



Hyphomycetous fungi in several forest ecosystems of Black sea provinces of Turkey

Selçuk F^{1*}, Hüseyin E¹, Şahin A² and Cebeci CC¹

¹Ahi Evran University, Arts and Sciences Faculty, Department of Biology, 40169 Kırşehir, Turkey

²Erciyes University, Faculty of Education, Department of Sciences Education, 38100 Kayseri, Turkey

Selçuk F, Hüseyin E, Şahin A, Cebeci CC 2014 – Hyphomycetous fungi in several forest ecosystems of Black sea provinces of Turkey. *Mycosphere* 5(2), 334–344, Doi 10.5943/mycospere/5/2/7

Abstract

Hyphomycetous specimens were collected in forest ecosystems of the middle and east Black Sea coastal region. Sixty-nine taxa in 50 genera were recorded on various substrates including 20 plant families. *Sporidesmium*, *Pseudospiropes*, *Passalora*, *Periconia*, *Ramularia*, *Helminthosporium*, *Taeniolella*, *Monodictys*, *Bispora*, *Chalara*, *Trichothecium*, *Tubercularia* and *Volutella* were the common fungal genera. Fagaceae, Betulaceae, Buxaceae, Ulmaceae and Pinaceae are common host plant families.

Key words – Fungal diversity – hyphomycetes – microfungi

Introduction

Hyphomycetes make up the majority of what are commonly called moulds, and some are regarded as the weeds of the fungal kingdom. In addition to growing on many natural substrates such as plant tissues, wood and bark, dung, insects and other arthropods, and other fungi including lichens, and in a diversity of ecological habitats, moulds are involved in food spoilage, contaminate many manufactured materials such as wood, paper and textiles, and are frequent visitors to the human indoor environment (Seifert et al. 2011). Hyphomycetous fungi comprise more than 1800 genera and 9000 worldwide species (Kirk et al. 2008).

Hyphomycetes are a group of conidial fungi characterized by the formation of asexual spores (conidia) on conidiophores that are not contained in a fruiting body; i.e., without acrevuli or pycnidia, although some form sporodochia and synnemata (Ulloa & Hanlin 2012).

The flora of Turkey is very diverse (about 10500 species and subspecies belonging to 1233 genera and 173 families) and many studies have been carried out dealing with higher plants. However, the mycobiota is insufficiently investigated, except for macromycetes (generally Agaricoid fungi). Turkey is characterised by high diversity of woody plants. It is rich in the *Pyrus*, *Crataegus*, *Prunus*, *Cerasus* and *Amygdalus* species and other members of Rosaceae, which are source of genetic diversity of most industrial fruit trees. Turkey's higher plants have been very well studied, whereas the mycobiota has not been extensively investigated and most studies on the fungi have dealt with macromycetes. Some information concerning micromycetes growing on higher plants was provided by Bremer et al. (1947, 1948, 1952). The list of plant diseases occurring in Turkey, including those caused by hyphomycetes, was provided by Karel (1958). Studies on

mitosporic fungi were carried out by Göbelez (1967). Most studies on hyphomycetes dealt with soil fungi and species of *Penicillium* and *Aspergillus* (Ekmekçi 1975, Hasenekoğlu 1991, Azaz & Hasenekoğlu 1997, Özkan et al. 2001, Asan 2004). Other reports of biotrophic and saprobic hyphomycetes are by Hüseyinov & Selçuk (2000), Hüseyin & Selçuk (2001), Selçuk & Hüseyin (2001a, 2001b), Hüseyinov et al. (2002), Yüksel et al. (2002), Hüseyin et al. (2003), Selçuk et al. (2004, 2012), and Erdoğan et al. (2012).

Materials & Methods

Material for this publication was collected during 1998–2003 in different Black Sea coastal regions of Turkey. Specimens of the host plants were identified using the “Flora of Turkey and East Aegean Islands” (Davis 1965 – 1985). For the identification of fungi species numerous literature sources were employed (Vasilevskij & Karakulin 1937, Ellis 1971, 1976, Svarcman et al. 1973, 1975, Matsushima 1975, Osipyan 1975, Revay 1985, Sagdullajeva et al. 1989, Mel’nik & Popusoj 1992, Braun 1995, 1998, Braun & Mel’nik 1997, Mel’nik 2000, Seifert et al. 2011). Taxa, family, and author citations were listed according to Kirk et al. (2008), and Index Fungorum (www.indexfungorum.org, accessed 2013). Family and species names are listed in alphabetical order in text according to their systematic position. All specimens are deposited in the Mycological Collection of the Arts and Sciences Faculty of Ahi Evran University, Kırşehir, Turkey.

Abbreviations

FS: Collection number of Faruk Selçuk; GP: Giresun Province; OP: Ordu Province; RP: Rize Province; SP: Samsun Province; TP: Trabzon Province.

