

gested or explored in the present study. The phenomena of population growth and overcrowding, territoriality, and demographic aspects may, either singly or in combination, relate to the problem at hand.—GEORGE K. REID, *Department of Zoology, Rutgers University, New Brunswick, New Jersey*, and HINTON D. HOESE, *Department of Biology, Agricultural and Mechanical College of Texas, College Station, Texas*.

WESTERN NORTH ATLANTIC RECORDS OF *BERYX SPLENDENS* LOWE AND *B. DECADACTYLUS* CUVIER AND VALENCIENNES.—

On the Atlantic coast of North America, there are three records of *Beryx splendens*. The first was caught by the U. S. Fish Commission R. V. ALBATROSS in 1885 (Goode and Bean, 1895, *Oceanic Ichthyology*, U. S. Nat. Mus. Spec. Bull: 177) off Savannah, Georgia. Two specimens were taken in 1955 by the U. S. Fish and Wildlife Service M. V. OREGON in the Gulf of Mexico (Woods, Copeia, 1957 (4): 298–299). Recently, two more specimens of *Beryx splendens* were caught by vessels that were otter-trawling for ocean perch (*Sebastes marinus*) in the northwestern Atlantic. Both specimens are deposited in The Museum of Comparative Zoology, Cambridge Massachusetts.

The U. S. Fish and Wildlife Service R. V. DELAWARE caught a 216-mm. (fork length) *B. splendens* on May 14, 1955, in 320 fathoms at 42°16'N and 65°07'W., which location is a few miles outside one of the Gulf of Maine's arbitrary boundaries that have been proposed by Bigelow and Schroeder (1953, U. S. Fish. Wildl. Ser., Fish. Bull., 53: 1). About 1,000 pounds of ocean perch were caught in the same tow. This specimen has dorsal IV, 14; anal IV, 29; pectoral I, 16; pelvic II, 13; and lateral line scales, 80. The depth of the body is 34.7 percent of the fork length.

The fishing boat FLO, captained by Percy Spurling of Rockland, Maine, caught a 419-mm. (fork length) *B. decadactylus* during the week of August 19–25, 1956, in 85 fathoms in the Gulf of Maine on Jones Ground, 40 miles east of Mount Desert Rock, Maine. The fish has dorsal IV, 18; anal IV, 28; pectoral I, 16; pelvic I, 10; and lateral line scales, 70. The depth of the body is 44.4 percent of the fork length. This is the first record of *B. decadactylus* in the western North Atlantic.

These species are cosmopolitan and found in moderate depths, usually on the border of the continental shelf (Bougis, 1956, Bull. Inst. Oceanogr., 891: 1).—LESLIE W. SCATTERGOOD, U. S. Fish and Wildlife Service, Boothbay Harbor, Maine.

HIGH SALINITY MORTALITY OF DESERT PUPFISH, *CYPRINODON MACULARIUS*.—

Cyprinodontiform fishes have been found frequently in shallow pools whose waters contained many dissolved solids (Miller, 1948, Mich. Univ. Mus. Zool. Misc. Publ., (68): 146; Steinitz, 1951, Nature, 167: 531; Smith, 1952, Ann. Mag. Nat. Hist., (12)5: 888). In a few instances the salinities were two to three times greater than that of the ocean although the ionic composition was different. Fox (1926, Trans. Zool. Soc. London, 22: 41–3) collected *Cyprinodon dispar* Rüppel (= *Aphanius dispar*) from brine pools at Kabret, Egypt; the salinities were equivalent to about 60‰ to 70‰. *Mollienesia latipinna* LeSueur, was abundant in water with salinities from 32‰ to 87‰, but absent when the salinity was 94‰ (Herre, 1929, Philippine Jour. Sci., 38: 121). Simpson and Gunter (1956, Tulane Stud. Zool., 4: 115) found *Cyprinodon variegatus* Lacépède to be plentiful at salinities as high as 80‰. They took a single live fish from water equivalent to 142‰; the only fish found in a pond with a salinity of 147‰ was one dead specimen. Coleman (1926, Calif. Fish and Game, 15: 227) quoted Mr. Hartley, of the Hartley Salt Works, Salton Sea, as stating that *C. macularius*, "...gets into their salt vats and will live in salt water up to 50 percent saturation, at which point it begins to die." This was a casual observation and should be regarded with caution: 50 percent saturation is difficult to equate for a heterogeneous salt solution but would be over 200‰. The few available records cited here indicate that the maximum salinity tolerance of cyprinodontiform fishes, with the exception of one specimen, is about 80‰ to 90‰.

