Some new records of powdery mildew fungi from Argentina (2)

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Abstract: DELHEY, R., BRAUN, U. & KIEHR, M. 2003: Some new records of powdery mildew fungi from Argentina (2). Schlechtendalia **10**: 79–90.

The new species *Oidium jacarandigena* is described. *Erysiphe rayssiae, Golovinomyces artemisiae, G. sordidus* and *Podosphaera plantaginis* are new to Argentina and South America. 13 new hosts for various powdery mildew species are recorded: *Blumeria graminis - Bromus brevis; Erysiphe cruciferarum - Lepidium bonariense; E. howeana - Oenothera mollissima; E. trifolii - Lathyrus tomentosus; Golovinomyces cichoracearum - Noticastrum diffusum, Solidago chilensis; Golovinomyces cichoracearum* var. *latisporus - Parthenium hysterophorus; G. sordidus - Plantago berroi, P. tomentosa; Leveillula taurica - Asclepias mellodora; Neoerysiphe cumminsiana - Bidens subalternans; Podosphaera clandestina - Pyracantha atalantoides; P. xanthii - Cucurbita maxima* ssp. *andreana*. Some other hosts are known from other countries, but they are new to Argentina: *Blumeria graminis - Avena barbata, Elytrigia repens; E. polygoni - Rumex crispus; G. biocellatus - Melissa officinalis, Mentha rotundifolia, Salvia verbenaca; G. cichoracearum - Gerbera jamesonii, Lactuca sativa, L. serriola, Ambrosia tenuifolia; G. orontii - Datura ferox, Viola tricolor; Podosphaera aphanis - Rubus idaeus; P. clandestina - Cydonia oblonga, Spiraea cantoniensis; P. pannosa - Eucalyptus camaldulensis; P. plantaginis - Plantago lanceolata.*

A total of 57 host-fungus combinations is presented, 17 with native host species and 40 with introduced host species. In only two cases the teleomorph state has been observed.

Zusammenfassung: DELHEY, R., BRAUN, U. & KIEHR, M. 2003: Einige neue Angaben von Mehltaupilzen aus Argentinien (2). Schlechtendalia **10**: 79–90.

Die neue Art *Oidium jacarandigena* wird beschrieben. *Erysiphe rayssiae, Golovinomyces artemisiae, G. sordidus* und *Podosphaera plantaginis* sind neu für Argentinien und Südamerika insgesamt. Weiterhin wird über neue Wirte für verschiedene Mehltauarten berichtet: *Blumeria graminis - Bromus brevis; Erysiphe cruciferarum - Lepidium bonariense; E. howeana - Oenothera mollissima; E. trifolii - Lathyrus tomentosus; Golovinomyces cichoracearum - Noticastrum diffusum, Solidago chilensis; Golovinomyces cichoracearum* var. *latisporus - Parthenium hysterophorus; G. sordidus - Plantago berroi, P. tomentosa; Leveillula taurica - Asclepias mellodora; Neoerysiphe cumminsiana - Bidens subalternans; Podosphaera clandestina - Pyracantha atalantoides; P. xanthii - Cucurbita maxima* ssp. *andreana*. Einige andere Wirtspflanzen sind aus anderen Ländern schon bekannt, aber werden für Argentinien erstmals angegeben: *Blumeria graminis - Avena barbata, Elytrigia repens; E. polygoni - Rumex crispus; G. biocellatus - Melissa officinalis, Mentha rotundifolia, Salvia verbenaca; G. cichoracearum - Gerbera jamesonii, Lactuca sativa, L. serriola, Ambrosia tenuifolia; G. orontii - Datura ferox, Viola tricolor; Podosphaera aphanis - Rubus idaeus; P. clandestina - Cydonia oblonga, Spiraea cantoniensis; P. pannosa - Eucalyptus camaldulensis; P. plantaginis - Plantago lanceolata.* Insgesamt werden 57 Kombinationen von Wirten und Pilzen aufgezählt, davon 17 mit heimischen Wirten und 40 mit Wirten, die nicht heimisch sind. In nur zwei Fällen konnte die Hauptfruchtform gefunden werden.

This is a second contribution, after BRAUN et al. (2000), on powdery mildew fungi of the southern Pampean region (S of Buenos Aires and adjacent parts of La Pampa and Río Negro provinces), Argentina. This region, as well as many others in Argentina, is still insufficiently known with respect to the occurrence and distribution of Erysiphales. On the contrary, the Andean parts of Patagonia and Tierra del Fuego as well as the northeastern provinces have been studied more thoroughly, mainly due to the efforts of M. Havrylenko in the former and M.A. Mazzanti, M.G. Cabrera and R.E. Alvarez in the latter region (for literature compilation see DELHEY & BRAUN 2001).

