Plate:1--Sections through gills of *L. rohita* exposed to DG 6 stained with H & E

**Figure 1.1:** - Normal gills
   (a) Primary gill lamella
   (b) Secondary gill lamellae

**Figure 1.2:** - Normal gills
   (a) Secondary gill lamellae

**Figure 1.3:** - DG 6 dye (low conc.) 5 days
   (a) Disorganization of central axis
   (b) Aneurysm

**Figure 1.4:** - DG 6 dye (low conc.) 10 days
   (a) Oedema in the epithelial cells
   (b) Epithelial lifting

**Figure 1.5:** - DG 6 dye (low conc.) 15 days
   (a) Severe haemorrhage in the axis of primary gill lamella
   (b) Mild hyperplasia (fusion)

**Figure 1.6:** - DG 6 dye (low conc.) 15 days
   (a) Complete erosion of secondary gill lamellae
   (b) Haemorrhagic tip of primary gill lamellae.

**Figure 1.7:** - DG 6 dye (moderate conc.) 5 days
   (a) Epithelial lifting

**Figure 1.8:** - DG 6 dye (moderate conc.) 10 days
   (a) Swollen and mild haemorrhagic tip of primary gill lamellae
   (b) Enlarged and vacuolated cartilage cells of primary gill lamellae.

**Figure 1.9:** - DG 6 dye (moderate conc.) 15 days
   (a) Hyperplasia
   (b) Enlarged and vacuolated cartilage cells of primary gill lamellae.

**Figure 1.10:** - DG 6 dye (high conc.) 10 days
   (a) More haemorrhagic tip of primary gill lamellae
   (b) Pointed tip of primary gill lamellae.

**Figure 1.11:** - DG 6 dye (high conc.) 10 days
   (a) Severe haemorrhage in the central axis
   (b) Erosion of secondary gill lamellae from the base of the primary gill lamellae.

**Figure 1.12:** - DG 6 dye (high conc.) 15 days
   (a) Complete erosion of the secondary gill lamellae.
Plate: 2–Sections through gills of *L. rohita* exposed to AO 7 stained with H & E

**Figure 2.1:** - AO 7 dye (low conc.) 5 days 100 x.
(a) Swollen tip of each primary gill lamellae
(b) Mild haemorrhage.

**Figure 2.2:** - AO 7 dye (low conc.) 10 days 400 x.
(a) Enlargement of cartilage cells
(b) Shortening of secondary gill lamellae

**Figure 2.3:** - AO 7 dye (low conc.) 15 days 1000 x.
(a) Hooked secondary gill lamella

**Figure 2.4:** - AO 7 dye (moderate conc.) 5 days 400 x.
(a) Severe haemorrhage in the axis of primary gill lamella
(b) Shortening of secondary gill lamellae

**Figure 2.5:** - AO 7 dye (moderate conc.) 5 days 400 x.
(a) Epithelial lifting

**Figure 2.6:** - AO 7 dye (moderate conc.) 10 days 400 x.
(a) Severe haemorrhage in the axis of primary gill lamella
(b) Mild hyperplasia

**Figure 2.7:** - AO 7 dye (moderate conc.) 15 days 400 x.
(a) Erosion of the secondary gill lamellae
(b) Curling of the secondary gill lamellae
(c) Enlarged and vacuolated cartilage cells of primary gill lamellae.

**Figure 2.8:** - AO 7 dye (high conc.) 5 days 100 x.
(a) Necrosis of secondary gill lamellae
(b) Shrinkage of primary gill lamellar axis

**Figure 2.9:** - AO 7 dye (high conc.) 10 days 400 x.
(a) Hyperplasia
(b) Enlarged and vacuolated cartilage cells of primary gill lamellae.
(c) Infiltration of blood cells

**Figure 2.10:** - AO 7 dye (high conc.) 15 days 100 x.
(a) Erosion of secondary gill lamellae from the base of the primary gill lamellae.

**Figure 2.11:** - AO 7 dye (high conc.) 15 days 400 x.
(a) Disorganization of central axis
(b) Severe haemorrhage in the central axis

**Figure 2.12:** - AO 7 dye (high conc.) 15 days 400 x.
(a) Erosion of secondary gill lamellae on one side
(b) Haemorrhage in the primary gill axis
Plate: 3-Sections through liver of *L. rohita* exposed to DG 6 stained with H & E

Figure 3.1: - Normal liver  
(a) Hepatocytes  
(b) Central vein

100 x.

Figure 3.2: - Normal liver  
(a) Hepatocytes  
(b) Central vein

400 x.

Figure 3.3:- DG 6 dye (low conc.) 5 days  
(a) Disorganization of hepatic cords  
(b) Mild focal necrosis.  
(c) Haemorrhage

400 x.

