

## The genus *Craterium* (*Myxomycetes*) in Poland

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The paper presents an extended list of species of the genus *Craterium*, hitherto found in Poland. In the monograph on Polish slime moulds Krzemieniewska (1960) 3 species and 1 variety of that genus were mentioned. Lately, the following two new species have been recorded: *Craterium concinnum* Rex. and *C. brunneum* Nann.-Bremek. *Craterium muscorum* Ing, reported earlier under the name of *Badhamia rubiginosa* (Chevall) Rostaf. is also included in the present paper. All together, with *Craterium aureum* (Schumach.) Rostaf. rarely occurring in Poland, and widespread *C. minutum* (Leers) Fr., *C. leucocephalum* (Pers.) Ditmar with its variety *scyphoides* (Cooke et Balf.) G. Lister, the number of taxa of the genus *Craterium* in Poland increased up to 7.

**Key words:** *Myxomycetes* slime moulds, *Craterium*, distribution, Poland

### INTRODUCTION

In respect of taxonomy, the genus *Craterium* Trentep. belongs to the family *Physaraceae*, order *Physariales*, and class *Myxomycetes* – slime moulds. According to the ninth edition of the "Ainsworth and Bisby's Dictionary of Fungi (Kirk et al. 2001) the genus includes 16 species. Neubert et al. 1995 in his monograph mentions 15 species and 4 varieties, Lado (2001) - 15 species, while Krzemieniewska (1960) reports 3 species and 1 variety from Poland. In this paper an extended list of species of the genus *Craterium* in Poland, following the taxonomy of Neubert et al. (1995) is present.

## DESCRIPTION OF SPECIES

*PHYSARALES**Craterium concinnum* Rex.

Sporangia funnel-shaped, dark-brown (russet) or cinnamon-brown up to 1 mm tall, stand solitary or in loose groups, on red-brown, longitudinally creased stalks up to 0.3 mm long, set in oval, brown or colourless, poorly visible hypothallus. The upper part of sporangium has slightly thickened (rod-like) wall rim, very close to the lid. Lid slightly convex, lighter than sporangium, 0.2-0.6 mm in diameter. Capillitial net inside the sporangium composed of short colourless (hyaline) and thin threads connecting numerous, small angular, polygonal, but mostly triangular lime nodes which are bigger in center of the sporangium, and sometimes aggregated into pseudocolumella. Spores in mass dark-brown, spores purple-brown, densely verrucose, 8-10  $\mu\text{m}$  in diameter. The species new is for Poland, it was collected by E. Panek 17.08.2002 from decaying wood of *Tilia* in the "Łęczczok" nature reserve near Racibórz (SW Poland) (Figs 1A, B).

**Distribution.** According to Martin and Alexopoulos (1969) the species occurs in USA, Jamaica, Colombia, in Europe (Holland, Poland), India and Japan. Neubert et al. (1995) as the site of occurrence, first of all indicate Austria (specimens collected from fructifications of *Alnus*, and from litter under *Alnus* trees), Germany, Italy (on leaves of *Castanea sativa*), and France (litter under *Alnus* trees). Next European records come from Great Britain and Poland. On other continents: Central and South America, India, China and Japan.

We suppose that Neubert et al. (1995) indicated the area of Poland erroneously in both cases because the Polish literature quoted by the authors contains neither description of this species in Poland, and what is more, nor its synonyms.

**Illustrations.** Coloured drawings of sporangia, capillitium and spores are in the monograph "Mycetozoa" (Lister and Lister 1925, Fig. 79). A coloured drawing is also in Martin and Alexopoulos (1969) monograph (Plate XXV No 226); Neubert et al. (1995) in the description of *Craterium concinnum* (pages 193-194) give coloured photograph of sporangia and black and white drawings of capillitium, spores, structure of sporangial wall and lid; on page 347 there are also 4 electronograms of spores and capillitium with lime nodules.

*Craterium brunneum* Nann.-Bremek.

Synonym: *Craterium minutum* var. *brunneum* (Nann.-Brem.) L. Krieglst.

In 1973 Nannenga-Bremekamp distinguished and described a new species *Craterium brunneum* out of *C. minutum*.

Sporangia stalked, urn-like in shape, stand in small groups, dark-brown, shiny, up to 1 mm tall. Cup 0.5 mm tall, 0.3 mm in diameter. Stalk brown or ochraceous-brown, grooved, up to 0.5 mm long, set in oval ochraceous-orange hypothallus. Sporangial wall composed of two layers, limeless. Sporangium opens by shedding of lid. Lid supported with a rib below the rim of cup, shiny and smooth, ochraceous-brown, slightly sunken into sporangium, flat. Columella absent. Capillitium formed of a delic-

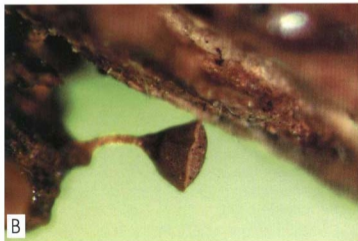


Fig.1. *Craterium concinnum*: A - macroscopically; B - microscopic view.



Fig.2. *Craterium brunneum*: A - macroscopically; B - microscopic view.



Fig. 3. *Craterium muscorum*.



Fig. 4. *Craterium aureum*.



Fig. 5. *Craterium minutum*.



Fig. 6. *Craterium leucocephalum*.

ate net; short, transparent net fragments with numerous small, polygonal sometime branched, white lime nodules. Spores in mass dark-brown, spores violet-brown, densely verrucose, 10-11 µm in diameter. The species is new for Poland. For the first time it was collected by W. Stojanowska 19.07.2002 from decaying wood in Chojnik Mountain in the Karkonosze Mts (Figs 2A, B).