The region covered by the present contribution phytogeographically includes parts of the "Provincia Pampeana" and the "Provincia Espinal" of CABRERA (1971). Especially the former is heavily modified by agriculture, animal husbandry and urbanization; introduced crops, ornamentals, forest trees, weeds and ruderals in many places have replaced the native vegetation.

The collections described are deposited in BB (Universidad Nacional del Sur, Departamento de Biología, Herbarium, Bahía Blanca, Argentina) and HAL (Martin-Luther-Universität, FB. Biologie, Institut für Geobotanik und Botanischer Garten, Herbarium, Halle/Saale, Germany).

New species

***Oidium* [subgen. *Pseudoidium*] *jacarandigena* sp. nov.** Fig. 1

Mycelium amphigenum, externum, effusum, tenellum. Hyphae superficiales, sparse ramosae, 2–5 µm latae, hyalinae, leves, septatae, tenuitunicatae; appressoriis singularis vel binis, oppositis, mammaeformibus vel lobatis, 3–6 µm latis. Conidiophora solitaria, ex hyphis superficialibus oriunda, erecta, recta vel raro leniter curvata, cellula basali cylindrica, 20–25 × 6–9 µm, et cellulis sequentibus, 1–2, brevioribus vel subaequalis. Conidia solitaria vel catenata, obovoidea, ellipsoidea–cylindrica, doliiformes, utrimque rotundata vel subtruncata, (20–)25–35(–38) × 10–18 µm, longit./latid. 1.5–3.2, hyalina, tenuitunicata.

Holotype: on *Jacaranda mimosifolia* D. Don (Bignoniaceae), Argentina, Bahía Blanca, 20 Jul. 2003, R. Delhey 1745 (HAL 1747); leg. R. Delhey.

Paratype: on *Jacaranda mimosifolia* (Bignoniaceae), Argentina, Bahía Blanca, 4 Sept. 2002, R. Delhey 1695 (HAL 1748); leg. M. Zazzetta.

Mycelium amphigenous, external, effuse, delicate. Hyphae superficial, sparingly branched, 2–5 µm wide, hyaline, smooth, septate, thin-walled, appressoria solitary or in opposite pairs, nipple-shaped to lobed, 3–6 µm wide. Conidiophores solitary, arising from superficial hyphae, erect, straight or rarely slightly curved, basal cells (foot-cells) cylindrical, 20–25 × 6–9 µm, followed by 1–2 shorter cells or cells of about the same length. Conidia solitary or often adhering in loose chains, primary conidia obovoid, apex broadly rounded, base subtruncate, secondary conidia ellipsoid–cylindrical, doliiform, ends rounded to subtruncate, (20–)25–35(–38) × 10–18 µm, l/w ratio 1.5–3.2, hyaline, thin-walled, fresh conidia with oil-drops.

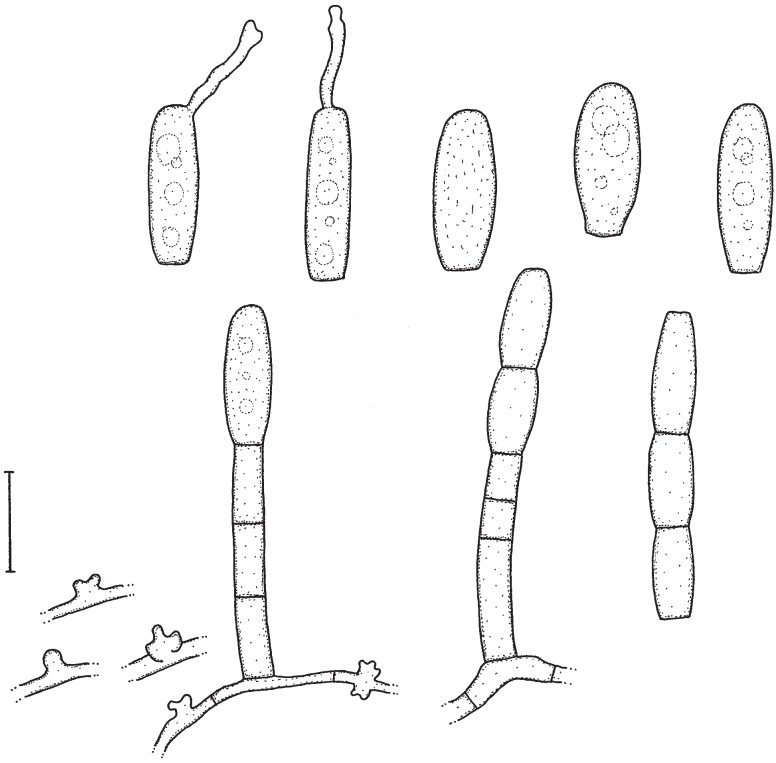

Fig. 1: *Oidium jacarandigena* sp. nov., conidia, conidiophores, appressoria; scale = 20 µm; U. Braun del.

