

MICROFUNGI ON PLANTS FROM TENDRA ISLAND (UKRAINE, BLACK SEA)*

VASYL HELUTA**, VERA HAYOVA, YURI TYKHONENKO,
VERONIKA DZHAGAN & OLGA UMANETS

Abstract. We studied the species diversity of microfungi associated with plants on Tendra Island on the northern part of Ukraine's Black Sea coast. The island's vegetation is quite well preserved and its flora has a high level of endemism. Altogether 101 species of fungi were recorded: Ascomycota, 75 species (29 Dothideomycetes, 23 Leotiomycetes, 22 Sordariomycetes, 1 *incertae sedis*); Basidiomycota, 25 species (1 Microbotryomycetes, 22 Pucciniomycetes, 2 Ustilaginomycetes); and Oomycota, one species (Oomycetes). The rare and interesting fungal species included two new records for Europe and nine new records for Ukraine; several species were noted on new host plants. A list of all collected microfungi known so far on Tendra Island is given, with their host plants, localities, dates and collectors.

Key words: Basidiomycota, Ascomycota, Oomycota, micromycetes, Tendra Island spit, Black Sea

Vasyl Heluta, Vera Hayova & Yuri Tykhonenko, M. G. Kholodny Institute of Botany, National Academy of Sciences of Ukraine, 2 Tereshchenkivska St., Kyiv, 01601, Ukraine; e-mail: vheluta@botany.kiev.ua

Veronika Dzhagan, Taras Shevchenko National University of Kyiv, 64 Volodymyrs'ka St., Kyiv, 01601, Ukraine; e-mail: dzhagan@yahoo.com

Olga Umanets, Black Sea Biosphere Reserve, National Academy of Sciences of Ukraine, 1 Lermontov St., Gola Pristan', Kherson region, 75600, Ukraine; e-mail: olg-umanets@yandex.ru

INTRODUCTION

Tendra Island is located on the northern part of Ukraine's Black Sea coast. It is a narrow spit about 70 km long which arches southeast to northwest (Fig. 1). Most of the spit is 50–450 m wide, but in the area called White Knolls it is 600–1500 m wide, and at the northwestern tip about 2 km wide. The island is formed by marine sand-shell deposits. Its vegetation is represented mainly by communities of geobotanical classes *Asteretea tripolium*, *Thero-Salicornietea*, *Juncetea maritimi*, *Cakilietea maritimae* and *Festucetea vaginatae* (Umanets & Solomakha 1999). Only on the wide northwestern part of the island are there trees and shrubs formed by unusually high tree-like *Ligustrum vulgare* L., *Cotinus coggygria* Scop., *Rhamnus cathartica* L., *Sambucus nigra* L. and *Prunus* sp., as well as some

nemoral species in the herbal layer. These isolated communities, occurring at the extreme southern margin of their distribution area, are of great scientific value. Meadow and steppe species grow in open areas between shrub thickets. A high degree of endemism characterizes the island's flora, which includes a considerable number of species whose distribution is limited to littorals of the Azov and the Black Seas [e.g., *Cakile euxina* Pobed., *Crambe pontica* Steven ex Rupr., *Elytrigia bes-sarabica* (Savul. & Rayss) Prokudin, *Silene syvas-chica* Kleopow, *Artemisia trautvetteriana* Besser]. For some vascular plant species Tendra Island is the *locus classicus*. *Galium tenderiense* Klokov, *Seseli tenderiense* Kotov, *Medicago tenderiensis* Opperman ex Klokov and *Helichrysum tenderiense* Umanets were described from here. Such endemic species as *Melica chrysolepis* Klokov, *Asparagus litoralis* Steven, *Senecio borysthenticus* Andr. ex Schischk., *Linaria sabulosa* Czern. ex Klokov and

* This paper is dedicated to Professor Tomasz Majewski on the occasion of his 70th birthday.

** Corresponding author.

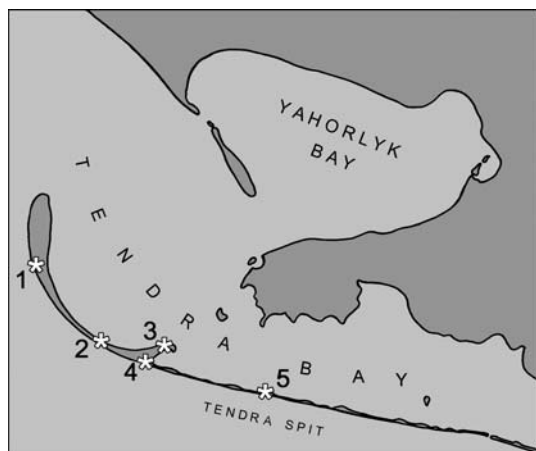


Fig. 1. Collection localities on Tendra Island. 1 – Tendra lighthouse, 2 – Abandoned boat, 3 – White Knolls, 4 – Ranger post, 5 – Austrian beacon.

