

HABRODON PERPUSILLUS (HABRODONTACEAE, MUSCI) –  
A NEW FAMILY, GENUS AND SPECIES FOR RUSSIA

HABRODON PERPUSILLUS (HABRODONTACEAE, MUSCI) –  
НОВЫЕ СЕМЕЙСТВО, РОД И ВИД ДЛЯ РОССИИ

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Abstract

*Habrodon perpusillus* (De Not.) Lindb. has been found in Caucasus, in the coastal area of the Black Sea near Adler. This species was known previously from Macaronesia, Medeterranean and Atlantic Europe, Turkey and Israel. The dendropark “Yuzhnye Kultury” where *Habrodon* was found is known also as the only Caucasian (as well as Russian) locality of *Cryphaea heteromalla*, a species with the similar general distribution in Western Palearctic.

Резюме

*Habrodon perpusillus* (De Not.) Lindb. найден на черноморском побережье Кавказа в окрестностях Адлера. Данный вид распространен в Макаронезии, Атлантической Европе, Европейском Средиземноморье, Турции и Израиле. Дендрарий “Южные Культуры”, где был найден *Habrodon*, известен также как единственное местонахождение на Кавказе (равно как и в России в целом) *Cryphaea heteromalla*, редкого вида, имеющего весьма сходное с *Habrodon* общее распространение в Европе.

In summer 2002 we were able to visit Adler, coastal area of Black Sea, and its dendropark “Yuzhnye Kultury”. The latter is the only locality of *Cryphaea heteromalla* (Hedw.) Mohr in Caucasus, as well as in whole Russia (found only once in 1957 by Shishkova, LE, and identified and published by Abramova & Abramov, 1961). Though the park was strongly affected by tornado in 2001 and many trees were broken, we were able to find *Cryphaea* on trunks of three trees of various species (*Fraxinus*, *Fagus* and *Acer*) in abundance, and on one *Fraxinus* we found also *Habrodon perpusillus*, a new species and genus for Russia.

***Habrodon perpusillus*** (De Not.) Lindb., Oefv. K. Vet. Ak. Foerh. 20: 401. 1863. – *Pterogonium perpusillum* De Not., Musc. Ital. Spec. 12. 1837. Figs. 1-3.

Plants small, green. Stem procumbent, to 1 cm long, densely foliate, irregularly branched, branch foliage similar; central strand absent. Axillary hairs 2-3-celled, 30-35 x 9-11  $\mu\text{m}$ , with upper cell often short, 10-12  $\mu\text{m}$  long. Rhizoids

inserted just below leaf insertion, below costa, red-brown, almost unbranched. Pseudoparaphyllia lacking, convex branch initial with filamentose or linear juvenile leaves (for discussion and illustration on juvenile branch leaves see Budyakova & al., 2003). Stem and branch leaves not differentiated, erecto-patent to spreading when wet, erect when dry with more or less recurved apex, 0.7-0.9 x 0.3-0.45 mm, from ovate or rounded base gradually or suddenly acuminate (typically upper leaves more gradually, leaves at certain distance from shoot apex – more suddenly), at base strongly or shallowly cordate; nerve short, forked or double, often appeared as longer unistratose cells; margin at base and especially in middle sinuose due to protruding incrassate cell walls, conspicuous due to thin wall of middle part of cell (uppermost gradually tapered leaves often almost entire, without any sinuosity); mid-leaf cells 15-40 x 5-13  $\mu\text{m}$ , elongate-rhomboidal to ovate, incrassate, smooth, towards leaf apex and margins shorter; basal cells subquadrate to

