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BLEACHING NEPTUNE BALLS

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Abstract: *Posidonia Oceanic is a seaweed from Mediterranean Sea and it is more concentrated at the Balerian SEA. This implies the Valencian Community also. It forms vaste underwater meadows in the sea and are part of the Mediterranean ecosystem. It is a seagrass specie with fruits and flowers. Leaves are ribbon-like and they grow in winter and at the end of summer some of them are separated and arrive to some sea line. Fuit is separated and can floate, it is known as "the olive of the sea" mainly in Italy, or as the Neptune Balls. As it can be used in different fields, it is is being studied in order ro have the precitice tests.*
Some authors have reported the manufacturing of fully bio-based comites with a gluten matrix by hot-press molding. And it has been considered as an effective insulator for building industry or even though to determine the presence of mercure in the Mediterranean sea some years ago. As many applications can be designed from that fibres, it has been considered to be bleached in order to used them in fashinable products. Consequently, its original brown color is not the most suitable one and it should be bleached as many other cellulosic fibres.
The aim of this paper is to bleache neptune balls however, the inner fibres were not accesible at all and it implied not to bleach the inner fibres in the neptune ball. Further studiesd will consider bleaching the individualised fibres.

Key words: *Fiber, seaweed, Neptune ball, bleaching, and cellulose.*

1. INTRODUCTION

Posidonia Oceanic is a seaweed from Mediterranean Sea and it is more concentrated at the Balerian SEA. This implies the Valencian Community also. It forms vaste underwater meadows in the sea and are part of the Mediterranean ecosystem. It is a seagrass specie with fruits and flowers. Leaves are ribbon-like and they grow in winter and at the end of summer some of them are separated and arrive to some sea line. Fuit is separated and can floate, it is known as "the olive of the sea" mainly in Italy, or as the Neptune Balls.

Because of a Eurpean directive about Habitats it is considered a Priority Habitat of Community Interest. However, When tehy arrive to the sea line, it is considered a solid residue which is water up taken from the sea in the beaches so as to clean them.

Some authors have reported the manufacturing of fully bio-based composites with a gluten matrix by hot-press molding [1]. And it has been considered as an effective insulator for building industry ore ven though to determine the presence of mercure in the Mediterranean sea some years ago. [2]. As many applications can be designed from that fibres, it has been considered to be bleached in order to used them in fashinable products. Consequently, its original brown color is not the most suitable one and it should be bleached as many other cellulosic fibres [3-6]. Some authors have reported its chemical composition [7] and some have used it as reinforcement of some composites [8]. However, not many papers have been published about the topic.

The aim of this paper is to bleache neptune balls however, the inner fibres were not accesible at all and it implied not to bleach the inner fibres in the neptune ball. Further studiesd will consider bleaching the individualised fibres.Regarles its concerns on environmental protection, it is importan to consider those fibres for some technical products or as the main component of some conventional garments. Thus it must be bleached so that it can follow the fashion standards in the future. The aim of this study is the suitability of bleaching Neptune balls in order to use them in a different color from the

characteristic brown as it can be observed in figure 1.

Fig. 1: *Neptune ball appearance*

2. EXPERIMENTAL

2.1 Materials

Seaweed from the Valencian Region have been used.

2.2 Bleaching

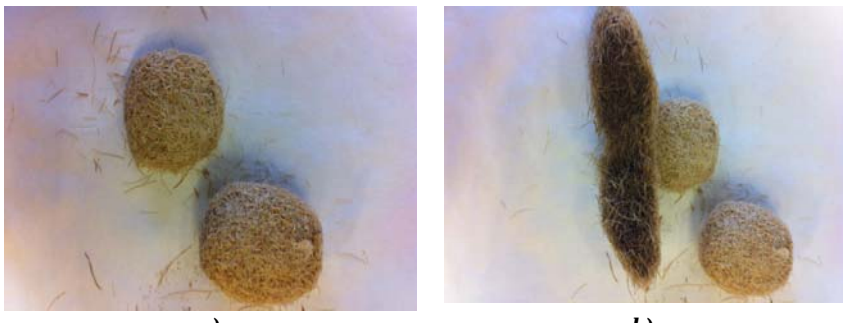
Two bleaching agents have been used, NaClO and H_2 O_2. NaClO has been used at room temperature with different concentrations considering a bath ratio of 1/40 for periods of time from 1 h to 12 h. H_2O_2 has been used at 100º C for periods od 1 h and the same liquor ratio.

2.4. SEM microscopy.

Fibres surface was obserbed by SEM microscopy. A scanning electron microscopy (Phenom Microscope FEI Company, Hillsboro, OR, USA) was used. Each sample was fixed on a standard sample holder and sputtered with gold and palladium accurately in order to convert the sample into a conductive one so as to be observed properly.

