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Chantransia hermannii (Roth) Desvaux and the systematic position of the genera *Chantransia, Pseudochantransia* and *Audouinella*

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Abstract

The occurrence of the species *Chantransia hermannii* (Roth) Desv. (*Rhodophyceae*) was found in a few sites in Poland. The description of the reproductive organs of this alga: monosporangia, tetrasporangia, antheridia, carpogones and gonimoblasts is given. The systematic position of the genera *Chantransia, Pseudochantransia* and *Audouinella* is also discussed. The author suggests that the name of *Chantransia* should be retained as it is older than *Audouinella*, while the artificial name of *Pseudochantransia* should be eliminated.

Key words: Chantransia hermannii (Roth) Desv., reproductive organs, systematic position

INTRODUCTION

Chantransia hermannii is encountered on stones in streams, particularly under water streams in cascades and on the housing of mill wheels constantly washed by the water current. *Chantransia violacea* constantly appears as an epiphyte on *Lemanea* vines. Both species have been known for a long time from Carpathian and Sudeten streams, in places where *Lemanea* appears at the same time, i.e., in the Beskid Śląski range and in the Tatra and Sudeten Mts. *Chantransia hermannii* has been known from a stream near Nowa Słupia in the Świętokrzyskie Mts. The two species differ insignificantly from each other and Israelson (1942/43) joined them, preserving the older name of *Chantransia hermannii*. Currently the species is frequently called *Audouinella hermannii* (Roth) Duby (Papenfuss 1945) and is regarded as an independent species, i.e., as one reproducing not only vegetatively by monospores but also sexually. According to Brand (1910), other freshwater species called *Chantransia* or *Pseudochantransia* are nonindependent species which reproduce only vegetatively by monospores. In general, it is also supposed that they constitute developmental stages of other red algae, as *Batrachospermum, Lemanea* and *Thorea.*

The systematics of the species of the genus *Chantransia* which commonly occur in the water bodies of Poland, is not quite clear. In Poland no specimens with sexual organs were observed from the species *Chantransia* (*Audouinella*) *hermannii*; such findings have only rarely been noted in the world. In England they were described by Murray and Barton (1891) and Drew (1935), in Portugal by Reis (1961), and they were also observed by Israelson (1942/43) in Sweden.

Mainly, material from Carpathian streams was examined, and apart from monosporangia, antheridia, carpogones and gonimoblasts were found. Therefore, it was possible to investigate these reproductive organs and compare them with the data known from literature. Beside the discussion on the reproduction of *Chantransia hermannii*, some remarks on the genera *Chantransia, Pseudochantransia* and *Audouinella* are presented.

RESULTS

DESCRIPTION OF *CHANTRANSIA HERMANNII* (ROTH) DESVAUX 1809

Synonyms: *Audouinella hermanii* (Roth) Duby Botan. Gallica II. 1830, 972. *Chantransia violacea* Kützing 1845, p. 285 Phyc. Herm. et Tab. Phycol. 5, tab. 44, 2 a,c. 1855. *Conferva hermannii* Roth 1801. Catalecta Bot. I. 1797, p. 164. *Trentepohlia pulchella* Agardh 1824, Syst. Alg. p. 37. *Audouinella miniata* Bory 1823, Dict. class. III. p. 340. *Chantransia boweri* Murray et Barton 1891. J. Soc. Linn. Bot. p. 28. *Rhodochorton violaceum* (Kütz.) Drew 1936 Ann. Bot., 49, p. 439.

Systematic position: Sine the name of the genus *Chantransia* De Candolle 1805 has been retained because it is older than the name *Audouinella* Bory 1823, the classification of higher taxons of red algae, given by Papenfuss (1945), is no longer taken into consideration. Thus, *Chantransia* is classified to the class *Florideophyceae*, order *Nemalionales* Schmitz (1892), Kylin (1956), (*Acrochaetiales* Papenfuss 1945), family *Chantransiaceae* Rabenhorst (1868), (*Audouinellaceae* Feldmann (1962)).

The investigated material was collected at a few stations in Wisła Śląska where *Ch. hermannii* epiphytically occurred on *Lemanea fluviatilis* vines and on stones in the rapid current of the Kamesznica stream in the Silesian Beskid Range, in the Tatra Mts. from the Kościeliska Valley on *Lemanea fluviatilis* and from the Roztoka Valley on *Lemanea sudetica*, from the River Dunajec at Ostrowsko where it grows on stones in the rapid current, frequently at the base of *Cladophora glomerata* thalli, from the Suszanka stream at Pcim, the Beskid Wyspowy Range, on stones and under the mill wheel in a stream in the village of Włochy near Nowa Słupia in the Świętokrzyskie Mts., and in the River Bystrzyca Kłodzka at Polanica on *Lemanea* sp. The samples were chiefly collected in the summer and autumn.

