

## 13 | Immature Stages

In many ways, Cimicidae are ideal for life-history studies. Specimens are easy to transport in small boxes or tubes. No moisture is required or desirable, as it may cause mold. In my studies, laboratory cultures were kept in small shell vials (3×9 cm is a convenient size) and confined by a cap of fine netting secured around the vial with masking tape. Two strips of blotting paper slit half way and fitted at right angles, are provided as a substrate for the bugs. These surfaces, and especially the corners, provide an ideal situation for the bugs. The blotting paper should be shorter than the vial to keep the bugs away from the net except when they are feeding, at which time (with the vial inverted) the filter paper slides down on the net cap and the bugs are in position to start feeding at once. None of the species I have reared has failed to feed through the netting. Blotting paper must be changed when it becomes covered with fecal matter, egg shells, and cast skins. Hundreds of colonies of this size will fit in a small incubator. For massive rearings, larger jars may be used, and for individual rearings to obtain precise life history data or virgin females, small tubes 7 mm in diameter are convenient.

Feeding may be accomplished simply by holding the vial against the skin (Fig. 13-1), but much time can be saved by confining the animal (a rabbit or chicken in most of my rearings) and holding the vials against a shaved or bare area of skin with a test tube holder or strap. Ryckman's (1952) technique, devised for mass rearing of Triatominae but applicable to cimicids, confines a rabbit in a wooden frame with a screened top jar inserted against the animal from below (Fig. 13-2c). Small vials containing individual rearings may be bound together with rubber bands so that a group of vials is held against the animal at one time. Davis (1956) (Fig. 13-2) straps the vials to the rabbit. For convenience, many of the leading students of bed bug biology seem to have fed the bugs on themselves. Rearing methods have been reviewed by Adkins and Arant (1959) and Wattal and Kalra (1961).

Studies on life history, developmental rates, etc., have been carried out by many investigators, starting with Southall (1730). The most noteworthy papers for *C. lectularius* are Girault (1905), Hase (1917, 1930),