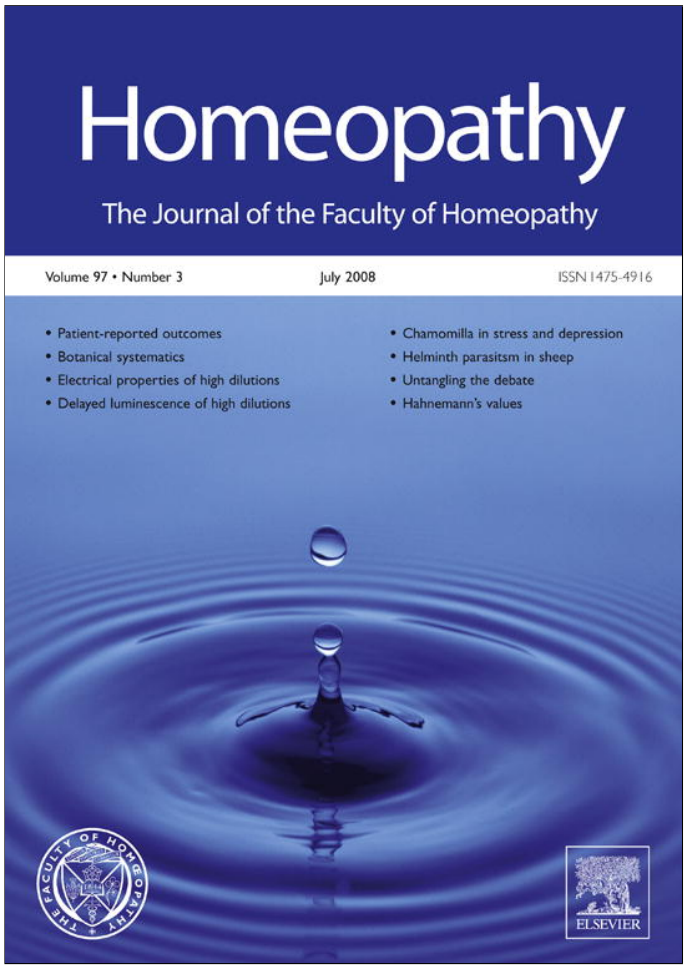

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ORIGINAL PAPER

Delayed luminescence of high homeopathic potencies on sugar globuli

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Delayed luminescence signals of *Arg.met.* CMf (100Mf), *Canth.* CMf, *Bov.* CMf absorbed onto sugar globuli was observed by exciting them at their known resonance frequency of 2.060 MHz. *Arn.* CMf also showed delayed luminescence when excited at 2.060 MHz and at 1.828 MHz. *Alc.* LMK (50MK) could not be excited by 2.060 MHz and showed properties of control globuli. *Canth.* LMK could not be excited at 2.006 MHz.
The delayed luminescence signals were characterized by the coefficient B_2 typical of the delayed luminescence of non-living complex systems, and by the coefficient B_0 typical of living systems. Both coefficients can be considered as indicative of holistic quantum structures in homeopathic potencies. *Homeopathy* (2008) **97**, 134–140.

Keywords: Quantum structure; Holistic photons; Characteristic frequencies; Electromagnetic fields; Homeopathic photons; Delayed luminescence

Introduction

In previous work Lenger reported the effect of high-frequency magnetic fields on homeopathic medicines in the form of sugar globuli.[1] In a large Faraday cage, the damping of the magnetic field of different Tesla Coils driven by frequencies of 2.060 MHz or 6.9 MHz, when medicated sugar globuli in high potencies were placed in the maximum of the coils' magnetic field, was observed. The damping of the magnetic fields was observed using homeopathic medicines at 2.060 MHz with: *Argentum metallicum* CMf (*Fincke*), *Bovista* CMf (*Fincke*), and *Cantharis* CMf (*Fincke*), and 6.9 MHz (*Arg. met.* CMf, *Canth.* CMf). It was shown that high homeopathic potencies have more than two resonance frequencies in the MHz region. Each resonance frequency can be used to excite the complete spectrum of a remedy. By an increase of the exciting magnetic field the homeopathic photons could be separated from the medicated sugar globuli. The magnitude of the field of separation is a characteristic constant for measuring the heights of different potencies.

