possess some of the simplest control systems elaborated in nucleated organisms.

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Gibrel: Effect on Decomposition of Plant Materials

Abstract. *Gibrel, a potassium salt of gibberellic acid, was added to various crop residues and industrial wastes, in the presence of ample nutrients, at the rate of 50 parts per million; with and without Gibrel, samples were incubated for 45 days at 35°C. Presence of Gibrel enhanced biologic decomposition of the materials; Gibrel can be used as an "activator" in composting.*

It is reported that Gibrel (*1*) affects soil respiration (*2*), numbers of *Azotobacter* (*3*), and the nitrification and sulfur oxidation of soils (*4*). We have studied its effects on microbial decomposition of several kinds of straw and of sawdust and other organic wastes that can be composted.

Eight grams of each waste material (oven-dry basis) was screened with a 10-mesh sieve and placed in a 250-ml erlenmeyer flask. The following were added: Gibrel, 50 ppm; Mo as molybolic acid and Bo as boric acid, each at 5 ppm; 1 ml of a solution of K_2HPO_4 (1 percent) and $MgSO_4 \cdot 7H_2O$ (0.3 percent); NH_4NO_3 to add 1 percent nitrogen to the organic materials (except the particle-board waste and coffee grounds, each of which already contained considerably more than 1 percent); and 1 ml of an inoculum—a suspension prepared by shaking 10 g of fresh garden soil with 200 ml of water. Water was added to bring the total moisture to 60 percent of the water-holding capacity. Control flasks were similarly treated except that Gibrel was omitted. All flasks were prepared in quadruplicate and incubated for 45 days at 35°C; water loss, determined by weighing, was replaced every 24 hours. Losses in dry matter and in carbon were used to indicate the degree of decomposition.

The plant materials were analyzed for total carbon by combustion at 1400°C, for total nitrogen by the Kjeldahl method, and for *p*H of 1:5 water suspensions by the glass electrode (Table 1). Water-holding capacity was found by saturating the material in a Gooch crucible, draining in a moist chamber, and drying at 105°C; from weight differences the water held against gravity could be calculated (Table 1).

The fact that only red-alder wood, Douglas-fir bark, particle-board waste, and spent coffee grounds were not affected by addition of Gibrel is shown by the statistical analysis of loss of dry matter and by C:N ratio. The urea-form binder in particle board is quite resistant to decomposition and requires a longer time for change in the C:N ratio to close to 10:1, which is considered a typical ratio for compost.

Maximum losses in dry matter and maximum decreases in C:N ratio were associated with the straws. Coffee grounds are relatively rich in nitrogen, and bagasse and alder wood contain more nitrogen than does coniferous sawdust (*5*). Bark is more resistant to decomposition than wood (*6*). Addition

Table 1. Analysis of waste materials before and after incubation for 45 days at 35°C.

Material	*p*H	H_2O (%)	Water-holding capac. (%)	Total carbon (%)	Nitrogen (%)	C:N ratio				Loss in dry matter (%)†	
						Before decomposition		After decomposition*			
						No N added	N added	No N added	N added	Without Gibrel	With Gibrel
					Sawdust						
Douglas fir	4.3	4.9	495	49.8	.08	622	46.1	37.2	26.1	10.4	25.7
Ponderosa pine	4.5	4.8	442	51.5	.05	1030	49.1	38.5	25.4	9.6	18.5
Hemlock	4.9	6.4	405	49.7	.04	1244	48.2	31.2	21.4	11.1	19.9
Red alder	3.2	3.9	492	49.6	.37	134	36.2	31.2	26.1	20.4	29.1
Cedar	4.4	7.1	531	51.1	.07	729	47.7	29.4	20.3	12.4	23.2
Juniper	3.9	5.8	507	48.2	.06	803	46.7	29.8	20.1	10.2	26.7
					Straw						
Wheat	5.1	5.4	460	45.1	.32	141	34.2	23.1	14.3	30.6	39.9
Oats	5.3	4.9	480	47.2	.28	168	36.9	22.4	15.1	31.9	42.3
Rye	5.8	4.6	480	47.4	.33	143	35.6	21.8	13.5	32.4	45.4
					Sundry						
Rice hulls	5.6	6.7	572	39.4	.55	72	25.3	24.2	14.9	30.4	40.1
Bagasse	6.1	6.1	648	44.9	.56	80	28.6	19.3	11.1	25.9	38.4
Douglas-fir bark	4.2	8.4	306	53.8	.16	336	46.4	41.4	38.3	9.9	17.2
Particle board	4.8	7.1	286	49.3	1.69	29	—	25.3	20.6	12.5	16.2
Coffee grounds	5.8	4.1	288	49.6	2.02	25	—	21.1	19.8	11.4	17.9

* Least significant difference at 1-percent level: C:N ratio, 8.2. † Least significant difference at 1-percent level: loss in dry weight, 6.8.

of Gibrel increased the losses in all but the instances mentioned; these increases may reflect increase in either numbers or physiological efficiency of microbes.

It had been found (*7*) that addition of Mo and Bo to wheat straw increased the rate of decomposition; these results indicate that Gibrel, in the presence of ample nutrients, further enhances the decomposition of various crop residues and industrial wastes containing celluloses and lignins. Practical use of Gibrel as an activator in composting awaits field trials.