Results

As a result of the study more than 120 species of microfungi have been identified in this area. Among these microfungi, 69 species are hyphomycetes. The following is a list of species and collection data.

Kingdom Fungi

Division Ascomycota

Classis Dothideomycetes

Order Capnodiales

Family Asterinaceae

Triposporium elegans Corda (asexual *Batistinula*) – on dead branches of *Coryllus avellana*. RP, Çamlıhemşin District, Kale village, the Fırtına river basin, 1230 m a.s.l., 24.09.2001. (FS 0535); on dead wood of *Castanea sativa*. GP, Yağlıdere district, Ayvat village, near Çıldere, 1260 m a.s.l., 27.09.2001. (FS 0625); on dead branches of *Coryllus avellana*. RP, İkizdere district, road junction of Cimil, 338 m a.s.l., 18.08.2003. (FS 0768).

Family Capnodiaceae

Tripospermum myrti (Lind) S. Hughes (asexual *Trichomerium*) – on living leaves of *Sambucus ebulus*. GP, Yağlıdere district, Ayvat village, near Güllendere, 1300 m a.s.l., 27.09.2001. (FS 0601).

Family Metacapnodiaceae

Capnobotryella sessilispora (S. Hughes & Y. Hirats.) Sugiy. (asexual *Capnodiales*) – on dead branches of *Picea orientalis*, RP, Çayeli district, the Çürükbel river basin, 1250 m a.s.l., 25.09.2001. (FS 0447); on dead branches of *Picea orientalis*, RP, Hemşin district, Kito environ, 1526 m a.s.l., 16.08.2003. (FS 0712).

Family Mycosphaerellaceae

Cercospora depazeoides (Desm.) Sacc. (asexual *Mycosphaerella*) – on living leaves of *Sambucus nigra*, GP, Yağlıdere district, Ayvat village, near Güllendere, 1300 m a.s.l., 27.09.2001. (FS 0601).

Passalora bacilligera (Mont. & Fr.) Fresen. (asexual *Mycosphaerella*) – on living leaves of *Alnus glutinosa*, RP, Çayeli district, the Çürükbel river basin, 1170 m a.s.l., 25.09.2001. (FS 0566).

P. campi-silii (Speg.) U. Braun (asexual *Mycosphaerella*) – on living leaves of *Impatiens noli-tangere*. RP, Çamlıhemşin district, near Zilkale, 600 m a.s.l., 24.09.2001. (FS 0643).

P. dubia (Riess) U. Braun (asexual *Mycosphaerella*) – on living leaves of *Atriplex* sp. GP, Yağlıdere district, Ayvat village, 1000 m a.s.l., 27.09.2001. (FS 0644).

Pseudocercospora rubi (Sacc.) Deighton. (asexual *Mycosphaerellaceae*) – on living leaves of *Rubus caesius*. TP, Tonya district, 18 km from Vakfikebir to Tonya road, 560 m a.s.l., 26.09.2001. (FS 0571).

Ramularia angustissima Sacc. (asexual *Mycosphaerella*) – on living leaves of *Cornus sanguinea*. TP, Tonya district, 18 km from Vakfikebir to Tonya road, 560 m a.s.l., 26.09.2001. (FS 0572).

R. sambucina Sacc. (asexual *Mycosphaerella*) – on living leaves of *Sambucus ebulus*. GP, Yağlıdere district, Ayvat village, near Güllendere, 1300 m a.s.l., 27.09.2001. (FS 0601).

Stigmina obtecta (Petr. & Esfand.) M.B. Ellis (asexual *Mycosphaerella*) – on dead branches of *Morus alba*. RP, Çamlıhemşin district, Kale village, 1750 m a.s.l., 24.09.2001. (FS 0647); on dead branches of *Morus alba*. RP, İkizdere district, Şimşirli mineral water environ, 338 m a.s.l., 18.07.2003. (FS 0757).

Order Pleosporales

Family Pleosporaceae

Alternaria tenuissima (Kunze) Wiltshire (asexual *Lewia*) – on dead branches of *Fagus orientalis*. GP, Espiye district, near Forestry Manager, 10 m a.s.l., 27.09.2001. (FS 0618).

Curvularia lunata var. *lunata* (Wakker) Boedijn (asexual *Cochliobolus*) – on bark of *Fagus orientalis*. GP, Espiye district, near Forestry Manager, 10 m a.s.l., 27.09.2001. (FS 0618).

Pithomyces chartarum (Berk. & M.A. Curtis) M.B. Ellis (asexual *Leptosphaerulina*) – on bark of *Fagus orientalis*. GP, Espiye district, near Forestry Manager, 10 m a.s.l., 27.09.2001. (FS 0616); on dead branches of *Diospyros lotus*. GP, Yağlıdere district, Kanlıca village, 230 m a.s.l., 27.09.2001. (FS 0548).