Notes: Some conidia with terminal or subterminal, short, straight to flexuous germ tubes, apex slightly swollen or lobed, have been observed. There is no comparable species of *Oidium* [*Pseudoidium*] on hosts of the Bignoniaceae. The conidia of the anamorphs of *Erysiphe catalpae* S. Simonyan (on *Catalpa* spp.), *Erysiphe elevata* (Burrill) U. Braun & S. Takam. (on *Catalpa* spp.) and *E. peckii* (U. Braun) U. Braun & S. Takam. (on *Campsis radicans*) [BRAUN 1987a] are consistently formed singly. *Oidium jacarandigena* is morphologically close to *O. neolycopersici* L. Kiss (KISS et al. 2001), a species of nearly circumglobal distribution wherever tomatoes are grown, which is also known from the Pampean region of Argentina. The latter species is a species of *Oidium* subgen. *Pseudoidium* with solitary conidia, but also formed in short chains under humid conditions. However, it differs from *O. jacarandigena* in having much longer conidiophores, 30–75 µm, occasionally somewhat inflated in the middle and constricted at the base.

Obs.: On small potted plants held indoors; the affected plants lost all the infected leaves which were replaced by new apparently uninfected ones which in turn became infected the following year. Many adult *Jacaranda* trees growing in the city of Bahía Blanca have been checked during different seasons but powdery mildew infections have never been observed.

The native range of the highly appreciated and widely cultivated *Jacaranda* tree includes the NW of Argentina, Bolivia and Brazil. Powdery mildews have not been reported before on this species. As *O. jacarandigena* has the potential to weaken young seedling plants it might be of economic importance in nurseries.

Other records

(N) native host; (I) introduced host.

Blumeria graminis Golovin ex Speer

On *Avena barbata* Pott ex Link (I), Herb. 549: Prov. Bs. Aires; B. Blanca; 1 Nov. 1989; leg. R. Delhey (anamorph). Herb. 1233: Prov. Bs. Aires; part. Tornquist; P. Prov. E. Tornquist; 10 Nov. 1996; leg. R. Delhey (anamorph).

On *Bromus brevis* Nees ex Steud. (N), Herb. 44: Prov. La Pampa; part. Caleu-Caleu; ca. Anzoátegui; 13 Sept. 1984; leg. R. Delhey (anamorph). Herb. 1614: Prov. Bs. Aires; Bahía Blanca; 5 Nov. 2001; leg. R. Delhey & M. Kiehr (anamorph).

On *Bromus catharticus* Vahl (N), Herb. 102: Prov. Bs. Aires; part. Necochea; est. Loma Danesa; 26 Jul. 1986; leg. R. Delhey & M. Kiehr (anamorph). Herb. 510: Prov. Bs. Aires; B. Blanca; 7 Aug. 1989; leg. R. Delhey & M. Kiehr (anamorph).

On *Elytrigia repens* (L.) Nevski (I), Herb. 403: Prov. Bs. Aires; part. B. Blanca; 30 Sept. 1988; leg. R. Delhey (anamorph). Herb. 1130: Prov. Bs. Aires; B. Blanca; 4 Dec. 1995; leg. R. Delhey & M. Kiehr (anamorph).

On *Hordeum stenostachys* Godr. (N), Herb. 1449: Prov. Bs. Aires; B. Blanca; 12 Oct. 2000; leg. R. Delhey (anamorph).

Notes: *B. brevis* is a new host of *B. graminis*; *A. barbata* and *E. repens* are new hosts for Argentina. On *H. stenostachys* the fungus has been reported before by CARRERA et al. (1942).

Erysiphe aquilegiae DC.

On *Aquilegia vulgaris* L. (I), Herb. 1501: Prov. Bs. Aires; B. Blanca; 14 Nov. 2000; leg. R. Delhey (anamorph).

On *Aquilegia* sp. (I), Herb. 1407: Prov. Bs. Aires; B. Blanca; 13 Aug. 2000; leg. R. Delhey & M. Kiehr (anamorph).

Notes: *E. aquilegiae* has been reported on *A. vulgaris* and *Aquilegia* sp. in the province of Río Negro (BRAUN 1987b, HAVRYLENKO 1998).

Erysiphe australiana (McAlpine) U. Braun & S. Takam.

On *Lagerstroemia indica* L. (I), Herb. 1526: Prov. Bs. Aires; B. Blanca; 16 Nov. 2000; leg. R. Delhey (anamorph). Herb. 1612: Prov. La Pampa; Santa Rosa; 23 Jan. 2001; leg. R. Delhey (anamorph).

Notes: This powdery mildew is widespread and common in Argentina (BRAUN 1987b, ALVAREZ & MAZZANTI DE CASTAÑÓN 1991). The present is the first record in the provinces of Buenos Aires and La Pampa.

