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CURRENT STATUS AND DISTRIBUTION OF THE MADREPORARIA *DENDROPHYLLIA LABORELI* IN THE CANARIES, SOUTH PORTUGAL AND MEDITERRANEAN SEA

O. Ocaña[1], R. Herrera[2], A. Brito[3], M. Garrido[2], G. González-Lorenzo[3], O. Monterroso[4] & R. Aguilar[5]

[1] Departamento de Oceanografía Biológica y Biodiversidad, Fundación Museo del Mar
Muelle Cañonero Dato s.n, 51001, Ceuta, North Africa, Spain. lebruni@telefonica.net. Corresponding author
[2] Viceconsejería de Ordenación del Territorio, Consejería de Medioambiente y Ordenación Territorial
Gobierno de Canarias. C/ Agustín Millares Carló, 18. Edificio de Servicios Múltiples II (4ª planta)
35071-Las Palmas de Gran Canaria
[3] Grupo de Investigación BIOECOMAC, Departamento de Biología Animal, Facultad de Biología
Universidad de La Laguna, C/ Astrofísico Sánchez s.n., 38206 La Laguna, Tenerife, islas Canarias
[4] Centro de Investigaciones Medioambientales del Atlántico S. L. (CIMA)
C/Arzobispo Elías Yanes, 44, 38206 La Laguna, Tenerife
[5] Oceana-España, Plaza de España-Leganito, 47, 28013 Madrid

ABSTRACT

New records of the Dendrophylliidae species *Dendrophyllia laboreli* in the Mediterranean Sea (Alboran basin), South Portugal and also in the Canaries are biogeographically relevant. The presence in the Mediterranean Sea and the recent wide distribution towards new locations in Canary Islands of such species is discussed in relation to the climatic fluctuations. In the Canaries several years of ecological searching have producing a high quantity of new data about the environment where the species occurs and its distribution along the islands. The population stability at the Mediterranean Sea and its characteristics are described, the habitats where the species occurs along the distribution area is also analyzed.

Key words: *Dendrophyllia laboreli*, Mediterranean Sea, Canary Islands, Portugal, sedimentation tolerance, population stability, climatic fluctuations.

RESUMEN

Los nuevas localizaciones del madreporario *Dendrophyllia laboreli* en el Mediterráneo, sur de Portugal y también en Canarias son datos relevantes desde el punto de vista biogeográfico. Esta expansión geográfica de la especie hacia nuevos enclaves es también discutido atendiendo a las fluctuaciones climáticas que están afectando a la temperatura del medio marino tanto insular como mediterráneo. Durante los últimos cinco años se han llevado a cabo en Canarias una serie de campañas de muestreo exhaustivo de los fondos marinos someros hasta cuarenta metros de profundidad, que han aportado nuevos datos sobre la distribución particular en cada isla y su hábitat. Las características de la población mediterrá-

nea y su estabilidad son analizadas, así como también los hábitats donde la especie es capaz de desarrollarse a lo largo de su área de distribución.

Palabras Clave: *Dendrophyllia laboreli*, Mar Mediterráneo, islas Canarias, Portugal, tolerancia a la sedimentación, estabilidad de la población, fluctuaciones climáticas.

1. INTRODUCTION

The geographical range of the species *Dendrophyllia laboreli* is increasing along the continental Atlantic coast of Andalucia (South of Spain) till Algeciras Bay (see LÓPEZ-GONZALEZ *et al.* [6]) although its presence in the Mediterranean (Alboran basin) (see OCAÑA *et al.* [9]) were not mentioned in their paper, looks as the authors overlooked the book about this Mediterranean area. However the species was recently noticed in the Mediterranean (see ZENETOS *et al.* [11]; OCAÑA et al., *op. cit.*). In the present article we have described the first established population in the Mediterranean Sea; this settlement is discussed as may have been favoured by the climate warming as the case of *Antipathella wollastoni* (see OCAÑA *et al.* [8]) or perhaps by other anthropogenic or even natural factors. Since its description *D. laboreli* was associated within infralitoral and circalitoral from 1 to 70 meters depth on rocky substrate affected by sedimentation (see ZIBROWIUS & BRITO [12]; BRITO & OCAÑA [4]). In the Mediterranean we find the specimens on rocks, big boulders and rocky platforms but always where the sedimentation is noticeable along the year, in fact the benthic communities are specialized in supported the high sedimentation influenced by the nearness of Martil River (Tetúan province). *D. laboreli* is a thermopile species spreading along the tropical and subtropical Africa coasts and also in Canary Islands (see ZIBROWIUS & BRITO, *op. cit.*). In the Canaries, the species has been recorded in three of the seven islands: La Gomera, Gran Canaria and La Palma. The new data allow discussing about the influence of the climatic fluctuations in the distribution of the species; the possible vectors and their biological particularities in the Canaries are discussed. *Dendrophyllia laboreli* is including as "interesting species for the Canarian marine ecosystems" into the Canarian Catalogue for Protected Species (Law 4/2010, of 4 June. B.O.C. nº 112, Thursday 9 June, 2010).