Otites artemisetorum Klokov are listed in the *European Red List of Globally Threatened Animals and Plants* (Anonymous 1991), and 11 species listed in the ‘Red Book of Ukraine’ (Anonymous 2009).

For a long time the island was difficult to access due to its remoteness and the special state border regime of the area. Unlike similar coastal maritime territories in Ukraine, Tendra Island has maintained a high level of species diversity, and for this reason it attracts the interest of many biologists from various fields. Before our research, however, the fungi of this area were almost unknown. There was a single publication with two species of fungi reported from the island: *Erysiphe limonii* and *Tranzscheliella hypodytes* (as *Ustilago hypodytes*) (Umanets 2005). Information about several species found during our observations of *Ephedra distachya* was published recently (Hayova & Minter 2009a–g; Hayova 2010). Here we report our more detailed examination of phytophobic fungi in this unique area.

MATERIALS AND METHODS

The main field studies took place at the end of May 2007. In addition, several samples of fungi were collected by O. Umanets (17 July 2003 and 2–11 August 2005) and V. Dzhanagan (1–2 May 2009). The collection sites were as follows: northern vicinity of Tendra light-

house (area north and west of 46°19'N/31°31'E); part of the spit adjacent to an abandoned research vessel, the *Mgla* (46°15'N/31°36"E), area called White Knolls (46°15'N/31°40'E), area near Nature Reserve ranger post (46°14'N/31°38'E), and area near Austrian beacon (46°13'N/31°47'E) (Fig. 1). Except for the first area, the surveyed areas are located within the Black Sea Biosphere Reserve. In the list of fungi collection localities, for brevity the areas are referred to as Tendra lighthouse, abandoned boat, White Knolls, ranger post and Austrian beacon, respectively.

Light microscope preparations were examined. Identifications, species taxonomy and nomenclature are based on numerous mycological sources (e.g., Majewski 1977, 1979; Dennis 1978; Sutton 1980; Braun 1987, 1995; Heluta 1989; Ellis & Ellis 1997). The collected materials are stored in the National Herbarium of the M. G. Kholodny Institute of Botany, National Academy of Sciences of Ukraine (KW).

The list of species is arranged taxonomically following Kirk *et al.* (2008); taxa within families are listed in alphabetical order. Author citations are given according to Kirk and Ansell (1992). For each species of fungus the following information is provided: scientific name, host plant, locality, date and collector(s).

RESULTS AND DISCUSSION

In total, 101 species were recorded on Tendra Island. Most of them are true fungi and are associated with plants. Ascomycota are presented by 75 species (29 Dothideomycetes, 23 Leotiomyces, 22 Sordariomycetes, 1 *incertae sedis*) and Basidiomycota by 25 species (1 Microbotryomycetes, 22 Pucciniomycetes, 2 Ustilaginomycetes). Only one species of fungus-like (chromistan) organisms was found – *Albugo candida* (Oomycota, Oomycetes).

Most of the collected species are common in Ukraine. Some are rare, and some are new records for the country or are registered on new host plants. For example, an interesting record is *Albugo candida* on *Crambe pontica*, a European-Mediterranean littoral representative of Brassicaceae, listed in the ‘Red Book of Ukraine’ (Anonymous 2009). Previously this fungus was unknown on representatives of *Crambe* L. in Ukraine. Another species, *Pleospora dura* var. *dura* Niessl., was collected on remnants of *C. pontica*, also a new

host plant in Ukraine. *Erysiphe buhrii*, *E. lycopersidis* and *Golovinomyces valerianae* are quite rare species of powdery mildew. *Anisantha tectorum*, *Onosma borysthena* (*O. arenaria* p.p.) and *Carduus thoermeri* were recorded as host plants of powdery mildew fungi for the first time in Ukraine. The last two species are apparently new hosts globally, as they are not mentioned in Amano's (1986) monograph.

Some host plants, for example *Ephedra distachya*, are rare in Ukraine and usually occupy threatened habitats. In our observations on the Tendra Island spit, 10 species of fungi were recorded on *E. distachya*. For most of them it is the only plant on which these species are known to occur in Ukraine. Eight species of fungi collected on *E. distachya* were reported for the first time in Ukraine: *Aposphaeria ephedrae*, *Teichospora ephedrae*, *Cucurbitaria ephedricola*, *Camarosporium ephedrae*, *Lophiostoma ephedrae*, *Macrophoma ephedrae*, *Microsphaeropsis ephedrina*, and *Pleospora ephedrae*. The first two were newly recorded in Europe (Hayova & Minter 2009a–f; Hayova 2010). A new record for Ukraine is *Melanotaenium cingens*, a smut fungus collected on *Linaria genitifolia*. The infection of *Holosteum umbellatum* by the rare species *Microbotryum holostei* found in the host's stamina and ovaries is epiphytotic. It is the second record of the fungus in Ukraine.

