PHOTOGRAPHS
LIVER CONTROL

Fig (1). Photomicrograph of the cross section of liver of control *Heteropneustes fossilis* covered by Glisson’s capsule (GC) having polygonal hepatic cells (HC) with distinct nucleus (N) having nucleolus (NU). (He) X 400.

Fig (2). Photomicrograph of the cross section of liver of control *Heteropneustes fossilis* showing pancreatic cells (PC) of pancreas arranged around branch of portal vein (PV). (HE) X 400.

Cypermethrin Exposure

Fig (3). Photomicrograph of the cross section of the liver of control *Heteropneustes fossilis* exposed to Cypermethrin at 15 days showing swollen hepatocytes (HC) with hypertrophied nucleus (N) having distinct nucleolus (NU) (HE) X 1100.

Fig (4). Photomicrograph of the cross section of the liver of *Heteropneustes fossilis* after 30 days exposure to Cypermethrin, showing vacuolization (V) in hepatocytes, (HE) X 400.

Fig (5). Photomicrograph of the cross section of the liver of *Heteropneustes fossilis* exposed to Cypermethrin at 45 days showing necrotic hepatocytes (arrow) with pycnotic nuclei (barred arrow) (HE) X 400.
Fig (6). Showing heavy disintegration in hepatocytes of *Heteropneustes fossilis* in exposed to Cypermethrin at 60 days. Note vacuolization (v) and pykcnosis (arrow). (HE) X 400.

Fig (7). Showing inflammatory reaction indicated by oozing of blood (B) into intercellular spaces of hepatocytes after 90 days exposure to Cypermethrin (HE) X 400.

Fig (8), (9), (10). Photomicrograph of the cross section of the liver of *Heteropneustes fossilis* after Cypermethrin exposure to 90 days showing hypertrophy (HP) in hepatopancrease (Fig. 8), pycnosis in hepatopancrease (Fig. 9) and necrosis in hepatopancrease (Fig 10).

**Permethrin Exposure**

Fig (11). Photomicrograph of the cross section of the liver of control *Heteropneustes fossilis* exposed to Permethrin at 15 days showing swollen hepatocytes (HC) with hypertrophied nucleus (N) having distinct nucleolus (NU) (HE) X 1100.

Fig (12). Photomicrograph of the cross section of the liver of *Heteropneustes fossilis* after 30 days exposure to Permethrin, showing vacuolization (V) in hepatocytes. (HE) X 400.

Fig (13). Photomicrograph of the cross section of the liver of *Heteropneustes fossilis* exposed to Permethrin at 45 days showing necrotic hepatocytes (arrow) with pycnotic nuclei (barred arrow) (HE) X 400.
Fig (14). Showing heavy disintegration in hepatocytes of *Heteropneustes fossilis* in exposed to Permethrin at 60 days. Note vacuolization (v) and pycnosis (arrow). (HE) X 400.

Fig (15). Showing inflammatory reaction indicated by oozing of blood (B) into intercellular spaces of hepatocytes after 90 days exposure to Permethrin (HE) X 400.

Fig (16), (17), (18). Photomicrograph of the cross section of the liver of *Heteropneustes fossilis* after Permethrin exposure to 90 days showing hypertrophy (HP) in hepatopancrease (Fig 16), pycnosis in hepatopancrease (Fig. 17) and necrosis in hepatopancrease (Fig 18).

**CONTROL OVARY**

Fig (19) – (21). Photomicrograph of the cross section of the ovary of control *Heteropneustes fossilis*.

Fig (19). Showing each stage of oocyte (oocyte I, II, III and IV) present in abundance. A large nucleus (N) can be seen in oocyte III cells. The ovarian wall is thick and intact. Atretic oocyte (AO) are also noticed. (HE) X 400.

Fig (20). Showing thick ovigerous lamellae and oocytes in different stages. Provitelline nucleoli (PN) can be noticed. Also note Atretic oocyte (AO). (HE) X 400.
Fig (21). Showing provitelline nucleoli (PN) and Euvitelline nucleoli (EU). The follicular lining (FL) and Zona radiata (Z) are distinct and intact. Numerous yolk vesicles (YV) and yolk granules (YG) and present in mature oocyte IV cells. (HE) X 400.

**Cypermethrin Exposure**

Fig (22) – (27) Photomicrograph of the cross section of the ovary of *Heteropneustes fossilis* at different exposures of Cypermethrin.

Fig (22) – Showing abundance of atretic oocytes (AO). Note loose ovigerous lamellae (OL). Zona radiata (Z) appear separated in mature oocytes. (HE, 15 days) X 400.

Fig (23) – Showing abundance of oocyte I and oocyte III cells. Note thick ovarian wall (OW) and ovigerous lamellae (OL). (HE, 30 days) X 400.

