Notes on Octocorallia from the Laccadives (SW India)

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Key-words: Octocorallia; Gorgonacea; Alcyonacea; new species; new records; Laccadives; Indian Ocean.

New records for the Laccadives are given and one new species is described and figured: *Sinularia abhishiktae*.

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Introduction

During the years 1987 to 1989 the divers of the National Institute of Oceanography, Goa, India, collected a number of organisms in the waters of the Laccadives, SW India (especially from the islands Kavaratti, Agatti and Bungarum) at depths between 20 and 30 meters. The purpose of this collection was to study the bio-active substances of these organisms. In the present paper the results of a taxonomic study of the octocorals of this collection are reported.

All material is preserved in 70% alcohol and deposited in the National Institute of Oceanography (NIO), Dona Paula, Goa, India and the National Natuurhistorisch Museum), Leiden, The Netherlands (formerly Rijksmuseum van Natuurlijke Historie: RMNH).

Up till now only Thomson and Simpson (1909) described four species of Gorgonacea from the Laccadives viz. *Subergorgia ornata, Nicella reticulata, N. pustulosa* and *Echinomuricea uliginosa*. Three more species of Gorgonacea and nineteen species of Alcyonacea are here added.

Gorgonacea: *Clathraria maldivensis* van Ofwegen, 1987 (RMNH Coel. no. 18411) (for a description see van Ofwegen 1987) ; *Junceella juncea* (Pallas, 1766) (RMNH Coel. no. 18412) (for a description see Francis-Mai-Bao-Thu & Domantay 1971); *Subergorgia suberosa* (Pallas, 1766) (RMNH Coel. no. 18413) (for a description see Stiasny 1937).

Alcyonacea: *Alcyonium flaccidum* Tixier-Durivault, 1966 (RMNH Coel. no. 17960) (for a description see Verseveldt 1971); *Lobophytum altum* Tixier-Durivault, 1956 (RMNH Coel. no. 17962); *L. crassum* von Marenzeller, 1886 (RMNH Coel. no. 17963); *L. pauciflorum* (Ehrenberg, 1834) (RMNH Coel. no. 17964); *L. schoedei* Moser, 1919 (RMNH Coel. no. 17967) (for a description see Verseveldt 1983); *Sarcophyton crassocaule* Moser, 1919 (RMNH Coel. no. 17968) (for a description see Verseveldt 1982); *Sinularia dissecta* Tixier-Durivault, 1945 (RMNH Coel. no. 17975); *S. elongata* Tixier-Durivault, 1970 (RMNH Coel. no. 18401); *S. facile* Tixier-Durivault, 1970 (RMNH Coel. no. 18402); *S. gaweli* Verseveldt, 1978 (RMNH Coel. no. 18403); *S. gravis* Tixier-

Durivault, 1970 (RMNH Coel. no. 18404); *S. hirta* (Pratt, 1903) (RMNH Coel. no. 18405); *S. inelegans* Tixier-Durivault, 1970 (RMNH Coel. no. 18406); *S. lochmodes* Kolonko, 1926 (RMNH Coel. no. 18407); *S. muralis* May, 1899 (RMNH Coel. no. 18408); *S. numerosa* Tixier-Durivault, 1970 (RMNH Coel. no. 18409); *S. variabilis* Tixier-Durivault, 1945 (RMNH Coel. no. 18410). (for descriptions see Verseveldt 1978; 1980).

Two species of Alcyonacea, viz.: *Sinularia densa* (Whitelegge, 1897) (RMNH Coel. no. 17971) and *S. abhishiktae* spec. nov. (RMNH Coel. no. 17969; 17970) are discussed below.

Systematic part

Sinularia densa (Whitelegge, 1897)
(figs. 1-4)

Lobophytum densum Whitelegge, 1897: 219, pl. 11 figs. 4a-h.

? *Lobophytum densum*; Hickson & Hiles, 1900: 505.

? *Sclerophytum densum*; Pratt, 1903: 521, pl. 29 fig. 18, pl. 30 figs. 20-22; Pratt, 1905: 256; Thomson & McQueen, 1907: 55; Thomson & Simpson, 1909: 6; Thomson & Mackinnon, 1910: 177; Cary, 1931, pl. 4 figs. 12, 13.

? *Sinularia densa*; Lüttschwager, 1915: 11.

Sinularia densa; Verseveldt & Alderslade, 1982: 625, fig. 3, pl. 5A ; Chang, Dai & Seng, 1988: 11.

not *Sinularia densa*; Kolonko, 1926: 314; Tixier-Durivault, 1945: 59; 1951: 38, figs. 39, 40, 45-48; 1966: 182-185, figs. 175-177; 1970: 149; Verseveldt 1960: 233, pl. 17 fig. 4; 1976: 498 (= *S. gibberosa* Tixier-Durivault, 1970)

not *Sinularia brongersmai*; Verseveldt, 1972: 460-463, figs. 2, 3, pl. 1 fig. 2; 1977: 20 (= *S. abrubta* Tixier-Durivault, 1970)

Material.— Kavaratti Island, 25 m, one colony (RMNH Coel. no. 17971); Funafuti Atoll, Ellice Is., unregistered sclerite slides of holotypes; *Sinularia abrubta*, Moku Manu Isl., Oahu, Hawaii, 20 fms, rock boulder bottom, visibility ca. 75 ft., coll. John Naughton, 27.x.1963, one colony (RMNH Coel. no. 10581); *S. abrupta*, off Moku Isl., Oahu, Hawaii, "deep hole", 28.viii.1964, about 120 ft. deep, coll. Alan Banner, sclerite slides only (RMNH Coel. no. 10590); *S. abrupta*, Oahu, Hawaii, sandy beach, 14. xi.1971, coll. R. Kinzie, sclerite slides only (RMNH Coel. no. 10591).

