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Algarum, Hepaticarum, Muscorumque in culturis collectio. Plantarum physiologiae institutum Universitatis Carolinae.

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The Czechoslovak Capital Praha (Prague) has a fairly good tradition in the work of cutivation of different organisms. From the years 1913 till 1914 Č. V. UHLÍŘ succeeded in the isolation and cultivation of some of the *Lichenes*-gonidia *(Algae* and *Cyanophyceae)* and other different *Cyanophyceae*. He was working in the Plant Physiology Laboratory of the Charles' University (Universitas Carolina). His method was very simple. He used mineral nutrient solutions with soil extract (decoct) and illuminated the cultures with constant electric light. Only weak bulbs (50 till 100 candles) were used; no cooling therefore was necessary. The cultures (testtubes and Petri-dishes) were in the 50 till 100 cm distance from the bulb. The method was not surpassed for its simplicity and good success.

The paper of UHLÍŘ was published only in two short Czech records:

V. UHLÍŘ: Isolace řas *Collemaceí*. — Živa 24: 233-234; 1914.

V. UHLÍŘ: Nová metoda isolace gonidií *Collemaceí*. — Věstník V. sjezdu českých přírodozpytců a lékařů v Praze: 391-392; 1914.

J. PEKLO: Některé novosti z rostlinné fotofysiologie. — Biologické listy 4: 208-219, 259-270; 1915.

The work of UHLÍŘ was twice refered in the Botanisches Centralblatt (Botan. Cbl. **128**: 498; 1915; **129**: 379; 1915), and mentioned by H. KUFFERATH: La culture des algues, (Paris 1930, pp. 32, 127) and by L. DELARGE: Recherches sur la culture d'une Schizophycée *Phormidium uncinatum* COM. (Bruxelles 1937, pp. 7). But in spite of it most of the later papers written in the same line do not mention the name of UHLÍŘ. His cultures perished when UHLÍŘ lost his life in the battle by Krasnik July 5, 1915.

The *Diatom*-cultures isolated by Dr V. Č. MRÁZEK as his liver-worth-cultures *(Pellia)* were lost in the World-War I. The same happened with the cultures of symbiotic *Cyanophyceae* by HOŘEJŠÍ.

V. MRÁZEK: Příspěvky k fysiologii Diatomaceí. (Věstník V. sjezdu českých přírodozpytců a lékařů v Praze 401—402; 1914.)

Č. MRÁZEK: Z biologie a fysiologie tufových mechů. — (Rozpr. II. tř. Čes. Akad. 33[5]: 1—20; 1924.)

J. HOŘEJŠÍ: Symbiotická řasa silná v kořenech u *Cycas revoluta*. — (Rozpr. II. tř. České Akademie **19**[9]: 1—32; 1910.)

The cultures of *Chorella* and other *Algae* were studied by J. PEKLO: Studie o inaktivaci fotosynthetické asimilace a tvorby chlorofylu III. O mutabilitě *Chlorell.* — (Rozpr. II. tř. České Akademie věd a umění 23[46]: 1—46; 1914.)

From the year 1914 till 1916 Dr S. PRÁT isolated many species of *Oscillatoria* and cultivated them as many other species of *Cyanophyceae* until he was obliged to take the military service. After the World-War I. some new isolations were made and some speciments changed with the well known Swiss Collection by R. CHODAT were cultivated.

Especially *Cyanophyceae* were cultivated (S. PRÁT: The Culture of Calcareous *Cyanophyceae*. — Studies from the plant physiological laboratory, Charles' University 3: 86—88; 1925.)

But later on all the cultures had to be abandoned because of the impossibility to get a financial support.

The cultures of *Vaucheria* isolated by J. KALOČ were lost in the World-War II. J. KALOČ: Kultury řasy *Vaucheria*. — Cultures of the Alga *Vaucheria*. — Public. fac. sc. Univ. Charles **158**: 1—14; 1938.

Before the Wold-War II. the Prague Collection of *Algae* was known. It was founded by professor Dr E. G. PRINGSHEIM.

E. G. PRINGSHEIM: Ber. d. deutsch. bot. Ges. **46**: 216—219; 1928. — Mikrokosmos **22**: 88; 1928—1929.

E. G. PRINGSHEIM: Algenreinkulturen. — Ber. d. deutsch. botan. Ges. 47: 530—535; 1929.

E. G. PRINGSHEIM: Algenreinkulturen. — Ber. d. deutsch. botan. Ges. 54: 533—541; 1936.

E. G. PRINGSHEIM: Algenreinkulturen. — Beih. Botan. Cbl. 57 A: 105—111; 1937.

E. G. PRINGSHEIM: Pure Cultures of *Algae*. — Cambridge Univ. Press 1946, pp. 1—119.

After the departure of prof. PRINGSHEIM from Prague many species from his original cultures were lost, otherwise some new species added. During the days of Prague Revolution we succeeded in saving the collections of *Algae*-cultures as the Collection of *Hepaticae* cultivated by professor Dr G. LORBEER.