Below is a list of phytotrophic microfungi known up to now on Tendra Island.

CHROMISTA
OOMYCOTA
OOMYCETES
Albuginales
Albuginaceae

Albugo candida (Pers.) Roussel

On *Crambe pontica* Steven ex Rupr.: White Knolls, 2 May 2009, leg. V. Dzhanan. On *Syrenia cana* (Piller & Mitterp.) Simonk.: Ranger post, 1 May 2009, leg. V. Dzhanan.

FUNGI
ASCOMYCOTA
Incertae sedis

Wojnowicia ephedrae Hollós

On *Ephedra distachya* L.: White Knolls, 22 May 2007, leg. V. Hayova (Hayova & Minter 2009g).

DOTHIDEOMYCETES

Botryosphaerales

Incertae sedis

Camarosporium elaeagni Potebnia

On *Elaeagnus angustifolia* L.: Tendra lighthouse, 27 May 2007, leg. V. Hayova.

Camarosporium ephedrae Cooke & Masee

On *Ephedra distachya* L.: White Knolls, 22 May 2007, leg. V. Hayova.; Austrian beacon, 23 May 2007, leg. V. Hayova; Ranger post, 24 May 2007, leg. V. Hayova (Hayova 2010).

Camarosporium incrustans (Sacc.) Sacc.

On *Cotinus coggygria* Scop.: Tendra lighthouse, 26 May 2007, leg. V. Hayova.

Camarosporium syringae Cooke & Masee

On *Syringa vulgaris* L.: Tendra lighthouse, 25 May 2007, leg. V. Hayova.

Botryosphaeriaceae

Botryosphaeria obtusa (Schwein.) Shoemaker

On *Pyrus communis* L.: Ranger post, 25 May 2007 (anamorph), leg. V. Hayova. On *Malus domestica* Borkh.: Tendra lighthouse, 26 May 2007 (anamorph), leg. V. Hayova.

Diplodia mamillana Fr.

On *Swida australis* Pojark. ex Grossh.: Tendra lighthouse, 26 May 2007, leg. V. Hayova.

Diplodia rhois Sacc.

On *Cotinus coggygria* Scop.: Tendra lighthouse, 26 May 2007, leg. V. Hayova.

Diplodia syringae Auersw.

On *Syringa vulgaris* L.: Tendra lighthouse, 25 May 2007, leg. V. Hayova.

Macrophoma ephedrae Gonz. Frag.

On *Ephedra distachya* L.: White Knolls, 22 May 2007, leg. V. Hayova (Hayova & Minter 2009d).

Microdiplodia elaeagni Potebnia

On *Elaeagnus angustifolia* L.: Ranger post, 24 May 2007, leg. V. Hayova.

Hysteriales
Hysteriaceae

Hysterium angustatum Alb. & Schwein.

On *Elaeagnus angustifolia* L.: Tendra lighthouse, 26 May 2007, leg. V. Hayova.

Patellariales
Patellariaceae

Patellaria atrata (Hedw.) Fr.

On *Artemisia trautvetteriana* Besser: Tendra lighthouse, 24 May 2007, leg. V. Hayova; Ranger post, 1 May 2009, leg. V. Dzshagan.

Pleosporales
Incertae sedis

Phoma pomorum Thüm.

On *Prunus* sp.: Ranger post, 24 May 2007, leg. V. Hayova.

Cucurbitariaceae

Cucurbitaria ephedricola Esfand.

On *Ephedra distachya* L.: White Knolls, 22 May 2007, leg. V. Hayova. This is the second record for Europe, as it was known before only from Georgia and Iran (Hayova & Minter 2009b; Hayova 2010).

Dacampiaceae

Teichospora ephedrae Esfand.

On *Ephedra distachya* L.: Ranger post, 24 May 2007, leg. V. Hayova. This is a new record for Europe; the species was previously reported from Asia (Iran, Kazakhstan, Turkmenistan, Uzbekistan) (Hayova & Minter 2009f; Hayova 2010).

Didymosphaeriaceae

Didymosphaeria oblitescens Fuckel

On *Rosa corymbifera* Borkh.: Tendra lighthouse, 26 May 2007, leg. V. Hayova.

