

Cementing bivalve molluscs of the genus *Chlamys* ('*Hinnites*') in Southern Africa

The bivalve molluscan form genus *Hinnites* has never been recorded from South Africa. A member of the Pectinidae, the young shell closely resembles a regular *Chlamys*. As growth proceeds, however, the right valve becomes fixed to a hard substrate at the umbonal area, and both valves continue to grow, often becoming irregular and superficially oyster-like. The genus is known from the Upper Eocene to Recent, generally living in tropical or warm-temperate waters. (While acknowledging that *Hinnites* is probably a polyphyletic taxon containing a hodge-podge of species, it is used here in a loose sense, to avoid complicated taxonomic issues.) The discovery of two valves of a *Hinnites* species

in a late Pleistocene raised beach at False Bay, Cape Province, prompted a closer look at the occurrence of the genus in Southern Africa.

Material

The raised beach at Mnandi Beach, False Bay, mentioned by Avery,¹ is exposed at about 2 m above present sea-level, in a band about 300 m in length. Hand collecting produced material of the species listed in Table 1. In addition, two *Hinnites* sp. valves were recovered from this horizon. As a result of the *Hinnites* occurrence in False Bay, the South African Museum's collections were scoured for further material (see Fig. 1). A total of six specimens from three localities was found. Two of the localities were fossil sites:

- 1) Klein River, Stanford, Cape Province, 1 specimen (the

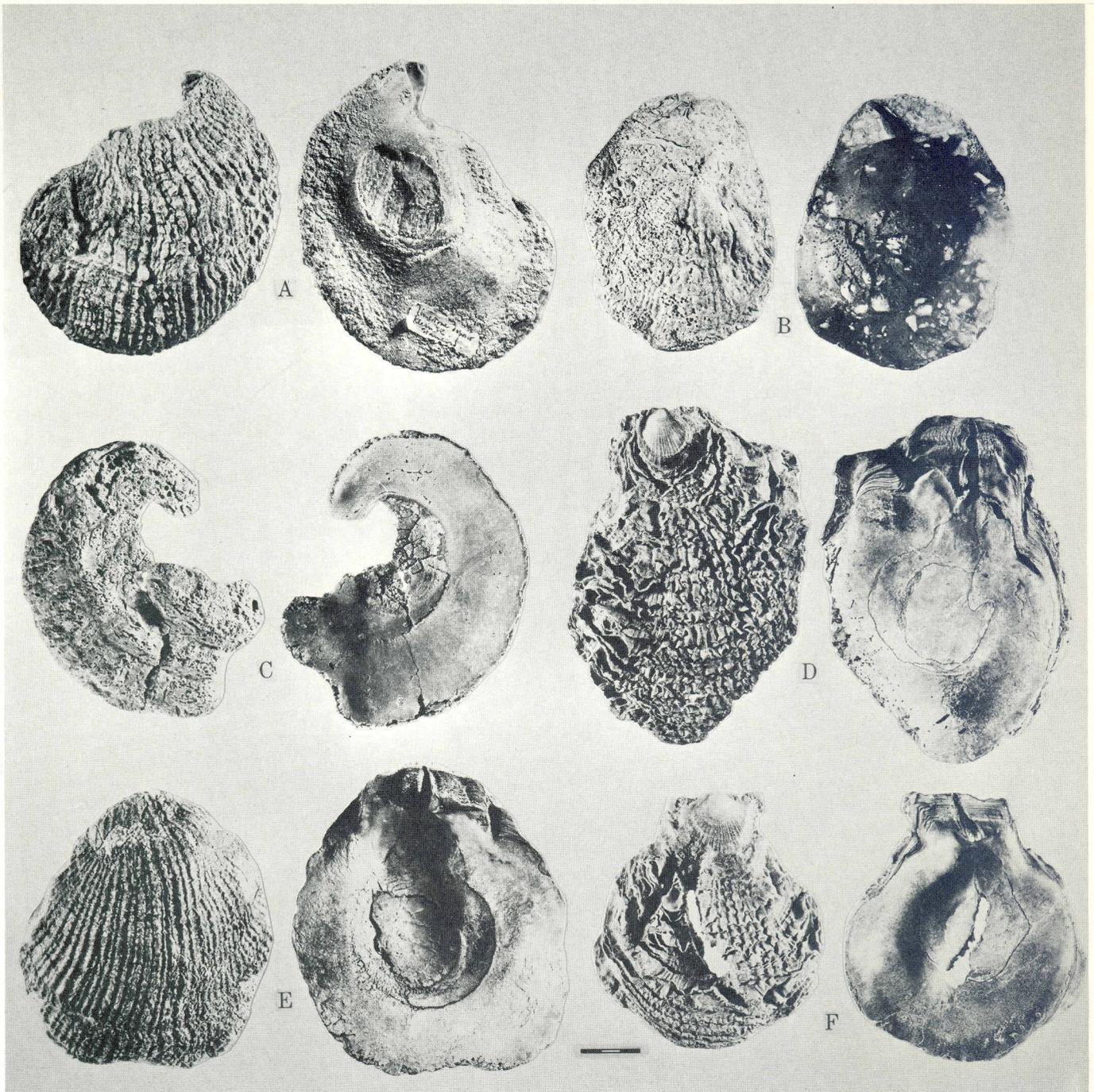


Fig. 1. Outer and inner views of *Hinnites* right valves: A, Stanford; B, C, Mnandi Beach, False Bay; D, E, F, Sandvis, Namibia.

'*Spondylus* sp.' of Barnard²), limestone deposit; SAM-A33794; specimen damaged.

The Stanford specimen, which is pale orange, shows almost no wear, the foliose squamae of the ribs being well preserved.

2) Mnandi Beach, False Bay, Cape Province, 2 m late Pleistocene raised beach, 2 specimens; SAM-PQ-2409a, b; 160 × 115 mm, second specimen damaged; coll. G. Avery and B. Kensley.

The False Bay specimens are very worn, but both show squamose radiating ribs. The outer surfaces of both are bright orange-red. Almost certainly, these specimens underwent considerable wear before being deposited in the beach horizon. The shells in the assemblage include many unworn specimens, e.g. *Donax*, *Dosinia*, *Choromytilus*, but also some species which are represented only by very worn specimens, e.g. the hinge areas of *Scissodesma*, *Ostrea* and *Bullia laevis*.

The two non-fossil records are from Namibia:

3) Sandvis, south of Walvis Bay, 23°20'S, 14°25'E, sand beach, 3 specimens; 135 × 120 mm, 185 × 140 mm, 165 × 155 mm; coll. M.J. Penrith and B. Kensley.

The Sandvis specimens show little wear, having the highly foliose lamellae well preserved. The colour is variable, ranging from orange-red to purple. The internal ligamental pit in one specimen contains remnants of ligamental material. It is probable that these specimens originated somewhere on the southern Angolan or northern Namibian coast.

4) Bosluisbaai, Namibia, sand beach, 21 specimens, USNM 782400, 23-100 mm; coll. B. Kensley.

Most of the Bosluisbaai specimens are very worn and damaged, but three of the smaller valves are well preserved, with remnants of hinge ligament material present.

Discussion

Palaeontology: The form genus *Hinnites* has rarely been men-

Table 1. List of molluscan species obtained from raised beach horizon at Mnandi Beach, False Bay.

Gastropoda

Amalda obtusa (Swainson, 1825)
Argobuccinum pustulosum (Lightfoot, 1786)
Bullia annulata (Lamarck, 1816)
Bullia digitalis (Dillwyn, 1817)
Bullia laevis (Gmelin, 1791)
Crepidula aculeata (Gmelin, 1791)
Crepidula capensis praerugulosa Kilburn and Tankard, 1975
Crepidula porcellana Lamarck, 1801
Cymatium cutaceum africanum (A. Adams, 1854)
Fissurellidea aperta (Sowerby, 1825)
Nucella squamosa (Lamarck, 1816)
Patella barbara Linnaeus, 1758
Phalium zeylanica (Lamarck, 1822)
Turbo cidaris cidaris Gmelin, 1791