Erysiphe betae (Vanha) Weltzien

On *Beta vulgaris* [L.] ssp. *cicla* (L.) W. Koch (I), Herb. 1560: Prov. R. Negro; Viedma, IDEVI; 3 Aug. 2001; leg. R. Delhey & M. Kiehr (anamorph).

Notes: *E. betae* has first been identified in Argentina by FRAYSSINET & DELHEY (1989), on chard and beetroot in the province of Buenos Aires. This is the first record on chard in the province of Río Negro.

Erysiphe cruciferarum Opiz ex L. Junell

On *Lepidium bonariense* L. (N), Herb. 1711: Prov. Bs. Aires; B. Blanca; 13 Mar. 2003; leg. R. Delhey (anamorph).

Notes: *L. bonariense* is a new host of *E. cruciferarum* which also has been found on the same host in the northeastern part of Argentina (ALVAREZ & CABRERA, in litt.).

Erysiphe howeana U. Braun

On *Oenothera mollissima* L. (N), Herb. 1497: Prov. Bs. Aires; part. Tornquist, Parque Prov. E. Tornquist; 12 Nov. 2000; leg. R. Delhey (anamorph).

Notes: This is a new host species. *Oenothera* sp. recorded in the dunes of Pehuén-Co as a host of this fungus (BRAUN et al. 2000) has now also been determined as *O. mollissima*.

Erysiphe polygoni DC.

Rumex crispus L. (I), Herb. 1451: Prov. Bs. Aires; B. Blanca; 12 Oct. 2000; leg. R. Delhey (anamorph). Herb. 1707: Prov. Bs. Aires; B. Blanca; 14 Jan. 2003; leg. R. Delhey (anamorph). Herb. 1709: Prov. Bs. Aires; part. Villarino; H. Ascasubi; 13 Feb. 2003; leg. R. Delhey (anamorph).

Notes: This is a new host for Argentina. An unidentified powdery mildew on *R. crispus* has been reported from Tucumán (WEHT 2001) and the north-eastern provinces (ALVAREZ & CABRERA, in litt.).

Erysiphe rayssiae (Mayor) U. Braun & S. Takam.

On *Spartium junceum* L. (I), Herb. 1518: Prov. Bs. Aires; B. Blanca; 18 Nov. 2000; leg. R. Delhey & M. Kiehr (anamorph). Herb. 1699: Prov. Bs. Aires; B. Blanca; 23 Nov. 2002; leg. R. Delhey (anamorph). Herb. 1703: Prov. R. Negro; Choele-Choel; 8 Jan. 2003; leg. R. Delhey (anamorph).

Notes: *E. rayssiae* is new for South America. *Leveillula taurica* has been reported on *S. junceum* in Mendoza province (KLINGNER & LUCERO 1983).

In Bahía Blanca, stems and leaves of adult plants where found to be infected, while in Choele-Choel seedling plants were heavily attacked. *S. junceum* is an exotic invasive plant of natural environments in Argentina. As *E. rayssiae* seems to affect seedling establishment its suitability as a biological control agent merits further studies.

Erysiphe cf. ***syringae*** (Schwein.) Magnus

On *Ligustrum* sp. (I), Herb. 1553: Prov. Bs. Aires; Bahía Blanca; 9 Jul. 2001; leg. R. Delhey (anamorph; causing purple leaf spots).

On *Syringa vulgaris* L. (I), Herb. 1632: Prov. Bs. Aires; part. Necochea, criadero Buck La Dulce; 28 Jan. 2001; leg. R. Delhey (anamorph). Herb. 1636: RA; Prov. Bs. Aires; Bahía Blanca; 13 Jan. 2002; leg. R. Delhey (anamorph).

Notes: *E. syringae* has been recorded on lilac in Río Negro and Chubut (HAVRYLENKO 2001). Unidentified powdery mildews have been reported on *L. vulgare* (CARRERA et al. 1942) and *Ligustrum* sp. (PÉREZ 1962).

Erysiphe cf. ***trifolii*** (Grev.) U. Braun

On *Lathyrus tomentosus* Lam. (N), Herb. 1500: Prov. Bs. Aires; part. Tornquist, Parque Prov. E. Tornquist; 12 Nov. 2000; leg. R. Delhey (anamorph). Herb. 1609: Prov. Bs. Aires; part. Tornquist, Villa Ventana; 6 Nov. 2001; leg. R. Delhey (anamorph).

Notes: This is a new host of *E. trifolii.*

Golovinomyces artemisiae (Grev.) V.P. Gelyuta

On *Artemisia verlotiorum* Lamotte (I), Herb. 1080: Prov. Bs. Aires; part. Cnl Suárez; Villa Arcadia; 10 Nov. 1994; leg. C. B. Villamil & F. Anderson. Herb. 1701: Prov. Bs. Aires; part. B. Blanca; 25 Dec. 2002; leg. M. Kiehr.