Figure 3.4:- DG 6 dye (low conc.) 10 days  
(a) Necrosis.  
(b) Fatty deposition

1000 x.

Figure 3.5:- DG 6 dye (low conc.) 15 days  
(a) Severe necrosis.

400 x.

Figure 3.6:- DG 6 dye (moderate conc.) 5 days  
(a) Karyolysis with bilobed nucleus  
(b) Karyorrhexis

1000 x.

Figure 3.7:- DG 6 dye (moderate conc.) 10 days  
(a) Dilated sinusoids  
(b) Necrosis; pyknotic hepatic cells

400 x.

Figure 3.8:- DG 6 dye (moderate conc.) 15 days  
(a) Dilated sinusoids  
(b) Haemorrhage

400 x.

Figure 3.9:- DG 6 dye (moderate conc.) 15 days  
(a) perinuclear vacuolization  
(b) Karyorrhexis

1000 x.

Figure 3.10:- DG 6 dye (high conc.) 10 days  
(a) Dilated central vein  
(b) hepatic cords move apart

400 x.

Figure 3.11:- DG 6 dye (high conc.) 15 days  
(a) Severe haemorrhage  
(b) Karyolysis  
(c) Karyorrhexis

1000 x.

Figure 3.12:- DG 6 dye (high conc.) 15 days  
(a) Cell death leading to necrosis  
(b) Hepatocyte with disintegrated nucleus and vacuolated cytoplasm

1000 x.
Plate: Sections through liver of *L. rohita* exposed to AO
7 stained with H & E

Figure 4.1: - AO 7 dye (low conc.) 5 days 400 x.
(a) Karyolysis
(b) Disorganization of hepatic cords

Figure 4.2: - AO 7 dye (low conc.) 5 days 400 x.
(a) Disorganization of hepatic cords
(b) Necrosis; pyknotic hepatic cells

Figure 4.3:- AO 7 dye (low conc.) 10 days 400 x.
(a) Karyolysis
(b) Disorganization of hepatic cords

Figure 4.4:- AO 7 dye (low conc.) 10 days 400 x.
(a) Disorganized and enlarged central vein
(b) Infiltration of blood cells in central vein

Figure 4.5:- AO 7 dye (low conc.) 15 days 400 x.
(a) Focal necrosis

Figure 4.6:- AO 7 dye (moderate conc.) 5 days 400 x.
(a) Karyolysis

Figure 4.7:- AO 7 dye (moderate conc.) 10 days 1000 x.
(a) Binucleated hepatocyte
(b) Focal necrosis
(c) Hepatocyte showed perinuclear band

Figure 4.8:- AO 7 dye (high conc.) 5 days 400 x.
(a) Dilated sinusoids
(b) Haemorrhage

Figure 4.9:- AO 7 dye (high conc.) 10 days 1000 x.
(a) Focal necrosis
(b) Karyorhexis
(c) Vacuolated cytoplasm

Figure 4.10:- AO 7 dye (high conc.) 15 days 1000 x.
(a) Necrosis as karyolysis

Figure 4.11:- AO 7 dye (high conc.) 15 days 400x.
(a) Necrosis
(b) Infiltration of blood cells

Figure 4.12:- AO 7 dye (high conc.) 15 days 1000 x.
(a) Karyolysis
(b) Karyorhexis
(c) Cytolysis
Plate: Sections through kidney of *L. rohita* exposed to DG 6 stained with H & E

**Figure 5.1:** - Normal kidney 40 x.
(a) Glomerulus
(b) Renal tubules

**Figure 5.2:** - Normal kidney 100 x.
(a) Glomerulus
(b) Renal tubules

**Figure 5.3:**- DG 6 dye (low conc.) 5 days 400 x.
(a) Shrinkage of glomerulus
(b) Increased periglomerular space
(c) Mild degeneration of renal tubule.

**Figure 5.4:**- DG 6 dye (low conc.) 10 days 400 x.
(a) Fatty deposition

**Figure 5.5:**- DG 6 dye (low conc.) 15 days 400 x.
(a) Dilated lumen of the tubule
(b) Infiltration of blood cells in the lumen of the tubules.

**Figure 5.6:**- DG 6 dye (moderate conc.) 5 days 400 x.
(a) Shrinkage of glomerulus and increased periglomerular space
(b) Degenerated glomerulus
(c) Increased peritubular space

**Figure 5.7:**- DG 6 dye (moderate conc.) 10 days 400 x.
(a) Degeneration of the renal tubule
(b) Mild haemorrhage

**Figure 5.8:**- DG 6 dye (moderate conc.) 15 days 400 x.
(a) Reduced lumen of the renal tubule
(b) Necrosis in the interstitial tissue.

