



Figures 42-46. *Balanus wilsoni* sp. n.; (42) group of shells, SDSNH Paratype 04258, SDSNH Locality L-2451, carinorostral length of orifice of left specimen 12 mm; (43) exterior of tergum of young individual showing partially open spur furrow, Paratype LACM 1222, LACM Locality 122, height 4 mm; (44) exterior of tergum of older individual showing partially open spur furrow in apical half, Paratype LACM 1223, LACM Locality 485, height 10 mm; (45) Holotype LACM 1224 (designated by "H") associated with group of *Balanus gregarius* (Conrad), Hypotype lot LACM 1202, LACM Locality 485, length of group 95 mm; (46) sutural edge of radius of lateral plate (basal edge to left), Paratype SDSNH 04259, SDSNH Locality L-2451, height 17 mm.

Africa in having the spur furrow closed only on the scutal side, but older specimens can be distinguished from this and other austral megabalanids with unbeaked terga by their closed spur furrows.

Aside from the major difference observed in the structure of the sutural edges of the radii, *B. wilsoni* can be distinguished from the extant Californian and Mexican megabalanids *B. tintinnabulum californicus* Pilsbry, *B. tintinnabulum coccopoma* Darwin, and *B. tintinnabulum peninsularis* Pilsbry by its smooth, red striped parietes, the absence of an adductor ridge on the scutum, and the presence of well defined depressor muscle crests on the tergum.

Large specimens of *B. wilsoni* were obtained only at the type locality (and at SDSNH L-2451 which represents the same locality), where they were attached to *B. gregarius*. Young adults attributed to this species were collected at LACM Locs. 107 and 122. These differ from larger individuals in having an uncolored sheath and a tergal spur furrow closed on the scutal side only. The half closed nature of the spur furrow can be seen in apical portions of well preserved terga of large specimens from LACM Loc. 485 (Figs. 43-44).

This species is named in honor of Dr. Edward C. Wilson.

Subgenus **Hesperibalanus** Pilsbry, 1916<sup>1</sup>

**Balanus proinus** Woodring, 1950

Figs. 26-32

*Balanus hesperius* Pilsbry, var. Woodring, in Woodring, Stewart, and Richards, 1940, pp. 30, 97.

*Balanus hesperius proinus* Woodring, in Woodring and Bramlette, 1950, p. 92, pl. 14, figs. 11, 15, pl. 16, figs. 1-3, 8-12.

*Occurrence:* LACM Locs. 305, 305C, 323.

*Range:* Pliocene, southern California.

*Remarks:* *Balanus proinus* is represented at the above mentioned localities by complete shells with contained opercular valves and several disarticulated compartmental plates and isolated scuta. Fossil hesperibalanids are common in Cenozoic deposits of the Pacific Coast of North America (Zullo, 1966), and are best distinguished at the specific level on characters of their terga. *Balanus proinus* was originally described as a subspecies of *B. hesperius* Pilsbry, but differs from it and its extant subspecies in the short, broad tergal spur, and is here considered as a distinct species. The scuta of *B. proinus* also differ from those of *B. hesperius* in having a longer basal margin and a less well developed internal callus.

<sup>1</sup>Henry and McLaughlin (1967) have synonymized *Hesperibalanus* with *Solidobalanus* Hoek, 1913.

Besides the type locality and the localities described herein, *B. proinus* has been found in the Early Pliocene Pancho Rico Formation of Salinas Valley, California (UCMP Locs. A-4947, A-7570, unpublished data), the Middle Pliocene Foxen mudstone of the Santa Maria District, and the Late Pliocene San Joaquin Formation of the Kettleman Hills, California (Woodring, in Woodring and Bramlette, 1950, p. 92).

#### Genus *Cetolepas* gen. n.

*Diagnosis:* Coronulines with short, nearly cylindrical body chamber; parietes bearing radial buttresses terminating in T-shaped flanges forming outer wall; buttresses reduced or absent in older individuals; sheath decidedly, but not strongly, grooved transversely, shorter than inner wall; inner surface of radial plate strongly grooved; sutural edges of radii narrow, linear; short horizontal sutural septa extend inwardly and outwardly from central vertical septum of sutural edge; no specialized alar plate or open space between radii and sheath; sutural edge of ala blunt, coarsely denticulate.

*Type Species:* *Cetolepas hertleini* sp. n.