Some workers believe that homeopathy involves an interaction between the resonance of a frequency of the remedy and the frequency of the disease or diseased system.[2,3] The characteristic frequencies of the medicines and of diseases or diseased systems have not been determined. The detection of characteristic frequencies of a few cell lines by physical methods has been reported.[3]

Delayed luminescence is the phenomenon of photon emission by a complex living system after exposure to white light for a few seconds.[4] The photon signal is observed after a few milliseconds delay and is observable for a few minutes. The delay of few milliseconds is sufficient to eliminate the contribution of fluorescence caused by exposure to light. The intensity of a delayed luminescence signal is weaker than the intensity expected in a forbidden transition but stronger than blackbody radiation. The signal cannot be attributed to phosphorescence as it is observable in almost all living systems. Popp[4] and Bajpai et al.[5] have developed a method for determining holistic attributes of living systems. A living system is stimulated by visible light for few seconds and the delayed luminescence emitted by the system is measured after of 10 ms using a photomultiplier detector (PMS) sensitive in the range of 300–850 nm. The delayed signal has a characteristic shape: it first decays non-exponentially and then becomes non-decaying.

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Holistic attributes are obtained from the shape of the signal in the decaying region and from the fluctuation in the non-decaying component. Bajpai has shown that the shape of the signal in the damped harmonic oscillator model of Popp can be analyzed in terms of four parameters: B_0, B_1, B_2 and t_0. I applied the methods of Popp[4] and Bajpai et al.[5] for the analysis and characterization of homeopathic medicines, non-living systems, in comparison with control globuli.

The decay shape indicates coherence in time in the photon signal. Popp[4] concretized the time coherence in a phenomenological model that attributes the decay shape to dynamical behaviour of photons given by a frequency stable damped harmonic oscillator with time dependent damping and mass terms. Popp suggested the following Hamiltonian for the dynamics[4,5]:

$$H(p,q) = \frac{p^2}{(1+\lambda t)^2} + \frac{1}{2}(1+\lambda t)^2\omega^2 q^2$$

where p and q are the usual canonical conjugated electromagnetic field variables of mode frequency ω, λ is the damping coefficient and t is time. The amplitude of its classical solution decays hyperbolically with time and its energy is proportional to the square of its amplitude. Bajpai et al.[5] solved this problem in the quantum framework and found that quantum state of the above oscillator is a squeezed state[6] that evolves in time. The evolution changes the number of photons in the field with time, which is observed as the shape of the signal. The number of photons in the squeezed state in small interval Δt around the time t is equal to $n(t)\Delta t$. The calculated value of $n(t)$ in the quantum dynamics is[5]

$$n(t) = B_0 + \frac{B_1}{(t+t_0)} + \frac{B_2}{(t+t_0)^2}$$

where B_0, B_1, B_2 are coefficients representing analytical expressions and t_0 is the inverse of damping coefficient. The coefficients depend on initial conditions and parameters of the Hamiltonian. All coefficients are real and positive, as is t_0. The coefficients and t_0 characterize a delayed luminescence signal and can be determined from the observed shape of a signal by non-linear minimization. The delayed luminescence signals of living systems can be correctly described in the quantum framework but not in the classical framework. The quantum nature is confirmed in a few signals by measuring the probability of zero photon detection in a small interval as the average number of photons detected in the interval falls to zero. We shall, therefore, take a signal to be quantum if its shape lacks exponential decay character and is correctly described by four parameters in the quantum framework.

A photon signal contains information about its emitting system in its various properties. The time coherence of photons in a delayed luminescence signal implies a coherent structure in the living system emitting the signal. The quantum nature of the signal implies quantum nature of the coherent structure. The four parameters of the signal are related to attributes of the coherent structure. These attributes as well as the quantum state of the coherent structure are currently unknown. We can at present only resort to a phenomenological study of four parameters in living systems. The study indicates that parameter t_0 measures the capability of the system to retain electromagnetic energy. It is an expected result as t_0 is the inverse of damping coefficient. The classical solution describes the shape with one parameter, similar to B_2. The contribution of B_2 will, therefore, be called classical. The quantum solution has in addition two other parameters, whose contributions will be called quantum corrections. The contribution of B_0 is like background noise. It is small and is and comparable to background noise. The contribution of B_1, if present, is substantial and easily measurable.

It is our experience that B_2 is larger than B_1 in signals of non-living systems while the reverse is true in signals of living systems.[5,6] Both B_1 and B_2 are well determined in the analysis and are sensitive to many factors characterizing the emitting system. We find B_1/B_2 to be a more sensitive parameter for differentiating small changes in these factors in living systems. This new parameter determines the decay shape of a signal and will be called shape parameter. We can envisage differing coherent structures in complex systems of medicated sugar globuli. The differing coherent structures give rise to subtle differences in the shapes of delayed luminescence signals. Our analysis quantifies these differences. Significant differences in the parameters of delayed luminescence signals emitted by control and medicated sugar globuli demonstrate the existence of differing coherent structures in them.