Notes: *G. artemisiae* is new for South America. An unidentified *Oidium* (*Fibroidium*) sp. has been detected on the same host in Río Negro province (HAVRYLENKO 1998).

Golovinomyces biocellatus (Ehrenb.) V.P. Gelyuta

Melissa officinalis L. (I), Herb. 1667: Prov. Bs. Aires; part. Tornquist; PPET casco; 6 May 2002; leg. R. Delhey & D. Zappacosta (anamorph).

Mentha × *rotundifolia* (L.) Huds. (I), Herb. 1706: Prov. Río Negro; isla Choele-Choel; 10 Jan. 2003; leg. R. Delhey & M. Kiehr (anamorph).

Salvia verbenaca L. (I), Herb. 1727: Prov. Bs. Aires; Bahía Blanca; 22 Apr. 2003; leg. R. Delhey (anamorph; mainly on stems).

Notes: These are all new hosts for Argentina; the infections on *M. officinalis* and *M. rotundifolia* may be of economic concern.

Golovinomyces cichoracearum (DC.) V.P. Gelyuta

On *Gerbera jamesonii* H. Bolus ex Adlam (I), Herb. 1722: Prov. Bs. Aires; B. Blanca (greenhouse); 8 Apr. 2003; leg. R. Delhey & M. Kiehr (anamorph).

On *Cichorium intybus* L. (I), Herb. 1453: Prov. Bs. Aires; part. B. Blanca; arroyo Sauce Chico; 25 Oct. 2000; leg. R. Delhey & M. Kiehr (anamorph). Herb. 1642: Prov. Bs. Aires; part. Villarino; Pedro Luro; 25 Jan. 2001; leg. R. Delhey & M. Kiehr (anamorph). Herb. 1728: Prov. Bs. Aires; part. B. Blanca; Villa Bordeu; 23 Apr. 2003; leg. J. Lusto (holomorph).

On *Lactuca sativa* L. (I), Herb. 1746: Prov. Bs. Aires; Bahía Blanca (greenhouse); 1 Aug. 2003; leg R. Delhey & M. Kiehr (anamorph).

On *Lactuca serriola* L. (I), Herb. 1428: Prov. Bs. Aires; B. Blanca; 6 Sept. 2000; leg. R. Delhey (anamorph). Herb. 1704: Prov. R. Negro; isla Choele Choel; 10 Jan. 2003; leg. R. Delhey & M. Kiehr (anamorph).

On *Sonchus oleraceus* L. (I), Herb. 1611: Prov. La Pampa; Sta Rosa; 23 Oct. 001; leg. R. Delhey (anamorph).

On *Aster novi-belgii* L. (I), Herb. 1650: Prov. La Pampa; Guatraché; 28 Mar. 2002; leg. M. Díaz (anamorph). Herb. 1726: Prov. Bs. Aires; B. Blanca; 17 Apr. 2003; leg. R. Delhey (anamorph).

On *Noticastrum diffusum* (Pers.) Cabrera (N), Herb. 1522: Prov. Bs. Aires; part. Tornquist; Sierra de la Ventana; 6 Mar. 2001; leg. R. Delhey & M. Kiehr (anamorph).

On *Noticastrum sericeum* (Less.) Less. ex Phil. (N), Herb. 1683: Prov. Bs. Aires; part. B. Blanca; 21 May 2002; leg. R. Delhey (anamorph).

On *Solidago chilensis* Meyen (N), Herb. 1712: Prov. Bs. Aires; part. B. Blanca; 14 Mar. 2003; leg. R. Delhey (anamorph).

On *Dendranthema grandiflora* Tzvel. (I), Herb. 1742: Prov. Bs. Aires; Bahía Blanca;

29 June 2003; leg R. Delhey & M. Kiehr (anamorph).

On *Ambrosia tenuifolia* Spreng. (N), Herb. 1689: Prov. Bs. Aires; B. Blanca; 8 Aug. 2002; leg. R. Delhey (anamorph).
Conidia 29–48(–54.5) × (12–)16–19 um; length/width ratio larger than 2.

On *Dahlia pinnata* Cav. (I), Herb. 1521: Prov. Bs. Aires; part. Tornquist; Sa de la Ventana; 25 June 2002; leg. R. Delhey & M. Kiehr (anamorph).

Notes: *G. cichoracearum* is the dominant powdery mildew on hosts of the Asteraceae in Argentina. *N. diffusum* and *S. chilensis* are new host species; *G. jamesonii, L. sativa, L. serriola* and *A. tenuifolia* are new hosts for Argentina. WOLCAN et al. (2001) recorded *A. novi-belgii, D. grandiflora* and *D. pinnata* as Argentinean hosts of this fungus; thus, the present records on these hosts are new for the south of the province of Buenos Aires, as is *S. oleraceus* for the province of La Pampa. ALVAREZ & CABRERA (in litt.) confirm the presence of *G. cichoracearum* on *C. intybus, S. oleraceus, S. chilensis* and *A. tenuifolia* for the north-eastern provinces. *N. sericeum* (as *N. haplopappus*) has been recorded before as a host in the dunes of Pehuén-Co (BRAUN et al., 2000). The infections observed on greenhouse grown lettuce and gerbera should be taken into account from an economical point of view.

