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Our premium natural extracts originate from meticulously selected flower pollen found in "Rye." These extracts undergo a unique proprietary production process crafted by Graminex L.L.C. in Ohio, United States. This exclusive process encompasses every stage, from cultivation and harvesting to the creation of high-quality natural extracts, specifically G60 and G63, derived from GBX flower pollen particles. Graminex holds the sole rights to this process and maintains adherence to strict pharmaceutical production standards in alignment with the World Health Organization's requirements.

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Pollitin - สารอาหารบำบัดเซลล์อ

สารสกัดธรรมชาติคุณภาพสูง สกัดจากเกสรดอกไม้จาก “ข้าวไรย์” ที่มีสูตรลับเฉพาะของ บริษัท (Graminex L.L.C.) ที่รัฐโอไฮโอ้ ประเทศสหรัฐอเมริกา ในการปลูก เก็บ และผลิตสกัดธรรมชาติคุณภาพสูง G60, G63 จากอณูละอองเกสรดอกไม้ GBX, Graminex® เอกสิทธิ์เฉพาะของบริษัท Graminex เท่านั่นที่ผลิตได้เพียงเจ้าเดียวในโลก อยู่ภายใต้การควบคุมมาตรฐานการผลิตยา ตามข้อกำหนดขององค์การอนามัยโลก

จนเราได้รับการรับรองมาตรฐานการผลิตระดับโลกระดับเดียวกับการผลิตยาเพราะ Pollitin ได้รับรองการทดสอบค่า ORAC หรือ ค่าระดับความเข้มข้นของสารต้านอนุมูลอิสระที่สูงมาก และ CAP-e Test หรือค่าความสามารถในการดูดซึมเข้าสู่เม็ดเลือดแแดงในระดับที่สูงจนได้รับ

การขึ้นทะเบียนเป็น “NUTRACEUTICAL” หรือ “โภชนเภสัช สารอาหารบำบัดระดับเซลล์” ที่สามารถแก้ไขปัญหาฟื้นฟูได้ลึกถึงระดับเซลล์ มีฤทธิ์ฆ่าเชื้อแบคทีเรีย และมีผลเสริมสร้างภูมิต้านทานเมื่อเซลล์ต่างๆ ได้รับสารอาหารที่เหมาะสมตามระบบต่างๆ ในร่างกาย ส่งผลให้ร่างกายสามารถต่อสู้กับ เซลล์ที่ผิดปกติภายในร่างกายได้ถึง 95% และยังได้รับรองมาตรฐานการผลิตและประสิทธิภาพจากองค์กรต่างๆ มากมายระดับโลก รวมไปถึงยังได้รับรางวัลการันตีอีกมากมายจาก เอกสิทธิ์สูตรลับพิเศษเฉพาะของ Graminex ทำให้สินค้ามีคุณภาพและเกิดผลลัพธ์ที่ดีและน่าเชื่อถือ จนได้รับการยอมรับระดับสากลอีกด้วย

ตลอดระยะเวลากว่า 50 ปี เราได้มีการวิจัยพัฒนาประสิทธิภาพอย่างต่อเนื่อง มีการวิจัยจากสถาบันทางการแพทย์และเภสัชกรรมรับรองมากกว่า 150 การวิจัย เรามีความภูมิใจอย่างมากในการเป็นผู้ผลิตหนึ่งเดียวของโลกที่ได้ครอบครอง ถือลิขสิทธิ์เอกสิทธิ์กระบวนการผลิตและสูตรเฉพาะ G60 และ G63 จากละอองเกสรดอกไม้ชนิด GBX ที่ไม่มีใครสามารถทำได้ ส่งผลให้ Pollitin เป็นที่ยอมรับจากคนจำนวนมากใน 6 ทวีป 50 ประเทศทั่วโลก และได้รับผลตอบรับที่ดีจากผู้บริโภคในการซื้อซ้ำสินค้าอย่างต่อเนื่องมากกว่า 50 ปี

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8 งานวิจัย เกสรดอกไม้ต่อโรคที่เกิดจากเชื้อไวรัสต่างๆ

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The Effect of Cernitin on Upper Respiratory Tract Infections

Jon Glomme, M.D.

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October 21st, 1973

A number of reports have given as the definite opinion of a number of well-known urologists that the carefully digested pollen extract called Cernitin, constituting the active principle in "Cernitin", has a good effect on chronic prostatitis when the definitions (1,2,3) and the indications are made clear (4,5,2,6).

There are also a number of reports stating that Cernilton has beneficial effect upon infections in the upper respiratory tract (7,8,9,10).

Experimentally a great number of investigations have shown that Cernilton is practically non-toxic (11,12,13). It has also been proved that there is a streptolysing inhibitory factor in Cernilton T 60 which is the main constituent of Cernilton (14, 15).

In animal experiments a statistically probable significant effect of Cernilton on the frequency of spontaneous lung infects in rats (17) may be present.

The above mentioned results, especially when having a certain support in well-controlled animal experiments, made it natural to go more detailed into the problems as to the possible anti-infectious effect of Cernilton regarding the upper respiratory tract. This problem was studied in some detail by Malstrom and Cederlof (7) when administering in a double-blind experiment Cernilton and placebo respectively to a fairly great number of military personnel. This type of clinical trials have many definite advantages especially for double-blind studies: the examined persons are of the same sex and age and are generally speaking under the same influence by the surroundings and the climate and they may be looked upon as randomized selection as to motivation. This should therefore a priori be acceptable as a group well suited for comparison. In the report of Malstrom and Cederlof (1966-1967) (7) there is some striking features. In total there were 615 observed military persons. The Cernilton and placebos respectively which were identical as to taste and appearance, there was by the dechiffration proved to be 294 who had got the placebos and 321 who had got Cernilton. The distribution was made in a way which gave very good randomizing of the distribution within every small group and section which made it highly improbable that there should be any significant difference because of the distribution of the preparations used.

