[Presented for 4th International Conference on Cold Fusion, ICCF-4, Hyatt Regency Maui, Hawaii, U.S.A., December 6th to 10th 1993]

AN APPROACH TO THE PROBABLE MECHANISM OF THE NON-RADIOACTIVE BIOLOGICAL COLD FUSION OR SO-CALLED KERVRAN EFFECT (Part 2)

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Introduction

Our observations on the non-radioactive biological cold fusion or the biological transmutation of elements has been presented at the 3rd International Conference on Cold Fusion (Oct. 21 to 25, 1992, Nagoya, Japan).[1] In previons several papers[2)~8)], with Prof. Dr. C. Louis Kervran, we suggested the probable occurrence of non-radioactive biological cold fusion or the biological transmutation of elements In this paper, in order to confirm the phenomena, under the more controlled condition, potassium, magnesium, iron and calcium were determined in the cells of Aspergillus niger IFO 4066, Penicillium chrysogenum IFO 4689, Saccharomyes cerevisiae IFO 0308, Torulopsis utilis IFO 0396, cultured in normal medium and media deficient in one of potassium, magnesium, iron or calcium. The probable mechanism of the biological cold fusion (non-radioactive) in these microorganisms will be discussed.

Method and Results

The method of culture, and the composition of the normal media (for mold and for yeast), and that of the media deficient in one of potassium, magnesium, iron or calcium, are quite equal to that in our previous paper.[1] The experimental results, under more controlled condition, are shown in Table I and II.

Conclusion

Our observations on the non-radioactive cold fusion or the biological transmutations of elements (so-called Kervran effect), in previous papers, have been reconfirmed under more controlled conditions. With Prof. Dr. C. Louis Kervran, the probable mechanism of the biological transmutations of elements, or non-radioactive biological cold fusion, may be summarized as follows:—

$Na_{23}+O_{16}=K_{39}$ $\quad$ $K_{39}+H_{1}\rightarrow Ca_{40}$

$^{23}Na+^{1}H::^{24}Mg$ $\quad$ $Mg_{24}+O_{16}\rightarrow Ca_{40}$

$Fe_{56}-H\rightarrow Mn_{55}$ $\quad$ $Si_{28}+C_{12}\rightarrow Ca_{40}$

References

(1) Histoki KOMAKI: Observations on the biological cold fusion or the biological transmutation of elements, Proceedings of ICCF-3 (Nagoya, Japan, 1992)

(2) Hisatoki KOMAKI: Production de proteins par 29 souches de microorganismes et augmentation du potassium en milieu de culture sodique, sans potassium (Revue de Pathologie Comparee 67, 213-216, 1967)

(3) Hisatoki KOMAKI: Formation de proteines et variations minerales par des microorganismes en milieu de culture, sort avec ou sans potassium, sort avec ou sans phosphore (Revue de Pathologie Comparee, 69, 83-88, 1969)

(4) Hisatoki KOMAKI: C.L.Kervran: Experiences de Komaki, Premiere Serie de Recherches (PREUVES EN BIOLOGIE DE TRANSMUTATIONS A FAIBLE ENERGIE, MALOINE, S.A., PARIS, 1975, p. 116-120)

(5) Hisatoki KOMAKI: C. Louis Kervran: Deuxieme Serie D'Experiences de KOMAKI (Ibid., p. 120-121)

(6) Hisatoki KOMAKI: C. Louis Kervran: Troisieme Serie D'Experiences de H. KOMAKI (Ibid., p. 122-130)

(7) Hisatoki KOMAKI et al.: Proceedings of 13th International Congress of Biochemistry, Amsterdam, 1986

(8) Hisatoki KOMAKI et al.: An approach to the probable mechanism of the non-radioactive biological cold fusion or so-called Kervran effect, Proceedings of 4th International Conference on Biophysics and Synchrotron Radiation, (Tsukuba, Japan, 1992)

In previous papers[1)~6)], with Prof. Dr. C. Louis Kervran, I suggested the probable occurrence of the biological cold fusion or the biological transmutation of elements.

