

QUANTITATIVE ESTIMATION OF ISLET TISSUE IN ECHIDNAS

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SYNOPSIS

The Australian spiny ant-eater, a prototherian mammal, lives on a diet rich in fat. The islet tissue of the pancreas, was sectioned and stained and projected for linear measurement using a projection apparatus. The mean observation, mean percentage and standard error calculated. The observed accuracy obtained. Thus the mean estimate of islet tissue was obtained. An observed accuracy of less than 5 showed that the linear distance scanned was sufficient.

Six such animals, both male and female, and the regions of head, neck, body and tail individually estimated.

Results revealed that a fairly uniform disposition of islet tissue was present, in both sexes, and individual regions.

INTRODUCTION

The Australian spiny ant-eater, a prototherian mammal, lives on a diet rich in fat. The feeding habits of the echidna consist of open mounds of meat ant at a time when virgin queens are present. Queens contain a high proportion of fat. The fat rich and energy rich diet which they obtain from these ants is important to echidnas at the time they are emerging from winter hibernation.

MATERIALS AND METHODS

Six echidnas, with an equal male and female distribution, were weighed and then anaesthetised with 180 mgms intraperitoneal nebutal. The pancreas was isolated and removed and individual regions fixed in Bouin's solution. The tissue was embedded, sectioned and stained with haemotoxylin and eosin. Using a projection apparatus, the section was projected on a paper with measured linear lines at intervals of a centimetre. A linear measurement was obtained of the islet tissue along these projected lines. 500 different fields of the pancreas were done and islet tissue estimated in all of these fields. The different regions, namely head, neck, body and tail of the series of six animals was systematically done.

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RESULTS

Echidna 6 (Head)

Total observations	—	94.9	
Mean	—	0.1898	
Total percentage	—	47.0	
Mean percentage	—	0.094	
Standard Error	—		$\frac{Ex^2 - (Ex)^2}{N}$
			$= \frac{469.45 - 18.012}{249500}$
			$= 0.0084$
Observed Accuracy	=	$\frac{0084 \times 100}{0.1898}$	
			$= 4.47$

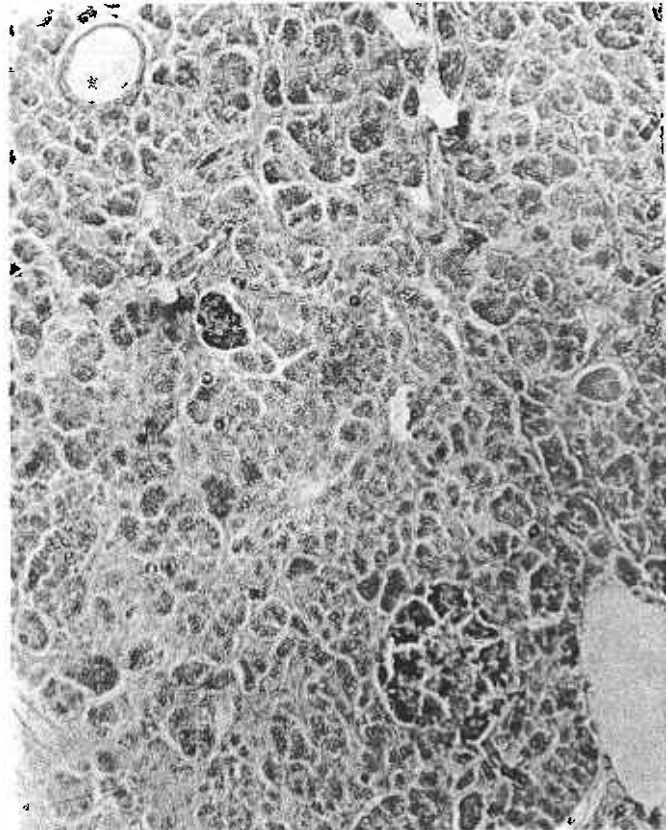
$$\frac{\text{Total distance scanned}}{\text{Required distance to be scanned}} = \frac{(\% \text{ Desired accuracy})^2}{(\% \text{ Observed accuracy})^2}$$

$$\frac{99600}{19900.97} = \frac{25}{19.980}$$

Desired accuracy 5

Thus, the distance to be scanned for a desired accuracy of 5 is correct.

ECHIDNA	HEAD	NECK	BODY	TAIL
E. I	0.4036	0.5583	0.3618	0.2226
E. II	0.4672	0.7152	0.5264	0.5976
E. III	0.3386	0.1688	0.3464	0.2228
E. IV	0.2218	0.1514	0.1936	0.1798
E. V	0.1120	0.1966	0.1548	0.1490
E. VI	0.1898	0.2014	0.2910	0.2446



DISCUSSION

The Australian ant-eater, a prototherian mammal, lives on a diet rich in fat. A quantitative estimation of islet tissue does not show any regional preponderance. This can be explained by the fact that the diet of the echidna is predominantly a fat diet. The study has revealed a uniform distribution of islet tissue in echidnas.

A comparative study of the distribution of islet tissue is to be undertaken, for investigations as to the pattern of distribution in relation to the dietary pattern of metatherian and eatherian members of the vertebrates.

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