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## A SERENDIPITOUS AGE ESTIMATION OF A LIZARD, *TILIQUA RUGOSA* (LACERTILIA: SCINCIDAE).

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## SUMMARY

A chance finding of compacted plugs of sloughed skin layers in the external ear canals of a *T. rugosa* specimen, enabled the minimum age of the animal to be estimated at twenty years.

## INTRODUCTION

The bobtail, *Tiliqua rugosa* (Gray, 1825) has for some time been a popular animal for both physiological and ecological studies since it is large, docile and is easily found in a wide range of habitats across most of temperate Australia (Cogger, 1979). Although aspects of its natural history are emerging (Bull, 1978; Satrawaha and Bull, 1981), little is known of its longevity, a critical factor in the adaptive strategy of any species. Through chance we have been able to estimate the age of one large male at a minimum of twenty years. This was predicted in Bustard's (1970) observation that *T. rugosa* has a potential for long life span in view of the low reproductive rate of commonly two young per year. Bustard's observation is substantiated if one assumes the species to be K-selected as reviewed and discussed by Congdon et al. (1982), pp. 241-242.

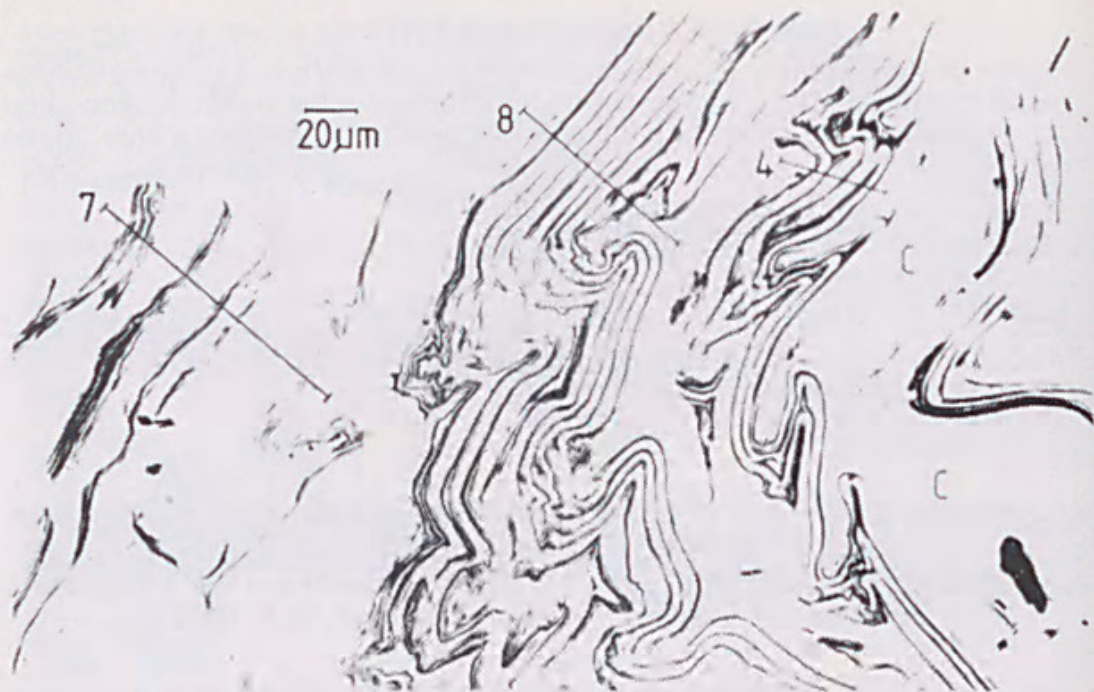
## METHODS AND RESULTS

In the course of our work on the auditory physiology of *T. rugosa*, the external ear canals were routinely cleared of parasites and any other obstructions. Commonly, a few layers of previously sloughed skin remained in the external auditory meatus. These were in the shape of a sock, the expanded end being a cast of the expansion of the external ear canal proximal to the tympanum. We were surprised to find one animal with both ears completely blocked by compacted skin layers. Once these plugs had been removed, it was obvious that the animal was unusual in that the diameter of the external ear canal was very small in relation to the space next to the tympanum, thus sloughed skin could not have been removed naturally unless it had disintegrated. One of the plugs was examined under a dissecting microscope and approximately fourteen distinct layers were counted before the individual layers began to crumble. The remaining plug was wax embedded, sectioned in 8  $\mu$ m slices, mounted and stained with toluidine blue. Examination of the layers revealed differential stain affinities within each layer of skin. Pale green sub-layers that appeared as a light grey in the outer layers in Fig. 1 were repeated in each skin layer and aided in identifying the individual layers of skin. Fig. 1 is a photographic montage of one section where all layers could be counted. However, we had to examine serial sections before and after that shown in Fig. 1 to confirm the continuity of layers. In all, 19 layers were counted.

## DISCUSSION

Over the previous four years we have held up to thirty animals at a time in open pens. These have regularly sloughed skin in mid to late summer and have produced live progeny in early autumn. The reproductive pattern has also been observed by Bourne (1980) and the sloughing cycle by Bull (1978). Bamford (1980) observed that the young born in autumn first shed their skin in the following summer. The plugs were removed from the animal in question in





**Figure 1.** A photographic montage of one section of a compacted skin layer plug, retrieved from the auditoty meatus, that contained all layers that were counted. The centre of the plug (C) is indicated and the layers are grouped by lines at right angles to the layers. The numbers denote the count of layers in each group. Differential stain affinities in each layer made definition of each layer easier. The lighter green stain that was repeated in each layer can be seen as a light grey between the outer layers.

October 1981 and it subsequently sloughed its skin in February 1982. Assuming that all skin layers shed since birth had been retained in the plugs and that it had sloughed its skin once per year, this would have given a minimum age estimate of 20 years in 1982. The weight of the animal varied between 535 and 617 grams for the year it was in captivity and it had a snout to vent length of 310 mm. Although the animal was a large specimen, we have recorded males weighing up to 830 grams (it is not unusual for pregnant females to exceed 700 grams). If these animals grow throughout life (Porter, 1972) it would be reasonable to assume the larger animals to be well in excess of twenty years, since growth rate slows with age (see review by Andrews, 1982, pp. 277-280).

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