

New species of the Diaporthales from eastern Asia and eastern North America

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Abstract: Seven previously undescribed diaporthalean species were found in eastern Asia and eastern North America. Three of these new species and one previously known species are assigned to a new genus *Leucodiaporthe*. Descriptions and illustrations are provided for the new taxa including *Allantoportha leucothöes* sp. nov., *Diaporthella corylina* sp. nov., *Leucodiaporthe acerina* sp. nov., *L. juglandis* sp. nov., *L. maackii* comb. nov., *L. robiniae* sp. nov., *Leucostoma pseudoniveum* sp. nov., *Leucostoma excipienda* comb. nov., and *Phragmodiaporthe padi* sp. nov.

Key words: Ascomycota, Sordariomycetes, systematics, taxonomy, wood-inhabiting fungi

INTRODUCTION

The Diaporthales are a distinct order within the Sordariomycetes, the class including ascomycetous fungi that produce asci primarily in perithecial fruiting bodies (Zhang and Blackwell 2001, Zhang et al 2006). The Diaporthales include fungi having perithecia either solitary or aggregated in a stroma, often with long necks, unitunicate asci that float free at maturity with a conspicuous refractive ring, ascospores that vary from short, nonseptate to elongate, multiseptate and pycnidial asexual states. Most species are inconspicuous, often immersed in the substratum and occur on hardwood trees and other plant hosts in temperate regions. At present six families are recognized in the Diaporthales (Castlebury et al 2002, Rossman et al 2007) although some species cannot be placed in any family. The new taxa described below belong primarily to the Diaporthaceae and Valsaceae, although for some species their familiar placement is unknown. Following are descriptions and illustrations of new taxa encountered while collecting in eastern Asia and eastern North America.

Accepted for publication 13 August 2007.

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MATERIALS AND METHODS

Collecting trips were made during 2000–2006 in eastern Asia (China, Republic of Korea, Russia) and eastern North America (USA: Maryland, Tennessee, West Virginia). The samples were air-dried. Morphological observations include macroscopic appearance of fruiting bodies on the substratum as viewed with a stereomicroscope and microscopic characters such as size, shape, color and arrangement of asci, ascospores, perithecial wall and perithecial ostiolar tissues. Specimens were observed with a Zeiss Axiophot microscope and photographed in the Far Eastern Center of Electron Microscopy (Institute of Marine Biology, Vladivostok) with a digital video camera Leica DFC300FX and microscopes Leica MZ75 and Leica DM 4500B. Specimens were sectioned with a freezing microtome for detailed observation of perithecial structures. Cultures derived from these collections were obtained by means of single ascospore isolation on cornmeal agar (Sigma[®], Sigma Chemical Co., St Louis, Missouri) plus 0.2% dextrose (CMD) supplemented with antibiotics (1% solution 0.2% streptomycin sulfate and 0.2% neomycin). Cultures are described on potato-dextrose agar (PDA, Sigma[®], Sigma Chemical Co., St Louis, Missouri) made according to the manufacturer's instruction after 7 d at room temperature under equal daylight-dark conditions and occasionally after a longer period time. Some cultures also are described on CMD. Colony colors are described based on Rayner (1970).

TAXONOMY

Allantoportha leucothöes Lar.N. Vassiljeva sp. nov.
FIGS. 1–5

Mycobank number 510558

Peritheciis cortice immersis, 300–350 µm diam, ostioliis papillatis discrete erumpentibus, singulis vel aggregatis linea nigra irregulariter circumscriptis. Ascis clavatis, 8-sporis, 35–45 × 8–10 µm, apparatus apicalis refractis. Sporidiis distichis, fusoides, 14–16 × 3–3.5 µm, 1-septatis, medio vix constrictis, hyalinis, non appendiculatis.

Holotype specimen: UNITED STATES. Tennessee: Cocke County, Great Smoky Mountains National Park, Cosby, on dead stems of *Leucothöe fontanesiana* (Steud.) Sleumer (Ericaceae), 8 May 2006, coll. Larissa N. Vasilyeva (HOLOTYPE-VLA).

Etymology: referring to the host plant.

Perithecia immersed in bark tissue, 300–350 µm diam, erumpent with short papillate beaks, groups of 1–3(–5) perithecia immediately surrounded by an indistinct, thickened black line composing a perithecial cluster, each perithecial cluster surrounded by dull yellow epidermis, then with a distinct, narrow black line enclosing a single perithecial cluster or two or more clusters, sometimes large with

up to 20 perithecial clusters, black line enclosing circular to smooth rounded area, 0.5–3 cm diam. Asci clavate, 8-spored, $35\text{--}45 \times 8\text{--}10 \mu\text{m}$, apical annulus refractive. Ascospores biseriate, fusoid, $14\text{--}16 \times 3.3\text{--}3.5 \mu\text{m}$, two-celled, slightly constricted at septum, hyaline, without appendages.

Culture on PDA after 7 d: colony 5.5 cm diam, mycelium diffuse, low tufted, white to pale mouse gray, sparse at margin, denser toward center, dense mycelium salmon, with margin irregularly scalloped, reverse intensely pigmented, bay to blood color, darker toward center.

Additional specimen examined: UNITED STATES. Tennessee: Cocke County, Great Smoky Mountains National Park, Big Creek Trail, on dead stems of *Leucothöe fontanesiana*, 6 May 2002, coll. Larissa N. Vasilyeva, cult. Amy Rossman AR 3807 = CBS 121122 (BPI 843486).