May I have Slide No. 1 [References [1)~6)]]

Of course I do not insist that our observations, with Prof. Dr. C. Louis Kervran, are the completely reliable evidences of the biological cold fusion.

In previous papers, with Prof. Dr. C. Louis Kervran, I merely suggested the probable occurrence of the biological transmutations of elements.

In 1799, Vauguelin, a French chemist, reported that, according to his observations, the hen was found to have excreted five times more lime than it had taken in the food. He concluded that lime had been produced but he could not determine the cause.

In 1831, the French chemist Choubard reported that the young plants (watercress, etc.) contained minerals which had not existed in the seeds.

In 1875, von Herzeele went a step further by verifying a weight increase in the ashes of young plants stemmed from germinating seeds. He concluded that there was a transmutations of elements.

In 1959, Prof. Dr. C. Louis Kervran began to publish his discoveries, but I did not yet know them.

It was in 1962 that Prof. Dr. Kervran's academic book "Biological Transmutations" was published by Librarie Maloine, Paris, France. In 1963, we began to verify the formation of several minerals from another minerals (atoms), using some microorganisms.

These observations — Reference (1) to (6) — were presented for Revue de Pathologie Comparee, etc, since 1965.

In order to confirm the phenomena, under the more controlled condition, potassium, magnesium, iron and calcium were determined in cells of *Aspergillus niger* IFO 4066, Penicillium *chrysogenum* IFO 4689, *Rhizopus nigricans* IFO 5781, *Mucor rouxii* IFO 0396, *Saccharomyces cerevisiae* IFO 0308, *Torulopsis utilis* IFO 0396, *Saccharomyces ellipsoideus* IFO 0213 and *Hansenula anomala* IFO 0118 cultured in normal medium and media deficient in one of potassium, magnesium, iron or calcium.

The experimental results were presented for 4th International Conference on Biophysics and Synchrotron Radiation, August 30th to September 4th 1992 at Tsukuba, Japan.[7)]

May I have a next slide (Slide No.2) (Table 1)

Table I shows the components of normal media, K-deficient, Mg-deficient, Ca-deficient and Fe-deficient media for mold. Of couse, all components used are pure chemicals.

May I have a next slide. (Slide No.3) (Table 2)

Table 2 shows the components of normal media, and K-deficient, Mg-deficient, Ca-deficient and Fe-deficient media for yeast.

All components used are, of course, pure chemicals.

May I have a next slide. (Slide No.4) (Table 3)

Table 3 shows the outline of the experimental results, which I presented for 4th International Conference on Biophysics at Tsukuba, last year, for your reference.

Table 3 shows the comparison of the yield, as the weight of dried cells(mg) of mold and yeast obtained by normal media and potassium-deficient, magnesium-deficient, iron-deficient, and calcium-deficient culture. (Cultured with each 200ml of culture media; shaking culture at 30℃ for 72 hours)

Then, may I have a next slide (Slide No.5) (Table 4)

Table 4 shows the comparison of the contents of potassium, magnesium, iron, and calcium(μg) of the whole amount of, and 1g of the dried cells of mold and yeast obtained by normal culture, and potassium-deficient, magnesium-deficient, iron-deficient and calcium-deficient culture. (Each 200ml; 30℃; 72 hours).

The each upper figure shows the content of potassium, magnesium, iron and calcium per whole amount of the obtained dried cells.

The each lower figure shows the content of potassium, magnesium, iron and calcium per 1g of the obtained dried cells.

These are our experimental data that I presented for 4th International Conference of Biophysics at Tsukuba, last year.

For your reference I would like to show the growth curve of several sorts of microorganisms in normal media and potassium-deficient media.

May I have a next slide. (Slide No.6) (Fig.1)

The left curve shows the growth curve of Aspergillus niger in normal and potassium-deficient media.

The middle curve shows the growth curve of Urococaus in normal and potassium-deficient media.

The right curve shows the growth curve of Saccharomyces rouxii in normal and potassium-deficient media.

May I have a next slide (Slide No.7) (Fig.2)

The curve No.1 shows the growth curve of Aspergillus niger in normal and phosphorus-deficient media.