2. MATERIAL AND METHODS

The specimens from the Mediterranean were collected by scuba diving and preserved in 8% formaldehyde in sea water. The general morphology and anatomy were studied by means of a stereo dissecting microscope. One single colony of four polyps was prepared using sodium hypochlorite to remove the organic tissue developing the skeleton.

Following ZENETOS *et al.* [11] we apply here the concept of established species as introduced or feral population of species settled in the wild with free-living, self-maintaining and self-perpetuating populations unsupported by and independent of humans. Species with at least two records in the area spread over time and space (at least three records for fishes) are also classified as established, in the sense of the CIESM Atlas series.

Material examined: Cabo Negro, 35º41'15.25"N 5º16'23.65"W, 5 July 2007, 35 meters depth, 4 small colonies (two with four polyps and two with five polyps), and one colony of four polyps was used to study the skeleton details. Colonies were settling in a crevice with calcareous algae and sediment. We observed 10 colonies but collected four and make images of two in the habitat. Cabo Negro, same location, 2 June 2009, 35 meters depth, 4 small colonies (three with four polyps and one with five polyps) spread in a vertical wall with algae and sediment. We take image of one colony with four polyps among the algae.

Specimens from Canary Islands were searching in the bottom by scuba diving. From 2002 to 2005 several biological exploration projects were headed by Canary Islands Government (SEGA 2002-2005) and one hundred sampling stations were searched from intertidal to 40 meters deep.

Table 1.- Localities where there is occurrence of *D. laboreli* in the Canary Islands.

UTM x	UTM y	Island	Locality	Date	Depth range	Habitat	Substrate
293917	3111303	La Gomera	Baja de Ávalo	10/06/05	15-37	Barren bottom	Rocky
287421	3118968	La Gomera	Caleta Hondura	09/09/02	5-25	Barren bottom	Rocky
276318	3123278	La Gomera	Los Órganos	12/09/02	5-35	Barren bottom	Rocky
292600	3115048	La Gomera	Punta Gaviota	09/09/02	5-25	Cliff	Rocky
292744	3114724	La Gomera	Punta Gaviota	10/06/05	5-25	Barren bottom	Rocky
284414	3121447	La Gomera	Pta. Laja del Infierno	08/09/02	10-35	Barren bottom	Rocky
284389	3121397	La Gomera	Pta. Laja del Infierno	09/06/05	10-35	Barren bottom	Rocky
288463	3118245	La Gomera	Punta San Lorenzo	09/08/02	15-25	Barren bottom	Rocky
282992	3121679	La Gomera	Roque de Fuera	09/09/02	5-15	Barren bottom	Rocky
272252	3105976	La Gomera	Roque de Iguala	11/09/02	5-33	Barren bottom	Rocky
272124	3105836	La Gomera	Roque de Iguala	16/11/04	5-33	Barren bottom	Mixed
284590	3121340	La Gomera	Punta de Agulo	13/09/03	20-25	Gorgonian assemblages	Mixed
282781	3123510	La Gomera	Punta los Órganos	14/09/03	20-30	Gorgonian assemblages	Rocky
292116	3116004	La Gomera	Punta Majona	16/08/02	20-25	Gorgonian assemblages	Mixed
293466	3113619	La Gomera	Puntallana	16/08/02	10-15	Barren bottom	Mixed
283924	3109586	La Gomera	Punta de San Cristóbal	17/08/02	15-20	Barren bottom	Mixed
283287	3108895	La Gomera	La Antorcha	17/08/02	10-20	Barren bottom	Mixed
430587	3114899	Gran Canaria	Los Abrigos	03/09/03	5-35	Barren bottom	Rocky
430188	3115520	Gran Canaria	Los Abrigos	29/04/04	5-35	Barren bottom	Rocky
431189	3114220	Gran Canaria	Puerto de Sardina	03/09/03	5-25	Barren bottom	Rocky
431099	3112549	Gran Canaria	Pta. del Arrastradero	02/09/03	10-25	Without algaes	Rocky
430406	3108019	Gran Canaria	Risco Partido	02/09/03	5-10	Algaes	Rocky
433825	3116748	Gran Canaria	El Tablero	2/09/06	25-30	Gorgoniam assemblages	Rocky
431418	3116171	Gran Canaria	Barranquillo del Vino	4/09/06	30-36	Gorgoniam assemblages	Rocky
430301	3111559	Gran Canaria	Lomo del Cardonal	5/09/06	25-30	Gorgoniam assemblages	Rocky
430425	3114620	Gran Canaria	Sardina	7/09/06	25-30	Gorgoniam assemblages	Rocky
438588	3115888	Gran Canaria	Cueva Bermeja	8/09/06	30-35	Gorgoniam assemblages	Rocky
442944	3114816	Gran Canaria	Charco de San Lorenzo	09/08/2006	10-15	Gorgoniam assemblages	Rocky
463951	3096223	Gran Canaria	Taliarte	10/01/2006	15-20	Barren bottom	Rocky
463005	3092282	Gran Canaria	Ojos de Garza	10/03/2006	15-20	Gorgoniam assemblages	Rocky
464861	3089433	Gran Canaria	Gando	10/03/2006	15-20	Gorgoniam assemblages	Mixed
421827	3099651	Gran Canaria	Degollada del carrizo	12/03/2006	50-60	Gorgoniam assemblages	Rocky
448896	3114781	Gran Canaria	El Portillo	13/03/2006	20-30	Gorgoniam assemblages	Rocky
210333	3193212	La Palma	Roques de Las Tabaibas	25/09/02	5-27	Barren bottom	Rocky
0792034	3184219	La Palma	Punta Gorda	24/04/02	30-40	Algaes	Rocky