*Remarks:* *Cetolepas* is similar to *Cryptolepas* Dall, but differs in the fainter grooving of the sheath and, most significantly, in the narrow, linear nature of the sutural edge of the radius, which consists of a single, vertical septum from which short, horizontal septa branch alternately on either side. In *Cryptolepas rachianecti* Dall and the fossil *C. murata* Zullo, the grooves of the sheath are deeply incised and the sutural edges of the radii are much broader and consist of a single series of septa that originate on the inner lamella of the radial plate and branch profusely as they pass to the outer half of the sutural edge in a complex pattern of crenulations.

*Cetolepas* differs from *Cetopirus* Ranzani in the possession of a grooved sheath and in the less complex sutural edge of the radius. In *Cetopirus* the completely branched sutural septa originate on the outer lamella of the radial plate and extend basally.

#### *Cetolepas hertleini* sp. n.

Figs. 47-72

*Diagnosis:* Same as for genus.

*Description:* Shell in younger stages of growth low conic, composed of nearly cylindrical body chamber from which T-shaped buttresses radiate to form outer wall surrounding large basal cavities; shell conic in progressively eroded older specimens; buttresses in older specimens reduced to low folds, giving shell the appearance of a short *Tubicinella* Lamarck; body chamber formed entirely by sheath; basal opening of body chamber nearly as large as

orifice; inner margins of radial buttresses usually not projecting below sheath in young conic forms; buttresses bifurcate towards base, ornamented externally by conspicuous, regularly spaced, horizontal ridges cut by longitudinal striae into fine beads; adjacent external flanges of buttresses not articulated or closely appressed; in older stages, flanges more distantly spaced, leaving basal cavities open to exterior; surface of large internal cavities longitudinally ribbed; walls of buttresses composed of an outer lamella with single row of small longitudinal tubes and an inner solid lamella; radii broad in conic forms, narrower and more linear in cylindrical specimens; sutural edges of radii linear, having a single vertical septum from which horizontal septa alternately diverge inwardly and outwardly; spaces between outer row of horizontal septa unfilled, forming single row of tubes in radii; inner row of horizontal septa greatly reduced or wanting in older cylindrical examples; no special alar plate and cavity present inward of radii; alae rest directly on inner surface of radii; sutural edges of alae blunt, coarsely denticulate.

Opercular valves unknown.

*Occurrence and Type Disposition:* LACM Locs. 305 (type locality), 305A, 305C, 319, 485; Holotype LACM 1230; Paratypes LACM 1225-1229; Paratypes CAS 13171-13176.

*Range:* Late Pliocene, San Diego Formation.

*Remarks:* *Cetolepas hertleini* is readily distinguished from species of *Coronula* Lamarck and *Cryptolepas* by the simple, linear nature of the sutural edges of the radii. Older specimens resemble *Tubicinella* in general shell configuration and in the form of the sutural edge, but differ in the plicate, rather than smooth, basal edge, and the blunt and crenulate, rather than sharp and smooth, edges of the alae.

As previously noted (Zullo, 1961) it would appear that the extant species of *Cryptolepas* evolved from a coronulid ancestor similar to *Coronula* (*Cetopirus*) *complanata* (Mörch) through a form resembling the Late Pleistocene species *Cryptolepas murata*. In several respects, *Cetolepas hertleini* gives the appearance of a form that might have been intermediate between *Cetopirus* and *Cryptolepas murata*. However, the radically different sutural edge of the new species indicates that this is not the case. It seems likely that the sutural edge of *Cetolepas hertleini* is homologous with the outer, unbranched part of

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Figures 47-58. Exteriors of compartmental plates of *Cetolepas hertleini* gen. and sp. n., arranged from top left to lower right in increasing age and wear, LACM Locality 305; (47) rostrum, Paratype LACM 1225, height 16 mm; (48) lateral, Paratype CAS 13171, height 10 mm; (49) rostrum, Holotype LACM 1230, height 11 mm; (50) carina, Paratype LACM 1227, height 14 mm; (51) rostrum, Paratype CAS 13172, height 13 mm; (52) lateral, Paratype CAS 13173, height 11 mm; (53) lateral, Paratype LACM 1228, height 12 mm; (54) rostrum, Paratype CAS 13174, height 16 mm; (55) lateral, Paratype LACM 1229, height 11 mm; (56) lateral, Paratype CAS 13175, height 8 mm; (57) lateral, Paratype CAS 13176, height 10 mm; (58) lateral, Paratype LACM 1226, height 10 mm.