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## **The Henri Milne EDWARDS' (1800-1885) collection of recent and fossil bryozoa**

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**A b s t r a c t :** The 87 indisputably subsisting specimens (32 fossil and 55 recent fragments of zoaria) from the Henri Milne EDWARDS' bryozoan collection, preserved in the National Museum of Natural History (Paris) have been rediscovered and inventoried. These collection includes 23 types (of 20 fossil and 3 recent species) of Bryozoa described by EDWARDS, in addition the type-specimens of 3 other species described by other authors, and 2 historical specimens arising from different collections. Some dubteful identifications have been verified. The following synonymies are so established: *Cellaria stokesii* (EDWARDS 1838) (senior synonym) = *Thalamoporella novaehollandae* HASWELL 1880 (junior synonym), *Cleidochasma affinis* (EDWARDS 1836) (senior synonym) = *C. porcellanum* (BUSK 1860) (junior synonym), *Adeonella sulcata* (EDWARDS 1836) (senior synonym) = *Lepralia mucronata* (= *Eschara mucronata*) MCGILLIVRAY 1887 (junior synonym).

**K e y w o r d s :** Bryozoa; Henri Milne EDWARDS; fossils; recent; types.

**M o t s - c l é s :** Bryozoaires ; Henri Milne EDWARDS ; fossiles ; espèces actuelles ; types.

### **Biography and scientific works of Henri Milne EDWARDS**

Henri Milne EDWARDS was the son, born from the second marriage, of William EDWARDS, military man and planter in Jamaica, who had yet 27 children from his first marriage. His second christian name, Milne, was the surname of his godmather. He was born in Bruges (Belgium) at the 23 October 1800, and this allowed him legally to obtain the French nationality after the installation of his father in Paris in 1814. Doctor in medicine in 1823, he became a teacher in a secondary school before the presentation of his doctoral thesis in sciences in 1836.

In the meantime, he was the co-founder of the litoral marine biology in France with his friend Jean-Victor AUDOUIN (1797-1841), as himself former student of LAMARCK and LATREILLE in the National Museum of Natural History in Paris. On several occasions, between 1826 and 1829, the two young scientists made together collections of marine animals on the coasts of Brittany and Normandy, and of the Channel Islands (AUDOUIN & EDWARDS 1829), seconded by their respectives wives who are commissioned to put in jars the organisms collected by the husbands. AUDOUIN himself was the son-in-law of Alexandre BRONGNIART (1770-1847), professor of Mineralogy in the Museum and, by hobby, by other way, entomologist and herpetologist. AUDOUIN, specialized in the study

of the insects and the crustaceans, guided by Georges CUVIER (1769-1842), was charged on the proposal of this later to redact the commentaries of the plates repr who charged him the preparation the commentaries of the plates representing the bryozoans collected during the French military and scientific expedition to Egypt, organized at the initiative of Napoléon BONAPARTE. These plates were engraved by various artists on the request of their author, Marie-Jules-César Delorgne de SAVIGNY (1771-1851), who had himself gathered the corresponding species on the Egyptian coasts, but who was not able to write their interpretations for reason of health. Fervent zoologist, AUDOUIN was also, with his brother-in-law, one of the co-founders in 1824 of one of the most prestigious French scientific journals, "The Annales de Sciences Naturelles", which was to have a longevity of more of 170 years, and in which all the main scientists of this epoch published some of their works – and particularly Henri Milne EDWARDS.

Henri Milne EDWARDS was firstly appointed as AUDOUIN's assistant naturalist in his chair of Natural History of the Crustaceans, Arachnids and Insects at the Museum. He was elected to the French Academy of Sciences in 1838 and succeeded AUDOUIN as director of the laboratory after the premature death of his friend. He held several offices from 1844, assuming concurrently the function of professor of Comparative Zoology and Physiology in the French Faculty of sciences. He became in 1832 one of the founders of the Société entomologique de France. He formed a friendship with Armand de QUATREFAGES de BREAU (1810-1892), professor in the Faculty of Sciences of Toulouse, who acted to obtain his nomination as professor at the Museum in 1855. QUATREFAGES was himself very excited by marine biology. Together they made a scientific voyage to Sicilia in 1863. From 1865, EDWARDS was appointed to succeed to Isidore GEOFFROY SAINT-HILAIRE as titular to the illustrious chair of Zoology of Mammals and Birds in the Museum, and occupied it to 1876; he left it to assume the administrative office of dean of the Faculty of sciences of Paris, where he staid as professor until his death.

