

# ***ADAPTIVE MANAGEMENT PLAN FOR RED CORAL (*Corallium rubrum*) IN THE GFCM COMPETENCE AREA***

SECOND PART - SOCIO-ECONOMIC ASPECTS

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## ABBREVIATIONS AND ACRONYMS

<b>CITES</b>	The Convention on International Trade in Endangered Species of Wild Fauna and Flora
<b>CoP</b>	Conference of Parties
<b>CPCs</b>	Contracting Parties and Cooperating non-Contracting Parties of GFCM of GFCM
<b>FAO</b>	Food and Agriculture Organization of the United Nations
<b>GFCM</b>	General Fisheries Commission for the Mediterranean
<b>IUCN</b>	International Union for Conservation of Nature
<b>MoU</b>	Memorandum of Understanding
<b>PACA</b>	Provence-Alpes-Côte d'Azur
<b>RMP</b>	Regional Management Plan
<b>SAC</b>	Scientific Advisory Committee
<b>SPA and BD</b>	Specially Protected Areas and Biological Diversity in the Mediterranean
<b>SPA</b>	Specially Protected Areas

## SUMMARY

The present document has been prepared to gather together all the available information useful for the first preliminary draft of a regional management plan (RMP) for red coral (*Corallium rubrum*) in the GFCM competence area.

It is prepared according to the Recommendation GFCM/35/2011/2 on the exploitation of red coral in the GFCM Competence Area that states:

“Scientific and technical knowledge acquired through the actions stipulated under paragraphs 3 (c), 5, 7 and 9 above shall be taken into account by SAC with a view to develop an adaptive regional management plan” (Paragraph 10)

and the Recommendation GFCM/36/2012/1 on further measures for the exploitation of red coral in the GFCM area that states:

“In addition to substantiate the Terms of Reference provided in the 2012 Work Plan of its Sub-Committee for Marine Environment and Ecosystems, and pending the development of a regional management plan for red coral, as requested by the Recommendation GFCM/35/2011/2...” (Paragraph 6)

“The GFCM Secretariat is requested to take actions in support of the SAC with a view to put into operation, not later than 31 May 2013, the adaptive regional management plan.” (Paragraph 7)

Three parts compose it:

‘FIRST PART – BACKGROUND INFORMATION’ contains data related to the distribution, biology, fishery, and legal instruments dealing with red coral

‘SECOND PART – SOCIO-ECONOMIC ASPECTS’ summarizes the main socio-economic data related to the red coral fishery

‘THIRD PART – MANAGEMENT of red coral’ contains the proposed the management for red coral

The first and second parts complement each other; only the combination of the two can give a complete picture of the past and present aspects concerning *C. rubrum*.

The second part is divided in four main sections:

**AT THE SEA (HARVESTING RED CORAL)**  
**AT THE WORKSHOP (PROCESSING RED CORAL)**  
**AT THE (JEWELLERY) STORE**  
**THE GLOBAL MARKET FOR PRECIOUS CORALS**

The first three sections contain data (figures) on the number of people, companies, and money generated by red coral are given, tentatively tracking its route from the sea to the benches of jewellers.

The last section contains information on other species or precious corals involved in trade. This is especially because in the global market, the 'fates' of precious and semi-precious corals are inextricably intermingled.

## PREMISE

Whilst there are thousands of species of corals on Earth, only a few are regarded as precious (or priceless), and harvested for treasures, collections, and precious jewellery; among them the oldest and most well known species is, without doubts, *Corallium rubrum* (Cooper *et al.*, 2011; Grigg, 2002; Grigg, 1993, 2010; Huang and Ou 2010; Torntore, 2009).

Apart from the fact that complete, independent and 'reliable' data on harvesting, manufacturing and trade of precious coral are not easy to find, a comprehensive analysis of all the commercial species is out of the scope of the present document.

Therefore, the following paragraphs are focused almost exclusively on *C. rubrum* and are intended to summarize the main socio-economic data with the aim of providing useful information to the understanding of the current situation and the decision-making process related to the management of the Mediterranean red coral.

## AT SEA (HARVESTING RED CORAL)

### COUNTRIES INVOLVED

The countries where the harvesting of the Mediterranean red coral is/was realized are less than a dozen: Albania, Algeria, Croatia, France, Greece, Italy, Malta, Montenegro, Morocco, Spain and Tunisia. Some of them have a long tradition in fishing, dating back to centuries, while others have been involved only recently (some decades ago) (for details see the section dealing with the history of red coral fishery). However, in some of these countries the harvesting of *C. rubrum* is not yet practised (e.g. Malta) or it has been (temporarily) forbidden (e.g. Algeria and Albania).

In 2010 (more recent data are not available at the time of writing), FAO dataset records production data for 9 countries (all the above mentioned except Algeria and Malta) totalling for about 54 tons of red coral (50.5 tons from the Mediterranean Sea, the rest from the Atlantic beds).

Nowadays, Torre del Greco manufactures supply with Mediterranean raw corals from France, Italy, Morocco, Spain, and Tunisia and in the past (when available) also from Albania, Algeria, and Greece. The imported raw coral is not usually re-exported but worked on site. (C. Conditto from ASSOCORAL, 2013, pers. comm.).

It is worth pointing out that, unfortunately, these are unofficial data on landings, not provided by Governments, but supplied to FAO by the Liverino company (Torre del Greco, Italy), a major import-export and coral jewellery wholesaler (Garibaldi in GFCM, 2011). Data on red coral production are provided by this same source on a regular base since the mid-1980s; while representing consistent information for trend analysis (data provided may also include IUU harvests that are otherwise not reported in official national data), there is a raising concern about a possible conflict of interest. These data may refer in some cases to trade information rather than to actual annual harvest) (Garibaldi in GFCM, 2010, 2011; Cannas *et al.* in GFCM, 2010). Recognizing the importance of continuous and unbiased data to carefully and independently evaluate the status of the species, FAO and GFCM would to progressively incorporate in their databases as much as possible data from official national sources (Garibaldi in GFCM, 2011). In particular, GFCM CPCs agreed to collect data on harvesting of red coral starting with the 2013 harvesting season (Recommendation GFCM/36/2012/1, Paragraph 8).

### PEOPLE INVOLVED

It is very hard to determine the exact number of people harvesting red coral. In general, they can be assigned to two categories: people materially collecting colonies (divers) and people indirectly involved in it (the crew and owners of the boats equipped for the diving, people involved in supplying services for the

SCUBA diving); while for the first ones some rough estimates can be tentatively presented, the number of the last category is almost impossible to define.

In the last years many countries have regulated the harvesting of red coral by defining a fixed number of authorized divers (or boats); the number of divers and the individual quota, whenever available, are summarized in the following Table 1; considering that the number of authorizations can sometimes vary from year to year, if not otherwise specified numbers and figures refers to 2010.

The numbers of divers shown in Table 1 are those indicated in the respective national legislations as the maximum number allowed in each year/for each area; those figures do not indicate the actual number of divers effectively working at sea, since often not all the licenses are granted in a given year/area or not all the divers with a valid license actually work.