The curve No.2 shows the growth curve of Penicillium chrysogenum in normal and phosphorus-deficient media.

The curve No.3 shows the growth curve of Urobacillus in normal and phosphorus-deficient media.

The curve No.4 shows the growth curve of Saccharomyces cerevisiae in normal and phosphorus-deficient media.

The curve No.5 shows the growth curve of Candida lypolitica in normal and phosphorus-deficient media.

The curve No.6 shows the growth curve of Torulopsis lactis condensi in normal and phosphorus-deficient media.

To avoid the data, concerning our experimental results which I[8] presented for the 3rd International Conference on Cold Fusion (ICCF-3), Nagoya, 1992, please refer to the Abstract of ICCF-3.

Then, in order to confirm these observations, which I presented for ICCF-3, last year, I determined the content of potassium, magnesium iron and calcium in the dried cells of Aspergillus niger IFO 4066, Penicillium chrysogenum IFO 4689, Saccharomyces cerevisiae IFO 0308, Torulopsis utilis IFO 0396, cultured in normal medium and media deficient in one of potassium, magnesium, iron or calcium, under more controlled conditions.

May I have a next slide (Slide No.8) (Table 5)

This is our main data.

Table 5 shows the comparison of the yield, as the weight of the dried cells(mg) of mold and yeast, obtained by normal media and potassium-deficient, magnesium-deficient, iron-deficient and calcium-deficient culture. (Cultured with each 200ml of culture media; shaking culture at 30℃ for 72 hours.)

May I have a next slide. (Slide No.9) (Table 6)

This is our most chief and most important data.

Table 6 shows the comparison of the content of potassium, magnesium, iron, and calcium (μg) of the whole amount of, and 1g of, the dried cells of mold and yeast obtained by normal media, and potassium deficient, magnesium-deficient, iron-deficient and calcium-deficient culture (Each 200ml; 30℃; 72 hours)

The each upper figure shows the content of potassium, magnesium, iron and calcium per whole amount of the obtained dried cells.

The each lower figure shows the content of potassium, magnesium, iron and calcium per 1g of the obtained dried cells.

Our conclusions would be summarized as follows.

May I have a next slide. (Slide No.10)

$Na_{23}+O_{16}=K_{39}$

$^{23}Na+^{1}H:=:^{24}Mg$

$Fe_{56}-H\rightarrow Mn_{55}$

Our observations on the non-radioactive cold fusion or the biological transmutations of elements (so-called Kervran effect), in previous papers, have been reconfirmed under more controlled conditions.

With Prof. Dr. C. Louis Kervran, the probable mechanism of the biological transmutations of elements, or non-radioactive biological cold fusion, may be summarized as the Slide No.10 and Slide No.11 shows.

Then, may I have a next slide. (Slide No.11)

$K_{39}+H_{1}\rightarrow Ca_{40}$

$Mg_{24}+O_{16}\rightarrow Ca_{40}$

$Si_{28}+C_{12}\rightarrow Ca_{40}$

My coworkers and I would like to conclude that the non-radioactive biological transmutations of elements, whether we call the phenomena as the biological cold fusion or not, are the real fact.

The non-radioactive biological transmutations of elements, or the biological cold fusion, would be the key of obtaining the endless and very clean energy, which my coworkers and I sincerely hope to promote my "Four Steps to Absolute Peace" Programme[9][10] into the real practice in the nearest future.

The problems to be solved in future, by us, may be summariged as follows: —

Dr. Goldfein[12], of the U.S. Army Laboratory, kindly suggested that the biological transmutations of elements (biological cold fusion, my coworkers and I would like to say) must be catalyzed by Mg-ATP as biological particle accelerator. In this connection, we have much concern with Prof. Dr. Katsuzo Wakabayashi (Osaka University) and Prof. Dr. Takeyuki Wakabayashi (Tokyo University)'s small-angle X-ray scattering analysis of conformational changes of the myosin head (SI) during hydrolysis of ATP (Mg-ATP)[13]

We sincerely hope that the late Prof. Dr. C. Louis Kervran's working hypothesis on the probable mechanism of the non-radioactive biological transmutations of elements (or the non-radioactive biological cold fusion) would be confirmed by the specialists in the field of biophysics, especially in the field of synchrotron radiation or in the related fields

[14][15][16][17][18](National Laboratory of High Energy Physics, Tsukuba, must be one of the best laboratories in these fields), and by the specialists in the field of nuclear physics, especially in the field of cold nuclear fusion: National Institute for Fusion Science, Nagoya, must be one of the best laboratories in these fields. Thank you.

