

AUSTRALIAN MUSEUM SCIENTIFIC PUBLICATIONS

Williams, R. B., 1981. A sea anemone, *Edwardsia meridionalis* sp. Nov., from Antarctica and a preliminary revision of the genus *Edwardsia* de Quatrefages, 1841 (Coelenterata: Actiniaria). *Records of the Australian Museum* 33(6): 325–360. [28 February 1981].

doi:10.3853/j.0067-1975.33.1981.271

ISSN 0067-1975

Published by the Australian Museum, Sydney

nature culture **discover**

Australian Museum science is freely accessible online at
www.australianmuseum.net.au/publications/
6 College Street, Sydney NSW 2010, Australia



A SEA ANEMONE, *EDWARDSIA MERIDIONALIS* SP. NOV.,
FROM ANTARCTICA AND A PRELIMINARY REVISION OF
THE GENUS *EDWARDSIA* DE QUATREFAGES, 1841
(COELENTERATA: ACTINIARIA).

R. B. WILLIAMS

2 Carrington Place, Tring, Herts., HP23 5LA, England

SUMMARY

A newly recognized sea anemone, *Edwardsia meridionalis* sp. nov., from McMurdo Sound, Antarctica is described and compared with other *Edwardsia* species. Its habitat and geographical distribution are described.

The generic name *Edwardsia* de Quatrefages, 1841 and the familial name Edwardsiidae Andres, 1881 are invalid. A summary of a proposal made to the International Commission on Zoological Nomenclature to conserve these names is given.

The genus *Edwardsia* is defined and its known synonyms are given. A review of the published descriptions found of nominal *Edwardsia* species revealed many *nomina nuda*, *nomina dubia*, synonyms and homonyms. The remaining *nomina clara* comprise forty currently accepted nominal species, which are listed with their known synonyms and geographical distributions.

The following nomenclatural changes are instituted: *E. carlgreni* nom. nov. is proposed as a replacement name for *E. pallida* Carlgren, 1921, a junior primary homonym of *E. pallida* Verrill, 1879; *E. neozelanica* Farquhar, 1898, a subjective synonym of *E. elegans* Farquhar, 1898, is proposed as a replacement name for *E. elegans* Farquhar, which is a junior primary homonym of *E. elegans* Verrill, 1869; *E. claparedii* (Panceri, 1869) is regarded as the valid name of *E. callimorpha* (Gosse, 1853) (*sensu* Stephenson, 1935) whilst *E. callimorpha* (Gosse, 1853) (*sensu stricto*) reverts to *Scolanthus callimorphus* Gosse, 1853; *E. perdita* nom. nov. is proposed as a replacement name for *E. grubii* Andres, 1883, a junior secondary homonym of *E. grubii* (A. Costa, 1869); *Fagesia janthina* comb. nov. is proposed for *E. janthina* Andres, 1881; *E. horstii* Pax, 1924b is a simultaneously published synonym of *Isoedwardsia curacaoensis* Pax, 1924b and its valid name is here regarded as *Scolanthus curacaoensis* (Pax, 1924b).

Further research may reveal invalid names amongst the currently accepted nominal species: notes are made on some of those which might prove to be invalid. Furthermore, any of the *nomina dubia* might be raised to the status of *nomina clara* if type material were found, but their validity would still remain to be established.

CONTENTS

	PAGE
Summary	325
Contents	325
Introduction	326
Systematics: description of <i>Edwardsia meridionalis</i> sp. nov.	326
Ecology: habitat of <i>E. meridionalis</i>	338
Geographical distribution of <i>E. meridionalis</i>	339
Differentiation of <i>E. meridionalis</i> sp. nov. from other nominal <i>Edwardsia</i> species	339
The status of anemones determined as <i>E. intermedia</i> McMurrich, 1893	342
Discussion	344

Acknowledgements	345
Appendix I. The usage of the name <i>Edwardsia</i> de Quatrefages, 1841	345
Appendix II. Currently accepted <i>Edwardsia</i> species, their synonyms and distributions	346
Appendix III. Invalid nominal <i>Edwardsia</i> species	347
References	351
Nomenclatural index	357

INTRODUCTION

The coelenterate genus *Edwardsia* de Quatrefages, 1841 is one of the largest known within the order Actiniaria (sea anemones) and its distribution is world wide: all members of the genus burrow into mud, sand or gravel. It is a curious fact that although Actiniaria have frequently been collected from McMurdo Sound in Antarctica, no species of *Edwardsia* have hitherto been reported there. However, during studies on the diversity and structure of benthic communities in the Sound, large numbers of an un-named *Edwardsia* species were collected in 1970 by Dr J. K. Lowry (then at the University of Canterbury, Christchurch, New Zealand; currently at the Australian Museum, Sydney). Through the kindness of Dr Lowry and Mr J. S. Oliver in supplying specimens I have been able to make the following description of the species for which I propose the name *Edwardsia meridionalis* sp. nov.: the trivial name refers to its southerly distribution.

Carlgren (1949), in a survey of the world's sea anemones, listed 55 species of *Edwardsia* which he apparently regarded as valid and several more have since been described. An examination of the original and some subsequent descriptions of these and all the other nominal species of *Edwardsia* which were found in the literature revealed the need for a review of the genus. The number of presently accepted species is reduced to forty and the remaining nominal species are classified as *nomina nuda*, *nomina dubia*, synonyms or homonyms. It should be emphasized that some of the presently accepted nominal species listed in appendix II might prove to be conspecific: some of the possible synonyms are noted, but further research is necessary to assess their status. Furthermore, any of the *nomina dubia* might be raised to the status of *nomina clara* if type material were found but their validity would still remain to be established.

SYSTEMATICS: DESCRIPTION OF *EDWARDSIA MERIDIONALIS* SP. NOV.

Edwardsia de Quatrefages, 1841*, p.427

Edwardsia. — de Quatrefages, 1842, p.68; Carlgren, 1921, p.27; Stephenson, 1935, p.52; Carlgren, 1949, p.22; Manuel, 1977, p.484.

Actinia. — Stimpson, 1853, p.7 (*pro parte*); [non *Actinia* Browne, 1756, = *Actinia auct.*, e.g. Stephenson, 1935†].

Milnea. — Reichenbach in Wright, 1866, p.782; (see appendix I).

Urophysalus. — A. Costa, 1869, p.56; (see below).

Halcampa. — Panceri, 1869, p.6 (*pro parte*).

Edwardsiella. — Andres, 1883, p.305 (*pro parte*); McMurrich, 1913, p.551; Verrill, 1928, p.27.

* The usage of this genus-group name which is preoccupied by *Edwardsia* O. G. Costa, 1834, is discussed in appendix I. No nominal species were included at the time the genus was established.

† *Actinia* Browne, 1756, being published before the starting point of zoological nomenclature, is an unavailable name: the valid name of this genus is *Priapus* Linnaeus, 1758.

Diphthera‡. — Sluiter, 1888, p.233; Sluiter, 1889, p.47; (see below.)

Edwardsioides. — Danielssen, 1890, p.100.

REMARKS. The name *Scolanthus* Gosse, 1853, p.157, has long been considered to be a junior synonym of *Edwardsia* de Quatrefages, 1841 (see Gosse, 1855a; Haddon, 1889; Stephenson, 1935.) Hence *Scolanthus callimorphus* Gosse, 1853 has been known for over a century as *Edwardsia callimorpha* (Gosse, 1853) (see Stephenson, 1935.) However, it has recently been found that *S. callimorphus* Gosse, 1853 is synonymous with *Isoedwardsia (Edwardsia) lucifuga* (Fischer, 1888) (Manuel, in preparation). *Scolanthus* Gosse, 1853 is therefore a senior subjective synonym of *Isoedwardsia* Carlgren, 1921 and the latter name is here regarded as invalid: for this reason, *Scolanthus* is no longer regarded as a synonym of *Edwardsia*. (However, *Scolanthus (sensu* Holdsworth, 1855, p.85) is a synonym of *Sagartia* Gosse, 1855a, p.272.) The valid name of *E. callimorpha (sensu* Stephenson, 1935) is here considered to be *E. claparedii* (Panceri, 1869) (q.v.), with which Mr Manuel concurs.

Lecythia Sars, 1829, p.27, was synonymized by implication with *Edwardsiella* Andres, 1883 by Andres (1883) and by Delage and Hérouard (1901) because the type-species by monotypy, *L. brevicornis* Sars, 1829 was synonymized doubtfully by Andres (1883) with *Edwardsia (Edwardsiella) sarsii* Düben and Koren, 1847. Although Carlgren (1921) subsequently synonymized *L. brevicornis* with *Paraedwardsia sarsii* (Düben and Koren, 1847) and furthermore, used the morphological data of Sars (1829) to add to his own description of *P. sarsii*, it is clear from his text that he really regarded *Lecythia* Sars, 1829 as a *nomen dubium*. If this were not the case the name *Lecythia* Sars, 1829 would have had priority over *Paraedwardsia* Carlgren, 1905. *Lecythia* is regarded here also as a *nomen dubium* and is therefore not synonymized with either *Edwardsia (Edwardsiella)* or *Paraedwardsia*.

Although *Urophysalus* A. Costa, 1869 is synonymized here with *Edwardsia*, as it was by Andres (1883), the only included species (*U. grubii*, q.v.), which Andres (1883) considered to be synonymous with *E. claparedii* (Panceri, 1869) is here regarded as a *nomen dubium*. Similarly, the type-species by monotypy (*D. octoplax*, q.v.) of *Diphthera* Sluiter, 1888 is here regarded as a *nomen dubium* although *Diphthera* is clearly a synonym of *Edwardsia*.

The generic definition of *Edwardsia* de Quatrefages, 1841 given below is that of Manuel (1977) which is based on that of Carlgren (1949).

“*Edwardsiidae (sensu* Carlgren, 1949) with column divisible into physa, scapus, scapulus and capitulum. Physa never with periderm (cuticle) or nemathybomes; morphologically and functionally differentiated from the scapus. Scapus long, always with periderm and nemathybomes, the latter being externally opening cavities sunk in the mesogloea which contain nematocyst batteries. Eight perfect mesenteries (macrocnemes) and at least four imperfect ones (microcnemes), the latter very weak and restricted to the most distal part of the column. Gonads, filaments, parietal and retractor muscles on the macrocnemes only. Parietals well developed; retractors strong, diffuse to circumscript-diffuse. Cnidom: spirocysts, basitrichs, microbasic *b*-mastigophores and microbasic *p*-mastigophores.”

For general terminology, see Stephenson (1928) and Carlgren (1949). Fig. 1 (a-c) is a diagrammatic representation of the general structure of an *Edwardsia*. Various species

‡ Mistakenly listed *Diphthera* by Neave (1939) in his *Nomenclator Zoologicus*.

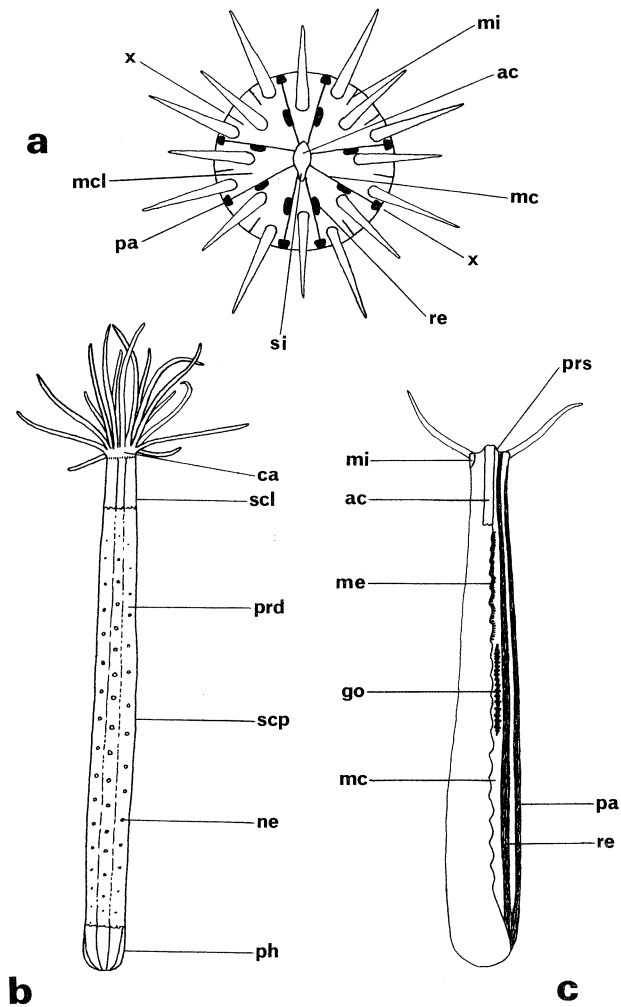


Figure 1. — Schematic diagrams of a generalized *Edwardsia*, to various scales: (a) transverse section through capitulum of a species with 16 tentacles (which are superimposed over the mesenteries); (b) external features of a whole specimen; (c) internal features — a longitudinal section passing through X-X of fig. 1a.

ac = actinopharynx; ca = capitulum; go = gonad; mc = macrocneme; mcl = macrocoel; me = mesenterial filament; mi = microcneme; ne = nemathybomes; pa = parietal muscle; prd = periderm; prs = peristome; ph = physa; re = retractor muscle; scl = scapulus; scp = scapus; si = siphonoglyph.

may differ in detail, particularly in the structure and arrangement of the mesenteries. Cnidae are named according to Weill's (1934) system as modified by Carlgren (1940). Recent research has suggested that basitrichs and *b*-mastigophores may belong to the same category (Westfall, 1965; Schmidt, 1969) but until there is more general agreement amongst researchers on nematocyst nomenclature, it may be better to retain Carlgren's (1940) modification.

***Edwardsia meridionalis* sp. nov.**

Fig. 2a-b

? *E. intermedia*. — Carlgren, 1899, p.6; 1927a, p.4; 1959, p.11 (pro parte(?)); [non McMurrich, 1893, p.136].

Edwardsia sp. — Dayton and Oliver, 1977, table 1, p.57.

Definition: *Edwardsia* typically with sixteen white-tipped tentacles in two cycles each of eight, the inner longer than the outer; eight macrocnemes and eight microcnemes. Nemathybomes not visible to the naked eye, concentrated in a band along the centre of each macrocoel, containing microbasic *b*-mastigophores measuring in the region of 29.0-50.7 x 2.6-4.7 μm . Actinopharynx containing microbasic *p*-mastigophores measuring in the region of 14.5-25.9 x 3.6-5.7 μm and two types of microbasic *b*-mastigophores measuring 14.5-23.8 x 1.6-2.6 μm and 35.7-40.3 x 2.6-4.1 μm . Physa imperforate.

