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SOME CONCHIOLIN DATES FROM COROMANDEL

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The temporal relationship of three Coromandel sites was investigated using the conchiolin dating method (see Schoute-Vanneck, 1960; Anderson, 1973). The sites were: Hot Water Beach N44/69, Opito Beach N40/3, and Slipper Island N49/43 and N49/48.

It was assumed that marine shells consisted of conchiolin and calcium carbonate, and that other constituents were of negligible quantity. Thus the calcium was determined by atomic absorption spectroscopy, this being an easier method than gravimetric determination of the conchiolin. Accurate standardisation of the analysis was not thought necessary as the differences were important, not the absolute amounts. This reflected in the percentage results greater than 100.

Shell species used were Lunella smaragda for all sites and Amphibola crenata for Hot Water Beach layers 4 and 5 as a check. (For information about choice of shells see Anderson, 1973).

Carbon dates exist for Opito Beach layer 4c: 640BP, and for Hot Water Beach layer 4: 329-607BP (Green, 1963, and Leahy, 1974). Loisel's pumice, dated to circa 1300AD, is present in Hot Water Beach layer 5 but not below the upper part of layer 4b or in layer 4c at Opito Beach. Thus, except for Opito Beach layer 4c, the results in Table 1 order the dated layers in their correct order. Layer 4c has a lower CaCO₃ percentage than expected for its C14 date. Slipper Island results are located between Opito Beach layer 3 and Hot Water Beach layers 4 and 5. The Amphibola crenata results confirm the Lunella results for Hot Water Beach layers 4 and 5.

Student's t-tests showed no significant intra-site difference in CaCO₃ percentage for Slipper Island or Opito Beach; so for further analysis pooled results were used.

Hot Water Beach layer 2 was found to have a significantly different percentage than all the other results. For Hot Water Beach layers 4 and 5 and Slipper Island, $p=0.05$, for Opito Beach, $p=0.10$. Statistically we are allowed only to date the Hot Water Beach layer 2 occupation as significantly later than the rest. This is consistent with its archaeological assessment.

Site layer/area	Sample number	Mean %CaCO ₃ ± standard dev.	Pooled mean %CaCO ₃
1. <u>Amphibola crenata</u>			
Hot Water Beach N44/69			
layer 4	5	100.9 ± 7.8	101.2 ± 9.0
layer 5	10	101.3 ± 9.3	
2. <u>Lunella smaragda</u>			
Hot Water Beach N44/69			
layer 2	4	89.3 ± 5.2	100.7 ± 12.5
layer 4	10	100.5 ± 12.8	
layer 5	10	100.9 ± 12.1	
Opito Beach N40/3			
layer 3	5	94.8 ± 12.0	98.6 ± 13.6
layer 4b	4	107.1 ± 15.8	
layer 4c	6	94.9 ± 14.3*	
Slipper Island N49/43			
HB/22	6	97.8 ± 6.0	97.9 ± 6.3
HB/25	6	95.0 ± 5.9	
N49/48			
SB/19a	6	99.1 ± 5.4	
SB/18/1-5	6	99.7 ± 7.8	

Mean calcium carbonate percentages and standard deviations for each site. The pooled means include those layers in a site between which there is no significant difference in %CaCO₃ (p=0.05).

* This value is that obtained when an abnormally high percentage is discarded, and was the one used in all the analyses.

TABLE 1. Results of Analysis.

Conchiolin dating seems to be a useful, if limited (because of small available sample sizes), dating technique for the Coromandel area, especially if other dating methods are available for comparison. When used on sites where large samples are possible, and where several shell species can be analysed simultaneously, it could be a very effective tool.

References

- Anderson, A.J. 1973 The conchiolin dating method. New Zealand Journal of Science, 16:553-558.
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