Family Massarinaceae

Helminthosporium microsorum D. Sacc. (asexual *Massarinaceae*) – on branches of *Quercus cerris*. SP, near the buildings of Arts and Sciences Faculty of the 19 Mayıs University, 100 m a.s.l., 28.09.2001. (FS 0588).

H. velutinum Link 1809 (asexual *Massarinaceae*) – on dead branches of *Alnus glutinosa*. RP, Hemşin district, Çat high plateau, 1230 m a.s.l., 24.09.2001. (FS 0516); on dead branches of *Corylus avellana*. TP, Tonya district, 18 km from Vakfikebir to Tonya road, 660 m a.s.l.,

26.09.2001. (FS 0575); on dead branches of *Ulmus laevis*. GP, Yağlıdere district, Ayvat village, near Güllendere, 1260 m a.s.l., 27.09.2001. (FS 0641); on branches of *Quercus* sp. SP, Kurupelit, near the buildings of Arts and Sciences Faculty of the 19 Mayıs University, 40 m a.s.l., 28.09.2001. (FS 0595); on dead branches of *Alnus glutinosa*. RP, Çamlıhemşin district, the Fırtına river basin, Tozkaban environs, 990 m a.s.l., 22.10.2003. (FS 0807).

Family Melanommataceae

Sporidesmiella hyalosperma var. *hyalosperma* (Corda) P.M. Kirk (asexual *Melanommataceae*) – on dead leaves of *Carex diluta*. RP, Çayeli district, the Çürükbel river basin, 1100 m a.s.l., 25.09.2001. (FS 0646).

Family Mytilinidiaceae

Taeniolella alta (Ehrenb.) S. Hughes (asexual *Glyphium*) – on dead branches of *Alnus glutinosa*. RP, Çamlıhemşin district, the Fırtına river basin, 600 m a.s.l., 24.09.2001. (FS 0648); on dead branches of *Alnus glutinosa*. RP Hemşin district, Kantarlı village, around Gindeş, 880 m a.s.l., 24.10.2003. (FS 0843).

T. breviscula (Berk. & M.A. Curtis) S. Hughes (asexual *Glyphium*) – on wood of *Castanea sativa*. GP, Yağlıdere district, Ayvat village, near Çilderesi, 1200 m a.s.l., 27.09.2001. (FS 0596).

Family Tubeufiaceae

Helicomycetes scandens Morgan (asexual *Acanthostigma*) – on dead wood of *Fagus orientalis*. GP, Espiye district, near Forestry Manager, 10 m a.s.l., 27.09.2001. (FS 0615).

Family Incertae sedis

Periconia atra Corda (asexual *Pleosporales*) – on branches of *Robinia pseudoacacia*. RP, Ardeşen district, General management for afforestation, around Nursery, 803 m a.s.l., 25.10.2003. (FS 0878).

P. cookei E.W. Mason & M.B. Ellis (asexual *Pleosporales*) – on dead twig of *Ulmus laevis*. GP, Yağlıdere district, Ayvat village, near Güllendere, 1260 m a.s.l., 27.09.2001. (FS 0627); on dead twig of *Ulmus glabra*. RP, İkizdere district, Mountain Ovit, Dereköy environ, 900 m a.s.l., 18.07.2003. (FS 0771).

P. minutissima Corda (asexual *Pleosporales*) – on dry leaves of *Carex diluta*. RP, Çamlıhemşin district, Kale village, 1750 m a.s.l., 24.09.2001. (FS 0645); on dead branches of *Diospyros lotus*. GP, Yağlıdere district, Kanlıca village, 230 m a.s.l., 27.09.2001. (FS 0548); on dead branches of *Corylus avellana*. RP, Çamlıhemşin district, Kale village, the Fırtına river basin, 1230 m a.s.l., 24.09.2001. (FS 0535); on dead branches of *Corylus avellana*. RP, İkizdere district, Mountain Ovit, Dereköy environ, 900 m a.s.l., 18.07.2003. (FS 0772).

Sporidesmium coronatum Fuckel (asexual *Pleosporales*) – on twig of *Juglans regia*. RP, İkizdere district, Şimşirli mineral water environ, 338 m a.s.l., 18.07.2003. (FS 0760).

S. eupatoriicola M.B. Ellis (asexual *Pleosporales*) – on wood of *Fagus orientalis*. RP, Çayeli district, the Çürükbel river basin, 1330 m a.s.l., 25.09.2001. (FS 0549); on wood of *Fagus orientalis*. RP, İkizdere district, Şimşirli mineral water environ, 355 m a.s.l., 23.10.2003. (FS 0823).

S. folliculatum (Corda) E.W. Mason & S. Hughes (asexual *Pleosporales*) – on bark of *Fagus orientalis*. GP, Yağlıdere district, Kanlıca village, 230 m a.s.l., 27.09.2001. (FS 0548).

S. hormiscioides Corda (asexual *Pleosporales*) – on wood of *Fagus orientalis*. GP, Espiye district, near Forestry Manager, 10 m a.s.l., 27.09.2001. (FS 0620).