TYPE SPECIMENS. The holotype is deposited in the Australian Museum, Sydney; regd no. G.15050; type locality Cape Bird, McMurdo Sound, Antarctica. The following information appears on the label: "*Edwardsia meridionalis* sp. nov.; holotype, dissected. Collected by Dr J. K. Lowry (University of Canterbury, Christchurch, New Zealand) on 28 December, 1970 as part of sample CB2 (depth 65 m) from Cape Bird, Ross Island, McMurdo Sound, Antarctica (77°13'S, 166°25'E). Deposited by Dr R. B. Williams (Tring, England), August 1978." The specimen has 16 tentacles and is 1.2 cm long and 1.5 mm in diameter. The capitulum and scapulus are polygonal, the latter being corrugated, and the physa is slightly puckered at the tip. The colour of the scapus is mainly beige, tan-coloured just above the physa.

Two paratypes are deposited in the British Museum (Natural History), London; regd nos. 1978.9.1.1-2. Three further paratypes (sectioned material) are in the author's private collection.

DESCRIPTION. This is based on examinations of both living and fixed material: the numbers examined are given where appropriate. Measurements of features in living or stained microscopical preparations were made, using an eyepiece micrometer and an oil immersion objective, to an accuracy of $\pm 0.26 \mu\text{m}$ after calibration. Measurements are all rounded off to the nearest 0.1 μm . Specimens fixed in 70% alcohol were sectioned at 10 μm and stained with Masson's Trichrome (Pantin, 1964). The material examined consisted of fixed specimens from Cape Bird (Ross Island, McMurdo Sound) collected by Dr J. K. Lowry, taken from samples CB1 (25 December, 1970) and CB2 (28 December, 1970); and living specimens from Cape Armitage (Ross Island, McMurdo Sound) collected by Mr J. S. Oliver in January, 1976.

Column. Divisible into physa, scapus, scapulus and capitulum, the last being rather indistinct. In fixed, contracted specimens the column was between 4 and 19 mm long and between 0.75 and 2 mm in diameter at its widest point. In living, buried specimens the column was up to 35 mm long and up to 2.5 mm in diameter. It is likely, however, that in relaxed undisturbed specimens, the column may be even longer.

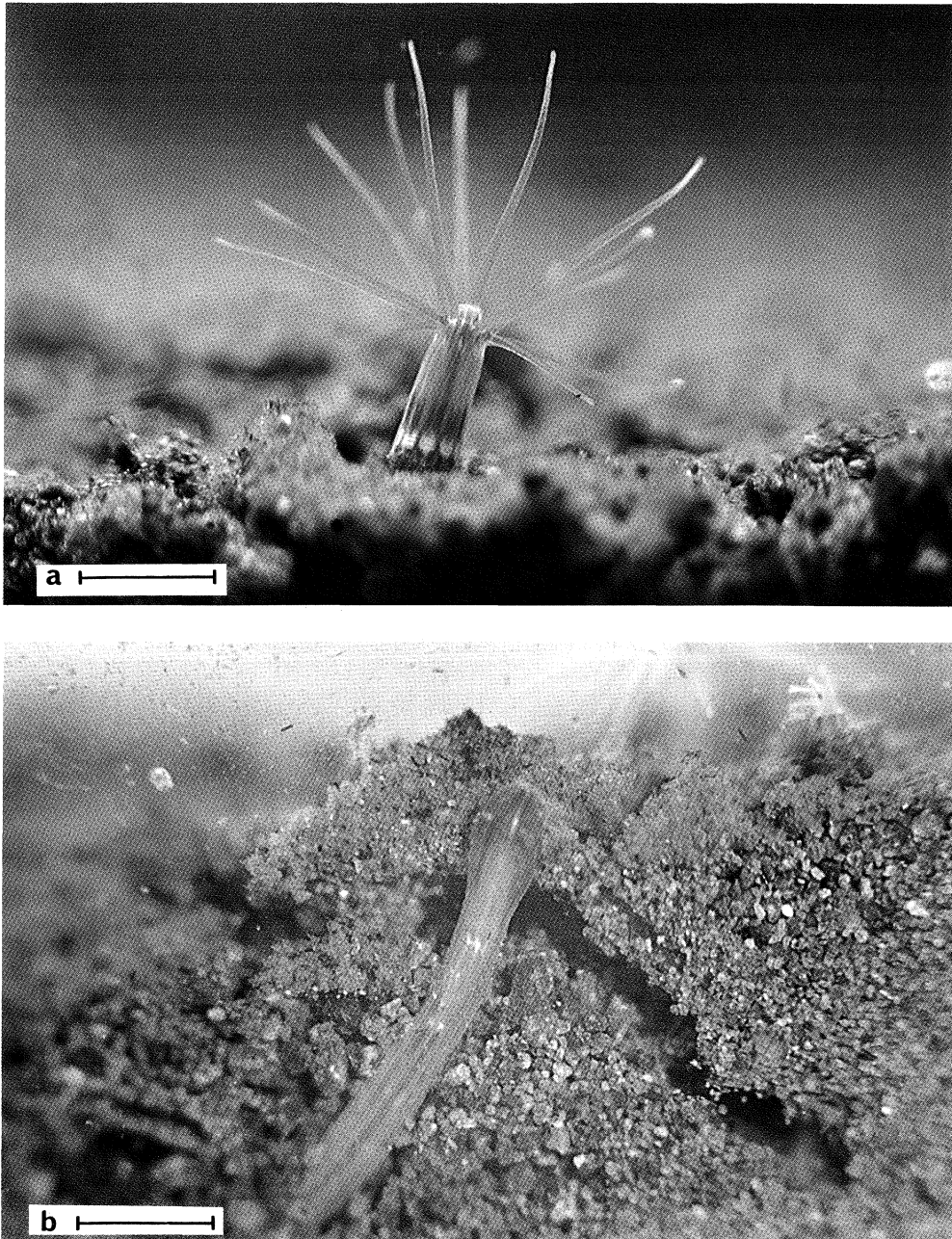


Figure 2. — Photographs of *E. meridionalis* in its natural position in a gravel substrate, viewed through the side of an aquarium (scales = 5 mm): (a) expanded at surface; (b) tentacles retracted but column still extended below surface.

The physa is translucent when distended, revealing the mesenterial insertions. It is bluish-grey, has no nemathybomes or periderm and is imperforate. Its extremity may become tucked in rosette-like but is not introvertible.

The scapus is corrugated and opaque in contraction, smooth and translucent when extended. The periderm likewise becomes translucent when stretched and ends in a ragged edge where the scapus joins the scapulus distally and the physa proximally. When contracted, the periderm is greyish-brown or ochre, modified by adhering foreign matter, but when stretched, the scapus shows through, being bluish-grey like the physa for most of its length (fig. 2b). The scapus bears non-tuberculate nemathybomes concentrated in a band along the centre of each macrocoel (fig. 3). (The arrangement is similar to that in *E. andresi* but in that species the nemathybomes are relatively smaller (see Carlgren, 1921, fig. 18). For comparison, note the scattered arrangement in *E. norvegica* (see Carlgren, 1942, fig. 68) and an intermediate arrangement in *E. danica* (see Carlgren, 1921, fig. 17).) Nemathybomes in live anemones measured from 39.0 to 58.5 μm across and were not visible to the naked eye in fixed or living material. In transverse sections of the column they were not present at the distal end of the scapus, although periderm was still present at that level. (This could simply have been a result of the column being contracted: fig. 3 was drawn from a live expanded specimen and so represents the nemathybomes in their natural arrangement.)

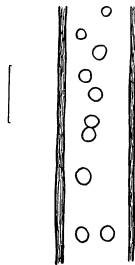


Figure 3. — Distribution of nemathybomes between two mesenterial insertions on the scapus of *E. meridionalis*, 0.7 mm in diameter; scale = 200 μm .

The scapulus has no nemathybomes. Its proximal part is pink or deep chestnut brown: this coloration extends a little way onto the distal scapus where it fades out. The distal part of the scapulus is translucent and bluish-grey, and the actinopharynx, which is pinkish-brown, is clearly visible through it. There are eight prominent chalk-white blotches, longitudinally elongated and each corresponding with a macrocoel, which occur on the chestnut coloured region just above the distal edge of the periderm (fig. 2a).

The scapulus narrows slightly towards the rather indistinct capitulum which bears a narrow semi-opaque white streak in the middle of each macrocoel, each about half the length of the white markings on the scapulus (fig. 2a).

Disc. The disc is circular, its diameter less than that of the scapulus. It bears a prominent hypostome which, together with the tapering scapulus, approximates to the shape of a truncated cone in living anemones (fig. 2a). The colour of the disc varied from opaque deep chestnut brown to almost colourless and translucent. The hypostome was always off-white and the macrocneme insertions were frequently marked with continuations of the hypostome pigment, extending over the margin just onto the capitulum.

Tentacles. Typically, the tentacles numbered 16 in two cycles of 8, presumably the normal adult pattern. The endocoelic (inner) tentacles were longer than the exocoelic (outer) tentacles. All the tentacles were colourless and translucent except for a more or less strongly marked white tip. Table 1 shows the numbers of tentacles counted on 25 specimens (16 from fixed samples and 9 living). The range was from 12 to 18 with a mode of 16 (80% of the specimens). Only one specimen had supernumerary tentacles. The tentacles were delicate in form and, in living specimens of about 2.5 mm diameter scapus, they tapered from just over 0.4 mm in diameter at the base to a fine point: inner tentacles about 11.25 mm long, outer tentacles about 9 mm long. In unburied specimens the tentacles tended to be blunter and shorter by about one half. In the fixed specimens, the tentacles were either completely withdrawn or contracted to 1 mm or less.

TABLE 1: Numbers of tentacles counted on 25 specimens of *E. meridionalis*

Number of tentacles	12	13	14	15	16	17	18
Number of specimens	1	0	1	2	20	0	1
Percentage of specimens	4	0	4	8	80	0	4

Anatomy. The description is based on dissections of nine whole fixed specimens and two living specimens, and examinations of two series of transverse sections and one series of longitudinal sections. The arrangement of the tentacles and mesenteries of *E. meridionalis* presents nothing unexpected, the two cycles of eight tentacles being associated with eight microcnemes (present only at the level of the capitulum) and eight macrocnemes. This is typical of an *Edwardsia* species with sixteen tentacles (see fig. 1a; Stephenson, 1935, fig. 45B; Carlgren, 1949, plate I, fig. 1). The fact that the inner tentacles are longer than the outer is, however, rather unusual.

The retractor muscles, at all levels of the column (figs. 4 to 7), had in cross-section a branched process (rarely two) in the outer part and between two and six other less branched or single processes in the inner part. The parietal muscles, however, varied in cross section depending on the level in the column. In the distal column, they were hastate in cross-section (figs. 4 and 5), becoming foliiform with six to ten processes more proximally (figs. 6 and 7). The extension of the parietal muscles onto the distal column wall was slight. However, towards the proximal end of the column, it became progressively more marked, though nowhere greatly exceeding the maximum width of the foliiform portion (figs. 4 to 7). Circular muscle was attached to the inner surface of the mesogloea at the base of the endoderm (figs. 4 to 8). The cnidoglandular tracts of the mesenterial filaments possessed many secretory cells containing granules about 1 μ m in diameter.

The mesogloea, at least in fixed and contracted specimens, was thinnest at the extreme distal and proximal ends of the column. At the distal end, it bore short radial

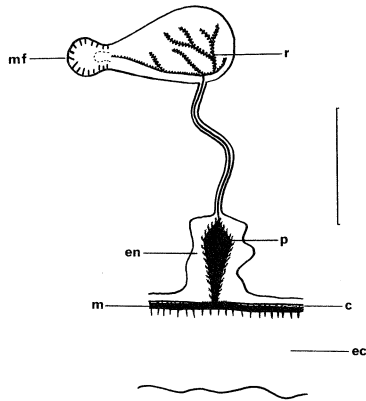


Figure 4. — Transverse section of macrocneme and part of body wall at the level of the scapulus of *E. meridionalis*, 0.9 mm in diameter; scale = 100 μ m.

c = circular muscle; ec = ectoderm; en = endoderm; m = mesogloea; mf = mesenterial filament; p = parietal muscle; r = retractor muscle.

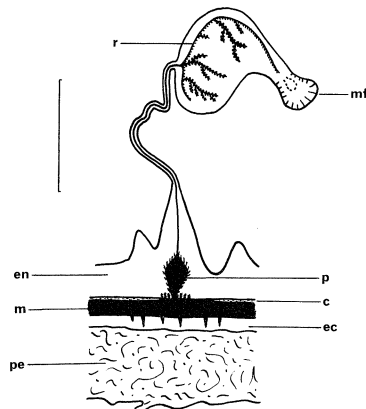


Figure 5. — Transverse section of macrocneme and part of body wall at the level of the upper scapus of *E. meridionalis*, 0.9 mm in diameter; scale = 100 μ m.

c = circular muscle; ec = ectoderm; en = endoderm; m = mesogloea; mf = mesenterial filament; p = parietal muscle; pe = periderm; r = retractor muscle.

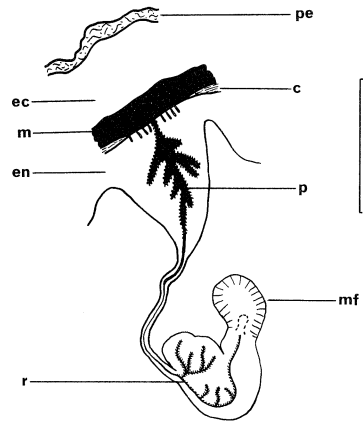


Figure 6. — Transverse section of macroceme and part of body wall at the level of the middle scapus of *E. meridionalis*, 0.9 mm in diameter; scale = 100 μ m.

c = circular muscle; ec = ectoderm; en = endoderm; m = mesogloea; mf = mesenterial filament; p = parietal muscle; pe = periderm; r = retractor muscle.

