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COEXISTENCE OF *CONOCHILUS UNICORNIS* WITH *C. HIPPOCREPIS* IN LAKE GENEVA, AND COMMENSAL ORGANISMS FOUND IN THEIR GELATINOUS MATRIX

BY

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ABSTRACT

Coexistence of *Conochilus unicornis* with *C. hippocrepis* in Lake Geneva, and commensal organisms found in their gelatinous matrix.- Coexistence of *Conochilus unicornis* with *C. hippocrepis* is confirmed in Lake Geneva. A number of commensal organisms in the gelatinous matrix of these colonial *Conochilus* was observed for the first time in Lake Geneva in 1992. Such colonies were intensively green in color from *Chlamydomonas gloeophila* var. *irregularis* and *Phormidium arcuatum* in May-June, becoming progressively colourless on and after mid-July.

Key-words: Lake Geneva, commensalism, *Conochilus unicornis, Conochilus hippocrepis, Phormidium arcuatum, Chlamydomonas gloeophila* var. *irregularis*.

CONOCHILUS IN LAKE GENEVA

Lake Geneva is inhabited by two species of *Conochilus*, with *C. unicornis* Rousselet 1892, being more abundant than *C. hippocrepis* (Schrank, 1830). *Conochilus hippocrepis* was first recorded by IMHOF (1885). However, WEBER (1898) found only *C. unicornis* and concluded that Imhof confused *C. unicornis* with *C. hippocrepis*. In fact, these two species of *Conochilus* coexist in Lake Geneva as they do, for example, in Lake Glubokoe (MATVEEVA, 1986).

There are still some taxonomic problems within the genus *Conochilus*, due to the existence of intermediate forms between *C. unicornis* and *C. hippocrepis* (PEJLER, 1956). These two species are the two clearly distinguishable extreme members of the series. Between them there are transitional forms, both in the size and fusion of antennae (from completely fused, or nearly so, in *C. unicornis* to completely separate, or only slighty fused, in *C. hippocrepis*) as well as in the ratio of body size to length of foot (PEJLER, 1957; POURRIOT, 1965).

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Most of our individual specimens could be rather securely assigned to one or the other of the two species, but sometimes the character of the antennae was not clearly definable in some of the preserved specimens. Moreover, considerable variation in size of colony and number of individuals occurs in colonies of *Conochilus*, with colonies intermediate in some respects between *C. unicornis* et *C. hippocrepis* (Table I).

TABLE I

Comparative data between *Conochilus unicornis* and *C. hippocrepis*

	Conochilus unicornis	*Conochilus hippocrepis*	Authors
Individual size (µm)	200-450	400-800	STEMBERGER, 1979
	250-380	500-800	RUDESCU, 1960
	320	500-600	BARTOS, 1959
	212-303	310-455	Present study
Size of colonies (mm)	0.5-3	2-4	KOSTE, 1978
	0.56-1.00	2-4	BARTOS, 1959
	0.80-1.00	4	RUDESCU, 1960
	0.40-0.76	0.52-0.98	Present study
Number of individuals in colonies		10-161	EDMONDSON & LITT, 1987
	2-25	60-100	BARTOS, 1959
	5-12	30-60	STEMBERGER, 1979
	5-25	30-200	KOSTE, 1978
	5->150	25->200	WALLACE, 1987
	4-38	12-98	Present work

COMMENSAL SPECIES IN THE GELATINOUS MATRIX

Colonies of *Conochilus* are a normal component of zooplankton in Lake Geneva. In 1992, they became extraordinarily abundant in May and June (BALVAY, 1993). This period marks the first time that they were very visually obvious in zooplankton samples due to their green coloring induced by commensal species located in the gelatinous matrix of the colonies of *Conochilus*. On and after mid-July, fewer and fewer colonies were coloured and in mid-September all of them were colourless. At the same time, the same phenomenon was observed by our Swiss colleagues J. Naef and R. Revaclier in the "Petit Lac" (western part of Lake Geneva).

Microscopic examination of living samples revealed coexistence of colonies of *C. unicornis* and *C. hippocrepis* in which the gelatinous matrix was more or less intensively colonized with commensal algae.

Several kinds of symbiotic algae and protozoa have been seen growing in the matrix of *Conochilus* colonies (Table II). During the 1992 occurrence of *Conochilus* in Lake Geneva, two commensal species were observed: *Chlamydomonas gloeophila* var. *irregularis* Skuja (first record in Lake Geneva) and *Phormidium arcuatum* Skuja.

TABLE II

Organisms found in the gelatinous matrix of *Conochilus*

	Conochilus unicornis	*Conochilus hippocrepis*	*Conochilus* sp
CYANOPHYTA			
Phormidium arcuatum Skuja	12	12	5, 10
Phormidium mucicola Huber-P. et Naumann	1		3, 10
Lyngbia endophytica Elenkin et Hollerbach	7		
CHRYSOPHYTA	7		
EUCHLOROPHYTA			
Carteria conochili Skuja		9, 11	
Chlamydomonas sp	7		
Chlamydomonas gloeophila Skuja		9	
C. gloeophila var. *irregularis* Skuja	12	12	
PROTOZOA			
Amoeba gracilis Greeff	7		
Amoeba mucicola de Graff	7		
Amoeba radiosa Dujardin	7		
Vorticella conochili Stokes	6, 7, 8		
Vorticella conosoma Stokes	6, 7	2	
Vorticella dimorpha Stiller	4		
Vorticella sp	12	12	

1. HUBER-PESTALOZZI & NAUMANN, 1929
2. KAHL, 1930
3. HUBER-PESTALOZZI, 1938
4. STILLER, 1940
5. SKUJA, 1948
6. FAURÉ-FREMIET, 1949
7. DE GRAFF, 1953
8. MORAVCOVA, 1956
9. HUBER-PESTALOZZI, 1961
10. STARMACH, 1966
11. ETTL, 1983
12. Present work

Chlamydomonas gloeophila var. *irregularis* generally exhibits two different shapes: a rounded form and an elongated form. In Lake Geneva, colonies of *Conochilus* often were colonized with elongated forms.

Gelatinous matrix is seen only on freshly collected living colonies. The mucous is destroyed in preserved samples in which only solitary individuals may be observed. This fact could explain why *Phormidium arcuatum* and *P. mucicola* were previously found in some phytoplankton samples (BALVAY *et al.*, 1990; DRUART *et al.*, 1983).

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RÉSUMÉ

La coexistence de *Conochilus unicornis* avec *C. hippocrepis* a été observée dans le Léman en 1992. Plusieurs organismes commensaux ont été identifiés dans la matrice gélatineuse de ces rotifères dont les colonies, fortement colorées en vert par *Chlamydomonas gloeophila* var. *irregularis* et *Phormidium arcuatum* en Mai-Juin, sont devenues progressivement incolores après la mi-Juillet.

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