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ORGANIZATION OF PITUITARY (HYPOPHYSIS) OF INDIAN HOUSE WALL LIZARD *HEMIDACTYLUS FLAVIVIRIDIS*

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ABSTRACT

Topological organization of the pituitary (hypophysis) of Indian house wall lizard has been studied by Eager's method. The pituitary (hypophysis) is well developed in Indian house wall lizard *Hemidactylus flaviviridis*. This is caudal most part of the diencephalon. It is located ventrally to the median eminence. This extends medio-laterally in tapering form. Hypophysis in presently studied *H. flaviviridis* is well differentiated. It is composed of mainly two parts as neurohypophysis and adenohypophysis. The neurohypophysis (posterior pituitary) comprises of neural lobe (NL). The adenohypophysis (anterior pituitary) is made up of pars tuberalis (PT), pars intermedia (PI) and pars distalis (PAD).

Keywords: Pituitary, Organization, Eager's Method 1970

INTRODUCTION

The lizards are among the most commonly spotted of all reptiles. There are over 3500 different types of lizards existing in all climates throughout India. The walls and ceilings are their niche where they walk and live their lives. The house wall lizard *Hemidactylus flaviviridis* belongs to the family Gekkonidae of suborder Sauria or Lacertilia is second largest family of this suborder. It is said that lizards are poisonous except two species *Heloderma suspectum* and *Heloderma hornidum* are poisonous. The lizards are predator of insects hence they are useful for farmers and agriculture. These can be used for pest management.

In our present study the pituitary of the diencephalon of the forebrain of *Hemidactylus flaviviridis* for better understanding of its anatomy and phylogenetic character has been presented.

MATERIALS AND METHODS

Ninety seven adult lizards, Sauria or Lacertilia of both sexes weighing 45 to 70 gms were used in this experiment. Animals were kept in the cage in the light and cool atmosphere at a room temperature (25 to 30°C). The experimental lizards were kept isolated in the separate cage from normal animal. Prior to the experiment, the specimens were acclimatized at room temperature for one day. Surgical procedures were performed with sterilized dissecting instruments. The specimens were anaesthetized by immersing with 10% formalin for 10 to 15 minutes prior to the surgery.

Operation Procedure

For perfusion, animals were anaesthetized with chloroform for 2 to 5 minutes. Completely anaesthetized lizard was kept in the operating tray. After fixing the lizard, a small longitudinal incision was made in the middle of the thorax (1cm). The rib cage was cut open right from the middle to expose the viscera. The thorax was opened to expose the heart. The pericardium was removed. Fine syringe of the perfusion set was inserted in the aorta through the posterior part of the ventricle. First of all 50 ml of physiological saline (0.75%) was allowed to pass through the aorta to the entire body, lower part of the ventricle was cut and blood was allowed to release. The whole blood of the body was replaced by physiological saline. One hundred ml. of fixative (10% formalin) was allowed to perfuse through the heart in continuation with saline. Precaution was taken to avoid the clotting of the blood which actually leads to incomplete perfusion. After the perfusion of the fixative, the animal become totally stretched. Following perfusion for about 15 minutes, the whole brain and spinal cord were dissected out and post fixed in the perfusion fluid at 4°C for twenty four hours. The brain and spinal cord were cut at 40 µm thick on AO HistoSTAT

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microtome at -20°C . The serial sections were put in section collecting trays containing 2 to 10% formaldehyde solution. For maintaining the serial orders only 5 sections were placed in each bin of the tray. The sections were processed with Eager's method (1970).

Perfusion

This method is conventional technique for preserving the whole animal body by pumping the fixative through the heart in to the whole body, via vascular system. The perfusion is performed by a simple infusion set. This technique works on the gravity flow principle. The perfusion bottle was kept three feet above to the operating table. The infusion set comprises to ordinary infusion set, a bottle with lid having two outlets, in one of them infusion needle was inserted and in other normal injection needle was inserted to avoid air lock. The infusion set comprises of plastic tube, an air column on both side, needle and a stopper.