Where *D. laboreli* was located we analyzed the density o relative abundance using diverse methodology. Due to the heterogeneity of the specimen's distribution, the relative abundance was measure by visual census in a time unit. Along 30 minutes diving in a random course but always perpendicular to the coast line. The colonies found were counted as well the deep range and number of the polyps was registered (adapted methodology from BORTONE *et al.* [2]). Measurements of the maximum diameter or width and maximum high (both in mm) were registered by a gauge. Densities were obtained by transectos of 50 meters in line and 2 meters width inside of which the colonies were counted. Also the density of the colonies was obtained by counting the colonies inside 1 meter four square area. The results of such research are summarized in the table above.

3. RESULTS AND DISCUSSION

3.1. Population stability and characteristics

The population of *D. laboreli* was firstly found in July 2007 at Cabo Negro point, on the bottoms described below (habitat observations and remarks). Ten colonies were counted and four collected (see Figure 3) in that time in the framework of a biological exploration headed by the Foundation Museum of the Sea of Ceuta. Other colonies of the same population were found again in the same spot and depth in June 2009, during the sea-works made within a different research project with the aim to extend three North-Moroccan protected areas into the sea (see Figures 1 and 2). Nevertheless, the exploration effort has been exhausted in most of the area studied (see OCAÑA *et al.* [9]), attending to the size of the current colonies found in the Alboran Sea (ZENETOS *et al.*, [11]; OCAÑA *et al.*, *op. cit.*) and Strait of Gibraltar, Huelva and Cádiz coasts (see LÓPEZ-GONZÁLEZ *et al.* [6]), it is quite possible that other spots with colonies in the same area might have been overlooked. Meanwhile, we can assure that along the searched area (see OCAÑA *et al.*, [9]) there is not another point with a similar sediment deposition, although the sediment may not be the exclusive key factor to explain the presence of *D. laboreli.*

For practical reasons, we follow the terminology exposed recently (see ZENETOS *et al.*, *op. cit.* and material and methods above) in order to define what is an established species in our geographical area. The Mediterranean population of *D. laboreli* is well established as we observed several years' populations of the species settle in different spots around the same area.

In a general perspective, our colonies from Cabo Negro (Alboran basin) suit to the descriptive details of those recorded in the Strait of Gibraltar, Huelva and Cadiz coast (see LÓPEZ-GONZÁLEZ *et al.*, *op. cit.*). The reduced number of the polyps agrees with our data, but the colonies showed in our article are much smaller (12 mm h x 17 mm w; 10 mm h x 14 mm w; 14 mm h x 15 mm w; 10 mm h x 14 mm w). It seems that the colony sizes decrease towards the Mediterranean Sea, as it can be deduced comparing our data with those of the population showed in the Strait of Gibraltar, Huelva and Cadiz coast (see LÓPEZ-GONZÁLEZ *et al.* [6]). This observation, together with the scarce amount of colonies, show a biological adaptation in its new habitat, so far from the ecological optimum, according to what is known from Africa continental, where the colonies present a high number of polyps (up to 51 calyces: see ZIBROWIUS & BRITO, [12]) and also in some spots from Canary Islands (up to 25 calyces at the present data).

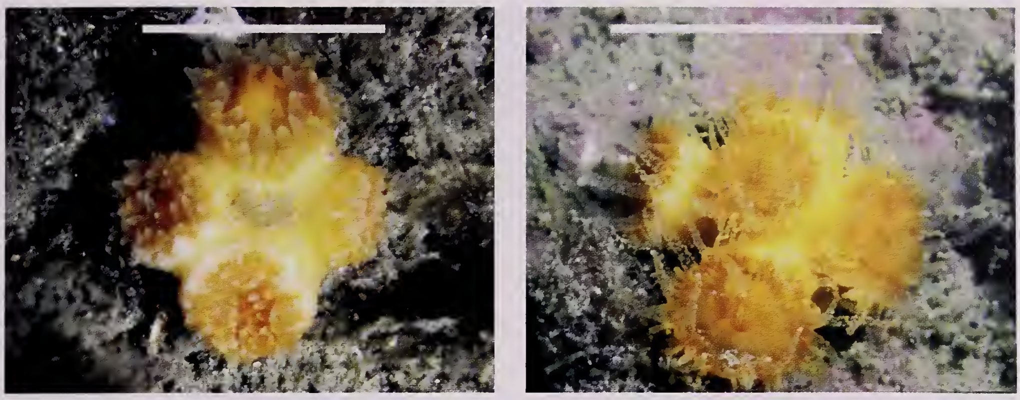

Figure 1.- Images from two colonies found in 2007 in Cabo Negro. Scale bars: image left: 15 mm; right: 17 mm.