Highly admiring LAMARCK, he sought to discredit the scientific works of LAMOUREUX, formerly a LAMARCK faithful, but later the author of a classification of the Zoophytes which, in spite of some inexactitudes, was better in some respects than his master's. It was perhaps at the instigation of LAMARCK, himself academician, that the publication of the LAMOUREUX book was "blocked" during some years on the initiative of the French Academy of Sciences, to be published only after the publication of LAMARCK's (1816). Henri Milne EDWARDS published 11 memoirs on the bryozoans (3 being monographes of this group issued in collective systematic books), of which two were in collaboration with the paleontologist Jules HAIME. However, five of his works were also published in one or two short versions, hence he in fact signed 18 publications on the Bryozoa.

Henri Milne EDWARDS' works on the recent Bryozoa concerns the collections he made on the French west coasts. His observations concerning the fossil material (Secondary and Tertiary) also bear on specimens of foreign origin (Crag from Sudbourne in Great Britain, not collected by himself, but for which he was the first descriptor), and from the French Tertiary strata in various French areas (particularly Loire valley and Aquitaine basin, where he worked in the field). His publications were spaced out between 1835 and 1840. The material actually present in the collections of the National Museum of Natural History, Paris, corresponds to only a part of Milne EDWARDS' specimens, some being unfortunately lost.

Originally, "Milne" was his second Christian name, his surname being only "Edwards". It

seems that he himself coupled his second Christian name and his surname, at the beginning of his career, and it is under this compound name he was henceforth known. The hyphen between "MILNE" and "EDWARDS" appears to have been added later, by other authors, but apparently not by his own initiative. His son, for his part, decided to be called "Milne-Edwards" with a hyphen.

His son Alphonse (1835-1900) replaced him in the chair of Mammals and Birds in 1876. Member of the Academy of Sciences in 1879, he twice became director of the Museum, in 1891 and 1896. He organized the First International Congress of Zoology, held in Paris in 1889, in the care of the young Société zoologique de France. In 1867, Henri de LACAZE-DUTHIERS, director of the Laboratory of Molluscs, Worms and Zoophytes of the Museum, consigned to a young benevolent collaborator, M. NYEVRE, the realization of a general inventory, in a calligraphied register, of the collections of Recent and fossil bryozoans kept in the National Museum of Natural History, with an indication of the history of each specimen and of its cabinet and shelf. After the arrival of the material of the oceanographic campaigns of "Travailleur" and "Talisman" in the national collections, Alphonse MILNE-EDWARDS organized the arrangement of the whole collection of Bryozoa, including the material registered by NYEVRE, in a specific room, under the roof of the Gallery of Zoology of the French Museum, as attested by an undated document written and signed in his own hand, still existing in one of the glass-cases in 1968. He wrote a single paper on the Bryozoa, concerning Atlantic and Mediterranean species (1882). The collection of the Museum contains only one specimen (N° 5322) arising from Alphonse MILNE-EDWARDS' material, labelled "*Eschara*", collected at Concarneau in 1891, and constituted by a magnificent zoarium of *Pentapora fascialis* (PALLAS 1761) subsp. *foliacea*.

#### **The Bryozoa collections of Henri MILNE-EDWARDS**

The specimens issuing from the former Bryozoa collections of Henri Milne EDWARDS are now scattered in the whole general collection of Recent Bryozoa in the National Museum of Natural History; the persisting fossils are registered and kept for historical reasons (global gift) together with the Recent material. In fact, when the first inventory of the collection was made by NYEVRE (1867), only a part of the specimens of EDWARDS was yet included in it; a great part of his material would only enter the next year, in 1868, and so was not registered by NYEVRE. The list of 1867 comprises lots of other historical specimens, formerly belonging to Sébastien VAILLANT, LAMARCK, QUOY & GAIMARD, de BOURNON, MICHELIN, SMITT (numerous specimens given in 1867), COSTE, BECQUEREL, GERVAIS, QUATREFAGES, VERREAUX, and some others transmitted by Henri Milne EDWARDS himself: CUMING (perhaps Hugh CUMING, 1791-1865, explorer of Malaysia?) and STOKES (among the numerous authors having this patronym, we have found any of them being a naturalist; so it is perhaps the American author publishing also at the end of the XIXth century on the freshwater gastrotrichs?). Unfortunately, some of these specimens (e.g. of GERVAIS) have disappeared since the NYEVRE's inventory. At the date of the gift, he appears as donator to the Museum collection under the name of "M. EDWARDS" (and in his bryozoological publications, before 1840, under the single first name of Milne).