Materials and methods

Our measuring system has been previously described.[7] It essentially consists of a light source, a measuring chamber and a PMS. The light source is an incandescent bulb emitting white light. The measuring chamber is more than 1 cm thick metallic chamber with two shutter-operated windows in its adjacent walls. Visible light from the source lamp falls on a sample placed in the measuring chamber. The duration of exposure of the sample is controllable.

Photons emitted by the sample travel towards a detector after passing through the other window. The detector is a broadband photomultiplier tube. It is sensitive in the range of 300–850 nm and operates on single photon counting mode. It counts the number of photons detected in bins of adjustable size. A sample is placed at a fixed location inside the measuring chamber in a sample holder. The temperature of 25°C at the location is fixed by an external control device having an accuracy of 1°C. The sample holder is a quartz cuvette, dimensions 2 cm × 2 cm × 5 cm, mass 12.23 g.

We tried to simulate the condition of resonance according to my previous work[1] by supplying a copper wire wound 20 times around the measuring chamber with an alternating voltage of 2.060 MHz and 50 mV for generating a magnetic field inside the chamber. In other experiments a small coil was used inside the chamber and yielded similar results to the coil outside the chamber. Therefore, we used routinely the coil outside the chamber for our measurements. The frequency of the oscillator in

most of measurements was 2.060 MHz and 50 mV. In two measurements the frequencies 1.828 MHz and 2.006 MHz were used. The globuli were excited by visible light and by the magnetic field at their resonance frequencies. This is the modification of the conventionally used photomultiplier method.

Sixteen sucrose globuli were used in every measurement presented in this paper. The volume and mass of these globuli were very small compared to those of a cuvette. The temperature was maintained at 25°C during all measurements. A cuvette containing sample globuli was put inside the chamber for at least 30 min for adaptation in the dark. The sample was then exposed for 10 s to visible light. The delayed luminescence signal of the sample was measured by detecting photons in 9000 contiguous bins of size 0.1 s. The measured signal was used for estimating its four parameters by least square minimization.

The stability of the parameters of the signal was shown by repeatedly measuring delayed luminescence signals of the same sample. At the beginning we performed 35 consecutive measurements without opening the measuring chamber using samples of *Arg. met.* CMf globuli or control. Because of the stability of the parameters, we subsequently restricted our measurements to 6–10 repetitions per sample. The climate of our measuring room varies with the atmospheric humidity and the air pressure and could influence the results of the measurements. Therefore, the average and standard deviation values of the results were taken.

Homeopathic medicines

We used homeopathic medicines in sucrose globuli and control globuli procured from Heel-Belgium, info@heel.be, 16 globuli weighed 700 mg. The medicines used were *Argentum metallicum* CMf (*Arg. met.* CMf), *Arnica montana* CMf (*Arn.* CMf), *Alcoholus* LMK (*Alc.* LMK, ethanol), *Bovista gigantea* CMf (*Bov.* CMf), and *Cantharis vesicatoria* LMK and CMf (*Canth.* LMK and CMf). These are produced according to the Korsakoff[8,9] (K-potencies) and Fincke[8,9] (CMf-potency) methods.

Korsakoff, a Russian physician, suggested in 1820s using only one vial and allowing the solution clinging the walls of the vial to be considered one part, adding the required amount of 87% alcohol and succussing in the usual manner. The potencies prepared according to the Korsakovian method are denoted as K. Today, the succussion of K-potencies is by machine and lower alcohol concentrations are used (47% or 24%). Heel-Belgium uses for manufacturing Korsakovian attenuations a Labotics K-TRONIC machine.[8,9]

Fincke developed a machine which allowed water to flow into a vial which contained one drop of a 30CH potency. The vial held 1 dram (about 3.5 ml). Fincke believed that every dram of water which flowed through the vial (flow rate approximately 1 dram/min) the potency was raised one level. To make the 10Mf potency he would start with a drop of a 30CH, and let 9969 drams of water flow through the vial (9999 potency), empty the vial, fill it with alcohol, and shake it 180 times.[8,9] Higher potencies such as CMf, (abbreviation for 100 000) can be made by this method. Heel-Belgium informed us that the Fincke potencies are not produced in house; they do not have information about the machine.

Results

The delayed luminescence signal of a sample of 16 sucrose globuli of *Arg. met.* CMf excited by 2.060 MHz along with the model fit is depicted in Figure 1. The figure depicts a non-linear fit and the coefficient of variance is 0.949.

Figures 2 and 3 illustrate B_0 and B_2 of *Arg. met.* CMf and control with visible light only and with light and excitation at 2.060 MHz. The illustrative example of the values of B_2 estimated in eight experiments with a sample of *Arg. met.* CMf and six experiments with control depicted in Figure 2 shows the discriminatory power of B_2. B_0 of *Arg. met.* CMf (Figure 3) also appears discriminatory though its discriminatory power is hampered by large errors in its estimation. It differs only slightly between remedy and control but appears to be more effective in identifying the resonance frequency than B_2. The other two parameters, B_1 and t_0, are not so discriminatory, therefore, they are not shown. We present the behaviour of only two parameters because these parameters clearly discriminate between medicated and control globuli.

