THE RAFFLES BULLETIN OF ZOOLOGY 2004 **52**(1): 7-10

A NEW SHALLOW-WATER SPECIES OF *JAVANIA* (SCLERACTINIA: FLABELLIDAE) FROM INDONESIA

Stephen D. Cairns

Department of Systematic Zoology (Invertebrate Zoology), National Museum of Natural History, Smithsonian Institution, P. O. Box 37012, Washington, D. C., U.S.A. 20013-7012
Email: cairns.stephen@nmnh.si.edu

***ABSTRACT.* –** A new species of azooxanthellate solitary Scleractinia, *Javania erhardti*, is described from relatively shallow water in Indonesia. It differs from congenerics in having six cycles of septa (192 septa), slightly concave septal axial edges, and a rudimentary columella. To aid in its identification, both a key to the 10 known Recent species in the genus and a distribution table of the 13 fossil and Recent species are given. *Javania erhardti* often contains commensal boring sponges in its base.

***KEY WORDS.* –** *Javania*, Flabellidae, new species, key, Indonesia, azooxanthellate, Scleractinia, boring sponges.

INTRODUCTION

The genus *Javania* is currently known to consist of 13 species (Table 1) that range from the Eocene to Recent and occur predominantly in deep water (30-2165 m), most specimens having been collected below 200 m. Within the exclusively azooxanthellate (Cairns, 1999a) family Flabellidae, *Javania* is characterized by having a thick base and pedicel produced by multiple, concentric layers of sclerenchyme called tectura (sensu Stolarski, 1995), a substance often called stereome before 1995. Whereas this tectura-reinforced base is a solid structure of high density, it also is the habitat for boring organisms such acrothoracican cirripedes (Cairns, 1998, 1999b) and sponges (reported herein). *Javania* is also characterized by having a jagged calicular margin produced by highly exsert septa. This new species is noteworthy in that it is one of the shallowest-living species, has the highest number of septa of any known species, and is often permeated with boring sponges.

MATERIAL AND METHODS

The following abbreviations are used in the text: CD - calicular diameter; GCD - greater calicular diameter; GCD:LCD - ratio of greater to lesser calicular diameter; Sx>Sy - in the context of a septal formula, septa of cycle x are wider than septa in cycle y; USNM - United States National Museum (now the National Museum of Natural History, Smithsonian); ZRC - Zoological Reference Collection of the Raffles Museum of Biodiversity Research, National University of Singapore.

SYSTEMATICS

ORDER SCLERACTINIA

SUBORDER CARYOPHYLLIINA

FAMILY FLABELLIDAE BOURNE, 1905

***Javania erhardti*, new species**
(Figs. 1, 2)

***Material Examined.* –** Holotype - Komodo National Park, Island Rinca, Canibal Rock, 42 m, 14 Sep.2002, USNM 1010480.

Paratypes – Komodo National Park, Island Rinca, Canibal Rock, 37-44 m, 6-14 Sep.2002, 10 dry coralla, USNM 1010481-1010490; Komodo National Park, Island Rinca, Canibal Rock, 40 m, 8 Sep.2002, 1 dry corallum, National Museum Natural History, Leiden Coel. 32151; Komodo National Park, Island Rinca, Canibal Rock, 35 m, 5 Sep.2002, 1 dry corallum, ZRC 2003.0100; Komodo National Park, Nusa Kode, 35-39 m, 9-12 Sep.2002, 5 coralla (4 dry, 1 in ethanol), USNM 1010491-1010494.

***Description.* –** Corallum trochoid, straight, firmly attached through a thick pedicel, and having a slightly flared calicular edge. Calice highly elliptical, having a GCD:LCD of 1.67-1.96-2.27. Holotype 35.7 x 20.15 mm in CD, 36.8 mm in height, and 18.3 mm in greater pedicel diameter. Largest specimen (USNM 1010491) 44.0 x 19.7 mm in CD and 36.5 mm in height. Calicular edge highly serrate (jagged), a tall, acute, triangular apex corresponding to each S1-3; a shorter and less acute apex corresponds to each S4; S5-6 not exsert. Theca relatively smooth and white; however, it is often

Table 1. Names and distributions of the 13 species of *Javania* Duncan, 1876.

