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ПЕРВАЯ НАХОДКА *DIDYMIUM PROJECTILE* (MYXOMYCETES) В РОССИИ

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В 2018 г. в ходе исследования видового разнообразия Судогодского р-на Владимирской обл. были обнаружены спороношения редкого вида *Didymium projectile* T.N. Lakh. et K.G. Mukerji. Ранее этот вид бы отмечен только в Индии, Руанде, Франции и Нидерландах. Внешне *D. projectile* очень похож на *D. squamulosum* (Alb et Schw.) Fr., но отличается от него наличием темных спиральных утолщений на поверхности нитей капиллиция. В работе приведено описание морфологии, рисунки и фотографии, полученные с помощью сканирующей электронной микроскопии.

Ключевые слова: Амоебозоа, Мухогастрия, слизевики, биоразнообразие, редкий вид, СЭМ, Владимирская область.

Myxomycetes are a rather small but widespread group of organisms. Their fruit bodies can be found in almost all biomes of the world (Schnittler et al., 2017). The number of described myxomycete species has steadily increased in recent decades. For example over the past 50 years, the number of described species has increased more than two times: from 422 (Martin, Alexopoulos, 1969) to 980 (Lado, Eliasson, 2017). However, there are no existing illustrations for many species, even those with detailed descriptions. Moreover, some of them are quite rare and very similar to other, much more widespread species. As a result, they are often not taken into account in routine species identification.

One such species is *Didymium projectile*, which is morphologically close to a widespread cosmopolitan species *D. squamulosum* (Alb. et Schwein.) Fr. et Palmquist. The main distinguishing feature of *D. projectile* is the dark spiral bands on capillitial threads. The type specimen was collected and described in India (Lakhanpal, Mukerji, 1979). Part of the material was transferred to the collection of N.E. Nannenga-Bremekamp (National Botanical Garden of Belgium). It was later found in the Netherlands (Nannenga-Bremekamp, 1991), Rwanda, and France (GBIF.org). In 2018, it was detected for the first time in the Vladimir region, Russia.

Specimen examined: Vladimir region, Sudogodsky district, Lobanovo village, 56°0'47" N, 40°48'43" E, ± 200 m. Forest dominated by pine (*Pinus sylvestris* L.). Leg.: Mishulin A.A., det. Gmoshinskiy V.I., 18.VIII.2018 (MYX 9790).

Specimen description: Sporocarps: stalked sporangia in compact group, 0.45–0.6 mm high. Sporangium globose, slightly flattened, umbilicate below, 0.3–0.4 mm thick, 0.4–0.5 mm diam., white (fig. 1, A). Peridium thin, membranous, translucent, with a dusting of stellate white crystals (fig. 1, B; 2, A) that are larger than the spores (7–20 µm diam.). Dehiscence by plates that remain attached to the ends of capillitium threads. Hypothallus white, calcareous, forms disc at the base of standalone sporangium, sometimes adhered and forms loose net. Stalk short, 0.2–0.3 mm high, sometimes hidden by umbilicus at the base of sporocarp, rugose, white, calcareous. Collumella depressed-globose, up to 0.2 mm in diam., calcareous, white. Capillitium of threads, connected to base of the sporangium, thin (1.5–2 µm diam.), light-brown, with dark spiral and globose thickness (up to 5 µm diam.). Length of the thread fragment on which the spiral thickening is located is 13–23 µm (fig. 1, B; 2, A, B). Spores black in mass; light-brown in transmitted light, globose, uniformly thickened, 8.2–9.5 µm diam., ornamented by warts, adhered in lines and loose net (fig. 2, D). Plasmodium unknown.

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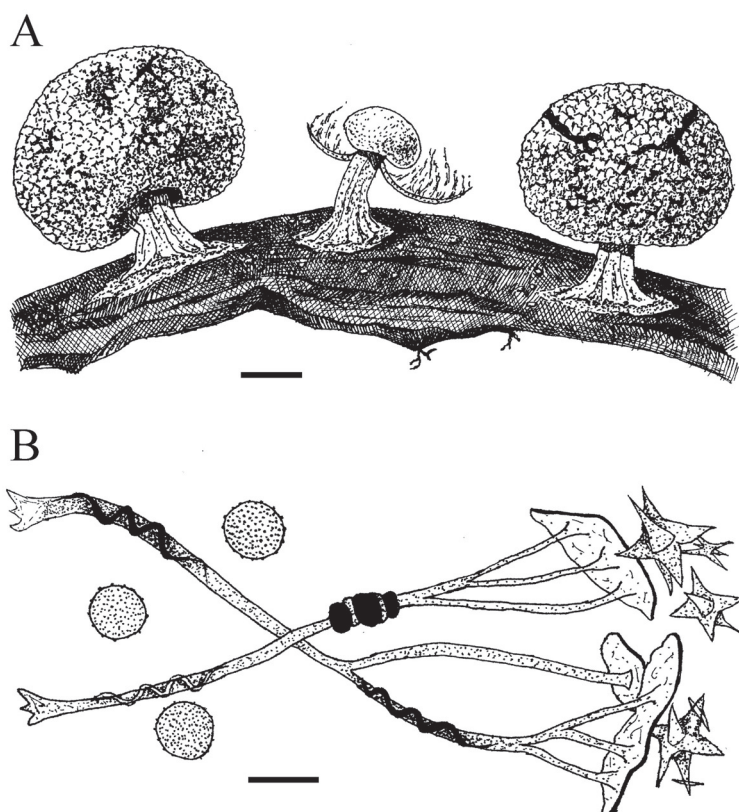


