

Table 1 *In vitro* fertilization of rabbit ova

Fertilization medium	A ¹	B ²	C*
No. of ova put to IVF	72	98	55
No. of ova fertilized (%)	23 (32) ^a	35 (35) ^a	22 (40) ^a
No of embryos transferred	10	20	—
No of embryos cultured <i>in vitro</i>	7	9	22
No of cultured embryos transferred	7	7	18
No. of bunnies born:			
Male	2	1	1
Female	2	3	6

*Medium A + 25% (v/v) heat treated rabbit serum; ^aNot significantly different (χ^2 , $P < 0.01$); No bunnies were born in the case of embryos transferred.

of 3 cm of mercury⁵. The jar was then incubated at $37 \pm 0.5^\circ\text{C}$ for 24 hr. At the end of the incubation, the ova were recovered, washed in two to three changes of fresh medium to ensure removal of accessory sperm adhering to the zona pellucida and examined under a microscope. Any ova cleaved into 2 cells or more were considered fertilized at this stage and were either cultured⁶ or transferred³ into the oviducts of synchronous recipients. Some of the cultured ova were also transferred³.

Birth of bunnies subsequent to IVF and ET in this study provides the unequivocal evidence for the

success of IVF (table 1). All the three media tested supported IVF of rabbit ova to the same extent (table 1). The fact that *in vitro* fertilized ova developed to term in synchronous recipients only after 24 hr of *in vitro* culture indicates that the type of developmental delay observed by Seidel *et al*² occurred in this study also. But in this study much shorter period of *in vitro* culture (24 hr) was sufficient to overcome this retardation which may mean that the extent of such retardation is less or the culture system was able to overcome this delay faster or probably both.

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Table 2 *Composition of fertilization media*

Ingredient	Medium A (Brackett's medium) ¹ (mM)	Medium B (modified Brackett's medium) ² (g/l)
NaCl	112.00	6.550
KCl	4.02	0.300
CaCl ₂	2.25	0.330
NaH ₂ PO ₄	0.83	0.113
MgSO ₄	—	0.128
NaHCO ₃	37.00	3.100
Glucose	13.90	2.500
Sodium pyruvate	—	0.055
Bovine serum albumin	3 mg/ml	3.000
Penicillin	31 µg/l	1,00,000, U
pH	7.8	7.4–7.6

STRESS-INDUCED STRUCTURAL ABERRATIONS IN THE OVARY OF IMAGINES OF *CORCYRA CEPHALONICA* (STANTON) (LEPIDOPTERA: PYRALIDAE)

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OVARIAN derangements have been noticed after treatment of juvenoids in the imagines of *Corcyra cephalonica* (Stainton)¹. In the present work an attempt has been made to compare the ovarian structural derangements induced by the topical application of three benzyloxy juvenoids AI3-63604

(2,6)-difluoro-*N*-[4-[(3-fluorophenyl)methoxy]phenyl]methyl]benzenamine), AI3-63629(1-(4-chlorophenyl)-2-methyl-3-[4-(phenylmethoxy)phenyl]-2-propene-1-one) and AI3-63701 (1-[(4-methylphenyl)methoxy]-4-pentylbenzene)²⁻⁴ to the imagines of *C. cephalonica* (Stainton) with those produced due to ligatures.

The rearing method of *C. cephalonica*, the procedure of different types of ligature experiments, the application technique of benzyloxy compounds in different doses, the designing of mating pairs and the method of evaluation for structural aberrations in the ovary were the same as described earlier^{1,5}.

The common anatomical abnormalities which appeared due to ligature and application of benzyloxy compounds were: short terminal bundle, differential ovariole length, more than one oocyte in a chamber, presence of eggless gap and increased length of ovariole. The abnormality typical of ligature was thin previtellogenic zone of ovariole (figure 1). Abnormalities developed by benzyloxy compounds only were: thin, transparent ovariole wall and ovary tightly packed up with eggs.

