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MYCOLOGICAL HERITAGE OF JOHANN BUXBAUM. 1. FUNGI DESCRIBED IN THE FIRST "CENTURIA" ISSUE (1728)

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The mycological heritage of Johann Christian Buxbaum is still little explored, but this issue has not only a great historical interest. In recent taxonomy, there is a tendency to splitting of "linneones" species complexes and in some cases it becomes justified even to appeal to pre-Linnean authors. The corpus of remarkable Buxbaum's drawings is still waiting for monographs in mycology field. The purpose of opened notices series is draw an attention of mycologists to figures of Buxbaum's "Centuria". In the first "Centuria" issue (1728) we can find descriptions and illustrations of five fungal species: 1) *Agaricus barbatus flavescens*, 2) *Agaricus gelatinosus, parte prona erinaceus*, 3) *Fungus erinaceus parvus in conis Abietis deiectis nascens*, 4) *Fungus parvus albus deiectis abietis nascens*, 5) *Lycoperdon magnum globosum, pulpa granulata, radice crassa*. The analysis of descriptions and original drawings made it possible to correlate these descriptions with 5 modern agaricomycetes species: *Hericium cirrhatum*, *H. erinaceus*, *Auriscalpium vulgare*, *Baeospora myosura*, and *Lycoperdon excipuliforme*. The nomenclature of these taxa is presented and their homogeneity is preliminary estimated in the light of current data.

Keywords: Auriscalpium, agaricomycetes, *Baeospora*, botanists of the 18th century, drawings of fungi, *Hericium*, *Lycoperdon*, morphology, nomenclature

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Johann Christian Buxbaum (1693–1730), naturalist and explorer of southeastern Europe, Asia Minor, and the Caucasus, was the first academician botanist of the St. Petersburg Academy of Sciences. He was born in Merseburg (Saxony). In 1721, under the direction of Heinrich Bernhard Ruppius (1688–1719), J.C. Buxbaum published in Halle his pioneering work entitled "Enumeratio plantarum precision in agro Hallensi locisque vicinis crescentium". This essay was commended by experts, and therefore, when Peter the Great turned to the venerable German physician Friedrich Hoffmann with a request to recommend a botanist capable of studying the Russian flora, J.C. Buxbaum was named the most worthy. Invited by the Medical College to St. Petersburg in the same 1721, the 28-year-old scientist took an active participation in organizing the botanical garden, lectured on botany to medical students, and made extensive botanic excursions collecting plants and fungi in St. Petersburg vicinities.

As a physician and naturalist, Buxbaum went to Constantinopolis in 1724 as part of the Russian embassy under the command of Count Alexander Rumyantsev. According to the instructions by great physician Laurence Blumentrost, he had to carry out thorough research, paying particular attention to medicinal plants. The full-time draftsman, painter Johann Christian Mattarnovi with his assistant apprentice was assigned to him. J.C. Buxbaum's reports were published in the proceedings of the Academy of Sciences "Commentarii Academiae Scientiarum Petropolitanae".

The report of the Academy of Sciences of August 27, 1727, proclaims: "Johann Christian Buxbaum, Professor of botany, the first centuria of new herbal species collected in his Turkish foray submits under Academy of Sciences attention; he also puts in order other things and began to write the natural history of Prussia, Livonia, and Ingria, concerning specially to the proper herbs".

A total of 5 "Centuria" (sets on 100 species) under the title "Plantarum minus cognitarum centuria circa Byzantium et in Oriente observatos" were published by the St. Petersburg Academy of Sciences. Basically, they describe and well illustrate the vascular plants associated with various habitats of North Africa, the Eastern Mediterranean, and South Russia. But among these several species of mosses, lichens, algae, and fungi were scattered, whereas their drawings were made with amazing for their time and sometimes almost photographic accuracy.

The archive of the Russian Academy of Sciences in St. Petersburg contains materials that formed the sources material for Buxbaum's "Centuria" engraving. First of all, these are drawings made directly during the expedition by Johann Christian Mattarnovi. They are