Ellisembia leptospora (Sacc. & Roum.) W.P. Wu (asexual *Sordariomycetes*) – on branches of *Buxus sempervirens*. RP, Çamlıhemşin district, the Firtına river basin, near Tozkaban, 930 m a.s.l., 24.09.2001. (FS 0514); on branches of *Cornus sanguinea*. TP, Tonya district, centrum of Tonya, 660 m a.s.l., 26.09.2001. (FS 0576); on branches of *Quercus cerris*. SP, Kurupelit, near the buildings of Arts and Sciences Faculty of the 19 Mayıs University, 100 m a.s.l., 28.09.2001. (FS 0590); on dead branches of *Buxus sempervirens*. RP, Çamlıhemşin district, Ayder high plateau, 736 m a.s.l., 15.07.2003. (FS. 0711).

Order Incertae sedis

Family Englerulaceae

Sarcinella questieri (Desm.) Höhn. (asexual *Englerulaceae*) – on living leaves of *Cornus sanguinea*. TP, Tonya district, 18 km from Vakfikebir to Tonya road, 560 m a.s.l., 26.09.2001. (FS 0572).

Family Myxotrichaceae

Oidiiodendron truncatum G.L. Barron (asexual *Byssosascus*) – inside of rotting bark of *Picea orientalis*. RP, Çayeli district, the Çürükbel river basin, 1650 m a.s.l., 17.07.2003. (FS 0742).

Family Incertae sedis

Bactrodesmium spilomeum (Berk. & Broome) E.W. Mason & S. Hughes (asexual *Stuartella*) – on wood of *Acer platanoides*. RP, İkizdere district, Çamçavuş environ, 560 m a.s.l., 18.07.2003. (FS 0786).

Monodictys putredinis (Wallr.) S. Hughes (asexual *Dothideomycetes*) – on dead branches of *Betula pendula*. RP, Çamlıhemşin district, Kale village, 1750 m a.s.l., 24.09.2001. (FS 0520); on dead branches of *Betula pendula*. RP, İkizdere district, Cimil high plateau, Başköy village environ, 1730 m a.s.l., 05.08.1999. (FS 0397).

M. spinosa Mercado, Heredia & J. Mena (asexual *Dothideomycetes*) – on dead twig of *Berberis vulgaris*. RP, Çamlıhemşin district, Kale village, 1750 m a.s.l., 24.09.2001. (FS 0531); on dead twig of *Berberis vulgaris*. RP, Çayeli district, the Çürükbel river basin, 1690 m a.s.l., 29.07.1998. (FS 0181a).

Classis Incertae sedis

Order Incertae sedis

Family Incertae sedis

Bispora antennata (Pers.) E.W. Mason (asexual *Pezizomycotina*) – on dead roots of *Fagus orientalis*. RP, Çayeli district, the Çürükbel river basin, 1330 m a.s.l., 25.09.2001. (FS 0548); on dead roots of *Fagus orientalis*. RP, İkizdere district, Mountain Ovit, 1029 m a.s.l., 18.07.2003. (FS 0778).

B. betulina (Corda) S. Hughes (asexual *Pezizomycotina*) – on wood of *Quercus petraea*. RP, Ardeşen district, Yurtseven neighbourhood, Afyon baba environ, 210 m a.s.l., 25.10.2003. (FS 0887).

Ceratophorum helicosporium (Sacc.) Sacc. (asexual *Pezizomycotina*) – on living leaves of *Castanea sativa*. RP, Çayeli district, 25 m a.s.l., 16.09.2000. (EH 008).

Chalara cylindrosperma (Corda) S. Hughes (asexual *Pezizomycotina*) – on cupules of *Fagus orientalis*. RP, Çayeli district, Çamlıbel around, 1640 m a.s.l., 25.09.2001. (FS 0552); on wood of *Ulmus laevis*. GP, Yağlıdere district, Ayvat village, near Güllendere, 1260 m a.s.l., 27.09.2001. (FS 0635); on cupules of *Corylus avellana* RP, Çamlıhemşin district, Kaplıca village environ, 800 m a.s.l., 22.10.2003. (FS 0817).

C. kendrickii Nag Raj (asexual *Pezizomycotina*) – on bark of *Rubus tereticaulis*. RP, Ardeşen district, Yurtseven neighbourhood, 445 m a.s.l., 25.10.2003. (FS 0870).

Cryptocoryneum condensatum (Wallr.) E.W. Mason & S. Hughes (asexual *Pezizomycotina*) – on dead branches of *Fagus orientalis*. RP, İkizdere district, around Tron river, 835 m a.s.l., 27.07.1998. (FS 0117).

Hydrometraspora symmetrica J. Gönczöl & Révay (asexual *Pezizomycotina*) – on bark of *Castanea sativa*. GP, Espiye district, near the Forestry Manager, 10 m a.s.l., 27.09.2001. (FS 0611).

