

ایہاں کر دیا

The deep sea typically has a sparse fauna ^{which is} dominated by tiny worms and crustaceans, with an even sparser distribution of larger animals.

However, near hydrothermal vents, areas of the ocean where warm water emerges from subterranean sources, live remarkable densities of

huge clams, blind crabs, and fish. Most deep-sea faunas rely for food

on particulate matter, ultimately derived from photosynthesis, falling

from above. The food supplies necessary to sustain the large vent

communities, however, must be many times the ordinary fallout. The

first reports describing vent faunas proposed two possible sources of

nutrition: bacterial chemosynthesis, production of food by bacteria

using energy derived from chemical changes and advection, the drifting of food materials from surrounding regions. Later, evidence

in support of the idea of intense local chemosynthesis was

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accumulated: hydrogen sulfide was found in vent water, many vent-

site bacteria were found to be capable of chemosynthesis, and

extremely large concentrations of bacteria were found in samples of

vent water [thought to be pure]. This final observation seemed decisive.

If such astonishing concentrations of bacteria were typical of vent

outflow, then food within the vent would dwarf any contribution from

advection. Hence, the widely quoted conclusion was reached that

bacterial chemosynthesis provides the foundation for hydrothermal-

vent food chains—an exciting prospect because no other communities

on Earth are independent of photosynthesis. There are, however,

certain difficulties with this interpretation. For example, some of the

large sedentary organisms associated with vents are also found at

ordinary deep-sea temperatures many meters from the nearest

hydrothermal sources. This suggests that bacterial chemosynthesis is

not a sufficient source of nutrition for these creatures. Another

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difficulty is ^{R(-) NO₂} that similarly dense populations of large deep-sea animals

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have been found in the proximity of "smokers" ^{NP₁} vents ^{R(-) m₅} where water

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emerges at temperatures up to 350° C. No bacteria can survive such

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heat, and no bacteria were found there

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