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Craterium dictyosporum: A new record of Myxomycetes from Hatay, Turkey

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Abstract: In this study specimens were collected from Belen-Hatay Province of Turkey on various occasions during 2016. As a result of field and laboratory studies *Craterium dictyosporum* (Rostaf.) H. Neubert, Nowotny & K. Baumann reported for the first time from Turkey. Morphological, chorological and ecological characteristics of this species was determined. Microscopical and macro structures were taken by light and scanning electron microscopes (SEM).

Keywords: *Craterium dictyosporum*, New record, Taxonomy, Belen-Hatay, Turkey.

Introduction

Myxomycetes, myxogastrids or plasmodial slime molds; a monophyletic group of amoeboid protists, which are found in almost all terrestrial ecosystems (Novozhilov et al., 2013). They are mainly present on wet decaying plants materials and on soil. They are not regarded as decomposers because they are not true fungi and also feed on other microscopic organisms. Sporulation occurs at certain periods of the year and some members are associated with certain substrate types (Everhart and Keller, 2008). For example, a distinct group of Myxomycetes was reported to live on the bark surface of living trees (Tee et al., 2014). Although they are mostly cosmopolitan, several microhabitats have also been reported in forest ecosystems. Currently, myxomycota division contains 64 genera and 994 species (Lado, 2017). There have been several studies on Myxomycetes in various parts of the world (Harkonen and Uotila, 1983; Ing and Haynes, 1999; Stephenson, 2003; Liu et al., 2007; Ko et al., 2010) but Turkish myxobiota are still incomplete, there are 46 genera and 262 known species (Ocak and Hasenekoğlu, 2003; Ergül and Akgül, 2011; Süerdem et al., 2015; Baba et al., 2016; Sesli et al., 2016) and many species still awaits for identification.

Materials and Methods

Myxomycetes collected from different habitats of Belen-Hatay Province. The specimens, natural mature fructifications were obtained from the barks, debrises, natural substrata, woods, leaves and litters, and stored in cardboard fungarium boxes. In addition, the fructifications were obtained from the moist chamber cultures. Mostly plant materials such as woods, barks, leaves, debris etc. collected from different localities and were moistened with distilled water in petri dishes. Samples were daily analyzed under dissecting microscope. The developed fruiting bodies were allowed to dry. Then, same chambers were re-moistened for another 4 week period and analysis was performed as early described. The identification was done according to the respective references (Martin and Alexopoulos, 1969; Neubert et al., 1995; Ing and Haynes, 1999). Samples were arranged as fungarium material and kept in the Biology Departments laboratory of Mustafa Kemal University (Hatay-Turkey).

Results

Craterium dictyosporum is recorded for the first time from Hatay-Turkey.

Physaraceae

Craterium dictyosporum (Rostaf.) H. Neubert, Nowotny & K. Baumann, İn: Myxomyceten, 2: 194 (1995).

Syn: *Badhamia dictyospora* Rostaf., Sluzowce monogr. suppl. 4 (1876); *Badhamia rubiginosa* var. *dictyospora* (Rostaf.) Lister, Monogr. Mycetozoa, ed. 1, 35 (1894); *Badhamia obovata* var. *dictyospora* (Rostaf.) Lister ex Nann.-Bremek., Nedherlandse Myxomyceten (Zutphen) 273 (1975); *Craterium obovatum* var. *dictyosporum* (Rostaf.) Lister ex Nann.-Bremek., Guide Temperate Myxomycetes 179 (1991); *Craterium obovatum* var.