Bivalvia

Choromytilus meridionalis (Krauss, 1848)
Donax serra Dillwyn, 1817
Dosinia lupinus orbignyi Dunker, 1845
Glycymeris connollyi Tomlin, 1925
 'Hinnites' sp.
Limaria rotundata (Sowerby, 1843)
Lutraria sp.
Macra glabrata Linnaeus, 1767
Ostrea sp.
Pecten sulcicostatus Sowerby, 1842
Scissodesma spengleri (Linnaeus, 1767)
Tivela compressa (Sowerby, 1851)
Venus verrucosa Linnaeus, 1758

tioned in either recent or fossil molluscan literature in Southern Africa. Live material has never been recorded from South Africa, and the only fossil record is that of Barnard (ref. 2, Fig. 15), of a single valve of '*Spondylus*' sp. from limestone deposits at Stanford, southern Cape coast. Kensley and Penrith³ mention a *Hinnites* sp. washed ashore at Sandvis, Namibia, which bears some resemblance to a juvenile *Hinnites* sp. from Luanda Bay, Angola. This latter was stated⁴ to be very similar to *H. ercolaniana* Cocconi, first recorded from the Miocene of France. Adam⁵ recorded live material of *Chlamys abscondita* (P. Fischer, 1898) [which he decided was a senior synonym of *C. ercolaniana* (Cocconi, 1873)] from Pointe Noire (5°S), Margate Head (7°S), and Punta do Dondo (8°S), on the West African coast. T. Waller (pers. comm.) has expressed the tentative opinion that the Namibian material may represent an undescribed species, while the Cape fossils more closely resemble *C. ercolaniana*. This would be consistent with prevailing sea temperatures. The Cape fossils occur in a faunal suite very similar to that found in the present-day warm-temperate conditions of False Bay. *C. ercolaniana* too occurs in warm-temperate to tropical waters. The Namibian material, on the other hand, while not taken alive, was recorded from areas well within the influence of cold upwelled water associated with the Benguela system.

The list of species obtained from the Mnandi raised beach is quite representative of the sort of shells that would wash ashore today on the False Bay coast. Intertidal and shallow infratidal rocky and sandy shore species are represented. Apart from the *Hinnites* sp, one other species is of particular interest. *Crepidula capensis praerugulosa*, an extinct species, has been recorded from the late Pleistocene at Velddrif, Dwarskersbos, and Saldanha Bay on the west coast,⁶ and Milnerton, Table Bay.⁷

Geology: At the western end of the raised beach horizon at Mnandi Beach a layer of shells showing obvious bedding is overlain by aeolian dune sand. At the eastern end of the exposure,

approaching the cliff-face near Swartklip, the shell-band loses its bedded appearance and is compressed under limestone boulders that have fallen from the cliff-face above. The Mnandi Beach shell bed is here interpreted as a deposit laid down seaward of the swash zone in the upper shoreface environment, probably no more than 1–2 m below mean sea-level. Given the 2 m elevation of the shell bed, this indicates a sea-level at the time of deposition of about 3–4 m above that of the present. How this shell bed related to the succession recorded by Barwis and Tankard⁸ in the Swartklip area is uncertain. However, in places it appears to overlie the laminated calcrite that caps the beachrock unit of the Swartklip succession, and it may therefore postdate this succession. Barwis and Tankard⁸ correlated the Swartklip deposits with a 6–8-m-high sea-level that they believed to be of last (Eemian or Dangamon) interglacial age (isotope substage 5e). Hendey and Cooke⁹ subsequently showed that the 6–8-m-high sea-level in South Africa, and the Swartklip succession, predate the last interglacial and are of late Early Pleistocene age. They went on to indicate that during substage 5e the sea was 3–4 m above its present level. Since this is the sea-level deduced from the Mnandi Beach shell bed, it is accordingly interpreted as a feature dating from substage 5e of the last interglacial. This shell bed is strikingly similar to the raised beach deposit at Milnerton in Table Bay described by Kensley,⁷ which was also dated as last interglacial.

The only other Quaternary high sea-level with which the Mnandi Beach shell bed might have been correlated is that of the mid-Holocene, which was about 1–2 m above present sea-level.⁹ This correlation is discounted partly on the basis of the altimetric inconsistency, and partly because G. Avery (pers. comm.) has obtained a minimum C-14 date of 34 300 B.P. based on shell derived from the bed (National Physical Research Laboratory, Pta-3045), which places it well beyond the Holocene limits.

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B. KENSLEY

Department of Invertebrate Zoology,
 National Museum of Natural History,
 Smithsonian Institution,
 Washington, D.C. 20560, U.S.A.

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