

ABSTRACTS OF MEMOIRS

RECORDING WORK DONE AT THE PLYMOUTH LABORATORY

STUDIES ON *LYSMATA SETICAUDATA* RISSO (CRUSTACEA DECAPODA). VIII. THE LACK OF INFLUENCE OF EYESTALK ABLATION AND OF INJECTION OF EYESTALK EXTRACTS ON TESTICULAR WEIGHT AND DEGREE OF DEVELOPMENT OF THE MALE GENITAL DUCTS

By D. B. Carlisle

Pubbl. Staz. zool. Napoli, Vol. 25, 1954, pp. 241-5

Eyestalk ablation and an injection of eyestalk extracts has no effect on testicular weight or on degree of development of the male genital ducts in *Lysmata seticaudata*. This result is quite opposite to that found by D emeusy in the crab *Carcinides*.

D. B. C.

THE EARLY DEVELOPMENT STAGES OF THE BASS, *MORONE LABRAX* (L.)

By L. A. J. Jackman

Proc. Zool. Soc. Lond., B, Vol. 124, pp. 531-4

On 21 May 1952 some of the bass in the Plymouth Aquarium spawned, and a number of these eggs were collected and their development observed.

The eggs of the bass in British waters are larger than those in the Mediterranean, and hatching occurs on the fourth day. The mean length of newly hatched larvae is 3.83 mm.

During the first 24 hr these post-larval stages rest for long periods at the surface of the water, are insensitive to touch and no evasive action is taken.

On the third day the larvae rest at an angle of forty-five degrees to the surface. By the sixth day they commence to swim, and make rapid darts through the water easily avoiding the approach of a pipette.

By the tenth day the oil globule is partially absorbed.

Throughout these observations the mean temperature of the tanks was 15  C.

From the observed rate of growth of these reared larval stages, it is likely that those taken in the plankton hauls off the Eddystone during the period 1925-33 (Russell, 1935) were from 3-15 days old.

L. A. J. J.

THE EFFECT OF GALVANIC POLARIZATION ON THE IMPULSE DISCHARGE
FROM SENSE ENDINGS IN THE ISOLATED LABYRINTH OF THE
THORNBACK RAY (*RAJA CLAVATA*)

By O. Lowenstein

J. Physiol. Vol. 127, 1955, pp. 104-17

The effects of galvanic polarizing currents on the impulse discharges from the crista of the horizontal ampulla and from other labyrinthine end-organs show that galvanic polarization produces impulse responses similar to those occurring on natural rotatory stimulation. The responses from single sensory units of the horizontal semicircular canal to galvanic stimulation by ascending and descending currents sum with the responses to ipsilateral and contralateral accelerations. This result is held to provide circumstantial evidence for the existence of a so-called generator potential intervening between the mechanical deformation of the sense organ and the propagated impulse discharge in the sensory nerve.

O. L.

THE PLANKTONIC DECAPOD CRUSTACEA AND STOMATOPODA OF THE
BENGUELA CURRENT. PART I. FIRST SURVEY, R.R.S. WILLIAM
SCORESBY, MARCH 1950

By Marie V. Lebour, D.Sc.

Discovery Reports, Vol. 27, 1954, pp. 219-34

Most of the specimens are larvae. Among the few adults were several specimens of the Pasiphaeid *Pasiphaea semispina* recently described by Holthuis (1951-52). The present records show that it occurs much farther north than those found previously in the South Atlantic. Other interesting finds are a late larva of a *Periclimenes* with a long antennular flagellum and a peculiar pagurid larva of a type unknown before. Phyllosoma larvae of *Jasus lalandii* are common and at times a *Callinassa* larva is abundant which does not appear to belong to any known adult (the adults, always difficult to find, are very little known from their regions). Brachyura zoeae are abundant at times but not attributable to known species, the only Stomatopod present is a *Squilla* larva, almost certainly *Squilla armata* as it occurs in the same locality as the adult and agrees with it in most essential features.

M. V. L.

THE PELAGIC MOLLUSCA OF THE BENGUELA CURRENT. PART I. FIRST SURVEY, R.R.S. WILLIAM SCORESBY, MARCH 1950. WITH AN ACCOUNT OF THE REPRODUCTIVE SYSTEM AND SEXUAL SUCCESSION OF *LIMACINA BULIMOIDES*

By J. E. Morton

Discovery Reports, Vol. 27, 1954, pp. 163-200

This paper records the occurrence and distribution in the Atlantic Ocean off south-west Africa of the following species of molluscs: *Ianthina ianthina*, *I. globosa*, *Atlanta peroni*, *Limacina inflata*, *L. bulimoides*, *Diacria trispinosa*, *Euclio pyramidata*, *Cavolinia inflexa*, *Cymbulia peroni*, *Thliptodon diaphanus*, *Pneumodermopsis paucidens*, as well as two species of larval lamellibranchs, one prosobranch larva, and several larval cephalopods. The ecology of *Limacina bulimoides* is discussed and information presented on its diurnal depth migrations. A size-depth division of the population appears to take place at night.

