reading in spite of its simple structure and style of its construction and the absence of illustrations. The many interesting relationships taken from multidisciplinary fields of

scientific streams make this text recommendable for any student of ecology and variability of life.

Pavel Kovář

Department of Ecology, Faculty of Science, Charles University in Prague, Benátská 2, CZ-128 01 Praha, Czech Republic

M. Chytrý (ed.): VEGETACE ČESKÉ REPUBLIKY. 2. RUDERÁLNÍ, PLEVELOVÁ, SKALNÍ A SUŤOVÁ VEGETACE; Vegetation of the Czech Republic. 2. Ruderal, Weed, Rock and Scree Vegetation; Academia, Praha, 2009, 524 pp., 256 colour figures. Price CZK 565.-, ISBN 978-80-200-1769-7

The second volume of Vegetation of the Czech Republic (Vegetace České republiky) presents an extensive group of various plant communities unified by a common feature: their close relation to human-influenced or to completely human-created habitats. This book includes vegetation of trampled habitats (class *Polygono arenastri-Poëtea annuae*), annual vegetation of arable land and ruderal habitats (*Stellarietea mediae*), xerophilous vegetation with biennial and perennial species (*Artemisietea vulgaris*), nitrophilous perennial vegetation of wet to mesic habitats (*Galio-Urticetea*), herbaceous vegetation of forest clearings and disturbed habitats in forest environments (*Epilobietea angustifolii*), vegetation of rocks, walls and stable screes (*Asplenietea trichomanis*), nitrophilous vegetation on walls (*Cymbalaria muralis-Parietarietea judaicae*) and vegetation on mobile screes (*Thlaspietea rotundifolii*). In addition to M. Chytrý's contribution, one can find extensive contributions from D. Láníková and Z. Lososová, along with J. Sádlo, Z. Otýpková, M. Kočí, P. Petřík, K. Šumberová, Z. Neuhäuslová, P. Hájková and M. Hájek.

The high quality and updated information, along with the high technical realization of this volume are on level with the traditionally high standard of this series. Coloured coding of classes helps one to quickly orient oneself in the book. People interested in new, complex information on the vegetation of Czech Republic will be enjoyably surprised by how quickly vegetation surveys can be processed seeing that this second volume comes only two years after the first one devoted to grassland and shrub vegetation (Chytrý et al. 2007). This speed has been facilitated by the good cooperation among prominent Czech botanical institutions and lengthy systematic preparation of theoretical and practical backgrounds, mainly the building up of a phytosociological database and the creation of essential software. This second volume can be used independent of the first because the chapter "Delimitation and interpretation of vegetation units" elucidates all steps that the authors have taken to reach the final version of syntaxa characteristics.

In contrast to "classical" vegetation surveys, this volume frequently includes a whole range of interesting and valuable "supplementary" information on the characteristics of classes, and alliances. Readers less familiar with this type of vegetation will especially obtain interesting data, e.g., on life strategies of species, which facilitate their survival in frequently and significantly disturbed habitats, on morphological and ecological adaptations mitigating survival of unfavourable periods, and on the history of communities from the last glacial

era. One can also find data on vegetation changes depending on management, on the influence of traditions (e.g. medicine) on the occurrence of some species combinations, and of the influence of agricultural farming operations on the occurrence of weeds (e.g. speirochory species). Furthermore, the reader can also find data on the influence of herbicides on the disappearing of specialized species and the spreading of resistant species or on possibilities of rescuing disappearing segetal phytocoenoses.

The description of associations has a unified pre-defined structure. In addition to the usual descriptive paragraphs (Structure and species composition, Habitats, Distribution, Variability) there are interesting paragraphs on Dynamics and management, and Economic importance and threat. In contrast to most national vegetation surveys, the authors have provided an overview of distribution data for the analyzed vegetation units throughout their area of occurrence, in some places also with commentary on the different opinions of their classification. Descriptions of associations are supplemented with maps showing their distribution in the Czech Republic, and quality colour photographs (except some rare or disappearing communities, e.g., *Chenopodietum urbici*). All descriptions include an eloquent English summary.

