

References

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NOTES

Productivity and energetics of giant tortoises on Aldabra, a reappraisal of existing data.

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The wild Aldabran giant tortoises, *Dipsochelys dussumieri* (Gray, 1834), have been studied in considerable detail. Much of the data collected has been combined into models and analyses of ecological and physiological processes. Data on food consumption, digestive efficiency and reproduction have been particularly useful in furthering our understanding of the ecology of this population. However, re-examination of one analysis has revealed a number of short-comings in both the data and the analysis. These are reappraised and new conclusions suggested below.

The energetics of digestion were used to predict productivity patterns on Aldabra by combining curves of size specific assimilation efficiency and respiration to provide a predictive production curve (Hamilton & Coe 1982). The published study found a marked difference between the predictive curve and real production values, with higher than predicted production in both small and large tortoises. These differences were suggested to result from errors in the assumption used to model the predictive curve, namely the linear change in consumption rates with only a crude seasonal aspect and the laboratory origins of the respiration rates.

The origins of the respiration data may affect the precise values but appear to be sufficiently robust to determine a reliable pattern (Hughes *et al.* 1971) which is all that is needed in this instance. In contrast the assimilation curve is derived from statistically non-significant regressions (Hamilton & Coe 1982). These data are insufficient to determine a true curve and more plausible patterns can be proposed.

As the true values of production have been calculated separately (Coe *et al.* 1979) it

is possible to evaluate the error in the assimilation curve. If the assimilation curve is derived from the difference between the actual curves for respiration and production a radically different pattern is obtained. In this case assimilation is high in hatchling, decreasing rapidly in juveniles with the rate of decrease slowing in large animals (Fig. 1). For this to occur hatchling and small juveniles would either have to have adaptations improving digestive efficiency or would be feeding on more easily digested, more nutritious plants than older tortoises.

The suggestion that hatchlings feed on more easily digested and/or more nutritious plants is in accordance with known feeding patterns; small juveniles feed on the herbs in mosaic rock whilst larger tortoises are restricted to the high cellulose containing grasses (Grubb 1971). The rapid decrease in the 2-7kg range apparent in Fig. 1 may be due to small tortoises making the switch from the nutritious mosaic rock diet to the open habitat diet. These tortoises would have straight lengths of approximately 20-30cm and would be expected to be 4-8 years old (Grubb 1971). The holes in mosaic rock that young tortoises feed in support a wide range of herbs and grasses, of which *Boerhavia crispifolia*, *Evolvulus alsinoides*, *Hedyotis prolifera*, *Hypoestes aldabrensis*, *Lagrezia oligomeroides*, *Phyllanthus maderaspatensis*, *Ruellia monanthos* and *Sida pusilla* are the most important in the tortoise diet (Grubb 1971). Chemical composition of Aldabran plants is unknown but confamilial species from the granitic Seychelles have relatively high protein levels (11.3-16.9%) and variable calcium to phosphorus ratios (1.0-4.0) (unpublished data from Acanthaceae and Convolvulaceae). Adult diet is dominated by grasses, data from the granitic islands indicate that these have lower values for protein and calcium:phosphorus (10.9% and 1.7 respectively). This supports the suggestion that the most nutritious diet is largely confined to the mosaic crevices from which the larger tortoises are excluded, giving rise to the productivity patterns described above.

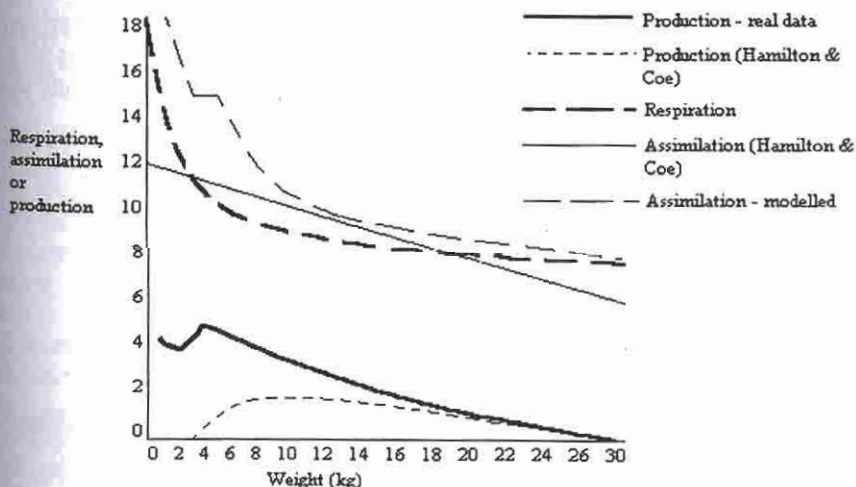


Fig 1. Energetic curves for wild Aldabran tortoises

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NOTES

Vascular wilt in takamaka (*Calophyllum inophyllum*) and the bark beetle *Cryphalus trypanus*

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A recent study of the vascular wilt fungus *Verticillium calophylli* (Wiehe, 1949) (now considered to be in the genus *Leptographium*) infecting takamaka trees *Calophyllum inophyllum* L. in Seychelles identified the bark beetle *Cryphalus trypanus* Sampson, 1914 (Coleoptera: Scolytidae) as a vector of the pathogen (Wainhouse *et al.* 1998).

The beetle breeds in takamaka branches and is abundant in trees infected with vascular wilt, burrowing into leaf petiole scars and cut branches. The vascular wilt fungus was cultured from beetles collected from infected trees, identifying *C. trypanus* as the likely vector of the pathogen in Seychelles (Wainhouse *et al.* 1998).

C. trypanus is endemic to Seychelles (Beaver 1987) and has been recorded from Mahé, Silhouette and Marianne (Sampson 1914). It has previously been recorded breeding only in *Northea hornei* (M.M. Hartog) Pierre (Sampson 1914; Beaver 1987) 300m above sea level.

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