**Figure 5.9:**- DG 6 dye (high conc.) 5 days 400 x.
(a) Increased peritubular space
(b) Reduced lumen of the renal tubule
(c) Degeneration of the renal tubule

**Figure 5.10:**- DG 6 dye (high conc.) 10 days 400 x.
(a) Cellular degeneration of tissue

**Figure 5.11:**- DG 6 dye (high conc.) 10 days 1000 x.
(a) Loss of tubular membrane
(b) Vacuolated cytoplasm of renal tubular epithelium

**Figure 5.12:**- DG 6 dye (high conc.) 15 days 1000 x.
(a) Completely degenerated tubule.
Plate:6–Sections through kidney of *L. rohita* exposed to AO 7 stained with H & E

**Figure 6.1:** - AO 7 dye (low conc.) 5 days
(a) Mild degeneration of renal tubule
(b) Reduced lumen of the renal tubule
(c) Increased peritubular space

**Figure 6.2:** - AO 7 dye (low conc.) 10 days
(a) Increased periglomerular space
(b) Degenerated glomerulus

**Figure 6.3:** - AO 7 dye (low conc.) 15 days
(a) Mild haemorrhage
(b) Mild degeneration of renal tubule

**Figure 6.4:** - AO 7 dye (low conc.) 15 days
(a) Increased periglomerular space
(b) Shrinkage of glomerulus

**Figure 6.5:** - AO 7 dye (moderate conc.) 15 days
(a) Severe haemorrhage
(b) Fat deposition in the interstitial tissue
(c) Increased periglomerular space

**Figure 6.6:** - AO 7 dye (moderate conc.) 10 days
(a) Increased peritubular space
(b) Degenerated interstitial tissue

**Figure 6.7:** - AO 7 dye (moderate conc.) 15 days
(a) Increased periglomerular space
(b) Shrinkage of glomerulus

**Figure 6.8:** - AO 7 dye (moderate conc.) 15 days
(a) Degeneration of the renal tubule
(b) Fat deposition in the interstitial tissue

**Figure 6.9:** - AO 7 dye (high conc.) 5 days
(a) Pyknoyic cell of interstitial tissue
(b) Karyolysis and bilobed nucleus
(c) Necrosis

**Figure 6.10:** - AO 7 dye (high conc.) 10 days
(a) Karyorhexis
(b) Cytolysis

**Figure 6.11:** - AO 7 dye (high conc.) 15 days
(a) Degeneration of the renal tubule
(b) Infiltration of blood cells

**Figure 6.12:** - AO 7 dye (high conc.) 15 days
(a) Severely degenerated tubules
(b) Intertubular necrosis
Plate: 7–Sections through brain of *L. rohita* exposed to
dG 6 stained with H & E

**Figure 7.1:** - Normal brain 100 x.

**Figure 7.2:** - DG 6 dye (low conc.) 5 days 400 x.

(a) Mild disjointment of two layers of optic tectum.

**Figure 7.3:** - DG 6 dye (low conc.) 10 days 100 x.

(a) Disjointment of two layers of optic tectum

**Figure 7.4:** - DG 6 dye (low conc.) 15 days 400 x.

(a) Migration of pyramidal cells towards outer layer of optic tectum.

**Figure 7.5:** - DG 6 dye (moderate conc.) 5 days 1000 x.

(a) Mild haemorrhage in the tissue

**Figure 7.6:** - DG 6 dye (moderate conc.) 10 days 100 x.

(a) Disjointment of layers

**Figure 7.7:** - DG 6 dye (moderate conc.) 15 days 400 x.

(a) Perivacuolar change in the pyramidal cells.

**Figure 7.8:** - DG 6 dye (moderate conc.) 15 days 400 x.

(a) Curved pyramidal cells.

**Figure 7.9:** - DG 6 dye (high conc.) 5 days 1000 x.

(a) Perinuclear space

**Figure 7.10:** - DG 6 dye (high conc.) 10 days 1000 x.

(a) Perinuclear vacuolization in the mononuclear cell

(b) Fatty deposition

**Figure 7.11:** - DG 6 dye (high conc.) 15 days 400 x.

(a) Fragmented mononuclear cell

**Figure 7.12:** - DG 6 dye (high conc.) 15 days 1000 x.

(a) Severe haemorrhage
Plate: 8 – Sections through brain of L. rohita exposed to AO 7 stained with H & E

