SPECIATION AND DIVERSITY OF CARIBBEAN NEOGENE TO HOLOCENE CHEILOSTOME BRYOZOANS

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Caribbean cheilostomes are a highly diverse component of the tropical American marine benthos with an excellent fossil record. Many workers have tended to lump taxa into morphologically variable, geographically widespread species originating in the Miocene, but recent morphometric and genetic analyses have revealed large suites of cryptic species, barely distinguishable morphologically, within several important genera. Most species in such suites have narrow geographic and stratigraphic ranges. In Stylopoma, for example, canonical discriminant and cluster analyses based on skeletal morphology yielded 19 late Neogene to Holocene species, most of which had been previously classified as S. spongites. Seven species were available for genetic analysis, of which six have been confirmed to differ by protein electrophoresis, either by fixed allele differences or significant genetic distances in sympatry. A combination of cladistic and stratophenetic analysis suggests that the most widely distributed and long-lasting species, which originated early in the Miocene, was ancestor to most or all of the other tropical American Stylopoma species . Despite extensive sampling, five species are narrowly distributed, with all known fossil and viving specimens separated by less than 1000 km, and all but three of the 18 descendant species have been restricted throughout their history to relatively limited parts of the tropical western Atlantic. These patterns are consistent with allopatric speciation of peripheral isolates, only a few of which have achieved wide distributions. Cladogenesis was highly episodic, reaching a peak in Late Miocene time, well before final closure of the Panamanian portal, but after formation of the sill that disrupted oceanic circulation patterns throughout the region.