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New Species of Fungi Recorded in the Azerbaijan Nature

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A B S T R A C T

Presented article was dedicated to study mycobiota of *Alhagi mourorum Medik* spreaded in the territory of the Absheron peninsula of Azerbaijan Republic. It became clear that, in the formation of mycobiota of plant was involved 8 species of fungi, which most of them belongs to the anamorphs of sac fungi and 2 species of registered fungi (*Botrytis longibrachiata* and *Aspergillus ornatus*) are new to the mycobiota of the Azerbaijan nature.

Introduction

Desert plants consist of important phytochemicals that are a cheap source of medicine for the local community. These phytochemicals are better than synthetic medicine for their harmless effects. The *Alhagi mourorum*, which belongs to the Papillonaceae family, is a branched herb of 1.5m rarely up to 4 m height and has the mentioned properties. Roots can reach up to 15-20 m in depth. The plant rapidly colonizes an area by producing new plants from its creeping roots. The stems of the plant are covered in sharp spines. Entire leaves are oval to lance shaped and are alternate along the stem. Small, pea like flowers are produced in June to August. The flowers from brown to dark red are growing rapidly, yellow sticks extends from 2.5 to 5 cm along the stiff branches. This species has a symbiotic relationship with certain soil bacteria. These bacteria from nodules on the roots and fix atmospheric nitrogen. Some of this nitrogen is utilized by the growing plant, but some can also be used by other plants growing nearby (Demirov *et al.*, 1988). Plant is rich with coumarin, essential oils, vitamin C, K_1, B_2, carotene, alkoloids and organic acids. The whole plant is diaphoretic, diuretic and laxative. Its flowers are used to treat migraine and verruca, oil extracted from its leaves treat rheumatism, and the aqueous extract of roots is used to remove kidney stones. The findings show that the therapeutic potential of the plant is broad-scale basis for photochemical and pharmacological studies (Demirov *et al.*, 1988).

Therefore, the purpose of this study was to investigate component composition of the mycobiota of *A.mourorum* spread in the various regions of Azerbaijan.

Materials and Methods

Samples for the research were taken based on known methods (Methods of experimental mycology, 1982) from vegetative and generative organs (that are supposed to be fungi) of plants growing in ecologically different regions of Azerbaijan (from the Absheron, Aran and Ganja-Gazakh economic regions). Either the obtained samples themselves or the solution gained after washing with sterile water were transfered into the nutrient medium. In both cases, getting pure cultures of fungi were kept in the thermostat (26-28 ^{0} C) and the colonies that emerged after 3-5 days were rarefied according to visual differences. These nutrient medium were used during the identification of fungi pure cultures.

The control of reception pure cultures was carried out by the microscope and identification using macro and micro feature. The identification of fungi was carried out using a variety of determinants (Samson and Pitt, 2000; Sutton *et al.*, 2001), drawn up under the culture-morphological and physiological properties of fungi.

Results and Discussion

Understanding the essence of the processes taking place in any ecosystem, clarifying the role of individual components start from identification of the taxonomic origin of living beings, and it is an acceptable approach in the case of mycological examinations.

Therefore, in the course of the research, the mycobiota of the *Alhagi* growing on the territory of three economic regions of Azerbaijan was characterized by the floristic composition. It has been clear that the number of fungi species involved in the formation of the plant's mycobiota equals to 8. The taxonomic structure of these species is summarized in Table 1. Apparently, 87,5% of the registered fungi belong to the anamorphs of sac fungi and 12,5% - to basidiomycetes.

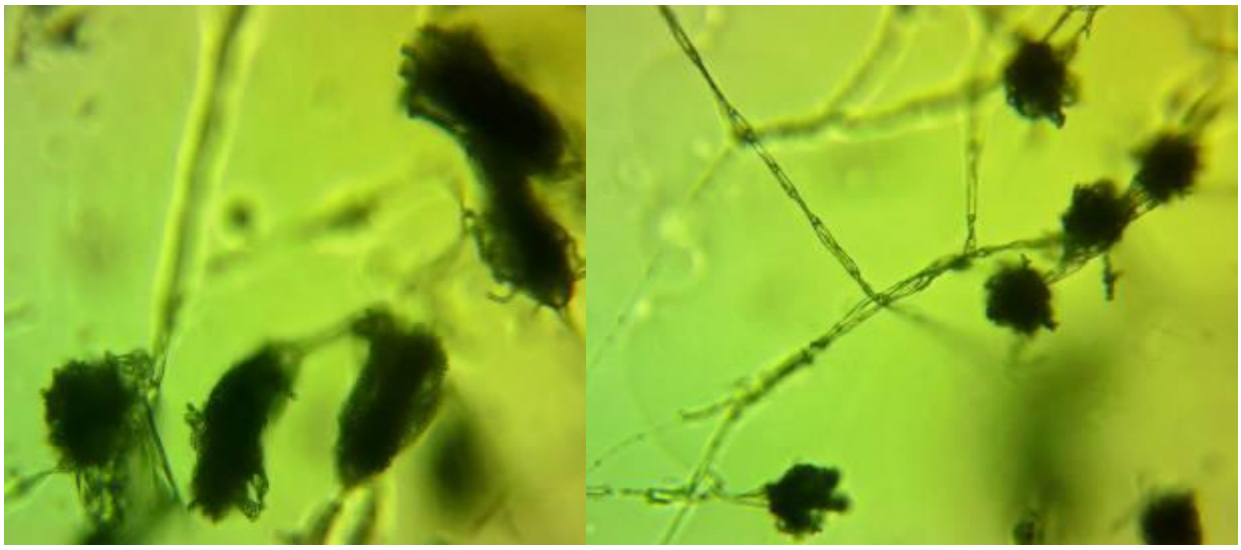
It should be noted during the reseach the fungi species 6 (*Aspergillus awamorii, Aspergillus repens, Aspergillus restrictus, Alternaria cucumerina, Fusarium oxysporium* və *Aspergillus niger*) from 8 registered reference information in the territory of Azerbaijan (Bakhshaliyeva, 2017; Hajiyeva, 2017; Ibrahimov, 2017). Another 2 species is not registered reference information in the territory of Azerbaijan, it means that the territory of Azerbaijan is characterized as a new species for these fungi.

