3. TRANZSCHEL, in „Travaux du Musée Botanique de l'Academie Impériale des Sciences de St. Pétersburg", livr. II, 1904, p. 15, 1905, p. 13.
4. KLEBAHN in SORAUER, Zeitschr. für Pflanzenkrankh. 1905, p. 70, 1912, p. 327.
5. —, Pilze in Cryptogamenflora der Mark Brandenburg, Bd. Va, H. 3, p. 534.
6. —, ibid. Bd. Va, H. 2, p. 216.
7. TRÉBOUX, Annal. Mycol. 1912, Bd. X, p. 305 u. 557.
8. BUBÁK, Einige neue oder kritische *Uromyces*-Arten. Sitzungsber. Kgl. Böhm. Gesellschaft der Wissensch. in Prag, II. Classe, 1902.
9. BOCK, Beiträge zur Biologie der Uredineen. Centralbl. f. Bacter. II. Abt. 1908, Bd. XX, p. 579.

# On some chemical activities of *Citromyces*: Utilization of nitrogenous substances, and effects of heavy metals in the medium.

By

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As is well known, a number of molds can utilize urea, uric acid, hippuric acid, guanine, guanidine, and glycocoll as sources of nitrogen[1]) and it seemed that it might be of interest to try some similar experiments with two cultures of *Citromyces*, which happened to be at hand, so a series of tests were accordingly made, and the results are presented here in.

The cultures were those of *Citromyces glaber* and *Citromyces Pfefferianus*, and had been obtaind about a year previous from the „Centralstelle für Pilzculturen". The standard medium contained %: agar 1,5, cane-sugar 1,0, $NH_4NO_3$ 0,5%, $MgSO_4$ (cryst.) 0,2, $K_2HPO_4$ 0,2. In the tests the ammonium nitrate was replaced by the nitrogen-containing substance in a proportion sufficient to introduce approximately the same amount of nitrogen.

In the case of uric acid, only a small portion of the acid introduced actually went into solution. Both species, however, grew rapidly under these conditions, showing ready utilization of this substance as a source of nitrogen.

Hippuric acid was utilized much less readily by both species. *C. Pfefferianus* started rather more readily on it than did *C. glaber*, but both grew very slowly, the growth being compact, and with the hyphae spreading but little beyond the edges of dense growth. Thinking that the acidity of this substance might cause this checking of the growth another set was tried, in which the acidity was neutralized with potassium carbonate before sterilization; upon this medium, both species started to grow promptly, *C. glaber* showing the greater early development; neither species, however, reached normal growth, the cultures remaining nearly white, with only a slight development of the green conidias; after the

1) See W. BENECKE in LAFARS Handbuch d. Techn. Mycologie 1907, **1**: Stickstoffquellen der *Eumyceten*, p. 401—408; CZAPEK, Biochemie 1905, **2**, p. 104ff.

rapid start, growth was very slow. Dox and Neidig[1]) have recently shown the presence in several species of *Penicillium* and *Aspergillus*, of an enzyme capable of splitting hippuric acid. Both species of *Citromyces*, when growing on the neutralized hippuric acid medium, produced a violet coloration therein.

Both species utilized urea readily as a source of nitrogen, the growths being dense, and healthy-looking, though not spreading as rapidly as on the uric acid medium, or as on the control medium.

Neither species utilized nitrogen in the form of hexamethylenetetramine. On the standard medium without nitrogen, mycelia formed, but spread but little, only a few scattered conidia-bearing hyphae were formed. Manganous acetate, present in very small amount, was found to accelerate the growth on the standard medium somewhat; with uranyl acetate, the effect was slightly greater. Agulhon and Sazerac[2]) found that uranium did not favor the growth of *Aspergillus niger*. Ferric and zinc chlorides both produced a distinct retardation, and pale cultures. These tests with heavy metal salts were all made with *Citromyces Pfefferianus*. All cultures were made in 10 cm Petri-dishes, and incubated at room-temperature, averaging about 20° C.

# Referate.

**Bezsonoff, N.,** Notice sur le développement des conidiophores et sur les phénomènes nucléaires qui l'accompagnent chez le *Sphaerotheca mors-uvae* et le *Microsphaera Astragali* (Bull. Soc. Mycol. France 1913, **29**, 279—291; t. 14—19).

Les conidiophores de *Sphaerotheca mors-uvae* se développent à peu près comme ceux du *S. Humuli* (Premier type de Foëx); ceux du *Microsphaera Astragali* constituent un type spécial dans lequel la cellule génératrice des conidies est toujours placée au sommet du jeune conidiophore, les articles qui la portent provenant de ses divisions successives et devenant à leur tous cellules-mères de conidies, et le tout étant porté par un pédicelle bicellulaire (type intermédiaire entre le premier et le troisième types de Foëx). Les chaînettes de conidies du *S. mors-uvae* ont des noyaux disposés dos-à-dos, c'est à dire se regardant par leurs faces non nucléolées; pendant le développement des conidiophores les noyaux sont au contraire tournés face au sommet, c'est à dire tournent leur face nucléolée vers le sommet. Chez *M. Astragali*, au contraire, les noyaux sont tournés face à la base. R. Maire (Alger).

**Foëx, E.,** Evolution du conidiophore de *Sphaerotheca Humuli* (Bull. Soc. Mycol. France 1913, **29**, 251—252; t. 10).

Chez *S. Humuli* le conidiophore ne produit tout d'abord qu'une seule cellule génératrice, qui forme deux conidies, différant ainsi de celui de l'*Erysiphe graminis* où deux cellules génératrices soeurs forment simultanément quatre conidies.

On observe un développement analogue chez *Sphaerotheca pannosa, Erysiphe Cichoracearum, Podosphaera Oxyacanthae*. R. Maire (Alger).

1) Bull. Soc. Chim., **11**, p. 867.
2) Zeitschr. f. Physiol. Chemie, **85**, p. 68.

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