**Distribution.** Type specimen from Holland, occurred on dead moss and leaves. Known from England, Germany, France and Finland.

**Illustrations.** The only illustration is presented by Nannenga-Bremekamp in "A Guide to temperate Myxomycetes" (1991) – it is a drawing of sporangium, capillitium and spores.

### *Craterium muscorum* Ing

Synonym: *Badhamia rubiginosa* (Chevall) Rostaf. var. *globosa* A. et G. Lister

According to a monograph of Martin and Alexopoulos (1969) *Badhamia rubiginosa* (Chevall) Rost. is a synonym of *Badhamia obovata* (Peck.) S. J. Smith, Lado (2001) also refers this synonym to *Craterium obovatum* Peck, whilst Krzemienińska (1960) considers it a real species, and gives the following synonyms: *Scyphium rubiginosum* Rost. and *S. curtisii* Rost. Both these synonyms appear under *Badhamia obovata* (Martin and Alexopoulos 1969). What is more, these authors consider the species *Craterium dictyosporum*, *C. obovatum* and *C. rubiginosum* to be transient forms and give the above names as synonyms of *Badhamia obovata*. In 1974 M. Farr, considering development and structure of sporangia, restored the original position of the species *Badhamia abovata*, and included it into the genus *Craterium*.

*Craterium muscorum* produces obovoid sporangia, about 0.5 mm in diameter and 1.5-3 mm tall, purple-brown or gray-brown (Fig. 3). Sporangia are densely clustered on brown hypothallus. Stalk brown-red or black, grooved, wider at base becomes narrow upward and penetrates sporangium as a spadix-like columella half as long as sporangium itself.

Sporangial wall rich in lime, covered with pink or white calcium crystals, more delicate at upper part.

Sporangium opens through irregular cracking of the wall in its upper part. Inside sporangium there is a stiff capillitium with poorly marked, light-brown nodules, joint with short, tubular fragments. Mass of spores back-lilac, spores red-brown 14-15 µm in diameter, reticulate, net loose of high ledges, sometime reduced to papilla.

**Distribution.** In Poland known from a few localities, reported as *Badhamia rubiginosa* by Schroeter (1889) from fallen twigs and dry leaves at Osobowice (now a quarter of Wrocław); Szulczewski (1951) collected this species in 1938 from wood of *Populus* at Puszczykowo near Poznań; Stojanowska (1972) recorded the species in 1968 on fallen twigs of *Carpinus* in Kaczawskie Mts. All three records were made in September. The species is known also from Germany, France, England, Hungary, Romania, and from North America.

**Illustrations.** Lister and Lister (1925) present coloured drawings of sporangium, capillitium and spores for *Badhamia rubiginosa* var. *globosa*, and var. *dictyospora*, Fig. 14; Martin and Alexopoulos (1969) also distinguish varieties,

present coloured drawings of sporangium and spores – Plate XXIII no. 211; Neubert et al. (1995) on page 204 present coloured photograph of sporangium, and on page 203 drawings of capillitium and spores.

First of the Polish *Craterium* species listed in Krzemieniowska's monograph (1960) is *C. aureum* (Schumach.) Rostaf. (Fig. 4), a rare myxomycete reported from three localities – vicinity of Warsaw, Białowieża Primeval Forest, and Silesia. Further investigations of Silesian slime moulds resulted in new data on distribution of this species (Stojanowska 2000). Now it seems that the status "threatened" (Stojanowska and Drozdowicz 1992) should be changed, since further field observations may yield additional data on its distribution.

The remaining two species are common in Poland *Craterium minutum* (Leers) Fr. (Fig. 5), and *C. leucocephalum* (Pers.) Ditmar (Fig. 6). They occur mostly on decaying litter, on small fallen twigs, and – rarely – on mosses, herbaceous plants or bark. Sporadic, only in two localities, were records of *C. leucocephalum* var. *scyphoides* (Cooke et Balf.) G. Lister (Krzemieniowska 1960).

As the above analysis of genus *Craterium* shows, the number of species found in Poland has increased up to 7. It is supposed that the list will expand again soon.

Specimens collected have been deposited in The Herbarium of Natural Museum of The Wrocław University.

Photographs 1-6 J. Maciążek.

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Rodzaj *Craterium* w Polsce

## Streszczenie

Rodzaj *Craterium* Trentep. pod względem taksonomicznym należy do rodziny *Physaraceae*, rzędu *Physarales*, klasy *Myxomycetes*.

Według Kirka i in. (2001) w świecie znanych jest obecnie 16 gatunków *Craterium*. Neubert i in. (1995) podają 15 gatunków i 4 odmiany. W monografii śluzowców Polski Krzemieniewska (1960) wymienia 3 gatunki i 1 odmianę. Przeprowadzona obecnie analiza tego rodzaju pozwala nam poszerzyć listę gatunków *Craterium* występujących w Polsce. W roku 2002 zebrano dwa nowe gatunki – w rezerwacie „Łęczczok” k. Raciborza w sierpniu, na butwiejącym drewnie lipy *Craterium concinnum* (E. Panek), a w lipcu, na butwiejącym drewnie, na Chojniku w Karkonoszach – *C. brunneum* (W. Stojanowska). Do rodzaju *Craterium* przeniesiono również zbierany w Polsce pod nazwą *Badhamia rubiginosa*, obecnie określony jako *Craterium muscorum*. Wyżej wymienione gatunki oraz podane przez Krzemieniewską (1960) – rzadko spotykany w Polsce *C. aureum* i pospolite *C. minutum* oraz *C. leucocephalum* wraz z rzadką odmianą var. *scyphoides* wzbogacają listę znanych w Polsce taksonów do 7.