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(1) Hisatoki KOMAKI: Production de proteins par 29 souches de microorganismes et augmentation du potassium en milieu de culture sodique, sans potassium (Revue de Pathologie Comparee 67, 213-216, 1967)

(2) Hisatoki KOMAKI: Formation de proteines et variations minerales par des microorganismes en milieu de culture, sort avec ou sans potassium, sort avec ou sans phosphore (Revue de Pathologie Comparee, 69, 83-88, 1969)

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(4) Hisatoki KOMAKI: C. Louis Kervran: Deuxieme Serie D'Experiences de KOMAKI (Ibid., p.120-121)

(5) Hisatoki KOMAKI: C. Louis Kervran: Troisieme Serie D'Experiences de H. KOMAKI (Ibid., P.122-130)

(6) Hisatoki KOMAKI et al.: Proceedings of 13th International Congress of Biochemistry, Amsterdam, 1986.

(7) Hisatoki KOMAKI et al: An Approach to the Probable Mechanism of the Non-radioactive Biological Cold Fusion or So-called Kervran Effect, Abstract of 4th International Conference on Biophysics and Synchrotron Radiation (BSR 92), p.272, Tsukuba, August 30th~September 5th 1992.

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(9) Hisatoki KOMAKI: "Selected Works of Prof. Dr. HISATOKI KOMAKI— FOUR STEPS TO ABSOLUTE PEACE Programme", Vol. I~Vol. IX, in English, French, German, Italian, Spanish and Russian version, The Earth Environment University Press, New York and Otsu, 1993.

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(12) Goldfein: United States Army Research Laboratories Report, No. (19)

(13) K. Wakabayashi et al.: Small -angle X-ray Scattering Analysis of Conformational Changes of the Myosin Head (S1) during Hydrolysis of ATP Ibid., F107, 1992.

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About the Author:—

Five Hundred Leaders of Influence

Hisatoki Komaki

Since 1990, Prof. Dr. Hisatoki Komaki has held the position of President of the Earth Environment University of Japan and U.S.A. (Hon. President is Prof. Dr. Linus Pauling, Nobel Prize Winner). He began his career as a professor at Nara Women's University in 1960, after receiving his Ph.D. in the field of biological science in 1959 from Kyoto University, and he later served as a professor at Mukogawa University (1963) and at L'Universite Transnational in Paris (1973). He is a fellow member of the Japan Society for Bioscience and the Japan Society for Nutrition and Food Sciences. In 1989 he was named a Paul Harris Fellow of Rotary International, U.S.A.

Throughout his career, Prof. Komaki has written a number of scientific works, including *Selected Works of Prof. Dr. Hisatoki Komaki*, Volumes 1-9 (in English, French, German, Italian, Spanish and Russian, 1992), *Discovery of Biological Cold Fusion*. For his work, he has received the Medal of Honor with Dark Blue Ribbon of the Japanese Government, the Highest Gold Medal of the Red Cross of Japan, and an Academic Grand Prize of the Japanese Academy. He was also a nominee for the Nobel Prize, as the discoverer of Biological Cold Fusion.

Prof. Dr. Komaki was born in Kyoto, Japan, on 29 August 1926. He is married to Yoriko Komaki and is the son of the late Prof. Dr. Saneshige and Mrs. Kiyoko Komaki.

