STEREOTAXIC APPARATUS FOR FROG BRAIN

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The stereotaxic apparatus, designed for the studies on brain function in human beings (19), buffalo (13), goat (21), dog (2, 3, 12), cat (1, 7, 14), rabbit (17) and rat (10, 20) have greatly enriched our knowledge in neurophysiology.

Although several studies have been made on the histology of the central nervous system (CNS) in anurans (4, 5, 6, 8, 11, 22), frog is still not being used widely by the neurophysiologists. There are obviously many advantages of using this amphibian as an experimental animal such as the easy maintenance in the laboratory throughout the year and the extreme amenability of its CNS to the experimental procedures. In recent years, we have been interested in several studies involving the neural mechanisms of hunger and satiety for which we have made use of frog (15, 16, 18). During the course of these studies, it was felt that a simple apparatus and method for stereotaxic localisation of the structures in CNS of frog would greatly facilitate such studies. Atlas of the frog's brain published by Kemali and Braithenber (9) has given further impetus to this attempt of designing a stereotaxic apparatus for frog brain. This communication describes such an apparatus.

THE PRINCIPLE.

In the absence of a well defined head region, the conventional principles that govern a stereotaxic apparatus for the mammalian head can not be relied upon in the case of frog. Hence the question of using ear pins to orientate and stabilize the skull does not arise. The instrument, described below provides for fixing the frog in such a way that the brain-stem longitudinally schematic as it is (Fig. 1) lies perpendicular to the electrode from above. The posterior meeting point of optic lobes in midline seen through the translucent dura is taken as the 0 point. Electrode movements in anteroposterior, lateral or in vertical dimensions with reference to this 0 point are expressed in millimetres.

DETAILS OF CONSTRUCTION:

Mild steel, wood and a good micromanipulator are essential materials. As is shown in the diagram (Fig. 2) the device consists of a heavy metal base (13x10") on which a pre-aligned wooden board (9.5x4") is mounted. There is a vertical metal carrier fixed to the anterior side of the metal base. This vertical carrier holds a horizontal plate. These vertical and hori-
The micromanipulator with movement capability in three planes is fixed on the metal frame at right angles to the length of the wooden board. The wooden board has shallow grooves, cut at a gradient on the surface and leading to an outlet provided at the posterior end. This helps in draining the solutions that might be used during the experimentation.
Fig. 2: Frog — brain in stereotaxic coordinates.
A-Anterior & P-Posterior to the stereotaxic zero in millimeters.

PROCEDURE TO ARRIVE AT 0 POINT:

After removing the skin, the skull is chipped off with a driller head, held laterally leaving only the dura, when the inner segments of the brain can be seen. The posterior meeting point of the optic lobes in midline is taken as the 0 point. To make sure of the same, a few more guidelines can be relied upon. By means of a needle fixed in the electrode holder of the micro-manipulator, the distance between the junctions of the upper and lower jaw on either side i.e., the interquadrate distance can be measured. The midline is equidistant from the two quadrates. After fixing the midline this way, the electrode can be moved posteriorly towards the meeting point of the optic lobes and the ‘0’ position.

CONCLUSIONS

We have used frog both male and female ranging in the weight between 55-65 g. Although the weight range of adult frog is 25-40 g; in our study, we found the younger on the group and the response more sensitive. The dimensions of this group, however, are different from those of older groups. Further study is required to modify the same to any size group. The fasciculus solitarius can be used as a focus of early responses in auditory pathway in frog.
The weight range of adult frog is 100-110 g as we were primarily interested in the neurophysiological study, we found the younger ones more suitable for two reasons. Bleeding was much less in this group and the response more marked. Hence the device, described above mostly conforms to the dimensions of this group. However, it is hoped that it would not be difficult to adapt and modify the same to any size group. Fig. 3 indicates the coordinates in the A-P plane, where the fasciculus solitarius can be seen in different weight ranges.

![Graph showing position of fasciculus solitarius in different weight groups of frogs.]

**REFERENCES**

SHORT COMMUNICATION

EFFECTS OF OXYGEN INHALATION

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Summary: The effect of 100% oxygen inhalation were studied in male subjects, during cold pressor tests. The cardiovasucular system to the application of oxygen at atmospheric pressure showed a slight decrease in heart rate.

Key words: cold pressor test, oxygen, cardiovascular system

Blood pressures and heart rates are generally considered to be unaffected by inhalation of oxygen at atmospheric pressure. However, during cold pressor tests, a slight decrease in heart rate was observed.

The subjects were selected from male subjects before, during and after removal of the hand, and then reclined quietly for 30 min. Subjects were selected from a group of 10 patients. Air or 100% oxygen, introduced through the nose by a special three-way inlet valve, was observed.

Control determinations were obtained. Following right hand was immersed in ice water, blood pressures were determined during the test, and after removal of the hand.