The most striking features is the results as to the number of persons during the 14 days of observation where all the preparations used when regarding the number of sick absences and the number of visiting doctors for upper respiratory tract troubles.

Among the 294 men in the placebo-treated group 17 were visiting the doctor for upper respiratory tract diseases. This makes 5.8 percent ± 1.39. In the Cernilton-treated group there were only 8 visits to the doctor because of upper respiratory tract diseases that makes 2.5 percent ± 0.87. The difference as to visiting the doctors because of upper respiratory tract diseases is 3.3 percent ± 1.64. This gives a t-value (according to Students-t-test) = 2.01 and a

probability of statistical significance on the 5 percent level.

As to the frequency of sick-leave this occurred in the placebo-treated group in 26 cases (among the 294 persons) which makes 8.8 percent ± 1.67. In the Cernilton-treated group there were altogether 11 cases of sick-leave among the 321 men, which makes 3.4 percent ± 1.01. This gives a difference between placebo-treated group and the Cernilton-treated group on 5.4 ± 1.95. According to Students-t-test this gives a t-value of 2.77 and a statistical significant difference on the 1 per cent level (0.01>p>0.001).

As to the single symptoms treated within each of the 4 different groups separately, there is a difference as to the frequency of sore throat on the 2 percent level in 2 out of the 4 groups in favor of Cernilton. It is also a difference as to the frequency of coughing between Cernilton and the placebo-treated groups in 2 of the separated divisions on respectively the 10 percent level and the 5 percent level. As to the rhinitis symptoms there is no certain difference of trend in any of the groups. The trend in the results of the enquete gives partly 10 percent partly 20 percent significance in favor of the Cernilton group generally speaking when regarding most of the symptoms from the upper respiratory tract but no definite or probable statistical significance except for the symptoms in the few groups mentioned above.

Even more interesting when regarding the generally roborating effect, which has been presumed for Cernilton, is the results given by the 615 men as to their general condition and feeling of well-being. It is as to these subjective symptoms a difference on the 10 percent level in favor of Cernilton as the total groups are regarded and when regarding only about 40 percent which have had any symptoms or signs indicating an upper respiratory tract disease, it is significant difference on the 2.5 per cent level in favor of the Cernilton-treated group compared with the placebo-treated group.

As this report has never been published it has been found of interest to give a fairly extensive extract of the results.

Dr. med. H. Klapsch (8) has in his report as to the effect of the “Grippen-Tabletten Fluaxin” stated that this tablet which contains a small amount of acetylsalicylic acid together with the pollen extract, was given as prophylacticum or as therapy to people occupied in a heavy industry where he was the industrial physician when the actual candidates had a feeling of getting sick in influenza or upper respiratory tract infections.

Altogether the tablets were given to 510 persons. In addition to the about 52 percent of the total number of employees who got the Cernilton-containing tablet there was 5.5 percent getting another so called “Grippen-Tableitte A” and 6.3 percent another type of so called “Grippen-Tablette B”.

It may be of some interest to give a few of the observations reported by Dr. H. Klapsch. Of the 510 (52 percent) who got the Cernitin-containing tablets, 6 (2.4 percent) who got the tablets only once (6 tablets specially prepared) got an upper respiratory tract infection which caused sick-leave. Among those who asked for the tablets only 1.1 percent had a sick-leave because of an upper respiratory disease during the period of observation.

The total frequency of sick-leave because of upper respiratory tract infections thus was about the same in the group which got the Cernitin-contained tablets as in the group getting one of the two other tablets which should serve the same purpose about: a total of about 2 percent sick-leave because of “Grippe” or upper respiratory tract diseases.

The fairly small difference between sick-absence: 2.4 percent and 1.1 percent respectively gives a t-value according to Students-t-test on 1.20 which is not statistically significant (0.3>p>0.2).

Only among a few of the patients getting the Cernitin-containing tablets Dr. Klapsch ask about the patients' reactions and in those cases about 8 percent gave a good or very good effect as about 14 persons gave a bad effect.

Altogether 7 patients (1.4 per cent) gave side effects as cephalalgia, extreme tiredness, feeling of being unwell and sweating. As there are given as the only spontaneous side-effects and all belong to most of the upper respiratory tract infections there does not seem to be any real side effect of the tablets as reported by Dr. Klapsch.

Although Dr. Klapsch himself is drawing the conclusion that there is a very good effect of the Cernitin-containing Fluaxin tablets as prophylacticum and therapeutics against upper respiratory tract disease and/or "influenza" there is no definite evidence in his report which supports his opinion.

As to the investigation of Lindberg and Sorensen (1968) (8) "A tentative treatment of the common cold with Cernitin", this is carried out as "prophylactic" treatment when the first symptoms of a common cold was observed by the test persons themselves. All the patients were treated according to double-blind controlled clinical trial technique. All of them got 30 tablets of which they should take 10 immediately as soon as they observed any symptoms or signs of a beginning common cold, then 10 tablets again after 8-12 hours and finally 10 tablets again after another 8-12 hours. Further supply of tablets could then be given by the physician in charge of trial. Neither the physicians not the patients knew anything about the type of tablets besides that they were quite harmless and contained vitamins, minerals and amino acids and other quite harmless substances. After dchiffation of the test it turned out that in the Cernitin-treated group there were 83 percent who have given that they were either completely free from symptoms within the first day or that the symptoms of the common cold or upper respiratory tract disease lasted for a shorter period and the symptoms were less severe than usual. Only 17 percent hold the opinion they could not observe any effect at all. In the control group which had got placebos, there were 63 percent who gave that they're signs and symptoms disappeared completely within the first day or that the signs and symptoms were easier or had a shorter duration than usual. The Cernilton=treated group proved to consist of 39 persons while the control group consisted of 24 persons. (If treating these results statistically the author got the following table:

Table 1.

