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Records of Breeding Activity of Marine Invertebrates
at Kaikoura

By J. F. C. MORGANS

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Abstract

THIS paper summarises records of breeding activity of marine invertebrates at Kaikoura from May, 1962, until May, 1966. Although many records are derived from personal notes the majority are based on specimens preserved in the catalogued "K" Collection started by the author and stored at the Edward Percival Marine Laboratory.

THE author established a catalogued collection of marine specimens as soon as possible after the establishment of the Edward Percival Marine Laboratory at Kaikoura. The cataloguing system has been described elsewhere (Morgans, 1965). The purpose of this collection was not only to provide stored specimens for handy reference but to include interesting specimens that could be referred to by their catalogue codes when, as was so often the case, proper identification could not be obtained.

It was the author's intention, from the start, to accumulate as many records of breeding activity as possible and the method of cataloguing rendered this a simple matter. The first larva was catalogued in May, 1962, when the "K" collection was started and, although the larva is still unidentified to species, it is identified by catalogue code and the specimen is stored for further examination.

The value of a summary of records of breeding activity is undoubted but accumulation of records is a lengthy process. Those summarised here are chiefly based on the months of May and late August-early September from 1962 to 1966 when zoology student field courses were run at Kaikoura during the short vacations. One of the projects set for the students in August-September was to seek out breeding activity and this emphasis must be expected to have biased the records. Other records were obtained during my visits in other months and I am indebted to helpful colleagues, Mrs F. R. Allison, Mr P. M. Johns and Mr I. Mannering, for their thoughtfulness in cataloguing valuable material in this cause. Although most records are referable to catalogued specimens (and this paper summarises entries from K.001 to K.923) there are many that were noted personally on the basis of specimens that unfortunately went astray in the turmoil of the student courses.

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Note	Species	April	May	August	September	November	December
1	SCYPHOZOA Ephyra larva (K 053 G)		053 G(P)	P.Obs. 378 F(Z)			
2	ACTINOZOA <i>Actinia tenebrosa</i> <i>Eptactis thompaoni</i>			Mrs. F. R. A. Obs. P.Obs. (D)			
3	TURBELLARIA <i>Leptoplana</i> sp.						
4	NEMERTEA GESTODA <i>Gomphynectis thysitae</i> : larva		499 A (in <i>Thysites</i>)				
5	FOLYGHAETIA <i>?Audouinia</i> sp. (K 653 L): with eggs		540 A(B): 551 H(B): 548 H(B)	653 L(G) 377 A(R)		460 C(B)	
6	<i>Lepidomorus</i> sp. (K 377 A): with eggs <i>Lumbrineris brevitarsis</i> : exuding eggs <i>Nerine antipoda</i> : with eggs or sperm		057 F(HN): 296 R(PN)	396 C, D(HN): 402 H(PN)		684 P(A)	
7	<i>Polydora</i> sp. (K 378 B) <i>Pomatoceros carinifera</i> : with eggs <i>Scotolepides benhami</i> : with eggs Heteronereids, etc.		053 F(P)	338 B(HN): 653 M(C) 338 A(HN)	401 C(PN)		
8	Saccomerids BRANCHIOPODA <i>Nebalia</i> ? <i>bipes</i> (K 393 D): in berry OSTRACODA <i>?Cyclasterope</i> sp. (K 401 W): with eggs COPEPODA General: with eggs Harpacticoid: with single, median egg mass Lernaeopodoid (K 061 L): with eggs <i>?Anthasoma crassum</i> (K 343 D): with eggs GIRRIPEIDIA <i>Chamaesiphio columana</i> : with eggs <i>Eliminus plicatus</i> : with eggs Nauplii Cypriis larvae (K 874 A)	617 A(HN)	874 A	393 D P.Obs. P.Obs. (P) P.Obs. (D) 061 L(Dr.) 343 D P.Obs. P.Obs. P.Obs. (P)			
9	MYSIDACEA <i>Stridella denticulata</i> : with eggs and young General: larvae (K 090 V)		090 V(PN)	P.Obs. P.Obs.			
11	ISOPODA <i>(Amphirotoidea falcifer)</i> <i>(Cymodoce</i> sp.)						
12	<i>Eudotea</i> sp. (K 598 K): with eggs						
13	<i>(Exosphaeroma</i> sp.)						
14	<i>Paridotea unguiculata</i> : with eggs <i>Platarrhium typicum</i> : with eggs General: elongate, white (K 634 B): with eggs				413 E(A)		
15	General: parasitic (K 608 B): with eggs AMPHIPODA <i>Phronima</i> ? <i>novae-zealandiae</i> : with eggs <i>Talorchestia quoyana</i> : with young General: pink (K 422 C, D): with eggs General: Gammarids: with eggs General: Caprellids: with eggs General: Gammarid (K 654 J): with eggs General: ?Hyperiid (K 353 B): with young General: Jassid (K 913 B): with eggs General: Lyssianassids: with eggs General: Photid (K 531 A): with green eggs		895 A(R)	654 B(B) P.Obs. (D) P.Obs. 598 K(R) P.Obs. P.Obs. 654 J(B) 653 K(G): 654 F(B)	608 B (on <i>Arripis</i>) 464 D(B): 465 B(B) 401 O(PN) 422 C, D(A) 353 B(R)		913 B(R)
16	NATANTIA <i>Alope spinifrons</i> : in berry <i>?Genades</i> sp. (K 053 E): larva <i>Hippolyte</i> spp. (K 401 A, B): in berry <i>Jassus lalandii</i> : phyllosoma larvae <i>Jassus lalandii</i> : juveniles (K 366 A) <i>Nauticaris mertoni</i> : in berry THALASSINIDEA <i>Callinassa filholi</i> : in berry		053 E(P) 057 D(HN)	P.Obs. 156 A(P) 305 A(HN) 637 A(R)	401 A, B(PN) 168 A(PD)		364 A
17	<i>Callinassa</i> ? <i>filholi</i> : larvae <i>Callinassa</i> sp.: larvae		053 K(P): 095 A(PN)	641 B, C: 642 A: 643 A: etc. (B)	440 A(B) 168 C(PD)		