The thalli on stones had a well-developed prothalle, composed of trailing filaments, irregularly ramified and grown together in some places. Their cells were relatively short. Erect filaments grew out of the prothalle. They formed tufted assemblages, (1)-3-5-(6) mm in height, red, sometimes brownish or pale-pink. The thalli which epiphytically grew on *Lemanea* vines had poorly developed prothalle composed of a few cells grown together in an irregular disc. Their vines were erect, bûshy or tufted, red, sometimes light- or pale-pink, (1)-3-5 mm in lenght. In both cases the erect vines were composed of filaments with abundant alternate or sometimes opposed ramifications, while the side branches were protruding at an angle of about 45° (Fig. 1B, C, D). The apical cells of vines were slightly narrower, rounded at the apex, sometimes sharpened or stretched and hair-like. Chromatophores were tape-like, usually spirally wound or irregularly lamellar, lobated, with margins turned back. The nucleus fairly small, more or less in the centre of the cell, visible only on staining. In filaments the cells are cylindrical, in epiphytic thalli they are 6-10-13 μm in width, 32-64 μm in lenght. In the thalli growing on stones the cells were 8-15 μm in width and 32-110 μm in length. In the lower part of the thalli, the cell membranes were 1.8-2.0-(2.5) μm in thickness.

Monosporangia were more abundantly developed in the lower parts of vines; they were set short lateral ramifications composed of 1-4 cells (Fig. 1E). The ramifications usually formed 2-3 basic cells on which 2-3 monosporangia were developed. Also single monosporangia set on a basic cell were found. Monosporangia were globose or oval, (5)-8-12-(14) μm in diameter.

Tetrasporangia were very rarely encountered (Fig. 1M, N). Two to four tetrasporangia were formed on the tips of short lateral ramifications. They were 9-11 μm in width and 12-(14) μm in length on the average.

Antheridia occur on separate plants, though, sometimes on the same plants which bear carpogonia, thus, while the species is monosexual in principle, male-female specimens are also encountred (Figs. 1G, 2, 3). Like monosporangia, antheridia are produced on short lateral ramifications, but generally on the upper part of the thallus. They form fairly abundant tufted assemblages. Antheridia are usually globose, sometimes ovoid. They produce single colourless or livid spermatozoids 3-4-(6) μm in diameter. In the sample from the Upper Vistula the thalli were bisexual (at least, no monoecius ones were observed). In the Kamesznica and in the Roztoka