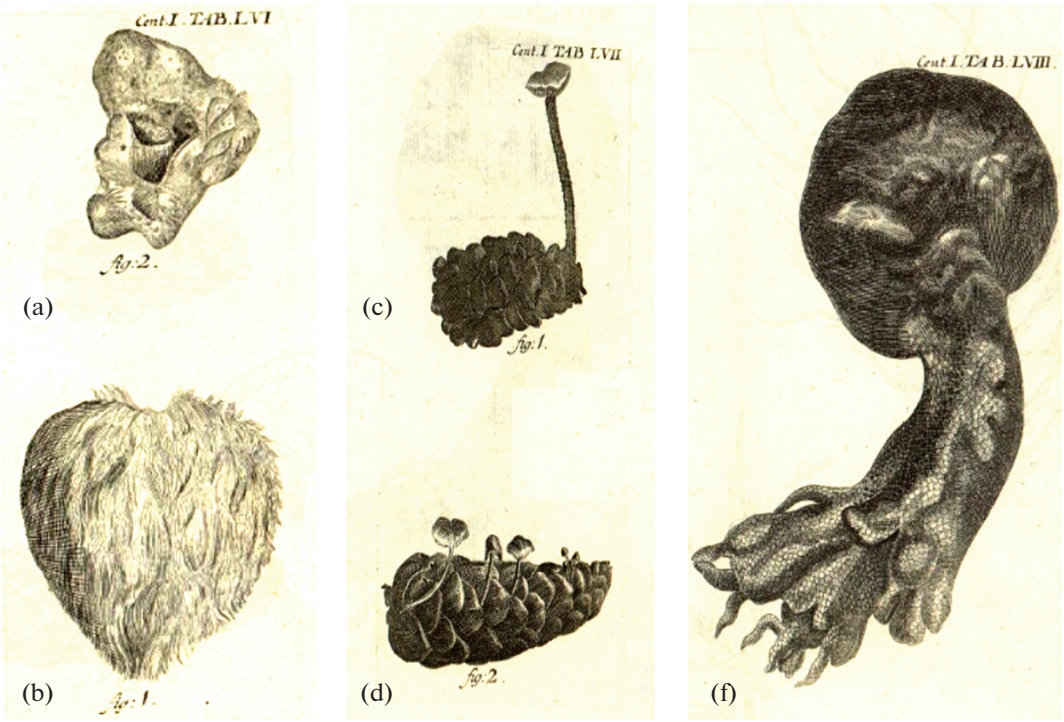

Fig. 1. Engravings from drawings to Buxbaum's "Centuria" I (Buxbaum, 1728) published within a book tables: a – *Agaricus barbatus flavescens* (*Hericium cirrhatum* in modern taxonomy); b – *Agaricus gelatinosus, parte prona erinaceus* (*Hericium erinaceus* in modern taxonomy); c – *Fungus erinaceus parvus in conis Abietis deiectis nascens* (*Auriscalpium vulgare* in modern taxonomy); d – *Fungus parvus albus ex conis Abietis deiectis nascens* (*Baeospora myosura* in modern taxonomy); f – *Lycoperdon magnum globosum, pulpa granulata, radice crassa* (*Lycoperdon excipuliforme* in modern taxonomy).

made in watercolors on paper without watermarks and have a preliminary outline drawn in pencil. The image of a shadow falling from a natural object is very characteristic. Some of the sources were made in the form of copies after the expedition. They are done in watercolors using tempera and other pigments, usually on paper already with watermarks. Apart from Johann Christian Mattarnovi, this work could also have been done by Dorothea Maria Gzell. The engravings from these drawings on a copper plate, due to the imperfection of this technique, in no way conveyed all the charm of the original drawings when replicating, but they also accurately captured the shape of objects of the plant world (Sytin, 2004).

The mycological heritage of Johann Christian Buxbaum is little explored till now, but this has not only a great historical interest. In recent taxonomy, there is a tendency splitting of "linneones" species complexes and in some cases it becomes justified even to appeal to pre-Linnean authors. The corpus of remarkable Buxbaum's drawings is still waiting for monographs in mycology field.

The purpose of the presented notice series is to draw an attention of monographs to the corpus of drawings of Buxbaum's "Centuria". In the first "Centuria" issue (Buxbaum, 1728) we can find descriptions and illustrations of 5 species of fungi (in pre-Linnean polynomial nomenclature). This notice is devoted to the analysis of these descriptions and illustrations (Fig. 1).

1. *Agaricus barbatus flavescens* – p. 35, tab. LVI, Fig. I.[1]

"Adnascitur castaneis mollis et spongiosus, interior substantia albicans, superficies vero tota innumeris aculeis concavis instar Fungi erinacei, multo tamen longioribus flavescentibus cingitur. Cordiformis fere figurae barbar aliquatenus refert, hinc nomen barbati imponere plaquit. In Thracia prope pagum Belgrad collegi Autumno".

Current status. Based on figure shape and description (laterally attached lingulate fruit body, covered with teeth not only from the side of the hymenophore, but also from the upperside, spongy consistency and surface and tissue color), the hydnoid agaricomyete *Hericium cirrhatum* (*Agaricomycetes*, *Hericiaceae*, *Russulales*), without any doubts, is presented here.

