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Book review

D. Godan, 1979. *Schadschnecken und ihre Bekämpfung*. 467 pp., 128 figs, 51 tables and 12 pages with colour photographs. Verlag Eugen Ulmer GmbH & Co., Stuttgart. ISBN 3-8001-30440-0. Price DM 118.

This is a monograph on slugs and snails that are in some way harmful to plants, animals or humans. It deals with terrestrial, amphibian and aquatic gastropods which are either phytophagous or important as intermediate hosts for parasites in higher animals and as vectors of viruses, bacteria and fungi. The book is divided into three main chapters. The first one covers morphology, physiology, taxonomy and ecology; the second one the damage gastropods can cause, including image of injury, methods to estimate population density and thresholds of control, and the third chapter deals with control in its broadest sense. The book concludes with 65 pages of references, a list of scientific names of the Molluscs and of organisms for which they can act as host, and a subject index.

The description of the anatomy is concise, with clear figures and some electron micrographs. The part on physiology is more extended for a better understanding of the mechanism of action of pesticides. It includes an overview on Mollusc endocrinology and discusses factors influencing hibernation, techniques of mass rearing and the use of Molluscs as pollution indicators. This first chapter concludes with a key for the determination of European gastropods.

Chapter 2 deals mainly with the damage caused to horticultural and agricultural crops. To facilitate preliminary diagnosis of the pest animal, the authoress has listed many crops alphabetically together with the relevant slugs and snails; the key in Chapter 1 can be used for final determination. Although the introduction to the book stresses the importance of gastropods as vectors of human diseases, only general remarks are made and a limited number of diseases is mentioned in this chapter. The book therefore cannot replace a handbook on parasitology.

The image of injury caused by the consumption of parts of plants is not very characteristic and therefore easily mistaken for that of chewing insects. The authoress advises to look for mucous tracks that stay visible as long as the substrate is not too dry.

At the end of this chapter many useful guidelines are presented to estimate the population density and to establish damage and control thresholds. Depending on the species, damage thresholds vary from about 200 to 2×10^6 animals per ha.

The main part of the book, Chapter 3, is dedicated to control measures. Chemical, mechanical, 'ecological' and biological measures are treated separately. Chemical control is still most frequently used, metaldehyde and methiocarb being preparations often applied in agriculture. The use of metaldehyde is strongly reduced in cool and humid weather, because the animals can recover from the dehydration caused by this compound. In contrast, carbamates perform better under humid conditions, but are systemic and therefore apt to create undesirable side effects. Many other molluscicidal chemicals are discussed and, as all of them are only partly successful, the authoress stresses the importance of alternative control. Mechanical control is by traps and various types of barriers, 'ecological' control refers to cultural measures that render the environment less suitable for the survival of slugs and snails. Many possibilities for biological control are mentioned, including the possible introduction of parasites such as Cestodes and Nematodes, and stimulation of activity of predators such as the 'Hunter snail', *Gonaxis kibweziensis*, which after introduction into the isle of Agiguan reduced an *Achatina* population with 60% within three years and was therefore also introduced into Hawaii, Mauritius etc.

Numerous insects attack slugs and snails. The biology of these insects is presented in a brief but instructive manner and many literature references as to their possible use as control agents are given. This chapter concludes with a review of genetic manipulations, such as the reduction of a natural population by production of hybrids that can be destroyed by parasites. The use of pheromones, inhibitors of sterol metabolism, deterrents and organic compounds influencing host-parasite relationships are in an experimental stage, although some are promising, like population-regulating auto-inhibitors, secreted by *Fossaria cubensis*, a host of *Fasciola hepatica* in Texas.

Usually it is easy to trace inaccuracies or imperfections in a monograph of these dimensions. In this well-written book, however, they are hard to find. There are a few names of authors erroneously spelled, and mistakes in the nomenclature of species that escaped later corrections. In the paragraph on biological control medically important species are not separated from agriculturally important ones, but these are minor disfigurations. Tables and figures are clear, photographs are of high quality and the lay out of the book is beautiful. This monograph is particularly valuable as a textbook in agricultural, horticultural and medical libraries and is fully worth its price. I can also recommend it to those working on plant/animal relationships. The fact that the book has been written in German, will undoubtedly hamper the world wide distribution it so well deserves.

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