The whole collection comprises 87 lots of specimens having indisputably belonged to

Henri Milne EDWARDS, and three doubtful specimens. Among these undeniable lots, 55 correspond to species from the Recent fauna, and 32 being fossil, arising from the British Crag (Pliocene: Norfolk, Sudbourne, Cullercoats), from the Postam region (two specimens) and from the French Pliocene: Parnes (3), Dax (1), Bordeaux (1), Doué-la-Fontaine (4), Chambly (1). The Recent specimens from the French coast arise from various collections made at La Rochelle, on Ré Island, at Concarneau, on Chausey islands and at Guernesey. Others originate from foreign countries: Scotland, Ireland, Belfast (4 specimens given by the British scientist THOMPSON), Temby, Bainborough, Northumberland (10 specimens offered by the British naturalist ALDER), Australia (2 species given by STOKES), Galapagos (one CUMING specimen), Sweden and Algeria. The dates of the gifts made to Henri Milne EDWARDS are generally not indicated, only the year of their deposition by EDWARDS in the national collections, i.e. 1868 for THOMPSON's and ALDER's materials (THOMPSON died in 1847, CUMING and ALDER in 1867).

The collection of Bryozoa offered by Henri Milne EDWARDS is interesting from several points of view:

- 1) It includes the types of some Recent and particularly fossil (essentially from Neogene, rarely from Cretaceous) species described and named by himself;
- 2) It contains some types of species described by other authors, integrated by EDWARDS in his own collection, and transmitted by his intermediary;
- 3) It comprises some historical specimens given to Henri Milne EDWARDS by contemporary foreign colleagues;
- 4) the systematic and biogeographical data given by this collection are chronologically the oldest known on the Bryozoa of Brittany and Normandy after those of VAILLANT and LAMOUREUX', which are respectively earlier by about 120 and 20 years.

In the following lists, the recent taxonomic names of the species mentioned are written in **bold** type. Some synonymies have been actualized thanks to the works of BUGE (1957), CANU (1917), DAVID et al. (1970), GALOPIM de CARVALHO (1971), LAGAAIJ (1952), ROGER & BUGE (1946), MONGEREAU (1970), VIGNEAUX (1949) and VOIGT (1975).

### The types of the species described by MILNE-EDWARDS

#### 1. Fossil species

- *Hornera affinis* EDWARDS 1838a (Sicila). N°4416. ***Tubulipora liliacea*** PALLAS 1766 on ***Fron dipora verrucosa*** (LAMOUREUX 1821). Det. J.-L. d'Hondt.
- *Hornera laevis* EDWARDS 1838a (Tertiary of Dax). N° 4418. ***Adeonellopsis laevis*** (MILNE-EDWARDS 1838). Det. J.-L. d'Hondt; material very badly illustrated in the original publication and needing to be redescribed (see hereafter in the Remarks).
- *Hornera reteporacea* EDWARDS 1838a (Crag). N°4419 (type), 4420, 4421 (Sudbourne). ***Hornera reteporacea*** MILNE-EDWARDS 1838).
- *Hornera striata* EDWARDS 1838a. (Crag, Norfolk). N°4417. ***H. striata*** MILNE-EDWARDS 1838.
- *Tubulipora brongniarti* EDWARDS 1836a (Cretaceous, Meudon). N°4409. ***Actinopora brongniarti*** (MILNE-EDWARDS 1838).