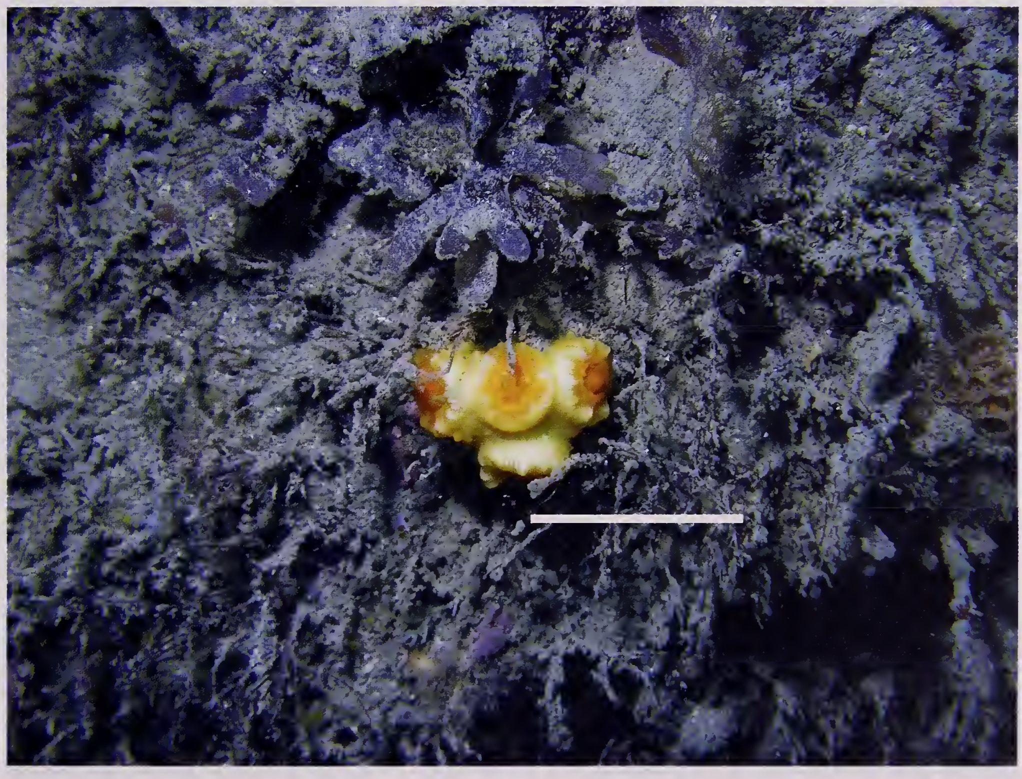

Figure 2.- Image of one colony found in 2009 in Cabo Negro. Scale bar: 15 mm.