Records are summarised in tabular form. They are lacking for June, July and October: the scanty records of January to March are recorded under the section entitled "Notes" that follows the tabular summary.

The tabular summary contains either the catalogue code of the reference material (omitting the prefix "K" because all specimens belong to the "K" collection) or notes that the record was a personal observation ("P.Obs."). In addition, brief reference is made to the habitat in which the material was found by the following conventions:

- P = Plankton.
- PD = Plankton, daytime.
- PN = Plankton, night.
- HN = Taken by hand net from the Old Wharf at night (with lamplights).
- B = From sandy beach.
- F = From flotsam.
- R = From rocks, rock pools, etc.
- Z = From *Zostera* beds.
- A = From algae on rocks.
- D = From beneath holdfasts of *Durvillea antarctica*.
- Dr. = Dredged offshore.
- G = General collection by students and staff.

NOTES

1. Four largish juveniles were spewed from stomodaeum.
2. Many small young (some of which were budding) within coelenteron.
3. Uterus contained early stage eggs.
4. Unidentified specimen with large white eggs in uterus.
5. In August, 1963, certain ?*Audouinia* specimens were observed releasing (through a split in the side of the worm) bright yellow eggs stuck together in a gelatinous mass. They hatched to trochophores in the aquaria.
6. Not *L. jacksoni* or *L. banksii*.
7. Noted that the posterior end of many tubes was packed with eggs that hatched as small worms resembling the adult; and these juveniles appeared to remain awhile in the parental tube.
8. Taken from algae encrusting *Leptomithrax longimanus* that was taken in a craypot.
9. In the gums of the jaws of *Isuropsis mako* of 112lb weight.
10. Attached to a detached, floating holdfast of *Durvillea*.
11. About 20 tiny isopods were attached beneath this specimen: possibly they were juveniles but Mrs F. R. Allison noted in September, 1965, that Epicarid isopods were found attached beneath *A. falcifer*.
12. In these Sphaeromids small isopods were found attached to the thoracic sternites and, so far as I can recollect, they appeared to be juveniles of the adult concerned. However, Mr P. Jansen (of this Department) informs me that parasitic Asellote isopod juveniles (e.g., *Iais* spp.) may be found similarly attached.
13. It is possible that the identity of the specimens observed was *Crabzyos elongatus*.
14. From *Macrocystis*.
15. Found alive in a dry little rock crevice. The amphipod was observed to be plastering numerous reddish eggs to the internal walls of its house. Despite attempts to hatch the eggs and keep the larvae there were so many accidents that the larvae were all lost and the animal died after three days in captivity. It was preserved as K.895 A.
16. From *Lessonia* holdfast.