The present collection contains species isolated by:

M. W. BEIJERINCK, V. CZURDA, O. JAAG, W. KRÜGER, I. LUCKSCH, K. ONDRAČEK, L. PROVASOLI, W. VISCHER, M. A. BRANNON, DOENS, M. KEIL, H. KUFFERATH, F. MAINX, S. PRÁT, R. ŘETOVSKÝ, J. VINTIKA, R. CHODAT, E. J. FOGG, V. KLEČKOVÁ, A. J. KLUYVER, O. LHOTSKÝ, ST. LHOTSKÝ, H. MEYER, E. G. PRINGSHEIM, M. TOMAN.

Some species of *Algae* and *Cyanophyceae* need further control and will be added to the next list.

Some cultures are bacteria-free; in the war-times some were contaminated and only species-cultures are held. The purity of the cultures is now examined.

Since May 1945 Dr R. ŘETOVSKÝ takes care of the cultures. All technical work is now done by Miss M. BASLEROVÁ.

Most of the algae are cultivated on nutrient mineral agar:

KNO_3	0,1 g	$FeCl_3 . 6 H_2O$	0,001 g
K_2HPO_4	0,01 g	Agar	8,0 g
$MgSO_4 . 7 H_2O$	0,01 g	H_2O ad	1000 ccm.

In some cultures temporarily extract (decoct) of soil is added (1 : 4 H_2O).

For *Chlorella protothecoides* KRÜGER, *Chl. vulgaris* BEIJ. and *Chlorella xanthella* BEIJ. following medium is used:

glucose	5,00 g	$MgSO_4 . 7 H_2O$	0,01 g
Pepton Witte	1,00 g	$FeSO_4 . 7 H_2O$	0,001 g
KNO_3	0,10 g	agar	10 g
K_2HPO_4	0,01 g	H_2O	ad 1000 cc

Cryptomonas is cultivated in the liquid medium:

decoct of soil	100 ccm
decoct of peat	20 ccm
H_2O ad	1000 ccm

The halophile organisms *(Dunaliella* and *Brachiomonas)* are cultivated in the solution:

soil decoct	50 ccm	$MgSO_4 . 7 H_2O$	0,01 g
NaCl	30 g	$FeSO_4 . 7 H_2O$	0,001 g
KNO_3	0,10 g	H_2O	ad 1000 cc
K_2HPO_4	0,01 g		

The *Cyanophyceae* are cultivated on the mineral agar with extract of soil. For *Anabeana cylindrica* the medium according G. E. FOGG is used:

agar	8,00 g	$(NH_4)_2Mo_4O_{13}$	0,0001 g
K_2HPO_4	0,20 g	H_3BO_3	0,0001 g
$MgSO_4 . 7 H_2O$	0,20 g	$CuSO_4 . 5 H_2O$	0,00001 g
KCl	0,10 g	$ZnSO_4 . 7 H_2O$	0,00001 g
$FeCl_3 . 6 H_2O$	0,0004 g	H_2O	ad 1000 cc
$MnCl_2 . 4 H_2O$	0,0001 g		

The list of the present cultures in the collection of: Institutum physiologiae plantarum Universitatis Carolinae, Viničná 5, Praha II, ČSR is as follows:

Cyanophyceae.

Anabaena cylindrica Lemn., isol. G. E. FOGG.
Calothrix sp.

Dr St. LHOTSKÝ isolated the symbiotic *Cyanophyceae (Nostoc)* from the thalli of the *Hepaticae* and from the roots of *Cycadeae*. The species-culture are not bacteria-free.

Blasia pusilla (2 strains)
Cycas circinalis
Dioon edule
Encephalartos Altensteinii
Macrozamia Denisonii

Algae.