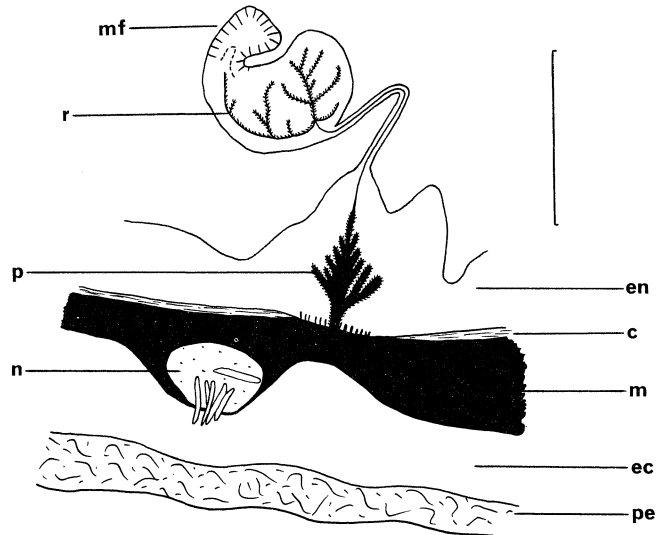


Figure 7. — Transverse section of macroceme and part of body wall at the level of the lower scapus of *E. meridionalis*, 0.9 mm in diameter; scale = 100 μ m.

c = circular muscle; ec = ectoderm; en = endoderm; m = mesogloea; mf = mesenterial filament; n = nemathobome; p = parietal muscle; pe = periderm; r = retractor muscle.

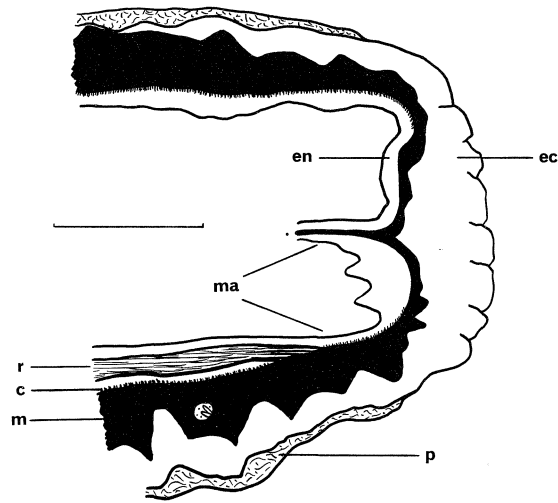


Figure 8. — Longitudinal section of physa and lower scapus of *E. meridionalis*, 1 mm in diameter; scale = $100\mu\text{m}$.
 c = circular muscle; ec = ectoderm; en = endoderm; m = mesogloea containing a nemathybome; ma = macrocnemes; p = periderm; r = retractor muscle.

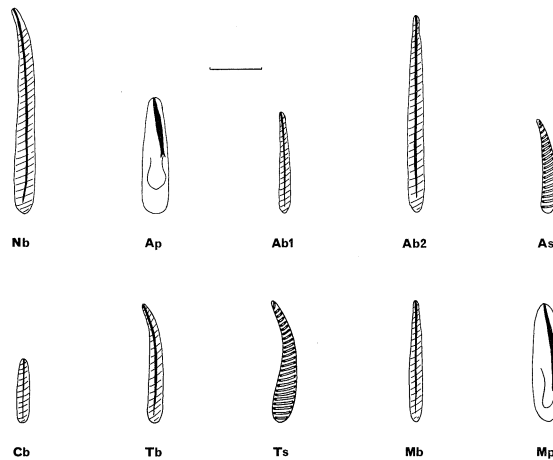


Figure 9. — Stylized representation of the cnidome of *E. meridionalis*; scale = $10\mu\text{m}$.
 Nb = microbasic *b*-mastigophore of nemathybome.
 Ap = microbasic *p*-mastigophore of actinopharynx; Ab1 and Ab2 = microbasic *b*-mastigophores of actinopharynx; As = spirocyst of actinopharynx.
 Cb = microbasic *b*-mastigophore (?) of column.
 Tb = microbasic *p*-mastigophore of tentacle; Ts = spirocyst of tentacle.
 Mb = microbasic *p*-mastigophore of mesenterial filament; Mp = microbasic *p*-mastigophore of mesenterial filament.

processes projecting into the ectoderm (figs. 4 and 5): such processes did not occur anywhere else. In addition, there were thickenings of the mesogloea in the form of longitudinal ridges extending into the ectoderm opposite each macrocoel which gave a polygonal appearance to the scapulus in fixed specimens. The nemathybomes were embedded in the scapus mesogloea (possibly not extending to the most distal part) and contained from about seven to at least fifteen nematocysts of one type (microbasic *b*-mastigophores) and numerous granules up to about $2.1\mu\text{m}$ in diameter. In a transverse section, usually only one nemathybome was cut through in each macrocoel but occasionally two were seen.

The periderm plus the closely associated foreign material (including sand, detritus and diatoms) was up to $65\mu\text{m}$ thick (the periderm alone being about $2.6\mu\text{m}$ thick) in contracted specimens. The periderm must be much thinner when stretched as in fig. 2b. The imperforate physa was morphologically differentiated from the scapus by its lack of circular muscle, of periderm and of nemathybomes, and by its thick ectoderm and thin mesogloea (fig. 8).

The sexes are probably separate (data from fixed specimens collected in December, during the Antarctic summer). The sperm heads were pointed as is usual in *Edwardsia* species (see Schmidt, 1974), about $3.1\mu\text{m}$ long and $2.1\mu\text{m}$ wide. The oocytes were spherical or elliptical in shape: the smallest measured was $22.8\mu\text{m}$ in diameter (nucleus $10.3\mu\text{m}$ diameter, nucleolus $5.2\mu\text{m}$ diameter) and the largest was $147.9\mu\text{m}$ in diameter (nucleus $31.0\mu\text{m}$ diameter, nucleolus $13.4\mu\text{m}$ diameter).

Cnidom. The description is based on examinations of four living specimens, twelve fixed specimens (including the holotype and both paratypes) and series of transverse sections of two further specimens. Up to fourteen cnidae of each type were measured from each tissue sample. The cnidom is summarized in table 2 and the types of cnidae are shown in stylized form in fig. 9. Besides those in the nemathybomes, nematocysts in the column wall are probably very rare: only two were found in seven tissue samples. Examination of stained transverse sections confirmed their rarity but it was still not possible to be absolutely certain of their type since no discharged examples were seen. They are shown as microbasic *b*-mastigophores, but may be basitrichs, these types being difficult to distinguish when undischarged (see Carlgren, 1940 and p.329). The larger microbasic *b*-mastigophores in the actinopharynx were found in only two out of five tissue samples; they are unlikely to have been contaminants since the nematocysts closest in appearance to them occur in the nemathybomes and furthermore the latter type is usually slightly curved whilst that in the actinopharynx is usually straight (see fig. 9). However, the spirocysts found in two out of five actinopharynx samples might possibly be contaminants from the tentacles or disc, although Carlgren (1940) noted the presence of spirocysts in the actinopharynges of some other Actiniaria. The microbasic *p*-mastigophores in the mesenterial filaments were found in only two out of four tissue samples and were rare in these; they appear to be similar to those in the actinopharynx. Microbasic *b*-mastigophores were found in the mesenterial filaments, which confirms the presence of this type of nematocyst in *Edwardsia* filaments noted for the first time by Manuel (1977).

Variation. The appearance of the living specimens examined was fairly constant: figs. 2a and b show typical specimens. Only two variants were observed which, although similar in form to the other specimens, bore only white pigment. This occurred at the tips of the tentacles, on the hypostome and in the form of eight blotches just above the junction of scapus and scapulus, all as described for normal specimens. However, the actinopharynx was also white but other parts of these specimens were devoid of pigment, being translucent.

TABLE 2: The cnidom of *E. meridionalis* (measurements in μm)

Tissues	Cnidae	Mean sizes	Ranges	Abundance
Tentacle tips	Spirocysts	23.4 x 4.1	10.3-39.3 x 2.1-5.2	Common
	Microbasic <i>b</i> -mastigophores	22.5 x 2.7	20.7-26.9 x 2.1-3.6	Common
Column	Microbasic <i>b</i> -mastigophores (?)	12.4 x 2.1	10.3-15.5 x 2.1	Very rare
Nemathybomes	Microbasic <i>b</i> -mastigophores	39.0 x 3.6	29.0-50.7 x 2.6-4.7	See p.336
Actinopharynx	Microbasic <i>b</i> -mastigophores	19.3 x 1.9	14.5-23.8 x 1.6-2.6	Predominant
	Microbasic <i>p</i> -mastigophores	22.1 x 4.9	14.5-25.9 x 3.6-5.7	Few
	Microbasic <i>b</i> -mastigophores	37.6 x 3.1	35.7-40.3 x 2.6-4.1	Rare
	Spirocysts	17.6 x 2.6	14.5-22.8 x 2.1-3.1	Very rare
Mesenterial filaments	Microbasic <i>b</i> -mastigophores	23.1 x 2.2	18.6-25.9 x 1.6-3.1	Predominant
	Microbasic <i>p</i> -mastigophores	22.8 x 5.0	20.7-25.9 x 3.6-6.2	Rare

ECOLOGY: HABITAT OF *E. MERIDIONALIS*

The information in this part was provided by Dr J. K. Lowry and Mr J. S. Oliver.

In McMurdo Sound *E. meridionalis* inhabits a zone between 30 and 180 m in depth along the western Cape Bird coastline at the northern end of Ross Island; and between 5 and 40 m in depth at Cape Armitage at the southern end of Ross Island and also on the western side of the Sound. Population densities at various depths are shown in table 3.

TABLE 3: Numbers per m² of *E. meridionalis* at various depths (Antarctic summer samples)*

Depth (m)	Ross Sea	Marble Point	New Harbour	Ferrar Glacier	McMurdo Station Jetty	Cape Armitage	Cape Bird
6	—	—	—	—	—	2,744	—
7	—	—	224	—	—	—	—
9	—	—	—	—	—	7,560	—
10	—	—	7,560	—	—	—	—
18	—	—	—	—	—	560	—
20	—	—	12,700	—	19,000	—	—
25	—	—	1,230	—	—	500	—
30	—	2,770	—	0-50	—	—	—
35	—	—	—	—	—	—	23,500
50	—	—	—	—	—	—	19,250
65	—	—	—	—	—	—	10,800
500	0-3	—	—	—	—	—	—

* Data provided by Mr J. S. Oliver and Dr J. K. Lowry

— No data

At Cape Bird between 30 and 50 m depth the substrate is medium to very fine sand with a mean particle diameter of 170 μm . *E. meridionalis* lives here in a community dominated by the tube building spionid polychaete *Spiophanes tcherniai* Fauvel; these two species along with the myodocopid ostracod *Philomedes heptathrix* Kornicker and the tanaidacean *Nototanais dimorphus* Beddard make up about 77% numerically of the total animal population. At Cape Armitage *E. meridionalis* lives in mud, sand, gravel, sponge spicule and cobble substrates, comprizing zones, I, II and III of Dayton, Robilliard and Paine (1970); the gravel with which the living anemones used in this study were received came from a depth of 10 m and analysis by sieving showed it to have a mean particle diameter of 540 μm . In shallow water, *Edwardsia* is most abundant just above the level of the dense maldanid and spionid polychaete tubes; these tubes cannot be maintained towards extreme shallows because they probably provide a substrate for ice crystal formation. *Edwardsia* does not have this problem and flourishes just above the tube zone and below the zone of permafrost or the anchor ice carpet. On the other side of McMurdo Sound at New Harbour, the tube zone is not present and *Edwardsia* is more abundant somewhat deeper in the shallows. Benthic diatom growth or the grazing activities of asteroids and ophiuroids may control the lower limit of this dense zone at New Harbour (*i.e.* in depths greater than *ca* 20 m). *E. meridionalis* is the un-named *Edwardsia* species included by Dayton and Oliver (1977) amongst "other Vermes" in the Antarctic benthic samples in their table 1.

Littlepage (1965) has summarized the physical conditions in southern McMurdo Sound at depths from 3 to 275 m: the annual mean temperature is -1.87°C (range -2.15 to -1.40°C); the annual mean salinity is 34.70‰ (range 33.96 to 34.99‰).

GEOGRAPHICAL DISTRIBUTION OF *E. MERIDIONALIS*

E. meridionalis has been found at several localities in McMurdo Sound, viz. Cape Bird, Ross Island (77°13'S, 166°25'E); Cape Armitage, Ross Island (77°51'S, 166°41'E); McMurdo Station Jetty (77°54'S, 166°38'E); Ferrar Glacier (77°42'S, 163°36'E); New Harbour (77°34'S, 163°34'E); Marble Point (77°25'S, 163°47'E) and also in the open Ross Sea (74°58'S, 170°48'E). (These co-ordinates are approximate and were estimated from maps.) In McMurdo Sound, it appears to be most abundant at depths from 6 to 65 m and is much less frequent at 500 m in the Ross Sea (table 3).

As noted previously, it is possible that some of the specimens assigned to *E. intermedia* by Carlgren (1899, 1927a, 1959) may belong to *E. meridionalis*. If this is so, then the distribution may include Graham Land, South Georgia, Tierra del Fuego and Southern Chile, all these records being from depths within the range recorded for *E. meridionalis* from McMurdo Sound and the Ross Sea. Records of *E. meridionalis* and of specimens identified as *E. intermedia* by Carlgren (1899, 1927a, 1959) are shown in fig. 10.

DIFFERENTIATION OF *E. MERIDIONALIS* SP. NOV. FROM OTHER
NOMINAL *EDWARDSIA* SPECIES

The most useful diagnostic features of *Edwardsia* species are the types and sizes of the nematocysts in the nemathybomes; the arrangement and prominence of the nemathybomes on the scapus; the types and sizes of the nematocysts in the actinopharynx; the arrangement of the mesenteries and tentacles in adult specimens; and in some species, the branching patterns seen in transverse sections of retractor and parietal muscles. The appearance of the nemathybome arrangement and, maybe to a lesser extent, that of the retractor muscles may be affected by the degree of contraction of an anemone and severe distortion may occur in preserved specimens. Transverse sections of longitudinal muscles also may vary in appearance depending on the level of the section through the column. Other anatomical features and patterns of coloration may under some circumstances serve to identify incompletely described specimens, but only when especially distinctive and known to be consistent.

An attempt has been made to trace all the published descriptions of nominal *Edwardsia* species. Each has been compared with the foregoing description of *E. meridionalis*. Discounting the invalid species listed in appendix III, 39 *nomina clara* (*sensu* Smith, 1963) remain. These may be differentiated from *E. meridionalis* by a process of elimination using various combinations of the diagnostic features noted above. For the sake of brevity, only some of the distinctive features are given here: further details may be obtained from the references given.