This new species is placed in the genus *Allantoportha* Petr. in the Diaporthaceae. *Allantoportha* differs from *Diaportha* in having stromata that consist of several perithecia singly immersed in bark tissue and surrounded by a black line, whereas species of *Diaportha* usually form clusters of perithecia that collectively are erumpent from the bark. The type of the genus *Allantoportha*, *A. tessella* (Pers.:Fr.) Petr., occurs on *Salix* spp. and has larger ascospores, $40\text{--}60 \times 7\text{--}9\text{--}(11) \mu\text{m}$ (FIGS. 6–9), than those of *A. leucothöes*. The third species of the genus, *Allantoportha decedens* (Fr.) M.E. Barr, does not have the characteristic appearance of the two other species; *A. decedens* lacks the black line around groups of perithecia and has ascospores $15\text{--}22 \times 4\text{--}6 \mu\text{m}$, slightly larger than those of *A. leucothöes*. *Allantoportha decedens* might be better placed in *Diaportha* as suggested by Wehmeyer (1933).

***Diaporthella corylina* Lar.N. Vassiljeva sp. nov.**

FIGS. 10–12

Mycobank number 510559

Stromatibus orbicularis, erumpentibus, 1.5–4 mm diam, linea nigra nullis, disco fusciscentis; peritheciis sphaeroidis vel compressis, 300–350 μm diam; ostiolis nigris, elongatis ad 1.5 mm, disco excedis. Ascis oblongo-fusoideis, 8-sporis, $42\text{--}50 \times 9\text{--}11 \mu\text{m}$, apparatus apicalis refractis. Sporidiis distichis, fusoidis vel ellipsoideis, $12\text{--}16 \times 3.5\text{--}4 \mu\text{m}$, 1-septatis, medio vix constrictis, hyalinis, non appendiculatis.

Holotype specimen: RUSSIA. Primorsky Territory: Gamov's Peninsula, on dying stems of *Corylus heterophylla* Fisch. ex Trautv. (Betulaceae), 3 Aug 2006, coll. Larissa N. Vasilyeva (HOLOTYPE-VLA).

Etymology: referring to the host plant.

Stromata circular, pulvinate, erumpent, 1.5–4 mm diam, without blackened zone in substratum, stromatic disk brownish. Perithecia spherical or

compressed, 300–350 μm diam, perithecial beaks black, elongated up to 1.5 mm, projecting well beyond disk, erumpent singly, numerous, crowded. Asci oblong-fusoid, eight-spored, $42\text{--}50 \times 9\text{--}11 \mu\text{m}$, apical annulus refractive. Ascospores biseriate, fusoid or ellipsoid, $12\text{--}16 \times 3.5\text{--}4 \mu\text{m}$, 2-celled, slightly constricted at septum, hyaline, without appendages.

Culture on PDA after 7 d: colony 4.7 cm diam, mycelium diffuse to dense, white to salmon, broadly tufted at regular margin, even toward center, reverse without pigments, pale peach beneath dense mycelium, white at margin.

Additional specimen examined: CHINA. Heilongjiang Province: Fuyuan, on dying stems of *Corylus* sp., 4 Aug 2004, coll. Larissa N. Vasilyeva, cult. Amy Rossman AR 4131 = CBS 121124 (BPI 871218).

