

### Short Communication

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## AN UNUSUAL TAIL REGENERATION IN AGAMA

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Fragility of tail is very common in many lizards which are blessed with the power of regeneration. However, the regenerated tail does not appear as a complete organ. The vertebrae do not reproduce but in their place a new segmented rod grows; new muscles are acquired but the scales which cover the new tail never exactly resemble the old one.

Muscle regeneration can take place either as a part of an epimorphic organ [1, 2] or independently as tissue regeneration in the otherwise non-regenerating system [3-6].

On the subject of tail regeneration much has been described in geckoes [6, 7] and some other lizard but very little is known about lizards belonging to genus *Agama*. The author in his collection of *Agama* has noticed this phenomenon in many species where distal part of the tail regenerated. However, a bifurcated tail was never observed during the studies of the genus *Agama*. The present report shows (Fig. 1) this unusual regeneration in *Agama tuberculata* collected from Domel, Hazara Division of NWFP, Pakistan. Observation of the tail reveals that new generated part does not resemble the old one (Fig. 2). It is suggested that the lizard might have met an accident and received some injury on the side of the tail as a result of which a new part of tail budded even though the broken part was not completely shed off.

Muscle regeneration in lizards following injury follows a typical pattern. Briefly, there is firstly a phase of degeneration of most of the original muscle fibres. This is followed by the appearance of a population of a myoblastic cells which then fuse to form multinucleate strap like myotubes within which then differentiate the contractile apparatus or the myofibrils [8]. The cellular origin of myoblasts and the factors which control the differentiation are very poorly known. However, three hypotheses have been put forth regarding the origin of myoblasts within the regenerate [9-15].

It is evident on the basis of present observation that shedding of tail is not indispensable for the regeneration of



Fig. 1. An unusual tail regeneration in *Agama tuberculata* Grey.

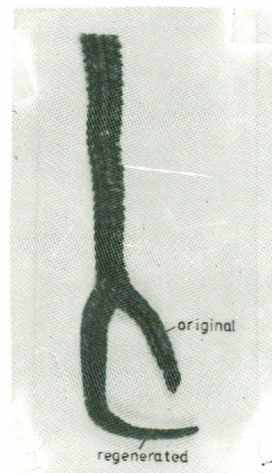


Fig. 2. P.M.N.H. 0267 showing difference in scales of regenerated and original tail.

tail. Merely, trauma or injury in the tail region can initiate the process of regeneration and the portion of the original tail distal to the injury may also persist.

**Key words:** Reptilia, *Agama*, Tail regeneration.

## REFERENCES

1. S.B. Simpson, *Regeneration in Animals and Related Problems* (ed. V. Kiaritsis and H.A.L. Trampusch, 1965) pp. 431-443.
2. S.A. Mufti, *Pakistan J. Zool.*, **7**, 15 (1973).
3. L.G. Clark, *J. Anat.*, **80**, 25 (1946).
4. G.C. Godman, *J. Morph.*, **100**, 27 (1957).
5. B.M. Carlson, *J. Morph.*, **125**, 447 (1968).
6. S.A. Mufti and M. Munir, *Biologia*, **19**, 183 (1973).
7. S.A. Mufti and J. Iqbal, *Pakistan J. Zool.*, **7**, 15 (1975).
8. S.A. Mufti and S. Mahmood, *Pakistan J. Zool.*, **8**(1), 85 (1976).
9. E.D. Hay, *Develop. Biol.*, **1**, 555 (1959).
10. T.L. Lentz, *Am. J. Anat.*, **124**, 447 (1969).
11. M. Renkiz, *Lab. Invest.*, **20**, 253 (1969).
12. A. Manro, *J. Biophys. Biochem. Cytol.*, **9**, 493 (1961).
13. J.C.T. Church., *J. Anat.*, **105**, 419 (1969).
14. R.J. Przybylski and J.M. Blumberg, *Lab. Invest.*, **15**, 836 (1966).
15. S.A. Shafique, M.A. Gorycki and A.T. Milhorat, *Neurology*, **17**, 567 (1967).