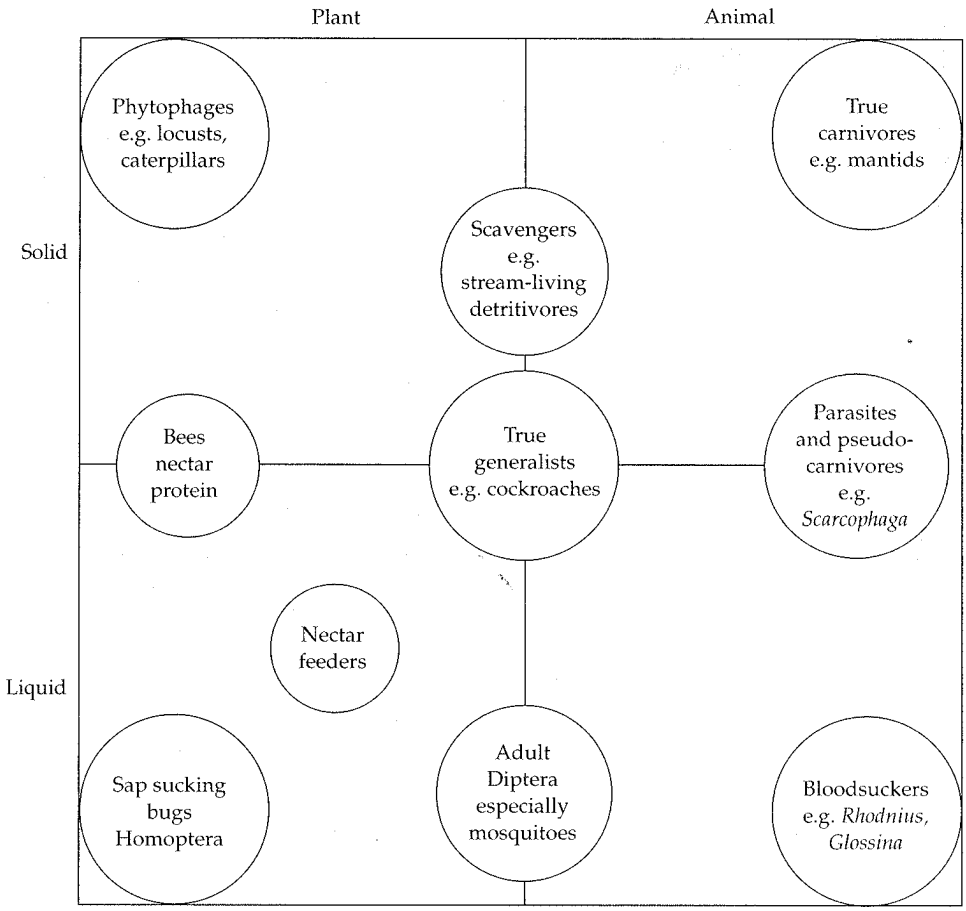

Figure 2.1 Classification of insect diets according to Dow (1986), based on plant/animal and liquid/solid dichotomies.

Note: Many insects can be placed in borderline positions, for example, adult female mosquitoes which feed on both nectar and blood.

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mechanistic aspects are covered in nine chapters of volume 4 in the 1985 series *Comprehensive Insect Physiology, Biochemistry, and Pharmacology* (Kerkut and Gilbert 1985), regulation of insect feeding behaviour by Chapman and de Boer (1995), and the ecological context is represented in the 1000-page text of Slansky and Rodriguez (1987), with emphasis on feeding guilds, and by a substantial book on caterpillar foraging (Stamp and Casey 1993). Schoonhoven *et al.* (1998) list two pages of books and symposium proceedings devoted to insect–plant interactions. The treatment that follows is necessarily extremely selective.

Two areas of research in particular are providing new opportunities and motivation to investigate the effects of plant quality on insect herbivores (Awmack and Leather 2002). These are global climate change, a long-term experimental system involving gradual changes in host plant quality, and the development, since the mid-1990s, of transgenic plants expressing genes for insect resistance (first *Bacillus thuringiensis* toxin, then antinutrient proteins). Transgenic plants expressing antinutrient proteins permit direct measurement of the costs and benefits of plant defences. Very recently, the emerging field of elemental stoichiometry (Sterner and Elser 2002) is adding a new dimension to insect nutritional ecology. Fagan *et al.* (2002) have shown that insect predators contain on average 15 per cent more nitrogen than herbivores,