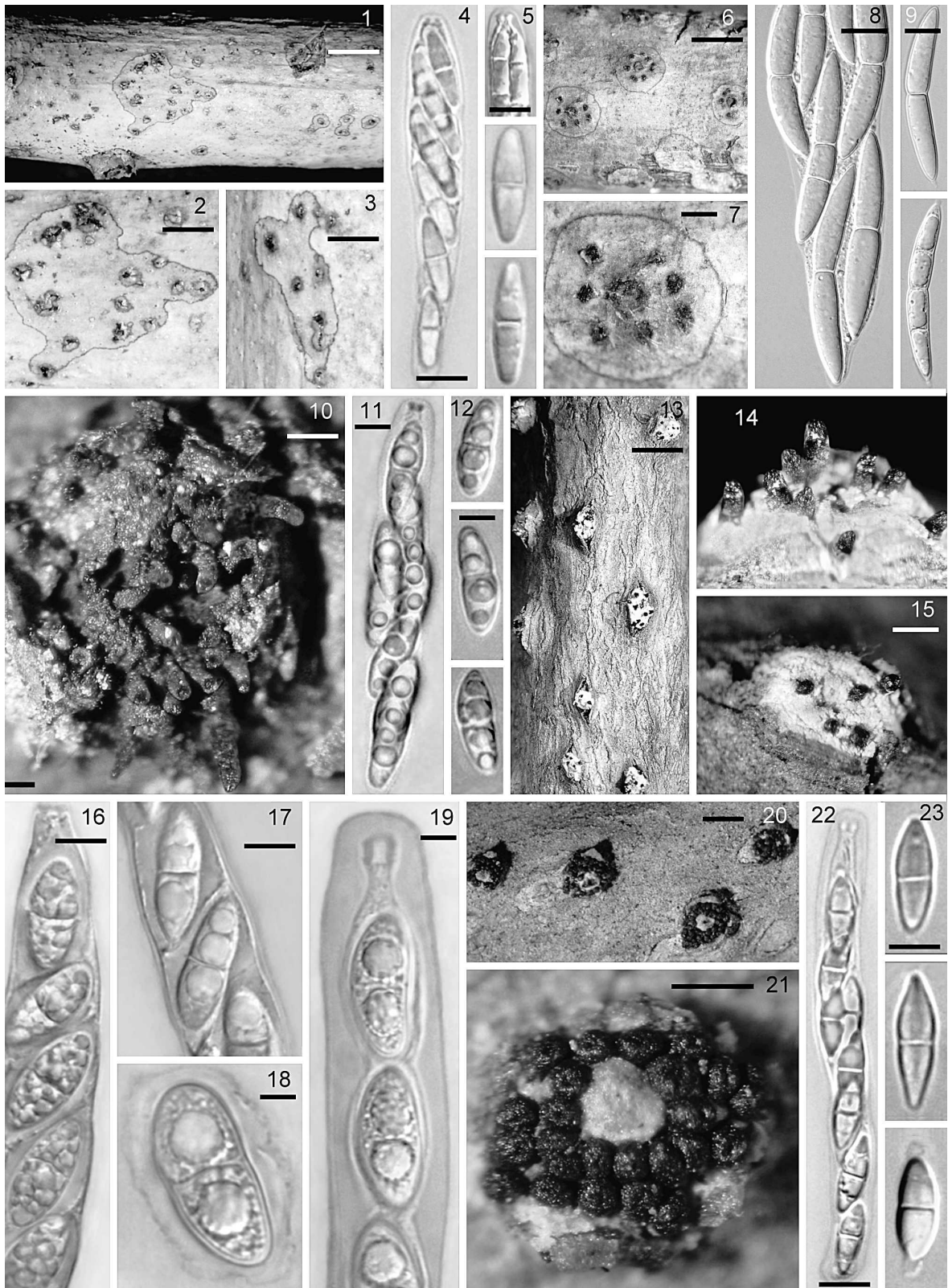
The genus *Diaporthella* Petr. is based on the type species *D. aristata* (Fr.) Petr. on *Betula* spp. *Diaporthella corylina* is similar to *D. aristata* in ascospore size; however the stromata of *D. corylina* are circular with a brownish disk while the stromata of *D. aristata* are black, erumpent and well developed. A third species in *Diaporthella*, *D. platasca* (Peck) Wehm. on *Betula* spp., has larger ascospores ($16\text{--}23 \times 3\text{--}5 \mu\text{m}$) than those of *D. corylina* (Vasilyeva 2004, Wehmeyer 1933).

The genus *Diaporthella* is similar to *Anisogramma* in having a well developed stroma in which the perithecia are aggregated. Unlike *Anisogramma* having unequally, 1-septate ascospores, *Diaporthella* has median, 1-septate ascospores. *Diaporthella corylina* is strongly parasitic and causes dieback of *Corylus* stems. Stromata are found at the base of host stems near the ground and appear superficially similar to those of *Sillia ferruginea* (Pers.:Fr.) P. Karst. The latter species occupies the same ecological niche, occurring at the bases of *Corylus* stems but differs in having elongated, multiseptate ascospores. *Anisogramma anomala* (Peck) E. Müll. on *Corylus* spp. occurs in North America and eastern Asia and causes witches brooms on branches. Of interest living plants of *Corylus* spp. are now known to support species of three diaporthalean genera, namely *Anisogramma*, *Diaporthella* and *Sillia*, that differ in ascospore shape. These genera were placed in tribe Endothieae of family Gnomoniaceae (Barr 1978) or tribe Pseudovalseae of family Valsaceae (Vasilyeva 1994). *Anisogramma* based on *A. virgultorum* (Fr.) Theiss. & Syd. is known to belong in the Gnomoniaceae *sensu* Castlebury et al (2002) (Castlebury 2007, pers obs).

***Leucodiaportha* M.E. Barr et Lar.N. Vassiljeva gen. nov.**

Mycobank number 510561

Stromata rotundata, pulvinata, erumpentia, disco ectostromatico, laete vel vivide colorato, circumcincta sur-



FIGS. 1–23. 1–5. *Allantoporthes leucothoes*. 1–3. Stromata on dead branch, note emerging perithecial clusters surrounded by uneven blackened area and distinct black line margin enclosing one to multiple perithecial clusters. 4. Ascus. 5. Ascospores. 6–9. *Allantoporthes tessella*. 6–7. Stromata in substratum, note similar emerging perithecial clusters with uneven blackened area and distinct black line margin enclosing perithecial clusters. 8–9. Ascospores. 10–12. *Diaporthella corylina*. 10. Stroma with

rounded zona denigrata in substrato, perithecia sphaerica, rostra aliquando projecta trans discos stromaticos. Asci clavati vel late cylindrici, 8-spori, annulo apicali refractivo. Ascosporeae biseriatae vel imbricatae uniseriatae, fusiformes vel ellipticae, bicellulares, medio constrictae, hyalinae, aliquando apiculatae, appendicibus obtusis, aliquando tunica gelatinosa.

Type species: Leucodiaporthe acerina M.E. Barr & Lar.N. Vassiljeva

Etymology: referring to its similarity to *Diaporthe* in having hyaline 2-celled ascospores and *Leucostoma* in having a well developed, often bright ectostromatic disk as well as a blackened marginal zone in the substratum.

Stromata rounded, pulvinate, erumpent, with a lightly or brightly colored ectostromatic disk, surrounded by a blackened zone in substratum. Perithecia spherical, beaks sometimes projecting beyond stromatic disk. Asci clavate or broadly cylindrical, 8-spored, apical annulus refractive. Ascospores biseriatae or overlapping uniseriatae, fusoid or ellipsoid, 2-celled, constricted in middle, hyaline, without or with blunt appendages, sometimes with gelatinous coating.