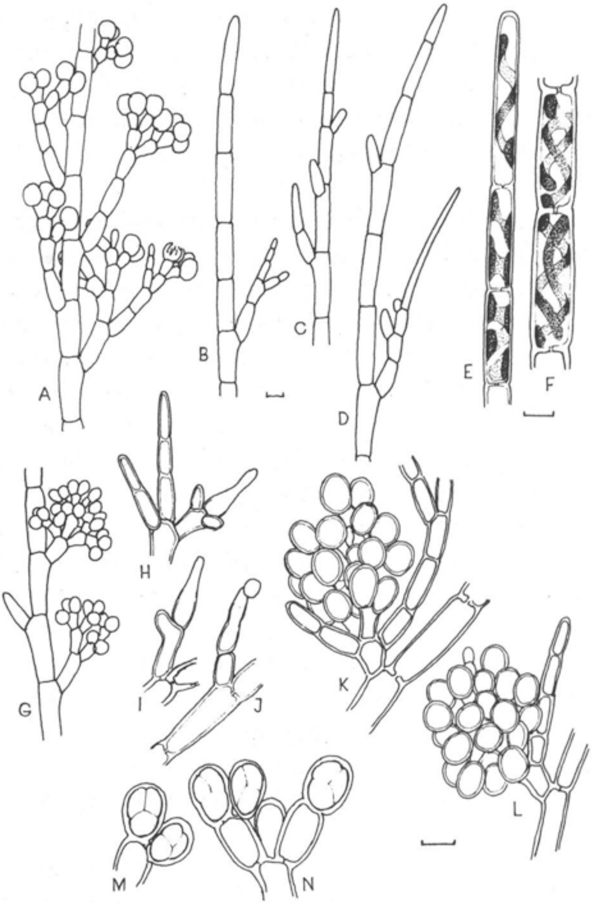
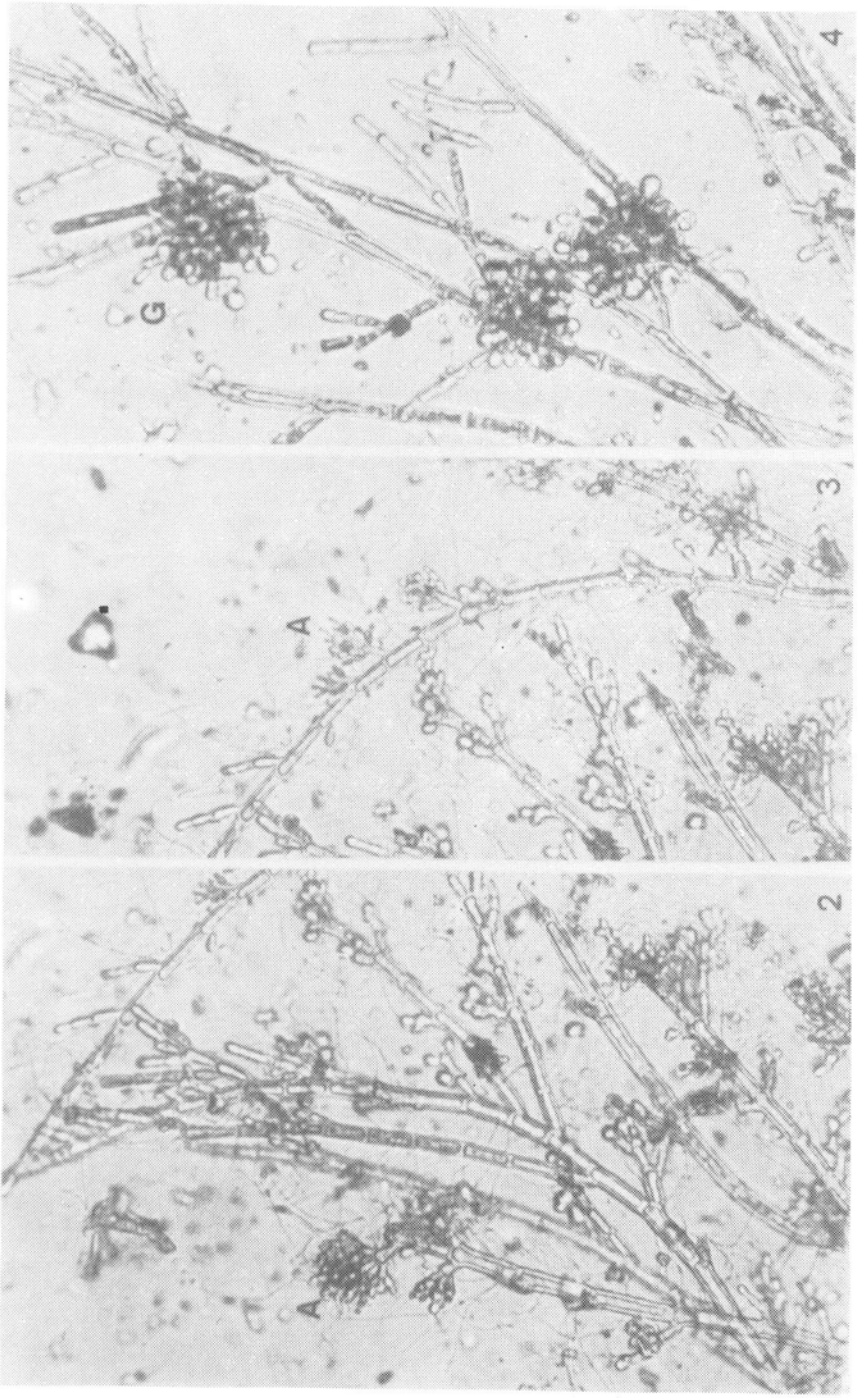