Fig. 1. *Didymium projectile* MYX 9790. A – Group of sporocarps. B – Capillitium and spores ($\times 1000$). Scale bars: A = 2 mm; B = 10 μm

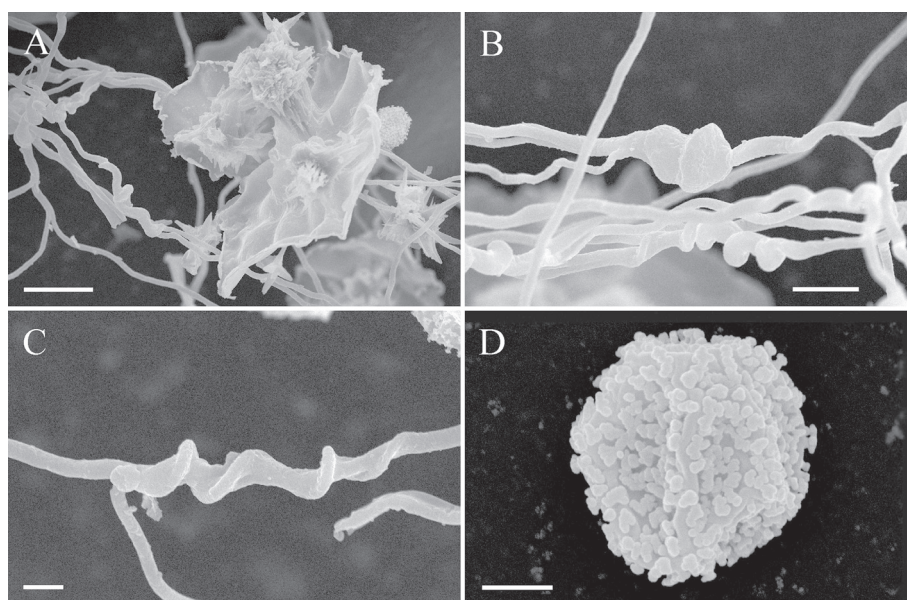


Fig. 2. Capillitium and spores of *Didymium projectile* MYX 9790, SEM. A – Part of peridium with attached stellate lime. B – Part of capillitial thread with globose and spiral bands. C – Part of capillitial thread with spiral bands. D – Spore. Scale bars: A = 10 μm ; B = 5 μm ; C = 2 μm ; D = 2 μm

Iconography: Lakhanpal, Mukerji, 1979 (fig. 2 b, d); Nannenga-Bremekamp, 1991, p. 294; Neubert et al., 1995 (fig. 130).

Substrate: on leaf litter of broad-leaved trees.

Notes. Our specimen generally corresponds to the original description; however, the sporangia are slightly shorter (0.45–0.6 mm), while the description of type specimen says that they can reach 1.2 mm in height. In some cases, *D. projectile* can form almost sessile sporangia on very short stalks, which are hidden in umbilicate base. A description of such specimen is given in the work of N.E. Nannenga-Bremekamp (1991).

According to the type specimen description, one of the morphological features of this species are dark swellings at the ends of capillitium threads (Lakhanpal, Mukerji, 1979). However, Nannenga-Bremekamp (1991, p. 294) does not mention this feature and the figure clearly shows that the capillitial threads are widened at the ends, forming funnel-shaped structures attached to the inner surface of the peridium. In our specimen, the terminal parts of the capillitial threads have visible dark rounded thickenings, but we are not sure that they are associated precisely with the capillitial threads endings. Thus, this should not be considered the main feature in the identification of *D. projectile*.

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FIRST RECORD OF *DIDYMIUM PROJECTILE* (MYXOMYCETES) IN RUSSIA

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Didymium projectile T.N. Lakh. et K.G. Mukerji is reported from Sudogodsky district of Vladimir region as a species new to Russia. It was previously reported from India, Rwanda, France, and the Netherlands. *D. projectile* is very similar to *D. squamulosum* (Alb. et Schwein.) Fr. et Palmquist, but differs by dark spiral bands on capillitial threads. The morphology of the fruit bodies (sporocarps) of the species was examined by light microscopy and scanning electron microscopy (SEM), and images of relevant details are included.

Key words: Amoebozoa, Myxogastria, slime moulds, biodiversity, rare species, SEM, Vladimir region.

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