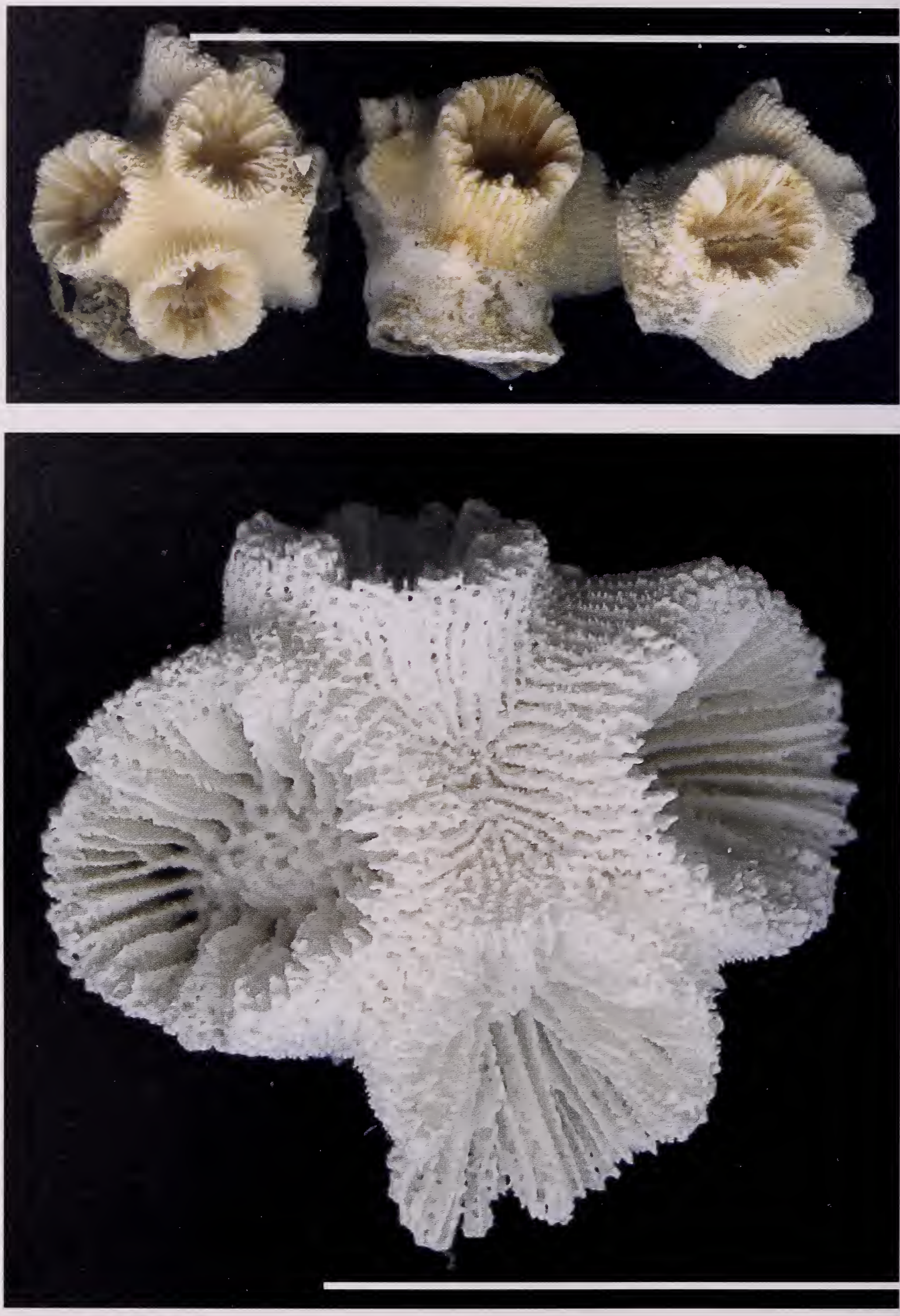

Figure 3.- Image of the four colonies collected in 2007 in Cabo Negro. Three colonies still have the soft tissue and one was prepared to observe the skeleton. Scale bars: image above: 50 mm; image below 11 mm.

Table 2.- Data obtained from the colonies searched around Canary Islands. Indiv.: Total number of colonies in each searched station; Abund-Density: Estimates of the abundance or density according to the method of sampling; N: Number of samples; number of square, transects, visual census, etc.; Max. widht: maximum width (mm); Max. height: maximum height (mm); Mean pol.: mean number of polyps; SD: standard desviation; Max. pol.: maximum number of polyps; Min. pol.: minimum number of polyps.

Locality	Mean Depth	Indiv.	Abund. Density	N	Samplig method	Mean width	Mean height	Max. width	Max. height	Mean # pol.	SD	Máx. pol.	Min. pol.
Baja de Ávalo	34,5	15	–	–	Count	29,9	18,6	53	27	9,87	4,66	21	3
Caleta Hondura	24,0	19	19,00	1	Visual census	–	–	–	–	–	–	–	–
Los Órganos	33,0	27	27,00	1	Visual census	–	–	–	–	–	–	–	–
Punta Gaviota	12,5	60	30,00	1	Visual census	–	–	–	–	–	–	–	–
Punta Gaviota	11,7	151	24,67	3	Visual census	–	–	–	–	–	–	–	–
Punta Laja del Infierno	30,0	84	69,00	1	Transect	–	–	–	–	–	–	–	–
Punta Laja del Infierno	27,9	157	–	–	Count	27,3	12,6	53	27	–	–	–	–
Punta San Lorenzo	25,0	25	9,00	1	Square	–	–	–	–	–	–	–	–
Roque de Fuera	30,0	10	–	–	Count	–	–	–	–	–	–	–	–
Roque de Iguala	28,0	14	14,00	1	Visual census	–	–	–	–	–	–	–	–
Roque de Iguala	28,0	63	34,00	1	Visual census	–	17,7	–	28	–	–	–	–
Los Abrigos (Costa Canaria)	21,9	48	–	–	Count	19,5	23,3	32	44	9,27	5,29	25	1
Los Abrigos (Costa Canaria)	23,6	7	7,00	1	Visual census	–	–	–	–	6,43	4,28	13	1
Puerto de Sardina	17,0	33	–	–	Count	105,0	159,4	230	240	3,58	3,56	12	1
Punta del Arrastradero	20,0	6	6,00	1	Visual census	–	–	–	–	7,50	1,76	10	5
Risco Partido (Dedo de Dios)	7,0	3	3,00	1	Visual census	–	–	–	–	1,00	0,00	1	1
Roques de Las Tabaibas	24,0	1	1,00	1	Visual census	–	–	–	–	–	–	1	1

Recent researches carried in the Canaries confirm the exclusively presence of *D. laboreli* in three of the seven islands (see BRITO & OCAÑA [4]) (Figure 4). Also shows the tendency to the abundance of the species in Gran Canaria and La Gomera (subpopulations with more than 100 colonies and density till 69 colonies/100m²) and also the very scarce presence in La Palma.