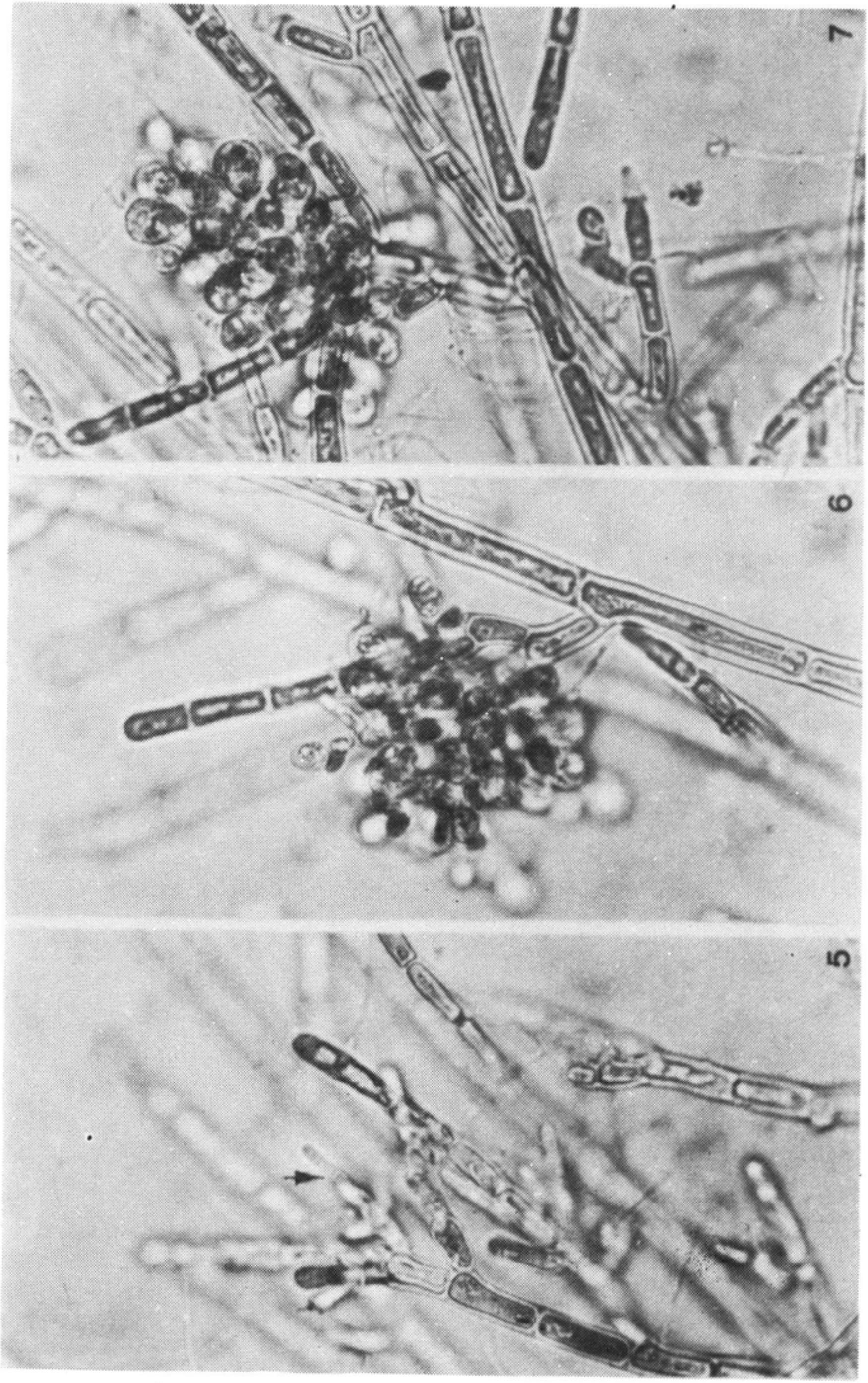
Fig. 1. *Chantransia hermannii* (Roth) Duby. A — A fragment of a thallus with monosporangia. B, C, D — Fragments of tips of branches. E — Apical cells with chromatophores. F — Cells in the lower part of the thallus with chromatophores. G — Antheridia. H, I, J — Carpogones. K, L — Gonimoblasts. M, N — Tetrasporangia. The scale 10 μm

Valley of the Tatra Mts., mono- and dioecius specimens were found. In the material from the Świętokrzyskie Mts., no specimens with antheridia or carpogones were found, while tetrasporangia occurred fairly frequently. In the rivers Dunajec and Pcim no antheridia were observed while gonimoblasts occurred, this indicating that either the male specimens were rare or the collected material was too scarce or sampled at an improper season of the year.

Carpogonia are difficult to observe. These small formations are either bottle-shaped, slightly cylindrical or longitudinally ovoid, they may or may not be slightly narrowed in the lower part, without chromatophores, 13.6-24 μm in length, in the lower part 3.6-4-(6) μm in width, set on the



Chantransia hermannii (Roth) Duby. Figs. 2 and 3 — Antheridia (A); Fig. 4 — Gonimoblasts (G)



Chantransia hermannii (Roth) Duby. Fig. 5 — Carpogones (arrow); Figs. 6 and 7 — Mature gonimoblasts tips of short lateral shoots or at the apex of the main shoot (Figs. 1H, I, J, 5). The formation of the carpogone terminates the growth of the vine, this inducing the growth of lateral ramifications in the basic cells. Hence, mature gonimoblasts which develop after the fertilization of the trichogin, are, as it were, set in the fork of two or three lateral branches.