Ankistrodesmus amalloides CHAT. et OETLI, isol. VISCHER
Ankistrodesmus angustus BERN., isol. VISCHER
Ankistrodesmus falcatus (CORDA) RALFS, isol. CHODAT
Ankistrodesmus falcatus var. *stipitatus* (CHOD.) LEMMERN, isol. CZURDA
Botrydiopsis alpina isol. VISCHER
Botrydiopsis intercedens VISCHER et PASCHER, isol. CZURDA
Botrydium Becherianum VISCHER, isol. VISCHER
Botrydium granulatum var. *Kolkwitzianum* VISCHER, isol. VISCHER
Bumillereopsis filiformis isol. VISCHER
Chlamydomonas agloeformis PASCHER, isol. MAINX
Chlamydomonas applanata PRINGSHEIM, isol. PRINGSHEIM
Chlamydomonas Brannonii PRINGSHEIM, isol. BRANNON
Chlamydomonas eugamentos MOEWUS, +, —, isol. CZURDA
Chlamydomonas gyrus PASCHER, isol. PRINGSHEIM
Chlamydomonas humicola LUCKSCH, isol. LUCKSCH

Chlamydomonas intermedia CHOD., isol. CZURDA
Chlamydomonas monoica PRINGSH., isol. PRINGSHEIM
Chlamydomonas oblonga PRINGSHEIM, isol. PRINGSHEIM
Chlamydomonas orbicularis PRINGSH., isol. PRINGSHEIM
Chlamydomonas pseudagloea PASCHER, isol. PRINGSHEIM
Chlamydomonas pseudococcum LUCKSCH
Chlamydomonas pulchra PRINGSHEIM, isol. PRINGSHEIM
Chlamydomonas pulvinata VISCHER, isol. VISCHER
Chlamydomonas simplex PASCHER, isol. PRINGSHEIM
Chlorella ellipsoidea GERNECK; Delft
Chlorella luteoviridis CHODAT, isol. KUFFERATH
Chlorella luteoviridis var. *aureoviridis* CHODAT, isol. KLUYVER
Chlorella protothecoides KRÜGER, isol. KRÜGER
Chlorella pyrenoidosa PRINGSHEIM, isol. PRINGSHEIM
Chlorella saccharophila (KRÜGER) NADSON, isol. KRÜGER
Chlorella variegata BEIJERINCK; Delft
Chlorella vulgaris var. *luteoviridis* CHODAT; Delft
Chlorella vulgaris BEIJERINCK; Delft
Chlorella vulgaris BEIJ. var. *viridis* CHODAT, isol. CHODAT
Chlorella xanthella BEIJ., isol. BEIJERINCK
Chlorella Zopfingiensis DOENS, isol. DOENS
Chlorellidium tetrabotrys VISCHER et PASCHER, isol. VISCHER
Chloridella neglecta PASCHER, isol. VISCHER
Chlorocloster engadinensis, isol. VISCHER
Chlorococcum humicolum (NAEG.) RABENHORST, isol. KLUYVER
Chlorogonium elongatum DANGEARD, isol. CZURDA
Chlorogonium euchlorum EHRENBERG, isol. PROVASOLI
Coccomyxa arvenesis JAAG, isol. JAAG
Coccomyxa elongata JAGG, isol. JAAG
Coccomyxa Chodatii JAAG, isol. JAAG
Coccomyxa icmadophilea JAAG, isol. JAAG
Coccomyxa mucigena (peltigerae apthosae) JAAG, isol. JAAG
Coccomyxa peltigerae variolosae JAGG, isol. JAAG
Coccomyxa Pringsheimii (botrydinae) JAAG, isol. JAAG
Coccomyxa Rayssiae CHODAT et JAAG, isol. JAAG