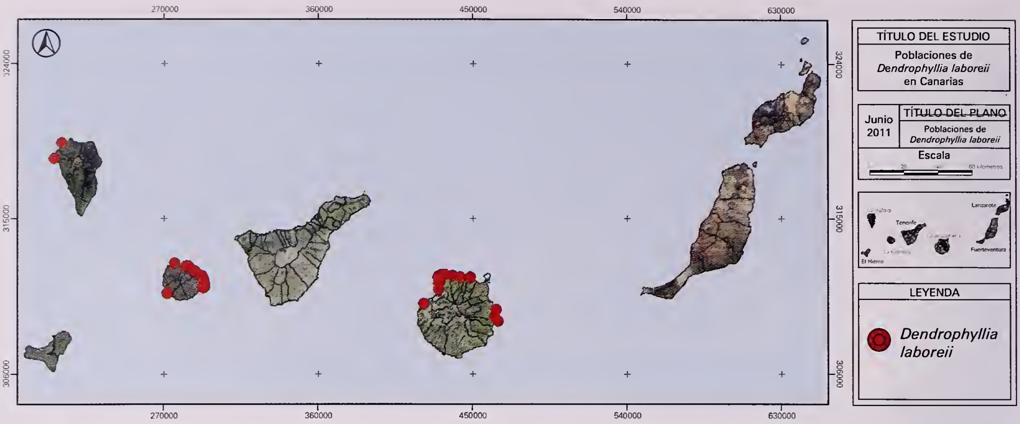

Figure 4.- Populations of *Dendrophyllia laboreli* at Canary Islands.

In Gran Canaria, the colonies are bigger and they present more polyps per colony (up to 25); also they are more concentrated in some spots (five sampling stations). Meanwhile, in La Gomera there are fewer polyps per colony but the colonies are deeper due to the rocky substrate disponibility and more extended along the bottoms (eleven sampling stations). La Gomera colonies are taller but thinner than those from Gran Canaria, and the maximum number of polyps registered reach 25. In Gran Canaria was observed a high number of a single polyp corallites. The colonies frequency is 3 to 12 polyps (see Figure 5). The current unequal distribution in the Canaries may be partially explained. There is certain current fluxes from continental Africa towards Gran Canaria island that favoured the colonization pattern in this island. The distribution in La Palma and La Gomera and also the apparent absence in the rest need further research. Furthermore, we can not ignore that the species may be present in the other islands (in cryptic or very scarce populations) where we did not find as we ignore aspects about the ecological distribution of the species.

3.2. Habitat observations and remarks

The Mediterranean population of *D. laboreli* was only found in one spot of the Moroccan coast. This spot is widely described in OCAÑA *et al.* [9] but we include here some descriptive items in order to make the marine context comprehensible.

At the end of the Cabo Negro, a rocky cape near the ancient harbour of Tetuan, there is a sloppy bottom with characteristic big boulders and rocky platform affected by sediment which is spread over the whole searched area. Due to the vicinity of the Martil River, the area is under the influence of the sedimentation provided by the fluvial system. The gorgonians *Leptogorgia* spp., *Eunicella gazella*, *Eunicella labiata* and also *Eunicella singularis* are the most characteristic bio-builder in the area, and the species *Alcyonium* spp reach high size. Both, gorgonians and *Alcyonium* spp, are important in ecological terms due to their dominance of the benthic assemblages and its importance to develop habitat possibilities and concentrate species diversity. The algae assemblages are abundant but inconspicuous, dominated by small species, partially covered by sediment. Taking into account the available habitat data for the species in the Atlantic African coast and its islands (see LÓPEZ GONZÁLEZ et