Phragmocephala stemphylioides var. *stemphylioides* (Corda) S. Hughes (asexual *Pezizomycotina*) – on dead wood of *Alnus glutinosa*. RP, Çamlıhemşin district, the Fırtına river basin, Tozkaban environs, 600 m a.s.l., 24.09.2001. (FS 0538); on wood of *Alnus glutinosa* RP, Çamlıhemşin district, Fırtına river, Tozkaban environ, 990 m a.s.l., 22.09.2003. (FS 0806).

Teratosperma uniappendiculatum Matsush. (asexual *Pezizomycotina*) – on wood of *Castanea sativa*. GP, Yağlıdere district, Ayvat village, near Güllendere, 1260 m a.s.l., 27.09.2001. (FS 0625).

Xylohypha nigrescens (Pers.) E.W. Mason (asexual *Pezizomycotina*) – on dead wood of *Alnus glutinosa*. RP, Çamlıhemşin district, the Fırtına river basin, Tozkaban environs, 700 m a.s.l., 24.09.2001. (FS 0540); on dead wood of *Alnus glutinosa* RP, İkizdere district, 355 m a.s.l., 18.07.2003. (FS 0762).

Zygosporium oscheoides Mont. (asexual *Pezizomycotina*) – on dead branches of *Diospyros lotus*. GP, Yağlıdere district, Kanlıca village, 230 m a.s.l., 27.09.2001. (FS 0548).

Classis Leotiomycetes

Order Helotiales

Family Helotiaceae

Pseudospiropes hachijoensis Matsush. (asexual *Strossmayeria*) – on dead branches of *Fagus orientalis*. RP, Çayeli district, the Çürükbel river basin, 1330 m a.s.l., 25.09.2001. (FS 0549); on dead branches of *Fagus orientalis*. RP, Çamlıhemşin district, Ayder high plateau, Galer environ, 1695 m a.s.l., 15.07.2003. (FS 0702).

P. longipilus (Corda) Hol.-Jech. (asexual *Melanomma subdispersum* (P. Karst.) Berl. & Voglino) – on bark of *Betula pendula*. RP, Çamlıhemşin district, Kale village, 1750 m a.s.l., 24.09.2001. (FS 0520); on dead branches of *Betula pendula*. RP, İkizdere district, Cimil village, Başköy environ, 1730 m a.s.l., 05.08.1999. (FS 0397).

P. obclavatus M.B. Ellis (asexual *Strossmayeria*) – on bark of *Alnus glutinosa*. RP, Çayeli district, the Çürükbel river basin, 1650 m a.s.l., 17.07.2003. (FS 0744).

P. simplex (Nees) M.B. Ellis (asexual *Strossmayeria bakeriana* (Henn.) Iturr.) – on dead wood of *Alnus glutinosa*. RP, Çamlıhemşin district, Kale village, Çat high plateau, 1800 m a.s.l., 24.09.2001. (FS 0516); on dead branches of *Corylus avellana*. RP, Çamlıhemşin district, the Fırtına river basin, Tozkaban environs, 800 m a.s.l., 24.09.2001. (FS 0538); on dead branches of *Alnus glutinosa*. RP, Hemşin district, Mountain Kito, 885 m a.s.l., 16.07.2003. (FS 0725).

Family Incertae sedis

Cystodendron dryophilum (Pass.) Bubák (asexual *Mollisia*) – on living leaves of *Quercus pontica*. RP, Çayeli district, near Seslidere, 220 m a.s.l., 03.08.1999. (FS 0371).

Dactylaria junci M.B. Ellis (asexual *Helotiales*) – on dead stems of *Juncus effusus*. RP, Çayeli district, the Çürükbel river basin, 1250 m a.s.l., 25.09.2001. (FS 0637); on dead wood of *Fagus orientalis*. RP, Çamlıhemşin district, Ayder high plateau, Galer environ, 1498 m a.s.l., 15.07.2003. (FS 0709).

Trimmatostroma betulinum (Corda) S. Hughes (asexual *Helotiales*) – on dead branches of *Betula pendula*. RP, Çamlıhemşin district, Kale village, 1750 m a.s.l., 24.09.2001. (FS 0519); on dead branches of *Betula pendula*. RP, İkizdere district, Cimil village, Başköy environ, 1730 m a.s.l., 05.08.1999. (FS 0397).

Family Sclerotiniaceae

Mycopappus alni (Dearn. & Barthol.) Redhead & G.P. White (asexual *Sclerotiniaceae*) – on living leaves of *Alnus glutinosa*. RP, Çamlıhemşin district, the Fırtına river basin, 700 m a.s.l., 24.09.2001. (FS 0539); on living leaves of *Rubus canescens*. RP, Çayeli district, 300 m a.s.l., 16.09.2000. (EH 011).

