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A NEW ISIDID OCTOCORAL (COELENTERATA:GORGONACEA)  
FROM THE GALAPAGOS RIFT

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RESUMO - É descrito e ilustrado um gorgonáceo isidídeo novo, coletado pelo submarino de profundidade "Alvin", das proximidades de aberturas hidrotermais ao longo de falha das Galápagos. A espécie caracteriza-se por sua colônia não ramificada e rígida com internodos distais muito longos e cobertos por mesogléia gelatinosa excepcionalmente grossa contendo muito poucos escleritos esparsos. Os antocódios dos pólipos possuem bastões grossos com extremidades rombudas dispostos em oito áreas que se estendem ao longo dos septos e bastões menores e escama nos tentáculos e pínulas. A espécie é dedicada à Dra. Eveline du Bois-Reymond Marcus.

ABSTRACT - A new isidid gorgonacean, collected by the deep-sea submersible "Alvin" from the vicinity of hydrothermal vents along the Galapagos Rift, is described and illustrated. A distinctive character of this species is its stiff, unbranched colony with very long distal internodes covered by unusually thick, gelatinous mesogloea containing very few, scattered sclerites. The anthocodiae of the polyps are armed with stout, blunt rods in eight tracts situated along the septa and smaller rods and scales in the tentacles and pinnules. The species is dedicated to Dr. Eveline du Bois-Reymond Marcus.

INTRODUCTION

Expeditions by the deep-sea research submersible "Alvin", supported by R/V "Knorr" and R/V "Lulu", to the sea-floor hot springs of the Galapagos Rift, during investigations in the International Decade of Ocean Exploration funded by the National Science Foundation resulted in a host of biological novelties including the giant vestimentiferan tube-worm *Riftia*, several previously unknown mollusks, crustaceans and polychaete worms (Corliss et al., 1979). Among the less spectacular but nevertheless interesting discoveries is an extraordinary gorgonacean coral of the family Isididae obtained at a site near the hot springs during dive 732 on

15 March 1977. It gives me much pleasure to dedicate this new octocoral to Dr. Eveline du Bois-Reymond Marcus who, together with her late husband Prof. Dr. Ernst Marcus, has contributed so much to our knowledge of the invertebrates, not only of South America but of the entire world.

Family ISIDIDAE Lamouroux  
Subfamily Keratoisidinae Gray  
**Lepidisis** Verrill, 1883

**Lepidisis** Verrill, 1883:18. Type-species, **Lepidisis caryo-  
phillia** Verrill, by subsequent designation: Kükenthal, 1915:  
119.

Diagnosis - Unbranched Keratoisidinae.

**Lepidisis evelinae** sp. nov.  
Fig. 1; Plates 1-3

Material Examined

Northeast of Galapagos Islands, 00°38.6'N, 86°07.2W ,  
2689 m, "Alvin" Dive 732, March 15, 1977. L. Shumaker, pilot;  
K. Green and D. Williams, observers. One complete specimen  
(broken into 3 pieces) with holdfast. Holotype, USNM No  
73571.

Description

Colony a stiff, upright, clavate rod 69.5 cm tall, arising from a discoidal holdfast attached to solid substrate. Axis composed of 5 tubular calcareous internodes 2.5-3 mm in diameter joined by horny nodes 3-3.5 mm in diameter and 2-2.5 mm long, articulated to the calcareous basal disk by a proximal node. The proximal internode is 2.7 cm long, the second 4.3 cm, the third 14.3 cm, the fourth 26 cm, and the distalmost one 21 cm. The holdfast and three proximal internodes are invested with thin, translucent, gelatinous coenenchyme completely devoid of polyps but containing scattered rodlike sclerites of typical form, most numerous in the basal part. The coenenchyme of the fourth and longest internode gradually thickens distally to a point about 19 cm above its lower node, where the diameter of the stem (exclusive of polyps) is 8 mm; the coenenchyme above this becomes gradually thinner toward the upper node, immediately below which the stem is only 4.5 mm in diameter. Polyps are distributed in loose spirals around this node, approximately 7-12 mm apart (measured center to center), forming broadly conical anthosteles up to about 3 mm high, with gently sloping sides, topped by the exsert anthocodiae with tentacles folded over the mouth. The most prominently exsert individuals are approximately 5-6 mm tall including the anthocodial part (Fig. 1, a). A few partly retracted individuals (Fig. 1, b, c) show