Gonimoblasts are shaped like an irregular cluster, on the shot they are globose or elongated in shape, 60-80 or 65-86 μm in diameter (Figs. 1K, L, 4, 6, 7). One, two or, rarely, three carpogonia are usually produced at the apex of a short basic cell. They are elliptical or ovoid 8-12-(16) μm in width and 8-13-(20) μm in length. They were chiefly found in the spring and summer, being very rare in the samples from September and October.

Table 1 contains the main features of species from the Carpathian Range, Sweden, Portugal and England. The distinct conformity of the traits can be seen while the small differences chiefly in the dimensions of cells, can be ragarded as habitat differences which do not justify any attempts to form varieties.

DISCUSSION

CHANTRANSIA, PSEUDOCHANTRANSIA, AUDOUINELLA

The name *Chantransia* was used for the first time by De Candolle (1805), however, he applied it to the genera *Lemanea, Batrachospermum, Cladophora* and *Oeodogonium* but not to *Chantransia* in the current approach. Therefore, Desvaux (1809, p. 310) was the first to introduce the generical name of *Chantransia* to the species *Confera hermannii* Roth 1797. Yet, Bory de St. Vincent (1822-1831) did not accept the name *Chantransia* and formed a new genus *Audouinella* (from the name of a French pathologist J. Audoin) for the species *A. fusiformis* (= *Ectocarpus tomentosus*) and *A. miniata* (= *Chantransia hermannii*). Later, Fries (1825) accepted the name *Chrantransia* as the older one for the species *Ch. hermannii* and *Ch. chalybaea,* comparing them with similar species found in seas. The name was commonly accepted because it included marine and freshwater algae of the same shape. Doubts did not aries before Thwaites (1849), Wartmann (1854) and above all Sirodot (1872, 1884) observed that in the development of the thalli of the red algae *Lemanea* and *Batrachospermum* a stage having the appearance of a typical *Chantransia* occurred. This is something of a prothallium for these species. Schmidle (1905) and Setchel (1890) found that such a stage could also be observed in the species of the genera *Thorea* and *Tuomeya*. Therefore, Brand (1910) attempted to set the problem in order

Table 1

Comparison of *Chantransia hermannii* traits from different stations

Traits	*Ch. hermannii* from Carpathians	*Ch. hermannii* from The Świętokrzyskie Mts.	*Ch. hermannii* acc. Israelson (1942/43)	*Audouinella violacea* P. Reis 1961	*Rhodochorton violaceum* Drew 1935
Height of thalli	1–3–(5) mm	3–5–(6) mm	1–3–(5) mm	1–3 mm	up to 3 mm
Breadth of cells	6–10–13 µm	8–15 µm	(7)–9–12–(15) µm	(4.5)–5–10–(12) µm	6–12 µm
Length of cells	32–64 µm	32.4–110 µm	(17.5)–23–60–(75) µm	12–15–45–60 µm	up to 40 µm
Chromatophores	red, tape-like	red, tape-like	red, at the wall	red, at the wall	red, tape-like
Monosporangia	5–8–12–(15) µm	9–12.5–(14) µm	7–10 × 8–13(16) µm	7.5–9 × 9–12 µm	7 × 9.5 µm
Tetrasporangia	9–11–(14) µm	10–14 µm	9–10 × 10–13 µm	?	9 × 11.5 µm
Carpogons Trichogines	bottle-shaped or cylindrical 3–4–(6) × 13–(24) µm	?	bottle-shaped 4–6 × 9–13.5 µm	bottle-shaped, cylindrical 3.3–5 × 8–16–(20) µm	bottle-shaped ovoid 4–6 × 9–13.5 µm
Gonimoblasts	cluster-like irregular, 60–80–(86) µm in diameter	cluster-like, irregular, 65.2–86 µm in diameter	cluster-like 50–70 µm in diameter	cluster-like 33–46 × 43–52 µm	cluster-like ?
Carpospores	ovoid 8–12 × 8–16–(20) µm	ovoid 12–15 × 12–22 µm	ovoid 9–11 × 10–15 µm	ovoid 9–10.5 × 10.5–12 µm	ovoid 6–7.5 × 7.5–10 µm
Sexuality	mono- or dioecius	mono- or dioecius	mono- or dioecius	mono- or dioecius	mono- or dioecius
Tips of vines	rounded, rarely with short setae	rounded, rarely with short setae	rounded, rarely with short setae	rounded or with short setae	rounded, sharpened or with short setae

