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**BATRACHOSPERMUM KERATOPHYTUM BORY EMEND.
R.G. SHEATH, M.L. VIS ET K.M. COLE, A NEW FRESHWATER RED
ALGAL SPECIES FOR UKRAINE**

A noteworthy species of freshwater red algae, *Batrachospermum keratophytum* Bory emend. R.G. Sheath, M.L. Vis et K.M. Cole, was record for the first time in the Ukraine. Information on the taxonomic position, description, and locations of *B. keratophytum* in the Ukraine is provided.

Key words : red algae, *Batrachospermum keratophytum*, Polissja, Ukraine.

Red algae are primarily marine and only approximately 3 % occur in freshwater habitats (Sheath, 1984). Twenty-four taxa of freshwater rhodophytes have been described from the Ukrainian flora, but this number includes taxa like *Chantransia pygmaea* Kütz., which may be the alternative life history stage another taxon (Chiasson et al., 2007). The most species rich genus in the Ukraine is *Batrachospermum* Roth with five species (Kovalenko, 2006).

Only two freshwater rhodophytes have been reported from the Polissja Natural Reserve (PNR), *B. gelatinosum* (L.) DC. and *Audouinella chalybea* (Roth) Bory (Moshkova, Vodopjan, 1973; Balashev, 1983). *Batrachospermum gelatinosum* is currently recognized species, but *A. chalybea* is most likely the chantransia stage of a batrachospermalean taxon and may be a synonymy of the form taxon, *Ch. pygmaea* (Necchi, Zucchi, 1995; Vis et al., 2006). During a study of the algal biodiversity of PNR, another taxon previously unrecorded for the reserve or the Ukrainian algal flora – *B. keratophytum* was identified. This alga was collected in the Zholobnytsya River and its canal. *B. keratophytum* belongs to section *Turfosa* of which members have not been previously recorded for the Ukraine. Members of this section occur mostly in acidic, brown waters with low conductivity (Sheath et al., 1994). Similar waters are in the Northern part of Zhytomyr Polissja due to swamps and forest massifs, which accumulate humic matter (Konenko et al., 1961).

Information on the taxonomic position, description and locations of *B. keratophytum* in Ukraine is provided.

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Rhodophyta Wettstein

Florideophyceae Cronquist

Batrachospermales Pueschel et K.M. Cole

Batrachospermaceae E.M. Fries

Batrachospermum Roth sect. *Turfosa* Sirodot (= *Turficola* Sirodot)

Description. Thallus is bluish on newer branches and distinctly brown on main axis and older portions and height 4-6 cm. Whorls are poorly defined with many secondary fascicles, 305-337 μm in diameter. Fascicles 3-8 cell storeys and no monosporangia observed. Main axis has much loose cortication. Carpogonia are infrequent with stalked trichogyne and 6.4-8.5 μm in diameter and 31-37 μm in length. Spermatangia were abundant, spherical, 5-7 μm in diameter and at the tips of fascicle branches. No mature carposporophytes present in specimens examined (Figure).

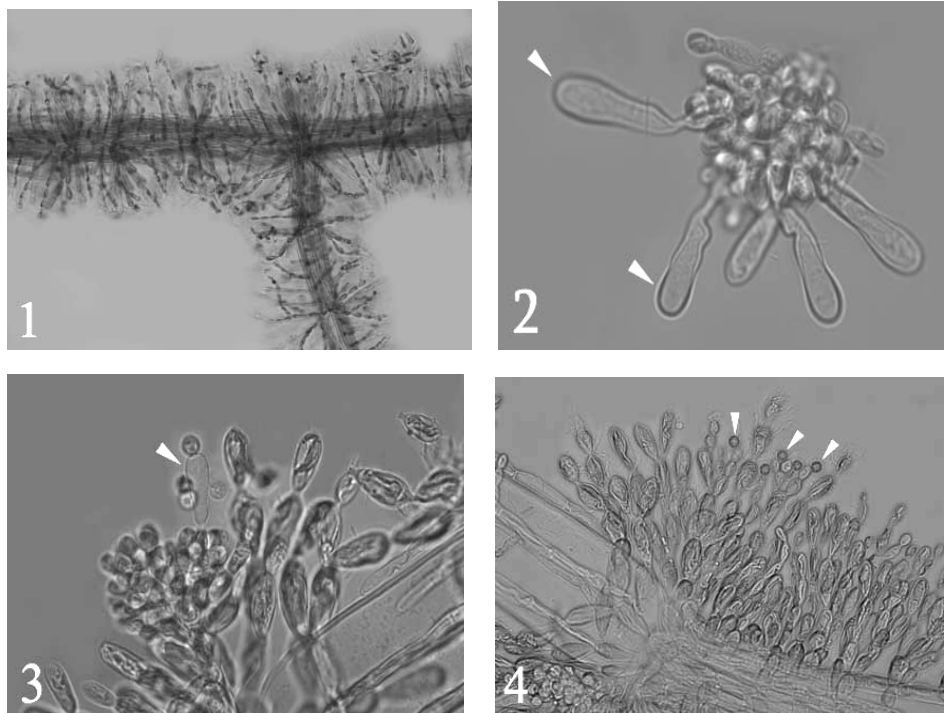


Figure. *Batrachospermum keratophytum*: 1 – portion of thallus showing indistinct whorls and loose cortication ($\times 100$); 2 – numerous carpogonia (arrows) from a mass of vegetative cells ($\times 600$); 3 – carpogonium showing the trichogyne (arrow) with numerous attached spermatia ($\times 600$); 4 – spermatangia (arrows) at the tips of fascicle branches ($\times 400$)

Locations in Ukraine. Zhytomyr District, Ovruch Region, PNR, Selezivka forestry, block 3, r. Zholobnytsya, on flowering plants, collected 30.VII.08; block 31, canal of Zholobnytsa River, on stem of *Equisetum fluviatile* L. and on leaves

of *Sagittaria sagittifolia* L., collected 31.VII.08, 13.IX.08; Zhytomyr District, Ovruch Region, pond “Didove ozero” (“Grandfather’s Lake”), on stem of *Phragmites australis* (Cav.) Trin. ex Steud. and on stones.