- *Fascicularia aurantium* EDWARDS 1838a (Crag, Sudbourne). ***Meandropora aurantium*** (MILNE-EDWARDS 1838).
- *Melicerita charlesworthii* EDWARDS 1836c (Crag, Sudbourne). N° 4569. ***M. charlesworthii*** MILNE-EDWARDS 1836b.
- *Salicornaria affinis* EDWARDS 1838b (Crag, Sudbourne). N°4628bis. ***Cellaria*** sp. (probablement *C. fistulosa* (HASSALL 1840). Very abraded specimen. Det. J.-L. d'Hondt.
- *Salicornaria crassa* EDWARDS 1838b (Crag, Sudbourne). N°4628. ***Melicerita charlesworthii*** MILNE-EDWARDS 1838. Det. J.-L. d'Hondt.
- *Eschara affinis* EDWARDS 1836b (Doué-la-Fontaine). N°4558. ***Cleidochasma affinis*** MILNE-EDWARDS 1836 (= *C. porcellanum* (BUSK 1860), junior synonym). Det. J.-L. d'Hondt.
- *Eschara deshayesii* EDWARDS 1836b (Doué-la-Fontaine). N°4556 (Holotype), 4557. ***Hippodenella deshayesi*** (MILNE-EDWARDS 1836).
- *Eschara elegans* EDWARDS 1836b (Bordeaux). N° 4559. ***Steginoporella elegans*** (MILNE-EDWARDS 1836).
- *Eschara incisa* EDWARDS 1836b (Crag, Sudbourne). N° 4547, 4548. ***Dakaria incisa*** (MILNE-EDWARDS 1836).
- *Eschara lata* EDWARDS 1836b (Doué-la-Fontaine). N° 4555. Undeterminable specimen, characterized by its two avicularia, spatulated in shape, latero-proximal to the aperture, symmetrical with regard one to other, moderately oriented to the longitudinal axis, and its frontal aurozoecial surface uniformly punctuated. Perhaps it could be (without certainty) a Schizoporellidae species.
- *Eschara lonsdalei* EDWARDS 1836b (Cretaceous, Postdam). N° 4560. ? *Inversaria* sp. (det. J.-L. d'Hondt).
- *Eschara milleporacea* EDWARDS 1836b (Parnes-en-Guyon). N° 4563. ***Reptadeonella*** sp. (very probably *R. violacea* (JOHNSTON 1847). Too much abraded specimen to be identifiable. Det. J.-L. d'Hondt.
- *Eschara monilifera* EDWARDS 1836a (Crag, Sudbourne). N°4549 et 4550, Sudbourne; 4551, Norfolk ; 4896: ?). ***Metrarabdotos monilifera*** (MILNE-EDWARDS 1836) et/or ***Trigonopora monilifera*** (Milne-EDWARDS 1836).
- *Eschara pertusa* EDWARDS 1836b (Crag, Sudbourne). N°4553. ***Hippopleurifera pertusa*** (MILNE-EDWARDS 1836).
- *Eschara porosa* EDWARDS 1836b ("Sudapennin du Plaisantin"). N° 4562. ? *Adeonella* sp. (too abraded specimen for an identification).
- *Eschara sedgwicki* EDWARDS 1836b (Crag, Sudbourne). N° 4552. ***Hippopleurifera sedgwicki*** (MILNE-EDWARDS 1836).

## 2. Recent species

- *Tubulipora verrucaria* EDWARDS 1838 (Algeria). N° 4411. ***Diplosolen obelia*** (JOHNSTON 1838). Det. J.-L. d'Hondt. See Remarks.
- *Salicornaria stokesii* EDWARDS 1838b (Galapagos). N° 4627. *Cellaria* aff. *fistulosa* (LINNÉ 1758) + *Thalamoporella novaehollandae* HASWELL 1880. ***Thalamoporella***

*stokesii* (MILNE-EDWARDS 1838). Det. J.-L. d'Hondt. See hereafter in the Remarks.

– *Eschara sulcata* EDWARDS 1836a (Port-Western, Australie, mission Quoy and Gaimard). N° 4467 (with an original handwritten label and consequently chosen here as lectotype) and 4468 (chosen as paralectotype). *Adeonella sulcata* (MILNE-EDWARDS 1836). Senior synonym of *Lepralia mucronata* MCGILLIVRAY 1887. Det. J.-L. d'Hondt.

N.B.: The types of some of the species described by Henri Milne EDWARDS, the ones recent (*Pustulopora proboscidea* EDWARDS 1838, *Crisia geniculata* EDWARDS 1838, *C. cornuta* EDWARDS 1838, *C. elongata* EDWARDS 1838), the other fossil (*Tubulipora grignonensis* EDWARDS 1837, *T. explanata* EDWARDS 1837, *Alecto gracilis* EDWARDS 1837, *A. granulata* EDWARDS 1837, *Diastopora eudesiana* EDWARDS 1838, *Criserpia michelini* EDWARDS 1838, *Pustulopora gracilis* EDWARDS 1838, *P. macrostoma* EDWARDS 1838, *Idmonnea cretacea* EDWARDS 1838), particularly almost all those he named, without description, in 1838 in the "Bulletin de la Société Philomatique" – (Recent: *Salicornaria arabica*, *S. bidentata*, *S. elongata*, *S. tenella*, fossil: *S. beaumontii*, *S. fragilis* and *S. excavata*) have not been found again and are certainly lost.

#### Types of other authors present in the collection of Henri MILNE-EDWARDS

- 1) *Membranipora stellata* THOMPSON 1833 (Down, Irlande 1835). N° 1270 (co-type), 4468. Specimen given by THOMPSON to Henri Milne EDWARDS. *Electra pilosa* (LINNÉ 1767).
- 2) *Membranipora craticula* ALDER 1857 (Northumberland). N° 4640. Type or co-type. *Callopora craticula* (ALDER 1857).
- 3) *Idmonnea transversa* LAMARCK 1816. N°4705, 5856 (syntype). *Tubulipora liliacea* PALLAS 1766.