This genus is unique in the Diaporthales in having a light to brightly colored stromatic disk with blackened marginal zones and hyaline, nonappendaged ascospores, occasionally with a gelatinous coating. *Leucodiaporthe* belongs in the Diaporthaceae *sensu* Castlebury et al (2002).

Leucodiaporthe acerina M.E. Barr & Lar.N. Vassiljeva
sp. nov. FIGS. 13–19

Mycobank number 510562

Stromata disco 1.5–2 mm diam, luteolo. Perithecia 350–400 µm diam, rostra nigra, laeviter trans discos projecta. Asci 110–130 × 20–24 µm. Ascosporeae bicellulares quamquam interdum ut videtur pseudomuriformes ob multas guttulas, 20–24 × 9–11 µm, sine appendicibus sed aliquando tunica gelatinosa.

Holotype specimen: RUSSIA. Primorsky Territory: Vladivostok vicinity, on dead branches of *Acer pseudosieboldianum* (Pax) Kom. (Aceraceae), 5 Nov 2000, coll. Larissa N. Vasilyeva (HOLOTYPE-VLA).

Etymology: referring to host plant.

Stromata rounded, pulvinate, erumpent, with pale yellow, ectostromatic disk 1.5–2 mm diam, within substratum surrounded by a blackened zone, perithecia spherical, 350–400 µm diam, beak black, contrast-

ing with ectostromatic disk and projecting slightly beyond stromatic disk. Asci clavate or broadly cylindrical, eight-spored, 110–130 × 20–24 µm, apical annulus refractive. Ascospores biseriatae or overlapping uniseriatae, fusoid or ellipsoid, 20–24 × 9–11 µm, 2-celled, although occasionally appearing pseudo-muriform due to numerous guttules, constricted at septum, hyaline, without appendages but sometimes surrounded by gelatinous coating.

Culture on PDA after 7 d: colony 2.5–3.4 cm diam, mycelium sparse, low to fluffy, tufted or not, white at regular to irregular margin, pale mouse gray or pale olivaceous gray to pale purplish gray toward center or purplish, numerous waves of hyphae, reverse without pigments or purplish, no sporulation. Culture on CMD after 7 d: colony 3.0–4.2 cm diam, thin, pallid, gray olivaceous toward center.

Additional specimens examined: RUSSIA. Primorsky Territory: Vladivostok vicinity, on dead branches of *Acer pseudosieboldianum* (Pax) Kom. (Aceraceae), 30 Oct 2000, coll. Larissa N. Vasilyeva, cult. Amy Rossman AR 3568 = CBS 121125 (BPI 863764). KOREA. Kangwon Province: Chiaksan National Park, Mount Chiak, on *Acer pseudosieboldianum*, 22 Sep 2006, coll. Larissa N. Vasilyeva (BPI).

Leucodiaporthe acerina is superficially similar to species of *Melanconis* Tul. & C. Tul. but is unlike that genus in the strongly developed marginal zone that surrounds the stromata within the substratum. In addition *Leucodiaporthe acerina* bears some resemblance to *Melanoporthe* Wehm., a genus that was considered a synonym of *Diaporthe* by Barr (1978). *Melanoporthe* is based on *M. talae* (Speg.) Wehm. This species is illustrated as having broadly ellipsoid, even pseudo muriform ascospores due to the numerous guttules as well as a blackened zone in the substratum (Wehmeyer 1938, FIG. 9) similar to *L. acerina*. *Melanoporthe talae* is a typical *Diaporthe* except for having ascospores that become brownish. Ascospores of *Leucodiaporthe acerina* are hyaline.

Leucodiaporthe juglandis Lar.N. Vassiljeva sp. nov.
FIGS. 20–23

Mycobank number 510563

Stromata valsoidea, 1–1.5 mm diam, disco luteo; rostra nigra, ad marginem annularia, discum obruentia. Perithecia 350–400 µm diam. Asci clavati vel angustae cylindrici, 65–75 × 7–9 µm. Ascosporeae 13–15 × 3.5–5 µm, aliquando obtusis appendicibus.

←

long-beaked perithecial ostioles. 11. Ascus. 12. Ascospores. 13–19. *Leucodiaporthe acerina*. 13–15. Stromata with light ectostromatic disk and emerging perithecial ostioles. 16–19. Asci and ascospores; note gelatinous sheath surrounding ascospores. 20–23. *Leucodiaporthe juglandis*. 20–21. Stromata with white ectostromatic disk and emerging perithecial ostioles in loose concentric rings. 22–23. Ascus and ascospores. Bars: 1 = 3 mm; 2–3 = 1.5 mm; 4, 8–9, 16–17, 22 = 10 µm; 5, 11–12, 23 = 5 µm; 6, 13 = 2.5 mm; 7, 19 = 5 mm; 10, 14–15, 21 = 0.5 mm; 18 = 4 µm; 20 = 1 mm.

Holotype specimen: CHINA. Heilongjiang Province: Hulin vicinity, on dead branches of *Juglans mandshurica* Maxim. (Juglandaceae), 2 Sep 2003, coll. Larissa N. Vasilyeva, cult. Amy Rossman AR 4035 = CBS 121123 (HOLOTYPE; BPI 871219).

Etymology: referring to host plant.