(Reprinted from FIVE HUNDRED LEADERS OF INFLUENCE) American Biographical Institute, Inc., 1993, p.203)

Table 1. Composition of the Normal, K-deficient, Mg-deficient, Ca-deficient and Fe-deficient Media for Mold

Components	Normal	K-deficient	Mg-deficient	Ca-deficient	Fe-deficient
Sucrose	3%	3%	3%	3%	3%
$NaNO_3$	0.3%	0.3%	0.3%	0.3%	0.3%
K_2HPO_4	0.1%	—	0.1%	0.108%	0.1%
KCl	0.05%	—	0.05%	0.05%	0.05%
$MgSO_4 \cdot 7H_2O$	0.05%	0.05%	—	0.05%	0.05%
$FeSO_4 \cdot 7H_2O$	0.001%	0.001%	0.001%	0.001%	—
$CaHPO_4$	0.008%	0.008%	0.008%	—	0.008%
Na_2HPO_4	—	0.1%	—	—	—
NaCl	—	0.05%	—	—	—
Na_2SO_4	—	—	0.05%	—	—
$MnSO_4 \cdot 7H_2O$	—	—	—	—	0.001%
Pure Water	to 100%	to 100%	to 100%	to 100%	to 100%

All components used are pure chemicals

Tabel 2. Composition of the Normal, K-deficient, Mg-deficient, Ca-deficient and Fe-deficient media for Yeast

Components	Normal	K-deficient	Mg-deficient	Ca-deficient	Fe-deficient
Sucrose	10%	10%	10%	10%	10%
Ammonium Tartarate	1%	1%	1%	1%	1%
$MgSO_4 \cdot 7H_2O$	0.25%	0.25%	—	0.25%	0.25%
$FeSO_4 \cdot 7H_2O$	0.001%	0.001%	0.001%	0.001%	—
$CaHPO_4 \cdot 2H_2O$	0.008%	0.008%	0.008%	—	0.008%
K_3PO_4	0.5%	—	0.5%	0.5%	0.5%
Na_3PO_4	—	0.5%	—	—	—
Na_2SO_4	—	—	—	—	—
K_2HPO_4	—	—	—	0.08%	—
$MnSO_4 \cdot 7H_2O$	—	—	—	—	0.001%
Pure Water	To 100%	To 100%	To 100%	To 100%	To 100%

Table 3. Comparison of the yield, as the weight of dried cells (mg) of mold and yeast obtained by normal media and K-deficient, Mg-deficient, Fe-deficient, and Ca-deficient culture. (Cultured with each 200*ml* of culture media ; shaking cultur at 30℃ for 72 hours.)

Species	Culture media				
	Normal	K-deficient	Mg-deficient	Fe-deficient	Ca-deficient
Aspergillus niger (IFO No.4066)	574	54	72	56	125
Penicillum chrysogenum (IFO No.4689)	907	83	99	90	196
Rhizopus nigricans (IFO No.5781)	496	42	56	45	121
Mucor rouxii (IFO No.5773)	388	35	40	38	98
Saccharomyces cerevisiae (IFO No.0308)	1480	141	146	138	281
Torulopsis utilis (IFO No.0396)	2710	253	263	220	365
Succharomyces ellipsoideus (IFO No.0213)	1540	155	163	159	294
Hansenula anomala (IFO No0118)	1060	98	105	103	215

Table 4. Comparison of the contents of K, Mg, Fe, Ca (μg) of the whole amount of, and 1g of, the dried cells of mold and yeast obtained by normal culture, and K-deficient, Mg-deficient, Fe-deficient and Ca-deficient culture (Each 200*ml* ; 30℃ ; 72 hours). (Upper : Per whole amount of the obtained dried cells ; Lower : Per 1g of the obtained dried cells)

