

OCCASIONAL PAPERS
OF THE
CALIFORNIA ACADEMY OF SCIENCES

No. 75, 6 pages, 2 tables.

October 22, 1969

Early Records of the Barnacle *Balanus improvisus*
Darwin from the Pacific Coast of North America

By

James T. Carlton and Victor A. Zullo

California Academy of Sciences, San Francisco, California

The previous first record of the
Atlantic barnacle *Amphibalanus*
improvisus on the Pacific coast
was 1939

Examination of mussels
and oysters revealed *A.*
improvisus had been
present as far back as
the 1850s.

TABLE 2. Early records of *Balanus improvisus* on the Pacific Coast (prior to 1939).

Date	Locality	Collector	Material
1853	UCMP 2394, San Francisco Bay	C. de Lange	2, on <i>Mytilus edulis</i> (Linnaeus)
1900	SU 21481, San Mateo, San Francisco Bay	E. E. Smith	1 live, 1 empty shell, on <i>Crassostrea virginica</i>
20 October 1903	CAS 41224, Cooley's Landing, Alviso, Santa Clara County, San Francisco Bay	unknown	2, 1 on <i>Modiolus demissus</i> (Dillwyn)
1910-1915	SU 4651, Redwood City estuary San Francisco Bay	H. Hannibal	4, on <i>Mytilus edulis</i>
3 April 1912	CAS 41202, San Francisco Bay	E. C. Johnston (naturalist, <i>Albatross</i>)	2, on <i>Mytilus edulis</i>
27 November 1912	CAS 41200, <i>Albatross</i> Station D-5812B, south San Francisco Bay, 1 fathom	(see Packard, 1918, p. 207)	common (dead), on <i>Crassostrea virginica</i>
October, 1913	CAS 41201, Alameda, San Francisco Bay	"DSG"	9, on valve of live <i>Ostrea lurida</i> Carpenter



Crassostrea nippona: pre-1889, Japan

Porifera	<i>Cliona</i>	spicules
	Siliceous white	spicules (abundant)
Polychaeta	Serpulidae species A	dried tissue, opercula
	Serpulidae species B	dried tissue, opercula
	Sabellariidae	dried tissue
Bivalvia	<i>Musculus</i> sp.?	
Gastropoda	Vermetidae	tissue
Cirripedia	<i>Balanus trigonus</i>	
	<i>Fistulobalanus</i> sp.?	
Hydrozoa	Unidentified	(abundant)
Bryozoa	Unidentified	multiple colonies
Phaeophyta	Unidentified	thalli
+ sediment under flukes		

At least 13 additional species



Bizen Sannozaki (old county in region of current Nagasaki-Saga Prefectures)

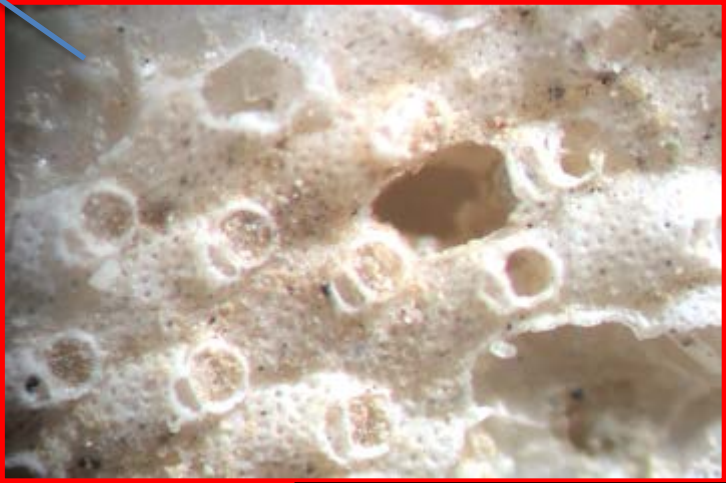
1889, Japan



Crassostrea gigas: pre-1889, Japan

- | | | |
|--------------------------------|-------------------------------------|------------------------|
| Porifera | <i>Cliona</i> | spicules |
| Polychaeta | Serpulidae species A | dried tissue, opercula |
| | Serpulidae species B | dried tissue, opercula |
| | Sabellariidae | dried tissue |
| | Spirorbinae | tissue? |
| Bivalvia | <i>Rupellaria</i> sp.? | paired valves |
| Cirripedia | Unidentified | |
| Bryozoa | Cheilostomata | |
| | Cyclostomata (<i>Tubulipora</i> ?) | |
| Rhodophyta | Corallinales | |
| + good deal of coarse sediment | | |