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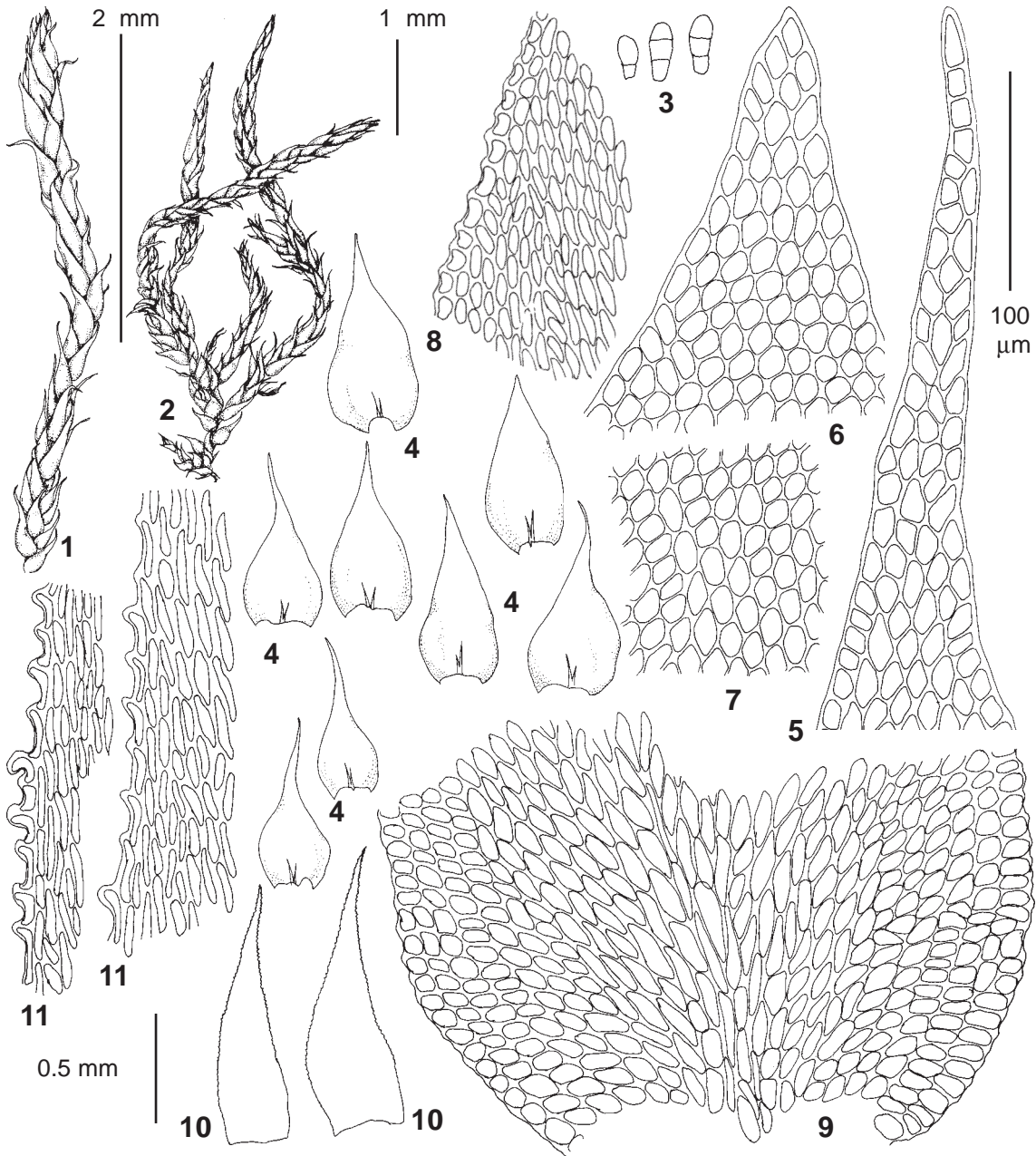


Fig. 1. *Habrodon perpusillus* (De Not.) Lindb.: 1-9 – from Adler, Ignatov & Ignatova 9.VIII.2002, MHA; 10-11 – France, H. Buch 29.XII.1930 H. 1, 2 – habit; 3 – axillary hair; 4 – leaves; 5, 6 – upper laminal cells, showing variation; 7 – midleaf cells; 8 – midleaf cells at margin; 9 – basal cells. 10 – perichaetial leaves; 11 – midleaf cells of perichaetial leaves. Scale bars: 2 mm for 1; 1 mm – 2; 0.5 mm – 4, 10; 100 µm – 3, 5-9, 11.

transverse rectangular, extending far up along margin. [Dioicous. Gametangia and sporophyte not seen. In plants from France (cf. Fig. 1-10 & 11) perichaetial leaves lanceolate, without costa, leaf margin more strongly sinuose comparatively with stem leaves. Seta 6 mm. Capsule erect. Endostome reduced to almost absent.