Stromata valsoid, 1–1.5 mm diam, with yellowish ectostromatic disk and black perithecial beaks arranged in ring at margin obliterating disk, surrounded by a blackened zone in substratum. Perithecia spherical, 350–400 µm diam. Asci clavate or narrow cylindrical, 8-spored, 65–75 × 7–9 µm, apical annulus refractive. Ascospores biseriolate or overlapping uniseriate, fusoid or ellipsoid, 13–15 × 3.5–5 µm, 2-celled, constricted at septum, hyaline, sometimes with blunt appendages.

Culture on PDA after 7 d: colony 4.9 cm diam, mycelium sparse, low, even, not tufted, white margin, grayish sepia in sectors, colony with regular margin, reverse without pigments, pale mouse gray beneath dense mycelium.

The only species similar to *Leucodiaporthe juglandis* is *Melanconis juglandis* (Ellis & Everh.) Graves described from eastern North America and also known from Asia (Kobayashi 1970). Unlike *M. juglandis* having ascospores 17–20 × 6.5–9.5 µm (Wehmeyer 1941) *L. juglandis* has ascospores that are different in shape as well as being smaller in both length and width. In addition *L. juglandis* has a distinctive pale yellow ectostromatic disk and a blackened zone in the substratum.

Leucodiaporthe maackii (Lar.N. Vassiljeva) M.E. Barr & Lar.N. Vassiljeva comb. nov. FIGS. 24–26
Mycobank number 510564

Cryphonectria maackii Lar.N. Vassiljeva, Mikologiya i fitopatologiya, 22:486, 1988.

Melanconis maackii (Lar.N. Vassiljeva) Lar.N. Vassiljeva, Pyrenomyces of the Russian Far East, 2:27, 1994.

Stromata rounded or ellipsoid, pulvinate, erumpent with creamy to brownish ectostromatic disk through which emerge the scattered dark brown ostioles, within substratum stromata surrounded by dark brown zone. Perithecia 300–400 µm diam. Asci clavate or broadly cylindrical, 90–100 × 12–14 µm. Ascospores biseriolate or overlapping uniseriate, ellipsoid, 20–26 × 8–12(–14) µm, 2-celled, constricted in middle, hyaline, without appendages.

Culture on PDA after 7 d: colony 0.5 cm diam, mycelium sparse, low, not tufted, even, mouse gray at surface, dark mouse gray beneath, reverse without pigments, dark mouse gray. Culture on CMD after 2 mo: colony slow growing, ca. 1 cm diam, black, compact, margin smooth to slightly scalloped, mostly submerged hyphae, with sparse appressed aerial dark

gray hyphae, reverse black, no pigment into medium, with one or two tan pycnidia in center of colony, producing conidia.

Specimens examined: RUSSIA. Primorsky Territory: Vladivostok, on dead branches of *Maackia amurensis* Rupr. et Maxim. (Fabaceae), 18 May 2000, coll. Larissa N. Vassiljeva, cult. Amy Rossman AR 3437 (BPI 863761). CHINA. Heilongjiang Province: near Xingkai Agricultural Farm, on dead branches of *Maackia amurensis*, 2 Sep 2003, coll. Larissa N. Vasilyeva (BPI 871239).

Leucodiaporthe maackii is placed in this new genus based on the characteristic creamy to brownish ectostromatic disk and the ellipsoidal, hyaline ascospores.

Leucodiaporthe robiniae Lar.N. Vassiljeva sp. nov.

FIGS. 27–30

Mycobank number 510565

Stromata parva, valsoidea, circa 1 mm diam, disco luteo cum nigra ostioliis; perithecia 300–350 µm diam. Asci 140–160 × 14–16 µm. Ascospores ellipticae, 23–26 × 10–12 µm, sine appendicibus.