Species	Normal culture				K-deficient	Mg-deficient	Fe-deficient	Ca-deficient
	K	Mg	Fe	Ca	K	Mg	Fe	Ca
Aspergillus niger (IFO No.4066)	5280	1110	390	260	130 (90)	32	7	12
	9198	1934	679	453	2407(1667)	472	125	96
Penicillum chrysogenum (IFO No.4689)	10100	1910	570	390	150 (110)	50	9	14
	11136	2106	628	429	1807(1325)	505	100	71
Rhizopus nigricans (IFO No.5781)	4240	960	250	190	110 (70)	21	5	10
	8548	1935	504	383	2619(1667)	375	111	83
Mucor rouxii (IFO No.5773)	3940	780	210	160	69 (29)	18	4	6
	10155	2010	389	412	1971 (829)	450	105	61
Saccharomyces cerevisiae (IFO No.0308)	16300	2820	1180	720	310 (270)	68	15	22
	11014	1905	797	486	2199(1916)	466	109	176
Torulopsis utilis (IFO No.0396)	23900	1750	2050	1380	490 (450)	130	22	29
	8819	645	756	493	1937(1779)	494	100	148
Saccharomyces ellipsoideus (IFO No.0213)	18400	2990	1220	790	340 (300)	62	16	28
	11948	1942	792	513	2194(1935)	380	101	231
Hansenula anomala (IFO No.0118)	12500	2060	840	520	170 (130)	42	12	15
	11792	1943	792	491	1735(1327)	117	400	153

Tabel 5. Comparison of the yield, as the weight of dried cells (mg) of mold and yeast obtained by normal media and K-deficient, Mg-deficient, Fe-deficient, and Ca-deficient culture. (Cultured with each 200 *ml* of culture media ; shaking culture at 30℃ for 72 hours.)

Species	Culture media				
	Normal	K-deficient	Mg-deficient	Fe-deficient	Ca-deficient
Aspergillus niger (IFO No. 4066)	560	45	62	48	120
Penicillum chrysogenum (IFO No. 4689)	855	73	85	81	183
Saccharomyces cerevisiae (IFO No. 0308)	1350	135	139	126	263
Torulopals utilis (IFO No. 0396)	1810	214	223	204	318

Table 6. Comparison of the contents of K, Mg, Fe, Ca (μg) of the whole amount of, and 1g of, the dried cells of mold and yeast obtained by normal culture, and K-deficient, Mg-deficient, Fe-deficient and Ca-deficient culture (each 200 *ml*; 30°C; 72 hours).
(Upper: Per whole amount of the obtained dried cells; Lower: Per 1g of the obtained dried cells)

Species	Normal Culture				K-deficient	Mg-deficient	Fe-deficient	Ca-deficient
	K	Mg	Fe	Ca	K	Mg	Fe	Ca
Aspergillus niger	5070	109	366	259	105 (65)	29	6	10
(IFO No. 4066)	9055	1940	654	463	2350 (1440)	461	121	86
Penicillium chrysogenum	8840	175	593	369	174 (134)	41	66	12
(No. 4689)	10340	2050	694	431	2380 (1830)	483	81	66
Sacchromyces cervisiae	13700	255	1057	641	290 (250)	58	12	38
(IFO No. 0308)	10150	1890	783	475	2148 (1851)	415	94	144
Torulopsis utilis	15440	1381	1341	871	141 (101)	94	22	36
(IFO No. 0396)	8534	763	741	481	658 (471)	423	91	114

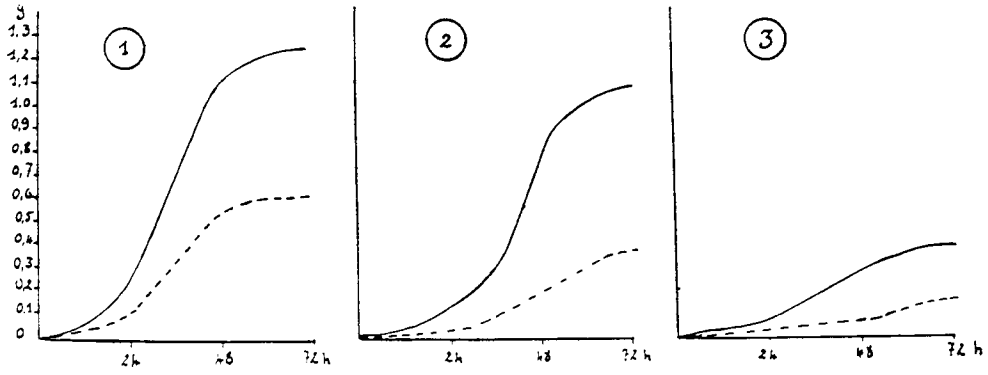

Fig. 1. — Quelques exemples de variation en 72 heures des poids de matière sèche.
——— en traits pleins : dans un milieu avec K
-------- en tirets : dans un milieu sans K
Chiffres cerclés : 1. Aspergillus niger ; 2. Urococcus ; 3. Saccharomyces rouxii

