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Does the Species *Erenna bedoti* (Siphonophora, Physonectae) Exist?*

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Erenna bedoti Lens et Van Riemsdijk, 1908 was described from the eastern Indian Ocean. The authors possessed only fragments of the colony: a section of the stem with the pneumatophore, young nectophore, young and mature tentilla, and gonodendra (Lens and Van Riemsdijk, 1908). In 1911, Bigelow (1911) regarded this species as a synonym of *E. richardi* Bedot, 1904 but gave no reasons. Following Bigelow, Totton (1965) also considers *E. bedoti* a synonym of *E. richardi*. Study of the zooids of an *E. richardi* colony from the Atlantic Ocean demonstrated that there are important differences in the structure of the tentilla in these two species (Margulis, 1977), and it was believed that *E. bedoti* was a valid species. In the collections of the 34th cruise of the R/V *Dmitriy Mendeleyev* from the southern Pacific (22 January 1985, st. 3043, 43°53′ S, 158°09′ W, 1000–0 m), a colony of *Erenna* was found; its nectophores, gastrozooids, and tentilla more or less differed from the corresponding zooids of *E. richardi*. Since the structure of the young tentilla is the same as in *E. bedoti* in the drawings of Lens and Van Riemsdijk, I believe that this colony belongs to this species.

Fragments of the colony were preserved: nectophores, gastrozooids, cystozooids, covering plates, and branched tentacles with young tentilla.

The nectophores of different age measure 16 × 13, 22 × 16, and 32 × 25 mm. The height of the nectophore is measured from the ostial opening to the distal part of the "wing." The "wings" are well pronounced and point up, rounded in young nectophores, and subquadrate in adults (Fig. 1 (A)–(C)). The valve in all the nectophores is small, perhaps as a result of poor preservation. The distal angles of the valve are strongly elongate and look almost like threadlike outgrowths. On the ventral surface of the valve are two lamellate outgrowths with rounded ends. On each of the lateral sides of the nectophore, there are two faces: upper triangular and lower subquadrate. Since all the nectophores are poorly preserved, the faces are not clearly visible, and in the largest specimen, the rib between the faces is not pronounced. The nectosac occupies two-thirds to one-half the nectophore, wings are lacking. The radial lateral canals do not make loops and may bear short branch canals. The pedicular canal is split in the distal part. The walls of the gastrovascular canals are colored with brown or black pigment. Lens and Van Riemsdijk (1908) drew a very young nectophore with the wings and valve still unformed. Thus comparison of the nectophores is not possible. The only similarity is the presence of short branches of the canals.

In the collection, there are well-preserved gastrozooids of various sizes. The gastrozooid consists of three parts: basal, central, and distal (Figs. 1 (D), (E); Figs. 2 (A), (B)). The distal part, apparently, is a manubrium; in all the gastrozooids, it is turned inside out so that rows of longitudinal ridges are visible. In old gastrozooids, these ridges are covered by the epidermis containing brown pigment. The central part of the cylindrical shape is more or less swollen. Its

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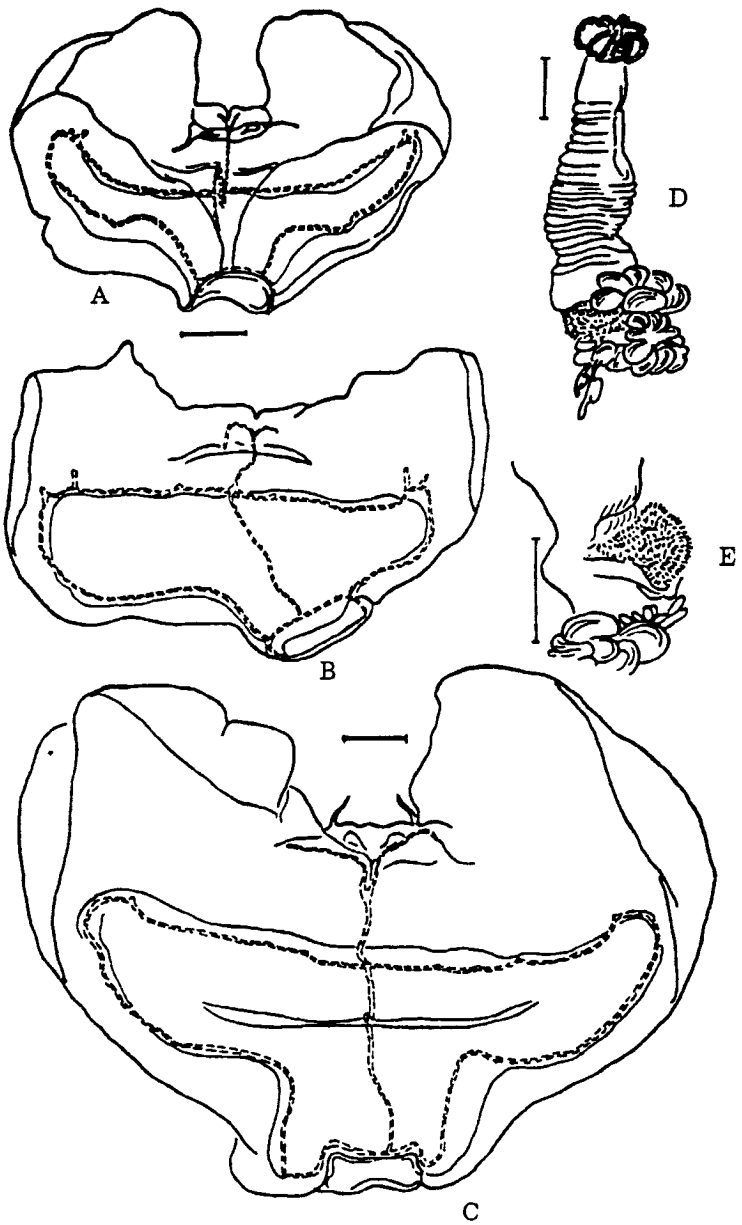