Exostome teeth from outside with smooth plates and moderately high dorsal trabeculae, from inside with high and dense ventral trabeculae (Fig. 3). According to Nyholm (1960) and Hedenäs (1992) also: exothelial cells irregular; stomata pore round, annulus deciduous, with thick-walled cells with slit-like

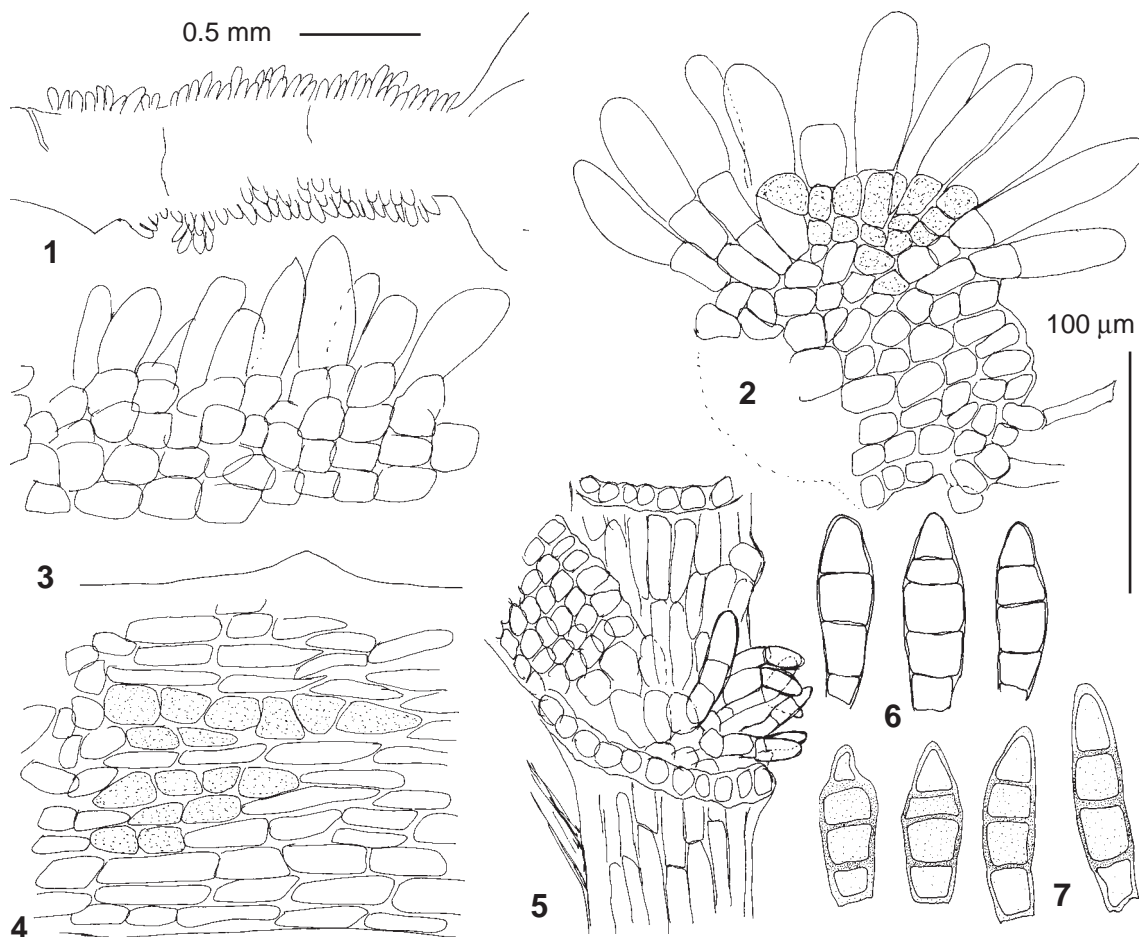


Fig. 2. *Habrodon perpusillus* (De Not.) Lindb. (from Adler, Ignatov & Ignatova 9.VIII.2002, MHA): 1 – upper part of stem with numerous more or less immature gemmae (leaves are mostly detached, gemmae are shown only along the stem outline); 2 – stem transverse section slightly below the area where gemmae cover whole surface; dotted are cells with non-collapsed cytoplasm rich in chloroplasts (other cells look empty, having very few chloroplasts near cell walls only); note that chlorophyllose cells at base of juvenile gemmae are well inside the stem; 3 – part of stem with very immature gemmae (cell walls extremely thin), arising from enlarged and lax surface cells); 4 – stem surface cells below the gemmiferous area; among longer cells are seen highly chlorophyllose and shorter cells, similar to those producing gemmae; 5 – part of shoot with densely arranged leaves and almost lacking gemmae, but in one axil (illustrated) there is a cluster of immature gemmae; 6 – fresh gemmae; 7 – old gemmae. Scale bars: 0.5 mm for 1; 100  $\mu$ m – 2-7.

lumen; spores 16-24  $\mu$ m]. In distal part of some stems epidermal cells transforme into uniseriate, shortly fusiform gemmae; this transformation restricted to axillary area or the whole distal part of stem.