Description.— The Laccadive specimen (figs. 1C, D) is 4 cm high and 6.5 x 3.5 cm in diameter. The sterile stalk varies in height from 0.5 to 1.5 cm; in places it has longitudinal striations. The capitulum projects slightly beyond the stalk. The primary lobes are branched or crest-like; lobes and lobules are flattened. The colour of the colony in alcohol is creamish white with some brown patches.

The polyps contain rods and small wart clubs, up to 0.20 mm long. In the surface layer of the lobes there are leptoclados-type clubs, 0.06 to 0.20 mm long, with rounded heads and thick leaves (figs. 2A-L); the longer the clubs the less foliaceous the heads are, so the largest are wart clubs (fig. 2M). In addition to the clubs there are rods, which merge into the spindles of the coenenchyme. In the surface layer of the stalk the leaf clubs are wider and the heads are more warty (fig. 3). The coenenchyme of the lobes and the stalk has spindles up to 3.8 mm long with simple or complex tubercles (fig. 4). These spindles have pointed ends, blunt ends, or one pointed and

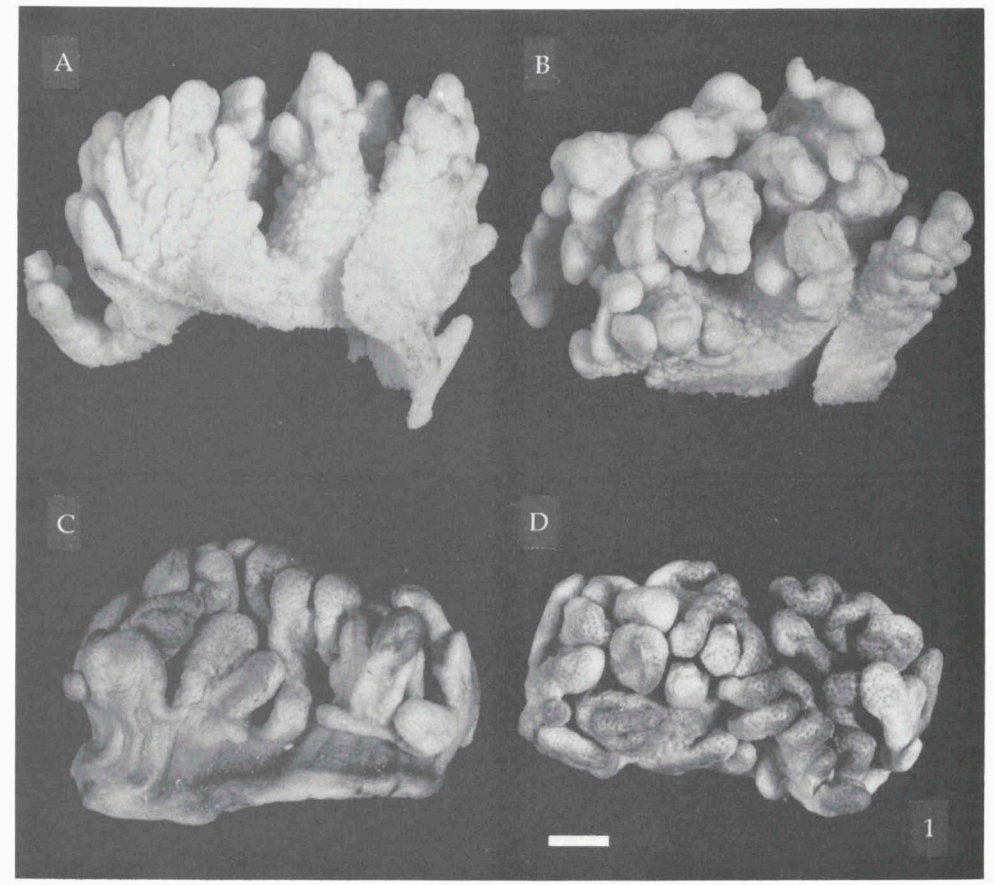

Fig. 1A-B. *Sinularia abhishiktae* spec. nov., holotype from Agatti Island; (RMNH Coel. no. 17969). C-D, *Sinularia densa* (Whitelegge, 1897), colony from Kavaratti Island; (RMNH Coel. no. 17971). Scale bar 1 cm.

one blunt end; some of them are bifurcated at one end.

Discussion.— Comparison of the sclerites of the Laccadives specimen with those of the holotype showed them to be in complete agreement. The species is characterized by the clubs with rounded heads and thick leaves, a character not found in other species of *Sinularia*.

In the collection of the Nationaal Natuurhistorisch Museum (RMNH Coel. no. 10581, 10590, 10591) we found slides and a piece of a colony which we consider to be *S. densa*. The material was sent from the Bernice P. Bishop Museum, Honolulu, and identified (but not published) by Verseveldt as *Sinularia abrubta* Tixier-Durivault, 1970. The sclerites match the material from the Laccadives, although the colony form differs in having thicker lobes and being encrusting. Verseveldt examined the specimens before having seen type-material of *S. abrubta* and *S. densa*, what probably explains his wrong identification.

