

195. Alvarez F. & C. C. Emig, 2000. Brachiopoda from the Luso-Iberian zone. I. Biology and ecology. Abstracts, Millennium Brachiopod Congress, London 2000, 1 p.
196. Alvarez F. & C. C. Emig, 2000. Brachiopoda from the Luso-Iberian zone. II. Geographic and bathymetric distribution. Abstracts, Millennium Brachiopod Congress, London 2000, 1 p.
197. Emig C. C., 2000. S. O. S. = Save Our Systematics (Linguloidea used as an example). Abstracts, Millennium Brachiopod Congress, London 2000, 1 p.
198. Pardo Alonso M. & C. C. Emig, 2000. Brachiopoda on the web... from EuroBr@chNet to World Br@ch Net. Abstracts, Millennium Brachiopod Congress, London 2000, 1 p.

BRACHIOPODA FROM THE LUSO-IBERIAN ZONE. I: BIOLOGY AND ECOLOGY**Fernando ALVAREZ¹ and Christian C. EMIG²**

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The study of the brachiopods living along the coasts of the Iberian Peninsula and associated islands started in the 19th century. Brachiopod subphyla are unequally represented on these coasts, the Linguliformea only by *Pelagodiscus atlanticus* and the Craniiformea by *Neocrania anomala*, whereas the Rhynchonelliformea is represented by about 30 species (in 22 genera).

P. atlanticus, attached by a pair of muscles to hard substrates, is capable of reorientation according to the direction of surrounding water currents. *N. anomala*, has the ventral valve (barely calcified at times) completely cemented to a hard substrate; this valve is thicker and more irregular in the specimens occurring in the Mediterranean than those from the Atlantic Ocean. In the Rhynchonelliformea, the 'thecideidines' are a peculiar group because only the larvae bear a pedicle, adults being cemented. The other species are anchored or supported by different kind of pedicles and some have the ability to move in response to changes in sediment level and to prevailing water currents.

Little is known about their social behaviour. It seems that they suffer a rather low level of predation, apparently because of the small body biomass. The incidence of parasites, infections or diseases seems to be insignificant. Predators and other organisms, such as chitons, gastropods and echinoderms, disturb the brachiopod's normal development; these seem to have induced displacement towards more cryptic situations. In these habitats, the larvae attach very closely to one another, producing dense populations of individuals, many of which are malformed. In deep waters the larvae seem to be less selective in settling onto a substrate.

Brachiopods have little potential for defence, being vulnerable to a broad spectrum of epibiont, especially fast growing ones. Taxa with punctate shell seem to have more protection against epifaunal attachment than those without punctae, although, for example, adult *Megerlia truncata* and *Terebratulina retusa* may have numerous epibionts over their punctate shells. Perforations, probably produced by gastropods, have been observed in *T. retusa* and in *Gryphus vitreus*.

The shell, particularly the fibres of the secondary layer, come apart easily during maceration, especially in species with punctae and/or those having no prisms of tertiary layer. Because of this only a small fraction of the shells present in the initial biocoenosis is preserved.

Due to the influence of environmental factors on the shell size, calculating the longevity of brachiopods is problematic because specimens of similar length may vary in age, sexual maturity and longevity. There is thus little data on brachiopod longevity. *Pelagodiscus* may live between 3 and 6 years, and *Neocrania* about 14 months. Brachiopods initially grow quickly; this helps survive the initial most vulnerable phase of the life. Growth subsequently becomes more stable, diminishing in the latest stages. In general brachiopods seem to live between about 8 to 12 years.

BRACHIOPODA FROM THE LUSO-IBERIAN ZONE. II: GEOGRAPHIC AND BATHYMETRIC DISTRIBUTION

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With the exception of *Lacazella mediterranea*, all other Mediterranean species occur also in the Atlantic Ocean, although generally extending to deeper waters. In the NE Atlantic, *Fallax dalliniformis*, *Glaciarcula spitzbergensis* and *Dallina parva* occur only in the Gulf of Biscay. *Cryptopora gnomon* and *Acrobelesia cooperi* do not appear in the area between Finisterre Cape and Gibraltar, although the presence of *Phaneropora incerta* has been confirmed. *P. incerta*, *Pajaudina atlantica* and *Argyrotheca grandicostata* are typical species of the Mauritanian faunistic province. Some species (e.g. *Dallina septigera*, *Hispanirhynchia cornea*, *Macandrevia cranium*) although now unknown in the Mediterranean, seem to have lived there at the end of the Tertiary or beginning of the Quaternary. Climatic fluctuations during the Quaternary induced changes in salinity, temperature, water currents, sea level and biotopes leading to a series of species replacement between tropical-temperate and boreal faunas.

From available data on depth, brachiopods from the Luso-Iberian zone can be divided into two main groups, one including those that live on the continental shelf and another in the deep-water realm (between the shelf break and the Abyssal zone). On the continental shelf (0 to 100 m depth), frequently in rocky cavities and calcareous concretions, species are commonly of small size with simple lophophore (trocholophe or schizolophe) adequate in these zones with abundant organic detritus. To this group belong all *Argyrotheca* species (except *A. grandicostata*, restricted to deeper waters around the Canary Islands), the tiny *Gwynia capsula* and *L. mediterranea*. On the continental slope, extending between the shelf-break (at about 100 m) to about 2000 m in depth (Upper and Middle Bathyal), brachiopods are varied in size with more complex lophophore (generally plectolophe), are abundant, (e.g. *Neocrania anomala*, *Terebratulina retusa*, *Megerlia truncata*, *Gryphus vitreus*, *Megathyris detruncata*, *Platidia anomioides* and *P. davidsoni*), with two species occurring exclusively in the Atlantic, *Macandrevia cranium* and *Pajaudina atlantica*. Some of these species extend also onto the continental shelf.