(1) First, those *Edwardsia* species with two nematocyst types in the nemathybomes and (with the exception of *E. delapiae*) having a different arrangement of nemathybomes from that of *E. meridionalis* are excluded as follows:—

E. beautempsii de Quatrefages, 1842. Nemathybomes in eight longitudinal lines (Manuel, 1977).

E. timida de Quatrefages, 1842. Nemathybomes scattered (Manuel, 1977).

E. tuberculata Dübén and Koren, 1847. Tuberculate nemathybomes in eight longitudinal lines (Carlgren, 1921).

E. sipunculoides (Stimpson, 1853). Nemathybomes scattered (Carlgren, 1931).

E. sulcata Verrill, 1866. Nemathybomes possibly in eight longitudinal lines, but at any rate not scattered (Carlgren, 1950a).

E. claparedii (Panceri, 1869). Tuberculate nemathybomes in eight longitudinal lines (Carlgren and Stephenson, 1928 as *E. callimorpha* (Gosse)).

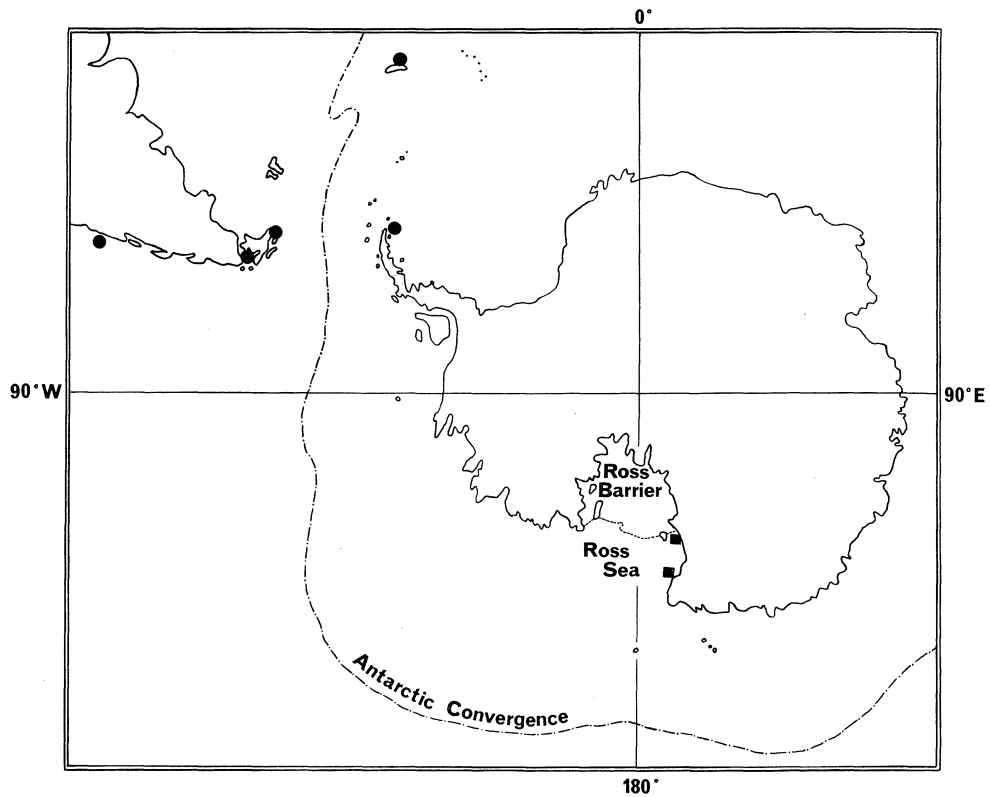


Figure 10. — Geographical distribution of *E. meridionalis* (■) and specimens identified by Carlgren as *E. intermedia* (●), some of which may be conspecific with *E. meridionalis*. The *E. meridionalis* symbol in McMurdo Sound represents 6 separate localities (see p.339). The *E. intermedia* symbol off Chile represents 8 separate localities (see Carlgren, 1959).

- E. elegans* Verrill, 1869. Nemathybomes in eight longitudinal lines (Carlgren, 1931).
E. neozelanica Farquhar, 1898. Nemathybomes scattered giving granulous appearance (Carlgren, 1924 as *E. tricolor* Stuckey).
E. californica (McMurrich, 1913). Nemathybomes in eight longitudinal lines (Carlgren, 1936).
E. tinctoria Annandale, 1915. Tuberculate nemathybomes in eight longitudinal lines (Annandale, 1915; Carlgren, 1925).
E. danica Carlgren, 1921. Nemathybomes more or less scattered (Carlgren, 1921).
E. longicornis Carlgren, 1921. Tuberculate nemathybomes in eight longitudinal lines, physa perforate (Carlgren, 1921).
E. delapiae Carlgren and Stephenson, 1928. Nemathybomes in a wide band in the centre of each macrocoel (Carlgren and Stephenson, 1928).
E. maroccana Carlgren, 1931. Nemathybomes in eight longitudinal lines (Carlgren, 1931).
E. octoradiata Carlgren, 1931. Nemathybomes in eight longitudinal lines (Carlgren, 1931).
E. capensis Carlgren, 1938. Nemathybomes in eight longitudinal lines (Carlgren, 1938).
E. sanctaehelenae Carlgren, 1941. Nemathybomes in eight longitudinal lines (Carlgren, 1941).
E. annamensis Carlgren, 1943. Nemathybomes in eight longitudinal lines (Carlgren, 1943).
E. ivelli Manuel, 1975. Tuberculate nemathybomes in eight longitudinal lines (Manuel, 1975).
E. carlgreni nom. nov. Nemathybomes in closely packed groups (Carlgren, 1921 as *E. pallida* Carlgren).

(2) Second, those species with only one type of nematocyst (of a size range not or only slightly overlapping that in *E. meridionalis*) in the nemathybomes (which, with the exception of *E. andresi*, are differently arranged) are excluded as follows:—

- E. andresi* Danielssen, 1890. Nemathybomes (nematocysts 48-67 x 3.5-4 μ m) irregularly arranged but concentrated in the centres of the macrocoels, physa perforate (Carlgren, 1921).
E. vegae Carlgren, 1921. Nemathybomes (nematocysts 84-101 x 3 μ m) visible to the naked eye and scattered, physa perforate (Carlgren, 1921).
E. kameruniensis Carlgren, 1927b. Nemathybomes (nematocysts 45-63 x 3.5-4.5 μ m) scattered (Carlgren, 1927b).
E. armata Carlgren, 1931. Nemathybomes (nematocysts 43-70 x 3.5-4.5 μ m) scattered (Carlgren, 1931).
E. japonica Carlgren, 1931. Nemathybomes (nematocysts 74-101 x 2.5-3.5 μ m) scattered (Carlgren, 1931).
E. norvegica Carlgren, 1942. Nemathybomes (nematocysts 47-58 x 3 μ m) scattered (Carlgren, 1942).
E. jonesii Seshaiya and Cuttress, 1969. Nemathybomes (nematocysts 48-72 x 4.5-5.5 μ m) in eight longitudinal lines (tending to become sixteen lines around mid-scapus) (Seshaiya and Cuttress, 1969).

(3) Third, those species with types and sizes of nematocysts in the actinopharynx differing from those in *E. meridionalis* (and having other significant differences) are excluded as follows:—

- E. pudica* Klunzinger, 1877. Retractor muscles extremely diffuse (Faurot, 1895 as *E. adenensis* Faurot; Carlgren, 1931).
E. fusca Danielssen, 1890. Distinctive coloration different from that of *E. meridionalis* (cf. Carlgren, 1921).

E. vitrea (Danielssen, 1890). Nemathybomes scattered, physa perforate (Carlgren, 1921).

E. arctica Carlgren, 1921. Tuberculate nemathybomes in eight longitudinal lines, physa perforate (Carlgren, 1921).

E. finmarchica Carlgren, 1921. Nemathybomes scattered, physa perforate (Carlgren, 1921).

E. islandica Carlgren, 1921. Nemathybomes scattered (Carlgren, 1921).

E. bocki Carlgren, 1931. Nemathybomes scattered (Carlgren, 1931).

E. duodecimentaculata Carlgren, 1931. Maximum of twelve tentacles (Carlgren, 1931).

E. stephensoni Carlgren, 1950b. Nemathybomes scattered (Carlgren, 1950b).

(4) Last, those species not falling into the first three groups, but having other distinctive characters, are excluded as follows:—

E. carneola (Verrill, 1928). Has twenty-four tentacles and a distinctive coloration different from that of *E. meridionalis* (cf. Verrill, 1928 as *Edwardsiella carneola* Verrill).

E. gilbertensis Carlgren, 1931. Nemathybomes in eight longitudinal lines (Carlgren, 1931).

E. vivipara Carlgren, 1950c. Nemathybomes scattered, twelve tentacles and diffuse retractors (Carlgren, 1950c).

THE STATUS OF ANEMONES DETERMINED AS *E. INTERMEDIA* McMURRICH, 1893

The name *E. intermedia* McMurrich, 1893 is here regarded as a *nomen dubium* (see p. 349). The holotype was sectioned and I do not know its whereabouts, if indeed it still exists. However, Carlgren (1899, 1927a, 1959) has determined several anemones from Subantarctic regions and South American waters as this species. Since some, at least, of these specimens have features in common with *E. meridionalis*, their status is discussed in detail. Although the single type-specimen of *E. intermedia* was incompletely described, the fact that its nemathybomes were scattered and visible to the naked eye immediately differentiates it from *E. meridionalis*, but not from some other *Edwardsia* species.

The anemones from the Magellan Strait (Chile), Ushuaia (Tierra del Fuego) and South Georgia determined by Carlgren (1899) as *E. intermedia* may belong to two or more species. They were described as having scattered nemathybomes. Later (Carlgren, 1927a), some of the same specimens were re-examined and the measurements of the nematocysts in their nemathybomes were given. Similar but more extensive data were also given for further anemones from South Georgia and Graham Land (Carlgren, 1927a) and they appear to be similar to those of *E. meridionalis* from McMurdo Sound (table 4). Further details of the cnidom of specimens from Chile (Carlgren, 1959) are also included in table 4.

Compared with the McMurdo Sound populations of *E. meridionalis*, Carlgren's specimens show great variation in numbers of tentacles on each individual (Carlgren, 1899, 1927a, 1959). In the case of an edwardsiid with a finite number of tentacles in the adult state, one would expect a population to have most individuals with tentacles up to and including this number, as in, for example, *Nematostella vectensis* Stephenson, 1935 (see Williams, 1975). This appears to be true of *E. meridionalis* since only one specimen examined had supernumerary tentacles, the adult number apparently being 16 (table 1). However, Carlgren's specimens have from 16 to 28 tentacles; so it is extremely unlikely that the adult number can be 16 if they are all the same species. It is remarkable, moreover, that with the great variation in the numbers of tentacles and also in the appearance of transverse sections of the retractor muscles (see figs. 2 and 3 of Carlgren

TABLE 4: A comparison of the size ranges(μm) of cnidae in *E. meridionalis* and *E. intermedia* (sensu Carlgren)

	<i>E. meridionalis</i>	<i>E. intermedia</i>		
	present study: McMurdo Sound	Carlgren (1927a): Magellan Strait, Ushuaia, South Georgia	Carlgren (1927a): South Georgia, Graham Land	Carlgren (1959): Chile
Tentacles	10.3-39.3 x 2.1-5.2 (sp.) 20.7-26.9 x 2.1-3.6 (m. <i>b-m.</i>)	— —	14-24 x 1.5-3.5 (sp.) 21-26 x 2-2.5(?)	— 15-36 x 2.5-3 (bas.)
Column	10.3-15.5 x 2.1 (m. <i>b-m.</i>)	—	15-19 x 2.5 (?)	—
Nemathybomes	29.0-50.7 x 2.6-4.7 (m. <i>b-m.</i>)	35-53 x 3-4 (?)	34-53 x 3-4 (?)	29.6-63.4 x 3-4 (?)
Actinopharynx	14.5-23.8 x 1.6-2.6 (m. <i>b-m.</i>) 14.5-25.9 x 3.6-5.7 (m. <i>p-m.</i>) 35.7-40.3 x 2.6-4.1 (m. <i>b-m.</i>) 14.5-22.8 x 2.1-3.1. (sp.)	— — — —	— 24-26 x 5 (?) 31-41 x 3-4 (?) —	— — 31-52 x 4.2-5.6 (bas.) —
Mesenterial filaments	18.6-25.9 x 1.6-3.1 (m. <i>b-m.</i>) 20.7-25.9 x 3.6-6.2 (m. <i>p-m.</i>) —	— — —	— — —	21-24 x 2.8 (bas.) 24-35 x 5.6-6.3 (m. <i>p-m.</i>) 31-49 x 4.2-5.6 (bas.)

- sp. = spirocysts
m. *b-m.* = microbasic *b*-mastigophores
m. *p-m.* = microbasic *p*-mastigophores
bas. = basitrichs
? = nematocyst type not stated
— = nematocysts not recorded

(1927a) and fig. 1 of Carlgren (1959)) there should be such similarity between the sizes of nematocysts in the nemathybomes and other tissues of his specimens. However, the nemathybomes have variable distributions (see Carlgren, 1899, 1959) and it is noteworthy that the retractor and parietal muscles described by Carlgren (1927a, 1959) are quite different from those of *E. meridionalis*.

It is concluded that in view of the poor description of the single specimen of *E. intermedia*, Carlgren could hardly have identified his material with this nominal species with any certainty. On the other hand, despite a similarity between the nemathybome and other nematocysts of some of his specimens and those of *E. meridionalis*, there seems to be too much variation in his subsequent descriptions to be sure of the conspecificity of all of his specimens with the latter species. Indeed, the present confusion regarding *E. intermedia* is perhaps best summarized by Carlgren himself (1959): "The identification of the individuals here mentioned is rather uncertain as the single type specimen is imperfectly described . . . I identified (1927a) some individuals from Tierra del Fuego, South Georgia and Graham Land with *intermedia*. They may not be referable to this species because the nematocysts of the nemethybomes are shorter than in our specimens, but the number of tentacles is greater."

DISCUSSION

The genus-group name *Edwardsia* de Quatrefages, 1841, currently used for the genus of actinarians dealt with in this paper, is preoccupied by *Edwardsia* O. G. Costa, 1834 (Crustacea): this homonymy invalidates the family-group name Edwardsiidae Andres, 1881. A request (Williams, 1979) has been made to the International Commission on Zoological Nomenclature for suppression of the name *Edwardsia* O. G. Costa and conservation of the names *Edwardsia* de Quatrefages and Edwardsiidae Andres. A brief outline of this request appears in appendix I.