Leptosphaeriaceae

Leptosphaeria acuta (Moug. & Nestl.) P. Karst.

On *Xanthium* sp.: Ranger post, 1 May 2009, leg. V. Dzshagan [soc. *Phoma acuta* (Hoffm.) Fuckel]. On *Urtica urens* L.: Ranger post, 1 May 2009, leg. V. Dzshagan [soc. *Calloria neglecta* (Lib.) B. Hein].

Leptosphaeria agnita (Desm.) Ces. & De Not.

On *Artemisia trautvetteriana* Besser: Ranger post, 1 May 2009, leg. V. Dzshagan.

Leptosphaeria doliolum (Pers.) Ces. & De Not.

On *Eryngium maritimum* L.: Austrian beacon, 23 May 2007, leg. V. Hayova.

Lophiostomataceae

Lophiostoma angustilabrum var. ***crenatum*** (Pers.) Chesters & A. E. Bell

On *Artemisia trautvetteriana* Besser: Ranger post, 24 May 2007, leg. V. Hayova; 1 May 2009, leg. V. Dzshagan.

Lophiostoma compressum (Pers.) Ces. & De Not.

On unidentified wood: Austrian beacon, 23 May 2007, leg. V. Hayova. On *Artemisia trautvetteriana* Besser: Tendra lighthouse, 24 May 2007, leg. V. Hayova.

Lophiostoma ephedrae Hollós

On *Ephedra distachya* L.: White Knolls, 22 May 2007, leg. V. Hayova (Hayova & Minter 2009c; Hayova 2010).

Lophiostoma nucula (Fr.) Ces. & De Not.

On unidentified wood: Austrian beacon, 23 May 2007, leg. V. Hayova. On bark of unidentified wood: Ranger post, 24 May 2007, leg. V. Hayova.

Lophiostoma quadrinucleatum P. Karst.

On *Prunus* sp.: Tendra lighthouse, 26 May 2007, leg. V. Hayova. On *Cotinus coggygria* Scop.: Tendra lighthouse, 26 May 2007, leg. V. Hayova.

Melanommataceae

Aposphaeria ephedrae Kravtzev

On *Ephedra distachya* L.: White Knolls, 22 May 2007, leg. V. Hayova. This is the first record for Europe and the

second location for this species, after its collection from Kazakhstan (Hayova & Minter 2009a; Hayova 2010).

Montagnulaceae

Microsphaeropsis ephedrina (Grove) Hayova & Minter

On *Ephedra distachya* L.: White Knolls, 22 May 2007, leg. V. Hayova (Hayova & Minter 2009e).

Microsphaeropsis olivacea (Bon.) Höhn.

On *Prunus* sp.: Ranger post, 24 May 2007, leg. V. Hayova.

Pleosporaceae

Pleospora dura var. *dura* Niessl

On *Crambe pontica* Steven ex Rupr.: White Knolls, 2 May 2009, leg. V. Dzhagan.

Pleospora ephedrae Fabre

On *Ephedra distachya* L.: White Knolls, 22 May 2007, leg. V. Hayova.

LEOTIOMYCETES

Erysiphales

Erysiphaceae

Blumeria graminis (DC.) Speer

On *Anisantha tectorum* (L.) Nevski: Tendra lighthouse, 26 May 2007, leg. V. Heluta. On *Elytrigia repens* (L.) Nevski: Tendra lighthouse, 26 May 2007, leg. V. Heluta. On *Poa trivialis* L. var. *semineutra* W. & K. Griseb.: Tendra lighthouse, 26 May 2007, leg. V. Heluta. On *Sclerochloa dura* (L.) P. Beauv.: Tendra lighthouse, 26 May 2007, leg. V. Heluta.

Erysiphe buhrii U. Braun

On *Melandrium album* (Mill.) Garcke: Tendra lighthouse, 27 May 2007, leg. V. Heluta.

Erysiphe convolvuli DC.

On *Convolvulus lineatus* L.: Tendra lighthouse, 26 May 2007, leg. V. Heluta.

Erysiphe euonymi DC.

On *Euonymus odessana* Klokov (*E. czernjaëvii* Klokov p.p.): Tendra lighthouse, 26 May 2007, leg. O. Umanets; ibid., 2 May 2009, leg. V. Dzhagan.

Erysiphe friesii (Lév.) U. Braun & S. Takam.

On *Rhamnus cathartica* L.: Tendra lighthouse, 4 Aug. 2005, leg. O. Umanets.

Erysiphe heraclei DC.

On *Anthriscus nemorosa* (M. Bieb.) Spreng.: Tendra lighthouse, 26 May 2007, leg. V. Heluta.