**Table 1 FAO data on production (FAO Global Capture Production Database, 2010): number of divers, quota limits and potential quota (see main text and notes for details).**

Country	FAO data	Max divers	n°	Quota limit (if available)	Potential total quota
<b>Albania</b>	1.2 tons	na	na		
<b>Algeria</b>	--	100 <sup>1</sup>			8.9 tons <sup>1</sup>
<b>Croatia</b>	6.5 tons	15		200kg/license	3 tons
<b>France (PACA+ Corsica)</b>	9.3 tons	30 (20+10)		50kg/license <sup>2</sup>	na
<b>Greece<sup>3</sup></b>	2.8 tons	10		na	na
<b>Italy</b>	10.3 tons	30 <sup>4</sup>		2.5kg/license/day <sup>4</sup>	13.5 tons <sup>4</sup>
<b>Montenegro</b>	1.4 tons	na		na	na
<b>Morocco (Atlantic)</b>	3.6 tons	max 30 <sup>5</sup>		600 kg/boat <sup>5</sup>	6 tons <sup>5</sup>
<b>Morocco (Mediterranean)</b>	3.51 tons	max 30 <sup>5</sup>		500 kg/boat <sup>5</sup>	6 tons <sup>5</sup>
<b>Spain Atlantic</b>	-- <sup>6</sup>	max 10		400 kg/license	4 tons <sup>6</sup>
<b>Spain Mediterranean</b>	5.4 tons	37 <sup>7</sup>		400 kg/license	14.8 tons <sup>7</sup>
<b>Tunisia</b>	10.1 tons	na		na	na

**NOTES** 1 - since 2001 the harvesting is forbidden; the number and quotas refers to the whole territorial waters of Algeria (Décret exécutif n° 95-323 du 21 Octobre 1995) and to the past when red coral could be legally collected in the country; 2 -the quota applies from 2012 and only in PACA = Provence-Alpes-Côte d'Azur (Arrêté n °2012157-0001); 3 - in 2011 no licenses were granted (see country profile for details); 4 - numbers of divers and quota refers to Sardinia, data from the rest of Italy is not available; potential quota was obtained multiplying the potential numbers of days in that season (180) x n° licenses x daily quota; 5 - the licenses and quotas for harvesting are granted to boats (10 boats in each area and a max of 3 divers/boat). From 2010 the harvesting in the Mediterranean is supposed to be closed; 6 - FAO data in 2010 are available only for Spain Mediterranean, potential quota for Spain Atlantic was obtained multiplying the total n° of divers in Atlantic (10)\*individual quota; 7 - potential quota Spain Mediterranean was obtained multiplying the total n° of permits issued in Mediterranean in 2010 (37)\*individual quota, considering that the

quota limit of 400 Kg comprise both exterior and internal waters for the same license.

On the overall, it could be hypothesized that about 350 divers can be involved in the legal fishing of red coral summing up the 300 divers (see Table 1, comprising Algeria and considering that the harvesting will be reopened with the same number of licenses as it was in the past) and at least 50 more divers presumably working in Tunisia (30) + Albania (10) + Montenegro (10).

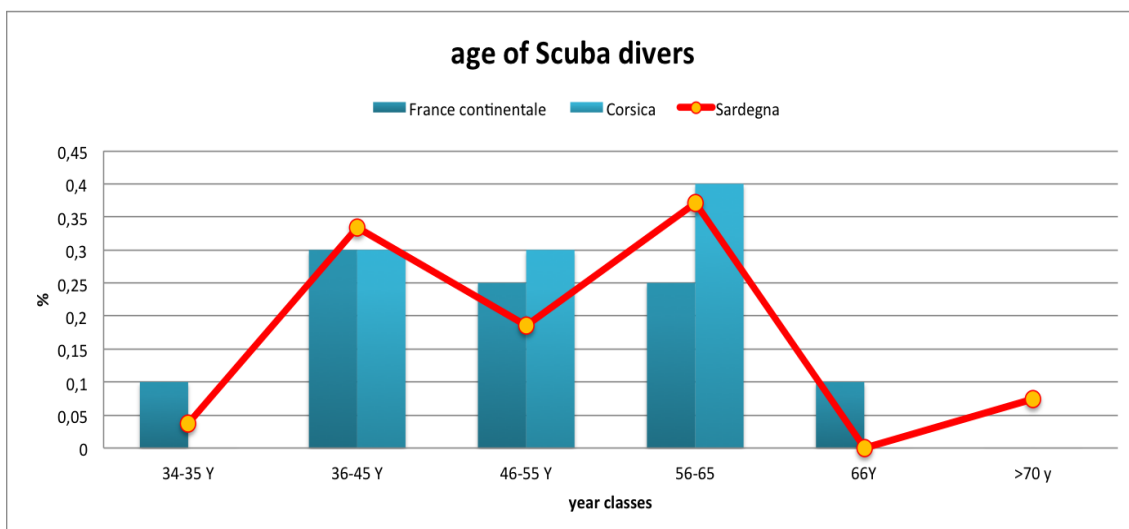
However, the actual number of people diving for red coral is supposed to be higher than that previously indicated, especially because in some areas the poaching seems to be very pervasive (CITES, 2007; CITES, 2010; Tsounis *et al.*, 2013; Tsounis *et al.*, 2010).

At the Costa Brava (Spain) all divers are natives and most of them in their 50s (the youngest is 45 year old). They usually form 2-3 person teams that dive together or in turns during the same trip (Tsounis *et al.*, 2010).

In Sardinia (Italy), 50% of the authorized divers are non-natives, the mean age is 52.6 years (ranging from 34 to 73 years) (data source Autonomous Region of Sardinia N.13984/DET/540, 12.07.2012); divers usually dive alone using mixed gas, from boats that are crewed by one coxswain and one diver (Andaloro and Cicogna, 1993).

In Corsica (France) all divers are French; the mean age is 52.4 years (ranging from 43 to 63 years) (Recueil des Actes Administratifs de Corse n°6, 2010). Similar figures are presented for the PACA region (France Continental) (see document by CRPMEM PACA Appendix F in GFCM, 2011).

The graph in Figure 1 summarizes data on age for divers authorized to harvest red coral in Sardinia (2012), France Continentale (2011) and Corse (2010).





**Figure 1 SCUBA divers harvesting red coral in France Continentale (PACA), Corsica and Sardegna (Italy) in % in the different classes of age**

In general 'young' divers (<34 years old) are absent, with the prevalence of those in the range 56-65 years.

As *Corallium rubrum* harvesting mainly concentrates on the warmer summer months (May –October), it means that most of the divers are effectively working part time, and have often invested into other businesses as well (Tsounis *et al.*, 2010).

As concerns the number of people indirectly involved in the harvesting, it is impossible to be determined from the available data; for instance, in some countries divers can work in couple or triple and hence share the crew or own the boat they use.

The collecting of such kind of information and more in general the realization of a full socio-economic analysis of the sector should be regarded as a priority by the countries involved in red coral exploitation.