Another common feature in different estimations is that B_2 is the most prominent parameter with small error of estimation. In order to depict the discriminating power of these parameters, we have depicted in Figures 4–8 and Table 1, the average values and their standard deviation of these parameters in repeated experiments on different days and with different medicines excited by 2.060 MHz. In Figures 4–6 the average values of the B-parameters, B_0, B_1 and t_0, are shown. B_1 is poorly determined and has larger error of estimation, the signals of remedy and control globuli overlap. B_0 is reasonably determined but its estimated value includes substantial contribution from the

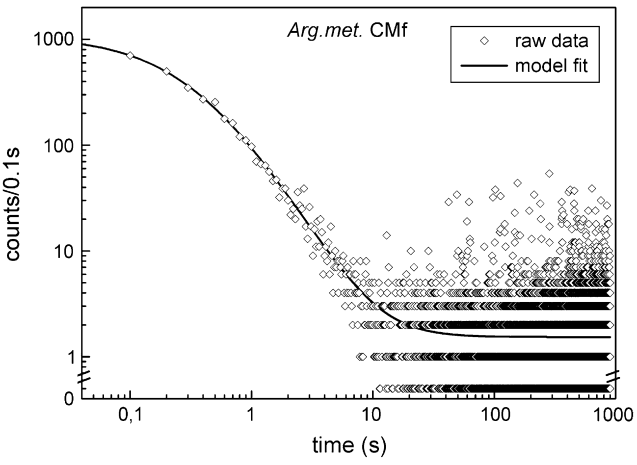

Figure 1 Delayed luminescence signal of *Argentum metallicum* CMf: the figure depicts the raw signal data for 900 s with bin size of 0.1 s. The fit to the observed data is also shown (model fit). An electromagnetic field of 2.060 MHz was applied.

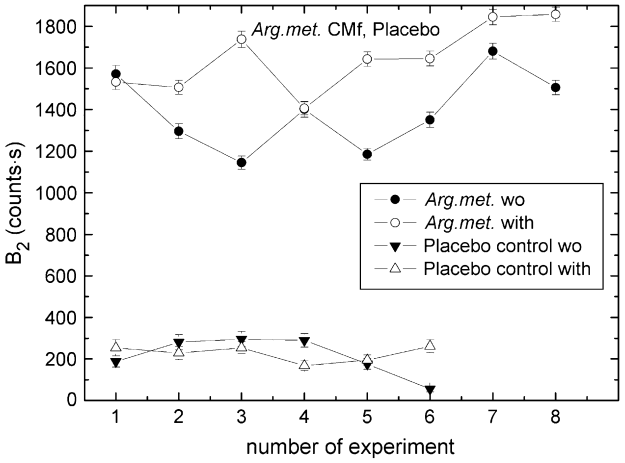

Figure 2 Values of the parameter B_2 (counts·s) in eight repeated experiments of *Argentum metallicum* CMf and CMf placebo. Without (wo) field, only visible light: ● – ● *Arg. met.* CMf, ▼ – ▼ placebo control globuli. With electromagnetic field 2.060 MHz: ○ – ○ *Arg. met.* CMf, △ – △ placebo control globuli. The error bar at a symbol indicates deviation in the estimated value for 95% confidence level.

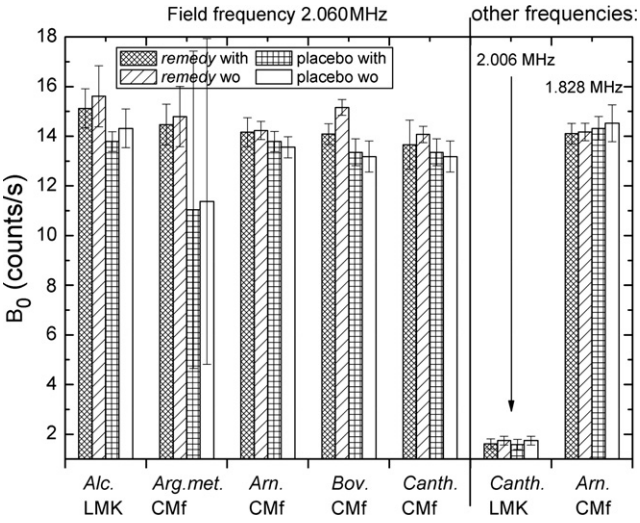

Figure 4 Average values of the parameters B_0 (counts/s) in different measurements (6–20) of various medicines obtained by excitation by three different frequencies: 2.060 MHz, 2.006 MHz and by 1.827 MHz and by visible light. Without (wo) field, only visible light: ▨ medicines, ▭ control globuli with error bars. With electromagnetic field at given frequency: ▩ medicines, ▤ control globuli with error bars.

background noise, which considerably reduces its discriminatory capability. The parameter t_0 (Figure 6) is reasonably determined but its value in a remedy is not much different from its value for control.