Subjective estimate of symptoms of common cold or from the upper respiratory tract in Cernilton-treated and placebo-treated groups.

Subjective estimate of symptoms	Cernilton-treated group		Control-group (placebo-group)	
	No.	Per cent	No.	Per cent
Symptoms disappeared completely within 1 day	13	45	8	33
Symptoms disappeared more rapid or were easier than usual	11	38	7	30
No effect at all	5	17	9	37
Total	29	100	24	100

It is obvious that we have a fairly high frequency of "placebo-effect" in both groups. If trying to find out whether there is a real difference between the groups it may be reasonable to treat together the groups which found that their symptoms and signs disappeared completely within one day and the group which found their symptoms and signs were easier or of shorter duration.

Table 2

Subjective estimate of symptoms	Cernilton-treated group		Control-group (placebo-group)	
	No.	Per cent	No.	Per cent
Definite improvement of signs and symptoms	24	83	15	63
No effect	5	17	9	37
Total	29	100	24	100

This makes a difference in favour of the Cernilton-treated groups fo 83 per cent $\pm$ 7.1 against 63 per cent $\pm$ 10.1.

The difference is 20 per cent $\pm$ 12.3 which according to Student-t-test gives a t-value on 1.63 and a probability of $0.2 > P > 0.1$. This does not give a significant difference.

In 1970 and 1972 Glømme has carried through a systematic clinical trial of Cernilton in cases which are bordered by infections as continuous or very often occurring recidives of sore throat or what they may call common cold. Most of these patients are known by the author from before and many of them have been interested in trying vaccination with standard-vaccine or auto vaccine to try to get rid of their troubles from the upper respiratory tract. Altogether these tests have been carried out as a prophylactic treatment in 180 cases and lasted 4 months. The patients in these controlled trials were all given medication according to the double-blind technique and the dechiffration was carried out unknown to the author who was treating the patients. Seventy nine percent did return and satisfied the requirements of the total examination. Sixty six (47%) belonged to the placebo-group. The difference in favor of Cernilton of 52 percent compared with 45 percent gives a t-value of 1.71 and (according to the students-t-test) and is significant on the 10 percent level that this difference may not only be occurring by chance.

In these cases there are carried out very careful clinical- and laboratory investigations which also include measuring of heights and weight (some of the patients are claiming that the appetite increases when using the preparations) sedimentation rate, hemoglobin amount, iron in serum, transferrin, cholesterol, electrocardiogram as to state as far as possible the normal condition of the heart, bacteriological examination from the nose and throat and examination as to the antistreptolysintiter. As to all these parameters these is no difference between the groups.

The four investigations referred to cannot be dealt with combined.

They are all aiming at somewhat different approaches. Malstrom and Cederlof have carried through a prophylactic treatment in a not definitely stated period of time and Lindberg has treated his patients at the onset of a common cold with a very high dosage but during a very short period of time. Glomme in contrast to the three others has, in his report, carried through a long-term prophylactic treatment on clinically very carefully examined patients who have been troubled in the past by upper respiratory tract diseases, more or less chronically or with frequent recidives. Therefore it is impossible to get a common statistical view on the possible effect of Cernilton on upper respiratory tract diseases by combining results from these four papers. It seems, a difference in favor of the Cernilton-treated groups in all of these papers but the difference is not great enough to make it statistically reliable or statistically significant.

On the other hand, as to frequency in sick-leave and visits to the doctor for upper respiratory tract diseases and even to general well-being and less pronounced symptoms with shorter duration in the paper reported by Malstrom and Cederlof statistical significant difference has been established.

However, these results seem so interesting that it must be worth-while to carry through careful and sufficiently extensive controlled clinical trials to try to find out whether there exists proved positive effect of Cernilton in cases of upper respiratory tract diseases. The results higher to

reported seem to tally fairly well with the opinion given by the author in connection with the experimental investigation on the effect of Cernilton on spontaneous lung infections in rats: that the most reasonable explanation may be that Cernilton gives a general roborating effect which may support the organism in its own resistance against infections. There is no indication that there are any definite and specific effects.

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OTHER SUPPORT:

GRAMINEX Flower Pollen Extract

Hay Fever and Pollen Tablets

By Einar Helander

Pollen preparations have been marketed since 1952. Until recently, they have not been used for medical purposes, but have been sold without restrictions as a commercial article. In a paper in this journal, Ask-Upmark (1960) has, however, suggested that pollen tablets should be used in the treatment of patients with prostatitis. It is still too early to state whether such therapy is rational, since a report is given of only a few patients. On the other hand, it can be expected that pollen preparations will be tested in the near future. The object of the present paper is therefore to clarify a problem of importance in this connection—one also raised by Ask-Upmark—i.e., can pollen preparations be administered to patients with pollen allergy without causing side-effects?