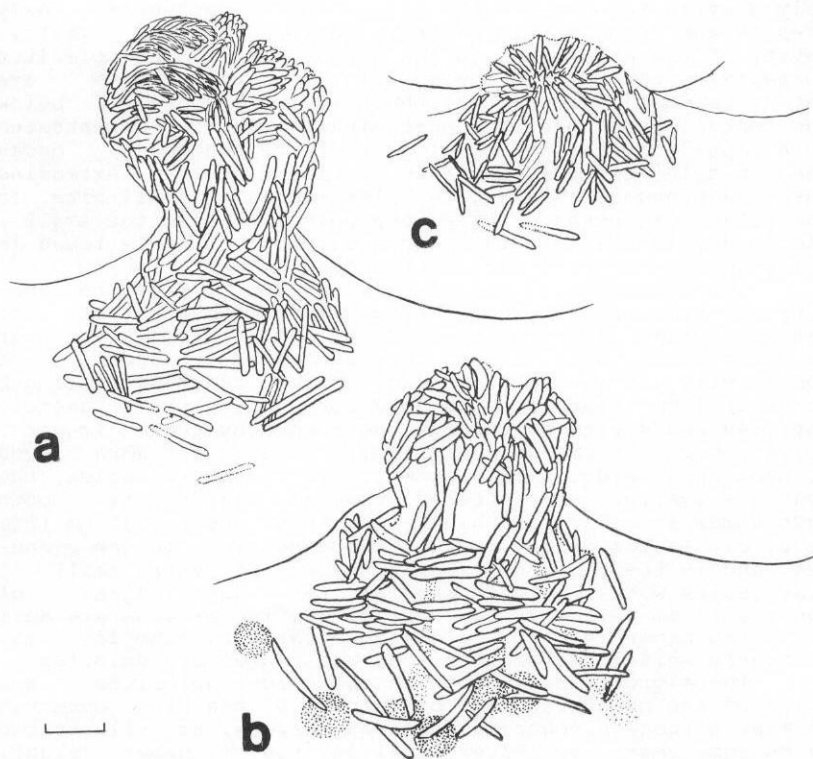


Figure 1 - Polyps of *Lepidisis evelineae* showing arrangement of sclerites and three stages of contraction. Scale represents 1 mm.

that the anthocodiae are capable of almost complete withdrawal into the anthosteles, but most are conspicuously exert in preservation.

The uppermost internode is about 5 mm in diameter (exclusive of polyps) near its proximal end, gradually increasing to 10 mm at a level roughly 5 cm from the apex before tapering to a bluntly rounded tip. The axis is at most only 2.5 mm in diameter, so the coenenchyme is about 3.75 mm thick in the widest part of the internode. The polyps are arranged in loose spirals as on the internode below.

The coenenchyme consists of whitish, firmly gelatinous mesogloea through which the opaque white calcareous axis is visible (Plate 1). Rod-shaped sclerites are extremely sparsely distributed between the polyps and are abundant only deep in the mesogloea immediately surrounding the gastric cavity of the polyps and in the anthocodiae. The sclerites surrounding the gastric cavity within the anthosteles are rather randomly oriented but those in the body wall below the tentacles are mostly longitudinally placed, concentrated in 8 septal tracts. The basal part of the tentacle backs contain sclerites that decrease in size distad, extending into the pinnules as elongate, flat scales of small size. In the polyps dissected, I have been unable to find the small, thorny double stars in the pharyngeal wall commonly found in other species of this and related genera.