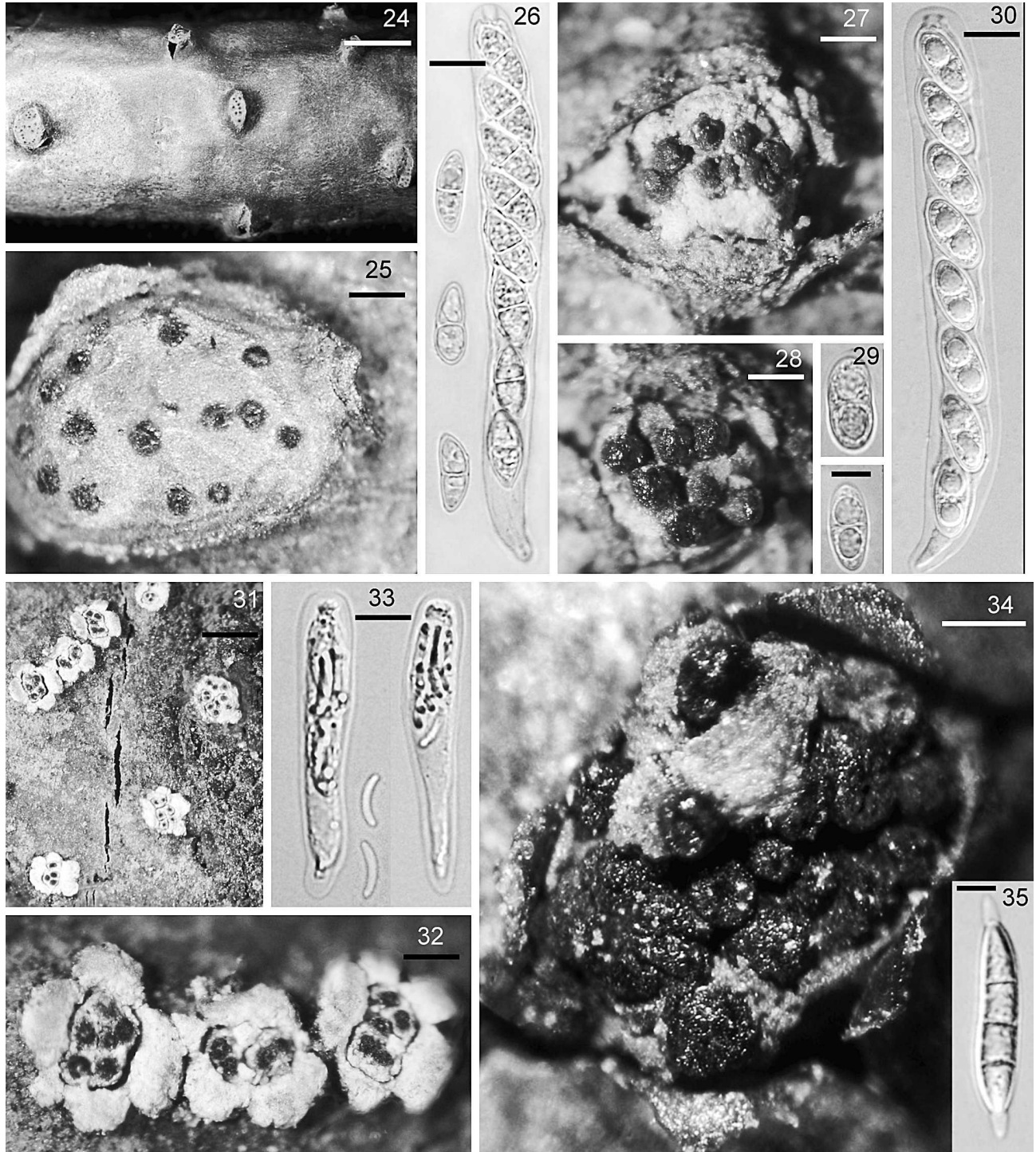
Holotype specimen: UNITED STATES. West Virginia: Pocahontas County, Monongahela National Forest, on dead branches of *Robinia* sp. (Fabaceae), 11 Sep 2002, coll. Larissa N. Vasilyeva, cult. Amy Rossman AR 3900 = CBS 121127 (HOLOTYPE-BPI 871007).

Etymology: referring to host plant.

Stromata small, valsoid, about 1 mm diam, with yellowish ectostromatic disk with black ostioles, within substratum surrounded by blackened zone, perithecia spherical, 300–350 µm diam. Asci clavate or broadly cylindrical, 8-spored, 140–160 × 14–16 µm. Ascospores biseriolate or overlapping uniseriate, ellipsoid, 23–26 × 10–12 µm, 2-celled, often slightly constricted in middle, hyaline, without appendages.

Culture on PDA after 7 d: colony 2.4 cm diam, mycelium dense, low, not tufted, even to slightly irregular especially toward center, white, margin regular, reverse without pigments, pale luteous, white at margin; after 29 d: colony 3.0–4.2 cm, sparse white fluffy mycelium with humped, compound sporodochia in concentric rings, reverse honey with dark spots where fruiting, some honey-colored pigments exuded into media. Conidia produced in compound stromata, dark, 1-septate, fusiform with appendages plus hyaline, smaller, elongate conidia. Culture on CMD after 29 d: colony 3.2–3.9 cm, no aerial hyphae except at margin, then only sparse, amber, reverse amber.

Leucodiaporthe robiniae is similar to *Ditopellopsis sophora* Tak. Kobay. on *Sophora japonica* L. known only from Japan based on the description and illustration in Kobayashi (1970). Although it is possible that *D. sophora* should be placed in *Leucodiaporthe*, this species has ascospores described as 17.5–20 × 9–11.5 µm, smaller than ascospores of *L. robiniae*. These



FIGS. 24–35. 24–26. *Leucodiaporthe maackii*. 24–25. Raised marginate stroma with perithecial ostioles emerging through light-colored ectostromatic disk. 26. Ascus and ascospores. 27–30. *Leucodiaporthe robiniae*. 27–28. Stroma with perithecial ostioles emerging through light-colored ectostromatic disk. 29–30. Ascus and ascospores. 31–33. *Leucostoma pseudoniveum*. 31–32. Stromata with white ectostromatic disk and irregular, pruinose margin. 33. Asci and ascospores. 34–35. *Phragmodiaporthe padi*. 34. Stroma with emerging perithecial ostioles. 35. Ascospore. Bars: 24 = 4 mm; 25, 27–28, 32, 34 = 0.3 mm; 26, 29, 33, 35 = 10 μ m; 30 = 20 μ m; 31 = 0.7 mm; 32 = 0.3 mm.

two species on fabaceous host plants might be vicarious in eastern Asia and eastern North America.

Leucostoma pseudoniveum Lar.N. Vassiljeva sp. nov.
FIGS. 31–33

Mycobank number 510566

Stromata parva, valsoidea, 0.5–1 mm diam, disco albido cum marginem irregularia, nigra ostiolis, circumcincta surrounded zona denigrata in substrato. Perithecia sphaerica, 200–250 µm diam. Asci clavati, 8-spori, 28–35 × 6.6–8 µm. Ascospores biseriatae, allantoidae, 8–12 × 2–2.5 µm, hyalinae.