The species *E. meridionalis* sp. nov. now described does not fit the generic definition of *Edwardsia* by Carlgren (1949), by virtue of its having the inner tentacles longer than the outer. Stephenson (1935, p.34) had already suggested that it may be advisable to place any species of edwardsiid possessing nemathybomes and having inner tentacles longer than the outer in a new genus. The only major difference between Carlgren's (1949) generic definition and that of Manuel (1977) is the omission by the latter author of any reference to the relative lengths of inner and outer tentacles. However, the present description of *E. meridionalis* and the description of *E. sipunculoides* by Verrill (1866), both with inner tentacles longer than the outer, provide justification for Manuel's (1977) amendment of Carlgren's (1949) generic definition. This makes unnecessary the proposal of a new genus to accommodate edwardsiid species with the inner tentacles longer than the outer and possessing nemethybomes, as suggested by Stephenson (1935).

Carlgren (1921) suggested that all members of the genus *Edwardsia* might have a perforate physa, although he did not include this feature in his generic definition. It is now known, however, that some *Edwardsia* species (e.g., *E. beautempsii* (see Manuel, 1977) and *E. meridionalis*) do have an imperforate physa.

It is interesting that anemones of the genus *Edwardsia* have been found so infrequently in Antarctic and Subantarctic seas. None was identified by Carlgren (1903, 1914, 1928, 1930, 1939), Carlgren and Stephenson (1929), Clubb (1902, 1908), Grebelny (1975), Mann (1948), Pax (1922, 1924a, 1926), Roule (1909) or Stephenson (1918), although some of the anemones examined by these authors were collected from McMurdo Sound where *E. meridionalis* is to be found. In some instances at least, the collecting gear used probably took only larger species: for instance, the sizes of the preserved specimens of

trawled anemones recorded by Stephenson (1918), which would have been even larger in life, are all much greater than the size of living specimens of *E. meridionalis*. Specimens assigned to *E. intermedia* by Carlgren (1899, 1927a, 1959) have already been discussed; the distribution of *E. meridionalis* will possibly become clearer when the true identity of Carlgren's material is determined. Carlgren's (1928) discussion of the distribution of *E. intermedia* may then have to be reconsidered.

Appendix II comprises a list of the names of all presently accepted *Edwardsia* species with notes on their synonyms and their geographical distributions. Appendix III is a list of nominal *Edwardsia* species here regarded as invalid.

ACKNOWLEDGEMENTS

I am grateful to Dr J. K. Lowry for providing me with fixed specimens of *E. meridionalis* and to Mr J. S. Oliver for diving for the living specimens. My thanks are also due to Dr P. F. S. Cornelius, Mr R. L. Manuel, Dr Lowry and Mr Oliver for valuable comments on the manuscript. Mr Manuel kindly took the photographs and prepared the sections. I am grateful also to Mrs S. C. Williams for undertaking the typing of the manuscript.

APPENDIX I

THE USAGE OF THE NAME *EDWARDSIA* DE QUATREFAGES, 1841

The problems relating to the homonymy between the generic names *Edwardsia* O. G. Costa, 1834 and *Edwardsia* de Quatrefages, 1841 can be summarized as follows.

The genus-group name *Edwardsia* has been proposed in five separate publications for different taxa, and replacement names have been proposed for the four junior homonyms (see Neave, 1939). The senior homonym, *Edwardsia* O. G. Costa, 1834 was long ago synonymized with *Sapphirina* Thompson, 1829, applied to a poecilostomatoid copepod (e.g. Giesbrecht, 1892). However, the oldest junior homonym, *Edwardsia* de Quatrefages, 1841, has been used regularly up to the present time and, furthermore, it is the name of the type-genus of the family Edwardsiidae Andres, 1881. The replacement name once proposed for *Edwardsia* de Quatrefages is *Milnea* Reichenbach in Wright, 1866 but it has apparently not been used since Wright's paper appeared and is regarded as an unavailable name (Williams, 1979).

Thus the little-used and now synonymized *Edwardsia* O. G. Costa threatens the established usage of *Edwardsia* de Quatrefages. Confusion would be caused by the use of a replacement name for *Edwardsia* de Quatrefages since the widely used actinian genus-group name *Edwardsia* would fall out of use. The family-group name Edwardsiidae Andres, 1881 is invalid since the name of its nominal type-genus, *Edwardsia* de Quatrefages, 1841, is a junior homonym. A request (Williams, 1979) has therefore been made to the International Commission on Zoological Nomenclature for suppression of the genus-group name *Edwardsia* O. G. Costa, 1834 and conservation of *Edwardsia* de Quatrefages, 1841 and also of the family-group name Edwardsiidae Andres, 1881.

The solution to these problems is dependent upon the publication of an Opinion by the Commission, and in the meantime the accepted usages of the names *Edwardsia* de Quatrefages and Edwardsiidae Andres have been followed in this paper.

APPENDIX II

CURRENTLY ACCEPTED *EDWARDSIA* SPECIES, THEIR SYNONYMS
AND DISTRIBUTIONS

Of the nominal species of *Edwardsia* which were found in the literature, many are at present considered to be invalid (see appendix III). The remaining *nomina clara* (*sensu* Smith, 1963) are listed below with *E. meridionalis* sp. nov. The question of whether some of these *nomina clara* are valid names or not can probably only be decided after examination of type material, if available, or live specimens but is beyond the scope of the present paper.

- Edwardsia beaumontii* de Quatrefages, 1842. This is the type species by subsequent designation (Carlgren, 1949), since no nominal species were included at the time the genus was established. Distribution: northern France.
- E. timida* de Quatrefages, 1842. Junior subjective synonyms: *E. harassi* de Quatrefages, 1842 (*q.v.*); *Edwardsiella harassii* — Andres (1883); ?*Fagesia* (\equiv *Milneedwardsia*) *dixonii* (Carlgren, 1921) (see Manuel, 1977); *E. callianthus* Rawlinson, 1935 (*q.v.*); *non E. timida* (*sensu* Walton and Rees, 1913) (see Stephenson, 1935). Junior objective synonym: *Edwardsiella timida* — Andres (1883). Distribution: northern France, north Wales, eastern Ireland.
- E. tuberculata* Düben and Koren, 1847. Distribution: western Scandinavia (Denmark, Sweden, Norway) and southern Iceland.
- E. sipunculoides* (Stimpson, 1853). Synonyms: *Actinia sipunculoides* Stimpson, 1853; *Edwardsiella sipunculoides* — Andres (1883). Distribution: Alaska and N.E. North America.
- E. sulcata* Verrill, 1866. Distribution: eastern United States.
- E. claparedii* (Panceri, 1869). Synonyms: *Halcampa claparedii* Panceri, 1869; *E. timida* (*sensu* Walton and Rees, 1913) (see Stephenson, 1935); *E. callimorpha* (*sensu* Stephenson, 1935); *non E. (Scolanthus) callimorpha* (Gosse, 1853) (see Manuel, in preparation). Distribution: southern Italy, northern France, southern and western England, southern Ireland.
- E. elegans* Verrill, 1869. Distribution: N.E. North America.
- E. pudica* Klunzinger, 1877. Junior subjective synonym: *E. adenensis* Faurot, 1895 (*q.v.*). Junior objective synonym: *Edwardsiella pudica* — Andres (1883). Distribution: Zanzibar, Gulf of Aden, Red Sea, southern India.
- E. andresi* Danielssen, 1890. Distribution: Denmark, Norway to Spitzbergen, Iceland, western Greenland.
- E. fusca* Danielssen, 1890. Distribution: southern Barents Sea.
- E. vitrea* (Danielssen, 1890). Synonym: *Edwardsioides vitrea* Danielssen, 1890. Distribution: eastern Greenland, Spitzbergen.
- E. neozelanica* Farquhar, 1898. Synonyms: *E. elegans* Farquhar, 1898 (\equiv *E. tricolor* Stuckey, 1909) (*q.v.*). Distribution: New Zealand.
- E. californica* (McMurrich, 1913). Synonym: *Edwardsiella californica* McMurrich, 1913. Distribution: south-western United States.
- E. tinctrix* Annandale, 1915. Distribution: north-eastern and western India.
- E. arctica* Carlgren, 1921. Distribution: Arctic (eastern Greenland to Kara Sea) and Sea of Japan (?).
- E. danica* Carlgren, 1921. Distribution: Baltic Sea, Denmark, Heligoland.
- E. finmarchica* Carlgren, 1921. Distribution: northern Norway.
- E. islandica* Carlgren, 1921. Distribution: Iceland.
- E. longicornis* Carlgren, 1921. The cnidom and certain other features of this species and *E. beaumontii* de Quatrefages, 1842 are very similar and the two species may prove to

- be identical (see Manuel, 1977). Distribution: Denmark.
- E. vegae* Carlgren, 1921. Distribution: Arctic Sea of Siberia.
- E. kameruniensis* Carlgren, 1927b. Distribution: Cameroun.
- E. carneola* (Verrill, 1928). Synonym: *Edwardsiella carneola* Verrill, 1928. Distribution: Kauai (Hawaii).
- E. delapiae* Carlgren and Stephenson, 1928. Although this species was accepted as valid by Manuel (1975), he later considered that it was in part synonymous with *E. timida* de Quatrefages, 1842 (see Manuel, 1977). Certain aspects of the cnidom, anatomy and coloration agree with *E. carlgreni* nom. nov. ($\equiv E. pallida$ Carlgren, 1921). Should *E. delapiae* and *E. carlgreni* prove to be synonyms, the former name would have priority over *E. carlgreni* as the replacement name for *E. pallida*. See also *E. tecta* Haddon, an older possible synonym (appendix III). Distribution: southern Ireland.
- E. armata* Carlgren, 1931. Distribution: Fiji.
- E. bocki* Carlgren, 1931. Distribution: Fiji.
- E. duodecimtentaculata* Carlgren, 1931. Distribution: Fiji.
- E. gilbertensis* Carlgren, 1931. Distribution: Gilbert Islands, Great Barrier Reef.
- E. japonica* Carlgren, 1931. Distribution: eastern Japan.
- E. maroccana* Carlgren, 1931. Distribution: Morocco.
- E. octoradiata* Carlgren, 1931. Distribution: Japan.
- E. capensis* Carlgren, 1938. Distribution: southern South Africa.
- E. sanctaehelenae* Carlgren, 1941. Distribution: Saint Helena.
- E. norvegica* Carlgren, 1942. Distribution: Norway.
- E. annamensis* Carlgren, 1943. Distribution: Cambodia.
- E. stephensoni* Carlgren, 1950b. Certain aspects of this species agree with *E. bocki* Carlgren, 1931 and the two species may be synonymous. Distribution: Great Barrier Reef.
- E. vivipara* Carlgren, 1950c. Distribution: southern Australia.
- E. jonesii* Seshaiya and Cuttress, 1969. Distribution: southern India.
- E. ivelli* Manuel, 1975. Distribution: southern England.
- E. carlgreni* nom. nov. Senior objective synonym: *E. pallida* Carlgren, 1921 (q.v.). Distribution: Sweden.
- E. meridionalis* sp. nov. Synonym: ? *E. intermedia* (pro parte (?) sensu Carlgren, 1899, 1927a, 1959); non *E. intermedia* McMurrich, 1893 (q.v.). Distribution: Ross Sea and South America (?).

APPENDIX III

INVALID NOMINAL *EDWARDSIA* SPECIES

The 39 *nomina clara* found amongst the published descriptions of nominal *Edwardsia* species have already been compared with *E. meridionalis*. The remaining nominal species comprise *nomina nuda*, *nomina dubia*, synonyms and homonyms considered to be invalid for the reasons shown below. However, if more detailed descriptions or type specimens applicable to these names could be found, some of them might be raised to the status of *nomina clara*.

(1) *Nomina nuda*

E. fischeri Chevreux and de Guerne, 1887. This species has apparently never been described (see Fischer, 1887, p.432 and 1890, p.311). Although Fischer (1887, 1890) attributed the name to Chevreux and de Guerne, no other reference to *E. fischeri* was found in the literature.

E. lucifuga Fischer 1887. Given by Fischer (1887, p.432) in a geographical distribution list but the name was not made available until the next year (Fischer, 1888).

(2) Nomina dubia

E. clavata (Rathke, 1843). This species (\equiv *Actinia clavata* Rathke, 1843) was considered to be a senior synonym of *E. tuberculata* Dübén and Koren by Andres (1883) and Carlgren (1893). Later, however, Carlgren (1921) rejected it as a *nomen dubium*, retaining *E. tuberculata* as a potentially valid name. Apparently Rathke (1843) did not record the presence of nemathybores so the species may not be an *Edwardsia*. *E. clavata* (Rathke, 1843) is therefore not regarded as a secondary homonym of *E. clavata* Stimpson, 1855.

E. brevicornis Stimpson, 1855. This species cannot be identified with or differentiated from other *Edwardsia* species. Indeed, Verrill at first (1865) considered it to be a *Halocampa* Gosse, 1858a. (He mis-spelt the name as *Halocampa*.) Carlgren (1949) doubtfully included this species in the genus *Haloclava* Verrill, 1899, but Verrill had already himself (1899) suggested that the species belonged to *Eloactis* Andres, 1883.

E. clavata Stimpson, 1855. The description of this species is also inadequate to be certain of the genus to which it belongs. Verrill (1865) considered that it should be referred to the genus *Phellia* Gosse, 1858b. However, the species was transferred to the genus *Telmatactis* Gravier, 1916 by Carlgren (1949). It is not regarded here as a homonym of *E. clavata* (Rathke, 1843) (see above) so it does not require a replacement name at present.

E. collaris Stimpson, 1855. The same argument applies to this species as to *E. clavata* Stimpson. Again, Verrill (1865) considered it to be a *Phellia*, but Carlgren (1949) provisionally referred it to *Telmatactis* Gravier, 1916.

E. cretata Stimpson, 1855. The description is inadequate to identify or differentiate this species from other *Edwardsia* species and it is also doubtful whether it is an *Edwardsia*. Carlgren (1949), with some doubt, admitted the species to the genus *Paraedwardsia* Carlgren, 1905.

E. rubricollum Stimpson, 1855. This is probably not an *Edwardsia* species, since it was described as having a tuberculate margin and being attached to stones. Verrill (1865) defined a new genus *Ammonactis* for it; Fischer (1890) cast doubt on its validity, although Andres (1883) had accepted it without comment. Carlgren (1949) did not list *Ammonactis* Verrill, 1865 as an accepted genus of anemones or as a synonym of one.