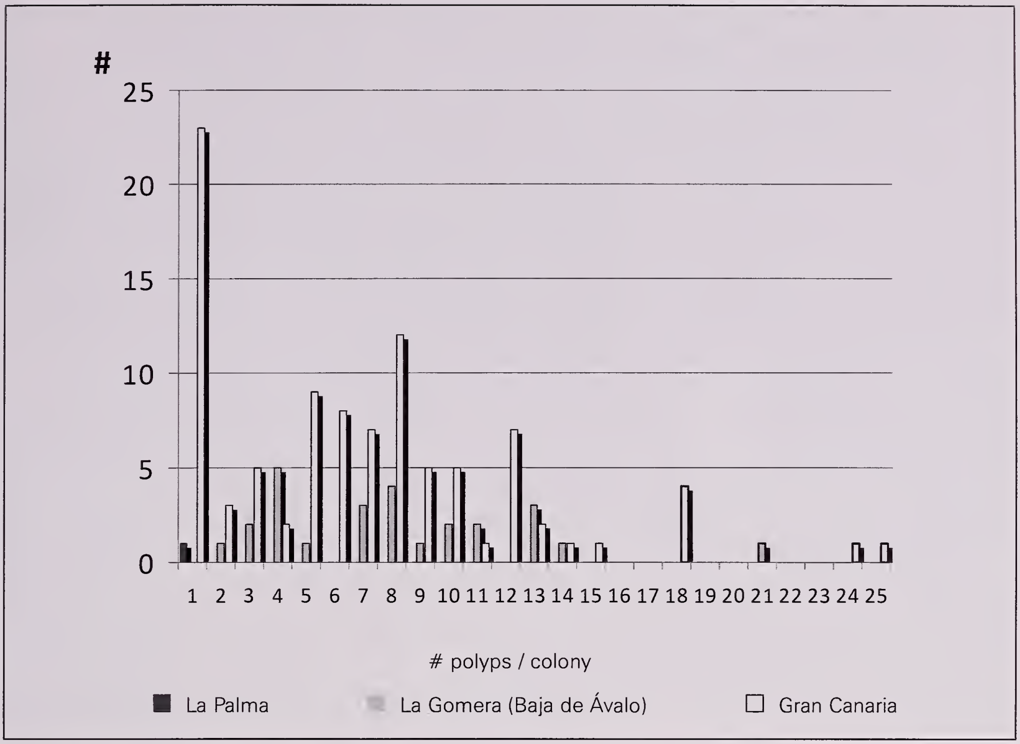

Figure 5.- Number of the polyps per colony in the three islands where *D. laboreli* occurs.

al. [6]; OCAÑA *et al.*, *op. cit.*;), it seems that the typical habitat of *D. laboreli* is in a general whole as described above and previously in LÓPEZ-GONZÁLEZ *et al.*, *op. cit.* Meanwhile, the last authors assumed this particular benthic assemblage in the Strait of Gibraltar as the same described previously in Africa continental shelf and its islands, the descriptions from those environments where *D. laboreli* occurs show that these habitats can be quite different. In Africa continental coasts the big brown algae may be even dominant instead of animal species (see ZIBROWIUS & BRITO [12]); also the peculiarity of the Canaries marine environment and the particular dominance of one species of sea urchin do not allow to make comparison with the habitat in a general whole (BRITO & OCAÑA [4]). We would say more precisely that the only common points among the geographical areas searched till now are the deep range, and the sediment tolerance showed by the species (even the level of sediment deposition is very different among the distribution area of the species). According to this, the ecological sediment tolerance does not limit the growing of *D. laboreli* as well as in many species belonging to the Dendrophylliidae family. This attribute helps Dendrophylliidae to be more competitive, avoiding the occurrence with other species. The absence of *D. laboreli* in many areas searched in the Ceuta region can be explained, surely among other factors, due to the high competence with the substratum and the increasing population of other Dendrophylliidae, *Astroides calycularis*. Clearly the sediment stress allows *D. laboreli* to be more competitive, far from its natural geographical area and ecological optimum (see "Population stability and characteristics" above). Meanwhile, in the Canaries

Figure 6.- Habitat of *D. laboreli* in Cabo Negro (West Mediterranean Sea).

there is a minor sedimentation deposition on the bottoms where the species occurs (compared with those bottoms from continental Africa, south Iberian Peninsula or Alboran Sea), being possible that the presence of the aggressive sea urchin *Diadema antillarum* is the most limiting factor to *D. laboreli* development. In the specific case of the Canary Islands, diverse benthic assemblages, rocks with sediment and high water movements are favouring the development of *D. laboreli*. With our actual knowledge about the species, it seems that the presence or the absence of algae, and the dominance of one or other organisms could be not relevant to explain the occurrence of *D. laboreli* in any site.

Despite of what has been described by ZIBROWIUS & BRITO, *op.cit.* and BRITO & OCAÑA, *op.cit.*, the new data recorded in the Canaries makes clear the presence of the species on rocky bottoms with algae, animal dominance or without them.

Attending to such data about the colonies characters and its sites, we can conclude that Gran Canaria presents the population with more anatomical development and, as a consequence of that, it also may have better ecological perspectives (see Fig. 4 and 7). The presence of the species linked to productive waters and high water movement can be applied to the species of Anthozoa in a general perspective. However *D. laboreli* may occurs also out of these areas in the Canaries as the population of the Roques de la Iguala in the South of La Gomera. We also should take into account that we do not know very much about the presence of *D. laboreli* in the circalitoral of the islands but its presence may be important, although the searched and exploration efforts carrying on this bathymetric range (see AGUILAR *et al.* [1]; BRITO & OCAÑA *op. cit.*) in the islands till now do not show any single colony below 35 meters (see Fig. 7), and most of the colonies occurs between 20 and 30 meters. Meanwhile, in the continental African coasts the species can reach at least 70 meters deep (see ZIBROWIUS & BRITO *op. cit.*).

Distribution: Climatic fluctuations or vessels traffic?