Coccomyxa solorinae bisporae JAAG, isol. JAAG
Coccomyxa solorinae sacharatae CHODAT, isol. JAAG
Coccomyxa subellipsoidea ACTON *(Botrydina)*, isol. PRINGSHEIM
Coccomyxa viridis VISCHER, isol. JAAG
Coelastrum proboscideum var. *dilatatum* VISCHER, isol. VISCHER
Cosmarium spec. div.
Cystococcus humicola (NAEG.) TREBOUX, isol. KLUYVER
Dictycoccus minus PETROVÁ, isol. CHODAT
Dictyosphaerium pulchellum WOOD, isol. BRANNON
Dunaliella salina (DUNAL) TEODORESCO, isol. CZURDA
Euglena gracilis KLEBS, isol. PRINGSHEIM
Gonium sociale MUELLER, isol. MAINX
Gonium tetras HARTMANN, isol. MEYER
Haematococcus pluvialis FLOTOW et WILLE, isol. PRINGSHEIM, isol. VISCHER
Heterococcus brevicellularis, isol. VISCHER
Heterococcus caespitosus VISCHER, isol. VISCHER
Heterococcus Mainxii VISCHER, isol. VISCHER
Heterococcus Marietanii VISCHER, isol. VISCHER
Heterococcus moniliformis VISCHER, isol. VISCHER
Heterococcus protonematoides, isol. VISCHER
Heterothrix solida, isol. VISCHER
Hormidium Barlowii PRINGSHEIM, isol. PRINGSHEIM
Hormidium flaccidum AL. BRUN sens. ampl., isol. PRINGSHEIM
Hormidium nitens MENEGH, isol. PRINGSHEIM
Mesotaenium Caldariorum (LAGERH.) HANSGIRG, isol. CZURDA
Mischococcus sphaerocephalus VISCHER, isol. VISCHER
Muriella aurantiaca VISCHER, isol. VISCHER
Muriella decolorata VISCHER, isol. VISCHER
Nephrodiella brevis, isol. VISCHER
Pandorina morum BORY, isol. CZURDA
Pediastrum sp., isol. CZURDA
Pleurochloris commutata PASCHER, isol. VISCHER
Pleurochloris magna BOYE-PETERSEN, isol. VISCHER
Pleurochloris meiringensis, isol. VISCHER

Protosiphon botryoides (KÜTZ.) KLEBS, isol. PRINGSHEIM *(monoec.)*
Protosiphon botryoides (KÜTZ.) KLEBS, isol. PRINGSHEIM *(dioec.)*
Pseudendoclonium Printzii VISCHER, isol. VISCHER
Raphidonema longiseta VISCHER, isol. VISCHER
Scenedesmus obliquus (TURP.) KRÜGER, isol. PRINGSHEIM
Staurastrum sp., isol. CZURDA
Stichococcus bacillaris NAEG. sens. ampl., isol. VISCHER
Stichococcus chloranthus KRÜGER, isol. KRÜGER
Stichococcus mirabilis LAGERHEIM, isol. PRINGSHEIM
Vaucheria sp., isol. KEIL
Vischeria punctata PASCHER, isol. VISCHER
Zygnema cylindricum TRANSEAU, isol. CZURDA
Zygnema peliosporum WITTROCK, isol. CZURDA

Hepaticae.

The *Hepaticae* collected by G. LORBEER are cultivated on the mineral nutrient agar:

agar	8,00 g	$MgSO_4 . 7 H_2O$	0,10 g
NH_4NO_3	0,20 g	$FeCl_3 . 6 H_2O$	0,005 g
$CaCl_2$	0,10 g	H_2O	ad 1000 cc
KH_2PO_4	0,10 g		

The species of *Riella* are cultivated in the same solution (without added agar) and are submerged in Erlenmayer flasks with sand on the bottom.

Aneura incurvata LINDB.
Aneura multifida (L.) DUM.
Aneura palmata (HEDW.) DUM.
Aneura pinguis (L.) DUM.
Aneura sinuata (DICKS.) DUM.
Anthoceros laevis L.
Aspiromitus sampalocemis BERGEFF
Bazzania trilobata LDBG., isol. KEIL
Blasia pusilla MICH.
Bucegia romanica RAD.
Calypogeia suecica (ARN. et PERSS.) MUELL.
Cephalozia ambigua MASS.
Cephalozia bicuspidata (L.) DUM. var. *Lammersiana* (HUB.) BREIDLER

Chiloscyphus pallescens (EHRH.) DUM.
Clevea hyalina (SOMM.) LINDB.
Clevea Rousseliana (MONT.) LEITG.
Corsinia marchantioides RADDI
Fimbriaria Blumeana NEES
Fossombronia pusilla (L.) DUM.
Frullania ornithocephala NEES
Frullania saxicola AUST.
Grimaldia fragrans (BALB.) CORDA
Grimaldia pilosa (HOR.) LDBG.
Haplozia crenulata (SM.) DUM.
Haplozia lanceolata (SCHR.) DUM.
Haplomitrium Hookeri NEES
Jamesoniella autumnalis (DC.) ST.
Lophozia ventricosa (DICKS.) DUM.
Lunularia cruciata (L.) DUM.
Marchantia polymorpha L.
Marchantia polymorpha L. f. *alpestris* NEES et f. *aquatica* NEES
Monosolenium tenerum GRIFF.
Mörckia Flotoviana (NEES) SCHFFN.
Neesiella rupestris (NEES) SCHFF.
Pellia Fambroniana RADDI
Pellia Neesiana (G.) LIMPR.
Peltolepsis grandis LINDB.
Petalophyllum Ralfsii (WILS.) GOTT.
Plagiochasma elongatum L. et G.
Plagiochasma rupestre (FORST.) ST.
Preissia commutata NEES
Reboulia hemisphaerica (L.) RADDI
Riccia Bischoffii HUEB.
Riccia crystallina L.
Riccia Curtisii JAMESON
Riccia fluitans L., isol. KEIL
Riccia glauca L.
Riccia Michelii RADDI
Ricia sorocarpa BISCH., isol. KEIL
Riccia Zachariae LORB. n. sp.
Ricciocarpus natans (L.) CORDA, isol. KEIL
Riella helicophylla MONT.
Riella Notarisii MONT.
Sauteria alpina NEES
Scapania nemorosa (MICH.) DUM.
Scapania undulata (L.) DUM.
Sphaerocarpus Donnellii AUST.
Sphaerocarpus europaeus LORBEER