RESULTS

The pituitary (PIT) (hypophysis) of Indian house wall lizard *H. flaviviridis* is well developed. It is posterior most part of the thalamencephalon. This is situated downwardly to the median eminence. It extends medio-laterally in tapering form. Pituitary (PIT) in presently studied *Hemidactylus flaviviridis* is well discriminated. Hypophysis consists of mainly two portions like neurohypophysis and adenohypophysis. The neurohypophysis (caudal pituitary) is formed of neural lobe (NL). The adenohypophysis (anterior pituitary) comprises of pars tuberalis (PT), pars intermedia (PI) and pars distalis (PAD) (Figs.1,2,3A&B).

In addition to the hypophysis, the following masses of cells/structures are observed together it in the caudal most part of the thalamencephalon in the presently studied *H. flaviviridis* (Figs.1,2,3A and B).

Tectum mesencephali (TM)

This is situated dorso-laterally. It is almost laterally U- shaped elevation dorso-laterally on the both sides dorsally to nucleus geniculatus pretectalis (GP) and nucleus entopeduncularis posterior (ENP).

Third ventricle (V-III)

It is located in the middle part of both nucleus hypothalamicus periventricularis (HPE). This is called as diocoel. It is a small cavity of diencephalon.

Nucleus hypothalamicus periventricularis (HPE)

This is situated medially to the third ventricle (V-III). It extend dorso-ventrally with tapering arrangement. This is larger in size. The neurons of it are small to medium in size.

Nucleus geniculatus pretectalis (GP)

It is demarcated downwardly to tectum mesencephali (TM) and dorsally to the nucleus entopeduncularis posterior (ENP). This is spherical in shape. The cells are small to medium in size.

Nucleus entopeduncularis posterior (ENP)

This is depicted ventrally to the nucleus geniculatus pretectalis (GP). It is almost spherical in shape. The cells are densely packed and small to medium in size.

Area lateralis hypothalami (ALH)

It is the area just below the nucleus entopeduncularis posterior (ENP), latero-dorsally to nucleus hypothalamicus ventralis (VH) and ventro- laterally to nucleus geniculatus pretectalis (GP).

Nucleus hypothalamicus ventralis (VH)

This is located dorso-laterally to the pituitary (PIT), ventro-laterally to the area lateralis hypothalami (ALH) and ventro-laterally to the third ventricle (V-III).