This question is important, since pollen allergy—usually in the form of hay fever—has been calculated to occur in 0.5-1% of all persons in Sweden. A number of different pollen types are responsible for these allergies. During a 10-year period (Sept. 1949 to Sept. 1959), 10.509 skin tests were made at the Allergy Department, Gothenburg, on patients who attended for various allergies. Routine tests were made for pollen grains of the following species: timothy, oxeye daisy, mugwort (*Artemisia vulgaris*), birch, alder, hazel and aspen. In a few cases additional tests were, for certain reasons, made with other pollen extracts. On the basis of these skin tests, provocation tests and data given by the patients, 2072 pollen allergies were diagnosed and subsequently treated.

The distribution of these allergies can be inferred from Tab. 1 (cf. Arnoldsson 1955). Since about one-third of the patients tested were allergic to more than one pollen species, the number treated is only just over half the total figure. The figures in this table can be regarded as representative of the Gothenburg region, whereas the distribution differs slightly in other parts of Sweden (Arner 1959).

The pollen preparations on the market (Cernelle, Cernident, Cernitin, Cernitol, Cerniton, Polloton, and Pollisan) contain both pollen husks and pollen extract. The husks are separated mechanically, and then heated with a view to decreasing the risk of allergy. The pollen extracts are obtained with water and organic solvents. In the different extraction procedures, up to 82% of the total nitrogen content of the pollen grains has been recovered. The various fractions are evaporated, and combined into a substance denoted as Cernitin.

According to statements from the manufacturers, the following pollen species are used in the preparation.

1. Timothy 26%
2. Maize 26%
3. Rye 19%
4. Hazel 6%
5. Sallow 6%
6. Aspen 6%
7. Oxeye daisy 6%
8. Pine 5%

It is already mentioned that allergies to timothy, oxeye daisy, hazel and aspen are common in the Gothenburg region. Allergy to sallow is not uncommon in other parts of Sweden in which it grows more

extensively (Arner 1959). Allergy to rye pollen is relatively rare, and that to pine pollen still more rare. Allergy to maize pollen is unknown in Sweden, but occurs in the U.S.A. (Urbach & Gottlieb 1946).

Present Investigation[1]

The composition of the pollen preparations gives good reason to investigate whether they can produce allergic symptoms. Several allergens cause allergic symptoms on oral administration, but the literature contains no data no whether this applies to pollen or preparations of it.

The tests were made on 25 patients who were allergic to pollen, but were healthy in other respects (see Tab. 2). The pollens to which these patients were allergic can be inferred from the table. The results of the tests were graded as follows. Histamine (1:10,000) was used as the positive control and 0.9% NaCl as the negative, the results being given in proportion to the area of the wheal produced by histamine, which is denoted as 3. Thus, 1 = a wheal with an area $^1/_3$ as large, 2 = $^2/_3$ of the area, 6 = twice as large, etc.

[1] The pollen preparations were kindly placed at my disposal by AB Cernelle, Vegeholm.

Tab. 1. Pollen allergies diagnosed at the Allergy Department, Gothenburg, 1949-1959.

Timothy and related grasses	913
Birch	358
Oxeye daisy and related plants	330
Alder	164
Hazel	150
Aspen	143
Rye	11
Fir	2
Reeds	1

1. Skin Tests with Extract of Pollen Tablets and Cernitin

After removing the sugar-coating, the Cernelle tablets were broken up and extracted with 5 parts of 0.9% NaCl, during vigorous shaking, for 2 hours on each of two consecutive days. This solution was sterile-filtered and then used for the tests. So-called cernitin, diluted to 1:10 with 0.9% NaCl, was used in the same way. Here as well, histamine was used as the positive control and 0.9% NaCl as the negative. The results were graded as described above. The extracts were tested on non-allergic subjects with negative results.

2. Demonstration of Antigen According to Praussnitz & Küstner

Venous blood was drawn from the 25 patients in question. After centrifugation, 0.1 ml of serum from each patient was injected intradermally into at least two healthy, non-allergic subjects. The latter had been given 5-25 Cernilton tablets on an empty stomach 60-90 minutes before the experiments. The results were graded as already started (Tab. 2).

3. Direct Administration of Pollen Tablets to Patients with Pollen Allergy

Each of the 25 patients with pollen allergy was given a test dose of one tablet of Cerniton. After one hour, a further four tablets were given, and somewhat later on the same day an additional 20 tablets on an empty stomach.

Tab. 2.

		Age	Skin Test for Pollen								Skin Test		Inverse Prauss.-Küst.			Reaction on oral adminis. No. of Tablets		
No.	Sex	Yrs	Ph	Be	Pr	Al	Co	Po	Ar	Se	Pt	Pe	5	15	25	1	5	25
1	F	19				2	3				2	2			(1)			
2	M	38		7							2	4		(1)	1			
3	M	21	3	6							2	3						
4	F	24		3	5						3	3		(1)	1			a
5	M	15		4	3						2	1			(1)			
6	F	45			4						2	1			(1)			
7	M	34	4		3						3	4						
8	M	53	5		3						1	3						b
9	M	23	4		3					4	5	7						
10	M	25	4								2	4			(1)			
11	M	35	5	5							3	5						
12	M	57	7	4							3	5						
13	F	18	5	5	6	4	3	4			3	4						
14	M	39	5								4	5						
15	F	39			3						1	1			(1)			
16	M	28			6			6			2	3						
17	M	23	5	3							3	5			1			
18	M	17	4	8							3	5			(1)			
19	F	26			4			5			2	3						
20	F	22	6								3	5						
21	M	17	4								2	3						
22	F	52			5				3		2	4						
23	M	14	7								4	5			(1)			
24	M	31	5	5		3	1				2	4			(1)			
25	F	48	6	4							4	5						

Ph = timothy; Be = birch; Pr = oxeye daisy; Al = alder; Co = hazel; Po = aspen; Ar = mugwort (*Artemisia vulgaris*); Se = rye; Pt = extract of pollen tablets; Pe = Cernitin. For grading of cutaneous reactions: see text.

a Inapp. incr. coryza.
b Flatulence.

