

## *Plasmopara Halstedii* s.l. in Poland

TOMASZ MAJEWSKI

(Warszawa, Polska)

*Plasmopara Halstedii* (Farl.) Berl. et de Toni is a collective species which parasitizes on numerous representatives of the family *Compositae*. Although the forms classified to *P. Halstedii* differed rather widely as regards biology, morphology and geographical distribution, they were for a long time considered as one species. Săvulescu (1943) described two new species of the genus *Plasmopara* on *Compositae* (of the *Liguliflorae* subfamily): *P. sphaerosperma* on *Tragopogon dubius* and *P. megasperma* on *Scorzonera humilis*.

More recent critical investigations on this collective species have been performed by Novotel'nova, who proved that *Plasmopara Halstedii* is a collective species including many small species differing by their physiological and morphological features as well as by their geographical distribution. She also established criteria for their classification (Novotel'nova 1962). In her further papers she described seven species and 12 forms: on representatives of the tribe *Astereae* — 2 species and 4 forms, on *Inulae* — 1 species, on *Heliantheae* — 3 species and 8 forms, on *Cynareae* — 1 species. She kept the name *Plasmopara Halstedii* for the fungus on plants from the tribe *Eupatorieae* (*Eupatorium purpureum* is the type host). The diagnoses of these new taxons may be found in the following papers: Novotel'nova 1961, 1963a, 1963b; in one of them (1963a) a review of all the so far described species and forms is given. Her latest work (1966) sums up all her investigations to that date.

As basis for distinguishing species Novotel'nova (1962) assumed their biological specialization — their occurrence on representatives of various tribes of the *Compositae* family (after De Dalla Torre and Harms 1900—1907) taking into account as complementary traits their morphological particularities. When fungi differing from one another by several characters occur on plants of the same tribe, they are treated as distinct species. On the other hand, specimens occurring on closely

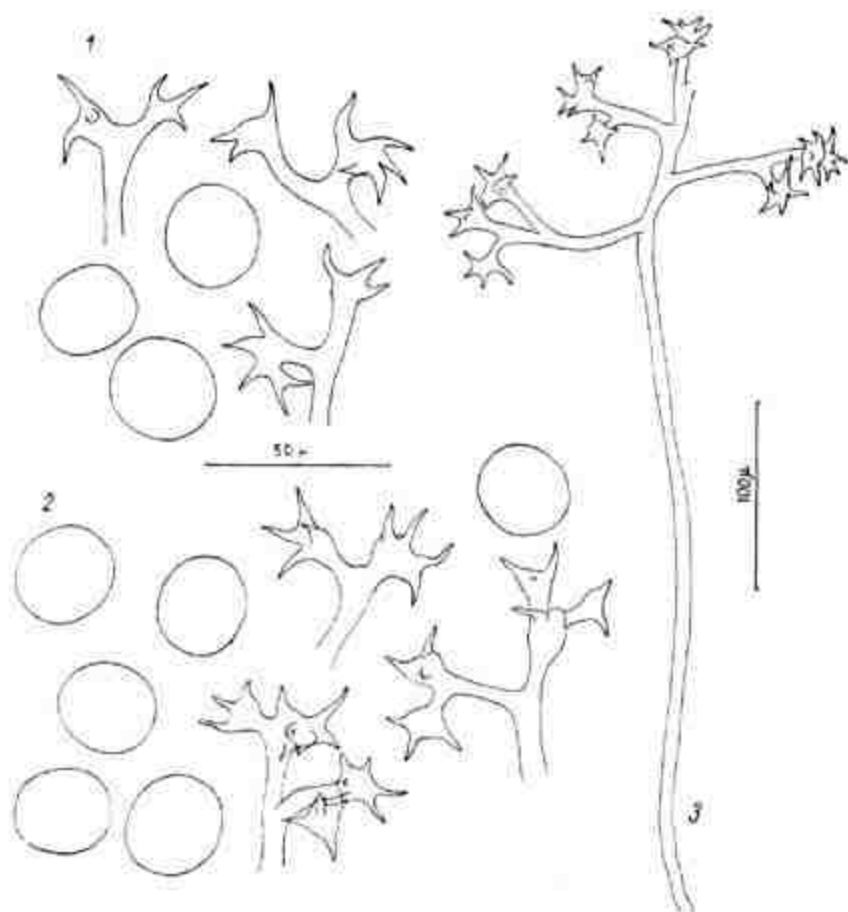


Fig. 1—3. *Plasmopara sphaerosperma* on *Tragopogon pratensis*: fig. 1 — branch endings and sporangia. *Plasmopora centaureae-mollis* on *Centaurea mollis*: fig. 2 — branch endings and sporangia; fig. 3 — sporangiophore.

interrelated species and genera of hosts, and similar as regards the structure of the sporangiophores, but differing by the size and shape of the zoosporangia, are classified by the author as different forms.