3. RESULTS AND DISCUSSION

Balls treated with NaClO were treated at different concentrations, 4gCl/L and 6 gCl/L. Balls were inmersen in the NaClO solution for 1 hour at room temperature. Then the balls were observed and as apparently no changes had occurred, it was observed in periods of 1 hour until 6 hoours had passed., although it seemingly no changes were observed they were rinsed wth water and dried at room temperature. Once the Neptune balls had been dried it was confirmed that no changes in colour were observed. Thus, some new balls were immersed in NaClO for 12 hours, and it could be appreciated a slightly difference in the fibre colour (figure 2).



a) ***b)***

Fig. 2: *Neptune ball appearance after 12 hours with NaClO. a) Otside part. b)inner part*

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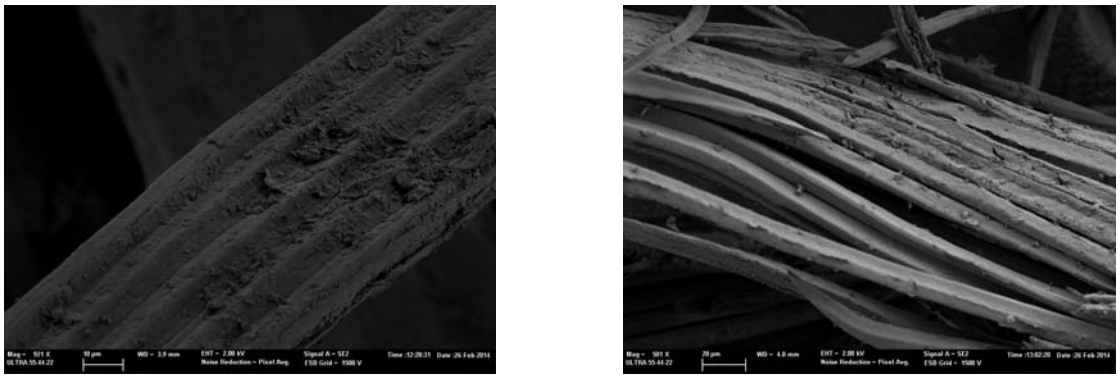
However, as soon as the balls were opened, it could be clearly appreciated that it was a superficial treatment and the inner parts were no affected by the changes in colour.

Simmilar behavior is appreciated when H_2O_2 samples were oserved, despite the fact that it was at boiling temperature.

The most streaking result to emerge from the data is that the most superficial fibres were treated but not the inner part, despite the high ratio of hydrophobicity stated by previous authors [1]. In order to determine the reason of its low reduction in the brown colours from the balls microscopy technique was used. Figure 2a shows the fibre and ot can be observes that it seems a grooved surface, and when it has been treated by different processes it seems to be divided into different hollow fibres, as it can be observed in figure 2b.



a) **b)**

Fig. 2: *Neptune ball appearance. a) without treatment. B) with NaClO (12 h) treatment*

However, when the fibres are observed conciosely, it can be observed that it is formed by different fibres which ares disposed in a way which offers the grooved surface. When the coating is removed, it is clearly appreciated that fibrils are hollow ones as it can be observed in figure 3. This is the reason why they flotate.

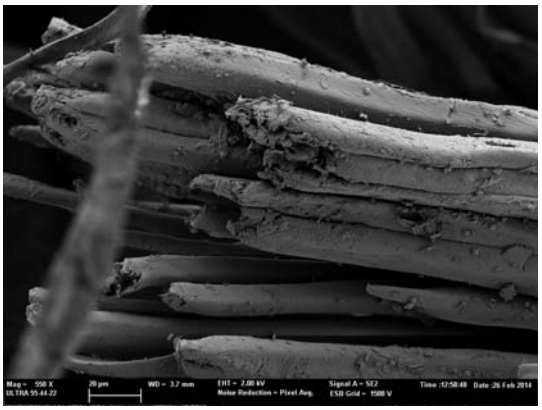


Fig. 3: *Neptune ball appearance after bleaching treatment.*

When fibres were trerated under long periods of time (12 hours) it can be appreciated that balls´surface show a courios state. It seems to be severely feltered on its surface and the reduction in brown colour is not considerably appreciated. Figure 4 shows this effect.

Fig. 3: *Neptune ball appearance after bleaching treatment in extreme conditions.*

4. CONCLUSIONS

It must be pointed out that the number of treatments could have been increased by the variation of different concentrations. However, it is not worth from an industrial point of view to treat the balls as its colour is slighty reduced and the inner fibres remain more or less in the same conditions. Further tests will control the belaching from Neptune fibres but not in the shape of balls but with the dibre without being sticked together.

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