Erysiphe limonii L. Junell

On *Limonium caspium* (Willd.) Gams: White Knolls, 17 July 2003, leg. K. & O. Umanets (Umanets 2005). On *L. meyeri* (Boiss.) O. Kuntze: White Knolls, 17 July 2003, leg. K. & O. Umanets (Umanets 2005); ibid., 2 May 2009, leg. V. Dzhagan.

Erysiphe lycopsidis R. Y. Zheng & G. Q. Chen

On *Onosma borysthenica* Klokov: Ranger post, 3 Aug. 2005, leg. O. Umanets.

Golovinomyces biocellatus (Ehrenb.) Heluta

On *Nepeta cataria* L.: Tendra lighthouse, 26 May 2007, leg. V. Heluta.

Golovinomyces cynoglossi (Wallr.) Heluta

On *Asperugo procumbens* L.: Tendra lighthouse, 26 May 2007, leg. V. Heluta. On *Buglossoides arvensis* (L.) I. M. Johnst.: Tendra lighthouse, 26 May 2007, leg. O. Umanets; Ranger post, 1 May 2009 (epiphytote), leg. V. Dzhagan. On *Cynoglossum officinale* L.: Tendra lighthouse, 26 May 2007, leg. V. Heluta.

Golovinomyces depressus (Wallr.) Heluta

On *Carduus thoermeri* Weinm.: Tendra lighthouse, 26 May 2007, leg. V. Heluta.

Golovinomyces valerianae (Jacz.) Heluta

On *Valeriana stolonifera* Czern.: Tendra lighthouse, 26 May 2007, leg. Y. Tykhonenko & O. Umanets.

Neoerysiphe galeopsidis (DC.) U. Braun

On *Ballota nigra* L.: Tendra lighthouse, 26 May 2007, leg. O. Umanets & V. Heluta.

Neoerysiphe galii (S. Blumer) U. Braun

On *Galium spurium* L.: Tendra lighthouse, 26 May 2007, leg. V. Heluta.

Phyllactinia mali (Duby) U. Braun

On *Crataegus* sp.: Tendra lighthouse, 26 May 2007, leg. V. Heluta.

Podosphaera euphorbiae (Castagne) U. Braun & S. Takam.

On *Euphorbia seguieriana* Neck.: Tendra lighthouse, 4 Aug. 2005, leg. O. Umanets; *ibid.*, 26 May 2007, leg. V. Heluta.

Podosphaera macularis (Wallr.) U. Braun & S. Takam.

On *Humulus lupulus* L.: Tendra lighthouse, 26 May 2007, leg. O. Umanets & V. Heluta.

Podosphaera pannosa (Wallr.) de Bary

On *Rosa corymbifera* Borkh.: Tendra lighthouse, 11 Aug. 2005, leg. O. Umanets; *ibid.*, 26 May 2007, leg. V. Heluta & O. Umanets.

Helotiales

*Incertae sedis****Calloria neglecta*** (Lib.) B. Hein

On *Urtica urens* L.: Ranger post, 1 May 2009 [soc. *Leptosphaeria acuta* (Moug. & Nestl.) P. Karst.], leg. V. Dzhagan.

Trimmatostroma salicis Corda

On *Salix rosmarinifolia* L.: Tendra lighthouse, 26 May 2007, leg. V. Hayova.

Dermateaceae

Mollisia ligni (Desm.) P. Karst.

On *Prunus* sp.: Ranger post, 24 May 2007, leg. V. Hayova.

Sclerotiniaceae

Amerosporium concinnum Petr.

On *Ephedra distachya* L.: White Knolls, 22 May 2007, leg. V. Hayova.

Rhytismatales

Rhytismataceae

Lophodermium arundinaceum (Schrad.) Chevall.

On *Elytrigia elongata* (Host ex Beauv.) Nevski: Ranger

post, 24 May 2007, leg. V. Hayova. On Gramineae: White Knolls, 2 May 2009, leg. V. Dzhagan.

SORDARIOMYCETES

Incertae sedis

Glomerellaceae

Colletotrichum dematium (Pers.) Grove

On dead stems: Ranger post, 1 May 2009, leg. V. Dzhagan.

Diaporthales

Diaporthaceae

Diaporthe eres Nitschke

On *Pyrus communis* L.: Ranger post, 25 May 2007, 24 May 2007 (anamorph), leg. V. Hayova.

Diaporthe fibrosa (Pers.) Fuckel

On *Rhamnus cathartica* L.: Tendra lighthouse, 26 May 2007, leg. V. Hayova.

Diaporthe oncostoma (Duby) Fuckel

On *Robinia pseudoacacia* L.: Tendra lighthouse, 25 May 2007 (anamorph), leg. V. Hayova.