Holotype specimen: CHINA. Heilongjiang Province: Fuyuan, on dead branches of *Populus* sp. (Salicaceae), 4 Aug 2004, coll. Larissa N. Vasilyeva (HOLOTYPE-VLA).

Etymology: referring to its similarity to *Leucostoma niveum* (Hoffm.: Fr.) Höhn.

Stromata small, valsoid, 0.5–1 mm diam, with whitish ectostromatic disk with irregularly expanded white margins and black dots of ostioles, within substratum surrounded by a blackened zone. Perithecia spherical, 200–250 µm diam. Asci clavate, 8-spored, 28–35 × 6.6–8 µm. Ascospores biseriatae, allantoid, 8–12 × 2–2.5 µm, hyaline.

Culture on PDA after 7 d: colony 5 cm diam, pale honey to isabelline in center, low scurfy to stringy, scalloped concentric rings at irregular distances within colony, margin scalloped, reverse similar in color; after 15 d: becoming dark greenish black, producing pycnidia.

Specimens examined: RUSSIA. Amur Region: Bastak Nature Reserve, on *Populus* sp., 19 Aug 2004, coll. Larissa N. Vasilyeva (VLA); Irkutsk Region: Irkutsk vicinity, on *Populus* sp., 8 Mar 1995, coll. T. I. Morozova (VLA); Primorsky Territory: Vladivostok vicinity, valley of the River Malaya Sedanka, 15 Apr 2000, coll. Larissa N. Vasilyeva, cult. Amy Rossman AR 3413 = CBS 109489 (BPI 748232).

A member of the Valsaceae (Castlebury et al 2002) *Leucostoma pseudoniveum* has ascospores that are distinctly smaller than those of *L. niveum* from Europe cited as having ascospores that are 13–18 × 2–4 µm (Hayova and Minter 1998a), 14–17 × 3–4 µm (Munk 1957 as *Valsa nivea*) or 12–14 × 3–4 µm in 8-spored asci and 16–20 × 3–4 µm in 4-spored asci (Nitschke 1867). Almost all reports of *Leucostoma niveum* (= *Valsa nivea* (Hoffm.: Fr.) Fr.) from North America represent the small spored species described here. Ellis and Everhart (1892) reported even smaller ascospores (7–9 µm) in specimens from Montana and Colorado (USA) as did Gilman et al (1957) from Iowa. Kern (1957) wrote that the specimens assigned to this species in North America were similar in all characteristics to those from Europe except in ascospore size. He reported on specimens having rather small ascospores collected in southern and

northern Michigan and other states that are most probably *L. pseudoniveum*.

Species of *Leucostoma pseudoniveum* from North America and eastern Asia have the same ascospore size as *L. persoonii* (Nitschke) Höhn. but differ in characteristics of the stroma (Hayova and Minter 1998c). In addition *L. persoonii* has never been reported on *Populus* spp. Species of *Leucostoma* on Salicaceae and Rosaceae display a similar diversity in having pairs of taxa, one with short ascospores and another with long ascospores. Thus *Leucostoma pseudoniveum* (8–12 µm) and *L. niveum* (13–18 µm) on Salicaceae are comparable to *L. persoonii* (10–13 µm, Hayova and Minter 1998b) and “*Leucostoma* sp.” on Rosaceae (15–17 µm, see below.).

Leucostoma excipienda (P. Karst.) Lar.N. Vassiljeva, comb nov.

Mycobank number 510567

Basionym: *Valsa excipienda* P. Karst., Bidrag till Kannedom af Finlands Natur och Folk 23:144. 1873.

Many specimens with the appearance of *Leucostoma persoonii* collected in Siberia and the Russian Far East on *Padus avium* Mill. (Rosaceae) have larger ascospores than true *L. persoonii*. The characteristics of a similar appearing *Leucostoma* on Rosaceae collected in eastern Asia also correspond to the specimens described as *V. auerswaldii* Nitschke on *Malus* and *Padus* (Merezhko and Smyk 1991), *V. excipienda* P. Karst. on *Sorbus* from Finland (Karsten 1873), “*V. leucostoma*” (Pers.: Fr.) Fr., “*V. massariana*” De Not. on *Sorbus* from Denmark and Japan (Kobayshi 1970, Munk 1957), “*V. nivea*” on *Sorbus* (Hayova and Minter 1998b) and *V. sibirica* Thüm. on *Cotoneaster* from Siberia (Thümen 1878). The specimens referred to by the names in quotation marks most likely are misidentified. All species listed above are considered to be conspecific. The earliest name for this species is *V. excipienda* and that epithet is herein transferred to *Leucostoma*.

Phragmodiaporthe padi Lar.N. Vassiljeva sp. nov.

FIGS. 34–35

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Stromata valsoidea, 1–1.5 mm diam, disco fusco; rostra nigra laeviter projecta; perithecia 300–350 µm diam. Asci 130–140 × 10–12 µm. Ascospores elongatae, 50–56 × 9–11 µm, 3-septatae, conicis appendicibus usque ad 7 µm longis.

Holotype specimen: CHINA. Heilongjiang Province: Weihushan Nature Reserve, Northern Tiger Forest Garden, on dead branches of *Padus avium* Mill., (Rosaceae), 9 Aug 2004, coll. Larissa N. Vasilyeva, cult. Amy Rossman AR 4122 – CBS 121225 (HOLOTYPE BPI 871220).