Figure 7 summarizes the average values of the B_1/B_2-shape parameter of medicines and control. The shape of the decaying portion of the signal is determined by the ratio B_1/B_2. In Figure 8 the average values of the parameter B_2 of different medicines are shown: the effect of the field of 2.060 MHz and visible light were used to excite the following medicines in a CMf-potency: *Arg. met.*, *Canth.*, *Bov.*, *Arn.*, in LMK-potency: *Canth.* and *Alc.* Here, *Arn.* CMf has significant B_2-parameter; 2.060 MHz is a newly detected resonance frequency of *Arn.* CMf. For *Canth.* LMK the calculated B-parameters do not differ from those of the control globuli excited by 2.006 MHz. Therefore, it is concluded that 2.006 MHz is not a resonance frequency of *Canth.* LMK, *Arn.* CMf excited by 1.828 MHz, has a significant B_2-parameter, 1.827 MHz is a second resonance frequency of *Arn.* CMf (see also Table 1).

The B-parameters and t_0 (Figures 4–8) of *Alc.* LMK are comparable with those of the control globuli (pure sugar), when stimulated at 2.060 MHz. Therefore 2.060 MHz is

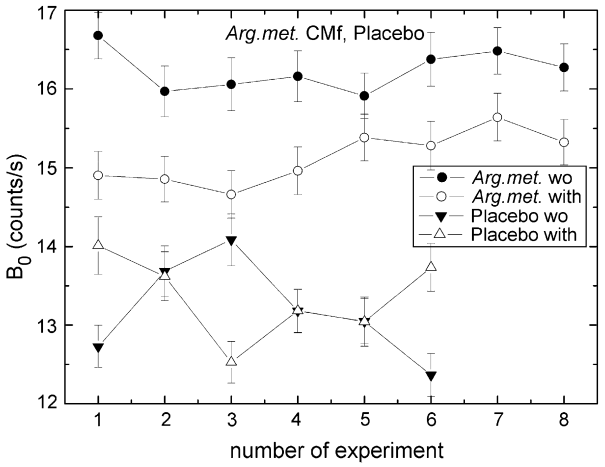

Figure 3 Values of the parameter B_0 (counts/s) in eight repeated experiments of *Argentum metallicum* CMf and control. Without (wo) field, only visible light: ● – ● *Arg. met.* CMf, ▼ – ▼ control globuli. With electromagnetic field 2.060 MHz: ○ – ○ *Arg. met.* CMf, △ – △ control globuli. Bars indicate 95% confidence interval.

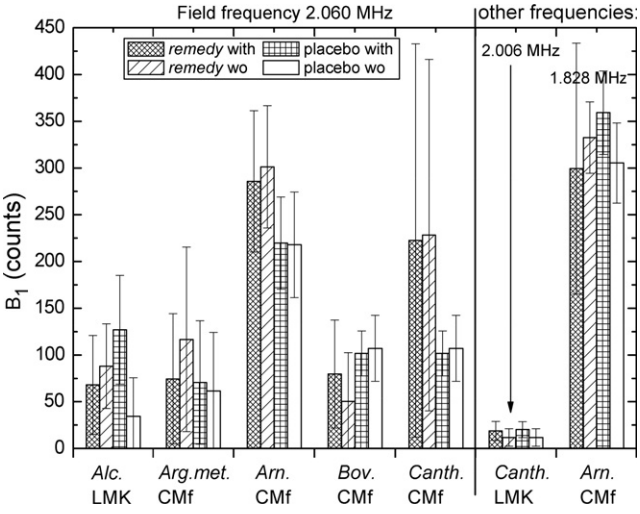

Figure 5 Average values of the parameters B_1 (counts) in different measurements (6–20) of various medicines obtained by excitation by three different frequencies: 2.060 MHz, 2.006 MHz and by 1.827 MHz and by visible light. Without (wo) field, only visible light: ▨ medicines, ▭ control globuli with error bars. With electromagnetic field at given frequency: ▩ medicines, ▤ control globuli with error bars.

