

Marine fungi associated with the sea grass *Posidonia oceanica* (L.) Delil from East coast of Libya

ALMASRI, T.A¹ & Kafu, R.M²

¹The Educational inspection Authority- Tripoli

²Tripoli University, faculty of Education, Department of Biology

Abstract:

Marine fungi can be found in every marine habitat and are important organisms from ecological and biotechnological perspective. However there is little information on marine fungi in Libya. This study is to reports on fungi species associated to the seagrass *Posidonia oceanica*(L.) Delil. An endemic seagrass of Mediterranean Sea. Method used is that, the Organisms were isolated from landed plant of the seagrass *Posidonia oceanica* from different locations along the East costal of Libya. The collected specimens were examined within one week microscopically. Examined samples were then incubated for further 3-4 weeks in sterile glass chambers at room temperature and reexamined. Fungi were identified from fruiting bodies (Ascocarps or Pycnidia) or from superficial conidia in the case of Hyphomycetes. Standard identification keys were used. (12) Fungal taxa have been identified .The identified organisms belong to the classes, Ascomycetes (6) taxa, Hyphomycetes (5) taxa and Coelomycetes (1) taxa. *Pleospora pelagicum* (Ascomycetes) and *Camarosporium roummequeri* (Coelomycetes) were not reported, previously from Libya.

1. Introduction

The first evidence that fungi occur in marine habitats appear to date Back to (1846) (in kohlm, 1979) when Durieu and Montagne record the Ascomycetes *Sphaeria posidonia* (L.) Delile, (*Halothia posidonia*) on the rhizomes of the seagrass *P.oceanica*(L.) Delile in Algeria. Little attention So far has been given to the mycoflora associated with the seagrass *P.oceanica* and our knowledge on the occurrence of such fungi has been confined to the work of Kohlmeyer and Kohlmeyer, 1979, Cuomo et al., 1985, L.Panno, 2011.

In 2017 a survey study of 12 marine fungal taxa from different habitats in Libya was published. (6) Amongst them three marines species associated with the landed rhizomes of the seagrass *Posidonia oceanica* including; *Corollospora maretima*, *Halothia Posidonia* and *Pontoporia biturbinata*. However there is little information on marine fungi in Libya.

This study has been carried out to further document the marine fungi associated to the seagrass *Posidonia oceanica* from Libya.

Our objectives in this study are:-

1. The isolation and identification of fungi associated to the seagrass *P.oceanica*.
2. The comparison of the mycoflora associated to the different district of *P.oceanica* meadow.(Rhizomes and Leaves)

2 .Material and Methods

Our study was conducted in February and March, 2019. The landed young plants of the seagrass *Posidonia oceanica* (L.) Delile, were randomly collected from the following locations; Benjuad ,Raslanof ,Ghemis ,Bengasi and Susa. Along the eastern coast of Libya and transported in sterile plastic bags to the laboratory where they examined

microscopically. Sections of the samples examined (rhizomes and leaves) were placed on moist filter papers in sterile glass chambers and reexamined after 3- 4 weeks. Marine Fungi were identified from fruiting structure in case of Ascomycetes or conidia in case of Hyphomycetes. For Ascomycetes squash mount of fruiting bodies were prepared on slides mounted with water and then covered with slide. For initial examination water was replaced with lactophenol cotton blue for measurement of conidia and ascocarps and to reveal appendages on or around ascospores.

Results

In the present study a total of (12) fungal taxa were identified from the two district of *P. oceanica*: rhizomes and leaves. The Identified taxa belong to the class Ascomycetes (6) species, Hyphomycetes (5) species and Coelomycetes (1) species. Rhizomes were the district with highest number of fungal species. Many specimens, rhizomes and leaves that showed only mycelial growth initially develop fructification of *Halosphaeria*, *Leptosporia*, *Lulworthia*, *Pleospora*, species (Ascomycetes) and conid *Cladosporium* (Hyphomycetes) during incubation period of (3-4) weeks Table (1).