In Poland only one species of *Plasmopara* was known so far on *Compositae* — *P. sphaerosperma* Sävul. on *Tragopogon pratensis* L. This species was mentioned (sub *Bremia lactucae* Regel) in the works of Hellwig (1897) and Schroeter (1889). In the herbarium of the Botanical Institute, the University, Wrocław, both specimens have been preserved from the following sites: Węgieyki, Września county, 7. 1892, leg. Hellwig and the environs of Legnica leg. Gerhardt (published in "Schneider, Herb. Schles. Pilze" No. 410). Both these specimens fit the diagnosis of *Plasmopara sphaerosperma* Sävul. (1943). The mean dimensions of the zoosporangia (material from Węgieyki) are  $26,4 \times 25,0 \mu$ , quotient 1,06 (Sävulescu 1943:  $28,50 \times 28,50 \mu$ , Novotelnova 1963a:  $24,57 \times 21,21 \mu$ ). The branch endings in their shape resemble more those of the species *Peronospora leptosperma* s. l. than

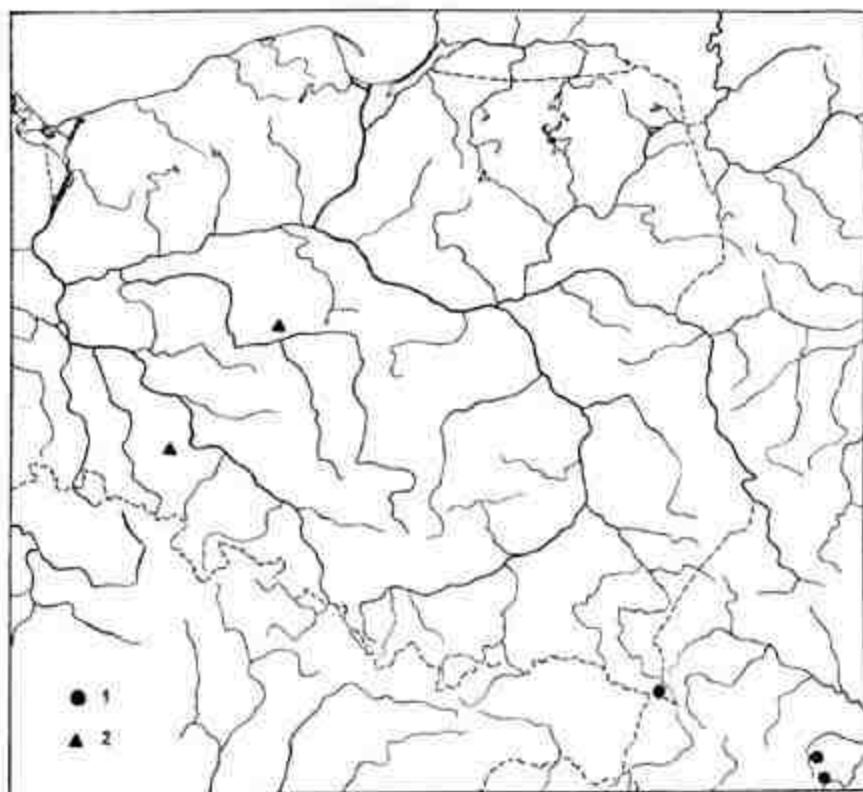


Fig. 4: Distribution of *Plasmopara centaureae-mollis* (1) and *P. sphaerosperma* (2).

of *Bremia lactucae* Regel (generally distinct thickenings are lacking, sterigmata occur by two's or three's; if more numerous they are arranged in the short, often irregular drepanium (Fig. 1).