from the point of view of systematics, and divided the freshwater *Chantransia* species known at that time into the genus *Chantransia* which included the species with a complete development, cycle, also reproducing sexually, and the species with an incomplete cycle, reproducing with vegetative monospores only. The latter were ragarded by him as belonging to other species of red algae as their prothallium. He assigned *Ch. violacea* and *Ch. hermannii* to the genus *Chantransia*, claiming that other species belong to different red algae species and should be called *Pseudochantransia*.

From the point of view of systematics *Pseudochantransia* is an artificial name. According to De-Toni (1847, 1905) this is a "genus biologicum" relating to the developmental stages of other species. The name was used neither by Hamel (1925) in his elaboration of red algae known in France nor by Schiller (1925) and Skuja (1944). However. Hamel used the generical name of *Audouinella* for sexually reproducing species such as *Audouinella violacea* (*Rhodochorton violaceum* Drew), *A. hermannii* (Roth) Desvaux, and also *A. boweri* (Murray et Barton) Hamel. He left the name *Chantransia* for other species, taking only *Chantransia chalybaea* and *Ch. pygmaea* into consideration, since he regarded other species, such as *Ch. lemanaea*, *Ch. batrachospermi* and *Ch. thoreae*, as not distinctly determined. Schiller used the name *Chantransia* for all known species. Similarly Skuja, who claimed that at the utmost, in the genus *Chantransia* the section *Audouinella* could be differentiated for species whose sexual reproduction was distinctly proved. In the elaboration of Swedish red algae Israelson (1942/43) uses the name *Chantransia* for the species *Ch. hermannii* and the name *Pseudochantransia* for the species which formed monospores only. Reis (1961) described the occurrence of *Chantransia violacea* in Portugal and attempted to compare his own materials with the species *Rhodochorton violaceum* Drew and *Chantransia boweri* Murray et Barton. The comparison showed slight differences which, however, could not be used in the identification of separate species. In another work Reis (1966) already uses the name *Audouinella*. Papenfuss (1947) gives a list of 10 species of the genus *Audouinella*, however, he quotes *A. violacea* (Kütz.) Hamel as the only European species, and remarks that according to Israelson this species is a synonym of *Chantransia hermannii*. In volume 14 of the Polish Freshwater Flora (Starmach 1977) the name *Chantransia* as the older one was accepted for all freshwater species. The classification of *Ch. violacea* to *Rhodochorton* (Drew 1935) was rejected; the marine genus *Rhodochorton* was also classified to *Acrochaetium* (Papenfuss 1947). The marine algae of the *Chantransia* type were described for the first time as *Callithamnion* Lyngbye 1819 and it was Nägeli (1861) who identified the genus *Acrochaetium*. According to Batters (1895) and Börgesen (1915) *Acrochaetium* corresponds to the older name of *Chantransia*. Thus, for marine species the name *Chantransia* was replaced by *Acrochaetium*.