It should be pointed out that another powdery mildew, *Podosphaera fusca* (Fr.) U. Braun & N. Shishkoff, has been recorded recently on *G. jamesonii* in the La Plata region (WOLCAN et al. 2001).

Golovinomyces cichoracearum [(DC.) V.P. Gelyuta] var. ***latisporus*** (U. Braun) U. Braun

On *Helianthus petiolaris* Nutt. (I), Herb. 1723: Prov. Bs. Aires; B. Blanca; 8 Apr. 2003; leg. R. Delhey (anamorph).
Conidia 24–38.5 × 14.5–17.5 um; length/width ratio about 2.

On *Parthenium hysterophorus* L. (N), Herb. 1724: Prov. Bs. Aires; B. Blanca; 8 Apr. 2003; leg. R. Delhey.
Conidia 24–35 × 13–17 um; length/width ratio about 2.

Obs.: The specimen of *P. hysterophorus* collected was the only one infected among many healthy plants of this native species growing as a weed on the border of a *H. petiolaris* experimental plot, heavily infected with *G. cichoracearum* (see Herb. Nº 1723). This may indicate that, in the local population of *P. hysterophorus*, genotypes susceptible to the *H. petiolaris* strain of *G. cichoracearum* var. *latisporus* are rather infrequent.

P. hysterophorus is a new host of *G. cichoracearum* var. *latisporus* and *H. petiolaris* is a new host for Argentina. On the former plant, the anamorph of *L. taurica* has been reported from Mendoza (KLINGNER & LUCERO 1983).

Golovinomyces orontii (Castagne) V.P. Gelyuta

On *Vinca major* L. (I), Herb. 1569: Prov. Bs. Aires; B. Blanca; 14 Aug. 2001; leg. R. Delhey & M. Kiehr (anamorph).

On *Datura ferox* L. (I), Herb. 1523: Prov. Bs. Aires; part. Saavedra; ruta 33, arr. Alfalfa, 10 Mar. 2001; leg. R. Delhey & M. Kiehr (anamorph). Herb. 1654: Prov. Bs. Aires; part.Villarino; Villa Merced; 22 Mar. 2002; leg. R. Delhey & M. Kiehr (anamorph).

On *Viola tricolor* L. (I), Herb. 1678: Prov. Bs. Aires; B. Blanca; 11 May 2002; leg. R. Delhey (anamorph).

Notes: *Erysiphe orontii* has been identified on *V. major* for Río Negro (HAVRYLENKO 1998), so that this collection is the first record for Buenos Aires province. On *D. ferox*, *"E. cichoracearum"* has been

reported in La Plata (DAL BELLO & CARRANZA 1995) and unidentified powdery mildews have been reported in the province of La Pampa (NOELTING et al. 2001) and northeastern Argentina (Alvarez & Cabrera, in litt.). As there are no previous records on *V. tricolor* it seems possible that the present finding marks the beginning of an epidemic spread of *G. orontii* on pansy in Argentina. Simultaneously, an unidentified powdery mildew has been observed on this plant in the Argentinean northeast (ALVAREZ & CABRERA in litt.).

Golovinomyces sordidus (L. Junell) V.P. Gelyuta

On *Plantago berroi* Pilg. (N), Herb. 1498: Prov. Buenos Aires; Part. Tornquist; Parque Prov. E. Tornquist; 12 Nov. 2000; leg. R. Delhey (anamorph).

On *Plantago tomentosa* Lam. (N), Herb. 1693: Prov. Bs. Aires; B. Blanca; 12 Sept. 2002; leg. R. Delhey (anamorph); Herb. 1747: Prov. Bs. Aires; B. Blanca; 13 Aug. 2003; leg. R. Delhey & M. Kiehr (anamorph; heavily parasitized by *Ampelomyces quisqualis* Ces. ex Schltdl.).

Notes: This is the first record of *G. sordidus* in South America, but it should be mentioned that *Erysiphe sordida* appears on a list of fungi of the northeastern provinces of Argentina (MAZZANTI et al. 1989), with no further information. *P. berroi* and *P. tomentosa* are new host plants; an unidentified powdery mildew has been observed on *P. tomentosa* in the north-east (ALVAREZ & CABRERA in litt.).

Leveillula taurica (Lév.) Arnaud

On *Allium cepa* L. (I), Herb. 1062: Prov. Mendoza; Dto. Lavalle; 16 Mar. 1994; leg. R. Delhey, M. Kiehr & A. Azpilicueta (anamorph).

