diameter. Cirrus pouch oval, transversely placed below middle of the segment, measures 0·24 × 0·11, opens by a common genital pore marginally; genital pores are irregularly alternate, measure 0·02 × 0·03. The vagina lies anterior to cirrus pouch and runs up to shell gland. Ovary is bilobed, 'H' shaped, situated at the posterior end of the segment, measures 0·14 in length at isthmus region 0·03 in width at isthmus, and 0·18 in width at lobe region. Uterus tubular, starts from shell gland, reaches up to middle of segment, just anterior to cirrus pouch, measures 0·68 in length and 0·07 in width. Shell gland is situated behind the ovary, measures 0·08 × 0·05. Vitellaria granular, situated in lateral cortical parenchyma, not reaching up to lateral margins of the segment.

Discussion

The genus *Yorkeria* was established by Southwell[1] with its type species *Y. parva* from *Chiloscyllium indicum* at Ceylon. Subhapradha[3] redescribed *Y. parva* from *Chiloscyllium griseum* at Madras, India. The present species differs from *Y. parva*, the only known species, in having 'T' and 'Rose thorn' shaped minute spines on bothridial stalks, in the number of testes (90–95 *vs.* 60–75, Subhapradha[3], position of genital pore (below middle of segment *vs.* above middle), structure of ovary ('H' shaped *vs.* 'X' shaped in cross section), structure of vitellaria (granular *vs.* consisting of large acini) and position of uterus (extends anterior to cirrus pouch *vs.* does not). Therefore the present species is considered as a new species and designated as *Y. southwelli* in honour of Southwell, T.

The author is thankful to Prof. R. Nagabhushanam and Dr. G. B. Shinde for providing laboratory facilities and valuable guidance. He is also grateful to CSIR for the award of Post-doctoral Research Fellowship.

Post-doctoral Research Fellow, R. A. Deshmukh.
Department of Zoology,
Marathwada University,
Aurangabad 431 004, India, *July* 15, 1978.

1. Southwell, T., *Ann. Trop. Med. and Parasitol.*, 1927, **21**, 351.
2. —, *The Fauna of British India Including Ceylon and Burma*, Cestoda, Taylor and Francis, London, 1930, **1**.
3. Subhapradha, C. K., *Ind. J. Helminth.*, 1955, **7** (2), 41.
4. Wardle, R. A. and McLeod, J. A., *The Zoology of Tapeworms*, University Minnestota Press, Minneapolis, 1952.
5. Yamaguti, S., *Systema Helminthum*, Vol. II. *The Cestodes of Vertebrates*, Intescience Publishers Inc., New York, 1959.

FORMATION OF CORPUS LUTEUM IN THE FIELD CRICKET *PLEBEIOGRYLLUS GUTTIVENTRIS* (WALK.)

The ripe oocyte of insects ruptures the epithelial plug at the time of ovulation and passes into the oviduct, leaving an epithelial plug as a degenerating conspicuous structure, known as corpus luteum[1]. The existence of this structure at the base of ovariole after ovulation has been reported for a few species of insects such as *Termes redemanii*[2], *Rhodnius prolixus*[3], *Locusta migratoria*[4, 5], *Schistocerca gregaria*[6], *Bombus*[7], and *Oncopletus fasciatus*[8]. The histological studies of the corpus luteum of *S. gregaria*[6] and *L. migratoria*[5] and the works referred to above have revealed that this structure does not show progressive development after ovulation like the corresponding organ in mammalian ovary but shrinks and almost disappears by the time the next egg completes its development. A review of literature on this subject warrants further investigations on the formation of corpus luteum, the occurrence of yellow pigments, their chemical nature and functional significance in other insects. The present paper deals with the formation of corpus luteum and its histological structure in *Plebeiogryllus guttiventris*.

Adult females of *P. guttiventris*, collected from Annamalainagar area, were reared in bottles along with males. They were fed with pumpkin, cucumber and powdered pea-seeds. The time of ovulation was recorded and the ovaries were dissected out at different intervals of time after ovulation under physiological saline solution, in order to study the progressive development of corpus luteum. The ovarioles were fixed in fresh Bouin's fluid. Heavily yolked eggs were treated with 4% phenol in 80% alcohol for a period of 24 hours to facilitate easy sectioning of them as suggested by Slifer and King[9]. Paraffin sections of ovarioles were cut at 6–8 μ thickness and stained with Heidenhain's iron haematoxylin and counterstained with eosin in 90% alcohol.

At the time of ovulation the epithelial plug breaks down and the egg leaves the pedicel. After ovulation the follicle consists of an empty colourless tube with scattered cells of the follicular epithelium at its apical region (Fig. 1). These cells, some of them showing signs of degeneration, have oval shaped nuclei. They are separated from the developing oocyte by the epithelial plug consisting of relatively smaller cells with feebly stained nuclei (Fig. 1).

