



Stylocoeniella nikei n. sp., a new zooxanthellate coral from the Pacific (Cnidaria, Anthozoa, Scleractinia)

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ABSTRACT

Stylocoeniella nikei, a new zooxanthellate astrocoeniid scleractinia is described, and affinities with the two other living species of *Stylocoeniella* are discussed. It lives on sedimentary substrates, in sheltered environments.

KEY WORDS: Coral - *Stylocoeniella nikei* - New species - Astrocoeniidae - Ramose coral - Pacific Ocean.

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INTRODUCTION

The genus *Stylocoeniella* Yabe and Sugiyama, 1935, includes *S. armata* (Ehrenberg, 1834), *S. guentheri* (Bassett-Smith, 1890), and *S. cocosensis* Veron 1990. In October 2000 in Manado, Indonesia, specimens of branching colonies of *Stylocoeniella* were collected, and later examined along with a specimen collected by Gérard Faure (1986) in Rapa, Austral Islands. Results of a detailed examination of the specimens are presented, comparisons with *S. guentheri*, *S. armata* and *S. cocosensis* are made, and *S. nikei* n. sp. is described.

MATERIALS AND METHODS

The specimens were collected by SCUBA diving in Manado, Northern Sulawesi, Indonesia, at 24 m depth on the reef slope, and in Rapa, Austral Islands, French Polynesia, at 10 m depth, on soft bottom. Specimens were bleached to clean the skeleton from coral tissue and dried. Morphological features were observed under stereomicroscope and by scanning electron microscopy. Types have been deposited in the Museo di Storia Naturale di Milano (MSNM), in the Acquario Civico e Stazione Idrobiologica di Milano, and in the Museum national d'Histoire Naturelle (MNHN), Paris.

TAXONOMINC ACCOUNTS

Family ASTROCOENIIDAE Koby, 1890
Genus *Stylocoeniella* Yabe and Sugiyama, 1935

Stylocoeniella nikei n. sp.

Synonymy

Stylocoeniella guentheri, Faure (1986); not Bassett-Smith (1890).

Material examined

Four specimens from Bunaken, Manado, Indonesia; one specimen from Rapa, Austral Islands.

Holotype

Museo di Storia Naturale di Milano (MSNM), COE218, Lekuan III, Bunaken, Northern Sulawesi, Indonesia, 3 November 2000, depth 24 m. Dimensions: 9.2 × 10.4 × 3.6 cm (Fig. 2).

Paratypes

Acquario Civico e Stazione Idrobiologica di Milano, CZ630, Lekuan III, Bunaken, Northern Sulawesi, Indonesia, 3 November 2000, depth 24 m. Dimensions: 10.0 × 6.6 × 3.2 cm. Specimen in three pieces.

Museum national d'Histoire Naturelle (MNHN), Rapa 114, Rapa, Austral Islands, French Polynesia 1996. Other paratypes are in the Authors' collections.

Description

Corallum ramose (Fig. 1), without any lamellar or encrusting basal expansion. Branches up to 35 cm long, tapering with blunt tips (Fig. 2), round or slightly oval in section, 0.4 to 0.8 cm in diameter. A few branch tips swollen, or knob-like, indicating a stage of separation into two branches. Often the lower 10-20 cm part of the branch, close to the substratum, is dead. Distance between branch division is between 0.5 and 3 cm. No anastomosis between branches. Angle of branching variable, between 30° and 80°. Individual colonies are 20-50 cm in diameter, often forming very large mono-specific masses or stands up to 3-5 m across.

Corallites circular, monocentric, 1.0-1.5 mm in diameter (Fig. 3A), on average up to 1 mm apart, but generally slightly more crowded towards the branch (Fig. 4), or the knob (in the middle of Figure 5) tips than on the lower part of the branches. Relationship between corallites is plocoid. Corallites are never hooded, and the top of the corallite wall is flush with the surface of the coenosteum. On a number of branches corallites show a



Fig. 1 - Living colony of *S. nikei* n. sp. (Manado, 24 m depth). Spiky appearance of the corallum and extended polyps are visible.