The reproductive system and sexual succession of *Limacina bulimoides* is described in detail. The genital ducts are typical of the lower level of both the groups Opisthobranchiata and Pulmonata, and in the condition of the gonad, as well as the development of penis and prostate, *Limacina* shows protandrous hermaphroditism. Six sexual stages are distinguished, ranging from small sexually undifferentiated individuals, through various stages of male development, to the females, which are the largest. A short discussion is added, dealing with the problem of the evolution of sexual succession in gastropods as a whole.

J. E. M.

CHEMICAL EVIDENCE ON THE ABUNDANCE AND BOTANICAL COMPOSITION OF THE MARINE PHYTOPLANKTON

By W. R. G. Atkins

Proc. 7th Int. Bot. Congr. Stockh., 1950, p. 262 (published 1953)

The sea twenty miles off Plymouth is representative of a large area subjected to uniform meteorological conditions and not normally affected by water movements from areas under other conditions. Figures for the phytoplankton crop, calculated for a depth of 70 m. were concordant when based upon the changes in phosphate, carbon dioxide and nitrate, but with silica the values were over 10 times too small. The diatom tests do not dissolve or do so slowly, but suspended clay amounts to about one part per million, and this goes into solution in measurable amounts as shown by storing in polythene bottles for three months.

Productivity may also be followed by chlorophyll estimation after filtration through collodion discs or using fine paper after addition of aluminium sulphate. In the gel thus produced small flagellates can be seen under the microscope, in slow motion. Dr M. Parke's pure cultures afforded counts, which, excluding large diatoms, ran from 50 to over 3000 million cells per milligram of chlorophyll.

W. R. G. A.

MECHANICAL STIMULATION IN THE SEA-ANEMONE *CALLIACTIS PARASITICA*

By L. M. Passano and C. F. A. Pantin

Proc. roy. Soc. B, 1955, Vol. 143, pp. 226-38

A method of administering measured local mechanical stimuli is described. Experiments were done upon the anemone *Calliactis parasitica*.

Mechanical stimuli show rapid apparent adaptation—partly due to simple mechanical causes such as contracture and passive deformation of the tissues.

When conditions are standardized a mechanical stimulus of sufficient intensity on the column gives a nervous impulse. These mechanical stimuli can be used in the same way as electric shocks to give facilitated responses.

Increasing the mechanical intensity shows (*a*) a threshold below which no impulse is generated, and (*b*) with further increase of strength, trains of increasing numbers of impulses.

There exists a graded mechanically excitable system. Gradation is to be observed below the threshold since there can be summation of subliminal impulses.

The excitable system appears to be orientated tangentially and responds to strains rather than pressure. The excitable system is purely endodermal. The ectoderm and mesogloea act only as an integument.

On histological grounds there are grave difficulties in supposing that impulses arise simply and directly in the numerous simple sense organs. The possibility is noted that the graded excitation of the mechanically sensitive system causes the nerve-net to fire off impulses.

The sensitivity of different parts of the animal varies greatly. In *Calliactis* the oral disc is at least 4000 times as sensitive as the column. The combination of a simple mechanically excitable system with the gross morphological features of the bodily organization permits purposive and varied responses. Thus strong stimulation of the column leads to the closure reflex, whilst weak stimulation of the disc by contact or by water movements leads to appropriate responses connected with feeding or rejection.

C. F. A. P.

RECHERCHES PRÉLIMINAIRES RELATIVES À LA SEPARATION ET À LA COMPARAISON
DES SUBSTANCES CHROMACTIVES DES CRUSTACÉS ET DES INSECTES (PRELIMINARY
STUDIES ON THE SEPARATION AND COMPARISON OF THE CHROMACTIVE
SUBSTANCES OF CRUSTACEA AND INSECTS)

By David Carlisle, Mme. Marie Dupont-Raabe and Sir Francis Knowles

C.R. Acad. Sci. Paris, T. 240, 1955, pp. 665-7

The chromactive substances of the sinus gland and post-commissural organs of crustacea and of the brain and *corpora cardiaca* of insects were separated by paper electrophoresis. The most striking results were the individuation and characterization of various chromactive substances. The first, designated substance A, was found in all these organs except the insect brain. It provoked concentration of all the red and yellow pigments of *Leander*. It was stable to boiling and did not pass freely through dialysis membranes. The second substance, substance B, was found only in the post-commissural organs. It concentrated the large red chromatophores of *Leander*, but expanded the small red chromatophores of the body and tail. These two substances were antagonistic. The brain of the insect contained a different chromactive substance, designated substance C. This substance caused darkening of *Carausius*, but had no effect on the pigments of *Leander*. It did, however, cause concentration of the chromatophores of *Crangon*. Other more mobile substances were found in the various extracts; they all pass freely through dialysis membranes and each acts only on a single pigmentary effector type. These substances appear to be the definitive hormones while substances A and B are probably the precursors.

Extracts of the X-organ of *Leander* have no effect when fresh, but after boiling, or after alcohol treatment, they attain an activity comparable to that of the sinus gland. It is probable that the site of production of the precursors of the hormone of the sinus gland is in the X-organ.

D. B. C.