## REVENUES FROM RED CORAL

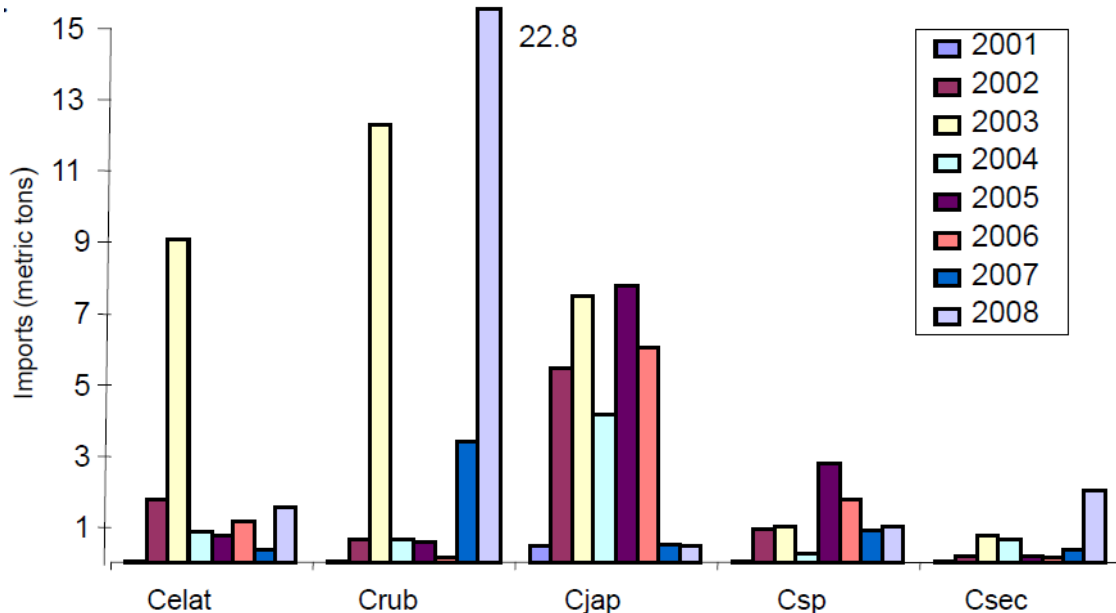
From the time of classical Rome, Italy has been the centre of Mediterranean red coral harvesting, manufacturing, and trading.

However, based on historic data collected and compiled by private industries, Sardinia coral (*C. rubrum*) has been imported and used in expensive jewellery in Taiwan (Huang and Ou, 2010 and references therein). This is also confirmed by the fact that in the years 1986-1988 substantial quantities of Mediterranean red coral were said to be exported to Taiwan and Japan for processing (GFCM, 1989). *Corallium rubrum* imported into Japan, was regarded as one of the most valuable presents to state officials, and is still highly revered (Tsounis *et al.*, 2010 and references therein).

Even in the very recent years relevant amounts of raw Mediterranean red coral have been exported from Italy to the US (CITES, 2010) and more recently to India and China (unconfirmed data, pers. comm. from Sardinian divers). In fact, taking advantage of the current economic crisis, Chinese and Indian buyers (without much experience in the field) are said to be purchasing, since a few years, in the Mediterranean raw coral from fishermen (C. Conditto from ASSOCORAL, 2013 pers. comm.). This fact leads to market distortion and loss of added value to the artisans of the Mediterranean countries, in particular in Morocco, Tunisia, and Italy (C. Conditto from ASSOCORAL, 2013 pers. comm.)

For instance, according to the data provided by the U.S. Fish and Wildlife Service from 2001 to 2008 the U.S. imported unworked skeletons of *Corallium rubrum* from Italy (Figure 2) (CITES, 2010); this is probably due to the marketing of

stockpiles rather than the discovery and harvesting of new coral beds (Grigg in IUCN/TRAFFIC, 2007).



**Figure 2 - Imports of five species of *Corallium* into the United States from 2001 to 2008. *C. elatius* = Celat, *C. rubrum* = Crub, *C. japonicum* = Cjap, *Corallium sp. nov.* = Csp, *C. secundum* = Csec. A. Total imports refer to unprocessed *Corallium* skeletons reported by kg. Source: U.S. Fish and Wildlife Service import data (from CITES, 2010)**

The market price of raw red coral varies consistent with its quality and origin. According to the information provided by Borrás, a Spanish coral manufacturer, during the first GFCM technical consultation in 1984 (GFCM, 1984), red coral colonies are classified in five different categories: tips, third category colonies (mainly < 7 mm of trunk diameter), second category colonies (7-9 mm of trunk diameter), first category colonies (>10 mm of trunk diameter, usually 12-14 mm) and special category colonies (>14 mm in diameter and >100 g in weight). The quintessential profitable red coral colony should have the following characteristics: 15 \* 12 cm in size, approximate weight of 100 g, 10-15 mm diameter of the trunk and at least 4 mm thickness at the tips.

The quality (and value) can vary depending on whether the specimen was harvested as a living or dead colony (or a dead broken branch). Coral that was harvested live is the most valuable because of its deep colour and high translucency, decreasing as a dead coral ages on the ocean bottom (Cooper *et al.*, 2011). The quality of products made is also affected by damage from boring sponges of the family Clionidae, that creates a series of holes in the skeleton (Cooper *et al.*, 2011).

In 1984, the market price of raw red coral in Spain varied between 10000 pesetas / kg and 100000 pesetas / kg (approx. 61 US \$ to 610\$/kg, considering the conversion rate for that years) (Borras in GFCM, 1984).

The prices of by products like twigs and/or thin trunks, pieces and impaired remains for the costume jewellery market ranged between 30 and 70 pts / g (182-426 US \$/kg)(Borras in GFCM, 1984).

In the same years, the market price for red coral in Italy ranged from 40000/50000 to 400000/500000 Italian lire per kg (25-300 US \$, considering the conversion rate for that years) depending on the quality, size and other elements that should be assessed case by case even for colonies caught in the same area (Iacobelli in GFCM, 1984). At that time, in order to make profit, a boat (dredges were still in use) or a diver needed to collect about 200 kg of coral a year (Iacobelli in GFCM, 1984).

According to the Chairman of the Association of Coral Producers of Torre del Greco, until the 1970's all kinds and qualities of coral were easily marketed (GFCM, 1989). Later, in the mid-80's there was a strong request only for dark red coral of high quality while clearer corals can hardly be sold. Certain types of corals, although available on the market at reasonable prices were not any more interesting for the processing industry, this was reflected also in decreasing of the overall quantity of coral processed at Torre del Greco in those years (GFCM, 1989).

Some year later, in Morocco red coral was sold to about 68 US \$/kg (8 tons for a total of 6 millions Dh, source Département des Pêches Maritimes, 2000).

Today, *C. rubrum* is still sold for relatively high prices: in Torre del Greco are prevalently worked medium and big sized colonies whose prize can range from a minimum of 200 to a maximum of 2000 €/kg (in cases of colonies of extremely high quality)(C. Condito from ASSOCORAL, 2013 pers. comm.)

Unconfirmed information indicates that single, large *C. rubrum* colonies with a basal diameter of more than 4 cm are reportedly sold for as much as 45,000 Euro per colony (Tsounis *et al.*, 2010).

Tropical *Corallium* species are also of high value. To have a term of comparison, in 2009 the prize/kg of the momo coral (*Corallium elatius*) in the Taiwanese auctions ranged from 840 to 2031 US \$/kg, while for Aka coral (*C. japonicum*) the prize was 1093 US \$/kg (Huang and Ou, 2010). Considering an average trading price of 1437,5 US \$ per kilogram, the total value for the production in 10 months only in 2009 works out to be about 4 million US \$, which averages to a monthly income of 7800 US \$ per vessel. The net profit after depreciation and overheads such as labour costs, fuel, provisions and maintenance is very little, and in some cases not even achieved (Huang and Ou, 2010). Recently, a large *Corallium elatius* colony 1.1 m high and weighing 67 kg was reported to have

been sold for about US \$ 100,000–300,000. It is not clear, however, if colonies of this size occur in sufficient quantities to make fishing trips commercially worthwhile (Tsounis *et al.*, 2010).