E. allmanni McIntosh, 1865. Despite the subsequent publication of a coloured figure (McIntosh, 1875), this description is not adequate to identify this species with or differentiate it from any other (see Stephenson, 1935 and Manuel, 1975).

E. goodsiri McIntosh, 1865. The same argument and references apply to this species as to the foregoing.

E. grubii (A. Costa, 1869). This species, described originally as a sipunculid *Urophysalus grubii* A. Costa, was considered to be synonymous with *E. clapedii* (Panceri) by Andres (1883). However, although definitely an *Edwardsia*, it is not possible from the original description to allocate with certainty the anemone to any known species.

E. arenosa Klunzinger, 1877. Andres (1883) thought that this species might be a juvenile cerianthid, with which I would agree, but the description was brief and based only upon one specimen.

E. coriacea Moseley, 1877. Although the coloration of the single specimen found is well described, in the absence of any other remarkable physical features in the description, the species definition is inadequate. The coloration is, however, quite different from that of *E. meridionalis*.

E. flaccida Marion, 1882. This species was extremely briefly described and no useful diagnostic features were given.

E. rigida Marion, 1882. As for *E. flaccida* Marion.

E. scabra Marion, 1882. As for *E. flaccida* Marion.

E. grubii Andres, 1883. This species was poorly described and may not be an *Edwardsia*. Pax & Müller (1962) failed to rediscover it in the Adriatic Sea. Its name is here replaced by *E. perdita* nom. nov. (see p.351).

E. octoplax (Sluiter, 1888). Originally described as a gephyrean worm (*Diphthera octoplax*) by Sluiter (1888), the species was later recognised as an *Edwardsia* (Sluiter, 1889). The nemathybomes appear to occur in tightly packed groups and to possess one type of nematocyst (Sluiter, 1888, plate I). Not enough detail is given to confidently assign this species, however. The trivial name appears as both *oktoplax* and *octoplax* in the original description, but the latter spelling is adopted here.

E. tecta Haddon, 1889. The species is of uncertain status but if it proves to be the young of *E. delapiae* Carlgren and Stephenson, 1928, as suspected by Stephenson (1935), the name will be a senior synonym of *E. delapiae* (q.v. in appendix II).

E. costata Danielssen, 1890. This species was described as having papillae upon its eight ribs from the capitulum down to the physa. Although almost certainly an edwardsiid species, it is difficult to be certain to which genus it belongs.

E. intermedia McMurrich, 1893. The single type specimen was incompletely described and probably poorly preserved since the nemathybomes contained no nematocysts. This species has already been discussed in detail (pp. 342-344).

E. ignota Stuckey, 1909. The species, though poorly described, was said to have a naked scapus and hence may not be an *Edwardsia*.

E. mammillata Bourne, 1916. No useful diagnostic features were given for this species.

E. rekaiyae Bourne, 1916. As for *E. mammillata* Bourne.

E. rugosa Bourne, 1916. As for *E. mammillata* Bourne. The single type specimen was largely decomposed.

E. vermiformis Bourne, 1916. As for *E. rugosa* Bourne.

E. willeyana Bourne, 1916. As for *E. mammillata* Bourne.

E. incerta Carlgren, 1921. This species was described from a single imperfect and badly preserved specimen. The large scattered nemathybomes, however, distinguish the species from *E. meridionalis*.

(3) Synonyms

(a) Species-group synonyms.

E. harassi de Quatrefages, 1842. A junior subjective synonym of *E. timida* de Quatrefages, 1842 (see Dixon, 1886).

E. farinacea Verrill, 1869. A junior subjective synonym of *E. duodecimcirrata* Sars, 1851 (q.v.) (Andres, 1883; Carlgren, 1893, 1949) and a senior subjective synonym of *E. lutkenii* Andres, 1883 (q.v.) (Carlgren, 1893).

E. grubii Andres, 1883. A senior objective synonym of its replacement name *E. perdita* nom. nov. (see p.351).

E. lutkenii Andres, 1883. A junior subjective synonym of *E. duodecimcirrata* Sars, 1851 (q.v.) and of *E. farinacea* Verrill, 1869 (q.v.) (Carlgren, 1893).

E. adersensis Faurot, 1895. A junior subjective synonym of *E. pudica* Klunzinger, 1877 (see Carlgren, 1949).

E. elegans Farquhar, 1898. A senior objective synonym of its replacement name *E. tricolor* Stuckey, 1909 (see Stuckey, 1909) and, according to Carlgren (1924), a subjective synonym of *E. neozelanica* Farquhar, 1898.

E. leidyi Verrill, 1898. A junior subjective synonym of *E. lineata* Verrill, 1873 (q.v.) (see Crowell, 1976).

E. tricolor Stuckey, 1909. A junior subjective synonym of *E. neozelanica* Farquhar,

1898 and a junior objective synonym of *E. elegans* Farquhar, 1898 (see Carlgren, 1924).

E. pallida Carlgren, 1921. A senior objective synonym of its replacement name *E. carlgreni* nom. nov. (see p.351 and appendix II).

E. callianthus Rawlinson, 1935. A junior subjective synonym of *E. timida* de Quatrefages, 1842 (see Manuel, 1977) and also, therefore, of *E. harassi* de Quatrefages, 1842 (q.v.).

(b) Nominal *Edwardsia* species transferred to other genera.

E. vestita Forbes, 1843. A junior subjective synonym of *Pachycerianthus solitarius* (Rapp, 1829) (see Andres, 1883; Pax and Müller, 1962).

E. sarsii Düben and Koren, 1847. Transferred to the genus *Paraedwardsia* Carlgren, 1905 (see Carlgren, 1921, 1949).

E. duodecimcirrata Sars, 1851. Transferred to the genus *Halcampa* Gosse, 1858a (see Andres, 1883 and Carlgren, 1893; see also its junior subjective synonyms *E. farinacea* Verrill and *E. lutkenii* Andres).

E. callimorpha (Gosse, 1853). Reinstated in the genus *Scolanthus* Gosse, 1853 (see p.327), but *E. callimorpha* (*sensu* Stephenson, 1935) is synonymous with *E. claparedii* (q.v.), being a misidentification.

E. sphaeroides (Holdsworth, 1855). Originally described as *Scolanthus sphaeroides* Holdsworth, and at first transferred to the genus *Edwardsia* by Gosse (1855b). Later (Gosse, 1860) was regarded as a synonym of *Sagartia troglodytes* (Price in Johnston, 1847), a view shared by Stephenson (1935).

E. carnea Gosse, 1856. Transferred first to the genus *Edwardsiella* by Andres (1883) and later to *Milneedwardsia* Carlgren, 1893 (see Stephenson, 1935), which name being preoccupied, was replaced by *Fagesia* Delphy, 1938. However, as Crowell (1976) has pointed out, the name *Fagesia* is also preoccupied and a further replacement name is required. Meanwhile, *Fagesia* remains in use (*sensu* Carlgren, 1949). The *E. carnea* of Appellöf (1891) was, according to Carlgren (1921), a misidentification of *Paraedwardsia sarsii* (Düben and Koren, 1847).

E. microps (Gosse, 1858b). This species (\equiv *Halcampa microps* Gosse) was regarded by Andres (1883) as an immature *Edwardsia*. Now known to be the young of *Fagesia carnea* (Gosse, 1856) (see Stephenson, 1935).

E. lineata Verrill, 1873. Currently known as *Fagesia lineata* (See Carlgren, 1949), but see note on *E. carnea* above.

E. kerguelensis Studer, 1878. Regarded as an *Edwardsiella* by Andres (1883) and later transferred to the genus *Halianthella* Kwietniewski, 1896 (see Carlgren, 1949).

E. pallida Verrill, 1879. Transferred to the genus *Drillactis* Verrill, 1922 (see Verrill, 1922).

E. janthina Andres, 1881. Andres (1883) reduced this nominal species to a variety of *E. claparedii* (Panceri, 1869). However, because of its external appearance and its natural habitat in holes in rocks (see Andres, 1883, plate 11), it is here transferred to the genus *Fagesia* Delphy, 1938. Further research may show *F. janthina* (Andres) to be synonymous with *F. carnea* (Gosse).

E. lucifuga Fischer, 1888. Transferred to *Isoedwardsia* Carlgren, 1921 (see Carlgren, 1949) but now regarded as a junior subjective synonym of *Scolanthus callimorphus* Gosse, 1853 (see p.327).

E. horstii Pax, 1924b. Carlgren (1931) examined the type material and found it to consist of specimens of both *Capneopsis solidago* Duchassaing and Michelotti, 1866 and *Isoedwardsia curacaoensis* Pax, 1924b. Hence, discounting the previously described *C. solidago*, *E. horstii* and *I. curacaoensis* are simultaneously published synonyms for the same taxon: since this taxon is a species of *Scolanthus* Gosse, 1853, the valid name adopted here is *S. curacaoensis* (Pax, 1924b).

E. leucomelos Parry, 1951. Transferred to the genus *Drillactis* Verrill, 1922 (see Carlgren, 1954). (Carlgren mis-spelt the trivial name as *leucomeles*.)

(4) Homonyms

E. grubii Andres, 1883 is a junior secondary homonym of *E. grubii* (A. Costa, 1869). The replacement name *E. perdita* nom. nov. is proposed for *E. grubii* Andres since there seem to be no available synonyms. The new trivial name refers to the apparent absence of records of this nominal species since it was first described by Grube (1864, p.107) as an un-named species.

E. elegans Farquhar, 1898 is a junior primary homonym of *E. elegans* Verrill, 1869. Stuckey (1909) proposed the replacement name *E. tricolor*, which is now rejected in favour of *E. neozelanica* Farquhar, 1898, since Carlgren (1924) considered *E. elegans* Farquhar and *E. neozelanica* Farquhar to be synonymous. If future work should show these two nominal species to be separate, then the name *E. tricolor* would be reinstated.

E. pallida Carlgren, 1921 is a junior primary homonym of *E. pallida* Verrill, 1879 (\equiv *Drillactis pallida* (Verrill, 1879)). The replacement name *E. carlgreni* nom. nov. is proposed for *E. pallida* Carlgren since there appear to be no available synonyms.

REFERENCES

- Andres, A., 1881. Prodromus neapolitanae actiniarum faunae addito generalis actiniarum bibliographiae catalogo. *Mitt. zool. Stn Neapel*, 2:305-371.
- 1883. Le Attinie. *Atti Accad. naz. Lincei Memorie*, (3rd Series), 14: 211-673.
- Annandale, N., 1915. Fauna of the Chilka Lake: Coelenterates. *Mem. Indian Mus.*, 5: 65-114.
- Appellöf, A., 1891. Zur Kenntniss der Edwardsien. *Bergens Mus. Arsberetn.*, No. 4: 1-31.
- Bourne, G. C., 1916. A description of five new species of *Edwardsia*, Quatr., from New Guinea, with an account of the order of succession of the micromesenteries and tentacles in the Edwardsidae. *J. Linn. Soc. (Zool.)*, 32: 513-530.
- Browne, P., 1756. *The Civil and Natural History of Jamaica*. London, 503 pp.
- Carlgren, O., 1893. Studien über Nordische Actinien. *K. svenska VetenskAkad. Handl.*, 25 (10): 1-148.
- 1899. Zoantharien. *Ergebnisse der Hamburger Magalhaensische Sammelreise*, 4 (1): 1-48.
- 1903. Actiniarien. *Résult. Voyage S. Y. Belgica*, 7 pp.
- 1905. In Nordgaard and Jørgensen (1905).
- 1914. On the genus *Porponia* and related genera, Scottish National Antarctic Expedition. *Trans. R. Soc. Edinb.*, 50: 49-71.
- 1921. Actiniaria, Part I. *Dan. Ingolf Exped.*, 5 (9): 1-241.
- 1924. Papers from Dr Th. Mortensen's Expedition 1914-16. XXI. Actiniaria from New Zealand and its subantarctic islands. *Vidensk. Meddr dansk. naturh. Foren.*, 77:179-261.
- 1925. A revision of the Actiniaria of the Chilka Lake. *Ark. Zool.*, 17A (21): 1-21.
- 1927a. Actiniaria and Zoantharia. *Further zool. Results Swed. Antarct. Exped.*, 2 (3): 1-102.
- 1927b. Actiniaria. *Faune Colon. fr.*, 1: 475-480.
- 1928. Actiniaria der Deutschen Tiefsee-Expedition. *Wiss. Ergebn. dt. Tiefsee Exped. "Valdivia"*, 22: 125-266.
- 1930. Antarctic and subantarctic Actiniaria. *Scient. Results Norw. Antarct. Exped.*, 1 (7): 1-6.