Fig. 1. Zooids of the colony of *Erenna bedoti*: (A–C) nectophores; (D) gastrozooid; (E) basal part of the gastrozooid. Scale: length of bar equals actual 1 mm.

outer wall has a well-marked ring musculature. This is the stomach of the gastrozooid, inside of which a typically structured "hepatic gland" was discovered in the dissection. The stomach is the longest part of the gastrozooid, particularly in the older zooids. The basal part is the forestomach. A stalk is lacking, which agrees with the description of Lens and Van Riemsdijk. In the young zooids, the forestomach occupies almost one-third its length and is covered externally as if

by a sleeve or loose coat which consists of randomly arranged spines, irregularly shaped outgrowths and chitinoid plates of various sizes between them (Fig. 2 (Q)). The older the gastrozooid, the smaller the basal part. Gradually, the outer coating begins to drop until it is completely absent. There remains only a ridge on the border between stomach and forestomach. Lens and Van Riemsdijk had in their possession only a piece of a gastrozooid—the basal part most likely of an older gastrozooid without the coat.

The branched tentacle is attached to the forestomach of the gastrozooid. This is a large muscular structure, spirally twisted at the base. It is impossible to determine the total length of the branched tentacle since there are only fragments. The stem of the branched tentacle is divided by deep bands, there is a ribbonlike muscle membrane along the dorsal side—a crest according to Bedot (1904). In the basal part of the branched tentacle, the membrane is very broad, much wider than the stem of the branched tentacle A large number of young tentilla was preserved (Figs. 2 (I)–(K)). Although there is significant structural diversity, they always have a stem, an expanded central part with an ovoid outgrowth and distal part elongated to various degrees. At some time during maturation of the tentilla, in the distal part two oval bodies appear of an unclear nature. They are preserved in the mature tentilla. Lens and Van Riemsdijk call them ocelli and believe they are incorporated as pigment spots. But the tentilla from our collection lack pigment and the oval bodies are colorless. The only mature tentillum in the collection is poorly preserved, its central part is destroyed and filled by a mass of discharged nematocysts (Fig. 2 (L)). The nematocysts of the two species are uniformly ciliary anisorhizic and atrichous nematocysts (Figs. 2 (M), (N)). The young tentillum sketched by Lens and Van Riemsdijk differs from those described above in the long outgrowth of the central part that apparently is explained by its more mature age. It is important that the expanded part of the tentillum does not bear a fingerlike outgrowth.

Cystozooids constitute the majority of zooids (Figs. 2 (C)–(H)). The cystozooid body is elongate, cylindrical. The stalk is sometimes well pronounced and in other cases is absent. It is possible that this results from the different state of the zooid at the time it was fixed. The main part of cystozooid is saclike, thin-walled. The transparent contents usually have black or brown pigment. The distal part is a dense structure with a slender outgrowth, more or less pigmented. Against the background of the pigment, four light longitudinal bands are visible. In some zooids, the distal outgrowth bears a "hat" of irregular outgrowths. Most likely, this hat covers a pore since in such zooids their contents do not emerge externally when pressed. In other cystozooids, the distal outgrowth is everted like the manubrium in the gastrozooid. At the base of the distal outgrowth, the wall of the zooid is thickened and forms a ring similar to a sphincter. At the base, the cystozooids bear a very slender and short palpacule without nematocysts.

Lens and Van Riemsdijk describe gonopalpons in which there may or may not be a stalk, and the distal part of some zooids consists of black banded structures. In the drawing, the distal part of the gonopalpons resembles that of the cystozooids. The central part of the gonopalpons differs from that of the cystozooids in being filled with wormlike aggregations against a transparent background.

The covering plates (poorly preserved in our collection) are flat, elongate, not armed with nematocysts (Figs. 2 (O), (P)). Because the structure of only a young covering plate was presented in the original description of the species, it is impossible to compare it to those in our collection.