Most published descriptions referring to *S. densa* are too imperfect to appreciate what actually was described (indicated in the synonymy with a query). The speci-

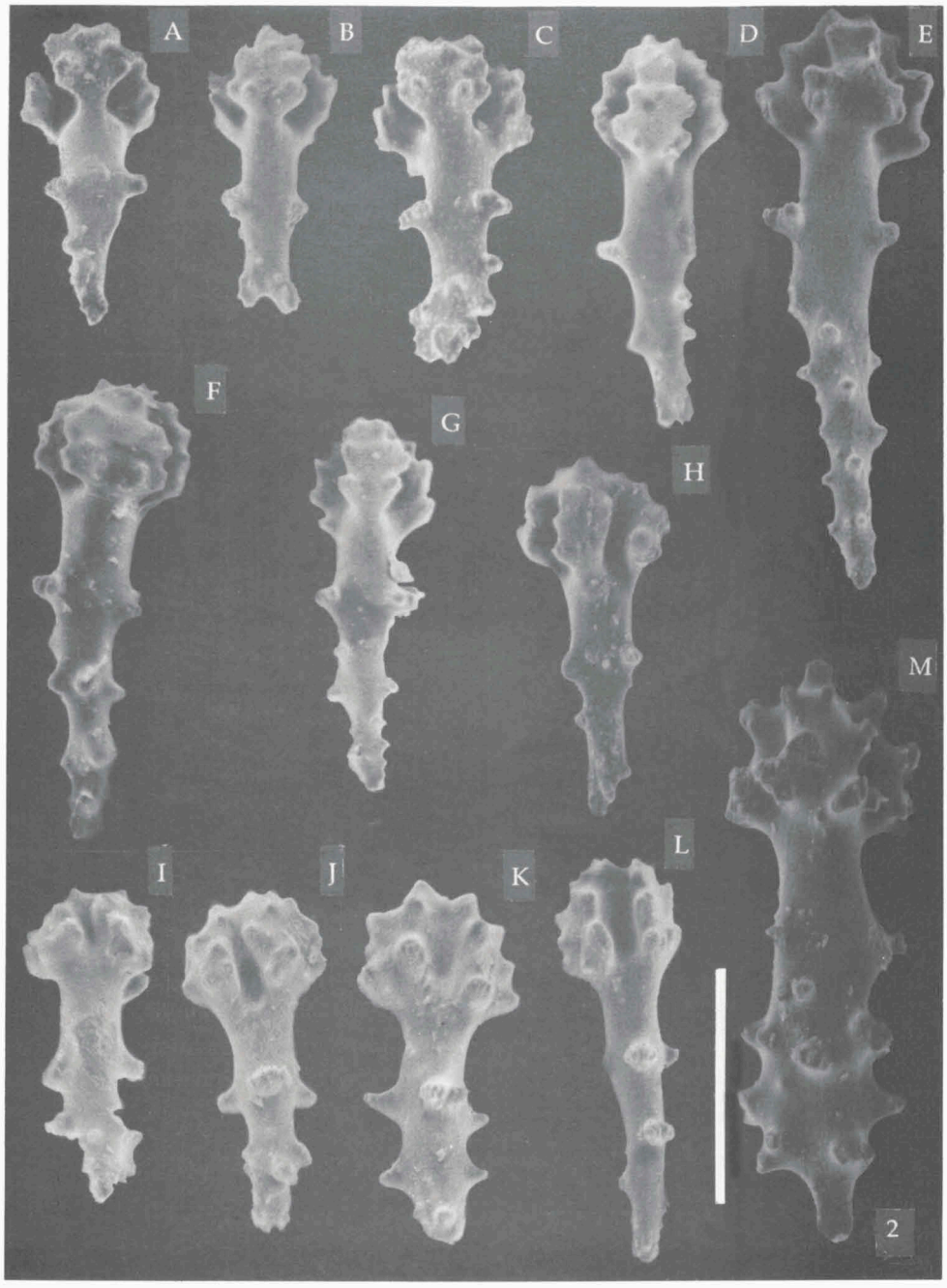

Fig. 2. *Sinularia densa* (Whitelegge, 1897) specimen from Kavaratti Island (RMNH Coel. no. 17971); sclerites from surface layer of a lobe. Scale bar 0.05 mm.