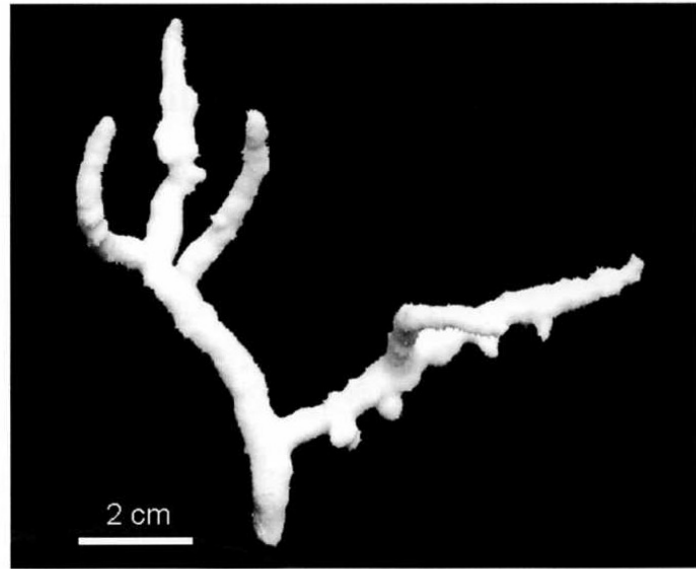


Fig. 2 - *S. nikei* n. sp. holotype (MSNM COE218).

tendency to be arranged in longitudinal series, in a *Seriatorpora*-like manner (Fig. 5), but such rows of corallites are less straight and regular than in the latter genus.

Septa arranged in two orders, in hexamerous plan. Septa of the first order are well developed, reaching the columella, and thick either triangular or parallel-sided in horizontal section. A few anomalous corallites with 8-10 septa, all reaching the columella, may be found on branch tips or at the bifurcation between branches. Free margin distinctly exsert particularly in its outer half, and even arched above the corallite wall, and forming a crown-shaped pattern (Fig. 3B), giving the corallum its spiky appearance. Septal ornamentation composed of up to four (granular) dentations. No pali or paliform lobes. In many corallites the exsert, outer part of one of the septal free margin extends vertically into a prominent, styliform pillar up to 1 mm high (Fig. 3C). These pillars are longitudinally costate (Fig. 6A). The costae bear on

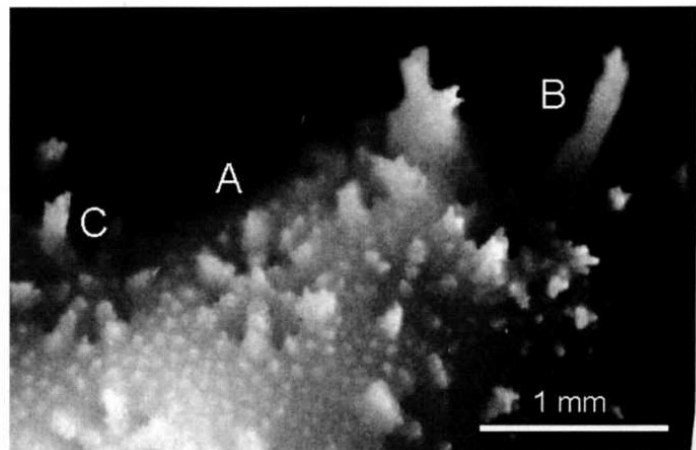


Fig. 3 - Corallites of *S. nikei* n. sp.: A, septa arranged in hexamerous plan reaching a tapering columella; B, free margins of septa distinctly exsert and forming a crown-shaped pattern; C, styliform pillar.

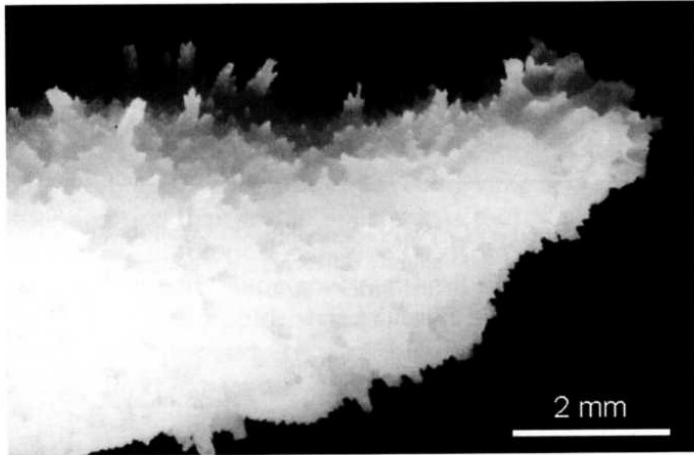


Fig. 4 - Branch tip of *S. n.* sp.. Corallites are crowded and septa very exsert at branch tip; styliform pillars associated with corallites are clearly visible at top left of the figure.

their edges minute teeth, tapering at their tips, which are ornamented with a few spines. Sides of the septa bear small conical or branching spines with acute tips.

Second order septa much less developed (length <math>< R/4</math>) or absent. Most often they are reduced to low ridges running down the corallite wall between two primaries, or to a few spines projecting inwards from the corallite wall.

Columella well developed, conical or styliform, often with a broad base, up to one corallite radius in width. Vertical development variable, from a hump in the centre of the corallite (Fig. 6B) to a process tapering abruptly with a spiny tip projecting above the level of the coenosteum (Fig. 3A).

