

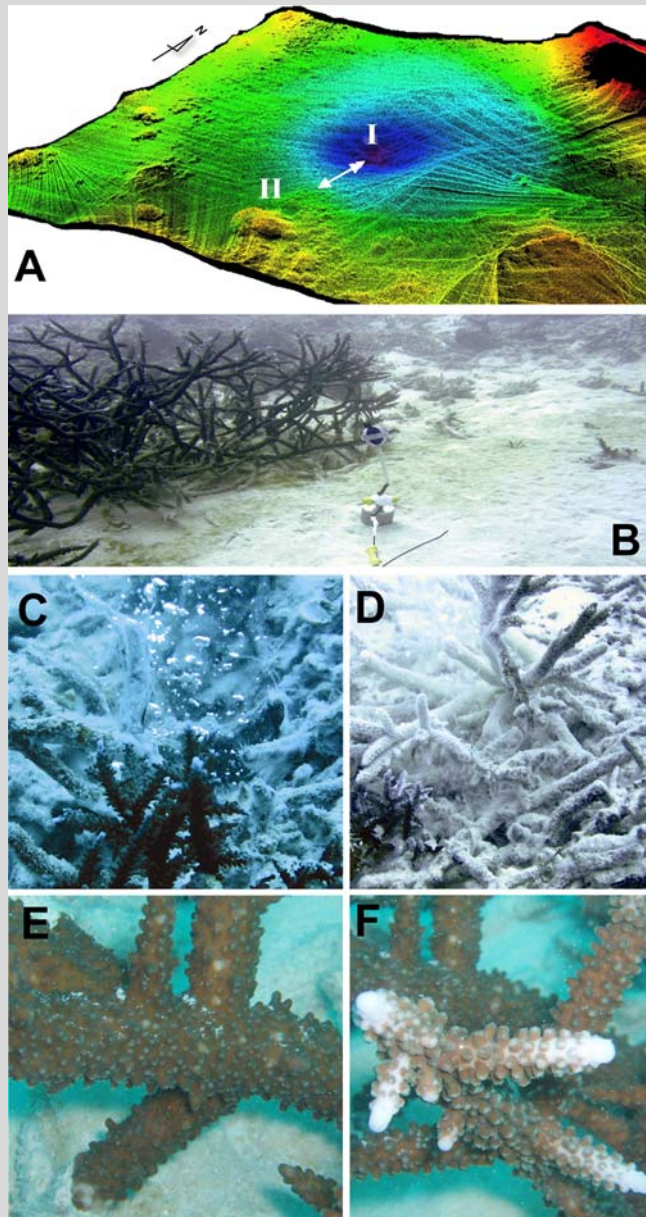
## Acroporid corals growing over a methane-bubbling hydrothermal vent, Southern Ryukyu Archipelago

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**Fig. 1** Hydrothermal vent field and Acroporid corals. **a** Overview of the vent field. **b** Appearance of the coral aggregation found on the outskirts. **c** Methane bubbles released directly below the Acroporid colonies. **d** Microbial mat. **e** Mid-part of the colonies with well-pigmented appearance. **f** Reduced pigmentation around branch tips

Hydrothermal vents have been reported from the areas of coral reef in Papua New Guinea (Price and Pichler 2005), Baja California (Prol-Ledesma et al. 2004) and Taketomi-jima in the southern Ryukyu Archipelago (Oomori 1987, Kuo et al. 2001). The high temperature and chemical composition of hydrothermal fluids are normally lethal to many marine animals. In 2005 an investigation was conducted of a submarine hot spring field 1 km off Taketomi Island, Okinawa, Japan in depths of 13–22 m. The main hydrothermal vent (Fig. 1a, I, 24° 20' 9" N, 124° 06' 10" E, depth 22 m) discharged water at 50–60°C, at a pH of 6.56, DO 1 g l<sup>-1</sup>, and salinity 3.3%. There was a barren zone surrounding the vent out to 5–10 m. At a distance of 20 m (Fig. 1a, II) small aggregations of live Acroporid corals were found (Fig. 1b, depth 13 m). Live branching corals were also found in an area of vigorous methane release, where coral and sediment are covered with a white microbial mat (Fig. 1c, d), notwithstanding temperatures of 41°C, salinity 3.3%, pH 6.67, and DO 0.4 g l<sup>-1</sup>. It is notable that no massive, encrusting, or tabular colonies grow in this area. The lower parts of colonies appear to be inhibited by the microbial mats (Fig. 1d); however, upper parts (20 cm above the substrate) are well pigmented (Fig. 1e). Reduced pigmentation at the axial tips is indicative of active growth (Fig. 1f).

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Reef sites

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