On *Asclepias mellodora* A.St. Hil. (N), Herb. 1524: Prov. Bs. Aires; part. Tornquist, Parque Prov. E. Tornquist, 4 Mar. 2001; leg. C.B. Villamil (anamorph).

On *Impatiens balsamina* L. (I), Herb. 1657: Prov. Bs. Aires; part. Tornquist; Sierra de la Ventana, Los Nogales; 6 May 2002; leg. R. Delhey & D. Zappacosta (anamorph).
Obs.: Mixed infection with *Podosphaera balsaminae*.

On *Lycopersicon esculentum* Mill. (I), Herb. 1528: Prov. Bs. Aires; B. Blanca; 9 Apr. 2001; leg. E. Gaido (anamorph; on field-grown crop).

Notes: *L. taurica* has first been recorded in Mendoza province, on 30 host plants including onion, balsam and tomato (KLINGNER & LUCERO 1983). The fungus is now widespread on introduced and native plants in central and northern Argentina, but not in Patagonia (DELHEY & BRAUN 2001). On tomato, the disease is of economic concern in Mendoza (PICCOLO et al. 1999). *L. taurica* has been found before in the southern Pampean region (BRAUN et al. 2000) and this is the first record on tomato and balsam for that area. *A. mellodora* is a new host of *L. taurica*.

Neoerysiphe cumminsiana (U. Braun) U. Braun

On *Bidens subalternans* DC. (N), Herb. 1679: Prov. Bs. Aires; B. Blanca; 13 May 2002; leg. R. Delhey (anamorph).

Notes: This is a new host of *N. cumminsiana. "E. cichoracearum"* has been recorded on *B. subalternans* in La Plata (DAL BELLO & CARRANZA 1995).

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

On *Rubus idaeus* L. (I), Herb. 1656: Prov. Bs. Aires; part. Tornquist, Sierra de la Ventana; Los Nogales; 5 Mar. 2001; leg. R. Delhey & D. Zappacosta (anamorph).

Notes: This is the first record of powdery mildew on raspberry in Argentina.

Podosphaera balsaminae (Kari ex U. Braun) U. Braun & S. Takam.

On *Impatiens balsamina* L. (I), Herb. 1657: Prov. Bs. Aires; part. Tornquist; Sierra de la Ventana, Los Nogales; 6 May 2002; leg. R. Delhey & D. Zappacosta (anamorph). Mixed infection with *Leveillula taurica*.

Notes: *P. balsaminae* has recently been reported on *I. balsamina* and *Impatiens* hybrid 'New Guinea' in La Plata (WOLCAN & RONCO 2002).

Podosphaera cf. ***clandestina*** (Wallr.: Fr.) Lév.

On *Crataegus monogyna* Jacq. (I), Herb. 1271: Prov. Bs. Aires; part. Tornquist, Villa Ventana; 27 Jan. 1998; leg. R. Delhey & M. Kiehr (anamorph). Herb. 1668: RA; Prov. Bs. Aires; part. Tornquist, Parque Prov. E. Tornquist; 6 May 2002; leg. R. Delhey & D. Zappacosta (anamorph).

On *Cydonia oblonga* Mill. (I), Herb. 1610: Prov. Bs. Aires; part. Tornquist; Parque Prov. E. Tornquist; 6 Nov. 2001; leg. R. Delhey (anamorph).

On *Pyracantha atalantoides* (Hance) Stapf (I), Herb. 1447: Prov. Bs. Aires; B. Blanca; 12 Oct. 2000; leg. R. Delhey (anamorph). Herb. 1638: Prov. Bs. Aires; B. Blanca; 10 Sept. 2001; leg. R. Delhey (anamorph).

On *Spiraea* cf. *cantoniensis* Lour. (I), Herb. 1520: Prov. Bs. Aires; part. Tornquist, Sierra de la Ventana; 5 Mar. 2001; leg. R. Delhey & M. Kiehr (anamorph). Herb. 1623: Prov. Bs. Aires; B. Blanca; 16 Nov. 2001; leg. R. Delhey (anamorph).

Notes: *P. clandestina* has been identified before on *C. monogyna* and *Spiraea* sp. in northern Patagonia (HAVRYLENKO 1998). In Bahía Blanca and surroundings this powdery mildew seems to be in expansion on *S. cantoniensis* (new host for Argentina), where heavy attacks, with leaf deformations and defoliation, have been observed in the last years. *P. atalantoides* is a new host of *P. clandestina*; infections have been found in different places of the city of Bahía Blanca, but always restricted to ripe fruit. Of special concern is the apparently first record of this powdery mildew on quince which is an important crop in arid and semiarid Argentina; so far, only one tree has been found to be infected in Tornquist (see above).