17. These colourless juveniles were also taken in January (K.366 A) from beneath rocks.
18. Eggs bright orange. On at least one occasion a clump of these eggs was found in a burrow without an adult present.
19. Found in May beneath a living *Haliotis*; in September from stipe of *Lessonia*.
20. September record from holdfast of *Lessonia*.
21. Eggs greyish-purple; over 150 counted on one adult. K.321 A are newly-hatched zoaea, and K.327 A are zoaea at 30–45 hours after hatching.
22. Taken in a craypot. This specimen may prove to be *Paramithrax peroni*.
23. From mussels (*Mytilus* and *Perna*) boiled to be eaten.
24. Many samples from nettings of tidal plankton over Armer's Beach.
25. From holdfast of *Carpophyllum*.
26. Mr Penniket suggests that this is the Therevid *Anabarhynchus* (possibly *bilineata*) but that it may in fact be the larva of an Asilid. It is a distinctive, rather nematode-like pink maggot that is common in the supralittoral fringe fauna and in well decayed flotsam (Morgans, 1967a, 1967b).
27. Common in decaying algal flotsam.
28. From certain supralittoral rock pools in which they are frequently found.
29. This caddis was found amongst algae around low spring tide level.
30. Found in the sand of the supralittoral fringe.
31. K.175 D taken from a wharf pile.
32. The numerous young are sheltered beneath the mantle groove.
33. Egg capsules dredged from 20 fathoms about five and a half miles north-east of the peninsula. Some of the capsules contained three young prosobranchs; the young were sufficiently developed to enable a provisional identification.
34. Graham's (1941) accounts and illustrations are of considerable interest.
35. Found on rocks in January.
36. Capsules assumed to belong to this species because the adults were nearby. Capsules closely packed into a honeycomb pattern, about a quarter of an inch in height, each capsule about one eighth of an inch in diameter, whitish with a brownish spot above. Several groups of capsules on the undersides of rocks.
37. A bunch of eggs was found on the beach in March and brought to the marine laboratory.
38. Mr I. Mannering very kindly agreed to contribute the following notes on the spawning of Patellacea (personal communication): "The Patellacea of Kaikoura appear to be summer spawners; *Cellana flava* (late Nov.-Dec.), *C. radians* (late Dec.-Jan.), *C. ornata* (late Jan.-March), *C. denticulata* (Jan.-March, but there is some evidence that it also spawns, on a smaller scale, from May to August). The first three species exhibit distinct reproductive regression in winter. Of the Acmaeidae, *Patelloida corticata* spawns during Dec.-Jan. but there is little information concerning other species".
39. Collected and identified by Mr I. Mannering (of this Department) who inferred the egg string (K.545 D) to belong to this species because of its proximity.
40. Flat masses of pale yellow eggs, several dozen eggs per mass.
41. The eggs were contained in an inverted, empty *Haliotis* shell upon which the parent brooded.
42. Eggs attached to the underside of a rock were collected and identified by Mr I. Mannering in February.

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Upogebia); Miss M. J. Gordon (Hymenosomid crabs), Zoology Department, University of Auckland; Professor W. C. Clark (Pycnogonida), University of Manawatu; Dr R. K. Dell (Prosobranch molluscs and *Robsonella*) of the Dominion Museum; and Mr J. G. Penniket and Mr A. G. McFarlane (Insecta) of the Canterbury Museum.

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J. F. C. MORGANS,
 Director, Oceanographic Research Institute,
 P.O. Box 736, Durban,
 South Africa.