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Albumin Naskapi: A New Variant of Serum Albumin

Abstract. *An apparently new variant of human serum albumin, albumin Naskapi, has been found in high frequency in the Naskapi Indians of Quebec and, in lower frequency, in other North American Indians. The family and population data of the albumin are consistent with its inheritance as a simple autosomal trait controlled by a gene designated* Al Naskapi. *This gene is allelic with the gene* Al^A *which controls the common albumin. Both homozygotes and heterozygotes have been distinguished. This is the first report of a homozygote for an albumin variant.*

Rare electrophoretic variants of serum albumin have been reported several times since the original description of bisalbumin by Scheurlen (*1*). In nearly all of the reports, the rare variant has an electrophoretic mobility less than that of the common form of albumin (*1–4*), but two investigators reported fast-moving forms (*5, 6*). Family studies are consistent with simple autosomal inheritance. There have been no reports of individuals homozygous for the rare variants, and the bis forms are apparently heterozygotes.

All of the albumin variants are rare in the populations tested (for example, one per 1015 in Norway) (*2*), and apparently disease is not associated with the trait. However, increase in concentration of cholesterol is associated with bisalbumin, but this elevation is not statistically significant (*3, 5*).

We now report an inherited, fast-moving, electrophoretic variant of albumin which is different from at least one of the other fast-moving variants (*6*). The trait is common in several North American Indian tribes, but has not been seen in other populations tested. Several homozygotes for the variant have also been identified.

The original finding of the albumin variant, and the subsequent screening, was made with whole serum with Ashton's discontinuous buffer system at *p*H 8.6 (*7*). The gels were prepared from hydrolyzed starch (Connaught) at a concentration 25 percent higher than that recommended by the manufacturers. The electrophoresis was performed in a horizontal system with a constant voltage of 9 volt/cm. The discontinuous buffer system (*p*H 8.6) described by Poulik (*8*) and Ashton's acid buffer system (*p*H 5.6) (*9*) with a constant voltage of 16 volt/cm were also used.

Cellulose acetate electrophoresis was performed with a microzone electrophoresis system in barbital buffer at *p*H 8.6. Immunoelectrophoresis was done in 1 percent special agar-noble gel with a modified barbital buffer (*10*) and horse antiserum to human albumin. Barbital buffer (*p*H 8.6; ionic strength, 0.75) was used in the paper electrophoresis experiments.

The populations studied are shown in Table 1. In several cases, the blood specimens were used in other studies, and the populations are described in the indicated references. Blood was collected by venepuncture, and the serum or plasma was separated and stored at −20°C until tested. The dates of collection vary from 1958 for the Athabascans to 1962 for the Naskapi and Montagnais Indians.

The fast-moving variant can be distinguished by electrophoresis in starch gel with Ashton's discontinuous buffer, Ashton's acid buffer, or cellulose acetate. It can also be seen with Poulik's buffer, but only when the serum is diluted. Good separations were not obtained with barbiturate buffer with paper as a supporting medium. The three phenotypes can be easily distinguished (Fig. 1). In immunoelectrophoresis the heterozygote has a slightly elongated albumin band, and the new fast homozygote has a greater mobility than the common slow homozygote. However, antigenic differences between the two albumins are not seen. In Fig. 1, the new variant is compared to that described by Wieme (*6*); it is clearly different. The fast-moving variant described by Tarnoky and Lestas (*5*) was not available for comparison.

The distribution of the trait in several populations and the expected frequencies as calculated by the Hardy-Weinberg formula are shown in Table 1. Serums from 365 Haida Indians from Canada (*12*), 100 Quechua and 92 Cashinahua Indians from Peru (*13*). 443 Eskimos from Alaska (*12*), and 114 Americans of European descent were tested. None of these had albumin Naskapi. The results correlate well with the expected distribution. The gene frequency of the new variant in the Indian populations ranges from 0.13 in the Naskapi to 0 in the Haida and South American groups. None was seen

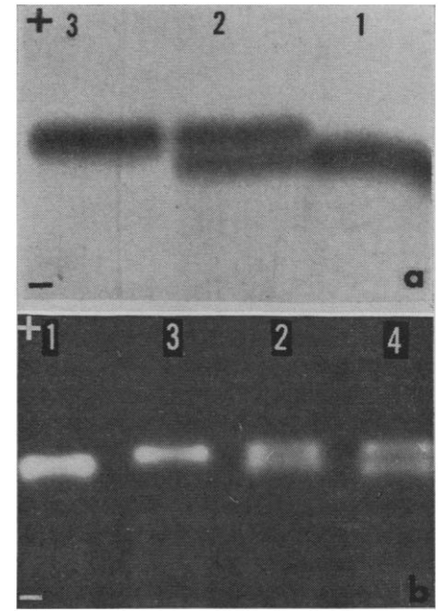

Fig. 1. Albumin variants. (a) Starch-gel electrophoresis in Ashton buffer. (b) Cellulose acetate electrophoresis (negative), Only the albumin areas are shown. (1) A/A; (2) Naskapi/A; (3) Naskapi/Naskapi, (4) Bisalbumin variant described by Wieme (*6*).