The sclerites of the coenenchyme and body of the polyps are rods of the general type common in members of the Keratoisidinae. Those of the body of the anthocodia are nearly cylindrical, some of them tapered toward the ends and mostly with a slight median constriction, reaching a length of about 1 mm (Plate 1, a); those surrounding the gastric cavities and scattered through the coenenchyme are longer, up to about 1.75 mm, more distinctly tapered and often curved or bent about mid-length (Plate 2, b). In the tentacles, the rods are smaller and flattened, commonly with one or both ends somewhat wider, reaching a length of about 0.35 mm (Plate 2, c). In the distal part of the tentacles, in the pinnules, and in the pharyngeal walls the sclerites are small, flat scales with scalloped margins, reaching a length of about 0.13 mm (Plate 2, d). Most of the larger rods are dull yellowish brown in color, although occasional examples may be nearly white; the smaller rods and scales are colorless.

The microcrystals of which the larger sclerites are composed are prismatic rods of calcite of the kind observed in many gorgonacean genera, such as *Muricea*, as illustrated by me some years ago (Bayer, 1981:24, fig. 5, upper right) although rather smaller (Plate 3, b). The microcrystals composing the small scales, however, have an unusual lamellar configuration clearly visible at moderate magnification (Plate 3, a), that appears quite remarkable at higher magnification. Minute lines interpreted as growth increments are distinct at X 7,500 (shown in stereoscopic view, Plate 3, c).

## Comparisons

Apart from its unbranched colonial form, *Lepidisis evelineae* bears little resemblance to any other species recorded in the literature. The genus *Lepidisis* was established by A. E. Verrill (1883:18) for three new species, *L. caryophyllia*, *L. longiflora*, and *L. vitrea*, upon the basis of "Calicles filled with large fusiform spicula. Coenenchyma with a layer of small oblong scales. Calicles armed." Of the three original species, *longiflora* was branched from the horny nodes, *caryophyllia* was unbranched, and the colonial form of *vitrea* was unknown but is presumably unbranched, as the species was synonymized with *L. caryophyllia* by Deichmann (1936:241).

Muzik (1978:737) proposed to redefine the genera, with all the species branched from the internodes assigned to *Keratoisis*, those branched from the nodes to *Isidella*, and those without branching to *Lepidisis*, regardless of the point of identification, leaves *L. longiflora* in limbo, as it differs from the species of *Keratoisis* by its branching from the nodes and its assignment to *Isidella* remains questionable pending a full-scale revision.

*Lepidisis evelineae* has numerous small scales but they are confined to the anthocodiae and do not occur as a layer in the coenenchyme, where large, rodlike forms are very sparsely distributed. Of the unbranched species accepted as valid by Kükenthal (1924), only *Keratoisis philippinensis* Wright & Studer, 1889, and *K. rigida* have a thick coenenchyme, but both of those species differ from this new species by having their polyps tall and crowded along a rather tall and slender stem. The anthocodial sclerites of *Keratoisis nuda* Wright & Studer, 1889, reported from "Reefs, Kandavu, Fiji," are arranged similarly to those of *L. evelineae* but are reduced on the adaxial side of the polyps, which are tall and inclined upward; the coenenchyme is thin and has no sclerites, and the stem is slender. *Lepidisis olapa* Muzik, from Hawaii, has similarly arranged but weaker anthocodial armature, taller polyps, shorter internodes, and very tall, flexible, spirally wound colonies.

The generic subdivision of the Keratoisidinae remains to be clarified. The sclerites of this subfamily are remarkably uniform, showing little morphological differentiation that could be useful at the generic level. Scale-like sclerites occur to a greater or lesser extent in almost all species. Branching may proceed from either the horny nodes (*Acanella*, *Isidella*, *Lepidisis*) or the calcareous internodes (*Keratoisis*). Unbranched species have been described in both *Lepidisis* and *Keratoisis*, but their differentiation is ambiguous if the presence or absence of small, scale-like sclerites is considered the major diagnostic difference between the two genera.