Our collection: Adler, dendropark “Yuzhnye Kultury” [43°25’N – 39°57’E, 10 m alt.], on *Fraxinus* trunk, coll. Ignatov & Ignatova 9.VIII.2002 (MHA, MW).

For practical identification of *Habrodon* are important the presence of gemmae, subpiliferous leaves (in part) and characteristically sinuose leaf margin, due to incrassate and protruding

transverse cell walls (the latter characters is seen better in mature leaves somewhat distant from the shoot apex, while more fresh leaes sometimes lack this sinuosity).

The gemmae in some shoots are very numerous, forming brush-like zone (Fig. 2-1) where gemmae are developed all around the stem. Below this part the gemmae are lacking, but at places cortical cells are differentiated, forming zones with short and highly chlorophyllose cells (similar to gemmiferous ones). These chlorophyllose cells are concentrated mostly in leaf axils. In some other shoots gemmae were not

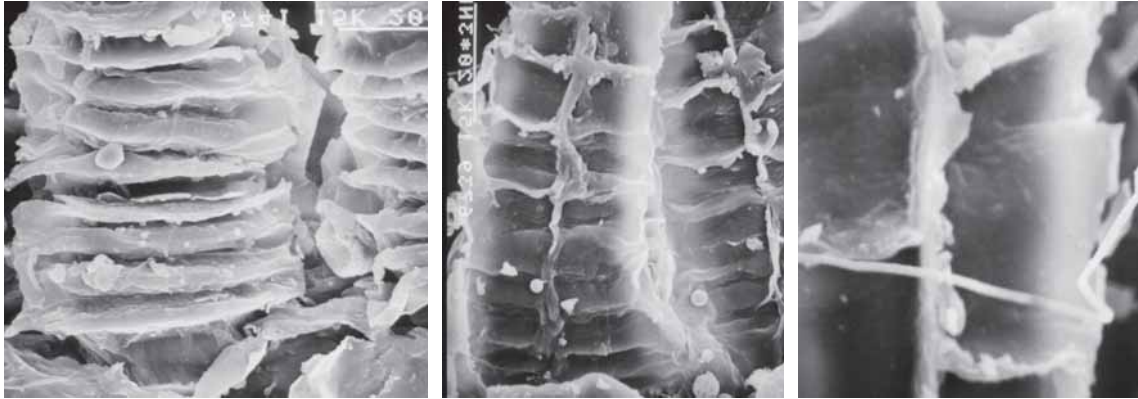


Fig. 3. Exostome teeth of *Habrodon perpusillus* (De Not.) Lindb. (France, H. Buch 29.XII.1930 H): A – ventral surface  $\times 1000$ , B,C – dorsal surface  $\times 800$  and  $\times 2000$ .

seen at all or seen in small quantity in axillary clusters (Fig. 2-5).

The gemmae formation [as could be assumed from different stages of development] is as follow: large cortical cell develops inflated vesiculus, which is elongated and then subdivided into 3-5 cells, along with progressive incrassation of cell walls. The differentiation of cortical cells seems involve also at least 1-2 layers of inner cortical cells (Fig. 2-2).

*Habrodon perpusillus* is known from Canary Islands, Madeira, Norway, Great Britain, the Netherlands, France, Spain, Portugal, Balearic Islands, Algeria, Tunisia, Corsica, Sardinia, Sicily, Italy, Switzerland, Serbia, Greece, Crete, Turkey

and Israel (cf. Ignatov, 2000). The Japanese (Saito, 1984) and Chinese (Gao Chien & Fu Xing, 2002) records probably belong to other species, judging from the illustrations in these publications. Besides the *H. perpusillus* (discussed in this paper), *Habrodon* includes one more little known Indian species, *H. kashmi-rense* Vohra (Vohra, 1969).

The familial position of *Habrodon* is discussed by Budyakova & al. (2003).

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