Results

The results of the experiments are recorded in Tab 2.

The skin tests, both will extract of pollen tablets and cernitin, showed that the preparations contain extremely potent allergens. In most cases, a very large wheal appeared. It can be mentioned that a patient who was allergic to birch only (pollen preparations do not contain birch pollen) also had positive reactions. I have been unable to find any explanation of this cutaneous reaction.

When the pollen preparation was administered orally the so-called inverse Praussnitz-Küstner test showed that a small but sufficiently large quantity of antigen was absorbed in some cases. The reactions were, however, inappreciable in the large majority of cases, and a definite reaction occurred in three patients only. The reactions denoted as (1) may have been unspecific.

In the cases with a definite reaction occurred, the reaction was nevertheless slight. Thus, despite the large quantity of tablets ingested, only small amounts of pollen antigen were absorbed. For this reason, the preparation might possibly be used in attempting oral desensitization in hay fever.

The tests with administration of pollen tablets showed that the incidence of side-effects was low, even with large doses. One patient stated that the large number of tablets produced flatulence, and another that he seemed to feel some increased coryza, persisting for about 12 hours. The patient's complaints were regarded as so negligible that no therapy was indicated.

Unfortunately, the preparation could not be tested in patients with allergy to maize, pine, or sallow pollen. However, in Sweden these allergies play an insignificant or no role. Moreover, there is no reason to believe that they involve any essential differences.

To sum up, it can be stated that the experiments have shown the following:

1. The pollen tablets contain highly concentrated pollen antigens, which are not inactivated by the technical procedure used in their preparation.
2. On oral administration of pollen preparations, the antigen or components of it may be absorbed.
3. Absorption is, however, so slight that no risk of serious complications seems to exist, even if large doses are taken by subjects with pollen allergies. Consequently, hay fever is not a contraindication in those cases in which it is desired to test the effect of pollen preparations in, e.g., prostatitis.

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POLLEN SUPPORT:

GRAMINEX Flower Pollen Extract

Study on the antioxidant properties of pollen extracts

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The study on the antioxidant and hyolipidemic effect of pollen extracts (Cernitins) was conducted in male mongrel rabbits and Wistar rats. The animals were fed a high-fat diet (HFD) composed of cholesterol, coconut oil and cholic acid, and received pollen extracts (Cernitins) orally (the rabbits over a period of 12 weeks and the rats over a period of 2 weeks). The levels of malondialdehyde (MDA) as an indication of the degree of peroxidation and lipids (cholesterol, triglyceride, separation of lipoproteins into fractions) were measured.

The study demonstrated the reduction of MDA concentrations under the influence of Cernitins, suggesting their antioxidant properties. Total cholesterol and triglyceride content was also decreased.

During the last ten years there have been reports on the toxicity of oxygen and oxygenated free radicals. The enzyme prostacyclin synthese is very sensitive to inhibition by lipid peroxides[10], which also stimulate arachidonic acid release from phospholipids[6] and thereby possibly enhance platelet thromboxane A_2 (TXA_2) formation. Lipid peroxides are present in many tissues, especially in atherosclerotic plaques[5] and possibly in hyperlipidemia. Moreover, it has been established that excessive lipid peroxidation occurs during the aging proceess[12].

The present study included an examination of lipid peroxidation in hyperlipidemic animals under the influence of pollen extracts. Malondialdehyde (MDA), a product of reduction during the oxidative process, was measured as an indicator of the degree of peroxidation.

The pollen extracts (Cernitins), supplied by AB Cernelle, Vegeholm (Sweden) contained mainly water soluble substances (Cernitin T60) and fat soluble components (Cernitin GBX). It has earlier been demonstrated that Cernitins have a remarkable lipid lowering effect, both in animals[1] and in humans[4]. In addition to this, it was established that they have a beneficial effect against the development of atherosclerosis[15].

Materials and Methods

The study was carried out on 30 male mongrel rabbits, with an initial body weight of 3.0-3.8 kg, and 30 male Wistar rats, with an initial body weight of 220-260 g. The animals were fed a standard basic diet, and were divided into three equal random groups: group 1 – control; group 2 – fed HFD; group 3 – fed HFD + pollen extracts (Cernitin T60 50 mg per 24 hrs + Cernitin GBX 10 mg per kg per 24 hrs) orally.

The HFD consisted of the following doses in grams per kg per 24 hrs: cholesterol – rabbits 0.5, rats – 4.0; hydrogenated coconut oil – rabbits 1.0, rats 10.0; cholic acid – rabbits 0.1, rats 0.2.

The experiment was conducted over a period of 12 weeks for rabbits and 2 weeks for rats. On the last day of the experiment the animals were fasted for 18 hrs, and blood samples were taken for biochemical analysis.

MDA (standard: 1-1-3-3-tetramethoxy-propane, supplied by Fluka AG) was measured using the technique described by Stuart and others[13]. The total cholesterol was assayed using a method based on the LIBERMANN-BURCHARDT reaction[1], and triglyceride level was determined by the technique described by Eggstein and Kreutz[3]. Lipoproteins were separated into fractions by agarose electrophoresis[4].