Phytosociological tables are arranged as shortened frequency synoptic tables. Diagnostic herb species of particular associations are first followed by diagnostic herbs of two or more associations, by species with higher frequency and by diagnostic moss species. Maybe as result of this arrangement, diagnostic species of alliances and classes are not presented in the tables. Depending on the width of variability of analyzed vegetation units, tables are arranged in various ranges – from tables of particular alliances through tables of groups of close alliances and class up to tables containing several related classes. Synmorphological and synecological descriptions are supplemented by box-plots comparing environmental conditions of evaluated associations based on Ellenberg's indication values, hypsometrical distribution and cover of herb layer.

The authors have critically revised all syntaxa from a syntaxonomical point of view, and they have also carefully checked their nomenclature including author's citations. All communities are consistently ranked on association level, including communities of (invasive) neophytes (yet usually ranked as “community with ...”). Arbitrary classification of the last mentioned units into the higher syntaxa does not always match the experiences of phytocoenologists from surrounding countries. The authors solved intraassociation variability on variant level by distinguishing 2–4 variants usually fitting to earlier described subassociations, associations or communities. The inclusion of often local syntaxa into the broader perceived units is certainly well founded, but ordering them into the existing subassociations would be much more useful for the stability of the syntaxonomical system than describing new variants that do not fall under the Code rules.

Particular associations and alliances are defined by groups of diagnostic species – statistically important species, with value of phi coefficient above the defined threshold ($\phi > 0.25$). Although according to the definition in the text, groups of diagnostic species comprise characteristic and differential species, they rather seem to be indication groups of species usable for recognizing a particular association. This is supported by differences found between groups of species in synoptic tables and related texts. We can

differentiate many communities using only diagnostic species common for two or more associations (they may better indicate alliances), or rarely using species with large ecological and coenological valence. Diagnostic species of most associations and alliances are overlapping (in some cases markedly) and this holds true also for many highly diagnostic species ($\phi > 0.50$). Data on mean cover of species or real values of phi coefficient should support differential and explaining value of tables.

Many associations are defined broadly to match with the area of the name-giving species. They can comprise several related associations, in some cases without consideration of their different synecology (and consequently also different species composition). Such an approach leads, in addition to weak floristic differentiation, to very complicated formal definitions.

The slightly peculiar application of the Code deserves special mention namely in connection with frequent proposals of changes in the association name (nomen mutatum propositum). Considering the base condition of article 45 several proposals seem to be disputable (e.g., *Conyzo canadensis-Lactucetum serriolae*, *Petasition hybridi*, *Petasitetum hybridi-kablikiani*, *Elytrigio repentis-Aegopodietum*, *Digitali-Senecionetum ovati*). Rejection of name (nomen ambiguum) based on article 36 (necessarily subjective) is also relatively frequent.

Although analyzed community data before fidelity were computation standardized to one per cent of all relevé dataset, some of them seem to be markedly non-balanced. This is evident mainly in the comparison of a homogeneous sample of a few relevés from the one known locality with a richly documented, variable and widely distributed community (e.g., *Teucrio-Melicetum* (3 relevés) or *Cryptogrammetum crispae* (2 r.) compared to *Asplenietum rutae-murariae-trichomanis* (60 r.); Tab. 11) Comparison of small homogeneous communities with those of broad variability and large area favors small communities. Consequentially, small communities are characterized by many (highly) diagnostic taxa of ambiguous value (e.g., 27 diagnostic taxa for *Teucrio-Melicetum*, including 21 with coefficient $\phi > 0.50$). Data on frequency, calculated from 2–4 relevés are rather misleading in table comparison with communities rich in relevés (e.g., 2 r. compared to 49 r. in Tab. 5; 3 r. compared to 135 r. in Tab. 7; 4 r. compared to 174 r. in Tab. 8).

Every author admittedly has a right to her/his view on how to evaluate a syntaxon. The question remains as to what extent is it possible (or correct) to apply syntaxonomical knowledge based on a partial area to the whole area of a syntaxon or a dominant species, which in other parts of its area grows in different unique communities. The alliance *Petasition officinalis* (here named as *Petasition hybridi*) is a good example. In the Czech Republic this alliance is represented mainly by stands variously influenced by humans. The author included it into two accepted and broadly defined associations (related to areas of dominant species) both which have been distinguished associations dominated by *Petasites hybridus* and *Petasites kablikianus* without respect to altitudinal distribution and different measure of human disturbance, inclusive of natural Carpathian communities. The author, in contrast to the original diagnosis (Sillinger 1933) wrongly identifies the association *Petasitetum officinalis-glabrati* with the association *Petasitetum kablikiani* Pawłowski et Walas 1949 (recte: *Agropyro caninae-Petasitetum kablikiani*).