N.B.: The type (however without original label) of *Criserpia michelini* EDWARDS 1838a (Bathonian) exists perhaps in the laboratory of Paleontology of the French Museum. The MICHELIN's original specimen was at the epoch lend for study to Henri Milne EDWARDS. The later at this time created for it the genus *Criserpia*, now considered as a most junior synonym of the genus *Mesenteripora*. *Mesenteripora michelini* BLAINVILLE 1830.

#### Other historical specimens included in the collection of Henri MILNE-EDWARDS

- 1) *Bugula fastigiata* ALDER 1857 (Northumberland). N° 4710. *Bugula serrata* (LAMARCK 1816). See hereafter in the paragraph Remarks.
- 2) *Membranipora magnilabris* (BUSK). Given by STOKES (Port-Jackson). N° 4726. *Steginoporella magnilabris* (BUSK 1854).

#### Redetermination of some of the recent specimen of the Henri MILNE-EDWARDS' collection

Many of the specimens collected by Henri Milne EDWARDS are still labelled with their original generic and specific names, under which he had himself identified them (parti-

cularly various zoaria of *Hornera frondiculata* LAMOUROUX 1821); other species he collected, that are obviously characterized and easily identifiable, have been later transferred to other genera by other authors, but without identification problems induced by its new assignment; in those both cases, it is not considered necessary to say anything further. For about 25 lots of species, some corresponding to since dismembered taxa, some to different species under a single label, some difficult to identify, and others needing to be verified, will be considered hereafter. The recent names of these species are written in **bold** types.

- 1) *Crisia denticulata* LAMARCK. Coll. Audouin and Edwards. Iles Chausey 1838 (N°4475): **C. denticulata** (LAMARCK 1816).
- 2) *Crisia eburnea* LINNÉ. " Mers d'Europe ". (N°3688): **C. denticulata** (LAMARCK 1816) + **Carbasea papyracea** (SOLANDER 1786).
- 3) *Tubulipora hispida* JOHNSTON. Northumberland (N°440): **Disporella hispida** (FLEMING 1828).
- 4) *Tubulipora* sp. (N°1268): crushed and unidentifiable.
- 5) *Fron dipora verrucosa* LAMOUROUX. Unknown origin (N°7739): **F. verrucosa** LAMOUROUX 1821).
- 6) *Membranipora lineata* BUSK. Cullercoats (N°4639): **Callopora lineata** (LINNÉ 1767).
- 7) *Membranipora spongiosa* JOHNSTON. Ayrshire (Ecosse) (N°1269): **Electra pilosa** (PALLAS 1767).
- 8) *Membranipora spinifera* JOHNSTON/ALDER. Cullercoats (N°4641): **Cauloramphus spiniferum** (JOHNSTON 1833).
- 9) *Flustra truncata* BUSK. " Angleterre " (N°4651): **Securiflustra securifrons** (PALLAS 1767).
- 10) *Bugula avicularia* OKEN. La Rochelle (N°575): **B. stolonifera** RYLAND 1960.
- 11) *Bugula murrayana* BUSK. Northumberland (N°4432): **Dendrobeatia murrayana** (JOHNSTON 1841).
- 12) *Salicornaria sinuosa* HASSALL. Guernesey (N° 4626): **Cellaria sinuosa** (HASSALL 1840).
- 13) *Lepralia linearis* HASSALL. Northumberland (N°4443): **Schizomavella linearis** (HASSALL 1841).
- 14) *Lepralia brongniartii* AUDOUIN. Northumberland (N°4516): **Chorizopora brongniartii** (AUDOUIN 1826).
- 15) *Hippothoa divaricata* LAMOUROUX. Tenby (N°4671): **H. flagellum** (MANZONI 1870)
- 16) *Lepralia auriculata*. Guernesey (N°4618): unidentifiable (Smittinidae?).
- 17) *Lepralia granifera* JOHNSTON. Bainborough (N°4605): **Haplopoma graniferum** (JOHNSTON 1841).
- 18) *Lepralia punctata* HASSALL. Cullercoats (N°4519): **Cribrilina cryptoecium** NORMAN 1903.
- 19) *Lepralia unicornis* JOHNSTON. Cullercoats (N°4608): **Schizoporella unicornis** (JOHNSTON in WOOD 1844).
- 20) *Lepralia verrucosa* ESPER. Cullercoats (N°4616): **Umbonula littoralis** HASTINGS 1944.