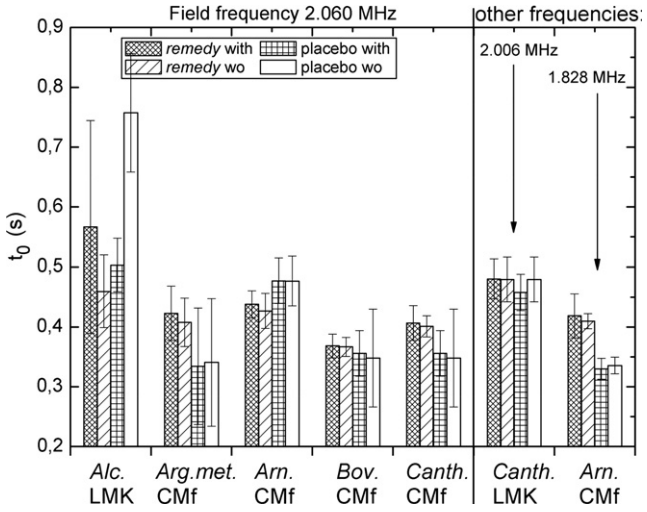

Figure 6 Average values of the parameters t_0 (s) in different measurements (6–20) of various medicines obtained by excitation by three different frequencies: 2.060 MHz, 1.827 MHz and by 2.006 MHz and by visible light. Without (wo) field, only visible light: ▱ medicines, ▭ control globuli with error bars. With electromagnetic field at given frequency: ▩ medicines, ▦ control globuli with error bars.

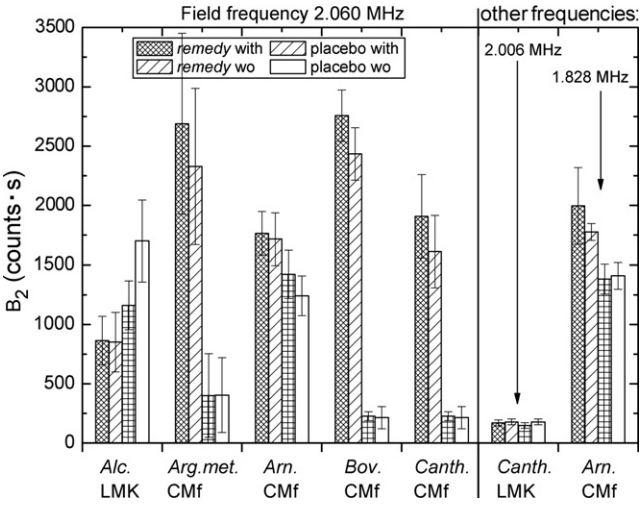

Figure 8 Average values of the parameters B_2 (counts·s) in different measurements (6–20) of various medicines obtained by excitation by three different frequencies: 2.060 MHz, 1.827 MHz and by 2.006 MHz and by visible light. Without (wo) field, only visible light: ▱ medicines, ▭ control globuli with error bars. With electromagnetic field at given frequency: ▩ medicines, ▦ control globuli with error bars.

not a resonance frequency of *Alc*. LMK. Figures 4–8 depict the effect of electromagnetic fields in the MHz region on the homeopathic medicines and show the average values of the *B*-parameters. In most cases, the frequency of the electromagnetic field was 2.060 MHz, one was 2.006 MHz, and another was 1.827 MHz.

It should be emphasized that these measurements by a photomultiplier method are only possible under the condition that the homeopathic photons are separated from the sugar globuli by their corresponding electromagnetic fields at their characteristic resonance frequencies. Excitation of the medicines by visible light (without field) did not give good results.

The above sets of measurements were performed on samples of 8, 16, 32 and 40 globuli of homeopathic medicines first (not shown). The signals with 16 globuli show the best patterns. Because of these results, we used 16 globuli for our measurements shown in this publication.

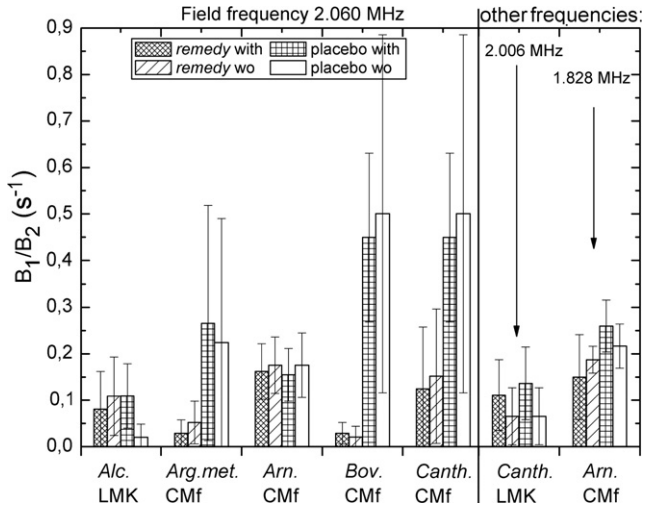

Figure 7 Average values of the shape parameters B_1/B_2 (s^{-1}) in different measurements (6–20) of various medicines obtained by excitation by three different frequencies: 2.060 MHz, 1.827 MHz and by 2.006 MHz and by visible light. Without (wo) field, only visible light: ▱ medicines, ▭ control globuli with error bars. With electromagnetic field at given frequency: ▩ medicines, ▦ control globuli with error bars.