The common histological abnormalities developed after ligature and treatment of benzyloxy compounds were: malformed follicle cells loosely arranged (figure 2) or they lost their identity. Abnormalities typical of ligature were: large trophocytes containing vacuoles, presence of chorionating oocyte between two chorionated oocytes, ooplasm divided into central and peripheral masses and presence of yolk globule in ooplasm (figure 3). Abnormalities induced by benzyloxy compounds were: presence of colloidal masses in ooplasm, an exceedingly defective accumulation of yolk protein

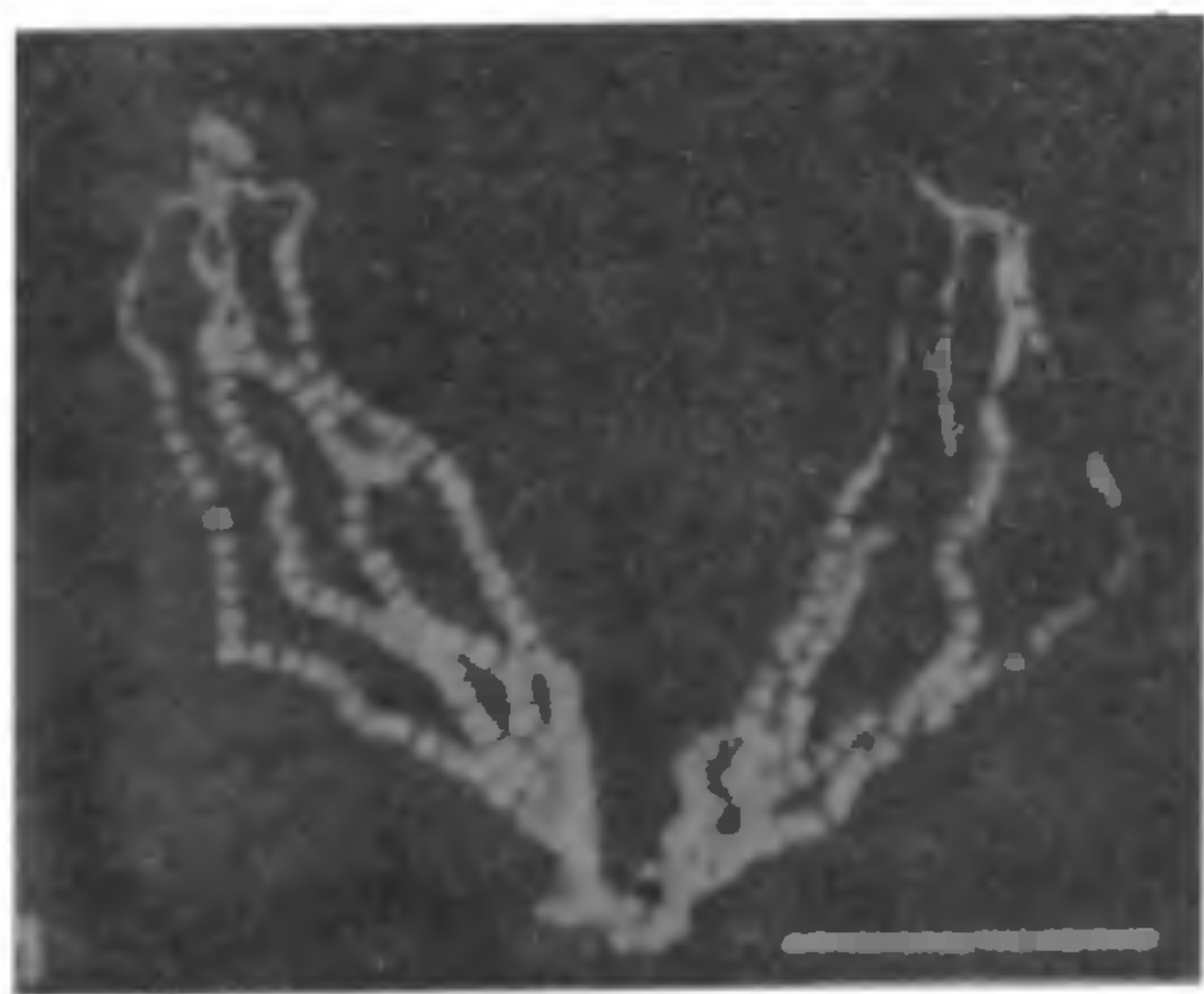
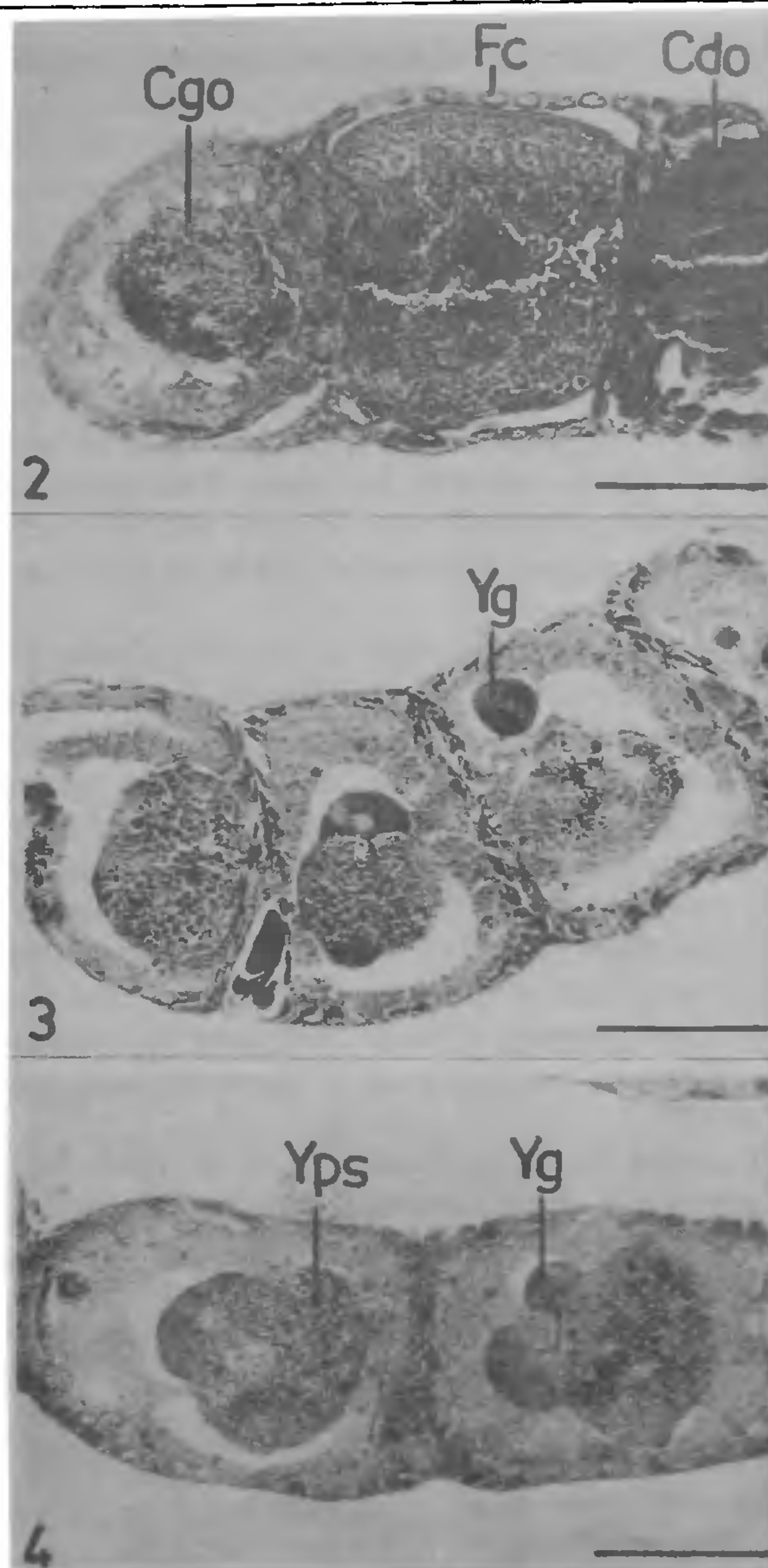


