Note on some Peronosporales described from Bulgaria

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Abstract. Three new taxa of *Peronospora* described from Bulgaria are revised: *P. jordanovii* is invalid and the type not extant, *P. parietariae* is most probably based on contaminated material, and *P. knautiae* var. *longispora* is apparently based on two fungi but only *P. knautiae* var. *knautiae* is present in the holotype. The presence in Bulgaria of *Plasmopara* on *Geranium* is not confirmed.

Key words: Bulgaria, *Peronospora,* Peronosporales, *Plasmopara,* taxonomy

During preparation of a note about the occurrence of Peronosporales in Bulgaria (Negrean *et al.* 2004), we came across some problems concerning three new taxa of *Peronospora* previously described from this country, as well as on the presence of *Plasmopara* on *Geranium.* Where available, type and/or original specimens of these records were examined. Herbaria abbreviations are those from Holmgren *et al.* (1990) updated at http://www.nybg.org/bsci/ih/. ICBN and numbers refer to the articles of the International Code of Botanical Nomenclature (Greuter *et al.* 2000).

Peronospora jordanovii Krousheva, Comptes Rendus de l'Académie Bulgare des Sciences **20**: 240, 1967 [*nom. inval.,* ICBN Art. 37.1]. Original collections on *Brassica jordanoffii* O.E. Schultz, Bulgaria, Pirin Mts, circus Kamenititsa, 8 Jul 1961, R. Krousheva; ditto, 3 Sep 1962.

Earlier doubts about the presence of original specimens at SOM (Constantinescu 1991) were confirmed. No such specimens are deposited at SOMF or SO and apparently none is extant. In fact, R. Krousheva (1928-2000) did not deposit any type of the taxa of parasitic fungi she described. Parts of the original description and illustration have been repeated in the monograph of Bulgarian Peronosporales (Vanev *at al.* 1993). Based on the description, this fungus most probably belongs to *Hyaloperonospra brassicae* (Gäum.) Göker *et al.,* s.l., but it has no nomenclatural status.

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Peronospora parietariae Vanev & E.G. Dimitrova, Fitologiya **34**: 55, 1988. Original collection on *Parietaria officinalis* L. (*P. erecta* Mert. & Koch), Bulgaria, Mt. Belasitsa, near Petrich, 18 Nov 1980, S. Vanev & E.G. Dimitrova (SOMF 15 548 holotype!).

The authors were apparently not aware of the earlier, though invalid homonym *Peronospora parietariae* Roum. (Roumeguère 1883) which is, in fact, *Ramularia parietariae* Pass. (Farlow 1883; Constantinescu 1991). They compared their taxon with both *Plasmopara* (*Peronospora*) *illinoensis* (Farl.) Davis parasitic on *Parietaria* in North America, and with the European *Peronospora debaryi* E.S. Salmon & Ware, parasitic on *Urtica urens* L.

The examination of the holotype specimen showed that almost exclusively *Ramularia parietariae* is present. Extremely scarce conidiophores and conidia of a *Peronospora* largely corresponding to the description of *P. parietariae* Vanev & E.G. Dimitrova, but also resembling *P. debaryi,* as well as conidiophores reminiscent of *Paraperonospora* were found. In addition, no connection of these conidiophores to the host could be noticed. They are sitting on the leaf surface, held in place by the characteristic uncinate hairs of the host trichome. Consequently, the presence of these fungal structures on *Parietaria* seems to be due to the accidental contamination of the specimen during handling and not by a peronosporaceous fungus genuinely harboured by the host.

Until more specimens are collected, this taxon is better considered doubtful.

Peronospora knautiae Fuckel ex J. Schröt. var. ***longispora*** Vanev & E.G. Dimitrova, Phytologia Balcanica **1**(1): 101, 1995. Holotype on *Knautia drymeia* Heuff., Bulgaria, Mt Vitosha, along the river Vladayska, 12 Jun 1977, E.G. Dimitrova (SOMF 15 577!).

This trinomial was first mentioned in Vanev *et al.* (1993: 79) but as an invalid name (ICBN Art. 32.1). The examination of the type specimen showed that the conidiophores are 200-410 µm long (trunk length 116-240 µm) and the conidia are yellowish to brownish, ellipsoidal, with rounded ends, (22–) 24.5-28.5 (–30) µm long, (15–) 17-20 (–21) µm broad, l/b (1.3–) 1.36-1.49 (–1.6) (n = 50). These are consistent with the characteristics of *Peronospora knautiae* var. *knautiae.* Neither conidiophores nor conidia showing the characters described as typical for *P. knautiae* var. *longispora* were found.

The description provided by the authors, particularly of conidia, is more reminiscent of *P. violacea* Berk. Interestingly, the specimen SOMF 15 577 was previously identified as a leaf type of attack of *P. violacea* by Vanev & Dimitrova (1983) and Dimitrova (1984, 1985). Dimitrova (1985) also cited two previous records of *P. violacea* from Bulgaria, i.e. Malkoff (1910) on *Knautia* sp., and Klika (1926), on *K. arvensis.* Although in three previous papers the authors commented on the detection of both *P. knautiae* and *P. violacea* on *Knautia drymeia,* the second fungus was later omitted without further explanation from the monograph of Bulgarian Peronosporales (Vanev *et al.* 1993). The presence of *P. violacea* on leaves, although this fungus is primarily a flower pathogen, is not unique. In *Peronospora radii* de Bary, also a chiefly flower pathogen, this phenomenon is well documented (Constantinescu 1989).

In conclusion, it seems that the description of *P. knautiae* var. *longispora* is based on a mixture of *P. violacea* and *P. knautiae* var. *knautiae* but only the last species is present in the holotype.

Plasmopara pusilla (de Bary) J. Schröt. was reported from Bulgaria first on *Geranium* sp. (Malkoff 1910), and later on *G. sylvaticum* L. (Radoslavov 1921) and *G. reflexum* L. (Dimitrova 1985; Vanev *et al.* 1993).

Because there is no other report of *Plasmopara* on *G. reflexum,* and *G. sylvaticum* is not host for *Plasmopara pusilla* (Constantinescu 2004), the study of specimens became indispensable. Only the specimen on *G. reflexum* was available for study (SOMF 15 949). This specimen turned out to consists of a few leaves of *Geranium* showing scarce presence of *Ramularia geranii* (Westend.) Fuckel, and of more leaves of *Anemone,* most harbouring *Plasmopara pygmaea* (Unger) J. Schröt.

Two additional specimens of *G. reflexum* present in the phanerogamic collection SOM and showing fungal presence were also examined, but only *Ramularia geranii* could be found. These specimens are deposited under SOMF 25 525 and 25 526.

Thus, we may conclude that *Plasmopara* on *Geranium* has not yet been found in Bulgaria.

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