Discussions

We measured the delayed luminescence signal of high homeopathic potencies by a modified photomultiplier method and exciting the medicines by their characteristic resonance frequencies in the MHz region and with visible light. Calculations were done by the application of a model[5,6] proposed to explain the non-exponential decay character of photon signals emitted by living systems in the term $n(t)$ of the four parameters B_0, B_1, B_2 and t_0.

The model postulates that a living system is associated with electromagnetic fields in a quantum squeezed state, whose time evolution is given by the frequency stable damped harmonic oscillator with time dependent damping and mass terms.[5] The model implicitly assumes that delayed luminescence emanates from the parts of a living system that are of quantum nature. The model has been extrapolated to non-living complex systems. The coefficients B_0 and B_1 of the term $n(t)$ usually give significant contributions in living systems while coefficient B_2 gives significant contribution in non-living complex systems.[5,6] The excellent fit depicted in Figure 1 of the raw data suggests that the complex system of medicated globuli falls into the purview of the model. Perhaps this complex system also has some quantum structures and delayed luminescence signal emanates from these structures. The parameter B_2 makes a major contribution to

Table 1 Holistic parameters of homeopathic medicines

Sample	*Field, 2.06 MHz*	B_0	B_1	B_2	t_0	*Shape*
Alc. LMK	No	15.6 ± 1.2	88 ± 45	851 ± 251	0.46 ± 0.06	0.11 ± 0.08
	Yes	15.1 ± 0.8	68 ± 53	864 ± 204	0.57 ± 0.18	0.08 ± 0.08
Control	No	14.3 ± 0.8	34 ± 41	1701 ± 344	0.76 ± 0.10	0.02 ± 0.03
	Yes	13.8 ± 0.4	127 ± 58	1161 ± 206	0.50 ± 0.04	0.11 ± 0.07
Arg. met. CMf	No	14.8 ± 1.2	117 ± 99	2329 ± 659	0.41 ± 0.04	0.05 ± 0.05
	Yes	14.5 ± 0.8	74 ± 70	2689 ± 762	0.42 ± 0.05	0.03 ± 0.03
Control	No	11.4 ± 6.6	61 ± 63	404 ± 316	0.34 ± 0.11	0.22 ± 0.27
	Yes	11.0 ± 6.4	71 ± 66	401 ± 353	0.33 ± 0.10	0.27 ± 0.25
Arn. CMf	No	14.2 ± 0.4	301 ± 65	1716 ± 221	0.43 ± 0.03	0.18 ± 0.06
	Yes	14.2 ± 0.6	286 ± 76	1765 ± 183	0.44 ± 0.02	0.16 ± 0.06
Control	No	13.6 ± 0.4	218 ± 57	1241 ± 167	0.48 ± 0.04	0.18 ± 0.07
	Yes	13.8 ± 0.4	220 ± 49	1421 ± 202	0.48 ± 0.04	0.15 ± 0.06
Bov. CMf	No	15.2 ± 0.3	50 ± 52	2434 ± 221	0.37 ± 0.02	0.02 ± 0.02
	Yes	14.1 ± 0.4	80 ± 58	2756 ± 218	0.37 ± 0.02	0.03 ± 0.02
Control	No	13.2 ± 0.6	107 ± 35	214 ± 94	0.35 ± 0.08	0.50 ± 0.38
	Yes	13.4 ± 0.5	102 ± 24	226 ± 38	0.36 ± 0.04	0.45 ± 0.18
Canth. CMf	No	14.1 ± 0.3	228 ± 188	1611 ± 304	0.40 ± 0.02	0.15 ± 0.14
	Yes	13.7 ± 1.0	223 ± 210	1908 ± 353	0.41 ± 0.03	0.12 ± 0.13
Control	No	13.2 ± 0.6	107 ± 35	214 ± 94	0.35 ± 0.08	0.50 ± 0.38
	Yes	13.4 ± 0.5	102 ± 24	226 ± 38	0.36 ± 0.04	0.45 ± 0.18
	Other fields					
Canth. LMK	No	1.7 ± 0.2	12 ± 9	178 ± 25	0.48 ± 0.04	0.07 ± 0.06
	2.006 MHz	1.6 ± 0.2	19 ± 10	169 ± 25	0.48 ± 0.03	0.11 ± 0.08
Control	No	1.7 ± 0.2	12 ± 9	178 ± 25	0.48 ± 0.04	0.07 ± 0.06
	2.006 MHz	1.6 ± 0.2	20 ± 8	148 ± 23	0.46 ± 0.03	0.14 ± 0.08
Arn. CMf	No	14.2 ± 0.3	332 ± 38	1776 ± 70	0.41 ± 0.01	0.19 ± 0.03
	1.827 MHz	14.1 ± 0.4	299 ± 134	1996 ± 322	0.42 ± 0.04	0.15 ± 0.09
Control	No	14.5 ± 0.7	305 ± 43	1410 ± 113	0.34 ± 0.01	0.22 ± 0.05
	1.827 MHz	14.3 ± 0.5	359 ± 45	1383 ± 126	0.33 ± 0.02	0.26 ± 0.06