Large jewellery pieces of *C. elatius* that were sold to tribal groups in Nigeria during the 1960s are now being bought back by the industry to be resold to the luxury market, indicating a shortage of large tropical *Corallium* colonies (Tsounis *et al.*, 2010).

## AT THE WORKSHOP (PROCESSING RED CORAL)

### A BRIEF HISTORY

The Mediterranean red coral has been made into beads and used by diverse cultures around the world for millennia (Torntore, 2009). The processing of *Corallium rubrum* dates to at least the Classical period and continued through the Middle Ages, with major exports from Rome to India (CITES, 2007). Throughout history, there were various centres of coral jewellery manufacture. In the tenth and eleventh centuries, Marsa'el Karez on the northern African coast was the largest coral port and trade centre. In the same period Genova, Trapani and Provence competed in the production of beads (paternostri) and coral artefacts (Liverino, 1998). In general, Sicilian products were sent to the Eastern markets, while Ligurian and Provençal in Northern Europe (Liverino, 1998).

In the fourteenth century, Paris and Barcelona were famous for its coral art (Liverino 1998); later, the main activity shifted to Lisbon and in the seventeenth century to Marseille, parallels between these shifts have been attributed to Jewish migrations (Tsounis *et al.*, 2010 and references therein).

By the 17th century the major centres of the red coral processing (and trade) were Naples, Marseilles and Livorno, with exports to India and West Africa (CITES, 2007). From the 19th century till present, the processing of red corals is mainly centred in Torre del Greco (near Naples).

Actually, although Torre del Greco was involved in coral harvesting since 1500 (when it had dozens of 'coralline' boats sailing along the coasts of all the Mediterranean Sea), it has not yet entered into any type of coral processing until the early 1800s, following the foundation (1805) of the first workshop for the manufacturing of red coral by Paul Bartholomew Martin, granted of a ten-year exclusive concession for the working of "red gold". This was the decisive step towards the creation of a complete economic cycle – harvesting, working, sales (Ascione, 2010). Only a few decades later, in 1837, at the end of the concession, there were already numerous shops and eight large factories with more than fifty workers. The entire population seemed to be involved in activities tied to coral, not only in harvesting and decoration, but also in related concerns, from supply to shipbuilding (Ascione, 2010).

In 1862, there were 347 boats fishing for corals, which in 1864 rose to 1200 vessels fishing, with 24 factories in Torre del Greco (Italy) and 17,000 persons employed in total (Tescione, 1968; GFCM, 1984). The great influence of coral processing on the cultural and economic life of the town is further witnessed by the creation, in 1878, of a 'School for the processing of Coral', annexed to the original laboratory for semi-precious stones created about a century and a half earlier by Charles III of Bourbon (Monti in GFCM, 1989).

In those years (around 1880s) the discovery of the Sciacca banks (Sicily, Italy) destabilized the sector of coral (Ascione, 2010). The excessive abundance of coral gave rise to a crisis, caused by market saturation and depreciation of a large part of the production. In just ten years, the fall of prizes forced many workshops to close (D'Antonio, 1998). In the same period, given that the Sciacca coral revealed to be unsuitable for detailed and elaborate workings that the market wanted, the manufacturers survived the crisis putting aside the supplies already acquired and using other sources, that is importing corals from Japan (Torntore, 2009; Ascione, 2010). The Italian coral industry adapted to market demand and crafted large coral pieces of the popular pale pink coral, but it struggled to survive (Tsounis *et al.*, 2010). The need to invest large amounts of capital for the purchase of the raw material caused a severe selection process among the existing companies. At the beginning of the XX century, given the higher prices for raw material, the production abandoned lower levels and moved up to luxury jewellery. The predominant use of Oriental coral in the most expensive and exclusive production did not mean that Mediterranean coral was no longer used, which on the contrary was kept alive to safeguard the harvesting of raw material, fundamental for the economy of Torre del Greco (Ascione, 2010).

The coral trade, therefore, depended not only on the state of the resource but also on market forces and the political situation (Tsounis *et al.*, 2010).

In the 1950s, after a pause during World War II, there was a slowly growing increase in sales. With the reopening of the North African markets, in Nigeria, in the United States, and in the Far East, demand grew for both raw and worked coral, which in the meantime had been rediscovered by important jewellers such as Cartier, Boucheron, and Van Cleef (Ascione, 2010).

In the mid-1980's the market for red coral in its artisan and industrial aspect was still confined to Italy and to a few firms just created in Costa Brava and the Balearic Islands (Spain) (Borras in GFCM, 1984).

Today, Torre del Greco is still known for the high quality of their products, and as a luxury production centre. It is still among the most important locations in the world for the production of coral beads, competing with Taiwan and Japan, and it is the unique world centre for the processing of shell cameos (Torntore, 2009).

In Torre del Greco the issues related to the coral industry are very complex, both because of the industry's economic and productive impact on everyday life and because of its importance on the social and cultural traditions, illustrated in the old saying 'corals and cameos are such a part of Torre del Greco that life without them is like trees growing without roots' (Monti in GFCM, 1989).

## THE PROCESSING OF CORALS NOW

Until the XI century only the production of coral grains or 'paternostri' is mentioned in the documents; regardless to their size and value, they were used to make prayers beads for Muslims and Christians, and later necklaces (Liverino, 1998). Therefore, for a long time processing of red coral was limited to simple operations: cutting, rounding and polishing. Only towards the end of the seventeenth century pieces also took forms other than spherical (Liverino, 1998).

Essentially, methods of processing red coral today are the same as in the past. It is a highly labour-intensive process of working, done mainly by hand, with mechanization appearing only in some steps (Stampacchia and de Chiara, 2000; Torntore, 2009 and references therein).

In general, a main division exists between artisan-artists who make the semi-finished product and the companies that perform the remaining steps of the assembly and placement of the product on the market.

At least 12 different stages are necessary before the production process is finished: these involves the washing, cutting, shaping, cleansing, polishing and stringing of red coral colonies (Stampacchia and De Chiara, 2000). As an example of how time-consuming the process is, it takes between 10.5 and 14.5 days to produce one kilo of the small beads called 'pallini' (Torntore, 2009).

According to ASSOCORAL, the artisanal production in Torre del Greco is characterized by an extremely wide range of products making it difficult to establish a standard prize for worked corals; they can have a commercial value at the wholesale market extremely variable, related to the size, nature and quality of the product. For instance, the production of 'filame a palline tonde' (small round beads from 3 to 6 mm of top quality, which are usually obtained from colonies with basal diameter of 7 mm or greater) could reach an average wholesale prize of approx. 1500-2000 €/Kg. The prize is obtained by calculating not only the value of the raw material but also, and above all, the costs for the processing, that in this case is extremely high, and of the skilled labour. Obviously, if the diameter of the ball is smaller the cost will be lower, if larger will be greater. Other products, realized with cuttings and scrap, have a lower average value (C. Condito from ASSOCORAL, 2013 pers. comm.).