The results were analyzed statistically using Duncan's test.

Results

The MDA concentration in the plasma of the rabbits in group 2 (fed HFD) was markedly higher (Table 1), showing an increase from 2.89 nmol/ml (control group) to 8.04 nmol/ml (i.e. by 372%). The addition of Cernitins to the diet produced a significant drop in the MDA concentration compared with that in the plasma of rabbits in group 2.

In the blood serum of rabbits fed with the HFD, the total cholesterol level was increased by 579%, while the level of triglyceride remained practically unchanged (Table 2). Only two fractions were separated by lipoproteins electrophoresis: practically pre-β and β-fractions remained unseparable. The percentage content of α-lipoproteins in the rabbits in group 2 was considerably reduced. In group 3, the increase in serum cholesterol was markedly and significantly suppressed, while the α-lipoprotein content was increased.

The MDA concentration was distinctly higher in rats in group 2 fed HFD as compared with those in group 1 (Table 3). The MDA concentration in rats in group 3 was significantly lower than that in rats in group 2.

An equally significant increase in the cholesterol level (428%) and in the triglyceride level (116%) was noted in the serum of rats in group 2 fed HFD (Table 4). Electrophoretic separation of lipoproteins revealed a suppression of the percentage content of the z-fraction. The addition of Cernitins to the HFD resulted in a significant reduction in the levels of cholesterol and triglycerides in the serum, and a marked increase in the percentage content of z-lipoproteins.

Table 1. Concentration of malondialdehyde (MDA) in the blood plasma of rabbits (mean ± SE)

Group		MDA	
		nmol/ml	nmol/10^9 platelets
1		2.60 ± 0.15	3.92 ± 0.13
2		12.27 ± 0.82	23.93 ± 2.90
3		9.30 ± 0.37	15.26 ± 1.59
P	1/2	< 0.001	< 0.001
	2/3	< 0.01	< 0.05

Table 2. Cholesterol (CH) and triglyceride (TG) levels in blood serum of rabbits, and electrophoretic separation of lipoproteins into fractions (mean ± SE)

Group		CH (nmol/l)	TG (nmol/l)	Lipoproteins (%)	
				α	pre-β + β
1		2.60 ± 0.23	0.98 ± 0.09	57.33 ± 3.10	42.67 ± 3.10
2		32.60 ± 4.48	1.06 ± 0.06	7.73 ± 1.26	92.27 ± 1.26
3		10.63 ± 3.79	0.79 ± 0.08	21.73 ± 6.22	78.27 ± 6.22
P	1/2	< 0.001	> 0.7	< 0.001	< 0.001
	2/3	< 0.01	> 0.05	< 0.05	< 0.05

Table 3. Concentration of malondialdehyde (MDA) in blood plasma of rats (mean ± SE)

Group		MDA	
		nmol/ml	nmol/10^9 platelets
1		2.89 ± 0.20	5.94 ± 0.32
2		8.04 ± 0.30	17.36 ± 0.38
3		5.29 ± 0.40	11.73 ± 0.69
P	1/2	< 0.001	< 0.001
	2/3	< 0.001	< 0.001

Table 4. Cholesterol (CH) and triglyceride (TG) levels in blood serum of rats, and electrophoretic separation of lipoproteins into fractions (mean ± SE)

Group		CH (nmol/l)	TG (nmol/l)	Lipoproteins (%)	
				α	pre-β + β
1		1.28 ± 0.16	1.25 ± 0.16	51.42 ± 3.92	48.58 ± 3.92
2		6.76 ± 0.62	2.70 ± 0.35	21.68 ± 2.45	78.32 ± 2.45
3		3.73 ± 0.29	0.75 ± 0.10	34.20 ± 3.40	65.80 ± 3.40
P	1/2	< 0.001	< 0.01	< 0.001	< 0.001
	2/3	< 0.001	< 0.001	< 0.01	< 0.01

Discussion

The antioxidant hypothesis assumes that health and recovery involves protection against the free radical injury which may be caused by endogenous oxygen radicals, by exogenous radicals or by secondary radicals propagated as a result of the chain reaction of polyunsaturated fatty acid peroxidation.

The MDA concentrations detected in our experiment show that an increase in lipid peroxidation occurs in animals suffering from hyperlipidemia when compared with controls. The reduction of the MDA concentrations under the influence of pollen extracts suggests that Cernitins are an effective means of reducing lipid peroxidation, i.e., that they have antioxidant properties.

MDA concentrations seem to be produced by the action of the cyclooxygenase. Since MDA is also one of the principal products of the breakdown of the endoperoxides, its measurement offers a simple method of assessing the function of this enzyme. TXA_2 formation occurs in equimolar amounts with that of MDA. TXA_2 is an active vaso-constrictor and platelet aggregating agent. It aggregates platelets via a direct process[9], and causes them to release adenosine diphosphate, which is also a potent aggregating agent[2]. Furthermore, the MDA concentration in plasma is probably relative to the MDA concentration in arterial walls, and lipid peroxidation plays a role in the production of atheromatous plaques and arterial tissue injuries[8].

Although platelet aggregation and lipid peroxidation are not synonymous, the events which lead to the release reaction appear to be accompanied by the generation of free radicals and the peroxidation of lipids. Pollen extracts may block this phenomenon, either by direct enzymatic inhibition of the conversion of arachidonic acid to labile aggregation stimulating substances or intermediary endoperoxides, or by restructuring the fatty acid so that it is rendered impervious to peroxidation.

