

The Peruvian Anchoveta, Charles Darwin and Us

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The last decade has seen — and rightly so — a boom of Darwiniana, culminating in 1991, in a fascinating new biography by A. Desmond and J. Moore.¹ Indeed, “spicing up” one’s writing with references to Charles Darwin seems one sure way for biologists to enliven an otherwise dull prose. Consequently, I shall bring Charles Darwin into this essay on the Peruvian anchoveta, although, as we shall see, Charles Darwin has very much ignored this fish.

The Peruvian anchoveta is an anchovy, scientifically known as *Engraulis ringens* (Jenyns 1842), the year being that which saw the publication of Rev. Leonard Jenyns’s descriptions of the fishes collected by Charles Darwin.² Anchoveta may

reach only to 20 cm and this in the cold end of their distribution (Southern Chile). Off Peru, their maximum size increased from 15 cm in the 1950s to 20 cm in the late 1980s - very much in line with what can be expected on theoretical grounds.³ Single anchoveta are thus really quite unimpressive except on pizzas, and then only to some people (Fig. 1). I personally love single anchovetas, whether on pizzas or not. Anchoveta come in schools, however, big schools, and that’s what make them impressive to most.

For eons, these schools have been supporting a wide array of predatory fishes, and more visibly for us, enormous numbers of fish-eating birds — chiefly cormorants, boobies and pelicans. The huge quantities of guano that this led to

can be easily imagined. These were mined at the turn of the last century, with methods terribly wasteful of human lives — not to speak of the birds. The latter recovered from the onslaught in the 1920s when the newly-founded Compañia Administradora del Guano began protecting the islets and other rocky areas where they reproduce, and thankfully deposit their guano.

In the late 1940s, following the collapse of the California sardine industry immortalized by John Steinbeck, several fish-processing plants were smuggled from California into Peru. (No, I will not entertain questions as to how you can smuggle a fish processing plant past a customs control point.) Fishing for the Peruvian anchoveta began in the early

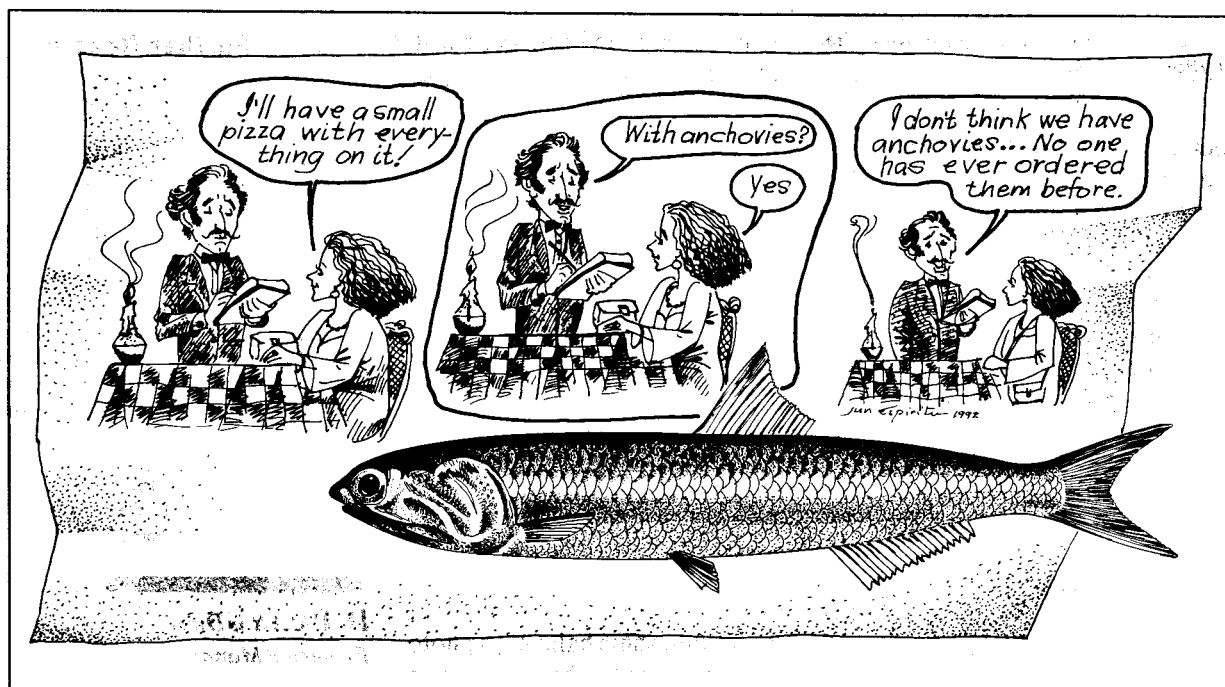


Fig. 1. The Peruvian anchoveta, and its relation to Italian cuisine (the latter adapted by Jun Espiritu from The Born Loser by Art Sansom).