## SARDINIA CORAL AND THE OTHERS

After the crisis that followed the discovery of Sciacca banks, in the late 1800s, Italy started to import Western Pacific *Corallium* from Japan (Torntore, 2009), that is new species discovered in the markets at Madras and Calcutta (India) (Ascione, 2010).

Since then, Torre del Greco is not only processing the Mediterranean red coral but it is a major importer of other "precious corals." Historically the term precious coral referred to *C. rubrum* only, later the term expanded to incorporate all the Pacific Coralliidae corals.

*Corallium* corals are traded as whole, dried colonies and unworked branches and branch fragments as well as beads and manufactured jewellery (Cooper *et al.*, 2011). In general, they command high prices and near-global market demand. As a result, their trade is extensive, profitable and provides ample incentive for their harvest (Cooper *et al.*, 2011).

In 2000 in Torre del Greco, apart from *C. rubrum*, other *Corallium* species were worked: principally *C. elatius*, and minor quantities of *C. japonicum*, *C. konojoi* and *C. secundum* (Torntore, 2009).

According to Torntore (2009) nowadays 30% of the processed corals in Torre del Greco are *C. rubrum*, as 70 % are tropical *Corallium* species, all imported from East Asia. On the other hand, ASSOCORAL affirms that 60% of the coral used in Torre del Greco is of Mediterranean origin and only 40% of Asian origin. Moreover, in the last two years, partly due to the economic crisis as well as the inclusion in CITES App III of Pacific corals, the amount of coral imported from those countries is considerably decreased (C. Conditto from ASSOCORAL, 2013 pers. comm.).

Even before the current crisis, a significant dichotomization of demand between products of low price / quality and medium-high price / quality has occurred. The first type of products is usually made from made with Pacific corals (Stampacchia, 2010). Despite the more recent developments, therefore, the bulk of high quality production (and revenues) remains strongly linked to a specific raw material - the Mediterranean red coral -and to the skills and relationships that around it and from it have spread and entrenched for other materials and areas (Stampacchia, 2010).

In any case, it is true that many workshops and independent producers import both beads and the roughly shaped Pacific coral blanks and then finish them in Torre del Greco. These rough blanks are produced in Asian locations (mainly Taiwan) very inexpensively and in large quantities, making the final Italian product less expensive for the producer and more cost effective in the marketplace (Torntore, 2009).

Today, the term precious coral has been further expanded to incorporate in trade for jewellery and fashion markets many more coral genera (Torntore, 2009; Cooper *et al.* 2011).



## HOW MANY PEOPLE ARE INVOLVED IN THE PROCESSING OF PRECIOUS CORALS?

At the end of the 19th century, despite the crisis that followed the discovery of the Sciacca banks, some 82 craft enterprises were still active in Torre del Greco with more than 4000 workers; three-quarters of them were women (D'Antonio, 1998). Less than half of these employees work in the factories, while the remainder are clandestine and anonymous people who work within their own houses and has a indirect relationship with the company often mediated by the figure of the 'raccoglitore' (collector), who takes care of the distribution of the raw material and withdraws the worked material (D'Antonio, 1998).

Today, the processing sector of corals, cameos and gold in Torre del Greco is based on a domestic and international network particularly dense and articulated. At the local level, many companies work for many other close companies, with a division of the total work that gives space to the creativity of the artisans and the ability to follow the international markets and follow trends in a proactive manner (Stampacchia, 2010).

In 1982, in Torre del Greco there were some 150 factories employing 4,000 workers (GFCM, 1989).

In 1999, according to the research carried out by the Department of Business Administration of the University Federico II of Naples (Stampacchia and de Chiara, 2000) the number of workers declined. In fact, there was a total of 306 firms involved in coral manufacturing, with some 1,900 employees, including 1,300 internal workers and 600 workers at home; 88,2% of enterprises in the sector did not exceeded 10 employees and most of them were family-owned and family-run. In average companies were composed of 5.5 workers. In many cases, businesses had even just one internal worker, which often operates in his own home by having dedicated a part of this to the productive activity.

A substantial number of small companies specialize in outsourced processes for the larger companies. The three oldest companies ('Antonino De Simone', 'Ascione' and 'Liverino' established in 1830, 1855 and 1894, respectively) are significantly larger than the rest (Tsounis *et al.*, 2010). For instance, the firm Antonino De Simone, listed among the "150 historical companies of Italy", employs some 30 people, some of them working consecutively for them for 40 years.

The total turnover of the coral industry of Torre del Greco in 1999 was around 170 million Euros (US \$ 174 million at that time) (Pani in IUCN/TRAFFIC, 2007).

In 2009 in Torre del Greco there were about 270 companies with over 2000 employees (Stampacchia, 2010).

Updated figures, accessible in the Assocoral web site (<http://www.assocoral.it/dettdati.asp>; accessed on March 2013), are summarized in the following tables (Tables 2 to 5) and seems indicate a substantial stability in the sector.

**Table 2 – Number of workers in the cameos and coral sector in Torre del Greco**

<b>Total workers</b>	<b>2600</b>
<b>Total Induced employees</b>	4500
<b>Companies with 1 worker</b>	32%
<b>Companies with 2 or 3 workers</b>	31%
<b>Companies with more than 3 workers</b>	34%
<b>others</b>	3%

To have a term of comparison, today, the principal competitor (the Taiwanese coral industry) includes some 2,000-3,000 companies/workshops/factories and over 30,000 people who work with coral and depend on the coral sector in some way for their livelihood (Torntore, 2009).

**Table 3 - Year of foundation of the coral companies in Torre del Greco**

<b>Before 1950</b>	<b>35%</b>
<b>From 1951-to 1970</b>	21%
<b>From 1971 to 1980</b>	19%
<b>From 1981 to 1990</b>	15%
<b>From 1991 to 1999</b>	10%

In general, the familial traditions are passed down through the generations. In fact, more than 24% of companies are founded before the 1950s, while only 9% after 1990.

**Table 4 - Classes of sale figures of coral companies in Torre del Greco**

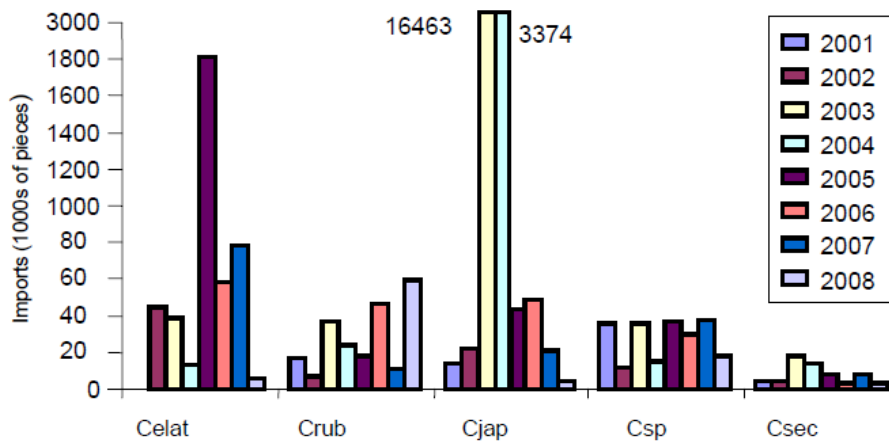
<b>Up to 250000 Euros</b>	<b>35%</b>
<b>From 250000 to 500000</b>	45%
<b>From 500000 to 2500000</b>	12%
<b>More than 2500000</b>	3%

**Table 5 - Subdivision of sales by type of customers for coral companies in Torre del Greco**

<b>Sale to the general public</b>	<b>9%</b>
<b>Sale to retailers</b>	27,3%
<b>Sale to wholesalers</b>	43,8%
<b>Sale to other companies in the sector</b>	19,6%

Apart from the processing, fifty companies are involved also in the distribution of the product, with special reference to exports (Japan, USA, Europe) which now accounts for over 75% of production (source ASSOCORAL web page).