- 21) *Eschara* sp. Unknown origin. (N°4466): ? *Escharella johnstoni* (QUELCH 1884). Very abraded.
- 22) *Eschara cribraria* JOHNSTON. Northumberland (N°4469): *Arctonula arctica* (M. SARS 1851).
- 23) *Cellepora hassallii* JOHNSTON. Bainborough (N°4504): *Celleporina hassallii* (JOHNSTON 1847).
- 24) *Cellepora spongites* LAMARCK. Algérie (N°4767): *Schizoporella errata* (WATERS 1878).

### Systematical remarks

#### 1. *Bugula fastigiata*

The specimen existing in the Henri Milne EDWARDS' collection raises some questions. Firstly, it does not correspond to the description of the true *B. fastigiata* (DALYELL 1847) sensu KLUGE (1962), distinct species from North Europa, and whose validity was attested by PRENANT & BOBIN (1966). *B. fastigiata* sensu ALDER is considered as junior synonym of *B. purpuroincta* NORMAN 1868 by RYLAND (1960), PRENANT & BOBIN (1966) and HAYWARD & RYLAND (1998). The specimen given to Henri Milne EDWARDS by ALDER neither corresponds to these species; instead it is indeniably the Mediterranean species described from Corsica by CALVET (1902) under the name of *B. germanae*, and also one of the both taxa (with *B. mollis* HARMER 1926) we recognized (D'HONDT 1994) after examination of the type to be itself a junior synonym of *B. serrata* (LAMARCK 1816). *B. serrata* is a rare species, very occasionally encountered in the warm seas and in localities very far apart (Australia, New Guinea, Java, Mediterranean Sea). ALDER's specimen is labelled as comin from Great Britain (Northumberland), a highly doubtful (because too northern) locality – by comparison with the actually known distribution of *B. serrata* –; the geographical origin cannot be testify by the NYEVRE'S inventory, the specimen being given by Henri Milne EDWARDS (in 1868) after the preparation of this document (1867). Consequently, we must consider the labelled provenance as erroneously.

#### 2. *Eschara sulcata*: *Aeonella sulcata* (MILNE-EDWARDS 1836a)

The zoarium est foliaceous, constituted by wide erect dichotomic and bistratified lobes. The autozooids are regularly lozenge-shaped, 0,44-0,60 mm in length and 0,28-0,30 mm wide. The zoecial outlines form rather salient rims. The aperture is 0,080-0,085 mm in length (exceptionally a little shorter) and 0,90-0,95 mm wide; it is hemicircular with a proximal edge almost rectilinear, or almost circular. Normally 3 aviculairia are present on each zooid. The first is lateral to the aperture, 0,08-0,10 mm long, narrow and sharp-pointed at the extremity, oriented forewards (very rarely backwards); it can be in some very exceptional cases larger (0,14 mm). The second is immediately preapertural (or, by exception, completely proximal), perpendicular to the longitudinal axis (hence parallel to the proximal side of the aperture), with a same shape as the previous and 0,08-0,09 mm in length. The third is axial, oriented forewards, 0,17-0,18 mm long, angular, with a base 0,09-0,18 mm wide. Immediately proximal to the previous, at the bottom of a hole in the



middle of the frontal surface, a minute circular spiramen is present, 0,045-0,050 mm in diameter, often obtured and virtual. No ovicell. The zooids in reproduction are much more voluminous and inflated, normally reunited (in groups of 2-5) in given areas scattered in the zoarium, 0,90 mm in length and 0,50 mm in width, with a wide and narrow transversal aperture in shape of crescent and an axial avicularium 0,16 mm in length localized in a groove delimited by tho symmetrical bulgings of the frontal face. Vicarious avicularian zooids, in lozenge-shaped like the autozooids, but much more voluminous, measuring 0,70-0,80 mm in length and 0,30-0,36 mm in width, often arranged in groups of 2 or 3, are also scattered in the zoarium; each of them carries a sharp-pointed avicularium, orientated distally, triangular in shape, measuring 0,40-0,45 mm in length and 0,20-0,24 mm in width at its base.

The species, arising from " Australie ", was very badly illustrated by EDWARDS (1836); he has not observed the transversal avicularium and has increased on his drawing the number of the zooids devoid of axial avicularia (in fact, their apparent lack depends of the state of abrasion according to the regions of the specimen). The original label joined to the material is more explicit: " de Port Western, mm. Quoy et Gaimard 1829 ". The same species has been further described and illustred by MCGILLIVRAY (cf. 1879-1890, pl. 48, figs. 6-7), apparently ignorant of the EDWARDS' works, under the name of *Lepralia mucronata* (MCGILLIVRAY 1868), a binomen he modified later as *Eschara mucronata*, a junior synonym of *Adeonella sulcata* (EDWARDS 1836). MCGILLIVRAY correctly noted the vicariant large avicularium, but he seems not have distinguished the two small and typical apertural avicularia. A long list of the synonymies of *Eschara mucronata* has been further published by JELLY (1889); she refers particularly to some REUSS' publications, but incorrectly and curiously regards *E. sulcata* EDWARDS 1836 as a junior synonym of a species described about thirty years before (1867), *Microporella coscinophora* REUSS 1867, from the Austrian Middle-Miocene. The type-specimen of Henri Milne EDWARDS being now rediscovered, a direct comparison of both taxa would now be judicious to confirm or infirm this synonymy.