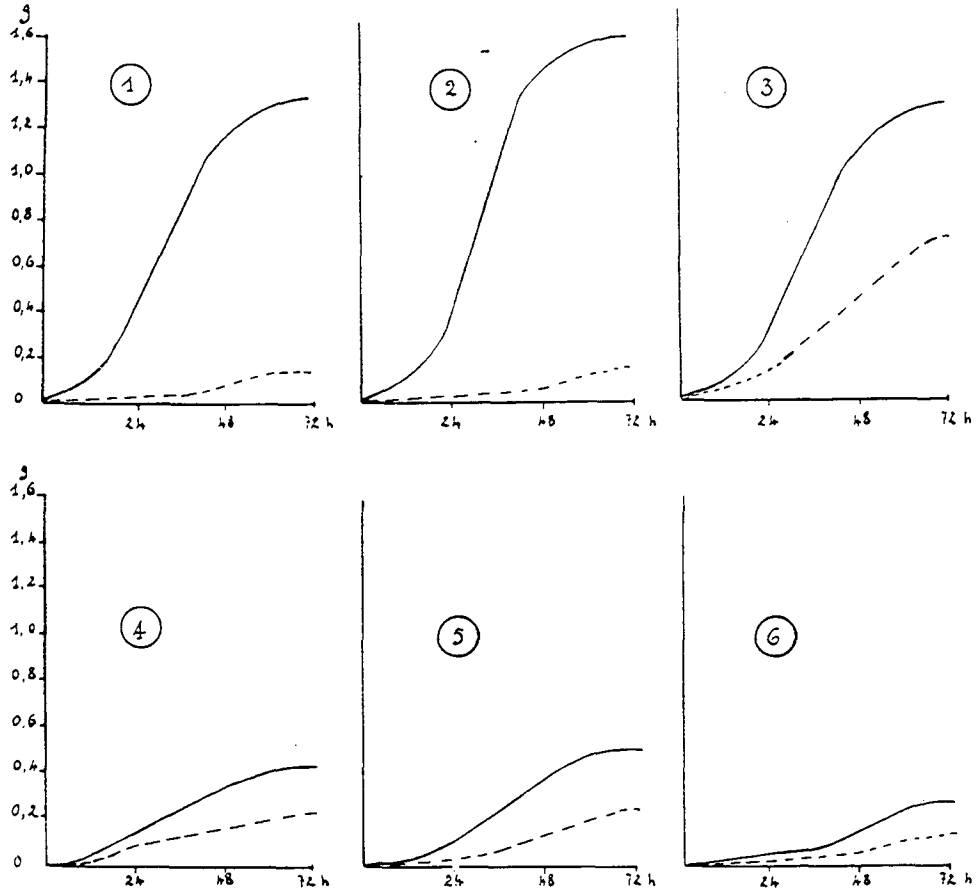

Fig. 2. — Quelques exemples de variation en 72 heures des poids de matière sèche.
——— en traits pleins : dans un milieu avec P
------- en tirets : dans un milieu sans P, ou avec P = 1/100 de P normal
Chiffres cerclés : 1. Aspergillus niger ; 2. Penicillium chrysogemum ; 3. Urobacillus ; 4. Saccharomyces cerevisiae ; 5. Candida lypolitica ; 6. Torulopsis lactis condensi.
(On remarquera que, de loin, c'est ùn urobacille qui est le plus actif en milieu carencé en P)

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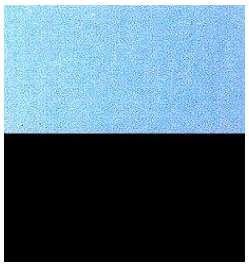

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