In a recent data compilation, *D. laboreli* was not considered as an alien species in the Mediterranean Sea (ZENETOS *et al.*, [11]), due to the uncertain mode of introduction, although it is mentioned the possible influence of the climate warming in relation to this recent settlement in the Alboran Sea. LOPEZ-GONZÁLEZ *et al.* [6] discussed the possible expansion due to global warming as well as the human mediated (Alien definition in the sense of ZENETOS *et al., op.cit.*) by the intense maritime traffic that supports the south-western Iberian Peninsula. The same author enforces the lack of information along the Atlantic Morocco as the possible cause of not having a plausible framework of the distribution of *D. laboreli*. Meanwhile, the tropical and subtropical affinity of *D. laboreli* is an incontestable fact, as well as other species also present in the Alboran Sea (see OCAÑA *et al.* [9]; OCAÑA *et al.* [8]; ZENETOS *et al., op.cit.*). Another fact is the tendency to the increase of the temperature measured during the last 30 years in the Mediterranean Sea and its biological consequences (see THIERRY PEREZ [10]). The increase of some species and the presence of others, not known before in some Mediterranean areas, are the visible signs of biological changes in the Mediterranean Sea. According to this, it can be postulated that the presence of *D. laboreli* in the Mediterranean Sea, as it was published already in the case of *A. wollastoni* (see OCAÑA *et al.* [8]), may be due to the actual framework of climatic fluctuations. Nevertheless, the arrival of the species can be favoured by the vessels traffic or not, but what is interesting is that the species is expanding from the Africa continental coast, the south-western Iberian Peninsula and the Strait of Gibraltar into the Alboran Sea,

Figure 7.- Habitat and close up of a colony from the Canary Islands.

Figure 8.- Bathimetric distribution of the searched colonies in the Canaries.

with established populations, thanks to find a hospitable environment conditions. According to LOPEZ-GONZÁLEZ *et al.*, *op. cit.*, *D. laboreli* should not be considered aggressive to other species.

In the Canaries there are also consistent proves of the global warming in the sea (BRITO [3]), and also about the biological consequences, as the recent arrival of some species always linked with climatic fluctuation evens. In spite of the previous search efforts, the current marine biological exploration in the Canaries has been showing a higher presence of *D. laboreli* occurring along areas where the species was never recorded previously. This actual expansion towards new areas, especially in La Gomera and Gran Canaria (see Fig. 8) proves that the species has been colonizing southern areas with warmer waters. We can tentatively explain this phenomenon according to the effect of the climatic fluctuations on the distribution of the marine species, but always linked with the asexual reproduction improved by the moderate increase of the temperature.

The high number of single polyp corals concentration in Gran Canaria presumes large larvae production as a normal consequence of better environment conditions and an improving settlement of new colonies (see Fig. 4). *D. laboreli* is a moderate thermophile species apparently absent from the warmer sectors (see ZIBROWIUS & BRITO [12]) so a slightly increase of the temperature should be favourable to its expansion. In the species *Astroides calycularis*, have been discussed the possible response to moderate temperature increasing and its expansion in the Mediterranean Sea (GRUBELIC *et al.* [5]; OCAÑA [7]; OCAÑA *et al.* [9]).

ANNEXE

In July 2011, the species *D. laboreli* has been recorded in South Portugal littoral (the Algarve). The colonies were observed attached to rocky bottoms, influenced by sedimentation. Specimens from Portugal coast (exploration efforts were carried by OCEANA in the Algarve, Ilheus do Martinhal: 37º00,90'N 008º54,90'W, July, 2011) were searched by scuba diving. 15 colonies were recorded in the area showing 7, 5, 5, 4, 2 polyps and the others: two colonies among 5-6 polyps and eight among 1-3 polyps.

The colonies from the Algarve may be the most highly developed in the European coasts (up to seven polyps have been observed in the colonies). Unfortunately, LÓPEZ-GONZÁLEZ et al. [7] do not clarify the number of polyps among the colonies they studied, and for this reason, we can not assure or reject the previous idea. Nevertheless, in terms of polyps number and colony development, the colonies from Algarve are more similar to those from Taghazout, in the Sous region (Morocco) (see LÓPEZ-GONZÁLEZ et al., *op.cit.*).

Figure 1.- Image from Algarve showing a central colony with seven polyps.

The recent observations of *D. laboreli* in the Algarve (South Portugal) allow describing the habitat where the species occurs as a rocky platform and boulders with sediment influence at 21 meters depth. The bottom present typical benthic assemblages where algae

Figure 2.- Typical habitat of *D. laboreli* in the Algarve.

show low developed and are mixtured with a carpet of hydroids; also there is conspicuous presence of calcareous algae. The species of the gorgonian genus *Leptogorgia* spp., and Eunicella spp., are common in the area where the *D. laboreli* occurs. This environment keeps some resemblance with the next Mediterranean site commented below (with less gorgonian species) and also with the habitat observed along the southwestern Iberian Peninsula (see LÓPEZ-GONZÁLEZ et al., *op.cit.*)

The species only was found in one spot (Ilheus do Martinhal) where the water reach 20ºC, meanwhile in the other spots searched *D. laboreli* did not occurs and the sea water was between 16-18ºC. This fact enforces the climatic fluctuations as an important factor in order to explain the recent expansion of *D. laboreli.*

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