*Adeonella sulcata* does not correspond to any of the species described or redescribed later by COOK (1973 1982) from African coasts, by HAYWARD & COOK (1983) from South Africa, or in the general recapitulations of all the species of this genus published by HAYWARD (1983, 1988), in which this taxon is not mentioned, even under the specific name of *mucronata*.

### 3. *Adeonellopsis laevis* (MILNE-EDWARDS 1838)

The zoarium is narrow, monostratified, dichotomously ramified, with a convex upper and a plane dorsal surface. It is very probably erect. The autozooids, a little enlarged distally, have 0,56-0,63 mm in length and 0,22-0,26 mm in width; their lateral boundaries are edged by a thin fold, demarcating a zoecial frame. Autozoecial orifice orbicular, measuring 0,09 mm in hight and 0,18 mm in width. The axial avicularium, proximal to the aperture (and attaining it), oriented forewards is 0,35-0,40 mm in length. Proximally to the avicularium exists a small spiramen, screen-like, 0,04-0,09 mm in diameter, perforated by 3 to 5 minute pores. The frontal surface is depressed; no ovicell observed. The apertures are only open on the frontal face; the dorsal side of the zooid is ornated with thin transversal crests, regularly distributed, parallel and equidistant, about 15 for a same zooid.

#### 4. *Salicornaria stokesii*: *Thalamoporella stokesii* (MILNE-EDWARDS 1838b)

The jar labelled *Salicornaria stokesii* (Galapagos Islands, Cuming coll., gift H. Milne EDWARDS) contains two different species. We identified the first (two minute specimens) as *Cellaria diffusa* ROBERTSON 1905 (species very close to the European *C. fistulosa* (LINNAEUS 1758)). The second, consisting of many big specimens of a *Thalamoporella*, constitutes in all probability the true EDWARDS' species and corresponds to a taxon later redescribed by HASWELL (1880) from Torres Strait under the name of *T. novaehollandiae*, and later found in Indonesia (HARMER 1926). Neither of these two genera was mentioned from Galapagos Archipelago by CANU & BASSLER (1929) but, according the further researchs of BANTA & REDDEN (1990), both are here respectively represented in fact by two (*C. diffusa* ROBERTSON 1905 and *C. veleronis* OSBURN 1950) and one (*T. californica* (LEVINSEN 1909)) species.

A – *Cellaria diffusa* ROBERTSON 1905. The thin zoarium presents an areolation normally rhomboidal, becoming hexagonal in the areas of the internodes being in reproduction. The autozoecial aperture is situated in the distal half of the zooid; its shape is hemicircular with forewards a convex proximal edge, without lateral incision, containing a latero-proximal tooth at each side, but without opposite distal tooth. The avicularia are few; they measure about 1/3 of the autozoecial length and are approximatively rectangular in shape, a little longer than wide, and bearing a hemicircular mandible, with the free edge distally oriented. The ovicellian pore is wide, in shape of crescent in the peripheral regions of the reproductive part of the zoarium, circular in the middle of it.

B – *Thalamoporella*. The zoarium is ramified dichotomously and constituted by claviform branches, enlarged at their distal extremity, quadrangular at the lower part, octogonal in transversal section at the apex. The autozoecial length varies from 0,64 to 0,75 mm, the distal wide being 0,40 mm. A sort of chitinous joint exists at the level of the ramifications, some rhizoids being shortly obvious on the surface. The aperture measures 0,20-0,24 mm in length and 0,20 mm in width, and presents a proximal sinus in shape of very open V. The ovicell is 0,60 mm in diameter, and is incised by a groove of 0,24 mm depth and 0,28 mm of opening, V-shaped with a round top. The frontal surface (cryptocyst), thinly perforated, is depressed and presents two antero-lateral opesiulae, rather regular in shape, 0,19 mm wide and 0,16 mm long. The avicularian zooid measures 0,60 mm in length; the mandible, generally truncated and much more rarely round at its distal extremity, fall back upon a notch, itself distally curved. A large calcified and mamilliform tubercle exists on the both sides of the aperture.