A number of recent publications have dealt with the possible role of lipid peroxidation in the process of atherosclerosis[8]. Peroxidation involves reduction of molecular oxygen to H_2O with intermediate free radicals, particularly toxic ones. Free radicals may

react with nucleic acids, proteins, polysaccharides and lipids. In lipid peroxidation, these radicals react with unsaturated fatty acid to produce endoperoxides, which are very active substances with cytotoxic properties. Peroxidation can occur as the result of inflammatory or degenerative processes. Atherosclerosis leads to hypoxia of the arterial walls, which is accompanied by inflammation.

The results of this study support our earlier experiments on the significance of pollen extracts in the treatment of lipid metabolism disturbances[11.14.15.] and our clinical studies on the inhibition of platelet aggregation by Cernitins[7]. They explain, and to some extent clarify, the mechanism of beneficial action in the management and prophylaxis of atherosclerosis.

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COLD SYMPTOM SUPPORT:

GRAMINEX Flower Pollen Extract

Pollen as a Prophylactic against the Common Cold

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Pollen extract has been employed to a considerable extent, since 1955, in the treatment of prostate problems of various kinds (1-5, 8-11).

There would appear to be a widespread opinion that pollen extract also possesses a certain value as a roborant and cold-preventative. This effect has been referred to by Noyes [12] on the basis of a small amount of research material. The roborant effect has also been studied by Glömme [6] in comprehensive experiments on animals.

Critical epidemiological investigations on a large scale have not, however, been carried out. Against this background it seemed desirable to conduct a major field study of the effect of pollen extract on those liable to military service, in connection both with prevention of colds and with general roborant properties.

MATERIALS AND METHODS

The investigation was initiated by the Defense Department Research Institute, and carried out with the consent of the Military Governor in the Sixth Military Area (Upper Norrland), the Chief Physician to the Army, and the State Pharmaceutical Laboratory. The study was carried out on three separate occasions on a total of 775 conscripts in the Sixth Military Region. The designation and size of the groups studied are shown in Table 1.

Table 1. Group division and number of experimental persons

Group	Unit	Number of experimental persons
A	Eng. 3	224
B	Eng. 3	116
C	A 8	99
D	A 8	140
E	Eng. 3 rep-unit	44
F	Eng. 3	152

Group A consisted of newly enrolled conscripts, who were confined to barracks during the whole test period. The object of this was to test the problem during a period in which conscripts, who often come from different environments and different infective situations, are known from experience to be affected by a large number of mixed infections. With regard to Groups B-F, the experiments were carried out in connection with winter field-exercises, under conditions where troops are often exposed to major physical and psychical strains in a period when the danger of infection is great. In other particulars the experiments were carried out on all the field-service groups under substantially identical conditions.

The preparation to be tested, Cernilton, was made available by the manufacturers, AB Cernelle of Vegeholm. The dosage in group A, B and C was one tablet three times daily for 14 days. Two tablets were administered once daily for the same period to subjects of group E and F. The specifications of the preparations tested are shown in Table 2.

Table 2. The specifications of the preparations tested

Specification	Groups	
	A - C	E - F
Cernitin T60 sec. (Extr. pollinis aquos sec.)	60 mg	200 mg
Cernitin GBX$_t$ (Extr. pollinis oleos.)	3 mg	10 mg
Constituentiae et coloris	q. s.	q. s.
M.F. tabl. No. 1		

The experimental model was of the so-called double-blind type. Each unit was divided up into more-or-less equal ,,primar'' research units of 10 - 15 men, generally consisting of personel belonging to the same barrack-room, of smaller working group, with high individual working frequency. With the change distribution of the tablets it was ensured that every ,,primary unit'' was represented by more-or-less an equal number of experimental persons, with Cernilton or placebo-medication. This arrangement was made in order to balance any effect which might arise between the experimental persons within the various ,,primary units'' (infected). The blind tablets and Cernilton tablets had exactly the same taste and appearance.

A leader was selected for each group, whose responsibility it was to see to it that the tablets were taken in the way arranged. The experimental persons were asked to make notes on a special diary card during the whole experimental period concerning their state of health, with special attention to certain subjective symptoms, visits to the doctor, and sickness certification. The group leader was responsible for seeing that this was thoroughly carried out. No doctor participated in this part of the experiment.

RESULTS

The possible prophylactic effect of a preparation against symptoms of the common cold can obviously only be evaluated on the basis of material where there is ,,normally'' a rather high incidence of sickness. Of the six units tested during the relevant experimental periods, symptoms indicative of infection of the upper air passage occurred as indicated in Table 3. The table shows that the frequency of colds was low or very low in groups B and E. These groups have therefore been excluded from following discussion. The incidence of certain symptoms of infection of the upper air passage, divided up in accordance with the investigation group and type of tablet, is shown in Table 4.

Table 4. Incidence of sore throat, coughing, hoarseness, and nasal catarrh within the experimental groups

Symptom	Experimental groups							
	A		C		D		F	
	P	C	P	C	P	C	P	C
Sore throat	21,4	18,8	23,6	12,5	17,3	9,8	17,9	21,2
Coughing	28,0	30,7	35,3	29,2	18,8	11,2	31,3	21,2
Hoarseness	11,1	14,5	11,8	20,9	13,0	7,0	13,5	10,6
Nasal catarrh	37,5	35,0	31,4	29,3	24,6	28,2	32,9	31,7
Basic number	107	117	51	48	69	71	67	85

P – placebo (%), C – Cernilton (%)

The table shows a clear distinction between Cernilton and placebo treated experimental persons in investigation groups C and D in relation to sore throat. The differences are in favour of the preparation, and are significant at the 10% level, Khisquare analysis with correlation for continuity in the present case. Coughing also tends to occur rather less frequently with the Cernilton-treated groups (C, D, and F), though it is only within group F that the results are significant at the 10% level. The figures shown in the table for hoarseness and nasal catarrh symptoms can not be regarded as showing any effect: the difference between Cernilton-series and placebo-series are not significantly different from zero. Symptoms of influenza occurred only to a slight extent, and could not be used to evaluate any possible prophylactic effect.

