FISHES OBSERVED AND COLLECTED DURING THE *ALVIN* DIVES AT THE LUCKY STRIKE THERMAL VENT SITE (MID-ATLANTIC RIDGE - 1993).

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RÉSUMÉ. - Pendant les six plongées du submersible *Alvin* sur le site Lucky Strike, au milieu de la vallée du rift Atlantique par 37° 18' N, plusieurs poissons ont été observés et capturés dans le champ hydrothermal entre 1609 et 1730 m de profondeur. Les Chimaeridae étaient le matériel le plus abondant. Un exemplaire d'*Hydrolagus mirabilis* a été capturé près des sources hydrothermales. Un exemplaire du Bythitidae *Cataetyx laticeps* fut capturé dans une cavité de la roche entourée par une moulière dense (t° de l'eau entre 5,7 et 13°C). Cette espèce se nourrit essentiellement des crevettes du peuple-ment hydrothermal. Quant à *H. mirabilis* aucune évidence à ce sujet n'a pu être démontrée. Des poissons strictement liés à l'hydrothermalisme ne furent pas trouvés mais la possibilité de leur existence ne doit pas être exclue.

Key-words. - Chimaeridae, Bythitidae, Moridae, A, Mid-Atlantic Ridge, Hydrothermal vents, Deep-sea.

The Lucky Strike thermal vent site was discovered in 1992 during the FAZAR cruise of the R/V *Atlantis*, led by Charles Langmuir of the Lamont-Doherty Earth Observatory of Columbia University, New York. The vent area is situated in the middle of the Atlantic rift-valley at 37° 18' N and 32° 17' W. In May-June 1993 the submersible *Alvin* made six dives over the thermal vent area at depths between 1609 and 1730 m. The ambient water temperature at these depths was close to 4.6 °C. Hydrothermal fluid temperatures ranged from ≤ 200°C (flanges) to 328°C (black smokers). The community was dominated by very rich mussel beds (*Bathymodiolus*?). Bresiliid shrimp were also very abundant. Polychaetes (Errantia), amphipods, bythograeid crabs and gastropods were also observed as well as an abundant and large pink sea-urchin. Several fishes were observed and only two were collected. Over the mussel beds in the vicinity of vents measured temperatures ranged from 5.7 to 13°C.

Methods

Fish observations were recorded on video tape during the six dives. Two fishes were collected during dives 2605 and 2606 using the *Alvin* arm net. A small fish trap baited with fresh mackerel was deployed in different places near the smokers and consequently in heated water. No fishes were trapped due perhaps to the small size of the trap and the food habits and behaviour of the fishes. The specimens were frozen aboard and later fixed in 5% formalin and transferred to 30% isopropanol at the laboratory.

Results

General overview

The most abundant group was the Chimaeridae, a group of fishes usually found at bathyal depths. *Hydrolagus mirabilis* was collected during dive 2605 (see below). Several of these animals were observed during the dives moving slowly and hovering at a certain distance from the bottom in the vicinity or far from the vent sites. These fishes were living in the ambient cold water of these depths and perhaps in heated water when penetrating the vent areas. Several sharks were observed. One of them, probably *Deania calceus*, was observed during dive 2603 swimming near the bottom. This common bathyal species has been photographed during the dives of the French bathyscaph *Archimède* in the Azores in 1969 (Saldanha, 1977).

The bythitid fish, *Cataetyx laticeps*, was observed and video recorded during dive 2605. The fish was lying in a rock cavity surrounded by mussels in heated water. A specimen of this species was collected during dive 2606 (see below) and another one was seen some 5 to 10 meters from a thermal vent during the same dive (site 3, 1627 m). A small morid (some 20 cm long) was also video recorded (dive 2606) in heated water in a small cavity surrounded by mussels. Morids were also observed several times but their specific identification through the video images obtained needs further study. Some unidentified fishes having "zoarcid" shape, whitish color and swimming vertically were observed during dive 2606 in the vicinity of the vents. Other fishes were observed resting on the bottom in cold ambient water. They seemed to be *Bathysaurus* but they

were at a considerable distance from the *Alvin* and thus their identification is tentative.

Collected material

Chimaeridae. - *Hydrolagus mirabilis* (Collet, 1904), one specimen. Coll. MB 3701. *Alvin* dive 2605, depth 1630 m, 31.05.1993.

Measurements in mm. - Total length 810 (mutilated specimen, caudal filament lacking), snout to caudal origin 675, body height 130, head length 160, preorbital length 69, horizontal eye diameter 38, preanal length 350, predorsal fin length 174, dorsal spine length 110, pectoral fin length 195, pelvic fin length 111.

Stomach contents. - Digested remains of decapod crustaceans, two amphipods and a cirriped. Due to the digested condition of this material there is no evidence that this fish fed on animals of the thermal vent community.

Distribution. - *H. mirabilis* was known from the Atlantic continental slope from Spain to Iceland and from about 450 to 1200 m, but these limits were hypothesized to be wider (Stehmann and Burkel, 1984). It is now recorded from the Atlantic rift valley at 1620 m.

Bythitidae. - *Cataetyx laticeps* (Koefoed, 1927), one specimen. Coll. MB 3702. *Alvin* dive 2606, depth 1626 m, 1.06.1993.

Measurements in mm. - Mouth to caudal origin 673, standard length 635, head length 155, preorbital length 34, horizontal eye diameter 22, predorsal fin length 244, preanal length 325, preanal fin length 337, dorsal fin maximum height 33, anal fin maximum height 27, pectoral fin length 77, pelvic fin length 42.

Stomach contents. - 6 specimens of bresiliid shrimps - two specimens were not digested at all and their cephalothorax lengths were 5.6 and 6.7 mm.

Intestinal contents. - Digested remains of shrimps, 3 mollusc shells (shell lengths: 6.8 and 7.6 mm, one broken), very small rock particles. The fish fed on animals of the thermal vent community. Shrimps are the most evident proof. It is probable that the small benthic molluscs and the small rock particles were engulfed by the fish when catching motile prey such as shrimps.

Distribution. - In European seas *C. laticeps* is known from depths varying between 1051 and 2830 m in the Mediterranean and the Atlantic. It was already recorded from the Azores (Nielsen, 1984).

Conclusions

The observations made during the *Alvin* dives and the two specimens collected did not allow the recognition of a characteristic thermal vent fish fauna (e.g., Cohen and Haedrich, 1983; Cohen *et al.*, 1985; Rosenblatt and Cohen, 1986) at the Lucky Strike site for the moment. The fishes recognized during the dives and those collected are regularly found at bathyal depths. Some of these fishes living in the neighbourhood of thermal vents, as it was verified for *C. laticeps*, may feed on animals of the vent community (cf. Geistdoerfer, 1988). Nevertheless the present observations are insufficient to exclude the existence of a true vent fish fauna at the Lucky Strike site. Further observations will be needed to clarify the situation.

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