Determination of four parameters B_0, B_1, B_2, t_0 and shape of various homeopathic medicines in very high potencies (CMf) and control globuli. Average and standard error of 8–16 measurements. In column 2 'yes' means a field of the specified frequency was applied, 'no' means only visible light was applied. Other fields were used for *Canth.* LMK (2.006 MHz) and for *Arn.* CMf (1.827 MHz).

the decaying portion of delayed luminescence signal of all samples mentioned in this paper.

The large difference in the value of B_2 between medicine and control must arise from some physical differences between them. The nature of physical differences is likely to be holistic and quantum. The envisaged quantum structures will have specificity and can only be shown when a magnetic field of a resonance frequency of the remedy is applied. This investigation confirms the existence of resonance frequencies of high homeopathic potencies identified by my previous work.[1] In addition, we have demonstrated the capability of B_2 to discover other resonance frequencies of medicines. We detected that *Arn*. CMf has two resonance frequencies at 2.060 MHz and 1.828 MHz. These findings suggest that each homeopathic potency has more than one resonance frequency.

The B_0, B_1, the ratio B_1/B_2 and $t_0$parameters of the medicines are not so prominent. The B_1-parameter of the medicines does not show much difference from that of the control globuli. This parameter is known to be very high in biophotons from living systems and its behaviour is coherent.[4,5] In this research we show that the B_2-parameter with a quantum character, holistic and coherent, is characteristic for homeopathic photons. The B_1-parameter is characteristic for biophotons of living systems.[4–6] The parameters of signals of control (Figure 4–8) varied on different days. This is probably caused by climatic differences. But the values of the control globuli show significant differences to the values of the medicines. The measurement of homeopathic photons is very sensitive. The values presented should be considered relative and not absolute. That is the reason why we can only show qualitative and not quantitative differences between control globuli and medicines.

The parameters of the signal of *Alc*. LMK at 2.060 MHz suggest that it is probably not an active medicine. In this case, it must be assured in future that no other frequency can excite *Alc*. LMK. Homeopathic medicines are succussed in alcohol–water dilutions (mostly 47% alcohol). Previous work[1] shows that *Succussed water* in XMK on sugar globuli had a signal similar to control.

Differences in the delayed luminescence of high homeopathic potencies and control globuli lead to the conclusion that photons must have arisen from the medicated globuli. The source of these photons can only be explained by their separation from the medicated globuli using their characteristic resonance frequencies. The differences in the delayed luminescence signals of medicated and control globuli are substantial and incomprehensible from the classical point

of view. These differences should be considered as indicative of holistic quantum structures in medicines that resonate with a field of definite frequencies and can only be explained by quantum physics.

The metallic enclosure of the PMS is a sort of Faraday cage. The quality of a Faraday cage is determined by its damping capacity. I have previously worked in a Faraday cage with a damping effect of 86%, which is one of the best qualities, although some penetrating frequencies could always be measured. In this paper we used initially a small copper coil with nine windings inside the measuring chamber which may work like a Faraday cage. The obtained measurements were compared with those using 20 windings of a copper wire outside the chamber. There were no differences between the results. Therefore, we used the copper coil outside the chamber cell, because it was more convenient. The generator level was adjusted to 50 mV and to the desired frequency, mostly 2.060 MHz. This is a high generator level compared with that used in previous work[1] and sufficient enough to separate the homeopathic photons from the medicated globuli.

The envisaged quantum structures in homeopathic medicines can explain the failure to find an explanation of homeopathy for we have only searched for classical structures. We have yet to develop techniques for identifying quantum structures. Living systems are probably capable of detecting quantum structures. The existence of quantum structures and the capability of living systems to detect them have been the subject of speculation by several authors.[10–15]

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