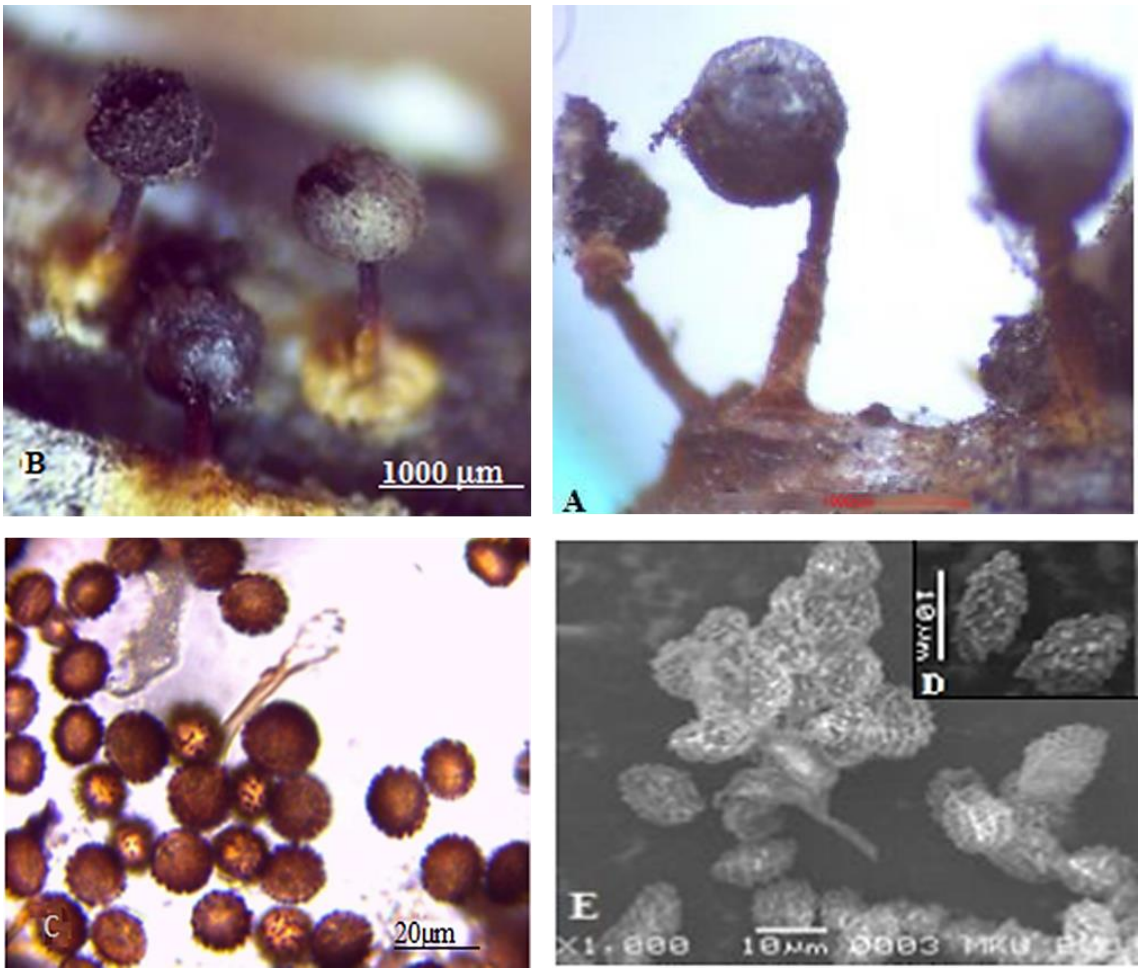

Figure 1. *Craterium dictyosporum*: A, B: sporangium; C, D, E: spores and capillitium; (A, B and C in light microscope; D, E in SEM).

dictyosporum (Rostaf.) G. Moreno & Illana, in Moreno, Illana & Burguete, Mycotaxon 46: 414 (1993).

Sporocarps; gregarious or densely crowded, usually stalked, total height 0.7-1.5 mm. Sporothecae usually ovate to obovate or sometimes globose, 0.2-0.8 µm diam. Hypothallus; discoid or confluent, brown. Stalk; pale brown, orange brown, paler below, pale orange brown to red brown, filled with irregular colourless lime scales up to 10 µm diam., 0.5-1 mm long, tapered upwards. Peridium; single, the upper half evanescent, grey and with brown lime flakes, the lower half persistent as a red-brown cup (Fig. 1A, B). Columella; pale brown, reaching to the centre of the sporotheca, up to 0.5 mm tall and 0.2 mm wide, the lower part opaque dull brown, the tip paler, filled with white lime. Capillitium; of lime-filled tubules, often connected by limeless threads or bands, sometimes filled with pink or white calcareous granules. Spore-mass black. Spores; brown to violet brown, sometimes paler on one side, 12-17 µm diam., irregularly verrucose, the warts dark, up to 1 µm high, arranged in rows and tending to form an incomplete network. Plasmodium; yellow (Figure 1C, D and E).

Specimens examined: Hasan Akgün, on fallen twigs of *Pinus brutia* Ten natural, Er, 148; Kömürçukuru, on dead log of *Pinus brutia* Ten, natural Hayri Baba, 384, 385.

Bracken and tree leaf litter on acid soils (Ing and Haynes, 1999), mosses, *Pinus*, *Picea* and *Betula* bark (Neubert et al., 1995).

Distribution: England, France, Germany, Israel, Italy, Japan, Netherland, Portugal, Spain, Uruguay, USA and now Turkey.

Discussion

Fruiting bodies of all members in Physaraceae are often limy, with non-crystalline lime granules and dark colored spore mass. Their capillitia are typically composed of calcareous nodes, connected by slender and hyaline threads (physaroid), or of calcareous tubes and thickened

nodes (badhamioid). General characteristics of *Craterium* genera is; fruiting body sporangiate, dehiscence often circumscissile or by a preformed lid, the lower portion always persisting as a deep cup. *Craterium dictyosporum* could be confused with *Craterium muscorum*, which has more globose sporangia, shorter, black stalks, more completely reticulate spores and a totally different habitat (Ing and Haynes, 1999). The most important feature for distinguishing *Craterium obovatum* are the spores. *C. obovatum* spores are dark violet or purple-brown, moderately to strongly warted, mostly 13-17 µm diam. The fructifications were found from July to December (Neubertet al., 1995). In our study *C. dictyosporum* is reported on leaves of some *Pinus* sp. *C. dictyosporum* was in Germany demonstrated scattered. This is known a rare species especially in Europe, North America, Morocco, India and Pakistan (Neubertet al., 1995).

Until now there were seventeen species of *Craterium* all over the world. In this study, we have identified *Craterium dictyosporum* for the first time in Turkey.and three species in Turkey; *C. concinnum*, *C. leucocephalum* and *C. minutum.*

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