The relative numbers of persons during the observation period who visited the doctor or were certified sick are shown in Table 5.
Visits to the doctor and sick-certification occurred practically only in groups D and F. There was a clear distinction favourable to the preparation between the Cernilton and placebo treated experimental persons, particularly in group D, but also to some extent in group F. The distinction for group D is significant at the 5% level with respect to visits to the doctor, and at the 1% level with respect to sick-certification.

Table 5. Visits to the doctor and sickness certification within the experimental groups

Visits	Experimental groups							
	A		C		D		F	
	P	C	P	C	P	C	P	C
Visited doctor	0,9	0,0	3,9	4,2	13,0	2,8	7,5	4,7
Certified sick	2,8	0,0	0,0	0,0	17,3	2,8	16,5	10,7
Basic number	107	117	51	48	69	71	67	85

P – placebo (%), C – Cernilton (%)

With respect to all the symptoms discussed here, and also to sick-certification, the experimental persons were asked to indicate for how long the symptoms or the certification had lasted. There was no clear distinction between Cernilton-treated and placebo-treated individuals, although there was a certain non-significant tendency for shorter times observed in the case of the Cernilton groups.

The experimental persons were also asked to give a general opinion about their condition during the experimental period, in particular as to whether they felt more tired or more alertt than usual. The alternative answers were formulated differently in the 1965 and 1966 investigations. In 1965 only the two alternatives ,,more tired than usua'' and ,,more alert than usual'' were given, with the result that the experimental persons were,,compelle'' to choose one alternative or the other, or to leave the question unanswered. In the 1966 investigations a further alternative ,,unchange'' was allowed.

Comparison shows that the experimental persons treated with Cernilton in groups C and D show a higher percent of ,,more tired'' than those with placebo-treatment The frequency ,,more tired" is higher throughout for the placebo-treated persons in all four groups. A summing-up of all the experimental groups gives significance at the 10% level.

Finally, it should be said that only individuals with common cold symptoms in the four groups have been considered. The frequencies of ,,more alert'' and ,,more tired'' amongst the persons showing symptoms of colds are given. The tendency is thus amplified and the effects of Cernilton summed up over the groups then reaches the significance-level of 2.5%.

DISCUSSION

The field experiment carried out has not given an unquivocal result in relation to the prophylactic effect of the preparations used against the common cold. It has been shown that under certain conditions it is effective against some symptoms, that is, sore throat and coughing, in groups C and D. That the corresponding effects could not be deduced from groups A and F indicates the need for great caution in generalizing the results. It lies in the nature of the experiment that the Cernilton-treated and placebo-treated experimental persons are fully comparable within the units because of the,,blind'' randomizing. On the other hand, the four main groups themselves are not comparable on the same basis because of the different risks of being infected by the common cold, or of the type of infection experienced. Thus, fur example, group A consisted of a depot unit, which differs from the exercise units with relation both to the incidence of infection and the extent of strain experienced.

The frequency of visits to the doctor and sick-certification indicate that group D and F may have experienced heavier burdens than the two remaining groups. Here a clear distinction between Cernilton-treated and placebo-treated experimental persons has proved demonstrable both with relation to visits to the doctor and sick-certification.

The roborant effect of Cernilton has been evaluated on the basis of a question about condition. Here also groups C and D, and possibly F, give the clearest indication. It should be observed that the distinction is primarily expressed in a lower frequency of ,,tired'' amongst the Cernilton-treated persons. This occurs, naturally, in relation to the situation of the experimental persons, in which the burdens and the occurrence of common colds gives the least encouragement for individuals to report themselves as ,,more alert'' than usual. The results of the condition-question has also been considered separately for those individuals who declared themselves as suffering from some symptoms of the common cold. The object with this was to obtain a specially afflicted group for which any effect of Cernilton would have been particularly valuable. It is found that the effect in this analysis is most clearly expressed where the frequency of ,.more tired'' is lower throughout for all four units. The effect is most marked in group D, where none of the 26 sick persons in the Cernilton-treated group complain of having been ,,more tired''. The number of sick persons is admittedly relatively low, but the overall tendency gives nevertheless an unequiocally significant picture.

As we have already said, the results should not be generalized, at all events not to the extent that quantitative evaluations of the protective effect are given. It should also be remembered

in this connection that the experimental situation for military personel in training is an extremely specialized one.

It would be expected that in this situation, particularly when those concerned are aware that an experiment is being undertaken, that such persons would be extremely observant about their condition of health, and that tendencies to exaggeration may be found. This would not, however, be the reason for the observed effect of Cernilton, but it would make any quantitative evaluation very hazardous. All that should therefore be said for the present, therefore, is that the preparation under certain conditions combats the symptoms associated with infection of the upper air passage, and might for this reason be a useful prophylactic. The preparation has in addition shown during this investigation a roborant effect, in accordance with the observations already reported by Ask-Upmark [1], Glömme and Rasmussen [6] and Graudal [7].

Further elucidation of the conditions under which this effect arises, or the principle on which it is based, could not be provided by this field experiment, nor was this envisaged when it was undertaken.

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