Phomopsis viticola (Sacc.) Sacc.

On *Vitis sylvestris* C. C. Gmel.: Tendra lighthouse, 26 May 2007, leg. V. Hayova.

Phomopsis ramealis (Desm.) Died.

On *Euonymus odessana* Klokov: Tendra lighthouse, 26 May 2007, leg. V. Hayova.

Gnomoniaceae

Cryptodiaporthe salicina Wehm.

On *Salix cinerea* L.: Tendra lighthouse, 26 May 2007, leg. V. Hayova. On *Salix rosmarinifolia* L.: Tendra lighthouse, 26 May 2007, leg. V. Hayova.

Melanconidaceae

Melanconium bicolor Nees

On *Betula borysthonica* Klokov: Tendra lighthouse, 27 May 2007, leg. V. Hayova.

Valsaceae

Leucostoma cinctum (Fr.) Höhn.

On *Pyrus communis* L.: Ranger post, 25 May 2007 (holomorph), leg. V. Hayova. On *Prunus* sp.: Ranger post, 24 May 2007, leg. V. Hayova.

Leucostoma persoonii (Nitschke) Höhn.

On *Cotinus coggygria* Scop.: Tendra lighthouse, 26 May 2007 (anamorph), leg. V. Hayova.

Valsa ambiens (Pers.) Fr.

On *Elaeagnus angustifolia* L.: Tendra lighthouse, 26 May 2007, leg. V. Hayova; Ranger post, 24 May 2007 (anamorph), leg. V. Hayova.

Valsa ceratosperma (Tode) Maire

On *Prunus* sp.: Tendra lighthouse, 26 May 2007, leg. V. Hayova.

Valsa cypri (Tul.) Tul. & C. Tul.

On *Ligustrum vulgare* L.: Tendra lighthouse, 26 May 2007 (anamorph), leg. V. Hayova.

Valsa malicola Z. Urb.

On *Malus domestica* Borkh.: Tendra lighthouse, 26 May 2007 (anamorph), leg. V. Hayova.

Valsa salicina (Pers.) Fr.

On *Salix rosmarinifolia* L.: Tendra lighthouse, 26 May 2007 (anamorph), leg. V. Hayova.

Valsa sordida Nitschke

On *Populus deltoides* W. Bartram ex Marshall: Tendra lighthouse, 27 May 2007, leg. V. Hayova. On *Salix cinerea* L.: Tendra lighthouse, 26 May 2007 (anamorph), leg. V. Hayova.

Valsella diatrypa (Fr.) Z. Urb.

On *Elaeagnus angustifolia* L.: Tendra lighthouse, 26 May 2007, leg. V. Hayova.

Xylariales

Amphisphaeriaceae

Amphisphaeria vibratilis (Fuckel) E. Müll.

On *Prunus* sp.: Ranger post, 24 May 2007, leg. V. Hayova.

Diatrypaceae

Eutypa lata (Pers.) Tul. & C. Tul.

On *Prunus* sp.: Ranger post, 24 May 2007, leg. V. Hayova. On *Swida australis* Pojark. ex Grossh.: Tendra lighthouse, 26 May 2007, leg. V. Hayova.

Eutypella extensa (Fr.) Sacc.

On *Rhamnus cathartica* L.: Tendra lighthouse, 26 May 2007, leg. V. Hayova.

Eutypella prunastri (Pers.) Sacc.

On *Prunus* sp.: Tendra lighthouse, 26 May 2007, leg. V. Hayova.

Hyponectriaceae

Pseudomassaria corni (Sowerby) Arx

On *Swida australis* Pojark. ex Grossh.: Tendra lighthouse, 26 May 2007, leg. V. Hayova.

BASIDIOMYCOTA

MICROBOTRYOMYCETES

Microbotryales

Microbotryaceae

Microbotryum holostei (de Bary) Vánky

On *Holosteum umbellatum* L.: White Knolls, 2 May 2009 (epiphytotoy), leg. V. Dzhagan.

PUCCINIOMYCETES

Pucciniales

Phragmidiaceae

Phragmidium bulbosum (Fr.) Schltdl.

(0, I). On *Rubus caesius* L.: Tendra lighthouse, 27 May 2007, leg. Y. Tykhonenko.

Pucciniaceae

Puccinia acetosae Barclay

(II). On *Rumex euxinus* Klokov: Tendra lighthouse, 27 May 2007, leg. Y. Tykhonenko.

Puccinia angelicae (Schumach.) Fuckel

(II, III). On *Peucedanum latifolium* DC.: Tendra lighthouse, 26 May 2007, leg. V. Heluta & Y. Tykhonenko; *ibid.*, 27 May 2007, leg. Y. Tykhonenko.