I. Species having three cycles of septa	
J. duncani Wells, 1977	Eocene, Tonga
J. californica Cairns, 1994	off California, 62-170 m
II. Species having four cycles of septa	
J. cailleti (Duchassaing & Michelotti, 1864)	Cosmopolitan, 30-2165 m
J. subturbinata (Michelotti, 1871)	Miocene, Italy
J. clavata (Michelotti, 1871)	Miocene, Italy
J. fusca (Vaughan, 1907)	Southwest Pacific, 271-1045 m
J. pseudoalabastra Zibrowius, 1974	North Atlantic, 625-1557 m
J. exserta Cairns, 1999	Southwest Pacific, 91-455 m
III. Species having five cycles of septa	
J. insignis Duncan, 1876	Indo-West Pacific, 46-1050 m
J. lamprotichum (Moseley, 1880)	Indo-West Pacific, 191-881
J. antarctica (Gravier, 1914)	Antarctica and Scotia Ridge, 53-1280 m
J. borealis Cairns, 1994	cold temperate North Pacific, 143-375 m
IV. Species having six cycles of septa	
J. erhardti, new species	Indonesia, 35-44 m

encrusted with a variety of attached invertebrates (e.g., bryozoans, serpulids, large foraminifera, boring and encrusting sponges), which sometime confer a rough and even coloured (e.g., rose, red, even green) tint to the theca and septa. Polyps have white tentacle tips, but remainder of tentacles and polyp body is light orange (Fig. 1). Pedicel quite thick, often half the diameter of the calice, produced by successive layers of tectura, in one specimen eight layers present in a calicular radius of 10 mm (Figs. 2E, H). Although these tectural layers are quite dense, the pedicels are usually extensively excavated by boring sponges, resulting in a very porous or loculated base (see ***Remarks***).

Septa hexamerally arranged in six complete cycles (192 septa) according to formula: S1-3>>S4>S5>S6; coralla less than 25 mm GCD often lack pairs of S6, and the holotype lacks two pairs if S6, resulting in only 188 septa. S1-3 highly exsert as much as 4.9 mm, having straight, slightly concave axial edges that meet with the rudimentary columella low in fossa. S4 less exsert (1.3-2.3 mm), about one-third width of the S1-3, and have slightly sinuous axial edges that do not quite merge with the columella. S5 non-exsert, about half width of an S4, often curving slightly toward their adjacent S1-3 in upper calice, extending only about half the distance down the fossa. S6 also non-exsert, rudimentary, often attached to the sides of their adjacent S1-3 near calicular edge. Fossa deep and elongate, containing a rudimentary trabecular columella that merges with the lower axial edges of the S1-3.

Distribution. **–** Known only from Komodo National Park, Flores Islands, Lesser Sunda Islands, Indonesia; 35-44 m.

Remarks. **–** Among the 13 species of *Javania* (See Table 1, Key), *Javania erhardti* is unique in having six cycles of septa in its adult stage. It is also unique in having a slight concavity on the axial margins of the S1-2 and a rudimentary columella. Its loculated base is distinctive, but at least one other species, *J. cailleti*, appears to have a similar symbiosis.

The pedicel region of most coralla is permeated with numerous closely adjacent cavities 1.5-3.4 mm in diameter, which are interconnected by slender tubes 0.4-0.5 mm in diameter (Figs. 2D, G), these tubes also communicating to the exterior theca as circular pores of the same diameter that are flush with the thecal surface or have slightly raised rims (e.g., 0.3 mm)(Fig. 2F). Sponge spicules are usually found in these cavities and tubes. The cavities are some numerous and closely spaced, producing a loculated region of low density, in contrast to the rather high density of an unaffected tectura-reinforced pedicel.

Etymology. **–** Named in honour of Dr. Harry Erhardt, natural history photographer and naturalist, who first discovered and collected this colourful species.

Fig. 1. *Javania erhardti*, in situ photograph of paratype from Canibal Rock, Isla Rinca (USNM 1010487), x 1.75 (Photo by Harry Erhardt).

