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Gadgil M & Bossert W H. Life historical consequences of natural selection. *Amer. Naturalist* **104**:1-24, 1970.
[Biological Laboratories and Division of Engineering and Applied Physics, Harvard University, Cambridge, MA]

In this paper, we modeled life-history processes, assuming that natural selection would so adjust the proportion of resources allocated to reproduction at every stage as to maximize genetic fitness. We generated predictions on reproductive effort in relation to age, growth potential, survivorship schedules, and so on. [The *SCI*® indicates that this paper has been cited in over 335 publications since 1970.]

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The late 1960s was an exciting time for young ecologists fired with an enthusiasm for moving ecology from its natural history phase into a rigorous predictive science. This movement owed a great deal to the grand old man of ecology, G.E. Hutchinson, and his most outstanding student, Robert MacArthur. E.O. Wilson at Harvard was a friend of MacArthur and was working with him on the theory of island biogeography. As an Indian, I had been deeply impressed by J.B.S. Haldane, one of the fathers of population genetics,[1] and under Wilson's influence was quickly drawn to this vigorous new school arising out of a fusion of population genetics and ecology.

For my master's dissertation in zoology at Bombay University, I worked on the life history of fish and as a consequence had become fascinated by the whole question of what molds mortality, growth, and fertility schedules of animals. At this juncture, I encountered "A general theory of clutch size" by Martin Cody.[2] This paper suggested how the problem of life-history strategy could be posed as one of resource allocation. From this sprang my proposal for doctoral research at Harvard. When I first outlined my proposal, Ernst Mayr gravely advised me instead to look at the polyandrous jacanas in the wetlands of India. But I persisted. With patient coaching by William Bossert, my guide, and Sulochana, my wife, then a graduate student in applied mathematics at Harvard, I taught myself enough mathematics and computing to pose and offer some interesting solutions to the problem of life-history strategies as a multistage resource-allocation problem. We came up with several interesting results. One result was a prediction that reproductive effort would increase with the level of density-independent mortality to which the organism was subject. This prediction was tested the next year through a comparative study of goldenrods and dandelions by Solbrig and me.[3] We also showed how the form of dependence of life-history parameters on investment in reproductive effort can lead to either repeated or a single big-bang breeding. This prediction was neatly verified three years later in a comparative study of yuccas and agaves by Schaffer and me.[4] Several years later, Prasad and I applied these ideas to the life histories of bamboos.[5] Our paper was evidently becoming a part of an important new paradigm of generating testable predictions on the basis of evolutionary arguments.

The paper was amongst the earliest systematic expositions of the theory of life-history strategies and has continued to evoke a great deal of interest since it was published 15 years ago. An excellent modern review of the topic is available in the form of a monograph by Charlesworth.[6]

1. **Haldane J B S.** *The causes of evolution.* Ithaca, NY: Cornell University Press, 1966. 234 p.
2. **Cody M L.** A general theory of clutch size. *Evolution* **20**:174-84, 1966. [See also: **Cody M L.** Citation Classic. *Current Contents/Agriculture, Biology & Environmental Sciences* **12**(23):14, 8 June 1981.]
3. **Gadgil M & Solbrig O T.** The concept of *r*- and *K*-selection: evidence from wild flowers and some theoretical considerations. *Amer. Naturalist* **106**:14-31, 1972. (Cited 270 times.)
4. **Schaffer W H & Gadgil M.** Selection for optimal life histories in plants. (Cody M & Diamond J, eds.) *Ecology and evolution of communities.* Cambridge, MA: Harvard University Press, 1975. p. 142-57.
5. **Gadgil M & Prasad S N.** Ecological determinants of life history evolution of two bamboo species of India. *Biotropica* **16**:161-71, 1984.
6. **Charlesworth B.** *Evolution in age-structured populations.* Cambridge, England: Cambridge University Press, 1980. 300 p.