However, the problem of these "nonindependent" *Chantransia* species is not simple. It is difficult to distinguish the independent and nonindependent species on the basis of morphological traits, if no antheridia or carpogonia are found with the former, and these forms are very rarely ancountered. It is also difficult to classify the commonly occurring species of the genus *Chantransia* to any determined *Batrachospermum* species. Some authors claimed to have observed young *Batrachospermum* thalli on the branches of *Chantransia pygmaea* and *Ch. chalybaea*, and yet it was never checked if the thalli developing young *Batrachospermum* thalli were really identical with *Ch. pygmaea* or *Ch. chalybaea*. Both species commonly occur all over Europe in the same streams where *Batrachospermum* is found, though, at numerous stations they never develop the thalli of the latter alga. This was already noted by Sirodot and supported by other workers. Israelson remarked that typical *Chantransia* also grew in lakes at considerable depths (e.g., in Poland in the Tatra lakes) and never formed the *Batrachospermum* thalli. During almost 50 years in some streams of the Beskid Wyspowy Range (the Carpathians), small thalli of *Ch. pygmaea* (1-3 mm in height) and slightly higher *Ch. chalybaea* which reproduced by monospores only were observed by this author. The *Batrachospermum* thalli were never found at these stations while they occurred at other places. In Carpathian streams downward from the springs, *Hildenbrandia* and *Chantransia pygmaea* or *Ch. chalybaea* are, as a rule, encountered first and then, in lower sectors where the water is deeper and less shaded, the *Batrachospermum* species appear. They are accompanied by prothallia similar to the above-discussed *Chantransia* which also produce monosporangia. In the streams of the Beskid Wyspowy Range, *Batrachospermum moniliformae, B. boryanum* and *B. sporulans* are most frequently observed. Numerous authors mentioned that *B. moniliformae, B. virgatum* and *B. virgato-decaisneanum* grew together with *Ch. chalybaea* or *Ch. pygmaea*. However, the identification of these species as belonging to a given *Batrachospermum* species is not easy. Young *Batrachospermum* thalli growing on *Chantransia* vines are too insufficiently developed to be assigned to a species. Some *Batrachospermum* species grew out of a small trailing prothalle only and are additionally strengthened with cortical filaments which go down as holders and expand at the basis of the thallus. The structure of the filaments is typical for *Chantransia*. Sometimes they also produce monosporangia. These facts make it difficult to determine precisely the connection between *Ch. pygmaea* or *Ch. chalybaea* and the *Batrachospermum* thalli growing at the same places. On stones, twigs lying in the water and sometimes on leaves of mosses, both *Chantransia* species form separate tufted or turfy thalli which retain the same form for years. This could be regarded as a case of neoteny in the development of *Batrachospermum,* dependent upon the character of the environment. However, it is not possible to check this during a field study. The explanation might be found in cultures started from single monospores and carpospores of the corresponding *Batrachospermum* species. This type of investigation has only been begun, e.g., Hurdelbrink and Schwantes (1972) investigated the development of a *Batrachospermum* sp. gametophyte in a culture from a corpospore. The filaments of the *Chantransia* type were first to develop in the culture. However, the above-mentioned authors did not investigate the cells karyologically. Using the Feulgen staining method, they only determined (cytomorphometrically) that the *Batrachospermum* thalli, i.e., the cladoms according to Chadefaud, contained half of the DNA content as compared with the corresponding *Chantransia* filaments. In the same study it was also found that no meiosis occurred during the first division of the zygote, as was formerly supposed, but that it took place in the transitory zone between the *Chantransia* stage and the gematophyte. Stosch and Theil (1979) reported an interesting observation in this respect. They found that the change from *Chantransia* to the *Batrachospermum* cladom was initiated by an unique type of meiosis. It is specific for red algae and is characterized by unequal cytokinesis followed by the degeneration of the side cell. In this way only one meiospore develops there while the other one wastes away. The germinated carpospores form a prothallium built of *Chantransia* filaments which develop on the *Batrachospermum* thalli. They have diploidal cells in their lower parts and they even produce monosporangia on short lateral shoots while only as high as after 1-8 segments of the axial shoot, single cells are transformed into meiocytes. On one side they form small protuberances where one nucleus migrates after the meiotic division. The protuberance is separated by a wall from the remaining cell which is already the terminal cell of the haploidal *Batrachospermum* thallus at this time. Similar development is observed in *Lemanea*.

The problem of the transition from a diploidal *Chantransia* filament, i.e., from its one cell which gemmates in a *Batrachospermum* thallus, is not clear yet and requires further studies. Neither are the development of the two types of prothallia and their role for different *Batrachospermum* species, or the conditions of the production of tetrasporangia and their role in *Chantransia hermannii* explained so for. These questions will probably be explained by biochemical investigations and in cultures developed from spores of species which were not only roughly determined as to their genus, but precisely identified.

It is a fact that thalli whose structure is similar to *Chantransia* filaments occur in *Batrachospermum*. Sirodot differentiated prothallia trailing on the substrate (prothalle) and erect vines growing on them (*Chantransia*). Some species have the "prothalle" only while other species develop erect "*Chantransia*" vines. Practićally there is no dependable way of differentiating the *Batrachospermum* species on the basis of the traits of their prothallia.