Valdensia heterodoxa Peyronel (asexual *Valdensinia*) – on living leaves of *Vaccinium myrtillus*. RP, Çayeli district, Çürükbel high plateau, 1930 m a.s.l., 03.08.1999. (FS 0360).

Classis Sordariomycetes

Order Chaetosphaeriales

Family Chaetosphaeriaceae

Phaeostalagmus tenuissimus (Corda) W. Gams & Hol.-Jech. (asexual *Chaetosphaeria*) – on dead wood of *Picea orientalis*. RP, Çayeli district, the Çürükbel river basin, 1330 m a.s.l., 25.09.2001. (FS 0546); on dead wood of *Picea orientalis*. RP, Hemşin district, Mountain Kito, 885 m a.s.l., 16.07.2003. (FS 0726).

Order Hypocreales

Family Bionectriaceae

Clonostachys buxi (J.C. Schmidt ex Link) Schroers (asexual *Bionectriaceae*) – on leaves of *Buxus sempervirens*. RP, Çamlıhemşin district, the Fırtına river basin, Tozkaban environs, 930 m a.s.l., 24.09.2001. (FS 0513).

Dendrodochium rubellum Sacc. (asexual *Bionectriaceae*) – on dead and fallen branches of *Castanea sativa*. RP, Ardeşen district, Yurtseven environ, 564 m a.s.l., 25.10.2003. (FS 886).

Family Cordycipitaceae

Gibellula pulchra Cavara (asexual *Torrubiella*) – on spider on leaves of *Buxus sempervirens*. RP, 3 km from Ayder to Rize road, 1750 m a.s.l., 31.08.1999. (FS 444).

Family Hypocreaceae

Trichoderma piluliferum J. Webster & Rifai (asexual *Hypocrea*) – on bark of *Picea orientalis*. RP, Çayeli district, the Çürükbel river basin, 1150 m a.s.l., 25.09.2001. (FS 0547); on bark of *Picea orientalis*. RP, Ardeşen district, General management for afforestation, around Nursery, 810 m a.s.l., 25.10.2003. (FS 0879).

Family Incertae sedis

Myrothecium cinctum (Corda) Sacc. (asexual *Hypocreales*) – on dead and rotten leaves of unidentified host from *Poaceae*. GP, Espiye district, near Güllen canyon, 1160 m a.s.l., 27.09.2001. (FS 0642).

Stilbella byssiseda (Pers.) Seifert (asexual *Hypocreales*) – on bark and wood of *Alnus glutinosa* RP, Ardeşen district, Gültekinler environ, 150 m a.s.l., 25.10.2003. (FS 0862).

Trichothecium roseum (Pers.) Link (asexual *Hypocreales*) – on leaves of *Ulmus laevis*. GP, Yağlıdere district, Ayvat village, near Güllendere, 1260 m a.s.l., 27.09.2001. (FS 0635).

T. candidum Wallr (asexual *Hypocreales*) – on dead branches of *Alnus glutinosa*. RP, Hemşin district, road from Kantarlı to Kito, Gindeş environ, 890 m a.s.l., 24.10.2003. (FS 0836).

Family Nectriaceae

Tubercularia ciliata Ditmar (asexual *Nectria*) – on bark of *Alnus glutinosa*. RP, Hemşin district, road from Kantarlı to Kito, Gindeş environ, 890 m a.s.l., 24.10.2003. (FS 0836).

T. histerina Corda (asexual *Nectria*) – on dead and fallen branches of *Fagus orientalis*. RP, Hemşin district, Kantarlı village, Gindeş environ, 890 m a.s.l., 24.10.2003. (FS 0890).

Volutella buxi (DC.) Berk. (asexual *Pseudonectria buxi* (DC.) Seifert) – on leaves of *Buxus sempervirens*. RP, Çamlıhemşin district, the Firtına river basin, Tozkaban environs, 930 m a.s.l., 24.09.2001. (FS 0513).

V. ciliata (Alb. & Schwein.) Fr. (asexual *Pseudonectria*) – on bark of *Buxus sempervirens*. RP, Çamlıhemşin district, Tozkaban environ, 990 m a.s.l., 22.10.2003. (FS 0808a).

Order Xylariales

Family Xylariaceae

Dicyma ampullifera B. de Lesd. (asexual *Ascotricha chartarum* Berk.) – under bark of *Alnus glutinosa*. RP, Çamlıhemşin district, Ayder high plateau, Galer environ, 1640 m a.s.l., 15.07.2003. (FS 0706).

Order Incertae sedis

Family Apiosporaceae

Arthrimum morthieri Fuckel (asexual *Apiospora*) – on dead leaves of *Carex remota*. RP, Çamlıhemşin district, near Zilkale, 600 m a.s.l., 24.09.2001. (FS 0651).