Sphaerocarpus texanus AUST.
Symphyogyna sp.
Tesselina pyramidata DUM.
Trichocolea tomentosa (SW.) G.

Sphagna.

Sphagnum sp. isolated by ST. LHOTSKÝ is cultivated in test tubes with mineral nutrient agar:

KH_2PO_4	1	mol. solution	2 ccm
$MgSO_4 . 7 H_2O$	1	mol. solution	2 ccm
$Ca(NO_3)_2 . 4 H_2O$	1	mol. solution	5 ccm
$FeCl_3 . 6 H_2O$	0,01	mol. solution	0,5 ccm
Peat decoct			20 ccm
agar			8 g
H_2O ad			1000 ccm

The peat decoct: 250 g of the peat soil (not *Sphagnum!*) boiled for 1 hour in 3 l of destilled water; the decoct is of dark brown or black colour. When left out in the nutrient solution the organisms are growing, but much slower.
Sphagnum squarrosum PERS., isol. KEIL.

Musci.

Musci isolated by E. G. PRINGSHEIM are cutivated on mineral agar (s. p. 64).
Aulacommnium androgynum (L.) SCHWAEG.
Ceratodon purpureus (L.) BRID.
Funaria hygrometrica (L.) SIBTH. norm. and bivalent, isol. by G. LORBEER.
Haplodon sp.
Leptobryum pyriforme (L.) SCHPR., norm. and bilavent.
M. KEIL isolated the following species:
Bartramia norvegica LINDB.
Blindia acuta Br. eur.
Brachythecium albicans Br. eur.
Brachythecium populeum Br. eur., isol. KLEČKOVÁ
Bryum pallens SW.
Buxbaumia aphylla L.

Calliergon cuspidatum KINDB., isol. KLEČKOVÁ
Calliergon giganteum KINDB., isol. KLEČKOVÁ
Calliergon stramineum KINDB.
Catharinea undulata W. et M.
Climacium dendroides W. et M.
Conostomum tetragonum LINDB.
Dicranella heteromalla SCHPR.
Dicranodontium denudatum HAGEN., isol. KLEČKOVÁ
Dicranum spurium HEDW.
Dicranum undulatum EHRH.
Distichium montanum HAGEN.
Drepanocladus aduncus MOENKEM.
Drepanocladus uncinatus HEDW.
Encalypta ciliata HOFFM.
Fissidens Arnoldii RUTHE
Fontinalis antipyretica L.
Georgia pellucida RABENH.
Grimmia torquata HORNSCH.
Hedwigia albicans LINDB.
Hylocomium proliferum LINDB. ♀
Isothecium viviparum LINDB.
Leucobryum glaucum SCHPR.
Mnium undulatum WEIS. ♀ and ♂.
Oligotrichum incurvum LINDB.
Philonotis seriata LINDB., ♀ and ♂
Plagiothecium denticulatum Br. eur.
Polytrichum juniperinum WILLD
Polytrichum strictum BANKS
Ptilium crista-castrensis de NOT.
Rhacomitrium aciculare BRID.
Rhodobryum roseum LIMPR., isol. KLEČKOVÁ
Rhytidium rugosum KINDB.
Schistostega osmundacea MOHR.
Splachnum ampullaceum L., ♀ and ♂
Splachnum sphaericum L. ♀ and ♂
Synchitria ruralis BRID.
Tayloria tenuis SCHPR.

Tetraplodon angustatus Br. eur.
Tetraplodon bryoides LINDB.
Timnia austriaca HEDW.
Trematodon ambiguus HORNSCH. ♀ and ♂
Ulota ulophylla BROT.

Phanerogamae.

Spirodella oligorhiza from the Haskins Laboratories, New York.