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Field Guide to the Common Bees of California: Including Bees of the Western United States *by Gretchen Lebuhn*

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BOOK REVIEW

Field Guide to the Common Bees of California: Including Bees of the Western United States. Gretchen Lebuhn. 2013. California Natural History Guides. University of California Press, Berkeley, CA. 175 pages; \$21.95, paperback. ISBN-13: 978-0-520-27284-2.

My childhood was spent mostly outdoors exploring the nearby fallow fields and orchards. I had my share of wasp and bee encounters, which typically ended with a painful sting. From paper wasps to honey bees, I was enamored with these colorful insects and gave them plenty of respect. When I became a wildlife biologist years later, I began to notice the many native bee species that are prevalent in California, as well as the bee mimics (usually syrphid flies). However, the rapid decline of these important species is now on the minds of many entomologists. Colonies are collapsing at an alarming rate, and the causes range from parasites to pesticides (Henry et al. 2012, Martin et al. 2012, Larson et al. 2014). The loss of bee colonies would be detrimental to local plant populations that depend upon insect pollination. Lebuhn's guide to the common bees of California is well timed, as public awareness of bees and their role on the ecological landscape is increasing.

The guide is easy to use and represents a catalyst of bee education and identification. The introduction provides a solid starting point by covering a variety of topics, including bee diversity, morphology, life cycle, social behavior, parasites, nesting, pollination, ecosystem services, and conservation.

The crux of the guide is the bee family and genus accounts. A quick key of basic bee characteristics on page 58 will get the reader to the desired family and genus. Five bee families are covered: Colletidae, Halictidae, Andrenidae, Megachilidae, and Apidae. Each family consists of 2 to 13 genera (for a total of 32 genera). In each account, a general description is provided, as well as information on food resources, nesting, and timing of flight. Ac-

counts also show how to tell one genus from another and how to identify similar insects commonly mistaken for members of the genus.

Unfortunately, individual species within a genus are not covered. If all species were covered, the guide would be a huge book. For example, in the genus *Lasioglossum* (sweat bees; page 74), there are 280 species in North America, approximately 87 of which are in California. Treatment of those species is clearly beyond the scope of this guide. The author states on page x of the preface, "Bees are extraordinarily difficult to identify to the level of species, and even for scientists who specialize in knowing bees, identifying our California bees to the species level is a challenge." Each genus account is accompanied with an outstanding color illustration of a representative species that generally captures the "look" of the genus. All illustrations are by Noel B. Pugh.

Appendix 1 is a list of bee families generally found in California. Here it is revealed that the guide is not comprehensive. One family (Melittidae) is not covered in the guide, along with 49 genera throughout the other families! However, the appendix lists the genera so the reader can research further. The preface suggests that the missing genera are those not particularly common in the state.

Appendix 2 contains a useful key of the females of genera included in the guide. The key provides a table with rows listing the genera and columns covering data on size, thorax integument color, markings, wings, and other identifying characteristics. Following the appendixes are additional sections, including a glossary and a list for further reading.

Although the book is not as comprehensive as I'd like, Gretchen Lebuhn clearly states that the intended audience is the nonprofessional. Keeping that aim in mind, I judge her guide to be more than satisfactory. It provides an adequate introduction to the common bees of California, and further study can be easily pursued within other resources. For anyone keen on the bees of California, this guide is a mandatory starting point for what is sure to be

a fascinating journey into the world of bee ecology.

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