Order Sordariales

Family Incertae sedis

Brachysporiella dennisii J.L. Crane & Dumont (asexual *Ascotaiwania*) – on dead branches of *Buxus sempervirens*. RP, Çamlıhemşin district, the Fırtına river basin, Tozkaban environs, 930 m a.s.l., 24.09.2001. (FS 0511); on dead branches of *Buxus sempervirens*. RP, İkizdere district, Çamçavuş around, 560 m a.s.l., 18.07.2003. (FS 0785).

Discussion

From all recorded Hyphomycetes, the Pleosporales order is characterised by the highest diversity of genera and species. Among Hyphomycetous, the genera *Sporidesmium*, *Pseudospiropes*, *Passalora*, *Periconia*, *Ramularia*, *Monodictys*, *Helminthosporium*, *Bispora*, *Chalara*, *Trichothecium*, *Tubercularia*, *Taeniolella* and *Volutella* are dominant according to the species numbers. *Alternaria tenuissima*, *Bispora antennata*, *Cercospora depazeoides*, *Ellisembia leptospora*, *Helminthosporium velutinum*, *Mycopappus alni*, *Passalora bacilligera*, *Periconia cookei*, *P. atra*, *Pseudocercospora rubi*, *Pseudospiropes simplex*, *Stigmina obtecta*, *Trichoderma piluliferum*, *Trichoderma roseum*, *Volutella buxi*, and *V. ciliata* are widespread and common on the forest ecosystems of Black Sea coast of Turkey. The species *Arthrimum morthieri*, *Brachysporiella dennisii*, *Capnobotryella sessilispora*, *Ceratophorum helicospodium*, *Clonostachys buxi*, *Cystodendron dryophilum*, *Dactylaria juncei*, *Gibellula pulchra*, *Helicomycetes scandens*, *Hydrometraspora symmetrica*, *Monodictys putredinis*, *Myrothecium cinctum*, *Phaeostalagmus tenuissimus*, *Phragmocephala stemphylioides*, *Pithomyces chartarum*, *Pseudospiropes hachijoensis*, *Sarcinella questieri*, *Sporidesmiella hyalosperma* var. *hyalosperma*, *Sporidesmium eupatoriicola*, *Taeniolella alta*, *Teratosperma uniappendiculata*, *Trimmatostroma betulinum*, *Tripospermum myrti*, *Triposporium elegans*, *Valdensia heterodoxa*, *Xylohypha nigrescens*, and *Zygosporium oscheoides* are rare. Large part of the identified fungi are saprotrophs (91 %), which develop on fallen leaves and dead branches or wood. The pathogenic species are members of *Ramularia*, *Stigmina*, *Chalara*, and *Mycopappus* genera.

References

- Asan A, 2004. – *Aspergillus*, *Penicillium* and related species reported from Turkey. Mycotaxon 89 (1), 155–157.
- Azaz AD, Hasenekoğlu I. 1997 – An investigation into the microfungus flora of field soils in the GAP (South eastern Anatolian project) irrigation area of Harran Plain. Turkish Journal of Botany 21, 165–172.
- Braun U, Mel'nik V. 1997 – Cercosporoid fungi from Russia and adjacent countries. Proceedings of the Komarov Botanical Institute. 20, 262–265.
- Braun U. 1995 – A monograph of *Cercospora*, *Ramularia* and allied genera (Phytopathogenic Hyphomycetes). IHV-Verlag. München.
- Braun U. 1998 – A monograph of *Cercospora*, *Ramularia* and allied genera (Phytopathogenic Hyphomycetes). IHV-Verlag. München.
- Bremer H, Ismen H, Karel G, Özkan M. 1948 – Beiträge zur Kenntnis der parasitischen Pilze der Türkei. Istanbul Univ. Fen. Fak. Mec. B 13(1), 1–53.
- Bremer H, Karel G, Bıyıkoğlu K, Göksel N, Petrak F. 1952 – Beiträge zur Kenntnis der parasitischen Pilze der Türkei. Istanbul Univ. Fen. Fak. Mec. B 17(3), 259–276.
- Bremer H, Petrak F. 1947 – Neue Kleinpilze aus der Türkei. Sydowia. Annales Mycologici II 1 (1-3), 248–263.
- Davis PH. 1965–1985 – Flora of Turkey and East Aegean Islands. 9 vols. Edinburgh University

Press, Edinburgh.