Table.1 Taxonomic structure of fungi participated in the formation of mycobiota of *A. mororoum* plant

Division	Class	Order	Family	Genus	Species
Asco-mycota	Euromycetes	Eurotiales	Aspergillaceae	Asper-gillus	*A.awamorii, A. niger A.ornatus A.repens, A.restrictus*
	Dothideomycetes	Pleosporales	Pleosporaceae	Alternaria	*A.cucumerina*
	Leotio-mycetes	Helotiales	Sclerotinaceae	Botrytis	*B.longibrachiata*
	Sordario-mycetes	Hypocreales	Nectriaceae	Fusarium	*F. oxysporium*
Bazidio-mycota	Puccinio-mycetes	Puccinales	Pucciniaceae	Uromuces	*U.alhagi*

Fig.1 The mycroscopic view of *Botrytis longibrachiata*

Fig.2 The mycroscopic view of *Aspergillus ornatus*



The following points were focused on during the identification of fungi, the distribution of which in Azerbaijani nature was recorded for the first time.

***Botrytis longibrachiata* Oudem. (1890) (MB#229218)**

Syn.: *Botryosporium longibrachiatum* (Oudem.) Maire, Annales Mycologici 1 (4): 340 (1903) (MB#120804) – Colonies are open, white, of medium-density, hairy. Conidiophore is straight or slightly bent, the main body carries many small walls extending from the right side of the base of the conidiophore, a little or much bipalmate, septate. The occuring rays are usually narrowed and inflated in the apex, inflated group includes swollen cells producing conidium. Many conidia are located on the

surface of the apical part of the ampoule, they are ellipsoidal, uncoloured and non-septate (Figure 1). This fungus is widely spread on polymeric materials and forms a white plaque. Ecological and physiological characteristics have been poorly studied. The minimum growth temperature is 7^0 C, the optimum temperature is 22^0 C, the maximum growth temperature is 32^0 C (Figure 1).

Aspergillus ornatus Raper, Fennell and Tresner, Mycologia 45 (5): 678 (1953) (MB#292852)

Syn.: *Sclerocleista ornata* (Raper, Fennell & Tresner) Subram, Current Science 41: 757 (1972) (MB#323241); *Neosartorya ornata* (Raper, Fennell and Tresner) Malloch ans Cain, Canadian Journal of Botany 50 (12): 2621 (1973) (MB#318631); *Hemicarpenteles ornatus* (Raper, Fennell and Tresner) Arx, The genera of fungi sporulating in pure culture: 94 (1974) (MB#315094); *Hemicarpenteles ornata* (Subram.) Arx (1974) (MB#265227); *Hemicarpenteles ornatus* (Raper, Fennell and Tresner) Arx (1974) (MB#587552); *Chaetosartorya ornata* (Raper, Fennell and Tresner) Bilai and Koval, Aspergilly: 60 (1988) (MB#127681) – The colony is slowly formed, its diameter is not more than 2-2.5 cm, i.e., its growth is limited, constructional structures occur on the thin, semi-transparent, colorless vegetative covering, it is multi-cellular. Conidial heads are radial, they are typically 150-200 μm in diameter, the length of conidiophores reaches up to 650 μm, no cleistothecium was formed. The colonies are intensely formed on the beer agar, they reach up to 7-8 cm, and do not effect on the depth of vegetative micellium of the nutrient medium. Fungi are grown under the conditions of scattered light and changing darkness. The conidial heads are intensely formed under the light, their yellow-orange shades vary from prumiline-yellow to old gold or olive-lemon color, they are radial, vary in sizes, typically are 300 to 400 μm in diameter. Conidiophore is colorless, septate, mainly 1-1.5 mm in height, thickness is 1-1.5 μm, when 1 fluid drop is investigated it looks smooth, but when it is dry it becomes rough; an apical expansion is button like or flask-shaped, is typically 25-40 μm in diameter, only ¾ of the surface is covered with sterigmata. The sterigmata is single, 8-10 x 4.5-5.5 μm. Conidia are lemon or pear shaped, 6.5-8 x 5-6 μm, color varies from gold to light brown, stained by lactophenol, rough pigments come from the wrong ring of colored pigments. Reverse side (reverzum) does not change in color (Figure 2).

It became clear that, in the formation of mycobiota of *A. moruroum* involved 8 species of fungi which 2 species of them (*Botrytis longibrachiata* and *Aspergillus ornatus*) are new to the mycobiota of the Azerbaijan nature.

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