Puccinia annularis (F. Strauss) G. Winter

(III). On *Teucrium stevenianum* Klokov: Tendra lighthouse, 26 May 2007, leg. Y. Tykhonenko.

Puccinia calcitrapae DC.

(II, III). On *Centaurea odessana* Prodan: Ranger post, 24 May 2007, leg. Y. Tykhonenko.

Puccinia coronata Corda

(0, I). On *Rhamnus cathartica* L.: Tendra lighthouse, 26 May 2007, leg. Y. Tykhonenko.

Puccinia cynodontis Lacroix ex Desm.

(0, I). On *Plantago lanceolata* L.: Tendra lighthouse, 26 May 2007, leg. V. Heluta & O. Umanets.

Puccinia dioicae Magnus

(0, I). On *Centaurea odessana* Prodan: Ranger post, 24 May 2007, leg. Y. Tykhonenko.

Puccinia hieracii (Röhl.) H. Mart.

(II). On *Picris hieracioides* L.: Ranger post, 24 May 2007, leg. Y. Tykhonenko.

Puccinia iridis Wallr.

(0, I). On *Urtica kioviensis* Rogow.: Tendra lighthouse, 26 May 2007, leg. Y. Tykhonenko.

Puccinia minussensis Thüm.

(0, I, III). On *Lactuca tatarica* (L.) C. A. Mey.: Ranger post, 24 and 25 May 2007, leg. Y. Tykhonenko; Tendra lighthouse, 26 May 2007, leg. V. Hayova; *ibid.*, 27 May 2007, leg. Y. Tykhonenko; White Knolls, 2 May 2009, leg. V. Dzhagan.

Puccinia opizii Bubák

(0, I). On *Sonchus palustris* L.: Ranger post, 22 May 2007, leg. Y. Tykhonenko; Tendra lighthouse, 26 May 2007, leg. Y. Tykhonenko.

Puccinia polygoni-amphibii Pers.

(0, I). On *Geranium sanguineum* L.: Tendra lighthouse, 26 and 27 May 2007, leg. Y. Tykhonenko.

Puccinia recondita Dietel & Holw.

(II, III). On *Secale sylvestre* Host: Tendra lighthouse, 26 May 2007, leg. Y. Tykhonenko.

Puccinia rugulosa Tranzschel

(0, I). On *Peucedanum latifolium* DC.: Tendra lighthouse, 26 May 2007, leg. V. Heluta, O. Umanets & Y. Tykhonenko.

Puccinia thesii (Desv.) Chaillet

(0, I, III). On *Thesium arvense* Horv.: Ranger post, 1 May 2009, leg. V. Dzhagan.

Uromyces cristulatus Tranzschel

(III). On *Euphorbia seguieriana* Neck.: Tendra lighthouse, 26 May 2007, leg. Y. Tykhonenko.

Uromyces geranii Speg.

(I, II). On *Geranium collinum* Stephan: Tendra lighthouse, 26 May 2007, leg. Y. Tykhonenko.

Uromyces laevis Körn.

(III). On *Euphorbia seguieriana* Neck.: Tendra lighthouse, 26 May 2007, leg. Y. Tykhonenko.

Uromyces limonii (DC.) Lév.

(I). On *Limonium meyeri* (Boiss.) Kuntze: White Knolls, 22 May 2007, leg. Y. Tykhonenko; Ranger post, 25 May 2007, leg. Y. Tykhonenko; Tendra lighthouse, 26 May 2007, leg. V. Heluta.

Uromyces striatus J. Schröt.

(II). On *Medicago lupulina* L.: Tendra lighthouse, 26 May 2007, leg. Y. Tykhonenko.

Anamorphic Pucciniales

Aecidium euphorbiae Link

(I). On *Euphorbia seguieriana* Neck.: Abandoned boat, 24 May 2007, leg. Y. Tykhonenko; Tendra lighthouse, 26 May 2007, leg. V. Heluta & Y. Tykhonenko.

USTILAGINOMYCETES

Ustilaginales

Melanotaeniaceae

Melanotaenium cingens (Beck) Magnus.

On *Linaria genistifolia* (L.) Mill.: Ranger post, 1 May 2009, leg. V. Heluta & Y. Tykhonenko.

Ustilaginaceae

***Tranzscheliella hypodytes* (Schltdl.) Vánky & McKenzie**

On *Leymus sabulosus* (M. Bieb.) Tzvelev: Ranger post, 2 Aug. 2005, leg. O. Umanets [Umanets 2005, as *Ustilago hypodytes* (Schltdl.) Fr.].