Neither was it demonstrated that all *Chantransia* reproducing with monospores, which were found in water bodies, were the *Batrachospermum* developmental stages only. Sirodot always made drawings of *Chantransia* found with each *Batrachospermum* species, and tried to find differences. However, his drawings gave no certainty as to what *Batrachospermum* species can be expected on the basis of a *Chantransia* only. Hence, it is impossible to say that all freshwater *Chantransia* species which reproduce only vegetatively are nonindependent species. Maybe, apart of them constitutes the developmental stages of *Batrachospermum* and another part is independent. In any case *Chantransia chalybaea* and *Ch. pygmaea*, the species known in Europe for a long time, may as well be independent species which reproduce vegetatively, as it is the case with e.g., *Hildenbrandia rivularis*. It is a known fact that after passing to fresh waters, marine red algae loose theire organs of sexual development. This is particularly pronounced in the Baltic Sea which eastwardly is decreasingly saline. There, such species as *Polysiphonia nigrescens, Rhodomela subfusca*, and some other algae which reproduce sexually in the North Sea, produce only monospores in the Baltic Sea.

Marine red algae of the genus *Acrochaetium* (formerly *Chantransia*) have red chromatophores. Skuja assumed that the independent species of freshwater *Chantransia* should have the same colour and that this could be their indentification trait. In fact, the sexually reproducing species *Ch. hermannii* is red while other species such as *Ch. chalybaea* and *Ch. pygmaea* are steel-green or violet at the outmost. However, this trait is not a sure one because species living deep in lakes are always red (chromatic adaptation). Similarly, species living in strongly shaded streams are at least red-violet. Skuja also reported that the vines of independent species have a distinct monopodial axis with opposed ramifications while the nonindependent species (prothallia) have no distinct main axis. They form tufts composed of numerous vines of the same order which are poorly ramified and produce scarce monosporangia. This is the most probable trait and only this one can be used in assessing the independence or "nonidependence". However, it must be noted that young thalli of some species, e.g., *Chantransia hermannii* which grow epiphytically, have no distinct main axis yet. Hamel remarked that the chromatophores of independent species were usually spirally wound but this is not regularly encountered. Thus, no quite positive criteria can be found for separating a prothallium from *Chantransia*. Nothing else remains but to follow the example of Sirodot and to describe as a prothallium only those *Chantransia* which grow in close association with *Batrachospermum* thalli. The name *Pseudochantransia* is unnecessary since it does not secure the certainty that the plants which are given this name are prothallia or independent species.

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Chantransia hermannii (Roth) Desvaux oraz pozycja systematyczna rodzajów Chantransia, Pseudochantransia i Audouinella

Streszczenie

Krasnorost *Chantransia hermannii* należy do rzadko wymienianych w Europie. Z Polski podany był dotąd jedynie z potoku Suszanka w Beskidzie Wyspowym, jako *Chantransia violacea* Kütz, i z Czarnej Wisełki pod Baranią Górą, jako *Chantransia hermannii.* Organy rozmnażania płciowego opisane były u tego glonu jedynie w Anglii, Szwecji i Portugalii. Na podstawie materiałów znalezionych na kilku innych stanowiskach w Polsce, opisano plechy i organy rozmnażania: anteridia, karpogonia, gonimoblasty, tetrasporangia i monosporangia tego rzadkiego glonu (ryc. 1-7).

Omówiono pozycję systematyczną gatunku *Ch. hermannii* oraz przedyskutowano rozpatrywane niekiedy w literaturze botanicznej zagadnienia tak zwanych samodzielnych i niesamodzielnych gatunków *Chantransia* oraz nazw: *Chantransia, Pseudochantransia* i *Audouinella.* Nazwy *Audouinella* nie uwzględniono jako późniejszej od nazwy *Chantransia.* Nie znaleziono też pewnego dowodu, że gatunki *Chantransia chalybaea* i *Ch. pygmaea* występujące pospolicie w potokach całej Europy są stadiami rozwojowymi (przedroślami) różnych gatunków *Batrachospermum.* Gatunki te traktowane bywają najczęściej jako *Pseudochantransia*, rozwijające się z karpospor różnych gatunków *Batrachospermum*, nie tworząca organów płciowych, rozmnażająca się jedynie za pomocą monospor. Istotnie, gatunki z rodzaju *Batrachospermum*, a także *Lemanea* i *Thorea*, mają u nasady mniej lub więcej rozwinięte utwory typu *Chantransia*, powstające z kiełkujących karpospor jako pewnego rodzaju przedrośla, które trudno odróżnić po cechach morfologicznych od niezależnie rosnących gatunków *Chantransia chalybaea* czy *Ch. pygmaea.* Te ostatnie, utrzymujące się latami na innych stanowiskach niż *Batrachospermum*, są zapewne gatunkami u których rozwój organów płciowych zaniknął w wodzie słodkiej, podobnie jak na przykład u słodkowodnego gatunku *Hildenbrandia rivularis* oraz u gatunków krasnorostów rosnących w silnie wysłodzonych wodach Bałtyku wschodniego.