- Ekmekçi S. 1975 – Güney Ege bölgesindeki *Asperigillus* (Michell) Corda ve *Penicillium* Link türleri. Bitki 2, 19–29.
- Ellis MB. 1971 – Dematiaceous Hyphomycetes. Kew, CMI.
- Ellis MB. 1976 – More Dematiaceous Hyphomycetes. Kew, CMI.
- Erdoğan M, Hüseyin E, Selçuk F, Suludere Z. 2012 – A new genus and two new species records on *Helleborus orientalis* for Turkey. Nova Hedwigia 95(1-2), 259–266.
- Göbelez M. 1964 – La Mycoflore de Turquie. II. Mycopathologia et Mycologia Applicata 23(1), 47–67.
- Hasenekoğlu I. 1991 – Toprak mikrofungusları. Vol. I-VII. Erzurum.
- Hüseyin E, Selçuk F, Gaffaroğlu M. 2003 – Some materials on Mitosporic fungi from Turkey I Hyphomycetes. Botanica Lithuanica 9(2), 151–160.
- Hüseyin E, Selçuk F. 2001 – New records of microfungi genera for Turkey; Proceeding of the 2nd Balkan Botanical Congress. Plants of the Balkan Peninsula: into the next Millenium. I, Faculty of Sciences, Istanbul University, Istanbul.
- Hüseyinov E, Mel'nik V, Selçuk F. 2002 – *Ceratophorum helicosporum* – a new for mycoflora of Turkey genus and species of Hyphomycetes (Dematiaceae). Mikologia i Fitopatologia 36(3), 11–13.
- Hüseyinov E, Selçuk F. 2000 – The Phyllostroph Micromycetes on forest plants on the Black Sea coast of Turkey (Rize Province); Mycology and Cryptogamic Botany in Russia: Traditions and Modern State. In Proceeding of the International Conference devoted to 100th Anniversary of Investigations on Mycology and Cryptogamic Botany in V.L. Komarov Botanical Institute RAS, Saint-Petersburg.
- Karel GA. 1958 – A Preliminary List of Plant Diseases in Turkey. Ayyıldız Matbaası, Ankara.
- Kirk PM, Cannon PF, Minter DW, Stalpers JA. 2008 – Dictionary of the Fungi. 10th edn. CABI, Wallingford.
- Matsushima T. 1993 – Matsushima Mycological Memoris. 7. Matsushima Fungus Collection. Kobe.
- Mel'nik V, Popushoj IS. 1992 – Nesovesennye griby na drevesnykh i kustarnikovykh porodakh. Ştiintsa, Kisinev.
- Osipjan LL. 1975 – Mikoflora Armjanskoj SSR. Gifal'nye griby, Jerevan.
- Özkan VK, Müftüoğlu NM, Göçmen H, Türkmen C. 2001. The microfungal flora of some agricultural areas in the Ezine (Çanakkale) vicinity. The herb Journal of Systematic Botany 8(1), 119–131.
- Revay A. 1985 – Dematiaceous Hyphomycetes inhabiting forest debris in Hungary. I. Studia Botanica Hungarica 18, 65–71.
- Sagdullajeva MS, Ramazanova SS, Kırgızbajeva KHM, Guljamova M, Fajzieva FC. 1989 – Flora gribov Uzbekistana. Gifal'nye griby (Moniliaceae). 5. Tashkent.
- Selçuk F, Hüseyin E, Bulbul AS. 2012 – Second record of *Ramularia hypericicola* – collected in Turkey on a new host. Mycotaxon 119, 369–372.
- Selçuk F, Hüseyin E, Gaffaroğlu M. 2004 – Occurrence of the araneogenous fungus *Gibellula pulchra* in Turkey. Mycologia Balcanica 1(1), 61–62.
- Selçuk F, Hüseyin E. 2001a – Poorly known parasitic genus of Hyphomycetes. Plant Disease Research 16(1), 30–32.
- Selçuk F, Hüseyin E. 2001b – New records of microfungi species for Turkey; Proceeding of the 2nd Balkan Botanical Congress. Plants of the Balkan Peninsula: into the next Millenium. I, Faculty of Sciences, Istanbul University, Istanbul.
- Steifert K, Morgan-Jones G, Gams W, Kendrick B. 2011 – The genera of Hyphomycetes. CBS, Utrecht.
- Svarcman SR, Vasjagina MP, Byzova ZM, Filimonova NM. 1973 – Flora sporovykh rastenij Kazakhstana. Nesoversennye griby – Fungi imperfecti (Deuteromycetes). 1. Monilial'nye – Moniliales. 8. Nauka, Alma Ata.

- Svarcman SR, Vaşjagina MP, Byzova ZM, Filimonova NM. 1975 – Flora sporovykh rastenij Kazakhstana. Nesoversennye griby – Fungi imperfecti (Deuteromycetes). 2. Monilial'nye – Moniliales. 8. Nauka, Alma Ata.
- Ulloa M, Hanlin RT. 2012 – Illustrated Dictionary of Mycology. Second Edition. APS Press. St. Paul, Minnesota.
- Vassilevskij NI, Karakulin BP. 1937 – Parazitnye nesoversennye griby. Gifomicety. Izd. Academi Nauk SSSR, Moskov-Leningrad.
- www.indexfungorum.org – 2014.
- Yüksel E, Selçuk F, Hüseyinov E, Bitmiş K. 2002 – Hyphomycete Dematiaceae of forest ecosystems on the Black sea coast of Turkey; Proceedings of the 5th International Conference. Problems of forest phytopathology and mycology. Moscow.