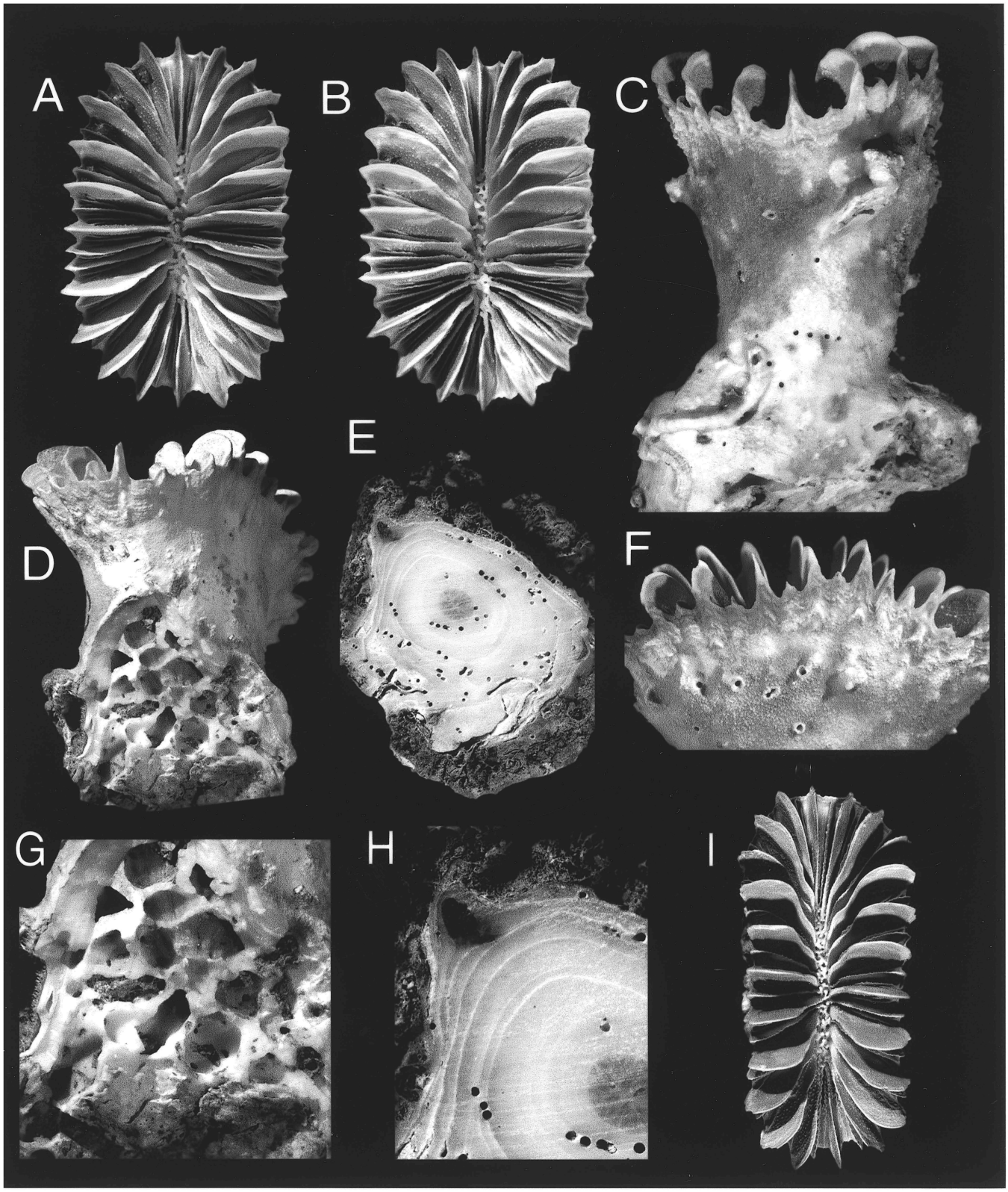

Fig. 2. *Javania erhardti*, A-C, F, holotype; D, G, paratype from Canibal Rock, 43 m, USNM 1010489; E, H, paratype from Canibal Rock, 44 m, USNM 1010485; I, paratype from Canibal Rock, 42 m, USNM 1010483: A, B, calicular and oblique calicular views, x 1.75; C, edge view of holotype, x 2.25; D, G, broken corallum showing loculated basal region caused by boring sponges, x 1.75, 3.0, respectively; E, H, cross section of a base showing small canals connecting sponge chambers and concentric bands of tectura, x 1.75 x 4.4, respectively; F, upper theca showing efferent pores of boring sponges, x 1.75; I, calicular view, x 1.6.

Key to 10 Recent species of *Javania* Duncan, 1876

1. Adult corallum with three cycles of septa (24 septa) ..... *J. californica*
– Adult corallum with four cycles of septa (48-64 septa) 2
– Adult corallum with five cycles of septa (96 septa) 5
– Adult corallum with six cycles of septa (192 septa) ..... *J. erhardti*
2. Calice elongate (GCD:LCD about 2), often constricted in center; upper half of corallum reddish-brown ..... *J. pseudoalabastra*
– Calice circular to elliptical (GCD:LCD < 1.5); corallum white or striped 3
3. S1 slightly wider than S2, the septa of both cycles highly exsert ..... *J. exserta*
– S1 and S2 equal in width and only moderately exsert 4
4. S4 rudimentary, not present at calicular edge; corallum small (GCD < 9 mm); theca often longitudinally striped ..... *J. fusca*
– S4 slightly exsert; corallum larger, up to 65 mm GCD; theca uniformly white ..... *J. cailleti*
5. Corallum slightly flared at calicular edge; upper two-thirds of theca pigmented reddish-brown ..... *J. lamprotichum*
– Corallum not flared; theca uniformly white 6
6. Theca and septa thin, delicate, and easily broken; GCD up to 44 mm; axial edges of S1-2 slightly sinuous 7
– Theca and septa robust, not delicate; GCD rarely exceeds 25 mm; axial edges of septa straight ..... *J. insignis*
7. Corallum elongate (ceratoid to trochoid) and often curved; fossa not narrow, containing a rudimentary columella ..... *J. antarctica*
– Corallum conical (trochoid) and usually straight; fossa quite narrow, the axial edges of the S1-2 almost touching, no columella ..... *J. borealis*

ACKNOWLEDGEMENTS

I would like to thank Harry Erhardt for collecting the specimens and bringing them to my attention.

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