The second Polish representative of *Plasmopara* on *Compositae* is the form collected by the author on *Centaurea mollis* W. K. in the Bieszczady mountain range on the area of the burnt village of Wołosate. The host occurring here in large quantities as a wild plant originates probably from the devastated gardens around the houses (Jasiewicz 1966). The parasite on these plants belongs to the genus *Plasmopara* as shown by the monopodial bifurcation of the sporangiophores. On the other hand, they resemble *Bremia lactucae* by the branch endings which are frequently thickened like drumsticks. Sterigmata occur on these thickened parts by two to six but less regularly than in *Bremia* (Fig. 2).

The fungus discussed differs from *Plasmopara sphaerosperma* not only by the endings of its branches but also by the relatively longer unbranched stalk (4/5 to 5/6 of the whole sporangiophore as compared to 1/2 to 3/4 in *P. sphaerosperma*). However, the sporangia in both these species are very similar both in shape and size.

To the same species belong the specimens collected by Wróblew-

ski (1913, 1916) on *Centaurea mollis* in the Pokucie Carpathian range and determined by him as *Bremia lactucae* Regel (Herbarium of Botanical Institute, Polish Academy of Sciences, Cracow).

The above discussed fungus differs from the species described recently by Novotel'nova and Săvulescu (known to the author only from the literature), by a greater similarity of its branch endings to those of *Bremia lactucae*. All the related species, with the exception of *Plasmopara saussureae* Novot., parasitize on representatives of other tribes of the *Compositae* family, thus they also differ by their biological specialization. *Plasmopara saussureae* parasitizes on *Saussurea alpina* DC. of the *Cynareae* tribe to which the genus *Centaurea* also belongs. It differs, however from the fungus on *Centaurea mollis* by its much smaller sporangia (according to Novotel'nova, 1963a, the dimensions of the sporangia of *P. saussureae* are  $12-24 \times 12-21 \mu$ , mean  $18,75 \times 15,78 \mu$ ) and by the absence of *Bremia*-like distensions at the ends of the branches.

The above quoted data seem sufficient for establishing the fungus above described as a new species.

*Plasmopara centaureae-mollis* n. sp.

*Caespitulis albidis, totum tergum foliorum subtegentibus, leviter visibilibus in tomentis. Sporangioforis 350—570  $\mu$  altis, monopodialiter ramosis, truncis 4/5—5/6 totius altitudinis, 7—12  $\mu$  crassis, basi solito non tumida; ramis primariis 3—5, rectis, saepe rectangulis, apice capitato inflatis, sterigmatis 2—6 irregulariter in tumidis extremitatibus insidentibus, 7—13  $\mu$  longis. Sporangiiis globosis vel late ovatis, vix papillatis, 23—30  $\mu$  longis, 20—28  $\mu$  latis, mediocriter 26,0  $\times$  23,5  $\mu$ . Oosporis ignotis.*

*Habitat in foliis Centaureae mollis W. K.: Bieszczady Occid., Wołosate vico incendio deleto, 24.5.1966 leg. T. Majewski (Typus); ibidem, 3.6.1964 leg. T. Majewski (Herbarium Laboratorii Mycologici Inst. Bot. Acad. Scienc. Pol., Varsoviae); Carpatiae Orient. (URSS), Kostrzyca ad Żabie, 8.6.1914 leg. A. Wróblewski, in valle Prutec inter Mikułiczyn et Lesina patenti, 5.7.1914, leg. A. Wróblewski (KRA).*

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### *Plasmopara Halstedii* s. l. w Polsce

#### Streszczenie

W południowo-wschodniej Polsce znaleziono na *Centaurea mollis* W. K. przedstawiciela rodzaju *Plasmopara* ze zbiorowego gatunku *Plasmopara Halstedii* (Farl.) Berl. et de Toni. Różni się on od dotychczas opisanych drobnych gatunków *P. Halstedii* s. l. pod względem specjalizacji biologicznej oraz cechami morfologicznymi; opisano go jako *Plasmopara centaureae-mollis* Majewski, n. sp. Dotychczas w Polsce znany był tylko 1 gatunek *Plasmopara* na przedstawicielu *Compositae* — mianowicie *Plasmopara sphaerosperma* Săvul. na *Tragopogon pratensis* L.