In the period 2001-2008, Italy exported about 90% of all their precious corals to the U.S.; however, Italy's contribution to US imports decreased from 50% in 2002 to less than 4% in 2006 (Figure 3)(CITES, 2010).



**Figure 3 Total imports into the United States from 2001 to 2008 for manufactured *Corallium*, reported by piece. *C. elatius* = Celat, *C. rubrum* = Crub, *C. japonicum* = Cjap, *Corallium sp. nov.* = Csp, *C. secundum* = Csec. Source: U.S. Fish and Wildlife Service import data (from CITES, 2010)**

In 1988, the average annual value of coral exports from Torre del Greco amounted to nearly US \$ 30 billion (Torntore in CITES, 2007). However, Pani (in IUCN/TRAFFIC, 2007) rejects these figures and affirmed that the total turnover of the coral industry of Torre del Greco in 1999 was much lower, around 170 million Euro (US\$ 174 million at that time).

Nowadays on the whole, the specialized coral jewellery industry located in Torre del Greco is estimated to generate more than US \$ 230 million per year (according to data ASSOCORAL from Tsounis *et al.*, 2009); only part of this money comes directly from the *C. rubrum* trade.

Industry insiders say that the black market is significant, maybe totalling 50% of the trade (Tsounis *et al.*, 2010).

## AT THE (JEWELLERY) STORE

### MAIN MARKETS

Torntore (2009) has categorized three markets for coral objects: 'Fashion', 'Ethnic', and 'Tourist' markets. The Fashion market prefers highly refined beads, without imperfections, that require a great deal of hand work to shape, polish, and match. Beads directed to Ethnic markets are larger in many cases and less refined in shape and texture than that for the Fashion market. The Tourist market caters to producing and selling less expensive souvenir types of items using beads all produced from coral pieces that would otherwise be thrown out as unworkable (Torntore, 2009).

The red coral is closely linked to the overall touristic image Italy to the point that typical products are offered and sought after by foreign tourists both in Neapolitan area (Sorrento, Pompeii, etc.) as well as in other typical Italian tourist areas (Venice, Florence, etc.) (Stampacchia, 2010). Vendors promote coral jewellery sold in many of the smaller, lower-end tourist shops, as "Italian" (i.e., Mediterranean or *C. rubrum*) even though in most cases it comes from Japan or Pacific waters (Torntore, 2009).

In recent years, the decrease in the harvesting of the most precious *Corallium* corals has led to a proliferation in the market to the enhancing or bleaching and dyeing of lower quality *Corallium* corals and unrelated corals to create the desired product that resembles the gold standard (Torntore, 2009). Bamboo and sponge corals have appeared on international markets, often being died pink or red and sold as Coralliidae (CITES, 2010).

Similar to the fraud with coral pieces that are made of plastic or low-quality species, red coral dust (still sold as a cure against various maladies or as an aphrodisiac), is often made from sponge coral that is sold as *Corallium* powder (Torntore cited in Tsounis *et al.*, 2010).

### MARKET PRIZES

In the mid-1980s the red coral partially worked, ready to be crimped, combined or designed for precious jewellery, reached a price ranging between 300 pts/g and 1500 pesetas/g (1825 US \$ to 9125 \$ /kg) considering the wholesale price (Borras in GFCM, 1984). Then, after the increases due to the design, manufacturing, addition of other precious items the original price doubled and/or triplicated when the coral was sold to retailers and final customers (Borras in GFCM, 1984).

Even the costume jewellery (made with the coral powder or the tiny twigs, after triturating and mixing) represented an additional source of income and allowed

for the training of the staff (e.g. allowing practical training and enhancement of knowledge of the advanced professionalized techniques) (Borras in GFCM, 1984).

Today, *C. rubrum* worked beads are sold for 30-50 \$ per gram (Tsounis *et al.*, 2009; CITES, 2010), while finished necklaces can cost as much as 20,000-25,000 \$ (CITES, 2010).

According to ASSOCORAL the market average prize of the finished product, mentioned in the CITES proposal, is likely relate to retail prizes in the U.S. market. In fact, prizes are significantly increased (even tripled) at retail jewellers as include their operating costs as well as gains and accessory costs. Therefore, it may be that a large necklace of Mediterranean coral can cost \$ 20,000 but it is likely that it has also a nice closure of gold and diamonds (C. Condito from ASSOCORAL, 2013 pers. comm.).

## THE GLOBAL MARKET FOR PRECIOUS CORALS

### OTHER COUNTRIES

Apart from the number of species, since the 1970s the locations for processing *Corallium* have also expanded, including 'traditional' places such as Italy (since the Classical period and Middle Ages), Taiwan (since the 1920s), Japan, and India, as well as 'new' countries such as US and China (CITES, 2010).

In the period 1990-1997, the majority of Mediterranean raw coral is sold to India and Japan. In particular, India was/is a big competitor in purchases of raw Mediterranean red coral, which is manufactured there for internal use and for export to Tibet and Nepal. They used to bought also large quantities of fragments of corals ("frantumi" and "cascami"), necessary in the preparation of medicines (Liverino, 1998).

Moving to the Pacific, between 1960 and 1980 Taiwan's coral fishery products used to account for over 80 % of total worldwide production. The saying, "buy corals, visit Taiwan" was used to describe the glorious state of the industry at the time (Huang and Ou, 2010 and references therein).

Nowadays, Taiwan still occupies a very important position in the coral industry; approximately 90% of Taiwanese coral is exported—10% of this is raw and 90% is processed or finished in some form. In contrast to both the Italian and Japanese coral industries, Taiwanese sector is much larger, labour in Taiwan is much cheaper and therefore many products do not have to be expensive, high quality products (Torntore, 2009).

Japan and China are also important manufacturing centres, with an annual value in 1982 of US \$50 million (CITES, 2007), although a large proportion of the exports are semi-finished products (Tsounis *et al.*, 2010).

China has recently reported to have begun exporting large quantities of raw *Corallium* corals and processing them into beads at even lower labour costs for the global market, in direct competition with Taiwan. However, the available data is not able to show the quantity and status of trade (Wu and Takahashi, 2009).

The United States is the largest importer of precious corals, including unworked coral from China and Italy. While the United States does not export coral or coral products, a large part is sold to tourists (especially in Hawaii). China and Taiwan were responsible for 84% of 1,807,357 precious coral products imported into the United States in 2006 (CITES, 2007).

## TENTATIVES OF TRADE CONTROLLING

### CITES and red coral

As concerns trade regulations, three times proposals for listing the Mediterranean red coral in CITES were presented: in 1987 by Spain, in 2007 by USA and in 2010 by Sweden (in behalf of EU) and USA. Actually, the first time the proposal was focused on the species *Corallium rubrum*, the second proposal aimed at listing the whole genus *Corallium* and the last one at listing the whole family Coralliidae. All of them were rejected.