In deep waters, in the Lower Bathyal to Abyssal zones, shells are commonly thin, delicate, almost transparent, and usually have a complex lophophore (plectolophe or spirolophe), regarded as being more efficient for filtering low concentrations of food particles. Species typical of deep water are *Pelagodiscus atlanticus*, *C. gnomon* and *H. cornea*. The latter species is frequently associated with *F. dalliniformis*, *Dallina septigera*, *D. parva*, *Stenosarina sphenoidea*, *Dyscolia subquadrata*, *D. wyvillei*, *Acrobelesia cooperi*, *Eucalathis tuberata*, *E. ergastica*, *Phaneropora incerta*, *Glaciarcula spitzbergensis*, *Megerlia monstrosa* and *Macandrevia novangliae*, with the only *Argyrotheca*, *A. grandicostata*, - confined to deep waters.

The dorsal valve of *C. gnomon*, *F. dalliniformis*, *Dallina septigera* and *Macandrevia novangliae* shows a tendency to develop a sulcus. Such species commonly live in deeper waters than those with a sulcus in the ventral valve such as *Argyrotheca cordata*, *A. cistellula*, and *T. retusa*. By contrast, in the southern hemisphere, sulcate brachiopod genera such as *Waltonia*, *Terebratella*, *Magasella*, *Magellania*, *Aerothyris*, live in shallow waters.

S. O. S. = SAVE OUR SYSTEMATICS (LINGULOIDEA USED AS AN EXAMPLE)

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Most of the taxonomic characters of extant lingulide species, as defined by Emig (1982, 1983), can and have to be applied to fossil lingulid forms. This statement is based on the studies of several hundreds of specimens from all the species belonging to the following lingulid genera : *Lingula*, *Glottidia* (see Emig 1982), *Lingularia* (see Biernat & Emig 1993, Marquez-Aliaga *et al.*, 1999), *Dignomia* (see Gagnier *et al.* 1996), as well as *Obolus*, *Ungula*, *Oepikites*,

and *Schmidtites* (unpublished data).

In the linguloid taxa, general shell features cannot be used alone to identify or discriminate either genus or species, but soft-bodied (i.e. internal) morphological characters must be used too. Furthermore, to be confident of the variability, all of the taxonomic characters must be measured, compared and discussed within the taxon and between all possible relatives before creating any new linguloid genus or species. Such descriptions have to be based on at least 20-30 well-preserved specimens, avoiding fragments or broken shells. Any description simply based on shell shape and size or using non-phylogenetical features to distinguish the so-called closely related species should have no taxonomic value, as well as too-short diagnoses that do not allow one to do valuable identifications. Such descriptions just increase confusion in identifying and describing lingulid species.

The main taxonomic characters which have to be described and represented are: umbonal region (internal, external, and sometimes profile); internal musculature arrangement and disposition; main anterior mantle canals. The shape and size of the shell can be given but their taxonomic value must be demonstrated, except when the shell shows a very specific feature. Several examples will be given and discussed. Recommendations 13A and 13B of the 4th Edition of the ICZN are emphasized, particularly in the description of higher taxa.

BRACHIOPODA ON THE WEB FROM EUROBR@CHNET TO WORLD BR@CHNET

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The present EuroBrachNet (<http://www.com.univ-mrs.fr/EuroBrachNet>) and World Brach Net (<http://www.com.univ-mrs.fr/EuroBrachNet/WBN.htm>) home pages, physically located in Marseilles, have as main aim to provide to the brachiopodologist community the following topics: - Bibliography since 1995; - Directory of all the brachiopodologists (and in Europe their geographic location), but all specialists are not listed; - Systematics and taxonomy of the Brachiopoda; - Announcements; - Links to other lophophorate web pages. The EBN & WBN pages are updated as new information reaches the webmaster (presently Christian Emig), mainly that sent in by the brachiopodologists to feed the home pages.

The development of those Web sites is under study to increase relationships within the brachiopodologist community. For that, several services may be proposed through *RedIRIS*, the Spanish Academic and Research Network (<http://www.rediris.es>). The basic tools will be a list server which is a simple and fast way to interchange any information, as well as the BSCW (Basic Support for Co-operative Work) and web-based file management software.

On the other hand, based on co-operation with all brachiopodologists, we suggest offering:-

- A multilingual dictionary of morphological and anatomical terms in Brachiopoda, available on WBN site, to facilitate translation of the usual "technical" words in, at least, the following languages: French, Spanish, German, Italian, and Portuguese, the English terms will be based on the glossary, published in the vol. 1 of the Treatise on Invertebrate Paleontology, Part H (1997). Collaboration with colleagues speaking these languages is highly desirable.

- Several web pages popularising "what is a brachiopod" and our research as brachiopodologist, for students, general public, and palaeontologist amateurs.

- Setting-up a database about brachiopod systematics and taxonomy. This project should develop the task done previously by Rex Doescher. The database will be located in RedIRIS, including images and other multimedia materials. It is emphasised that such a database may be complementary to the Treatise, and continuously updated!

The World Brach Net should become the "official" structure of our scientific community working on or dealing with Brachiopoda linking all the members and acting as its window. The development of the net depends directly upon the need expression and the use of the web pages made and fed by our scientific community. Feel free to contact by email the authors of this abstract.