At least 10 additional species



産地
Owari (old county in region of current Aichi Prefecture)

Crassostrea gigas: pre-1889, Japan



NAME Ba
LOCALITY
aed
COLL.
IDENT. V
ORIG.FIX
NOTES

GROUP 67-1-3-8
PHYLUM ARTHROPODA
TAXON CIRRIPIEDIA:THORACICA:BALANOMORPHA:
FAMILY BALANIDAE
NAME Balanus calidus Pilsbry, 1916
LOCALITY FLORIDA: off "Scyllarides
aequinoctialis"
COLL.
IDENT. V. Zullo 9 Apr 1969
ORIG.FIX
NOTES several spec.

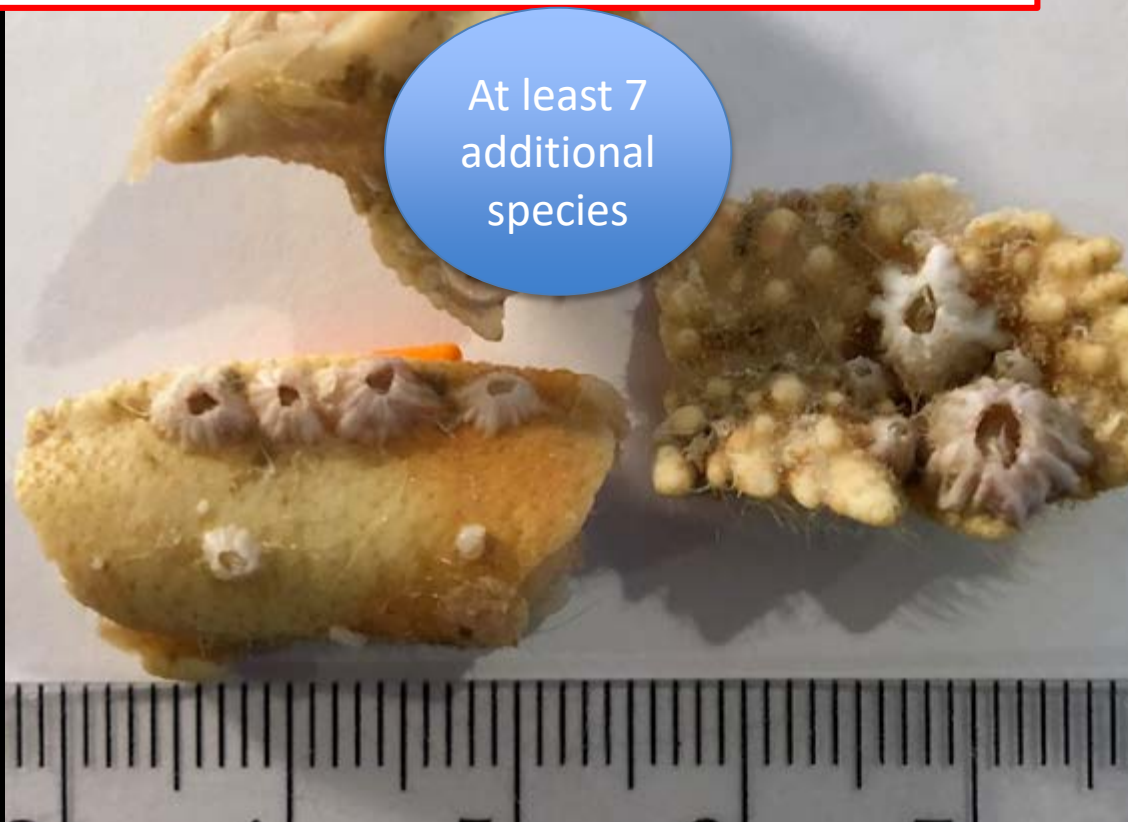
CAT.NO. 094231
ACC.NO. 23869
PRES. 75% Et