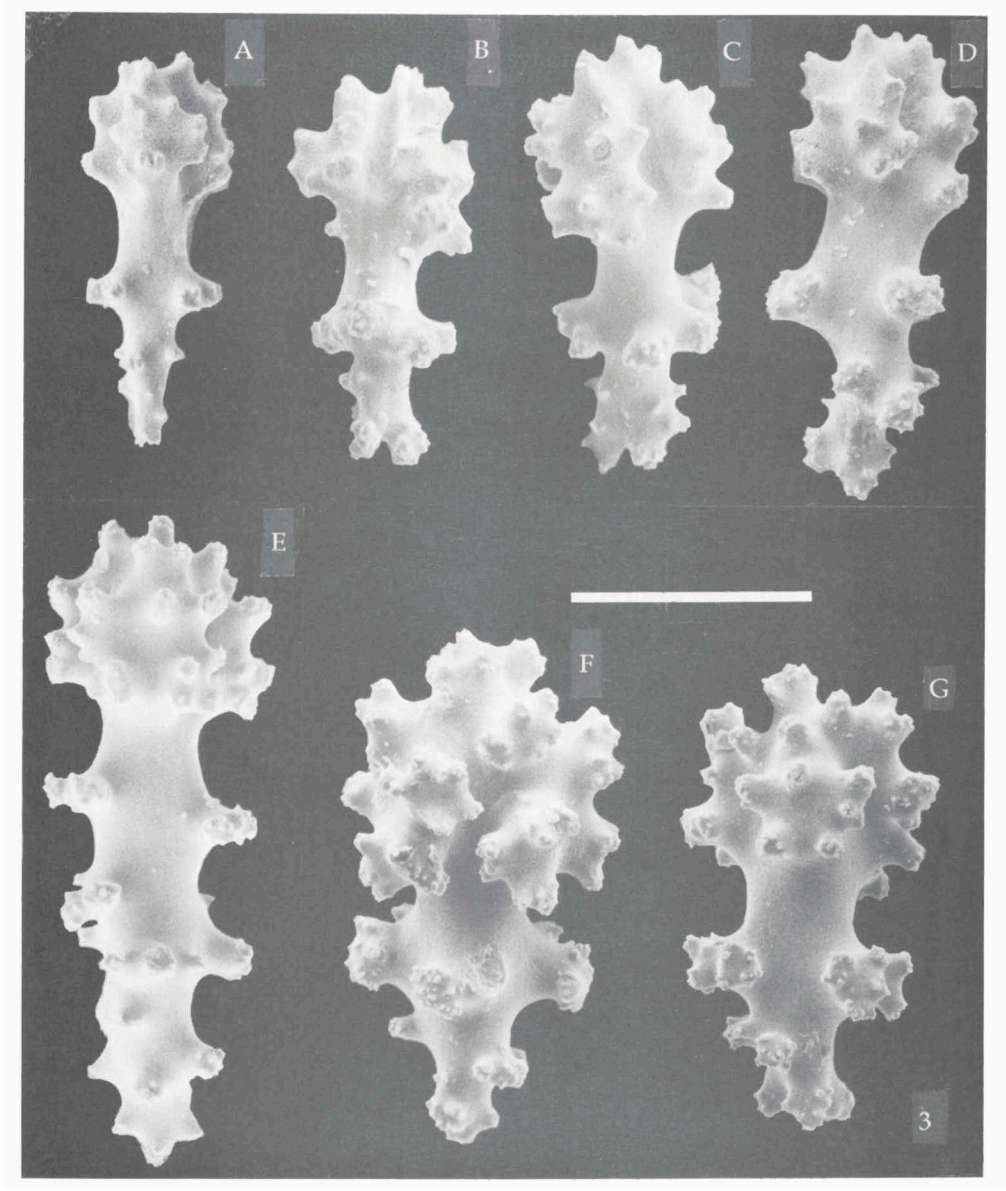

Fig. 3. *Sinularia densa* (Whitelegge, 1897), specimen from Kavaratti Island (RMNH Coel. no. 17971); sclerites from surface layer of the stalk. Scale bar 0.05 mm.

mens described by Kolonko and Tixier-Durivault clearly do not belong to *S. densa* because these authors mentioned clubs with a central wart, a type of club that does not occur in *S. densa*.

The wrong identifications of Verseveldt (1960, 1976) were corrected by himself in his revision of the genus (Verseveldt, 1980)

Sinularia brongersmai Verseveldt, 1972, synonymized by Verseveldt & Alderslade

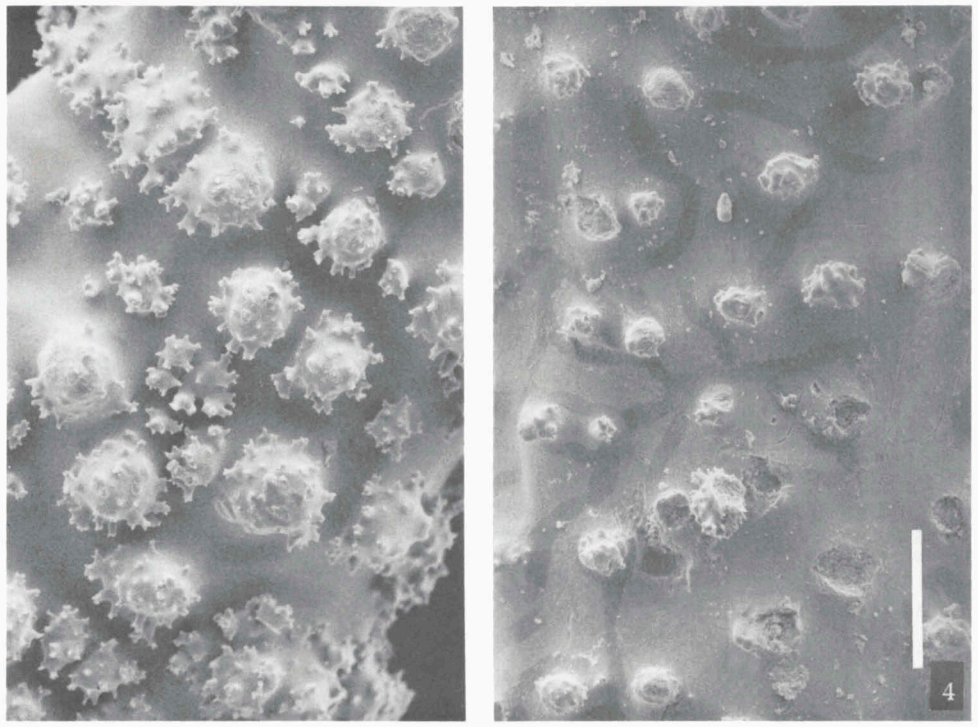

Fig. 4. *Sinularia densa* (Whitelegge, 1897), specimen from Kavaratti Island (RMNH Coel. no. 17971); tubercles on coenenchymal sclerites from the stalk. Scale bar 0.05 mm.