Most of criteria used in the identification of the Ascomycetes genera and species are related to the Ascospores characters (e.g. hyaline, unicellular or septate, and morphology of the sporulation structure (e.g. Ascus type, uni or bitunicate and ascospores appendages). The Hyphomycetes are generally separated on conidial structure, separation and shape. In Table (1) the number of species of marine fungi identified before and after 3 – 4 weeks of incubation

Table 1: Genera and species of Fungi isolated from rhizomes and leaves of *P. oceanica*

	Fungal species	Initial Examination	Incubation Period			
		Rh	L	Rh	L	Taxonomy
Ascomycetes						Ascospores
1	<i>Halosphaeria sp</i>	-	-	+	-	30 × 10-26 μ
2	<i>Halottia Posidonia</i>	+	-	+	-	1-1-5 cm
3	<i>Leptosporia sp</i>	-	-	+	-	4-6 × 20-26(50) μ
4	<i>Lulworthia sp</i>	-	-	+	+	4-6 μ × 160 -216 μ
5	<i>Pleospora pelagicum</i>	-	-	+	-	35-52 × 10-15 μ
6	<i>Pontoporia biturbionta</i>	+	-	+	-	42-52 μ × 46-80 μ
Hyphomycetes						Conidia
1	<i>Alternaria sp</i>	+	-	+	+	22-35 μ × 9-14 μ
2	<i>Aspergillus sp</i>	+	-	+	+	5-6 × 3-4 μ
3	<i>Cladosporium sp</i>	-	-	+	+	
4	<i>Fusarium sp</i>	+	-	-	+	Macroconidia 4-5 × 25-30 μ Microconidia 2 × 4-6 μ
5	<i>Penicillium sp</i>	+	-	+	+	2.5-3 × 2 μ
Coelomycetes						Conidia in pycnidia
1	<i>Camarosporium roumegueri</i>	+	-	+	-	10-25 × 7-10 μ

Rh=Rhizomes

L=Leaves

4. Discussion

The mycoflora associated to the four district of *Posidonia oceanica* L. (Delile) have a very low similarity. Rhizomes was the district with highest number of fungal species followed by matte leaves and roots (L.panno,2011). In the present investigation a total of (12) taxa were identified from the two districts, Rhizomes and leaves of the seagrass *P. oceanica* collected from the locations included in this study. The earliest evident fungal sporulation on the rhizomes of the seagrass *P. oceanica* were *Halothia Posidonia* and *Pontoporeia biturbionta* at the initial examination ,while the Ascocarp of *Lulworthia* , *Halosharia* , *Leptosphaeria* and *Pleospora pelagicum* developed on the same rhizomes during incubation period of 3-4 weeks. *Halothia Posidonia* and *Pontoporeia biturbionta* generally found commonly on washed up rhizomes along the Mediterranean coast. Kohlm 1972. Cuomo *et al*, 1985 surveyed the fungi associated to the seagrass *P.oceanica* on the Island of Ischia, Bay of Italy (Napoli), they reported that the most frequently identified fungus was *H. Posidonia* usually occurs on *P.oceanica* in marine habitat. The organism was among several fungi identified from mangrove leaf litter in India. Rajendran, N and Kathiresan, K, 2007. Rani and Panneerselvam, 2009 reported that *Leptosphaeria* spp. Are frequently occurred in wood samples collected from the intertidal regions of the Muthupet mangrove environment in east coast of India, while *Lulworthia sp* was occasionally found in such samples.

Many of the Hyphomycetes species found in the present study: *Alternaria Sp.* *Aspergillus Sp.* *Cladosporia Sp.* *Fusarium sp.* and *Penicillium sp.* were reported by L.Panno, 2011.associated with seagrass *Posidonia oceanica* ,They have been mostly shown to dominate in terrestrial habitats from wide range of host as well as in other marine sources ,i.e. sediments ,sponge, corals and sea fans. John and Sparrow,1937. The Coelomycetes *Camarosporium roumegueri* is a marine or salt marsh fungus occur predominately on halophytes Kohlm and Kohlm ,1979. In the present study the identified hyphomycetes became common on leaf district only after incubation of 2-3 weeks. Incubation is also thought to promote the sporulation of hyphomycetes. Meyers,S.P and Reynolds, E.S.1959.

5. Conclusion

In conclusion (12) fungal taxa have been identified from the seagrass *P.oceanica*. These taxa belong to the classes: Ascomycetes (6) taxa, Hyphomycetes (5) taxa and Coelomycetes (1) taxa. *Halothia Posidonia* and *Pontoporia biturbinata* species were reported previously from Libya. (Ghenghish M.S et al., 2004) More studies are needed in future to report the maximum number of fungal taxa associated to the seagrass *P.oceanica* from Libya.

6. References

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