After 20 hours of ovulation the follicle cells seem to aggregate, perhaps due to the contraction of the follicle, at the base of ovariole immediately below the epithelial plug forming the corpus luteum. The nuclei of the cells of the corpus luteum are intensively stained with haematoxylin. The corpus luteum, at this stage, forms a globular mass of cells with a small cavity

(Fig. 2). The wall of the pedicel, which is composed of columnar epithelial cells, shows the contraction along the length of the follicle reducing the egg passage (Fig. 2).

After about 24 hours of ovulation the structure of the corpus luteum becomes quite compact. Most of its cells form a ring like structure enclosing a large cavity, while the pycnotic nuclei become few in number and less basophilic (Fig. 3). The epithelial plug is now composed of several layers of cells. The follicular epithelium indicates signs of degeneration (Fig. 3).

FIGS. 1–3. Fig. 1. L.S. through base of ovariole soon after oviposition showing epithelial plug (EP), scattered follicle cells (FC) and some degenerating follicle cells (arrow). Scale 35 μ. Fig. 2. L.S. through base of ovariole after 20 hours of ovulation showing corpus luteum (CL), contraction of follicle (horizontal arrow) and egg passage (vertical arrow). Scale 35 μ. Fig. 3. L.S. through base of ovariole after 24 hours of ovulation showing ring shaped corpus luteum (CL) with cavity (Cl. C), epithelial plug (EP) and degeneratoin of follicle cells (arrow). Scale 35 μ.

The mode of formation of corpus luteum by follicle cells in *P. guttiventris* appears to be similar to that of *L. migratoria* and *S. gregaria*[5]. However, the corpus luteum of *P. guttiventris* differs from these insects in certain structural variations. In the initial stage of its formation it is represented by a few scattered follicle cells at the base of the developing oocyte. These cells are then pushed towards the anterior end of the follicle by its contraction so as to form, finally, into a ring shaped structure with a large cavity. This cavity of the corpus luteum of this insect seems to represent the large canal-like cavity of the tubular corpus luteum described for *L. migratoria* and *S. gregaria*[5]. Further, the formation of a ring-like structure of the corpus luteum with a large cavity in *P. guttiventris* is considered to be due to the contraction of the follicle. This agrees with the findings of Singh[5] reported for *L. migratoria* and *S. gregaria*.

Further studies on the histology of the second, third and successive corpora lutea and their pigmentation in *P. guttiventris* are in progress.

The authors are thankful to Dr. P. Govindan, Professor and Head of the Department of Zoology, Annamalai University, for facilities provided and to Dr. Vijayam Sriramulu, Reader in Zoology, Annamalai University, for his help in photomicrography.

Department of Zoology, Annamalai University, Annamalainagar 608 101, India,
July 31, 1978.

K. RAMASAMY.
N. RAMALINGAM.

1. Wigglesworth, V. B., *The Principles of Insect Physiology*, Chapman and Hall, London, 1972.
2. Ahrens, W., *Z. Mikr-Anat. Forsch.*, 1934, **37**, 467.
3. Wigglesworth, V. B., *Quart. J. micr. Sci.*, 1936, **79**, 91.
4. Vel'tischer, P. A., *Priroda*, 1941, p. 78.
5. Singh, T., *Trans. R. Ent. Soc. Long.*, 1958, **110**, 1.
6. Roonwal, M. L., *Rec. Indian Mus.*, 1947, **44**, 375.
7. Palm, N. B., *Opusc. Ent. Lond. Suppl.*, 1948, **7**, 1.
8. Bonhag, P. F. and Wick, J. R., *J. Morph.*, 1953, **93**, 177.
9. Slifer, E. and King, R. L., *Science*, 1933, **78**, 366.

STATE OF HYDRATION IN POST-EMBRYONIC STAGES OF SOME BLOWFLIES (CALLIPHORIDAE; DIPTERA)

THE significance of stage specific total water in insects is not well understood. An attempt has therefore been made to project the functional potentialities of species specific water in relation to developmental rates and physiological processes.

Total water is estimated in all the sequential post-embryonic stages of blowflies, *viz.*, (1) *Lucilia cuprina* Wiedeman, (2) *Chrysomia megacephala* Fabricius, (3) *Chrysomia rufifacies* Macquart and (4) *Sarcophaga ruficornis* Fabricius. The replicates (5–10) of each stage with fifty to hundred individuals in it were used at a time for the above purpose. The wet weights were determined correct to 0·01 mg. Then stages were heated to constant weight at 120° C to obtain dry weights.

The observations made in the present study indicate a trend of a species specific rhythmic changes in water system during growth (Fig. 1). The amount of water was found to be highest in one day old larvae which is the most active phase of an insect life. During larval growth, the water percentage gradually decreased. With the onset of histolysis the water percentage in pupal stage decreases but during histogenesis it increases. In females, the water content was found to increase with progressive gonadal development but in males it showed very little fluctuations. Quantification of water content and growth rate in species studied was found to be in the order of *L. cuprina* > *C. rufifacies* > *C. megacephala* > *S. ruficornis*.