

# The New International Encyclopædia — Orthoptera



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**ORTHOP'TERA** (Neo-Lat. nom. pl., from Gk. ὀρθόπτερος, having upright wings, from ὀρθός, *orthos*, straight, correct + πτερόν, *pteron*, wing). A large and important group of insects comprising the forms known as the straight-winged insects, and including the grasshoppers or true locusts, long-horned grasshoppers (including katydids), crickets, cockroaches, walking-sticks, and leaf-insects, and the praying mantis or rear-horse (qq.v.). The mouth parts are fitted for biting, and the metamorphoses are incomplete, the young when first hatched closely resembling the adult insects except in lacking wings. The eggs are few in number, and as a rule are laid in specialized egg-cases, although with some they are deposited without such cases, and with a few are scattered singly. The fore wings are somewhat thickened, but are not as tough as the wing-cases of beetles, and when at rest lie closed upon the back so as to protect the abdomen and the hind wings. They are known as 'tegmina.' The hind wings function in flight, and are delicate and usually folded like a fan. About 10,000 species exist, which makes it a small order when compared with the Hymenoptera, the Coleoptera, and the Lepidoptera, but, in spite of the comparatively small number of eggs, many of the species are tenacious of life and apparently very prolific, and swarm in enormous numbers of individuals, as in the case of the destructive and migratory locusts. One of the striking peculiarities of the order is that we find here most highly developed the ability to produce sounds of a more or less musical character, by rubbing one

part of the body, modified for the purpose, upon another. This capability thus to make sounds is confined to the male sex, and its object is to attract the female; and this ability belongs only to the families which jump (the Saltatoria); the runners, walkers, and graspers (Cursoria, Gressoria, and Raptoria) make no sound, but in these groups the phenomena of protective and aggressive resemblances are very highly developed, especially in the tropical forms. In these groups the wings seem to be of little use as organs of flight, but they are of striking value in ornamentation and in concealment. This is especially true with the Phasmidæ and Mantidæ, where the effectiveness of color and pattern is extraordinary, the tegmina resembling plant structures with remarkable minuteness of detail. Even the eggs are so modified as to resemble the seeds of plants.

Orthoptera are among the oldest of fossil insects. Cockroaches were numerous and varied in Paleozoic time, and the other families are numerous represented in Mesozoic and Tertiary rocks.

Consult: Sharp, *Cambridge Natural History* (London, 1895); Comstock, *Manual for the Study of Insects* (Ithaca, 1898); Howard, *The Insect Book* (New York, 1902); Luger, *Annual Report of the State Entomologist of Minnesota* (Minneapolis, 1898); Scudder, *North American Orthoptera* (Cambridge, 1897).



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