SUMMARY
1. Normal mating behaviour in the cricket, *P. guttiventris* was distinguished into five progressive steps from which a score system for quantitative evaluation of mating behaviour was developed.

2. When a comparative assessment of the role of different senses in mating behaviour of *P. guttiventris* was made with respect to mating behaviour score, duration for mating and per cent mating, auditory communication was found to be less critical than tactile or visual sense.

3. As the age of adult males and females increased, the crickets exhibited progressive mating
behaviour and more per cent of them mated. Maturation periods, as assessed by the receptivity and ability to mate, for males and females of *P. guttiventris* were 9.7 ± 0.4 and 10.1 ± 0.6 days.

4. Removal of gonads in both males and females, and of accessory gland in males of this species did not affect the mating ability or maturation period.

5. Six-week-old males of *P. guttiventris* developed overt readiness to mate and hence when such males were paired with 1-day-old females, a high mating rate leading to decrease of fecundity and fertility was observed.

6. Though pairing females with males, both as single pair and multiple pairs, increased the fecundity of the cricket under investigation, group effects resulting in further increase of fecundity and also mortality were evident in multiple pairs.

7. Mated females of the cricket, *P. guttiventris* not only produced and deposited higher number of eggs but also oviposited at a higher rate. Further,
mating was followed by an immediate increase in daily oviposition. While the effect of single mating on fecundity was temporary, periodic mating was necessary for the full expression of its influence.

8. Although females of *P. guttiventris* showed tendency for fecundity increase in the mere presence of males, mating without insemination in them obviously increased the fecundity.

9. When subjected to different photoperiods, this cricket showed highest fecundity and fertility at natural light of 13.40L:10.20D. Thus photoperiod was found to regulate fecundity and fertility even in the nondiapausing cricket, *P. guttiventris*.

10. During starvation female crickets failed to produce any eggs. Mated females during starvation were found to have retained less number of eggs than virgin females. However, such females survived for a longer duration as a result of increased oocyte resorption. This dual role of mating - responsible for increase of egg
production during fed condition and increase of survival time during starvation - was due to two different components of the mating stimulus in *P. guttiventris*.

11. Feeding 1% biotin, mixed with the diet, to the females of *P. guttiventris* led to decrease in oviposition. Ovaries of such females contained no developed eggs. However, this effect of biotin could be reversed as the crickets refed on control diet resumed their normal egg laying.

12. Role of neuroendocrine system in the increase of fecundity following mating was investigated in *P. guttiventris* by implanting corpora allata and cardiaca and also by allatectomy. Implantation of corpora allata, like mating, resulted in increase of egg production and oviposition. But mating in allatectomised females though resulted in increased oviposition, failed to increase total egg production. Hence it appears that mating primarily stimulated oviposition without the mediation of corpora allata, but subsequent higher production of eggs followed due to the activation of these endocrine glands.