

E³ (evolution, ecology and ethology) effect on cetacean life history strategies

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Life history strategy is a series event of life from birth to death and is affected by many factors such as phylogeny, ecology, ethology. The objective of this paper is to figure out the factors shaping cetacean life history strategies. Being described by various life history traits (*LHT*), it is a practicable way to estimate animal fitness (growth and feeding) and reproductive optimal allocation. The *LHT* in used are lengths at birth (L_B), weaning (L_W), mature (L_M), asymptotic (L_∞) and age at mature (A_M), longevity (A_∞) as well as periods in gestation (GP), lactation (LP) and calving interval (CI). Cetaceans evolved with two suborder and extant lineages arisen with 14 families and 83 species. Cetaceans are all aquatic lifestyle living in fresh waters, estuarine, coastal, pelagic areas and from sea surface to deep sea as well as from tropical to Artic-Antarctic areas with some migrating between them. Their food items are zooplankton, fish, squid, and other marine mammals. We collect *LHT* from worldwide-published papers and books. We examine these *LHT* individually and collectively with general linear model, factor analysis, and discriminant analysis among phylogenetic taxa. We then regroup evolutionary taxa based upon statistical significance and interpret from ecological/ethological meaning. Our up-to-date summary on Cetaceans' E³ effects (evolution, ecology and ethology) are (a) phylogenetic factor primarily impacts prenatal allocation via morphological and ontogenic constraints; (b) ecological factor impacts both fitness and reproductive allocation via resource availability; and (c) ethological factor impacts reproductive (postnatal) allocation via social system. The scientific contribution of this world class cutting edge research with the aim to publish 7 SCI papers (2 submitted) in top-ranked journals targeted more than 25 impact factors within the next 3 years. These results would offer a feasible way to study E³ effects in biodiversity and be valuable basis for wildlife conservation and management.

Key words: cetacean, whale, dolphin, evolution, ecology, ethology, life history strategy

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