Post-linnean synonymy: *Hericium cirrhatum* (Pers.) Nikol., Acta Inst. Bot. Acad. Sci. USSR Plant. Crypt., Ser. II 6: 343, 1950. ≡ *Hydnum cirrhatum* Pers., Neues Mag. Bot. 1: 109, 1794. = *H. corrugatum* Fr., Observ. mycol. 2: 269, 1818. = *H. diversidens* Fr., Syst. mycol. 1: 411, 1821. = *H. paradoxum* Schultz, Prodr. Fl. Starg.: 492, 1806.

[1] Protologues refer to page and table number of the original description (Buxbaum, 1728).

Modern monograph: Stalpers (1996).

Note. Possessing a known reserve of modification variability, the species is quite stable at the micromorphology level. At present, no prerequisites for this taxon splitting are seen.

2. *Agaricus gelatinosus, parte prona erinaceus* – p. 36, tab. LVI, Fig. II.

"Noti sunt *Agarici lamellati*, porosi et utrisque destituti, qui vocantur membranacei. Hic exhibemus aliam *Agarici* speciem, quae loco lamellarum aut poporum appendiculis aculeatis instar linguae vitulinae exasperatur, et *Fungum erinaceum* I. B. iuniorem refert. Color est dilute coeruleus aut purpurascens antiquarum *Alnorum* truncis adnascitur Autumno".

Current status. The characteristic capitate fruiting body covered with downward-facing teeth, a rather cartilaginous-fleshy-waxy consistency and variations in the base of the marsh coloration (with a blue tinge or purplish-brownish when cut), make it possible to unequivocally identify *Hericium erinaceus* (*Agaricomycetes*, *Hericiaceae*, *Russulales*).

Post-Linnean synonymy: *Hericium erinaceus* (Bull.) Pers., Comm. fung. clav. (Lipsiae): 27, 1797. ≡ *Hydnum erinaceus* Bull., Herb. Fr. 1: tab. 34, 1781. = *Martella echinus* Scop., Annus hist.-nat. 4: 151, 1770. = *Manina cordiformis* Scop., Diss. sci. nat., Edn 1: 97, 1772. = *Hydnum hystricinum* Batsch, Elench. fung.: 113, 1783. = *H. caput-medusae* Bull., Herb. Fr. 9: tab. 412, 1789. = *Clavaria conferta* Paulet, Traité champ. 2 (Index): 427, 1793. = *Hericium hystrix* Pers., Comm. fung. clav.: 27, 1797. = *Hericium grande* Raf., Ann. Bot. 1: 237, 1813.

Modern monograph: Stalpers (1996).

Note. Like *H. cirrhatum*, the species is outwardly polymorphic, but micromorphologically rather constant. Many old authors used the noun as a species epithet (*echinus*, *hystrix*, *erinaceus*), and these names were sanctioned by Fries (1821) as separate species. The name *Agaricus gelatinosus* J.F. Gmel., Syst. Nat. 2 (2): 1429, 1792 is currently is connected to another agaricomycete species, *Crepidotus mollis* (Schaeff.) Staude, Schwämme Mitteldeutschl. 25: 71, 1857 (*Agaricales*, *Crepidotaceae*).

3. *Fungus erinaceus parvus in conis Abietis deiectis nascens* – p. 36, tab. LVII, Fig. I.

"Fuscus est et hirsutus, cuius pediculus non in mediam insteritur capitulum, sed in margine, spinulae molles albicantes loco lamellarum sub capitulo prominent. Occurrit in cones deiectis *Abietis rubrae* Autumno".

Current status. A spiny hymenophore, hard consistency, brown pubescent pileus and stipe, coupled with a characteristic habitat on a fallen cone, undoubtedly indicate on *Auriscalpium vulgare* (*Agaricomycetes*, *Russulales*, *Auriscalpiaceae*).

Post-Linnean synonymy: *Auriscalpium vulgare* Gray, Nat. Arr. Brit. Pl. 1: 650, 1821. = *Hydnum auriscalpium* L., Sp. pl. 2: 1178, 1753. = *Hydnum fechtneri* Velen., České Houby 4–5: 746, 1922.

Modern monograph: Stalpers (1996).

Note. Till now, no any prerequisites for splitting of this taxon.

4. *Fungus parvus albus ex conis Abietis deiectis nascens* – p. 36–37, tab. LVII, Fig. II.

"Intra squimas putrescentis coni ex media costa, cui squamae adherent, provenit ex multis radiculis fibrosis, deinde secundum squamae tractum flexus, quando ex illa exit, se erigit, totus albus et tener, creberrimis sultus instructus lamellis. Quae lamellae non statim circa oras capituli incipiunt, sed marginem aliquem relinquunt, nec terminantur in pediculum et triplicis sunt magnitudinis. Color capituli interdum subfuscus, ut et in pediculo. Tortuosus nonnunquam radicibus uncialibus aut longioribus instruitur, quae tamen in cono terra operto radicantur. Occurrit passim Augusto".