- 1931. Zur Kenntnis der Actiniaria Abasilaria. *Ark. Zool.*, 23A (3): 1-48.
- 1936. Some west American sea anemones. *J. Wash. Acad. Sci.*, 26: 16-23.
- 1938. South African Actiniaria and Zoantharia. *K. svenska VetenskAkad. Handl.*, 17 (3): 1-148.
- 1939. Actiniaria and Zoantharia of the Scottish National Antarctic Expedition, 1902-1904. *Trans. R. Soc. Edinb.*, 59: 791-800.
- 1940. A contribution to the knowledge of the structure and distribution of the cnidae in the Anthozoa. *Acta Univ. lund.*, N. F. Avd. 2, 36(3): 1-62.
- 1941. Papers from Dr Th. Mortensen's Expedition 1914-16. LXX. The Actiniaria and Zoantharia of St. Helena. *Vidensk. Meddr dansk. naturh. Foren.*, 105: 1-20.
- 1942. Actiniaria, Part II. *Dan. Ingolf Exped.*, 5 (12): 1-92.
- 1943. East-Asiatic Corallimorpharia and Actiniaria. *K. svenska VetenskAkad. Handl.*, 20 (6): 1-43.
- 1949. A survey of the Ptychodactylaria, Corallimorpharia and Actiniaria. *K. svenska VetenskAkad. Handl.*, Fjarde Serien, 1 (1): 1-121.
- 1950a. A revision of some Actiniaria described by A. E. Verrill. *J. Wash. Acad. Sci.*, 40: 22-28.
- 1950b. Actiniaria and Corallimorpharia. *Scient. Rep. Gt. Barrier Reef Exped.*, 5 (7): 427-457.
- 1950c. Actiniaria and Zoantharia from South Australia. *K. fysiogr. Sällsk. Lund Förh.*, 20: 121-135.
- 1954. Actiniaria and Zoantharia from South and West Australia with comments upon some Actiniaria from New Zealand. *Ark. Zool.*, 6: 571-595.
- 1959. Reports of the Lund University Chile Expedition 1948-49. 38. Corallimorpharia and Actiniaria with description of a new genus and species from Peru. *Acta Univ. lund.*, N.F.Avd. 2, 56 (6): 1-39.
- Carlgren, O. and Stephenson, T.A., 1928. The British Edwardsidae. *J. mar. biol. Ass. U.K.*, 15: 1-31.
- 1929. Actiniaria. *Scient. Rep. Australas. antarct. Exped.*, Series C, 9 (2): 1-34.
- Chevreaux, J. and de Guerne, J., 1887. See Fischer (1887).
- Clubb, J. A., 1902. Actinia, with an account of their peculiar brood chambers. *Rep. Coll. Nat. Hist. Southern Cross*, 294-309.
- 1908. Coelenterata. 4. Actinia. *Nat. Antarct. Exped. 1901-1904 Nat. Hist.*, 4(4): 1-12.
- Costa, A., 1869. Di un genere di Saponculidei. *Annuaire Mus. zool. Univ. Napoli*, 5: 56-57.
- Costa, O. G., 1834. *Cenni zoologici, ossia descrizione sommaria delle specie nuove di animali scoperti in diverse contrade del regno nell'anno 1834*. Naples, 90 pp.
- Crowell, S., 1976. An edwardsiid larva parasitic in *Mnemiopsis*. In G. O. Mackie, ed., *Coelenterate Ecology and Behavior*, Plenum Publ. Corp., New York, 744 pp.
- Danielssen, D. C., 1890. Actinida. *Norske Nordhavs-Exped.*, 19: 1-184.
- Dayton, P. K. and Oliver, J. S., 1977. Antarctic soft-bottom benthos in oligotrophic and eutrophic environments. *Science, N.Y.*, 197: 55-58.
- Dayton, P. K., Robilliard, G. A. and Paine, R. T., 1970. Benthic faunal zonation as a result of anchor ice at McMurdo Sound, Antarctica. In M. Holdgate, ed., *Antarctic Ecology*; Vol I, Academic Press, London and New York, 604 pp.
- Delage, Y. and Hérouard, E., 1901. *Traité de Zoologie Concrète*; Tome II, 2me Partie, Les

- Coelentérés. Paris, 848 pp.
- Delphy, J., 1938. Les actinies athénaires (Actiniaria, Athenaria) de la faune française. *Bull. Mus. natn. Hist. nat. Paris*, (2nd Series), 10: 619-622.
- Dixon, G. Y., 1886. Notes on two Irish specimens of *Edwardsia timida* (Quatrefages). *Scient. Proc. R. Dubl. Soc.*, 5: 100-106.
- Düben, M. W. and Koren, J., 1847. Om nogle norske Actinier. *Forh. skand. Naturf. Møte* (den 11-18 Juli 1844), p.267.
- Duchassaing, P. and Michelotti, J., 1866. Supplément au mémoire sur les coralliaires des Antilles. *Memorie R. Accad. Sci. Torino*, (2) 23: 97-206.
- Farquhar, H., 1898. Preliminary account of some New Zealand Actiniaria. *J. Linn. Soc. (Zool.)*, 26: 527-536.
- Faurot, L., 1895. Études sur l'anatomie, l'histologie et le développement des actinies. *Thès. Fac. Sci. Dr. Univ. Paris*, Sér. A, No. 226, 220 pp.
- Fischer, P., 1887. Contribution à l'actinologie française. *Archs Zool. exp. gén.*, (2nd Series), 5: 381-442.
- 1888. Description d'une nouvelle espèce du genre *Edwardsia* Quatrefages. *Bull. Soc. zool. Fr.*, 13: 22-23.
- 1890. Note sur une nouvelle espèce du genre *Edwardsia*, Quatrefages. *Act. Soc. linn. Bordeaux*, 43 (for 1889): 310-311.
- Forbes, E., 1843. Retrospective comments. *Ann. Mag. nat. Hist.*, 12: 40-42.
- Giesbrecht, W., 1892. Systematik und Faunistik des pelagischen Copepoden des Golfes von Neapel und der angrenzenden Meeresabschnitte. *Fauna Flora Golf. Neapel*, 19: 1-831.
- Gosse, P. H., 1853. Notes on some new or little-known marine animals. *Ann. Mag. nat. Hist.*, (2nd Series), 12: 153-159.
- 1855a. Description of *Peachia hastata*, a new genus and species of the class Zoophyta; with observations on the family Actiniadae. *Trans. Linn. Soc. Lond. (Zool.)*, 21: 267-276.
- 1855b. *A Manual of Marine Zoology for the British Isles*, Part I. London, 203 pp.
- 1856. On *Edwardsia carnea*, a new British zoophyte. *Ann. Mag. nat. Hist.*, (2nd Series), 18: 219-221.
- 1858a. Synopsis of the families, genera and species of the British Actiniae. *Ann. Mag. nat. Hist.*, (3rd Series), 1: 414-419.
- 1858b. Characters and descriptions of some new British sea anemones. *Ann. Mag. nat. Hist.*, (3rd Series), 2: 192-196.
- 1860. *A History of the British Sea Anemones and Corals*. London, 362 pp.
- Gravier, C., 1916. Sur un type nouveau d'Actinie de l'Île San Thomé (Golfe de Guinée). *Bull. Mus. natn. Hist. nat. Paris*, 22: 234-236.
- Grebelny, S. D., 1975. On the fauna of Corallimorpharia and Actiniaria of the eastern Antarctic coastal waters. *Biol. Morya, Vladivostok*, 5: 3-14 (in Russian).
- Grube, A. E., 1864. *Die Insel Lussin und ihre Meeresfauna*. Breslau, 113 pp.
- Haddon, A. C., 1889. A revision of the British Actiniae. I. *Scient. Trans. R. Dubl. Soc.*, (2nd Series), 4: 297-361.
- Holdsworth, E. W. H., 1855. Description of a new sea anemone. *Proc. zool. Soc. Lond.*, 1855: 85-86.

- Johnston, G., 1847. *A History of the British Zoophytes*, Vol. I, 2nd edn. London, 488 pp.
- Klunzinger, C. B., 1877. *Die Korallthiere des Rothen Meeres. I. Die Alcyonarien und Malacodermen*. Berlin, 98 pp.
- Kwietniewski, C. R., 1896. Revision der Actinien, welche von Herrn Prof. Studer auf der Reise der Korvette Gazelle um die Erde gesammelt wurden. *Jena. Z. Naturw.*, 30: 583-603.
- Linnaeus, C., 1758. *Systema Naturae*, Vol. I, 10th edn. Stockholm, 824 pp.
- Littlepage, J. L., 1965. Oceanographic investigations in McMurdo Sound, Antarctica. *Antarctic Res. Ser. Washington*, 5: 1-38.
- Mann, G. F., 1948. *Biologia de la Antartica Suramerica*. Chile University Press, Santiago, 364 pp.
- Manuel, R. L., 1975. A new sea-anemone from a brackish lagoon in Sussex, *Edwardsia ivelli*, sp. nov. *J. nat. Hist.*, 9: 705-711.
- 1977. A redescription of *Edwardsia beauteempsii* and *E. timida* (Actiniaria: Edwardsiidae). *Cah. Biol. mar.*, 18: 483-497.
- (in preparation). On the identity of the sea anemone *Scolanthus callimorphus* Gosse, 1853 (Actiniaria: Edwardsiidae).
- Marion, A. F. 1882. Actiniaires atlantiques des dragages de l'avis le Travailleur. *C.r. hebd. Séanc. Acad. Sci., Paris*, 94: 458-460.
- McIntosh, W. C., 1865. On the nudibranchiate Mollusca of St. Andrews; *Edwardsia*; and the polyps of *Alcyonium digitatum*. *Proc. R. Soc. Edinb.*, 5: 387-395.
- 1875. *The Marine Invertebrates and Fishes of St. Andrews*. Adam and Charles Black, Edinburgh, 186 pp.
- McMurrich, J. P., 1893. Report of the Actiniae collected by the United States Fish Commission Steamer Albatross during the winter of 1887-1888. *Proc. U.S. natn. Mus.*, 16: 119-216.
- 1913. Description of a new species of actinian of the genus *Edwardsiella* from Southern California. *Proc. U.S. natn. Mus.*, 44: 551-553.
- Moseley, H. N., 1877. On new forms of Actiniaria dredged in the deep sea; with a description of certain pelagic surface-swimming species. *Trans. Linn. Soc. Lond.*, (2nd Series Zool.), 1: 295-305.
- Neave, S.A., 1939. *Nomenclator Zoologicus*, Vol. 2 (D-L). Zoological Society of London, London.
- Nordgaard, O. and Jørgensen, E., 1905. Hydrographical and biological investigations in Norwegian fiords. *Bergens Mus. Skr.*, 7: 1-254.
- Panceri, P., 1869. Intorno a due nuovi polipi, *Cladactis costa* ed *Halcampa claparedii*. *Atti Accad. Sci. fis. mat. Napoli*, 4 (11): 1-11.
- Pantin, C. F. A., 1964. *Notes on Microscopical Technique for Zoologists*. University Press, Cambridge, 76 pp.
- Parry, G., 1951. The Actiniaria of New Zealand. A check-list of recorded and new species, a review of the literature and a key to the commoner forms. Part 1. *Rec. Canterbury Mus.*, 6: 83-119.
- Pax, F., 1922. Diagnosen neuer Actiniarien aus der Ausbeute der Deutschen, 1901-1903, und der Französischen 1908-1910, Südpolar-Expedition. *Zool. Anz.*, 54: 75-92.
- 1924a. Antarktische Aktinien aus der Ausbeute des "Pourquoi Pas". *Zool. Jb.*, 47: 1-28.
- 1924b. Actiniarien, Zoantharien und Ceriantharien von Curaçao. *Bijdr. Dierk.*, 23: 93-123.
- 1926. Die Aktinien der Deutschen Südpolar-Expedition 1901-1903. *Dt. Südpol. Exped.*, 18 (Zool.) (10): 1-62.

- Pax, F. and Müller, I., 1962. Die Anthozoenfauna der Adria. *Fauna et Flora adriat.*, 3: 1-343.
- [Quatrefages, A. de], 1841. Zoologie: Côtes de la Manche. *Institut*, 9: 427.
- Quatrefages, A. de, 1842. Mémoire sur les Edwardsies (*Edwardsia*, Nob.) nouveau genre de la famille des Actinies. *Annls Sci. nat.*, (2nd Series Zool.), 18: 65-109.
- Rapp, W., 1829. Untersuchungen über den bau einiger Polypen des Mittelländischen Meeres. *Nova Acta physico-med.*, 14: 643-658.
- Rathke, H., 1843. Beiträge zur Fauna Norwegens. *Nova Acta Acad. Caesar. Leop. Carol.*, 20: 1-264c.
- Rawlinson, R., 1935. *Edwardsia callianthus* spec. nov. A new British species from Menai Straits. *J. mar. biol. Ass. U.K.*, 20: 129-146.
- Reichenbach, -, 1866. See Wright (1866).
- Roule, L., 1909. Hexactinides. *Expéd. Antarct. franc.*, 19 pp.
- Sars, M., 1829. *Bidrag til Söedyrenes Naturhistorie*. Bergen, 59 pp.
- 1851 Beretning om en i sommeren 1849 foretagen zoologisk Reise i Lofoten og Finmarken. *Nyt Mag. Naturvid.*, 6 (2): No. 10, 122-211.
- Schmidt, H., 1969. Die Nesselkapseln der Aktinien und ihre differentialdiagnostische Bedeutung. *Helgoländer wiss. Meeresunters.*, 19: 284-317.
- 1974. On evolution in the Anthozoa. In *Proceedings of the Second International Coral Reef Symposium 1*: 533-560.
- Seshaiya, R. V. and Cuttress, C. E., 1969. *Edwardsia jonesii* n.sp. (Actiniaria: Edwardsiidae) from Porto Novo, S. India. *J. mar. biol. Ass. India*, 11: 73-77.
- Sluiter, C. P., 1888. Über zwei merkwürdige Gephyreen aus der Bai von Batavia. *Natuurk. Tijdschr. Ned.-Indië*, 48: 233-248.
- 1889. Berichtigung. *Zool. Anz.*, 12: 47-48.
- Smith, H. M., 1963. Proposal for reconsideration of the hierarchy of nomenclatural status of generic and trivial names as recognised in the Code of Zoological Nomenclature (Z.N. (S.) 1565). *Bull. zool. Nom.*, 20: 63-66.
- Stephenson, T. A., 1918. Coelenterata. Part I. Actiniaria. *Nat. Hist. Rep. Br. antarct. Terra Nova Exped.*, 5 (Zool.): 1-68.
- 1928. *The British Sea Anemones*, Vol. I, Ray Society, London, 148 pp.
- 1935. *The British Sea Anemones*, Vol. II, Ray Society, London, 426 pp.
- Stimpson, W., 1853. Synopsis of the marine Invertebrata of Grand Manan: or the region about the mouth of the Bay of Fundy, New Brunswick. *Smithson. Contr. Knowl.*, 6 (art. v): 1-67.
- 1855. Descriptions of some of the new marine Invertebrata from the Chinese and Japanese seas. *Proc. Acad. nat. Sci. Philad.*, 7: 375-384.
- Stuckey, F. G. A., 1909. A review of the New Zealand Actiniaria known to science, together with a description of twelve new species. *Trans. N.Z. Inst.*, 41 (for 1908): 374-398.
- Studer, T., 1878. Zweite Abtheilung der *Anthozoa polyactinia*, welche während der Reise S.M.S. Corvette Gazelle um die Erde gesammelt wurden. *Mber. K. preuss. Akad. Wiss.*, 1878: 524-550.
- Thompson, J. V., 1829. On the luminosity of the ocean, with descriptions of some remarkable species of luminous animals, *Pyrosoma pigmaea* and *Sapphirina indicator* and particularly of the four new genera, *Nocticula*, *Cynthia*, *Lucifer* and *Podopsis*, of the Shizopodae. *Zoological Researches, Memoir 3*: 37-61.