(1982: 627) with *S. densa*, was also re-examined. The species has clubs with very thin leaves (see Verseveldt, 1977: fig. 14), a character of *S. abrubta* Tixier-Durivault, 1970. Verseveldt himself already mentioned (1977: 20) "In many respects *S. brongersmai* resembles *S. abrubta*", only the clubs in the stalk differ somewhat from those of *S. abrubta*. Why he synonymized the species with *S. densa* in his later publication is puzzling to us as the clubs are quite different. In our opinion *S. brongersmai* must be referred to *S. abrubta*.

Distribution.— Funafuti Atoll, Ellice Is.; Hawaii; Taiwan; Laccadives.

Sinualaria abhishiktae spec. nov.
(figs. 1, 5-7)

? *Sinularia triaena*; Verseveldt, 1971: 35, figs. 20-21, pl. 9 fig. 2
not *Sinularia trianea* Kolonko, 1926: 304, pl. 1 fig. 4 (= *S. brassica* May, 1898)

Material examined.— Agatti island, 30 m, the holotype (RMNH Coel. no. 17969) and one fragment of a colony (RMNH Coel. no. 17970)

Description.— The holotype (figs. 1A, B) is 4.5 cm high and 5 x 7.5 cm in diameter, presumably encrusting, but a sterile stalk may also be missing due to careless col-

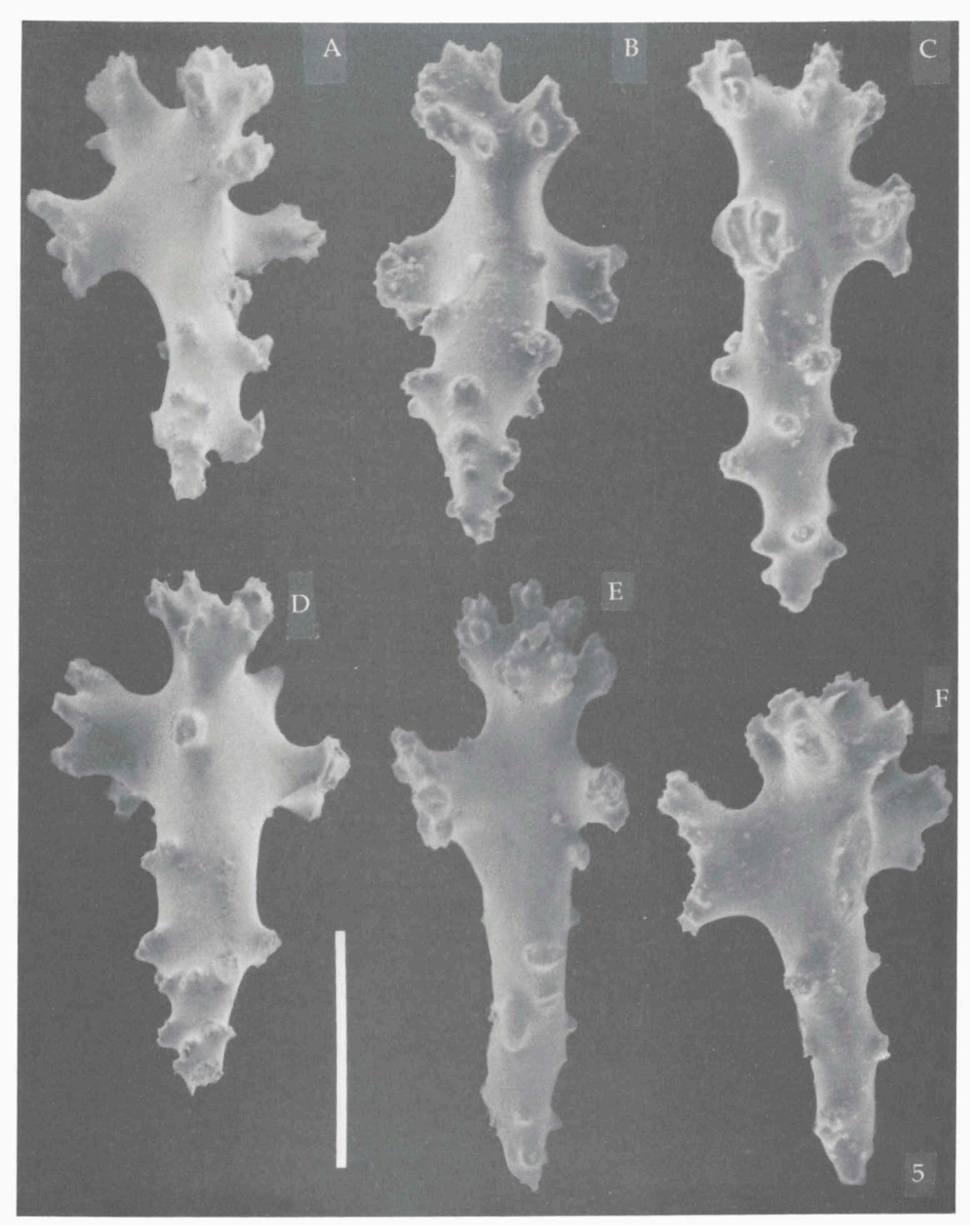

Fig. 5. *Sinularia abhishiktae* spec. nov., holotype from Agatti Island (RMNH Coel. no. 17969); sclerites from surface layer of a lobe. Scale bar 0.05 mm.

lecting. The primary lobes are up to 4 cm long, somewhat compressed laterally and mostly branched. The lobules are knob-like to finger-like. The surface of the colony is strongly corrugated. The colour of the colony in alcohol is creamish white.