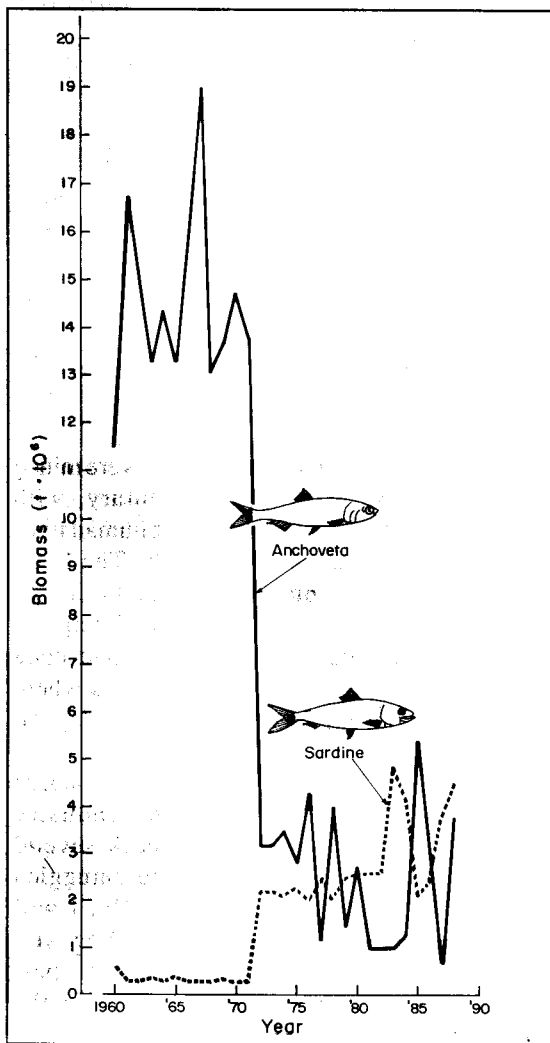


Fig. 2. Biomass of anchoveta and its major competitor in the Peruvian upwelling system, the sardine, from 1960 to 1988.

1950s, and soon contributed to the demise of the fish-eating birds whose numbers — along with the Peruvian exports of guano — collapsed in 1965, during one of those periods of El Niño, when sea surface temperatures increase, and which either kill anchoveta, or make them seek refuge in deeper waters where they are inaccessible to birds.

The anchoveta stock itself collapsed in 1972-73, in the wake of another El Niño event, and the greatest single-species fisheries in the world, up to 15-20 million tonnes per year, was no more (Fig. 2).

A much smaller fishery has continued, beset with problems typical of other fisheries: excess harvesting capacity, fluctuating supply, and aggravated by occasional El Niño events, notably a devastating one in 1982-83. The scientific

challenge of making sense of such a fishery was picked up by numerous Peruvian and other scientists, resulting in a wide array of articles and books.⁴

Together, these studies suggest that it was not only the El Niño event of 1971-72 which brought down the fishery, but previous overfishing, which had rendered the resource susceptible to environmental perturbations. Also, there is evidence that the “habitat” of the Peruvian anchoveta has actually shrunk since 1972, and that this (perhaps as much as the continued, excessive effort) is what keeps the anchoveta from recovering. Finally, there is strong evidence that this habitat shrinkage is only temporary, and that the upwelling area of the Peruvian coast available for colonization by anchoveta will actually expand, due to an increase of the strengths of the winds along the Peruvian coast, caused by global warming (see account of CEOS Project, p. 26).

Thus, the long time prospects for anchoveta are positive despite its present, much diminished status.

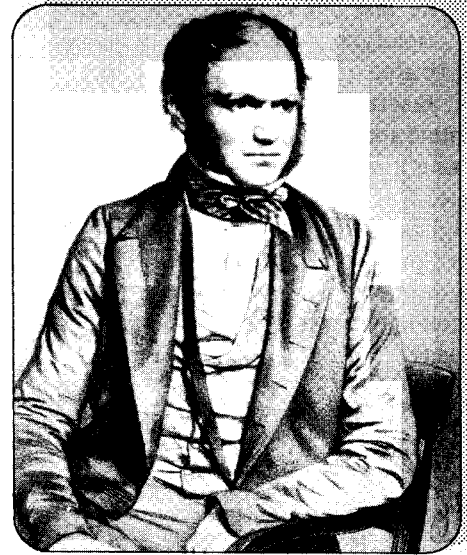
Unfortunately, the studies still to be conducted in this area will not be guided by any of the profound insights with which Charles Darwin usually enriched his observations.

His stay on the coast of Peru was short; all he did was geological and the only ichthyology he did was obtain a sample of anchoveta and write home that he found Lima uninteresting - except for the women, or in his own words “everything exceeded by ladies like mermaids”.⁵

So, to maintain some balance, a photo is included here (see box) which shows that Charles Darwin, too, was rather handsome when young.

The photo below, representing Charles Darwin at 40 years of age (in 1849), is based on a drawing executed by his friend T. Maguire (1821-1895), [A reproduction of this may be found - without attribution - in Darwin’s most recent biography¹]. The original was inherited by Dr. H. Maguire, nephew of the artist, who gave it in 1961 to his Chilean friend, Dr. Duberli Yañez-Araya, who gave it to his son, Dr. Alejandro Yañez-Arancibia.

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Further Reading

- ¹Desmond, A. and J. Moore. 1991. Darwin Michael Joseph. London.
- ²Jenyns, L. 1842. Fish. Part 4. In C. Darwin (ed.) The zoology of the voyage of the *H.M.S. Beagle*, under the command of Captain Fitzroy, R.N., during the years 1832-1836. Smith, Elder and Company, London. 172 p.
- ³Longhurst, A.R. and D. Pauly. 1987. Ecology of tropical oceans. Academic Press, San Diego.
- ⁴Jarre, A., M.L. Palomares, M.T. Cruz and M.S. Camacete. 1989. A preliminary bibliography of anchoveta (*Engraulis ringens*), p. 244-279. In D. Pauly, P. Muck, J. Mendo and I. Tsukayama (eds.) The Peruvian upwelling ecosystem: dynamics and interactions. ICLARM Conf. Proc. 18, 438 p.
- ⁵Moorehead, A. 1971. Darwin and the Beagle. Penguin Books, Harmondsworth, Middlesex.

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