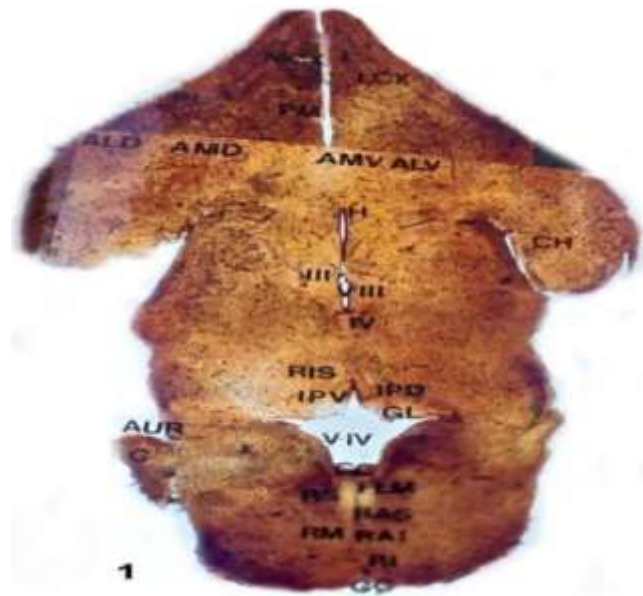


Figure 1

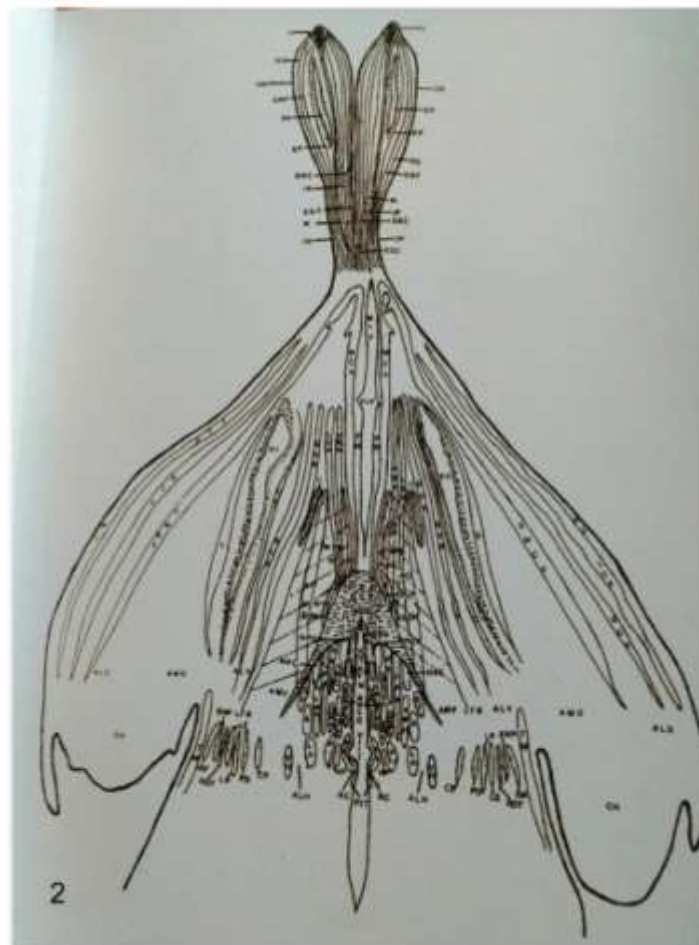


Figure 2

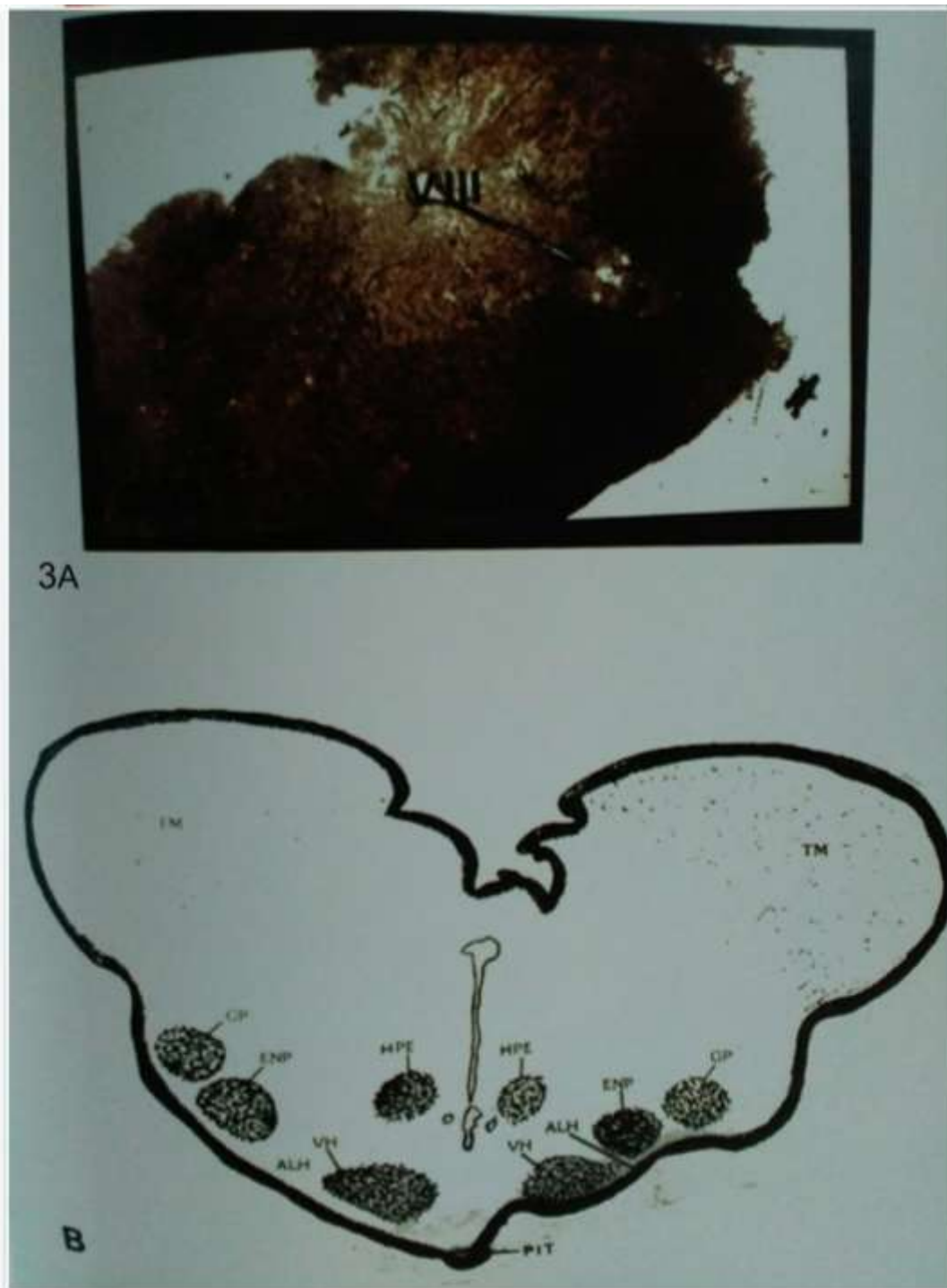


Figure 3A-B

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DISCUSSION

The wall lizard possesses well developed pituitary (hypophysis). It is posterior most part of thalamencephalon (diencephalon). This is situated downwardly to the median eminence. It extends medio-laterally in tapering form. Pituitary in presently studied *Hemidactylus flaviviridis* is well discriminated. This comprises of mainly two portions like neurohypophysis and adenohypophysis. The neurohypophysis (posterior pituitary) is composed of neural lobe (NL). The adenohypophysis (anterior pituitary) is formed of pars tuberalis (PT), pars intermedia (PI) and pars distalis (PAD).

Although the present neuroanatomical observations appear to support a hypothesis of Etkin (1941) and Etkin (1962) that in tadpole and frog. In lizard (Gesel and Callard, 1972), Indian wall lizard (Haider and Sathyanesan, 1974), aves (Oksche and Farner, 1974), snake (Philibert and Kamemoto, 1965), frog (Prasada Rao, Sato and Ueck, 1997) and lizard (Zaloglu, 1973), it has been observed that is composed of mainly two parts neurohypophysis and adenohypophysis. The neurohypophysis (posterior pituitary) is formed of neural lobe (NL). The adenohypophysis (anterior pituitary) is made up of pars tuberalis (PT), pars intermedia (PI) and pars distalis (PAD).

In addition to pituitary, few masses of cells/structures are observed together it in the posterior most portion of the diencephalon in the presently studied *H. flaviviridis*. These are as tectum mesencephali (TM), third ventricle (V-III), nucleus hypothalamicus periventricularis (HPE), nucleus geniculatus pretectalis (GP), nucleus entopeduncularis posterior (ENP), area lateralis hypothalami (ALH) and nucleus hypothalamicus ventralis (VH).

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