On September 23, 1957, Dr. Otto Kinne and I visited the Salton Sea, California, to collect desert pupfish, *Cyprinodon macularius* Baird and Girard. These fish congregate in pools along the shore of the sea. Sometimes the pools become isolated from the sea and the salinity of the water increases as the water evaporates. One highly saline shore pool, which still contained pupfish, lay perpendicular to the shore rather than parallel to it as did the other pools. The pool was about 15 m. long, 2 to 4 m. wide, and 25 to 50 cm. deep, with almost vertical sides. The water at the surface was 36.1°C at 4 PM, which is shortly after the time of day of maximum temperature (Barlow, in press). The salinity was approximately 90‰ (freezing point –5.06°C; determined by F. W. Munz using a Fiske Osmometer). The color of the water was reddish-orange, a condition often associated with high salinity.

A much smaller pool lay between the first

pool and the sea. Marks on the sandbar showed that high waves often spilled into the tiny pool. The water in this pool was clear, suggesting a salinity much lower than 90‰. A water sample was not taken. A school of nearly 100 small pupfish was seen in the pool; they appeared to be in excellent condition.

At first only dead fish were found in the larger pool. Twenty-five freshly dead pupfish, 10 to 15 mm. in standard length, were floating at the surface. A few individuals of about the same size, and some larger fish, 20 to 30 mm. long, lay dead on the bottom. The larger fish were coated with a thin film of algae and apparently had been dead for a longer period of time than the smaller pupfish.

Ten live pupfish were captured with a fine-mesh seine. One of these was an adult female about 25 mm. long, and the other nine were juveniles about 10 to 15 mm. in length. All were extremely thin, swam feebly, and had difficulty maintaining equilibrium. The one adult was especially feeble. The fish were transferred to Salton Sea water (about 30‰) for transportation to the laboratory. The large female died shortly after being transferred, but the smaller fish survived and recovered completely.

The high salt content of the water probably caused the death of these pupfish; however, it is difficult to assess the role of the other environmental factors. In this instance the density of the fish population was low, when compared with earlier observations, and the food supply appeared to be adequate. Therefore it seems likely that the emaciated appearance of the fish was caused by osmotic dehydration rather than starvation. Disease was ruled out by the quick recovery of fish transferred to less saline water. Nor was the temperature lethal, because this fish can tolerate temperatures higher than 36°C at lower salinities (Barlow, in press). Further, the water of the smaller and less saline pool must have reached a higher temperature than that of the larger pool and yet there were no dead fish in the small pool. Thus it may be concluded that the maximum salinity tolerance of young *C. macularius*, in the field, is approximately 90‰; that of the adults is probably somewhat lower. This is in reasonable agreement with the known salinity tolerances within this group of fishes.—GEORGE W. BARLOW, *Department of Zoology, University of California, Los Angeles, California.*

A CONCENTRATION OF THE RATFISH, *HYDROLAGUS COLLIEI* CAPE ARAGO, OREGON.—On June 26, 1957, a concentration

of the chimaerid fish, *Hydrolagus colliei* (Lay and Bennett), was observed in the mid-tide and low-tide zones at South Cove, Cape Arago, Coos County, Oregon. Specimens were collected on a low tide of minus one foot at about 5:00 AM. Several were found trapped in the tide pools among rocks in the mid-tide zone; some were swimming slowly, others were dead. One male specimen, taken from the bay, was first seen swimming slowly at the surface. Ten specimens were noted in all, about equally divided between males and females. The bay was extremely cloudy and a great deal of wood pulp and sawdust was washed ashore and floating on the surface. Large numbers of juvenile rockfish, *Sebastes* sp., were also found, some stranded and dead, others swimming in the tide pools. Most of the rockfish in the pools were living. The water in the pools was clearer than that in the bay.

Egg cases of *Hydrolagus colliei* were first noticed by Mr. Robert Bayly who found one protruding from an oviducal opening of a female collected in a tide pool. One egg case was removed in the field, and several others in the laboratory. In each the case was in position for the large end to emerge first. Clemens and Wilby (1946, Fisheries Research Board of Canada, Bull. 68: 72) reported that Dr. A. L. Pritchard had observed such cases "set upright in the mud in the intertidal zone in Massett inlet." Possibly the ratfish noted at Cape Arago were part of a spawning concentration.

On the same day a party was trawling on the bottom about four miles off shore from the mouth of Coos Bay, at a depth of 27 to 30 fathoms. Mr. Lyle Jenkins, of the Oregon Institute of Marine Biology, reported the capture of a number of individuals of *Hydrolagus colliei* along with several egg cases.—HARRY G. M. JOHNSON, *Bridgewater College, Bridgewater, Virginia.*

RECORD OF A HATCHERY-REARED RAINBOW TROUT, *SALMO GAIRDNERI GAIRDNERI*, WITH THREE PELVIC FINS.—On April 26, 1954 at the U. S. Fish and Wildlife Service Fish Cultural Station, Winthrop, Washington, a yearling rainbow trout was found which had three pelvic fins. In formalin it was 16.9 cm. in total length. The third pelvic fin was located between the normally placed pelvics, and appeared to be normal in every respect. The pelvic girdle appeared normal in the X-rays.

The specimen, X-rays, and photographs have been deposited in the U. S. National Museum, Washington, D. C., No. 174970.—GALEN H. MAX-