The structure of *E. richardi* zooids differs from the *E. bedoti* zooids described above. The nectophores of the former species have a larger valve, the distal angles of which are never stretched into threadlike outgrowths, and the outgrowths on the ventral surface of the valve are fingerlike or papillose, but not lamellate. The distance between the wings even in the oldest nectophores is

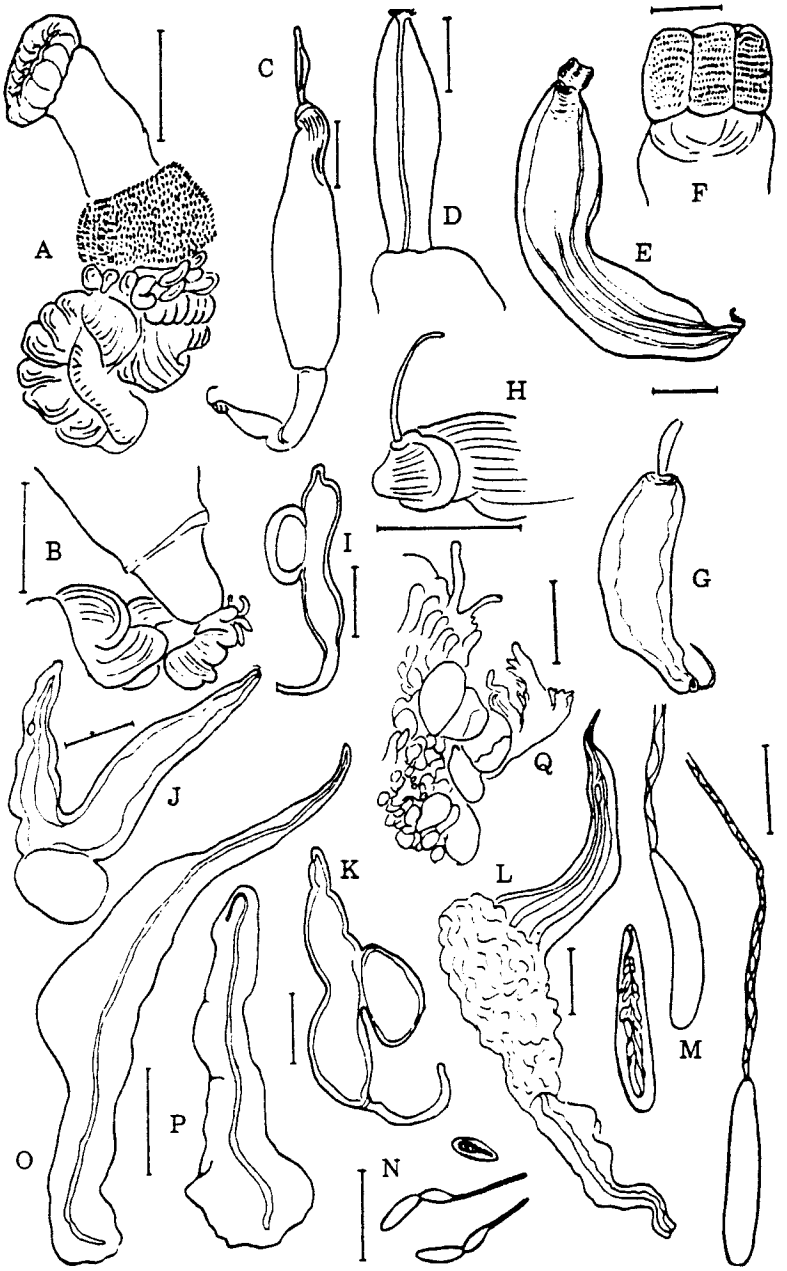

Fig. 2. Zooids of the colony of *Erenna bedoti*; (A) gastrozooid; (B) basal part of an old gastrozooid; (C, E, G) cystozooids; (D) distal part of a cystozooid; (F) same, inside out; (H) basal part of a cystozooid with a palpacula; (I–K) young tentilla; (L) mature tentillum with discharged nematocysts; (M, N) nematocysts; (O, P) cover plates; (Q) structure of sleeve around the forestomach of the gastrozooid. Scales: A, B, C, E, G, H, L, O, P—bar equals 3 mm; D, F, I, J, K—bar equals 1 mm; M, N—bar equals 0.1 mm; Q—bar equals 0.3 mm.

markedly less than in *E. bedoti*. The gastrozooids of the two species differ significantly. The *E. richardi* gastrozooid does not have a clearly pronounced manubrium, its stomach is thin-walled, the transparent "hepatic gland" does not have pigmented spots and does not form rounded lobes as in *E. bedoti*. The forestomach in *E. richardi* forms two large rounded expansions and is not surrounded externally by a sleeve. Under the expansion there is a short dense cylindrical part that may be seen as stalk. The branched tentacle emerges here. In *E. bedoti*, there is nothing similar. The basal part of branched tentacle is preserved; parts of its stem are identically structured in both species. Young tentilla of *E. richardi* at a thickening in the central part bear a fingerlike outgrowth, next to it is a cavity filled with pigmented cells. In *E. bedoti*, the outgrowth is oval, without pigmented cells in our collection. Mature tentilla of both species are identically structured. Cystozooids of palpons in *E. richardi* are not known.

These data on the differences in the structures of *E. richardi* and *E. bedoti* zooids support the validity of both species.

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