Etymology: referring to host plant.

Stromata rounded, valsooid, 1–1.5 mm diam, with brownish ectostromatic disk and clusters of thick, black, slightly projecting perithecial beaks, within the substratum a dorsal blackened zone, perithecia spherical, 300–350 µm diam. Asci clavate or broadly cylindrical, 8-spored, 130–140 × 10–12 µm. Ascospores biseriate or overlapping uniseriate, elongate, 50–56 × 9–11 µm, 3-septate, hyaline, with conical appendages up to 7 µm long.

Culture on CM after 2 mo: colony barely visible as sepia spot, sparse aerial sepia mycelium, hyphae immersed in agar, irregular, no pigments secreted into agar.

The genus *Phragmodiaporthe* Wehm. based on *P. caryae* (Peck) Wehm. was established for species similar to *Diaporthe* but having elongated, multi-septate ascospores (Wehmeyer 1941). This new species, *P. padi*, differs from *P. caryae*, which has ascospores 29–44 × 6.5–8 µm, in having longer ascospores. A second species in *Phragmodiaporthe*, *P. tiliacea* (Ellis) M.E. Barr, has shorter ascospores, 24–39 × 6–9.5 µm (Wehmeyer 1933), than *P. padi*.

ACKNOWLEDGMENTS

We thank Aleksey Chernyshev (Institute of Marine Biology) for his help with the preparation of illustrations and Christian Feullet (Smithsonian Institution) for translating the diagnoses into Latin. The first author acknowledges the Discover Life in America program (DLIA 2006-4) for opportunities to travel to the United States and collect fungi in the Great Smoky Mountains National Park. This research was conducted as part of a project financially supported by the National Science Foundation PEET (NSF 03-28364).

LITERATURE CITED

- Barr ME. 1978. The Diaporthales in North America with emphasis on *Gnomonia* and its segregates. *Mycol Memoir* 7:1–232.
- Castlebury LA, Rossman AY, Jaklitsch WJ, Vasilyeva LN. 2002. A preliminary overview of the Diaporthales based on large subunit nuclear ribosomal DNA sequences. *Mycologia* 94:1017–1031.
- Ellis JB, Everhart BM. 1892. The North American Pyrenomycetes. Philadelphia: Publ by the authors. 793 p.
- Gilman JC, Tiffany LH, Lewis RM. 1957. Iowa Ascomycetes II. Diaporthaceae: Valseae. *Iowa State Col J Sc* 31:623–647.
- Hayova VP, Minter DW. 1998a. *Leucostoma cinctum*. IMI descriptions of fungi and bacteria 1361:1–3.
- , ———. 1998b. *Leucostoma niveum*. IMI descriptions of fungi and bacteria 1362:1–3.
- , ———. 1998c. *Leucostoma persoonii*. IMI descriptions of fungi and bacteria 1363:1–3.
- Karsten PA. 1873. *Mycologia Fennica* 2. Pyrenomycetes. Bidr Känn Finlands Natur Folk, Helsingfors. p 1–250.
- Kern H. 1957. Untersuchungen über die Umgrenzung der Arten in der Ascomycetengattung *Leucostoma*. *Phytopathol Zeitschrift* 30:149–180.
- Kobayashi T. 1970. Taxonomic studies of Japanese Diaporthaceae with special reference to their life histories. *Bull Gov Forest Exp St* 226:1–242.
- Merezhko TA, Smyk VL. 1991. Flora Fungorum RSS Ucrainicae. Ascomycetes, Diaporthales. Kiev: 215 p (In Russian).
- Munk A. 1957. Danish Pyrenomycetes. Copenhagen: 491 p.
- Nitschke T. 1867. *Pyrenomycetes Germanici*. Breslau: 320 p.
- Rayner RW. 1970. A Mycological Colour Chart. Kew, UK: Commonwealth Mycological Institute.
- Rossman AY, Farr DF, Castlebury LA. 2007. A review of the phylogeny and biology of the Diaporthales. *Mycoscience* 48:135–144.
- Thuemen F. 1878. Beiträge zur Pilz-Flora Sibiriens II. *Bull Soc Imp Nat Moscou* 53:206–252.
- Vasilyeva LN. 1994. Pyrenomycetes of the Russian Far East 2. Valsaceae. Vladivostok: p 1–80.
- . 2004. New records of pyrenomycetous fungi from Sakhalin Island. *Flora and fauna of Sakhalin Island. Vladivostok*: p 93–100 (In Russian).
- Wehmeyer LE. 1933. The genus *Diaporthe* Nitschke and its segregates. *U Michigan Stud Sc* 9:1–349.
- . 1938. Les especies de “*Diaporthe*” en el herbario Spegazzini. *Rev Museo La Plata* 2:65–88.
- . 1941. A revision of *Melanconis*, *Pseudovalsa*, *Prosthecium* and *Titania*. *U Michigan Stud Sc Ser* 14: 1–161.
- Zhang N, Blackwell M. 2001. Molecular phylogeny of dogwood anthracnose fungus (*Discula destructiva*) and the Diaporthales. *Mycologia* 93:355–365.
- , Castlebury LA, Miller AN, Huhndorf SM, Schoch C, Seifert KA, Rossman AY, Rogers JD, Kohlmeyer J, Volkman-Kohlmeyer B, Sung G-H. 2006. An overview of the systematics of the Sordariomycetes based on a four-gene phylogeny. *Mycologia* 98:1077–1088.