Figure 1. Ovaries obtained after neck ligature-cum-decapitation showing thin previtellogenic zone of ovarioles in right ovary (scale 5 mm).



Figures 2-4. Microstructure of ovarioles. **2.** Longitudinal section through the junction of chorionating and chorionated parts produced due to neck ligature. Presence of malformed follicle cells in chorionating oocyte; **3.** Longitudinal section through the chorionating part produced due to neck ligature-cum-decapitation. Ooplasm divided into central round heterogeneous mass (yolk protein spheres), homogeneous and weakly stained peripheral layer and a deeply stained homogeneous part adjoining the central mass; **4.** Longitudinal section through the chorionating part produced due to 10 μ g of AI3-63701 treatment. Follicle cells lost their identity and defective accumulation of yolk protein spheres attached with yolk globule. (scale 100 μ m). Fc = Follicle cell, Cgo = Chorionating oocyte, Cdo = Chorionated oocyte, Yps = Yolk protein sphere, Yg = Yolk globule.

spheres (figure 4), ooplasm undergoing necrosis, splitting and separation from the ovariole wall and irregular nature of chorionated oocytes. The ooplasm of immature and mature oocytes of ligatured and treated moths showed very faint affinity for ponceau xyloidine-acid fuchsin and light green stains.

The structural aberrations in the architecture of ovary induced by ligature and by benzyloxy compounds are strong enough to inhibit egg laying and it has been reported earlier⁵ that the ligatured and treated moths do not lay eggs. The common aberrations produced after ligature and chemical treatments suggest the causal factor to be endocrine in nature.

The anatomical as well as histomorphological disorders developed after treatment of benzyloxy compounds are very significant and well related with the reproduction of the insect, and are in agreement, in a general way, with those produced after treatment of terpenoid or sesquiterpenoid juvenoids on many other insects⁶⁻¹². This may be possible because these benzyloxy compounds are designated as potent insect juvenile hormone mimics² and the functional principle of these benzyloxy compounds is similar to bio-analogues of juvenile hormone (JH)^{13,14}.

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COMPARATIVE STUDIES ON GROWTH AND NITROGENASE ACTIVITY OF WATER FERN *AZOLLA* GERMPLASM COLLECTIONS

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THE water fern *Azolla* harbours a symbiotic N_2 -fixing blue-green alga *Anabaena azollae* on its dorsal leaves¹⁻⁵. Species of *Azolla* are widely distributed in both temperate and tropical freshwater ecosystem, although *Azolla pinnata* is commonly found in India. The high rate of nitrogen fixation by *Azolla*, its suitability as a biofertilizer to rice crop, besides its ability to control weed and prevention of water losses, have been recognized^{1-4,6-8}. This Institute has collected 86 *Azolla* of different countries belonging to all the seven species. Of these, 48 were found to grow well at Cuttack and among these, 22 belonged to *A. pinnata*, 12 to *A. caroliniana*, 6 to *A. filiculoides*, 2 to *A. microphylla*, 3 to *A. mexicana*, 2 to *A. nilotica* and 1 to *A. rubra*. It was necessary to study their performance to find out better species/strains for practical application in the country. Hence, in the present study, the growth, total chlorophyll and nitrogenase activity (N_2 -fixation) of these collections were determined, when grown in net house and field conditions.

Azolla species were cultivated in triplicates in shallow earthen pots (10 cm height \times 28 cm diameter) containing flooded soil (3 kg CRRI farm