The polyps contain no sclerites. The clubs of the surface layer of the lobes vary highly in shape. The heads may consist of (1) two diverging toothed prominences

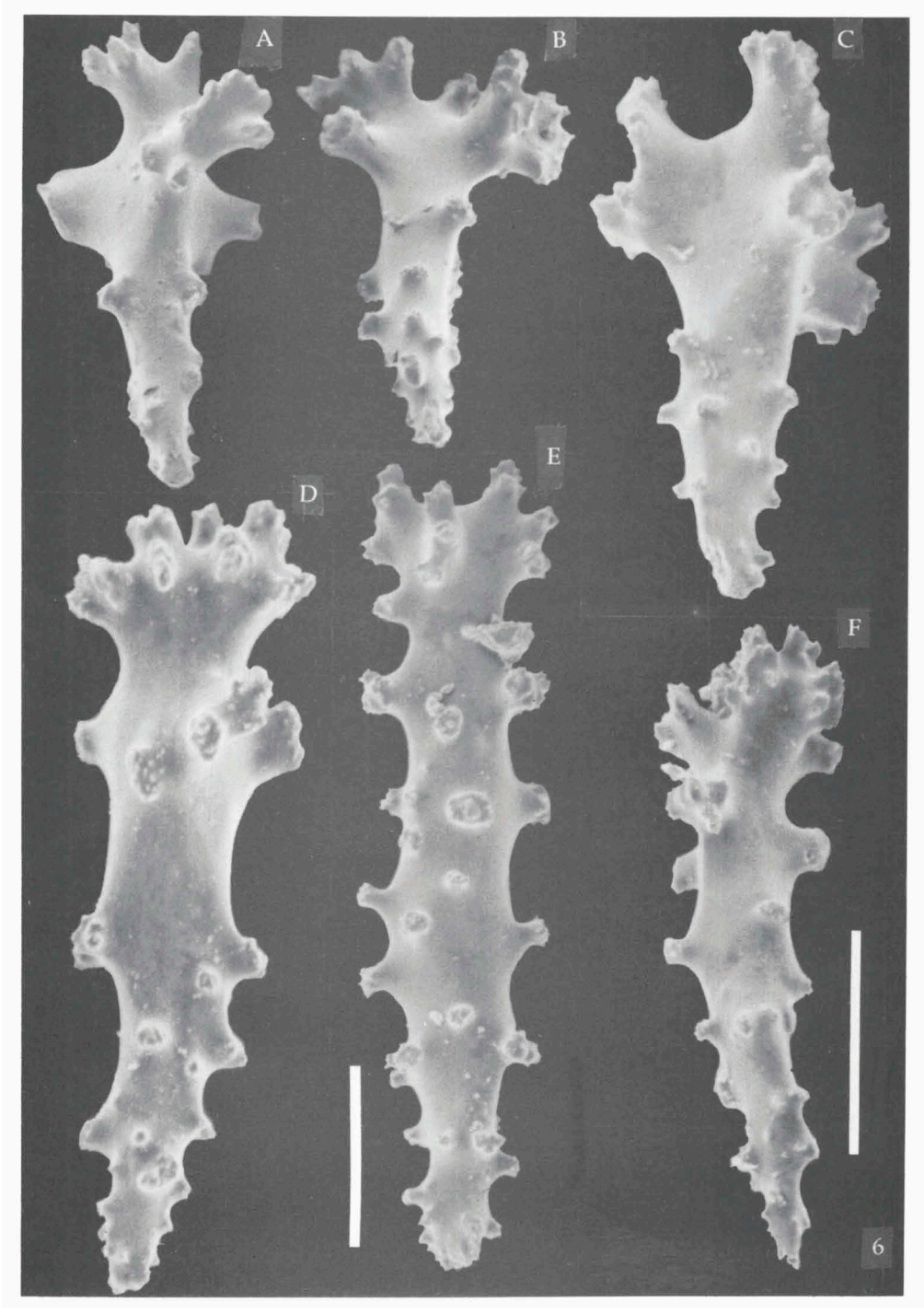

Fig. 6. *Sinularia abhishiktae* spec. nov., holotype from Agatti Island (RMNH Coel. no. 17969); sclerites from surface layer of a lobe. Scale bars 0.05 mm; scale bar at E only applies to E.