(2)  
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Plate 1 - *Lepidisis evelineae*, new species. a, part of distalmost internode, showing distribution of polyps and translucent coenenchyme through which the axis is visible; b, part of the penultimate internode, showing arrangement of polyps. Stereoscopic photographs, approximately X 1.5.

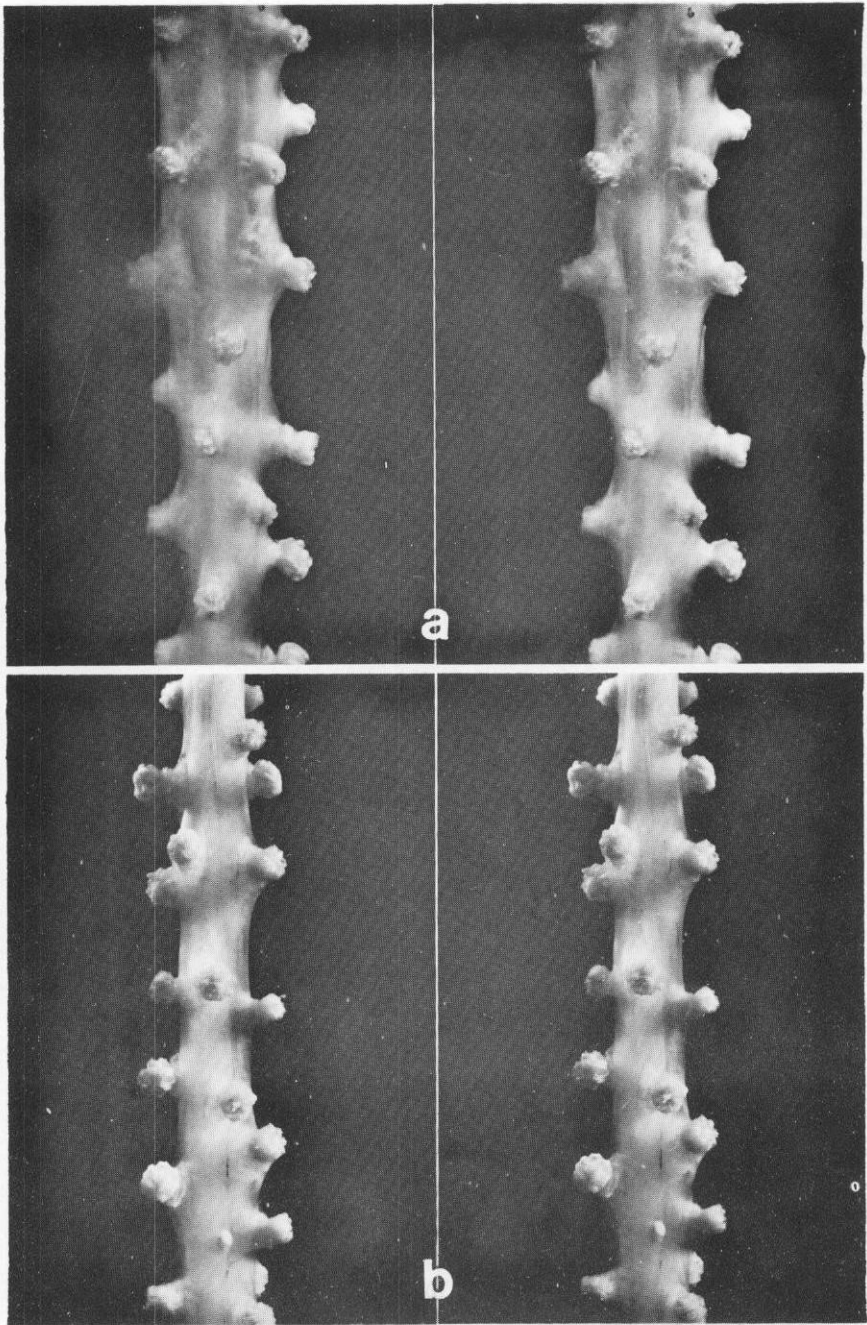


Plate 2 - *Lepidisis evelineae*, new species. Sclerites: a, curved and bent rods from coenenchyme surrounding gastric cavity, X 66; b, blunt rods from anthocodiae, X 66; c, flattened rods from tentacles, X 165; d, small scales from pinnules and pharyngeal walls, X 265. Scanning electron micrographs by Walter R. Brown.