CALIFORNIA ACADEMY OF SCIENCES INVERTEBRATE ZOOLOGY

Balanus calidus on fragments of the slipper lobster *Scyllarides aequinoctialis*
Gulf of Mexico, pre-1969

Foraminifera	Unidentified, 2+ species
Polychaeta	Serpulidae sp. A dried tissue, opercula
	Spirorbinae dried tissue
Bivalvia	<i>Hiatella</i> sp. intact, tissue
Cirripedia	<i>Balanus calidus</i> valves + tissue
	<i>Amphibalanus</i> sp. valves + tissue
Bryozoa	Cheilostomata

At least 7 additional species



NAME Ba
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 COLL.
 IDENT. V
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***Balanus calidus* on fragments of the slipper lobster *Scyllarides aequinoctialis*
 Gulf of Mexico, pre-1969**

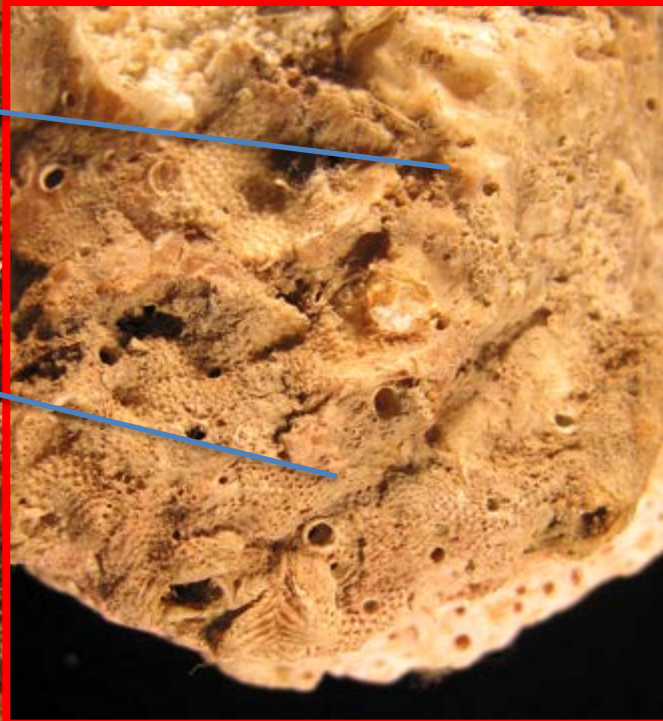


U. S. Nat. Mus. Washington, D. C.
Ostrea
edulis

Ostrea edulis
USNM 196382
Oxwich Bay, Wales, 1862 (J. G. Jeffreys)

Foraminifera	Unidentified, 2+ species
Porifera	2 species
Hydrozoa	Unidentified
Polychaeta	Sabellariidae Serpulidae
Bivalvia	Mytilidae Veneridae? (nestling, did not excavate)
Cirripedia	Unidentified + cyprids
Bryozoa	Cheilostomata
Phaeophyta	Unidentified, leafy
Rhodophyta	Corallinales

At least 13 additional species



Ostrea edulis
USNM 196382
Oxwich Bay, Wales, 1862 (J. G. Jeffreys)



Bivalves embedded in large mat of **hydroids** (with ovicells)