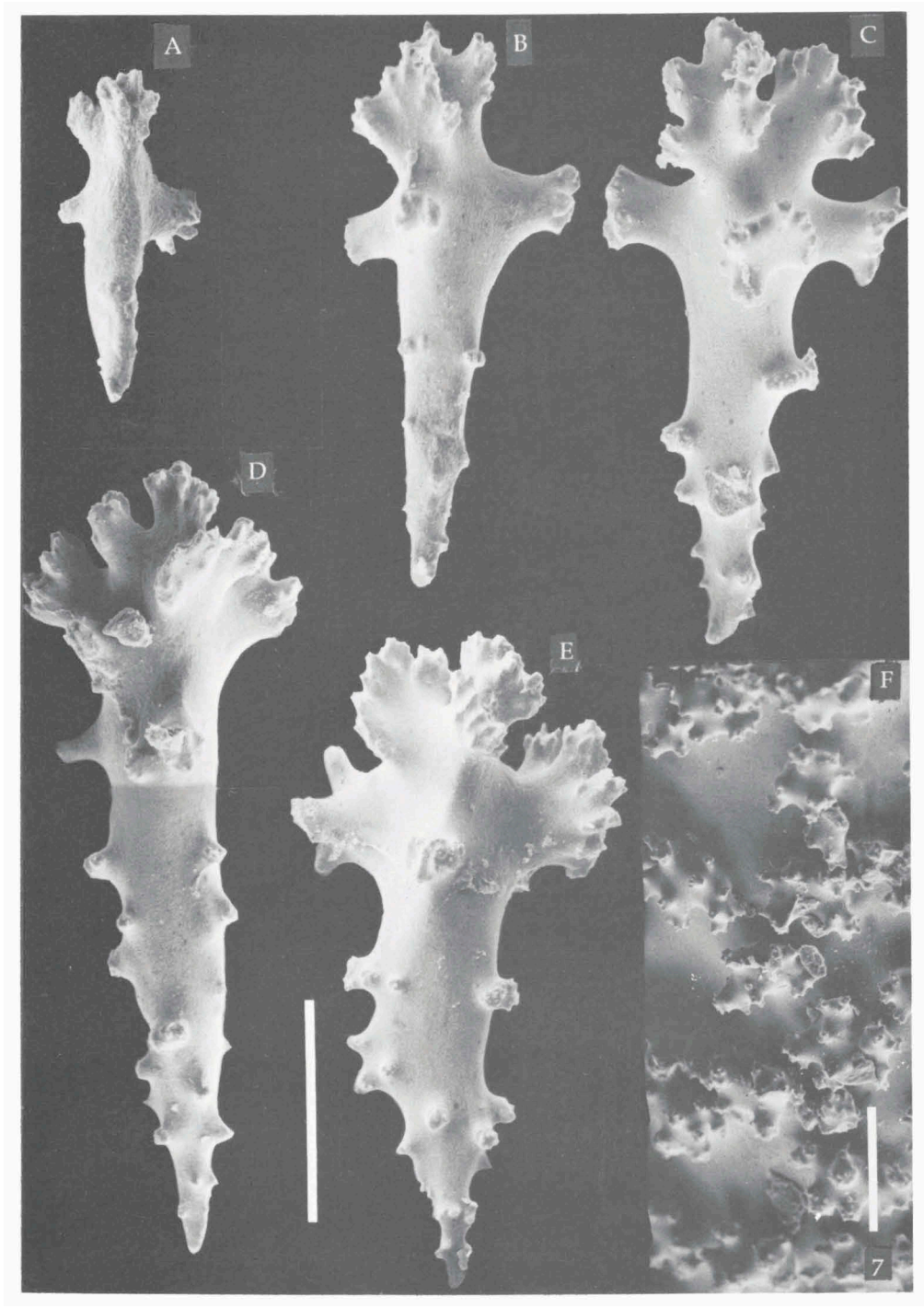

Fig. 7. *Sinularia abhishiktae* spec. nov., holotype from Agatti Island (RMNH Coel. no. 17969); sclerites from surface layer of the stalk and tubercles on coenenchymal sclerite from the stalk. Scale bars 0.05 mm. Scale bar at F only applies to F.

(figs. 5A-C, 6A-C), (2) a central wart of leaves with a distinct girdle of prominences below this (figs. 5D-F, 7B-C, E), (3) a mass of warts (figs. 6F, 7D) or (4) of a few high prominences (figs. 6D, E). The length of the clubs varies from 0.08 to 0.25 mm. The clubs of the surface layer of the base do not differ from those of the lobes. The coenenchyme of the lobes and the base has spindles up to 3.25 mm long, with simple or complex tubercles (fig. 7F).

Discussion.— Because of the variation in club-shape it is difficult to place this species in one of Verseveldt's groups (Verseveldt, 1980: 7). Group II (clubs with a central wart) as well as group IV (clubs longer than 0.12 mm, without central wart and not of the leptoclados-type) are possibilities.

In group II *S. deformis* Tixier-Durivault, 1969, and *S. gyrosa* (Klunziger, 1877) have clubs in the surface layer of the lobes which are similar to those of *S. abhishiktae*, but both species have different clubs in the base of the colony, and the colony forms too are quite different from that of *S. abhishiktae*. As concerns the clubs in the base of the colony of *S. abhishiktae*, we must (as mentioned above) take in consideration the possibility that the base is missing and that it is not an encrusting species. However the shape of the colony of both species is so different from that of *S. abhishiktae* that, also on the basis of this character alone, we consider them different species.

In group IV some specimens identified by Verseveldt (1971: 35) as *S. triaena* Kolonko, 1926, show some resemblance with *S. abhishiktae*. The main differences are that the clubs in the surface layer of *S. triaena* sensu Verseveldt have a more spiny character and that the clubs of the base are different from those of the top. Taking into account that the base of the colony of *S. abhishiktae* may be missing and that the slightly different shape of the clubs of the surface layer may represent intraspecific variation, it is possible that we are dealing here with the same species. In a later publication Verseveldt (1974: 105) synonymized *S. triaena* Kolonko, 1926, with *S. dura* (Pratt, 1903), and referring to his publication of 1971 he wrote "I described four colonies from Madagascar as *S. triaena*, but now this identification needs revision". In his revision of the genus *Sinularia* he (1980: 24) synomymized *S. triaena* with *S. brassica* May, 1898, but did not mention anything about "the four colonies from Madagascar", and neither did he in any other publication. We include these specimens in *S. abhishiktae*, but, because of the above mentioned differences, with a question-mark.

Etymology.— The species is named after Abhishikta, the daughter of the second author.

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References

Chang, K.H., Dai, C.F., & Seng, M.S. 1988. Studies on soft corals of the Kenting National Park.— Conservation Research Report No. 53, Kentin National Park Headquarters: 1-44, figs. 1-21.