Podosphaerea pannosa (Wallr.: Fr.) de Bary

Eucalyptus camaldulensis Dehn. (I), Herb. 1681: Prov. Bs. Aires; part. B. Blanca; 10 May 2002; leg. A. Servera.

Notes: Infections have been observed only in young potted plants, but not in adult trees of *Eucalyptus*. In Mendoza province, an unidentified powdery mildew has been recorded on several *Eucalyptus* species, including *E. camaldulensis* (FELDMAN & PONTIS 1960). *Podosphaera pannosa* has been reported on *E. camaldulensis* from Australia by CUNNINGTON (2002), who confirmed the identity of this fungus by means of molecular methods (ITS).

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

On *Plantago lanceolata* L. (I), Herb. 1675: Prov. Bs. Aires; part. Tornquist, Parque Prov. E. Tornquist; 6 May 2002; leg. R. Delhey & D. Zappacosta (anamorph, parasitised by *Ampelomyces quisqualis*). Herb. 1705: Prov. Río Negro; isla Choele-Choel; 10 Jan. 2003; leg. R. Delhey & M. Kiehr (holomorph).

Notes: *P. plantaginis* is a new powdery mildew for South America.

Podosphaera xanthii (Castagne) U. Braun & N. Shishkoff, in Braun & Takamatsu (emend.)

On *Cucumis melo* L. (I), Herb. 1715: Prov. Bs. Aires; part. B. Blanca; Gral Cerri; 17 Mar. 2003; leg. R. Delhey (anamorph).

Cucurbita maxima Duchesne (I), Herb. 1527: Prov. Bs. Aires; Bahía Blanca; 27 Mar. 2001; leg. J. Lusto (anamorph).

Cucurbita maxima Duchesne ssp. *andreana* (Naudin) Filov (N), Herb. 1530: Prov. Bs. Aires; part. Balcarce; 19 Apr. 2001; leg. S. Alonso (anamorph).

Notes: *P. xanthii* is common and widespread on cucurbitaceous crops in Argentina (MAZZANTI DE CASTAÑÓN et al. 1987, BRAUN et al. 2000). *C. maxima* ssp. *andreana* is a new host plant.

Oidium neolycopersici L. Kiss

On *Lycopersicon esculentum* Mill. (I), Herb. 1651: Prov. Bs. Aires; part.Villarino; Va. Merced; 22 Apr. 2002; leg. R. Delhey & M. Kiehr.

Notes: This powdery mildew appeared for the first time in 1994 in Argentina (WEHT 2001) and it seems to be of economic importance in some places. The present record is the first for the southern Pampean region.

Discussion

One new powdery mildew species is described and four additional species are recorded as new for South America. In addition, there are 13 new host species for known powdery mildew fungi and 19 new host records for Argentina. A total of 57 host-fungus combinations is presented, 17 with native host species and 40 with introduced host species. In only two cases the teleomorph has been observed.

DELHEY & BRAUN (2001) proposed three categories of powdery mildew fungi in Argentina, according to their origin: ancient natives, recent natives and exotics. Ancient natives (or their direct ancestors) are supposed to have been present in South America before the pliocene. Recent natives (or their direct ancestors) would have immigrated after the physical connection of North and South America which allowed the exchange of the biota of both continents. Exotics have been introduced in the last 500 years, after the European colonization of the Americas. The criteria for the inclusion of any powdery mildew species in one of these categories are based on the following considerations. The association of the fungus with pre-pliocene native taxa of higher plants is a characteristic for ancient natives, while the association with plants supposed to have immigrated after pliocene (or evolved from such immigrants) would identify a recent native fungal species. Exotic powdery mildews are associated with introduced plant taxa. In many cases, a given powdery mildew species infects both, native and introduced hosts, which may be due to a recent shift to the new hosts or the simultaneous presence of native and exotic fungus strains. The latter might be the case in species such as *Blumeria graminis, Golovinomyces cichoracearum* and others.

According to these criteria, the new species *Oidium jacarandigena* is an ancient native of southern South America. Of the species recorded new for South America, *E. rayssiae, G. artemisiae* and *P. plantaginis* have been found on introduced hosts

only and are therefore considered exotic for South America. On the contrary, *G. sordidus* has been found to be associated with two native species of *Plantago* and is, thus, a fungus native to South America. However, as the question whether *Plantago* entered South America before or after pliocene still has not been settled, it can not be decided here if it is an ancient or a recent native. In general, the new records presented here do not question the tentative categorizations proposed by DELHEY & BRAUN (2001).

From an agronomical point of view, the new records on crops such as quince, raspberry, lettuce, *Melissa, Mentha, Gerbera*, pansy, *Pyracantha, Spiraea, Eucalyptus* and *Jacaranda* should be taken into account. On the other hand, the powdery mildew found on the broom *Spartium junceum* might be useful as a biological control agent for this invasive plant.

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