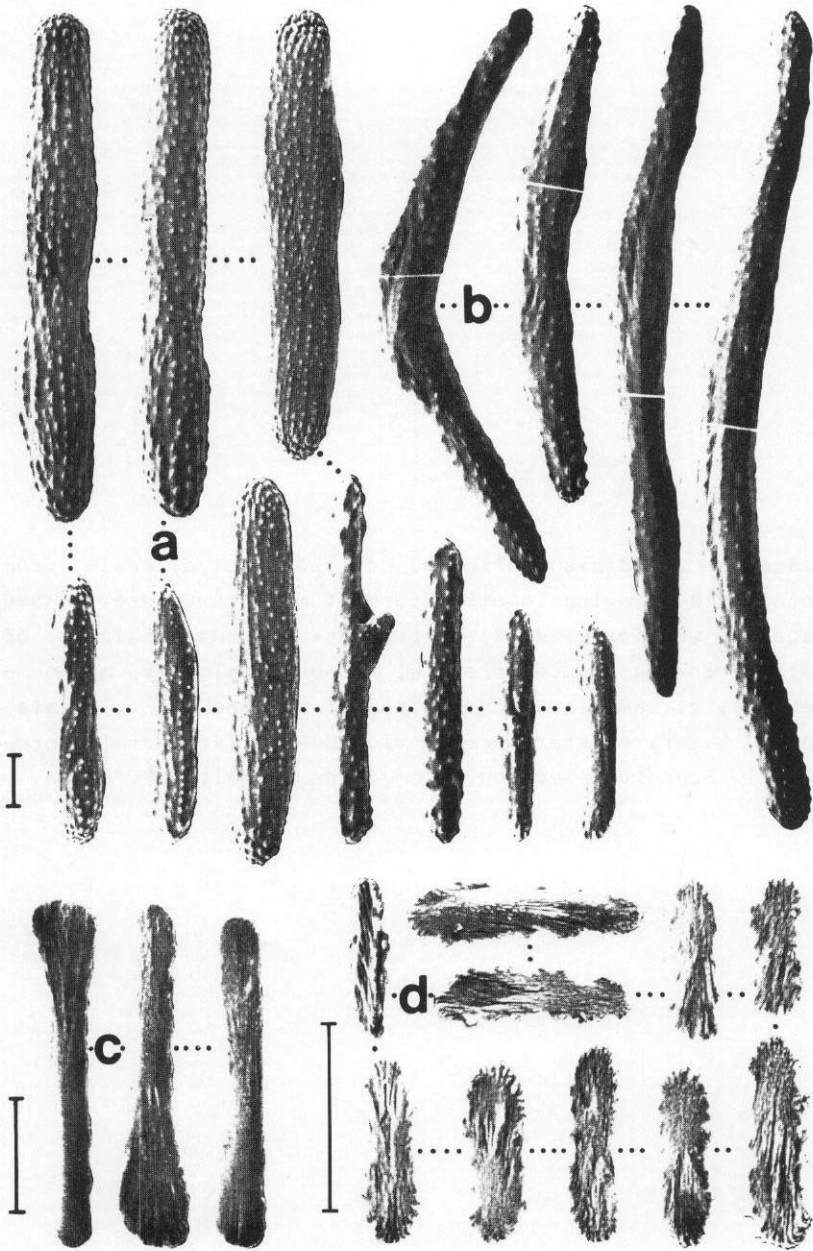
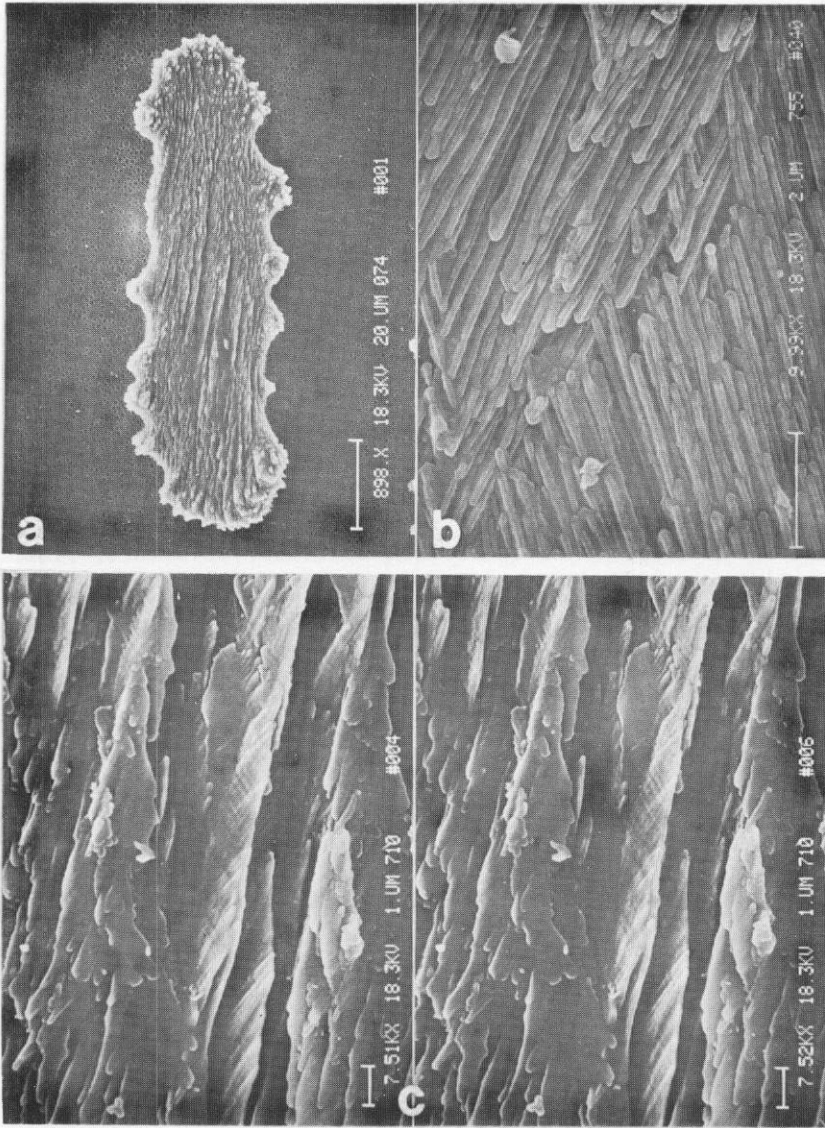


Plate 3 - *Lepidisis evelineae*, new species. a, scale from anthocodia, showing lamellar form of microstructure, X 590 (scale = 20 micrometers); b, prismatic microcrystals of calcite in rod-shaped sclerite, X 6600 (scale = 2 micrometers); c, lamellar microcrystals of calcite in scale-shaped sclerite, stereoscopic view X 4950 (scale = 1 micrometer). Scanning electron micrographs by Walter R. Brown.



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