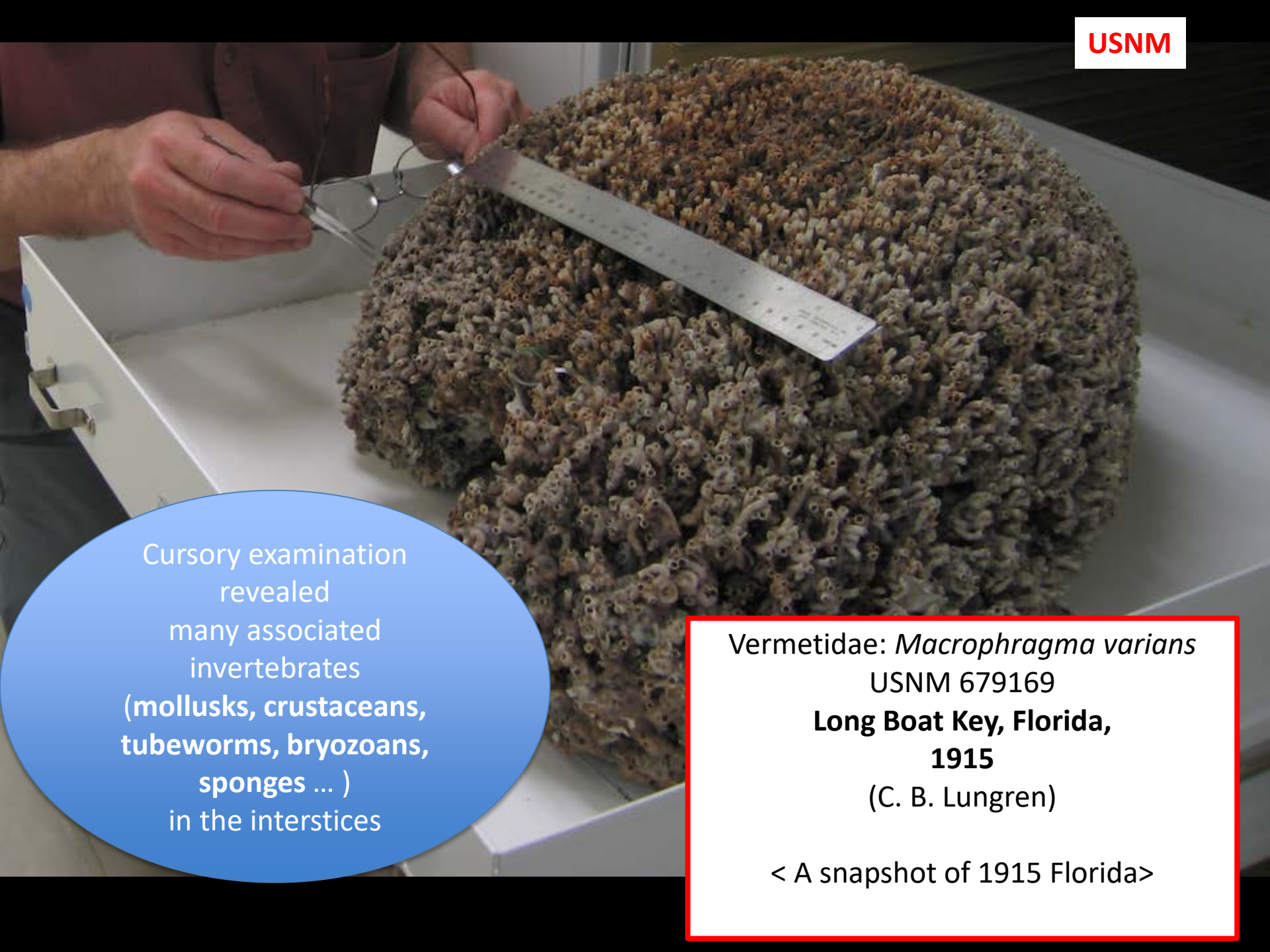
Adula diegensis
USNM 216417
Anaheim Bay, California, 1930s (E. P. Chace)

(in situ) J Wall.
Anaheim B. E. P. Chace.

1. A. Branch of *Stictis*
Stictis, branch, No. 1
1871

1. A. Branch of *Stictis*
Stictis, branch, No. 1
1871





Cursory examination
revealed
many associated
invertebrates
(mollusks, crustaceans,
tubeworms, bryozoans,
sponges ...)
in the interstices

Vermetidae: *Macrophragma varians*
USNM 679169
Long Boat Key, Florida,
1915
(C. B. Lungren)

< A snapshot of 1915 Florida >

Wet preserved sea squirts

USNM



Chesapeake Bay, 1915
USNM 6908



Vineyard Sound, 1875
USNM 4949

Muséum national d'Histoire naturelle, Paris



Boston

M. Milbert 1819

The Virginian Oyster
Crassostrea virginica: 1819, Boston



Ostrea Canadensis. Lam.
de New York par K. Wilber

The Virginian Oyster
Crassostrea virginica: 1818, New York



Ostrea Canadensis Lamk
de New York par K. Wilber

The Virginian Oyster
Crassostrea virginica: 1818, New York

DNA
extraction/PCR



Sequence?



Metagenetic
sequencing?