RADIATION INDUCED ABNORMALITIES IN THE CHICK EMBRYONIC DEVELOPMENTS

THESIS

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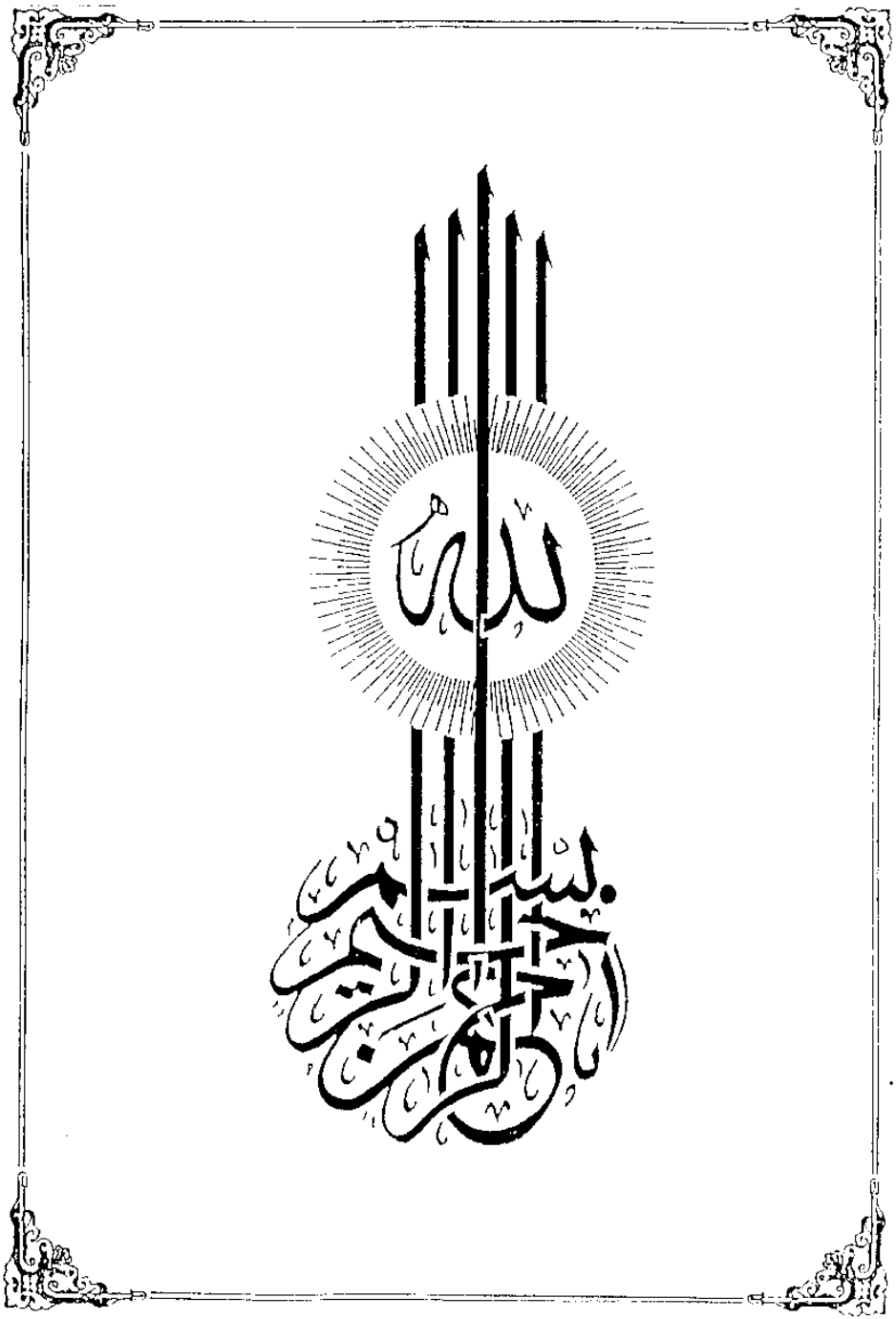

A B S T R A C T

The chick embryo was chozen for the presented investigation as its offers anumber of advantages which enhance its application to gamma irradiation experiments.

Percentage lethality of Gallus donesticus and white Leghorn chick embryos were examined at the end of the incubation period. Among the ten irradiation doses practised, the LD_{50}(21) for Gallus donesticus was 650 r., while the LD_{50}(21) for white Leghorn was 780 r. This ~~invoked~~ evoked difference suggests that radiosensitivity may be influenced by the specie.

Irradiation at the sub-lethal range induced retardation of embryonic development, the magnitude of which was proportional to the dose. This was also associated with various anomalies.

At the end of incubation, hatchability was severely inhibited at all tested radiation levels. Hatching chicks exhibited an assortment of malformations including feathers, sense organs, beaks, wings, limbs and digits. The mechanism of abnormal differentiation is explained on the basis of experimental evidence stressing the role of R.N.A. in morphogenesis.