Since the documents are so numerous, and opinions quite contrasting (pros and against the listing) it is out of the target of this working document to deal with them. The following Tables 6-9 can help people particularly interested in deepening this aspect in having a reference guide.

**Table 6 - CITES Conferences of Parties (related to the red coral issue) – proposals and documents**

<b>CITES Cop6</b>		
<b>1987</b>	Ottawa (Canada), July 12-24	CITES Cop6 - Proposals for amendment of Appendices I and II Cop6 Prop. 61 by Spain Inclusion in Appendix II of <i>Corallium rubrum</i> Rejected
<b>CITES Cop13</b>		
<b>2004</b>	Cop13 Doc. 57	CITES- Proposed revision of Resolution Conf. 9.24 (cop12 Com. I. 3). Criteria for listing on Appendix I and Appendix II. Test of the applicability of the criteria - <i>Corallium rubrum</i>
<b>CITES Cop14</b>		
<b>2007</b>	The Hague, Netherland, June 3-15	CITES Cop14 - Proposals for amendment of Appendices I and II Cop14 Prop. 21 by USA Inclusion of all species in the genus <i>Corallium</i> in Appendix II of CITES The listing proposal was defeated in a secret ballot, failing to achieve a two-thirds majority with 61 votes in favour and 55 against. Rejected
<b>2007</b>	The Hague, Netherland, June 3-15	Additional information on biological and trade criteria for precious corals in the genus <i>Corallium</i> Cop14 Inf. 36 by USA
<b>2007</b>	IUCN/TRAFFIC	IUCN/TRAFFIC analyses of the proposals to amend the CITES appendices Cop14 Inf. 13
<b>CITES Cop15</b>		
<b>2010</b>	Doha (Qatar), March 13-25	CITES Cop15 - Proposals for amendment of Appendices I and II Cop15 Prop. 21 by Sweden, on behalf of the Member States of the European Community, and The United States of America Inclusion of all species in the family Coralliidae in Appendix-II of CITES The proposal was put to a vote, with a secret ballot requested by Tunisia, and was rejected with 64 votes in favour, 59 against and 10 abstentions Rejected
<b>2010</b>	IUCN TRAFFIC	IUCN/TRAFFIC analyses of the proposals to amend the CITES appendices CoP15 Inf. 18
<b>2010</b>	IUCN TRAFFIC	Summary of IUCN/TRAFFIC Analyses of the Proposals to Amend the CITES Appendices at the 15th Meeting of the Conference of the Parties CoP15 Inf. 18A
<b>2010</b>	Doha (Qatar), March 13-25	ICRI recommendation on international trade in corals, coral reef species and related products Cop15 Inf. 42 BY SAMOA
<b>2010</b>	Doha (Qatar), March 13-25	Additional information on the family Coralliidae Cop15 Inf. 48 by USA
<b>2010</b>	Doha (Qatar), March 13-25	International workshops on Coralliidae science, management and trade Cop15 Inf. 54 by USA
<b>2010</b>	Doha (Qatar), March 13-25	Conservation of and trade in Coralliidae species Cop15 Doc. 54 by USA



**Table 7 - FAO documents on CITES proposals (as regards red coral)**

<b>2007</b>	FAO Fisheries Report No. 833	Report of the second FAO ad hoc expert advisory panel for the assessment of proposals to amend Appendices I and II of CITES concerning commercially-exploited aquatic species.
<b>2010</b>	FAO Fisheries Report No. 925	Third FAO expert advisory panel for the assessment of proposals to amend Appendices I and II of CITES concerning commercially-exploited aquatic species

**Table 8 - Comments/documents by other subjects on proposals to list red coral on CITES**

<b>Cop14 Prop. 21</b>		
<b>2007</b>	Seaweb	Corallium in the red. Synopsis of literature for an Appendix II listing.
<b>2007</b>	Pani and Berney - IWMC	A review of the proposal to include the genus Corallium in Appendix II of CITES
<b>Cop15 Prop. 21</b>		
<b>2010</b>	WWF	WWF POSITION STATEMENT Proposal 21: Red and pink corals (Coralliidae)
<b>2010</b>	Seaweb	Synopsis of literature for an Appendix II listing for red and pink coral - Coralliidae in the red
<b>2010</b>	Pani - IWMC	PROPOSAL No. 21 Inclusion of the family Coralliidae in Appendix II. Ten reasons to reject the proposal

Actually, a timely restricted (January 1987 – June 1997) strict protection of *Corallium rubrum* was in place in Germany through the listing of the species in Annex 1 of Germany’s Federal Ordinance on Species Conservation. This resulted in a total prohibition of any commercial trade into Germany both from EU and non-EU Member States. In that period German customs was confronted with commercial imports of pre-manufactured and manufactured products made of other *Corallium* species with significant (irresolvable) identification problems on the species level for enforcement officials in particular for pre-manufactured products, jewellery, or products made of coral powder (Dietrich, 2010).

#### CITES and other corals

As regards other species of corals, in 2008, four species of Coralliidae had been listed by China on Appendix III of CITES: *C. elatius*, *C. japonicum*, *C. konojoi*, and *C. secundum*.

As a result, the Parties to the Convention were required to enforce the necessary CITES permitting requirements for those species. This in turn required enforcement and other authorities to identify products in trade made from Coralliidae to the species level in order to distinguish items made from the CITES-listed species from those not listed by CITES.

## RECOGNISING THE DIFFERENT CORAL SPECIES IN TRADE

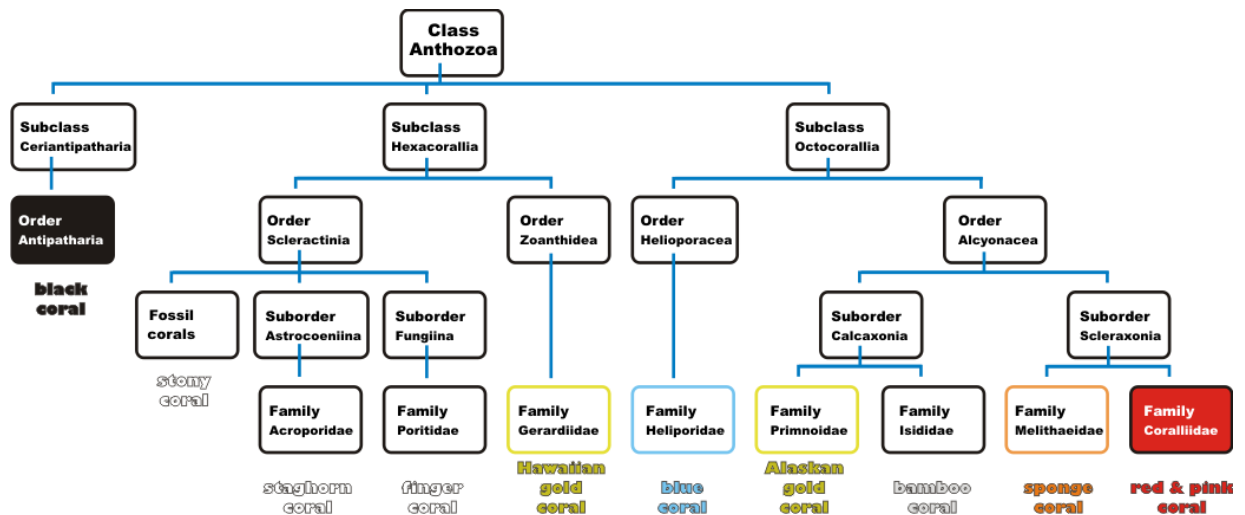
Considering that there are about 35 different species in the Coralliidae family (see taxonomy section for details) it is worth pointing out that only 7 species have populations large enough to support commercial harvest: six species are harvested in the Western Pacific and one is collected mainly in the Mediterranean (Table 9, from Cooper *et al.*, 2011).