Fig (24) – Showing nuclear retraction (NR) and cytoplasmic retraction (CR) in oocytes. Note disintegrated stroma (ST) and separation of Zona radiata (Z) from the mature oocyte. Also note disintegrated germinal epithelium (GE). (HE, 45 days) X 400.

Fig (25)- Showing retardation of oocyte I, II & III. Note extreme degeneration of ovarian wall and ovigerous lamellae. (HE, 60 days) X 400.
Fig (26) – Showing most several damage. Note necrosis, Cytoplasmic retraction (CR), nuclear retraction (NR), expelled nucleus (EN), vacuolization (V). (HE, 90 days) X 400.

Fig (27) – Showing necrosis or loss of genetic material. Note damaged nuclear membrane, zona radiata & follicular layer.

**Permethrin Exposure**

Fig (28) – (33) Photomicrograph of the cross section of the ovary of *Heteropneustes fossilis* at different exposures of Permethrin.

Fig (28) – Showing abundance of atretic oocytes (AO). Note loose ovigerous lamellae (OL). Zona radiata (Z) appear separated in mature oocytes. (HE, 15 days) X 400.

Fig (29) – Showing abundance of oocyte I and oocyte III cells. Note thick ovarian wall (OW) and ovigerous lemellae (OL). (HE, 30 days) X 400.

Fig (30) – Showing nuclear retraction (NR) and cytoplasmic retraction (CR) in oocytes. Note disintegrated stroma (ST) and separation of Zona radiata (Z) from the mature oocyte. Also note disintegrated germinal epithelium (GE). (HE, 45 days) X 400.

Fig (31)– Showing retardation of oocyte I, II & III. Note extreme degeneration of ovarian wall and ovigerous limellae. (HE, 60 days) X 400.
Fig (32) – Showing most severe damage. Note necrosis, Cytoplasmic retraction (CR), nuclear retraction (NR), expelled nucleus (EN), vacuolization (V). (HE, 90 days) X 400.

Fig (33) – Showing necrosis or loss of genetic material. Note damaged nuclear membrane, zona radiata & follicular layer.

**CONTROL TESTIS**

Fig (34) – (36). Photomicrograph of the cross section of the testis of *Heteropneustes fossilis* at control (Fig 34-35) and at 15 days of cypermethrin treatment (Fig. 35).

Fig (34) – Showing lobules (L) Containing spermatogonia, spermatocytes, spermatids & sperms. The interlobular space (ILS) contains connective tissue, blood capillaries and interstitial cells (IC). (HE) X 400.

Fig (35) – Showing clear differentiation of various stages of spermatogenesis in different lobules (L). Also note Blood cells (BC) and interstitial cells (IC) in interlobular space (ILS). (HE) X 400.

**Cypermethrin Exposure**

Fig. (36)-(39) - Photomicrograph of the cross section of the testis of *Heteropneustes fossilis* at different exposures of Cypermethrin
Fig. (36) - Showing Clumping of Spermatozoa (arrow). Also note vacuolization (V) and thinning of lobular wall (barred arrow).

Fig. (37) – Showing disintegrated cells (arrow) in lobules. Also note disintegration of interstitial cells (barred arrow). Note cellular hypertrophy (CH) and nuclear hypertrophy (NH). (HE, 30 days) x 400.

Fig. (38) – Showing high degree of nuclear degeneration (ND) and cytoplasmic vacuolization (v). Note disintegration of lobular boundary (arrow) and extensive necrosis in Spermatogenesis (barred arrow). (HE, 45 days) x 400.

Fig. (39) – Showing extensive necrosis in Spermatogenesis (arrow). Note clumped spermatozoa (CS). Also note vacuolization (v) in cytoplasm and pycnosis in nuclei (PN) (HE, 90 days) x 400.

**Permethrin Exposure**

Fig. (40)-(42) - Photomicrograph of the cross section of the testis of *Heteropneustes fossilis* at different exposures of Cypermethrin.

Fig. (40) - Showing Clumping of Spermatozoa (arrow). Also note vacuolization (V) and thinning of lobular wall (barred arrow).

Fig. (41) – Showing disintegrated cells (arrow) in lobules. Also note disintegration of interstitial cells (barred arrow). Note cellular
hypertrophy (CH) and nuclear hypertrophy (NH). (HE, 30 days) x 400.

Fig. (42) – Showing high degree of nuclear degeneration (ND) and cytoplasmic vacuolization (v). Note disintegration of lobular boundary (arrow) and extensive necrosis in Spermatogenesis (barred arrow). (HE, 45 days) x 400.

Fig. (43) – Showing extensive necrosis in Spermatogenesis (arrow). Note clumped spermatozoa (CS). Also note vacuolization (v) in cytoplasm and pycnosis in nuclei (PN) (HE, 90 days) x 400.