The authors of this volume in some cases markedly change the original concept (wideness) concerning syntaxa, e.g., the alliance *Impatienti-Stachyion sylvaticae*

(class *Galio-Urticetea*), from forest fringes and forest roadsides was extended to utterly cultural country (stone-pits, railway embankments, moist shambles, old walls etc.). Similarly, nitrophilous communities and stands of shrubs were excluded from the class *Epilobietea angustifolii*, but other semi-natural and natural biotopes (forest fringes, sides of brooks, stabile screes, rocky crevasses, moist and cold ravines) and also anthropogeneous places (embankments, shambles of forest buildings, abandoned stone-pits, downhill courses, fallow land, balks etc.) were included in addition to the forest glades and spontaneously arising clearings. The class *Asplenietea trichomanis* was enriched by communities on stabile screes, ordered originally into the class *Thlaspietea rotundifolii*, with regard to similar ecology (communities on mobile screes remained in this class). Differentiation of alliances takes into consideration only altitudinal gradient and chemical composition of background (carbonates, silicates and serpentines) and ignores different light conditions on sunny versus shady habitats. In this way, in the alliance *Cystopteridion* communities of wet shaded rocks rich in mosses (up to 90% cover) are mixed with communities of dry sunny rocks with mosses that cover maximally 10%.

To summarize, the second volume of vegetation survey of the Czech Republic is a priceless source of valuable information. It can be justly recommended to all persons interested in knowledge of Czech vegetation, specialists and also for “vegetation enthusiasts”. It should be part of every natural-science institution’s library and be located together with the first volume at a highly visible place always at hand. It will certainly not be on your shelf as decoration. Considering the collective authors’ expertise we believe that the forthcoming two volumes will be as well written as this one.

References

Chytrý M (ed) (2007) *Vegetace České republiky. 1, Travinná a keříčková vegetace (Vegetation of the Czech Republic. 1, Grassland and heathland vegetation)*. Academia, Praha

Ján Kliment, *Botanical Garden of Comenius University, SK-038 15 Blatnica, Slovak Republic* & **Ivan Jarolímek**, *Institute of Botany, Slovak Academy of Sciences, Dúbravská cesta 14, SK- 845 23 Bratislava, Slovak Republic*

Hong Kong Herbarium & South China Botanical Garden (eds.): FLORA OF HONGKONG, Vol. 3; Agriculture, Fisheries and Conservation Department, Government of the Hong Kong Special Administrative Region, Hong Kong, 2009, 352 pp. + color plates. Price GBP 35.50, USD 56,-, EUR 41.-, ISBN 978-988-98253-8-6

The third volume of the Flora of Hong Kong is of the same excellent quality as the first two volumes. They were reviewed in *Folia Geobotanica* recently (Hédl 2011) and more information about the series can be found therein. The present volume was co-authored by 16 botanists from five institutions based both in Hong Kong and Guangzhou in China’s mainland. The book in English starts with a chapter devoted to conservation of the Hong Kong nature focusing on flora. The main part comprises

subclass *Asteridae* with 29 families occurring in Hong Kong. The most important ones, regarding the species richness, are *Apocynaceae*, *Asclepiadaceae*, *Solanaceae*, *Convolvulaceae*, *Verbenaceae*, *Lamiaceae*, *Scrophulariaceae*, *Acanthaceae*, *Rubiaceae* and *Asteraceae*. The structure of descriptions follows botanical systematics, starting with characteristics of families, then keys to genera, brief descriptions of genera and keys to species. Species descriptions are comprehensively succinct, no more than half a page long. In addition to descriptions of species morphology, brief information on distribution in Hong Kong and adjacent regions in China as well as about species ecology is provided. Most species are depicted using precise ink drawings with details of parts important for determination. Moreover, 559 species are illustrated with high quality color photographs. This makes the Flora partly a photo atlas of the Hong Kong vascular plants. The forthcoming Vol. 4 will include families of the class *Liliopsida*.

References

Hédl R (2011) Flora of Hong Kong, Vols. 1–2. Book review. *Folia Geobot* 46: 100–101

Radim Hédl

Institute of Botany of the Academy of Sciences of the Czech Republic, Lidická 25/27, CZ-602 00 Brno, Czech Republic

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