**Table 9 Species, common names, and colour of commercially important Coralliidae (from Cooper *et al.* 2011)**

Scientific name	Common (commercial) name	colour
<b><i>Corallium elatius</i></b>	Pink coral, momoiro sango, momo	Light red, salmon, orange, and pink colours; interior core white
<b><i>Corallium konojoi</i></b>	White coral, siro sango	White; white with red or pink spotting
<b><i>Corallium regale (laauense)</i></b>	Pink coral Hawaii to the Milwaukee	Pink; may be streaked with white
<b><i>Corallium rubrum</i></b>	[Mediterranean] red coral, chichuukai sango, kowatari sango	Solid red; pale pink or white is rare
	Sciacca	Salmon or orange pink (bright or pale), occasionally yellowish marks
<b><i>Corallium secundum</i></b>	Midway coral, pink coral, angel skin, bokè, mittdo sango	White, spotted pink, light pink
<b><i>Corallium sp. nov.</i></b>	Midway deep-sea coral, sinkai sango	Bright pink with strong red markings (never a solid colour)
<b><i>Paracorallium japonicum</i></b>	Red coral, aka sango, tiaka	Dark to very dark red, blood red; interior core of white

Different methods for identifying the species of corals exist; in particular for *Corallium* corals, they depend on whether the coral specimens are still in a raw state or have been worked or processed. Where raw or dead corals are concerned, these can usually be identified to species level (CITES, 2010). In some cases (e.g. when dealing with white or very pale specimens), the visual identification of worked coral and manufactured goods is very difficult (Cooper *et al.*, 2011).

Apart from the red and pink corals (Coralliidae), species of commercial importance are the "bamboo" corals (Isididae), the "sponge" corals (Melithaeidae), the Antipatharian "black thorny corals", the "golden" corals (Primnoidae, Gerardiidae), the "blue" corals (Heliporidae), the "stony" corals (Scleractinia), that encompasses the "fossil", the "finger" and the "staghorn" corals (Cooper *et al.* 2011). Figure 4 (redrawn from Cooper *et al.*, 2011, with minor modification as concerns the classification of some taxa) summarizes the main orders and families involved in commercial trade.



**Figure 4 - Phylogenetic relationships among the precious and semi-precious corals of commercial importance (redrawn from Cooper *et al.* 2011; the classification follows that reported in WoRMS, 2013).**

Features sufficient for reliable identification do not exist for skeletons or as manufactured jewellery and curios, which is the bulk of the trade (CITES, 2010). Nonaka and Muzik (2009) note that some identification reported in the scientific literature and identifications by commercial sources are doubtful.

Taxonomic identification of octocorals requires microscopic analysis of shape, size and colour of sclerites embedded in the coenochyme and in the organic matrix of the axial skeleton, and these are lost when processed for jewellery. Identifying worked pieces of Coralliidae to species level could eventually be possible with use of laboratory techniques such as DNA analysis (Cooper *et al.*, 2011).

However, it is worth pointing out that even this task is not an easy one. At present, the standard DNA barcoding system (based on cytochrome c oxidase subunit I) has been found to be 'unsuitable'; due to the low interspecific genetic divergence, it has been impossible to discern most Anthozoan species using this gene (Huang *et al.*, 2008; Shearer and Coffroth, 2008).

Particularly, where worked specimens contain multiple species, it may only be possible to identify worked specimens to the family level (CITES, 2010). For coral powder that might be in trade, species may not be readily recognizable unless labelled (CITES, 2010).

The introduction in national legislations of traceability systems and certification of origin for precious gems, hopefully and definitively would contribute to eliminate the problem of identification and fraud (C. Conditto from ASSOCORAL, 2013 pers. comm.).

Some recent papers (Torntore, 2009; Cooper *et al.*, 2011; and references therein) could give further information and insights for those who are interested in identification of precious and semi-precious corals in commercial trade.

## APPENDICES

### APPENDIX A

#### CITES

CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) is an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival. CITES is an international agreement to which States (countries) adhere voluntarily; however, it does not take the place of national laws. Rather, it provides a framework to be respected by each Party, which has to adopt its own domestic legislation to ensure that CITES is implemented at the national level. The species protected by CITES are listed in one of the three Appendices: Appendix I (species threatened with extinction. Trade permitted only in exceptional circumstances), Appendix II (species not necessarily threatened with extinction, but where trade must be controlled in order to avoid utilization incompatible with their survival), Appendix III (species are listed at request of individual countries in order to gain assistance from other CITES Parties in controlling the trade).

#### CITES and FAO

A Memorandum of Understanding (MoU) between FAO and CITES was adopted by the 10th Session of the COFI Sub-Committee on Fish Trade in June 2006 and signed by FAO and CITES during the 54th Meeting of the Standing Committee of CITES, on the third of October 2006. The MoU formalizes the intentions of the two Organizations in strengthening cooperation on issues related to commercially aquatic species listed on CITES Appendices and has been considered an important achievement by many FAO Member countries and Parties to CITES. Under the MoU, FAO and CITES will review and consult together on the scientific, legal and technical evaluation of commercially exploited aquatic species listed or proposed for listing in the CITES Appendices. For species that are already listed or set to become so, FAO will work with CITES and exporting countries to improve the monitoring and management of fisheries resources and help them ensure that exports only come from responsibly managed operations.

The following Table 10 summarizes the main documents related to CITES criteria and to the Memorandum of Understanding FAO/CITES.

**Table 10 Main documents related to FAO and CITES**

<b>FAO documents on CITES criteria</b>		
<b>2000</b>	FAO Fisheries Circular No. 954	An appraisal of the suitability of the CITES criteria for listing commercially-exploited aquatic species
<b>2001</b>	FAO Fisheries Report No. 667	Second technical consultation on the suitability of the CITES criteria for listing commercially-exploited aquatic species
<b>2004</b>	CITES	Conf. 9.24 (Rev. Cop13)* Criteria for amendment of Appendices I and II
<b>2004</b>	FAO Fisheries Report No. 741	Expert consultation on implementation issues associated with listing commercially-exploited aquatic species on CITES appendices
<b>2004</b>	FAO Fisheries Report No. 748	FAO ad hoc expert advisory panel for the assessment of proposals to amend Appendices I and II of CITES concerning commercially-exploited aquatic species
<b>Memorandum of Understanding (MoU) FAO/CITES</b>		
<b>2006</b>	FAO /CITES	Memorandum of Understanding (MoU)
<b>2006</b>	FAO	CITES issues with respect to international fish trade and the CITES/FAO MOU

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