This form corresponds perfectly to the HASWELL'S description (1880) and to the illustrated redescription published by HARMER (1926), with a single difference – but bearing nevertheless on a very obvious and significant character –, the presence of the two latero-apertural tubercles. According my own experience of the degrees of intraspecific variability amongst the Bryozoa, I regard this character having only a subspecific value, despite the geographic distance existing between the two regions where this species has been collected. The binomen *T. stokesii* (senior synonym) has the priority, by anteriority, over *T. novaehollandiae* (junior synonym) ones. Consequently, the Galapagos specimens must be designated as *T. stokesii* (EDWARDS 1838), typical form, and the material from Torres strait and Indonesia becomes *T. stokesii* (EDWARDS 1838) subsp. *novaehollandiae* (HASWELL 1880).

### 5. *Cribrilina cryptoecium* and *Arctonula arctica*

Henri MILNE-EDWARDS has respectively referred to these species under the names of *Lepralia punctata* and *Eschara cribraria*, two taxa already existing at his epoch, but still not dismembered; so before the identification and description of the two species confounded with the previous and now designated as *C. cryptoecium* and *A. arctica*. So, I cannot consider him as author of these species, according the position adopted by PRENANT & BOBIN (1966).

### 6. *Hornera striata*

These species have been put by VIGNEAUX (1949) in synonymy with *H. frondiculata* LAMOUREUX 1821 on morphological criteria. On the other hand, BUGE (1957), without reference to VIGNEAUX, considered them as distinct species on biometric characters. I choose to adopt here the position of the most recent revisor.

### 7. *Tubulipora verrucosa*

By strict respect of the priority law, this species ought probably be called *Diplosolen verrucosa* (EDWARDS 1838). Referring to article 23.9.2 of the International Code of Zoological Nomenclature (1999), I choose here to keep the most recent binomen (by just some months), *Diplosolen obelia* (JOHNSTON 1838), consecrated by usage, the taxon created by Henri Milne EDWARDS having not be utilized since the description of this species.

### Main synonymies established in this work

*Thalamoporella novaehollandae* (HASWELL 1880) (junior synonym): *T. stokesii* (MILNE-EDWARDS 1838) (senior synonym).

*Cleidochasma porcellanum* (BUSK 1860) (junior synonym): *C. affinis* (MILNE-EDWARDS 1836) (senior synonym).

*Lepralia mucronata* (= *Eschara mucronata*) MCGILLIVRAY 1887: *Adeonella sulcata* (MILNE-EDWARDS 1836).

### Conclusion

The study of Henri Milne EDWARDS' collection of Bryozoa, for the main part constituted by current Recent and fossil species, but including about twenty forgotten type-specimens, essentially of fossil species, allowed us to revise about 90 lots of specimens. Some Recent species collected by this author have been for the first time recorded by him on the French coasts, sometimes before its identifications as valid species by other scientists. He also described new species, of which the type-specimens are still existing, but re-described under other names by later authors after many years; consequently, the taxonomic names he created have to keep their priority. This study allows us to verify some of his identifications and to rectify various synonymies. It also reveals the existence of scientific relations established during the XIXth century between Henri Milne EDWARDS

and some of his foreign colleagues (German, English and American), concretized by exchanges of scientific specimens, even on the brink of the 1870 war. This fact attests his international fame, and confirms the independence and the transcendence of the scientific activities as regards to the political context. Thus the Henri Milne EDWARDS collection simultaneously presents a scientific and a historical interest.

### Résumé

Les 87 indiscutables spécimens subsistants de la collection de Bryozoaires d'Henri Milne EDWARDS, comprenant 32 échantillons fossiles et 55 actuels conservés au Muséum national d'Histoire naturelle de Paris, ont été redécouverts et inventoriés. A cette occasion ont été retrouvés les types de 23 des espèces fossiles (20) et actuelles (3) qu'il avait décrites, ainsi que les types de 3 autres espèces nommées par d'autres auteurs et deux spécimens historiques d'autres provenances. Un certain nombre de déterminations douteuses ont également été vérifiées. Les synonymies suivantes ont été établies : *Cellaria stokesii* EDWARDS 1838 (senior synonym) = *Thalamoporella novaehollandae* HASWELL 1880 (junior synonym), *Cleidochasma affinis* (EDWARDS 1836) (senior synonym) = *C. porcellanum* (BUSK 1860) (junior synonym), *Adeonella sulcata* (EDWARDS 1836) (senior synonym) = *Lepralia mucronata* (= *Eschara mucronata*) MCGILLIVRAY 1887 (junior synonym).

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