ACKNOWLEDGEMENTS. We are grateful to Stanislav Syrotyuk, keeper of the Tendra lighthouse, for assistance during field observations, to Cyril Savchenko for identifications of smut fungi, and to an anonymous reviewer for critically reading the manuscript and making valuable suggestions.

REFERENCES

- AMANO K. 1986. Host range and geographical distribution of the powdery mildew fungi. Japan Scientific Societies Press, Tokyo.
- ANONYMOUS 1991. European Red List of globally threatened animals and plants and recommendations on its application as adopted by the Economic Commission for Europe at its forty-sixth session (1991) by decision D (46). United Nations, Economic Commission for Europe, New York.
- ANONYMOUS 2009. Chervona knyha Ukrainy. Roslynni svit. Globalkonsalting, Kyiv.
- BRAUN U. 1987. A monograph of the Erysiphales (powdery mildews). *Beih. Nova Hedwigia* **89**: 1–700.
- BRAUN U. 1995. The Powdery mildews (Erysiphales) of Europe. G. Fisher, Jena, Stuttgart, New York.
- DENNIS R. W. G. 1978. British Ascomycetes. J. Cramer, Vaduz.
- ELLIS M. B. & ELLIS J. P. 1997. Microfungi on land plants an identification handbook. The Richmond Publishing Co Ltd., UK.
- HAYOVA V. P. 2010. New records of Ascomycota on *Ephedra distachya* L. from Ukraine. *Ukrains'k. Bot. Zhurn.* **67**(1): 104–111 (in Ukrainian with English summary).
- HAYOVA V. P. & MINTER D. W. 2009a. *Aposphaeria ephedrae* Kravtzev. *IMI Descriptions of Fungi and Bacteria. Set 180, no. 1792*: 1–3.
- HAYOVA V. P. & MINTER D. W. 2009b. *Cucurbitaria ephedri-cola* Esfand. *IMI Descriptions of Fungi and Bacteria. Set 180, no. 1794*: 1–3.
- HAYOVA V. P. & MINTER D. W. 2009c. *Lophiostoma ephedrae* Hollós. *IMI Descriptions of Fungi and Bacteria. Set 180, no. 1795*: 1–3.
- HAYOVA V. P. & MINTER D. W. 2009d. *Macrophoma ephedrae* Gonz. Frag. *IMI Descriptions of Fungi and Bacteria. Set 180, no. 1796*: 1–3.
- HAYOVA V. P. & MINTER D. W. 2009e. *Microsphaeropsis ephedrina* (Grove) Hayova & Minter. *IMI Descriptions of Fungi and Bacteria. Set 180, no. 1797*: 1–3.
- HAYOVA V. P. & MINTER D. W. 2009f. *Teichospora ephedrae* Esfand. *IMI Descriptions of Fungi and Bacteria. Set 180, no. 1799*: 1–3.
- HAYOVA V. P. & MINTER D. W. 2009g. *Wojnowicia ephedrae* Hollós. *IMI Descriptions of Fungi and Bacteria. Set 180, no. 1800*: 1–3.
- HELUTA V. P. (as GELUTA W. P.) 1989. Flora gribov Ukrainy. Muchnistorosyanye griby. Naukova Dumka, Kiev.
- KIRK P. M. & ANSELL A. E. 1992. Authors of Fungal Names [Index of Fungi Supplement]. Wallingford (<http://www.indexfungorum.org/names/authorsoffungalnames.asp>).
- KIRK P. M., CANNON P. F., MINTER D. W. & STALPERS J. A. 2008. Dictionary of the Fungi. 10th ed. CABI Europe, UK.
- MAJEWSKI T. 1977. Flora Polska. Grzyby (Mycota). **9**. Basidiomycetes, Uredinales. I. Państwowe Wydawnictwo Naukowe, Warszawa – Kraków.
- MAJEWSKI T. 1979. Flora Polska. Grzyby (Mycota). **11**. Basidiomycetes, Uredinales. II. Państwowe Wydawnictwo Naukowe, Warszawa – Kraków.
- SUTTON B. C. 1980. The Coelomycetes. CAB International, Wallingford, Oxon.
- UMANETS K. S. 2005. Fitotrofni obligatni hryby-parazyty Chornomorskoho biosferneho zapovidnyka NAN Ukrainy. In: *Aktualni problemy botaniky ta ekologii*. **1**: 37–41. Fitotsotsiysentr, Kyiv.
- UMANETS O. Y. & SOLOMAKHA I. V. 1999. Syntaksonomia roslynnosti Chornomorskoho biosferneho zapovidnyka. II. Ostriv Tendra. *Ukrainskyi Fitotsenotychnyi Zbirnyk, Ser. A 1–2*(12–13): 63–77.

Received 8 April 2010