Current status. The small-sized fleshy (not dry, like in *Marasmius* s.l.) fruiting bodies, the convex, but not bell-shaped (like in *Mycena*) and not funnel-shaped (like in *Omphalina* s.l.) brownish pileus, coupled with the habitat on the fallen cone, undoubtedly indicate on *Baeospora myosura* (*Agaricomycetes*, *Agaricales*, *Marasmiaceae*).

Post-Linnean synonymy: *Baeospora myosura* (Fr.) Singer, Revue Mycol., Paris 3: 193, 1938. ≡ *Agaricus myosurus* Fr., Observ. mycol. 2: 129, 1818. = *Marasmius varicosus* Fr., Epicr. syst. mycol.: 376, 1838. = *Collybia friesii* Bres., Iconogr. Mycol. 5: tab. 214, 1928.

Modern monograph: Maas Geesteranus, Horak (1995).

Note. According some data (Hutchinson et al., 2012), here can be hidden the species complex.

5. *Lycoperdon magnum globosum, pulpa granulata, radice crassa* – p. 37, tab. LVIII.

"Radix solida, lutea, multis soveis nigricante mucore repletis distincta, inferius in ramos spongiosos et tandem in reticulum definit. Huic radici insistit globus magnus, coloris nigricantis fusco permixti, valde sordidus, cuius pulpa, si nempe iunior, tota ex granis albicantibus, materia mucida nigro fusco colore digitos inficiente turgidis, constat. Fatiscit tandem in pulverem more reliquorum Lycoperdorum, folidiorem tamen et magis compactum, qui quadantenus pulverem sternutatorium Hispanicum in pyxide adhuc compressum refert. Sub arena primo latet, uti Tubera, deinde prorumpit et cum parte radicie eminet. Scrobium arenosarum margines amat Octobri. Collegi propi Astracanum, occurrit etiam in Ingria".

Current status. Somewhat swollen base of the fruit body, together with a pronounced head, a characteristic longitudinal depressions, the color range of the medial stages of peridium degradation, clearly indicate on *Lycoperdon excipuliforme* (*Agaricomycetes*, *Agaricales*, *Lycoperdaceae*).

Post-Linnean synonymy: *Lycoperdon excipuliforme* (Scop.) Pers., Syn. meth. fung. 1: 143, 1801. ≡ *L. polymorphum* var. *excipuliforme* Scop., Fl. Carniol. 2: 488, 1772. = *L. boletiforme* Batsch, Elench. fung.: 149, 1783. = *L. saccatum* Vahl, Fl. Danic. 7: tab. 1139, 1794.

Modern monograph: Moyersoen, Demoulin (1996).

Note. This is a moderately variable, rather a good species with stable nomenclature. However its generic position stays unstable till now.

Subsequent notes will focus on mycological material of "Centuria" II–V.

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Микологическое наследие Иоганна Буксбаума. 1. Грибы, описанные в первой "Центурии" (1728)

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Микологическое наследие Иоганна Христиана Буксбаума еще мало освоено, но оно представляет не только исторический интерес. В настоящее время наметилась тенденция дробления видов-линнеонов и в некоторых номенклатурных ситуациях становится оправданным обращение к работам долиннеевских авторов. Корпус замечательно исполненных рисунков Буксбаума до сих пор ждет микологов-монографов. Целью учреждаемой серии заметок является привлечение внимания к корпусу рисунков, иллюстрирующих "сотницы" (центурии) Буксбаума. В первой центурии (1728) можно найти описания и иллюстрации пяти видов грибов: 1) *Agaricus barbatus flavescens*, 2) *Agaricus gelatinosus, parte prona erinaceus*, 3) *Fungus erinaceus parvus in conis Abietis deiectis nascens*, 4) *Fungus parvus albus ex conis Abietis deiectis nascens*, 5) *Lycoperdon magnum globosum, pulpa granulata, radice crassa*. Проведенный анализ описаний и оригинальных рисунков позволил соотнести эти описания с пятью видами агарикомицетов: *Hericium cirrhatum*, *H. erinaceus*, *Auriscalpium vulgare*, *Baeospora myosura*, *Lycoperdon excipuliforme*. Представлена номенклатура этих таксонов и предварительно оценена их гомогенность в свете современных данных.

Ключевые слова: агарикомицеты, ботаники XVIII в., морфология, номенклатура, рисунки грибов, *Auriscalpium*, *Baeospora*, *Hericium*, *Lycoperdon*