- Verrill, A. E., 1865. Classification of polyps. Extract condensed from a synopsis of the polypi of the North Pacific Exploring Expedition under Capts. Ringgold and Rodgers, U.S.N. *Ann. Mag. nat. Hist.*, (3rd Series), 16: 191-197.
- 1866. Revision of the Polypi of the eastern coast of the United States. *Mem. Boston Soc. nat. Hist.*, 1: 1-45.
- 1869. Descriptions of a remarkable new jelly fish and two actinians from the coast of Maine. *Ann. Mag. nat. Hist.*, (4th Series), 4: 160-163.
- 1873. Report upon the invertebrate animals of Vineyard Sound and the adjacent waters, with an account of the physical characters of the region. *Rep. U.S. Commnr Fish.*, 1871-72: 295-778.
- 1879. Notice of recent additions to the marine invertebrata of the northeastern coast of America, with descriptions of new genera and species and critical remarks on others. *Proc. U.S. natn. Mus.*, 2: 165-205.
- 1898. Descriptions of new American actinians with critical notes on other species, I. *Am. J. Sci.*, (4th Series), 6: 493-498.
- 1899. Descriptions of imperfectly known and new actinians, with critical notes on other species, II. *Am. J. Sci.*, (4th Series), 7: 41-50.
- 1922. Alcyonaria and Actiniaria. *Rep. Can. arct. Exped.*, 8 (G): 1-165.
- 1928. Hawaiian shallow-water Anthozoa. *Bull. Bernice P. Bishop Mus.*, 49: 1-30.
- Walton, C. L. and Rees, O. M., 1913. Some rare and interesting sea anemones from Plymouth. *J. mar. biol. Ass. U.K.*, 10: 60-69.
- Weill, R., 1934. Contribution à l'étude des Cnidaires et de leurs nématocystes. I. Recherches sur les nématocystes. *Trav. Stn zool. Wimereux*, 10: 1-347.
- Westfall, J. A., 1965. Nematocysts of the sea anemone *Metridium*. *Am. Zool.*, 5: 377-393.
- Williams, R. B., 1975. A redescription of the brackish water sea anemone *Nematostella vectensis* Stephenson, with an appraisal of congeneric species. *J. nat. Hist.*, 9: 51-64.
- 1979. *Edwardsia* Costa, 1834 (Arthropoda: Crustacea): proposed suppression under the plenary powers with conservation of *Edwardsia* de Quatrefages, 1841 and Edwardsiidae Andres, 1881 (Coelenterata: Actiniaria). Z.N. (S.) 2261. *Bull. zool. Nom.*, 36:175-179.
- Wright, E. P., 1866. Coelenterata. *Rec. zool. Lit.*, 2: 768-784.

NOMENCLATURAL INDEX

Accepted names are in Roman type and invalid names are in italic type. Main page references are in bold type.

<i>Actinia</i>	326, 346, 348.
<i>adenensis, Edwardsia</i>	341, 346, 349.
<i>allmanni, Edwardsia</i>	348.
<i>Ammonactis</i>	348.
<i>andresi, Edwardsia</i>	331, 341, 346.
<i>annamensis, Edwardsia</i>	341, 347.
<i>arctica, Edwardsia</i>	342, 346.
<i>arenosa, Edwardsia</i>	348.
<i>armata, Edwardsia</i>	341, 347.
<i>beautempsii, Edwardsia</i>	339, 344, 346.
<i>bocki, Edwardsia</i>	342, 347.
<i>brevicornis, Edwardsia</i>	348.
<i>brevicornis, Eloatis</i>	348.
<i>brevicornis, Halcampa</i>	348.
<i>brevicornis, Halocampa</i>	348.
<i>brevicornis, Haloclava</i>	348.
<i>brevicornis, Lecythia</i>	327.
<i>californica, Edwardsia</i>	341, 346.
<i>californica, Edwardsiella</i>	346.
<i>callianthus, Edwardsia</i>	346, 350.
<i>callimorpha, Edwardsia</i>	325, 327, 339, 346, 350.
<i>callimorphus, Scolanthus</i>	325, 327, 346, 350.
<i>capensis, Edwardsia</i>	341, 347.
<i>Capneopsis</i>	350.
<i>carlgreni, Edwardsia</i>	325, 341, 347, 350, 351.
<i>carnea, Edwardsia (sensu Appellöf)</i>	350.
<i>carnea, Edwardsia (sensu Gosse)</i>	350.
<i>carnea, Edwardsiella</i>	350.
<i>carnea, Fagesia</i>	350.
<i>carnea, Milneedwardsia</i>	350.
<i>carneola, Edwardsia</i>	342, 347.
<i>carneola, Edwardsiella</i>	342, 347.
<i>claparedii, Edwardsia</i>	325, 327, 339, 346, 348, 350.
<i>claparedii, Halcampa</i>	346.
<i>clavata, Actinia</i>	348
<i>clavata, Edwardsia (sensu Rathke)</i>	348.
<i>clavata, Edwardsia (sensu Stimpson)</i>	348.
<i>clavata, Phellia</i>	348.
<i>clavata, Telmatactis</i>	348.
<i>collaris, Edwardsia</i>	348.
<i>collaris, Phellia</i>	348.
<i>collaris, Telmatactis</i>	348.
<i>coriacea, Edwardsia</i>	348.
<i>costata, Edwardsia</i>	349.
<i>cretata, Edwardsia</i>	348.
<i>cretata, Paraedwardsia</i>	348.
<i>curacaoensis, Isoedwardsia</i>	325, 350.
<i>curacaoensis, Scolanthus</i>	325, 350.
<i>danica, Edwardsia</i>	331, 341, 346.
<i>delapiae, Edwardsia</i>	339, 341, 347, 349.
<i>dimorphus, Nototanis</i>	338.
<i>Diphthera</i>	327, 349.
<i>Diphthera</i>	327.
<i>dixonii, Fagesia</i>	346.

<i>dixonii</i> , <i>Milneedwardsia</i>	346.
<i>Drillactis</i>	351.
<i>duodecimcirrata</i> , <i>Edwardsia</i>	349, 350.
<i>duodecimcirrata</i> , <i>Halcampa</i>	350.
<i>duodecimtentaculata</i> , <i>Edwardsia</i>	342, 347.
<i>Edwardsia</i> (<i>sensu</i> O. G. Costa).....	326, 344, 345.
<i>Edwardsia</i> (<i>sensu</i> de Quatrefages).....	325-326, 326-329, 329-345, 345-347, 351.
<i>Edwardsia</i> (<i>sensu</i> de Quatrefages).....	325, 347-351.
<i>Edwardsiella</i>	326-327, 346-347, 350.
<i>Edwardsiidae</i>	325, 327, 344-345.
<i>Edwardsioides</i>	327, 346.
<i>elegans</i> , <i>Edwardsia</i> (<i>sensu</i> Farquhar).....	325, 346, 349-351.
<i>elegans</i> , <i>Edwardsia</i> (<i>sensu</i> Verrill).....	325, 341, 346, 351.
<i>Eloactis</i>	348.
<i>Fagesia</i>	325, 346, 350.
<i>farinacea</i> , <i>Edwardsia</i>	349, 350.
<i>finmarchica</i> , <i>Edwardsia</i>	342, 346.
<i>fischeri</i> , <i>Edwardsia</i>	347.
<i>flaccida</i> , <i>Edwardsia</i>	348.
<i>fusca</i> , <i>Edwardsia</i>	341, 346.
<i>gilbertensis</i> , <i>Edwardsia</i>	342, 347.
<i>goodsiri</i> , <i>Edwardsia</i>	348.
<i>grubii</i> , <i>Edwardsia</i> (<i>sensu</i> Andres).....	325, 349, 351.
<i>grubii</i> , <i>Edwardsia</i> (<i>sensu</i> A. Costa).....	325, 348, 351.
<i>grubii</i> , <i>Urophysalus</i>	327, 348.
<i>Halcampa</i>	350.
<i>Halcampa</i>	326, 346, 348, 350.
<i>Halianthella</i>	350.
<i>Halocampa</i>	348.
<i>Haloclava</i>	348.
<i>harassi</i> , <i>Edwardsia</i>	346, 349, 350.
<i>harassii</i> , <i>Edwardsiella</i>	346
<i>heptathrix</i> , <i>Philomedes</i>	338.
<i>horstii</i> , <i>Edwardsia</i>	325, 350.
<i>ignota</i> , <i>Edwardsia</i>	349.
<i>incerta</i> , <i>Edwardsia</i>	349.
<i>intermedia</i> , <i>Edwardsia</i>	325, 329, 339, 342-344, 345, 347, 349.
<i>islandica</i> , <i>Edwardsia</i>	342, 346.
<i>Isoedwardsia</i>	325, 327, 350.
<i>ivelli</i> , <i>Edwardsia</i>	341, 347.
<i>janthina</i> , <i>Edwardsia</i>	325, 350.
<i>janthina</i> , <i>Fagesia</i>	325, 350.
<i>japonica</i> , <i>Edwardsia</i>	341, 347.
<i>jonesii</i> , <i>Edwardsia</i>	341, 347.
<i>kameruniensis</i> , <i>Edwardsia</i>	341, 347.
<i>keruelensis</i> , <i>Edwardsia</i>	350.
<i>keruelensis</i> , <i>Edwardsiella</i>	350.
<i>keruelensis</i> , <i>Halianthella</i>	350.
<i>Lecythia</i>	327.
<i>leidyi</i> , <i>Edwardsia</i>	349.
<i>leucomeles</i> , <i>Drillactis</i>	351.
<i>leucomelos</i> , <i>Drillactis</i>	351.
<i>leucomelos</i> , <i>Edwardsia</i>	351.
<i>lineata</i> , <i>Edwardsia</i>	349, 350.
<i>lineata</i> , <i>Fagesia</i>	350.
<i>longicornis</i> , <i>Edwardsia</i>	341, 346.
<i>lucifuga</i> , <i>Edwardsia</i>	327, 347, 350.
<i>lucifuga</i> , <i>Isoedwardsia</i>	327, 350.

<i>lutkenii</i> , <i>Edwardsia</i>	349, 350.
<i>mammillata</i> , <i>Edwardsia</i>	349.
<i>maroccana</i> , <i>Edwardsia</i>	341, 347.
<i>meridionalis</i> , <i>Edwardsia</i>	325-326, 329-339, 342-345, 347.
<i>microps</i> , <i>Edwardsia</i>	350.
<i>microps</i> , <i>Halcampa</i>	350.
<i>Milnea</i>	326, 345.
<i>Milneedwardsia</i>	346, 350.
<i>Nematostella</i>	342.
<i>neozelanica</i> , <i>Edwardsia</i>	325, 341, 346, 349, 351.
<i>norvegica</i> , <i>Edwardsia</i>	331, 341, 347.
<i>Nototanais</i>	338.
<i>octoplax</i> , <i>Diphthera</i>	327, 349.
<i>octoplax</i> , <i>Edwardsia</i>	349.
<i>ocoradiata</i> , <i>Edwardsia</i>	341, 347.
<i>oktoplax</i> , <i>Diphthera</i>	349.
<i>Pachycerianthus</i>	350.
<i>pallida</i> , <i>Drillactis</i>	350, 351.
<i>pallida</i> , <i>Edwardsia</i> (<i>sensu</i> Carlgren).....	325, 341, 347, 350-351.
<i>pallida</i> , <i>Edwardsia</i> (<i>sensu</i> Verrill).....	325, 350-351.
<i>Paraedwardsia</i>	327, 350.
<i>Paraedwardsia</i>	348.
<i>perdita</i> , <i>Edwardsia</i>	325, 349, 351.
<i>Phellia</i>	348.
<i>Philomedes</i>	338.
<i>Priapus</i>	326.
<i>pudica</i> , <i>Edwardsia</i>	341, 346, 349.
<i>pudica</i> , <i>Edwardsiella</i>	346.
<i>rekaiyae</i> , <i>Edwardsia</i>	349.
<i>rigida</i> , <i>Edwardsia</i>	349.
<i>rubricollum</i> , <i>Ammonactis</i>	348.
<i>rubricollum</i> , <i>Edwardsia</i>	348.
<i>rugosa</i> , <i>Edwardsia</i>	349.
<i>Sagartia</i>	327, 350.
<i>sanctae-helenae</i> , <i>Edwardsia</i>	341, 347.
<i>Sapphirina</i>	345.
<i>sarsii</i> , <i>Edwardsia</i>	327, 350.
<i>sarsii</i> , <i>Edwardsiella</i>	327.
<i>sarsii</i> , <i>Paraedwardsia</i>	327, 350.
<i>scabra</i> , <i>Edwardsia</i>	349.
<i>Scolanthus</i>	325, 327, 346, 350.
<i>Scolanthus</i>	327, 350.
<i>sipunculooides</i> , <i>Actinia</i>	346.
<i>sipunculooides</i> , <i>Edwardsia</i>	339, 334, 346.
<i>sipunculooides</i> , <i>Edwardsiella</i>	346.
<i>solidago</i> , <i>Capneopsis</i>	350.
<i>solitarius</i> , <i>Pachycerianthus</i>	350.
<i>sphaeroides</i> , <i>Edwardsia</i>	350.
<i>sphaeroides</i> , <i>Scolanthus</i>	350.
<i>Spiophanes</i>	338.
<i>stephensoni</i> , <i>Edwardsia</i>	342, 347.
<i>sulcata</i> , <i>Edwardsia</i>	339, 346.
<i>tcherniai</i> , <i>Spiophanes</i>	338.
<i>tecta</i> , <i>Edwardsia</i>	349.
<i>Telmatactis</i>	348.
<i>timida</i> , <i>Edwardsia</i>	339, 346, 347, 349-350.
<i>timida</i> , <i>Edwardsia</i>	346.
<i>timida</i> , <i>Edwardsiella</i>	346.

<i>tinctrix</i> , <i>Edwardsia</i>	341, 346.
<i>tricolor</i> , <i>Edwardsia</i>	341, 346, 349, 351.
<i>troglydytes</i> , <i>Sagartia</i>	350.
<i>tuberculata</i> , <i>Edwardsia</i>	339, 346, 348.
<i>Urophysalus</i>	326-327, 348.
<i>vectensis</i> , <i>Nematostella</i>	342.
<i>vegae</i> , <i>Edwardsia</i>	341, 347.
<i>vermiformis</i> , <i>Edwardsia</i>	349.
<i>vestita</i> , <i>Edwardsia</i>	350.
<i>vitrea</i> , <i>Edwardsia</i>	342, 346.
<i>vitrea</i> , <i>Edwardsioides</i>	346.
<i>vivipara</i> , <i>Edwardsia</i>	342, 347.
<i>willeyana</i> , <i>Edwardsia</i>	349.

Manuscript accepted for publication 12 July, 1979.