**Figure 8.1:** AO 7 dye (low conc.) 5 days 100 x.
(a) Mild disjointment of two layers of optic tectum.

**Figure 8.2:** AO 7 dye (low conc.) 10 days 40 x.
(a) Moderate disjointment of two layers of optic tectum.

**Figure 8.3:** AO 7 dye (low conc.) 10 days 1000 x.
(a) Clumping of blood cells

**Figure 8.4:** AO 7 dye (low conc.) 15 days 400 x.
(a) Spongiosis
(b) Necrosis

**Figure 8.5:** AO 7 dye (moderate conc.) 5 days 40 x.
(a) Disjointment of layers

**Figure 8.6:** AO 7 dye (moderate conc.) 10 days 1000 x.
(a) Haemorrhage in the tissue.
(b) Vacuole formation

**Figure 8.7:** AO 7 dye (high conc.) 5 days 40 x.
(a) Disjointment of layers

**Figure 8.8:** AO 7 dye (high conc.) 5 days 100 x.
(a) Spongiosis

**Figure 8.9:** AO 7 dye (high conc.) 10 days 400 x.
(a) Perinuclear space
(b) Fragmented nucleus of mononuclear cells
(c) Blebbing of cytoplasm of mononuclear cells

**Figure 8.10:** AO 7 dye (high conc.) 10 days 100 x.
(a) Fibrosis like appearance in the tissue

**Figure 8.11:** AO 7 dye (high conc.) 15 days 400 x.
(a) Severe haemorrhage in the tissue

**Figure 8.12:** AO 7 dye (high conc.) 15 days 400 x.
(a) Fibrosis
(b) Pyknotic cell
Plate 9 – Sections through intestine of *L. rohita* exposed to
DG 6 stained with H & E

**Figure 9.1:** - Normal intestine
(a) Intestinal villi
(b) Intestinal wall

**Figure 9.2:** - Normal intestine
(a) Intestinal villi
(b) Lamina propria
(c) Goblet cell

**Figure 9.3:** - DG 6 dye (low conc.) 5 days
(a) Mild damage in intestinal villi

**Figure 9.4:** - DG 6 dye (low conc.) 15 days
(a) Loss of intestinal villi
(b) Atrophy in the muscularis

**Figure 9.5:** - DG 6 dye (moderate conc.) 5 days
(a) Necrotic change in the intestinal epithelium

**Figure 9.6:** - DG 6 dye (moderate conc.) 10 days
(a) Shortened and necrotic intestinal villi

**Figure 9.7:** - DG 6 dye (moderate conc.) 15 days
(a) Loss of intestinal villi

**Figure 9.8:** - DG 6 dye (high conc.) 5 days
(a) Degenerated muscularis and submucosa
(b) Shortened intestinal villi

**Figure 9.9:** - DG 6 dye (high conc.) 5 days
(a) Shortened intestinal villi

**Figure 9.10:** - DG 6 dye (high conc.) 10 days
(a) Shortened and necrotic intestinal villi
(b) Degenerated lamina propria

**Figure 9.11:** - DG 6 dye (high conc.) 15 days
(a) Complete necrosis in the intestinal villi
(b) Loss of muscularis and serosa layers

**Figure 9.12:** - DG 6 dye (high conc.) 15 days
(a) Complete loss of intestinal villi
Plate: 10 – Sections through intestine of *L. rohita* exposed to AO 7 stained with H & E

**Figure 10.1:** - AO 7 dye (low conc.) 5 days 400 x.
   (a) Mild damage in intestinal epithelium

**Figure 10.2:** - AO 7 dye (low conc.) 10 days 400 x.
   (a) Mild damage in intestinal epithelium
   (b) Mild separation of layers of intestinal wall

**Figure 10.3:** - AO 7 dye (low conc.) 15 days 100 x.
   (a) Fusion of intestinal villi
   (b) Loss of intestinal villi

**Figure 10.4:** - AO 7 dye (low conc.) 15 days 400 x.
   (a) Necrosis in the intestinal villi

**Figure 10.5:** - AO 7 dye (moderate conc.) 5 days 100 x.
   (a) Lumen with less number of intestinal villi

**Figure 10.6:** - AO 7 dye (moderate conc.) 10 days 100 x.
   (a) Degenerated intestinal villi

**Figure 10.7:** - AO 7 dye (moderate conc.) 15 days 100 x.
   (a) Shortened intestinal villi
   (b) Loss of muscularis layer

**Figure 10.8:** - AO 7 dye (high conc.) 5 days 400 x.
   (a) Hyperactive intestinal villi
   (b) Loss of muscularis and serosa layers

**Figure 10.9:** - AO 7 dye (high conc.) 10 days 400 x.
   (a) Necrotic and shortened intestinal villi

**Figure 10.10:** - AO 7 dye (high conc.) 10 days 400 x.
   (a) Necrotic and shortened intestinal villi
   (b) Loss of serosa layer

**Figure 10.11:** - AO 7 dye (high conc.) 15 days 400 x.
   (a) Complete loss of intestinal villi

**Figure 10.12:** - AO 7 dye (high conc.) 15 days 400 x.
   (a) Complete loss of intestinal villi
   (b) Loss of mucosa, submucosa and muscularis layers