Notes. *Batrachospermum keratophytum* was synonymous, with *B. turfosum* Bory based on research showing monosporangial and gametangial thalli from a single location as being genetically identical (Müller et al., 1997). However, this taxonomic feature has not been fully adopted and some subsequent taxonomic treatments have kept these species separate (Kumano, 2002; Eloranta, Kwadrans, 2007). It would appear that the distinguishing characteristics present are monosporangia, abortive carposporophytes, and no spermatangia on the involucrel filaments of the carpogonial branch in *B. turfosum* and lack of monosporangia, determinant carposporophytes, and spermatangia on the involucrel filaments of the carpogonial branch in *B. keratophytum* (Eloranta, Kwadrans, 2007). The specimens from the present study more closely match the description of *B. keratophytum*. However, no spermatangia on the involucrel filaments of the carpogonial branch were observed, but only very few carpogonia were found in the specimens. Since there is no consensus whether *B. keratophytum* is synonymous with *B. turfosum*, we have chosen to be conservative and use the name *B. keratophytum*. Further molecular research on section *Turfosa* is warranted, but will be difficult because many times the thalli collected are vegetative with neither gametangia nor monosporangia.

Both *B. keratophytum* and *B. turfosum* have been widely reported in Europe, Asia, North America, and South America (Kumano, 2002). Both species have been reported from the same type of habitats, and it is difficult to determine differences in their distribution.

Traditionally, freshwater rhodophytes were considered to be noteworthy representatives of Ukrainian flora. However, recent studies confirm that such a conclusion most probably results from still insufficient data on freshwater red algae of Ukraine, and further studies will hopefully increase our knowledge.

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BATRACHOSPERMUM KERATOPHYTUM BORY EMEND. R.G. SHEATH, M.L. VIS ET
K.M. COLE – НОВЫЙ ДЛЯ УКРАИНЫ ВИД ПРЕСНОВОДНЫХ КРАСНЫХ
ВОДОРОСЛЕЙ

Сообщается о нахождении нового для Украины вида пресноводных красных водорослей *Batrachospermum keratophytum* Bory emend.. R.G. Sheath, M.L. Vis et K.M. Cole. Приводится его систематическое положение, описание и местонахождения на территории Украины.

Ключевые слова: красные водоросли, *Batrachospermum keratophytum*, Полесье, Украина.

- Balashev L.S.* Vegetation of Polissja State Reserve. – Kiev, 1983. – P. 108.
- Chiasson W.B., Johanson K.G., Sherwood A.R., Vis M.L.* Phylogenetic affinities of the form taxon *Chantransia pygmaea* (*Rhodophyta*) specimens from the Hawaiian Islands // *Phycologia*. – 2007. – **46**, N 3. – P. 257-262.
- Eloranta P., Kwardrans J.* Freshwater red algae (*Rhodophyta*): identification guide to European taxa, particularly to those in Finland. – Helsinki: Bot. Museum, Finnish Museum of Nat. Hist., 2007. – 103 p.
- Konenko G.D., Pidgajko M.L., Radzymowski D.O.* Ponds of Ukrainian Polissja. – Kiev: Acad. Sci. Press, 1961. – 140 p.
- Kovalenko O.V.* *Rhodophyta* // *Algae of Ukraine: Diversity, Nomenclature, taxonomy, ecology and geography* / Ed. by P.M. Tsarenko, S.P. Wasser, E. Nevo.– Rugell: A.R.G. Gantner Verlag, 2006. – Vol. 1. – P. 536-572.
- Kumano S.* Freshwater red algae of the world. – Bristol: Biopress, Ltd., 2002. – 185 p.
- Moshkova N.O., Vodopjan N.S.* Periphytic algal flora of r. Bolotnytsa in Polissja Reserve // *Ukr. Bot. J.* – 1973. – **30**, N 4. – P. 473-478.
- Müller K.M., Vis M.L., Chiasson W.B. et al.* Phenology of a *Batrachospermum* population in boreal pond and its implication for the systematics of section *Turfosa* (*Batrachospermales*, *Rhodophyta*) // *Phycologia*. – 1997. – **36**, N 1. – P. 68-75.
- Necchi O.Jr., Zucchi M.R.* Systematics and distribution of freshwater *Audouinella* (*Acrochaetiaceae*, *Rhodophyta*) in Brazil // *Eur. J. Phycol.* – 1995. – **30**. – P. 209-218.
- Sheath R.G.* The biology of freshwater red algae // *Progr. Phycol. Res.* – 1984. – **3**. – P. 89-157.
- Sheath R.G., Vis M.L., Cole K.M.* Distribution and systematics of *Batrachospermum* (*Batrachospermales*, *Rhodophyta*) in North America. 6. Section *Turfosa* // *J. Phycol.* – 1994. – **30**. – P. 872-884.
- Vis M.L., Entwistle T.J., West J.A., Ott, F.D.* *Ptilothamnion richardsii* (*Rhodophyta*) is a chantransia stage of *Batrachospermum* // *Eur. J. Phycol.* – 2006. – **41**. – P. 125-130.

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