

Skeletal Structure of the Intertidal Bivalve *Donax gouldii* and the Taphonomic Implications for the Fossil Record

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Donax gouldii are bivalves that can be found along sandy beaches in the intertidal zone from southern California through Baja California, ranging in abundance up to 20,000 individuals per m² (Morris et. al., 1980). *D. gouldii* shells sometimes display post-mortem band stripping at varying intervals from the dorsal to ventral margins. Post-mortem modifications result from the shell's susceptibility to a number of factors, including: microarchitectures, mineralogy, and porosity (Kidwell and Bosence, 1991). Chemical and physical processes affecting shell modification are primarily controlled by the environment of deposition. Intertidal zones where *D. gouldii* are found experience high energy with fluctuating periods of desiccation.

The purpose of this study is to inspect post-mortem modification of *D. gouldii* shells in an attempt to determine whether low preservation is due to variation in shell composition or local environmental conditions.

Despite *D. gouldii*'s great abundance, the species has a surprisingly poor fossil record. If shell structure or minor elements vary, which cause the species to be selectively removed from the fossil record, shell composition rather than the environment could be controlling preservation.

Individual shells were powdered and analyzed with XRD, revealing aragonitic composition. Preliminary SEM results on fractured shells indicate increasing porosity and minor elemental changes between the inner and outer shell layers. The abundance of individual shells collected from local beaches that display band stripping are compared statistically with Chi square by holding each individual local beach separately as the expected value and then comparing it to the other four beaches. Chi square results show significant differences between all five beaches in regard to the amount of band stripping observed.