Francis-Mai-Bao-Thu, O.P., & Domantay, J. 1971. Taxonomic studies of the Philippine gorgonaceans in the collections of the University of Santo Tomas, Manila (con't).— Acta manil. (Ser. A) 7: 3-77, pls. 19-44.

Hickson, S.J., & Hiles, I.L., 1900. The Stolonifera and Alcyonacea collected by Dr. Willey in New Britain, etc.— Willey's zool.Results, Vol. 4: 493-508, pls. 50, 51.

Kolonko, K., 1926. Beiträge zu einer Revision der Alcyonarien. Die Gattung *Sinularia*.— Mitt. zool. Mus. Berlin, 12 (2): 291-334, pls. 1-4.

Lüttschwager, J., 1914. Beiträge zu einer Revision der Familie Alcyoniidae.— Arch. Naturgesch., 1914(A) 80 (10):1-42, figs. 1-9.

Ofwegen, L.P. van, 1987. Melithaeidae (Coelenterata: Anthozoa) from the Indian Ocean and the Malay Archipelago.— Zool. Verh. Leiden 239:3-57, figs. 1-35.

Pratt, E.M., 1903. The Alcyonaria of the Maldives, Part II. The genera *Sarcophytum, Lobophytum, Sclerophytum,* and *Alcyonium*.— Fauna and Geography of the Maldive and Laccadive Archipelagoes., 2(1): 503-539, pls. 28-31.

Pratt, E.M., 1905. Report on some Alcyoniidae collected by Prof. Herdman, at Ceylon, in 1902.— In Herdman, W.A. and Honell, J., Report to the Government of Ceylon on the pearl and oyster fisheries of the Gulf of Manaar, 3(19): 247-268, pls. 1-3.

Stiasny, G., 1937. Die Gorgonacea der Siboga Expedition. Supplement II. Revision der Scleraxonia mit Ausschluss der Melitodidae und Coralliidae.— Siboga Exped. 13b8: 1-138, figs. A-LL, pls. 1-8.

Thomson, J.A. & D.L. Mackinnon, 1910. Alcyonarians collected on the Percy Sladen Trust Expedition by Mr. J. Stanley Gardiner. II. The Stolonifera, Alcyonacea, Pseudaxonia, and Stelechotokea.— Trans. Linn. Soc. London, Zool., (2) 13 (8): 165-211, pls. 6-14.

Thomson, J.A. & J.M. McQueen, 1907. Reports on the marine Biology of the Sudanese Red Sea. VIII. The Alcyonarians.— J. Linn. Soc. London, Zool., 31 (1908): 48-75, pls. 5-8.

Thomson, J.A. & J.J. Simpson, 1909. An account of the Alcyonarians collected by the R.I.M.S.S. Investigator in the Indian Ocean. II. The Alcyonarians of the littoral area: i-xviii, 1-319, pls. 1-9. Calcutta.

Tixier-Durivault, A., 1945. Les Alcyonaires du Muséum. I. Famille des Alcyoniidae. 2. Genre Sinularia.— Bull. Mus. nat. Hist. nat. Paris (2) 17 (1): 55-63.

Tixier-Durivault, A., 1951. Révision de la famille des Alcyoniidae. Le genre *Sinularia* May, 1898. Mém. Inst. roy. Sci. nat. Belgique (2) 40: 1-146, figs. 1-194.

Tixier-Durivault, A., 1966. Octocoralliaires de Madagascar et des îles avoisinantes. Faune de Madagascar, 21: 1-456.

Tixier-Durivault, A., 1970. Les octocoralliaires de Nha-Trang (Viet-Nam).— Cah. Pacif. 14: 115-236, figs. 1-74.

Verseveldt, J., 1971. Octocorallia from north-western Madagascar (Part II).— Zool. Verh. Leiden 117: 1-73, figs. 1-40, pls. 1-15.

Verseveldt, J., 1974. Octocorallia from New Caledonia.— Zool. Med. Leiden 48: 95-122, figs. 1-17, pls. 1-8.

Verseveldt, J., 1977. Octocorallia from various localities in the Pacific Ocean.— Zool. Verh. Leiden 150: 1-42, figs. 1-28, pls. 1-10

Verseveldt, J., 1978. Alcyonaceans (Coelenterata: Octocorallia) from some Micronesian Islands.— Zool. Med. Leiden 53: 49-55, figs. 1-3, pls. 1-3.

Verseveldt, J., 1980. A revision of the genus *Sinularia* May (Octocorallia, Alcyonacea).— Zool. Verh. Leiden 179: 1-128, figs. 1-68, pls 1-38.

Verseveldt, J., 1982. A revision of the genus *Sarcophyton* Lesson (Octocorallia, Alcyonacea).— Zool. Verh. Leiden 192: 1-91, figs. 1-39, pls 1-24.

Verseveldt, J., 1983. A revision of the genus *Lobophytum* von Marenzeller (Octocorallia, Alcyonacea).—

Zool. Verh. Leiden 200: 1-103, figs. 1-51, pls. 1-31.

Verseveldt, J. and P. Alderslade, 1982. Descriptions of types and other Alcyonacean material (Coelenterata: Octocorallia) in the Australian Museum, Sydney.— Rec. Aust. Mus. 34 (15): 619-647, figs. 1-9, pls. 1-8.

Whitelegge, T. 1897. The Alcyonaria of Funafuti. I.— Mem. Aust. Mus. III, The Atoll of Funafuti, 3 (10): 211-225, pls. 10-12.

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