Coenosteum uniformly and densely covered with fine spinules (Fig. 7). These spinules tend to be arranged in circles around the corallites, but no fusion of these spinules into a bounding ridge around the margin of the corallites is ever observed.

Polyps cylindrical, translucent with a slightly pink to

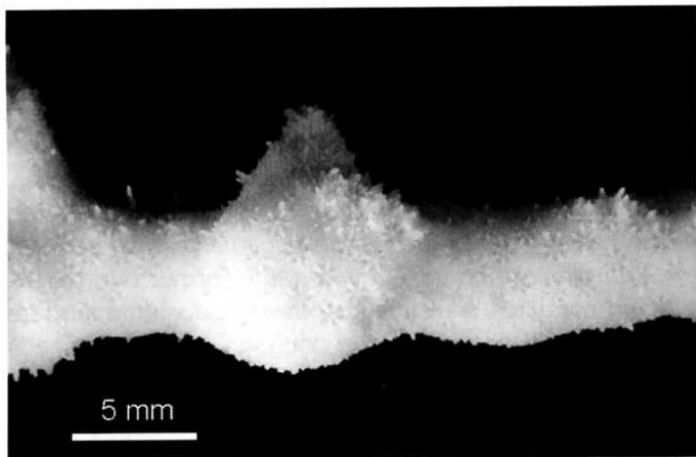


Fig. 5 - On a branch of *S. nikei* n. sp. a group of corallites with very exserted septa and the serial arrangement of corallites are visible.

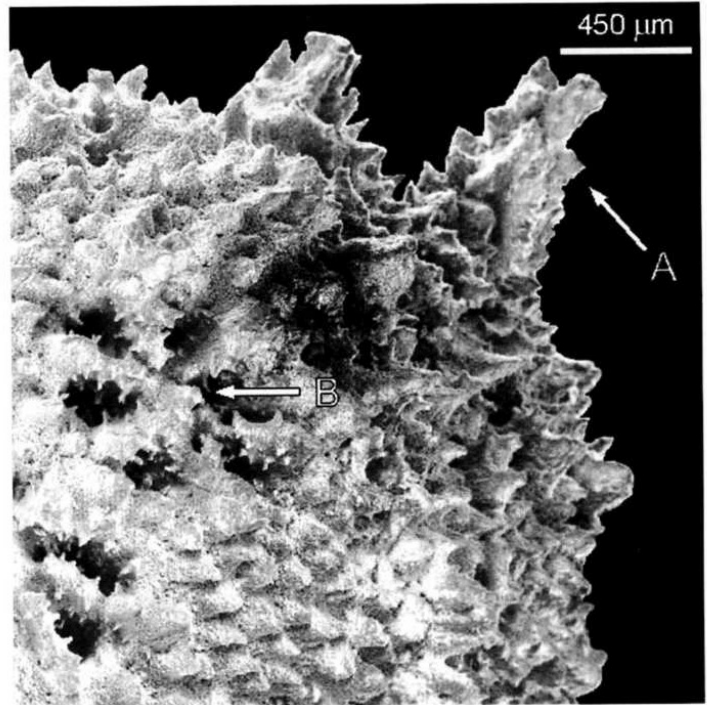


Fig. 6 - SEM image of *S. nikei* n. sp. corallites and styliform pillars. Arrows showing the longitudinally costate structure bearing minute teeth on the edges (A), and the point-shaped columella (B).

brownish tinge, expanded during daytime. Twelve digitate tentacles, with rounded opaque tips.

There is little intra- or intercolonial variability in the characters described above, and between specimens from the Sulawesi and the Austral islands.

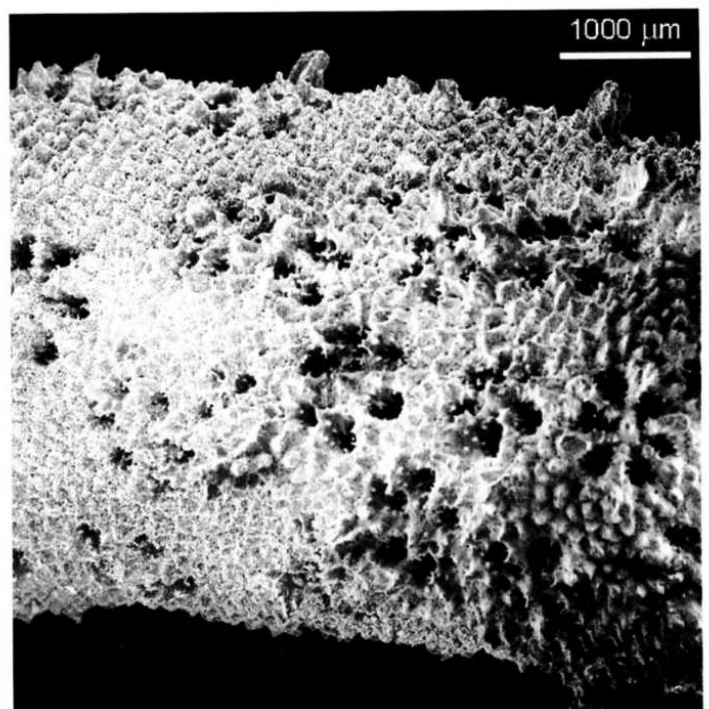


Fig. 7 - SEM image of a branch of *S. nikei* n. sp. showing the fine spinules uniformly and densely covering the coenosteum.