The livers of hatching chicks displayed a dose dependant increase in weight. Gross changes were characterized by the development of dark depressed areas on a pale yellowish back ground.

The histopathologic feature of the livers of chicks exposed to 260 r. was represented by degenerative parenchymal cells. At 390 rads, radiation induced damage progressed to generalized necrosis and fibrosis, characterized by having no regular pattern.

Hepatic tumours were produced in chicks exposed to 520 r. The main form was of the infiltrative type, invading tissues, with their consequent replacement by tumour cells. Not infrequently, however, expansive tumours were evident. The chief structural feature of tumours of both types was their a abnormal arrangement of tissue elements in relation to the surrounding tissues, their abnormal structure and intensive staining of cellular elements.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

-

Figure(11) Mean values for body weights in grams of 10-days embryos of Gallus domesticus.

Figure(12) Mean values for body lengths in cm for 10 days embryos of Gallus domesticus.

Figure(13) Representative 10-day Gallus domesticus embryos, showing variations in development.

Figure(14) 10-day Gallus domesticus embryo exposed to 260 rad., showing retardation in development of hind limb.

Figure(15) 10-day Gallus domesticus embryo exposed to 390 rad-unsymmetrical wings.

Figure(16) 10-day Gallus domesticus exposed to 390 rad. embryo showing abnormal head and brain development.

" (17,18) 10-day Gallus domesticus embryos exposed to 390 and 720 rad. Note their small size and deformed eye vesicles.

Figure(19) 10-day Gallus domesticus embryos exposed to 520 rad., showing Congenital auditory pit anomaly.

Figure(20) Control White Leghorn chick embryo 48-hours.

Figure(21) White Leghorn chick embryo 48-hours irradiated at 260 r.

Figure(22) White Leghorn chick embryo 48-hours irradiated at 390 r.

Figure(23) White Leghorn chick embryo 48-hours irradiated at 520 r.

Figure(24) Control White Leghorn chick embryo 72 hours.

Figure(25) White Leghorn chick embryo 72-hours irradiated at 260 r.

Figure(26) White Leghorn chick embryo 72-hours irradiated at 390 r.

Figure(27) White Leghorn chick embryo 72 hours irradiated at 520 r.

Figure(28) Mean values for body weights of 10-days white Leghorn embryos.

Figure(29) Mean values for body lengths of 10-days-White Leghorn embryos.

Figure(30) Representative 10-day White Leghorn embryo. Note the variations in development.

Figure(31) 10-day White Leghorn embryo exposed at 260 rad. showing twisted neck.

Figure(32) 10-day White Leghorn embryos exposed at 390 rad.
,(33) Note the malformed beak, twisted neck and paralysed wings.

Figure(34) 10-day White Leghorn embryos exposed at 520 rad.
,(35) Note the fusion of eyelids (43), malformed beaks
&(36) (35), wing and hind limb anomalies(35 & 36).

Figure(37) 21-day Gallus domesticus chicks, of the 260r group
,(38) showing: Alopecia, paralysis and congenital
&(39) anomalies in fore and hind limbs.

Figure(40) Gallus domesticus chick at 390 rad. Note the Alopecia and paralysed limbs.

Figure(41) Gallus domesticus chick to 390 rad. Note oedaema in hind brain region.

Fig.(42) Gallus domesticus hatching chick at 390 rad. showing Alopecia.

Figure(43) Gallus domesticus chick at 390 rad., showing paralysis in hind limbs.

Figure(44, Gallus domesticus hatching chick at 520 rad.
45) Note the Alopecia and paralysis in hind limbs.

Figure(46) 21-day Gallus domesticus chick, 520 rad. showing Congenital anomalies of beak and eyelids.

Figure(47) 21-day Gallus domesticus chicks to 420 rad. showing malformed digits.

Figure(48) Mean values for body weights of Gallus domesticus chick at the time of hatching.

Figure(49) Mean values for body lengthes of Gallus domesticus chicks at the time of hatching.

Figure(50) Representative 21-day Gallus domesticus chicks. Note the variations in development.

Figure(51) Mean values for absolute liver weights of Gallus domesticus chicks.

Figure(52) Mean values for relative liver weights of Gallus domesticus chicks.

Figure(53) Control liver of Gallus domesticus chick.

Figure(54) Liver of Gallus domesticus chick irradiated at 260r.

Figure(55) Liver of Gallus domesticus chick irradiated at 390r.

Figure(56) Liver of Gallus domesticus chick irradiated at 520r.

Figure(57) White Leghorn hatching chicks exposed to 260 rad. showing elongated and twisted neck and malformed digits.

Figure(58) White Leghorn hatching chicks exposed to 390 rad. Note the oedaema, fusion of evelids and paralysis.