

Chapter 3

**SEX DETERMINATION IN INSECTS**

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**I. INTRODUCTION**

Sex determination is the process by which the gender of a bisexual organism becomes fixed, so that the individual progeny develops either as a son or a daughter. As is the case with other fundamental biological processes, evolution has in the course of time produced a seemingly infinite variety of ways of achieving this one essentially simple objective, and classical genetic and cytogenetic observations have, over the years, combined to display a bewildering diversity of sex-determining mechanisms. Much of this work has been on insects, from the first recognition of sex chromosomes in the heteropteran *Pyrrhocoris apterus*,<sup>1</sup> through the classic experiments of Bridges<sup>2-4</sup> on *Drosophila* and Goldschmidt<sup>5,6</sup> on *Porthetria dispar*, to the recent molecular work elucidating the hierarchy of regulatory genes responsible for the sex of fruit flies.<sup>7,8</sup>

In the general literature on sex determination, two works stand out,<sup>9,10</sup> each with a radically different approach to the subject. Both cover the full range of sex-determining systems, but the cytogeneticist White<sup>9</sup> gives pride of place to evolutionary changes in the sex chromosomes, whereas the evolutionary geneticist Bull<sup>10</sup> pays more attention to the underlying