TABLE I - Main diagnostic characters of the species in the genus *Stylocoeniella*.

	Corallum	Corallite arrangement	Pillars	Septa	Columella
<i>S. armata</i>	Encrusting	Ceriod to sub-ceriod	Well developed styliform	Two orders only slightly different, first order = R/2, slightly exsert	Well developed conical
<i>S. guentheri</i>	Encrusting to columnar	Sub-ceriod to plocoid	Weakly developed, often hood-like	Two markedly different well developed orders, first order = 3/4 R, slightly exsert	Well developed conical
<i>S. cocosensis</i>	Encrusting	Plocoid, conical protruding	Weakly developed or absent	Two slightly different orders, first order < R/3, not exsert	Weakly developed
<i>S. nikei</i> n. sp.	Ramose	Plocoid on branch length, plocoid to sub-ceriod at branch tips	Very developed, styliform	Two markedly different orders, first order $\geq 3/4$ R, markedly and irregularly exsert, second order weakly developed	Well developed conical to styliform

Etymology

This species is named in honour of Carlo Nike Bianchi, who has fostered the growth of tropical marine biology research and interest in Italy.

Occurrence

Stylocoeniella nikei is found in relatively shallow water on coral reef slopes in sheltered environments (protected embayments) where sediment deposit (sand, mud) is abundant. Depth range: 1 to 25 m.

Distribution

Hitherto recorded from the Pacific only: Northern Sulawesi, Austral Islands.

CONCLUSIVE REMARKS

The colony shape and branching growth form of *S. nikei* is broadly similar to that of *Palauastrea ramosa* (Yabe & Sugiyama, 1941), but the branches of *Stylocoeniella* do not anastomose, are thinner (0.4-0.8 cm as opposed to 1.0-1.4 cm for *P. ramosa*), less tapering and with more rounded tips. The angle of branching is also smaller than in *Palauastrea*. The thickness of the primary septa is also somewhat reminiscent of that of *P. ramosa*, but they are clearly more exsert in *S. nikei*,

with a better developed ornamentation of the upper septal margin, giving the corallum its distinctly spiky appearance. Relationships between *Stylocoeniella*, *Palauastrea* and *Stylophora* have been discussed by Veron & Pichon (1976) and need not to be reiterated here. The presence in our specimens of well developed, typical pillars leaves no doubt as to the position of this new species in the genus *Stylocoeniella*.

Within the genus *Stylocoeniella*, *S. nikei* is clearly separated from the three other species, *S. guentheri* (Bassett-Smith, 1890), *S. armata* (Ehrenberg, 1834) and *S. cocosensis* by its ramose colony growth (Table I). (For detailed descriptions of *S. guentheri* and *S. armata*, the reader is referred to Yabe & Sugiyama, 1933, 1935; Wells, 1954, 1966; Veron and Pichon 1976). Although *S. guentheri* can sometimes display knob-like or column-like vertical expansions of its skeleton, its colonies never form branches, and they remain characteristically encrusting. Conversely, as mentioned in the description, *S. nikei* never shows any lamellar or encrusting expansion at the base of the branches. *Stylocoeniella nikei* is closer to *S. guentheri* than to *S. armata*, the former two having plocoid corallites, a distinctly spinose coeosteam, and intercorallite pillars close to the corallites or even connected to one of the primaries. However, even besides the growth form, the two species, *S. nikei* and *S. guentheri*, are well separated, *S. nikei* constantly having thicker and much more exsert primary septa (a most obvious character), and rudimentary or no secondary septa.

The *Stylocoeniella* specimen from Rapa, Austral Islands, referred to as *S. guentheri* by Faure (1986) is hereby ascribed to the new species *S. nikei*. Like the Indonesian samples, the Rapa colony also displays a typically branching growth form. The branches, however, are slightly more parallel to each other, with more rounded tips than in the specimens from Manado. Other skeletal differences can also be observed (less exsert primaries for the Rapa specimen); all of them, however, are minor and could be explained by the particularly sheltered and muddy type of environment in which the colony from Rapa was living.

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