

# Promotion Rate Index in ELF Magneto-protonics

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**Abstract**— An evaluation index for the promotion rate with 1–2% per week in the ELF magneto-protonics is proposed for development of the bio industry such as the cultivation and the farming on the basis of the tests for the vegetable plant cultivation, goldfish culture, and the hardening of the high strength concrete.

## 1. INTRODUCTION

We have proposed a new hypothetical principle named “Magneto-protonics”, since 2001 [1–3] in which the free proton generated in the water exposed to an extremely low frequency (ELF) small magnetic field. When the free protons generate in the bio-cell water, the promotion of the ATP production ability due to the proton flow in the mitochondria ATP-ase activates organisms including human [4, 5]. The magnetization of a magnetized water exposed to the ELF magnetic field has been detected using a Pico-Tesla MI sensor [6]. The magneto-protonics principle has been reviewed in detail [7]. Various evidence for the magneto-protonics bio-activation effect has been accumulated in the agricultural tests of such as the Gifu strawberry cultivation test in the Gifu prefectural agriculture research center in Japan [8].

Exposure to the ELF magnetic field in the bio body is realized using not only a conductor coil connected with the electronic oscillator but also a group of magnetized stones generating periodical alternating pulse distributed magnetic field through which the bio water such as the blood water flows [8–12]. Remarkable effects of the arousal for prevention of the drowsiness during car driving [9–11] and the health recovery for a patient with the angina pectoris [12] both would be useful for the establishment of the super-elderly sustainable society such as Japan. Therefore, we defined a promotion rate index for reasonable evaluation of the magneto-protonics effect on the bio activation such as the body growth of the crop and the domestic animal even in an early stage.

We have also found the hardening of the concrete has been promoted when using the magnetized coarse aggregate such as the magnetized olivine crashed stone and the magnetized oxidized slag crashed stone utilizing the free proton generation in the water during the concrete ingredients mixing [13]. We found that the hardening promotion effect of the magnetized aggregate concrete is also evaluated using the same promotion rate index.

## 2. GROWTH PROMOTION RATE INDEX: 1–2% PER WEEK IN MAGNETO-PROTONICS

Figure 1 illustrates measured results of the Japanese goldfish culture experiment through 800 days. The twenty baby goldfish showing around 4 cm long and around 2 mg weight each were separated into two groups: one in an aquarium with magnetized olivine stones floor, whilst another in an aquarium with non-magnetic stones floor. We found the average weight of the magnetized aquarium group grow faster and became around twice at 740 days. The growth promotion rate defined as  $G = ((\text{Average weight of the magnetized goldfish group})/(\text{Average weight of the control goldfish group}) - 1.0) \times 100(\%)$  for Figure 1 is represented in Figure 2, in which we tentatively illustrated a linear approximated line of “1% per week line” as the growth promotion rate index for the evaluation of the ELF magnetic field effect.

Figure 3 illustrates calculated results of the plant growth promotion rate on the basis of measured results of plant cultivation tests: A the Gifu strawberry cultivation test using ELF magnetic field generator coils [8] with A1 the average plant length, A2 the average leaf width, A3 the winter time yield amount, and A' the annual total yield amount. B and C are both for the Komatsuna vegetable plant cultivation tests setting each plant pot on a magnetized oxidized slag aggregate concrete board with B1 the total yield amount, B2 the average plant length, and B3 the average leaf width. We found these data for the plant cultivation tests of less than 22 weeks are distributed

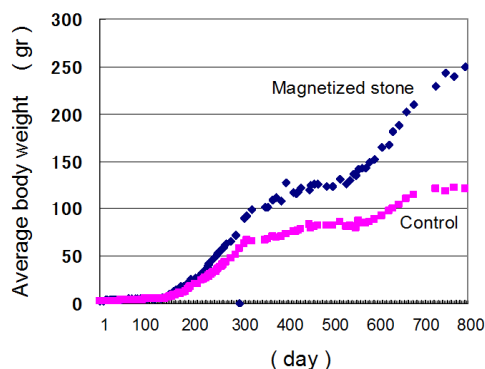


Figure 1: Rearing test for Japanese goldfish group in an aquarium with magnetized olivine stones comparing with a control group.

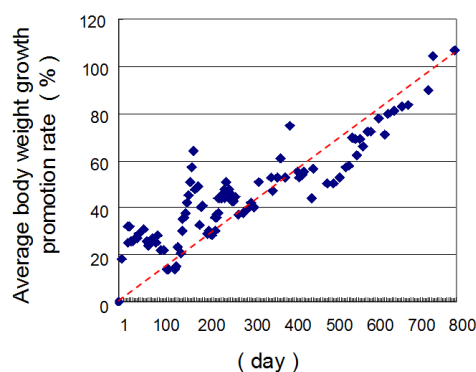


Figure 2: Goldfish growth promotion rate vs. feeding period for the group in magnetized stone set aquarium. A dotted line shows the 1% per week line.

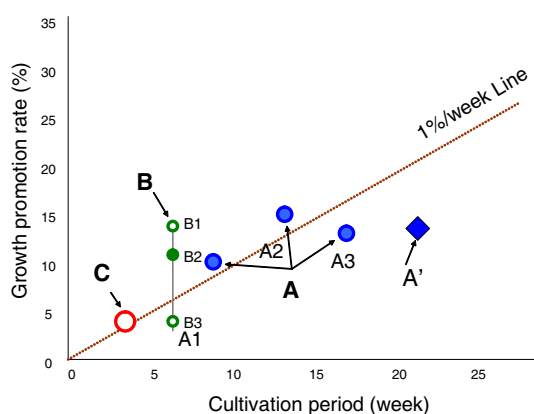


Figure 3: Plant growth promotion rate vs. cultivation period characteristics: A for Gifu strawberry cultivation using the ELF coil magnetization with A1 for the plant length, A2 the leaf width, A3 the winter-period yield amount, and A' the annual yield amount, B and C are both for the Komatsuna vegetable plant tests on the oxidized slag concrete with B1 for the total yield amount, B2 for the plant length, and B3 for the leaf width.

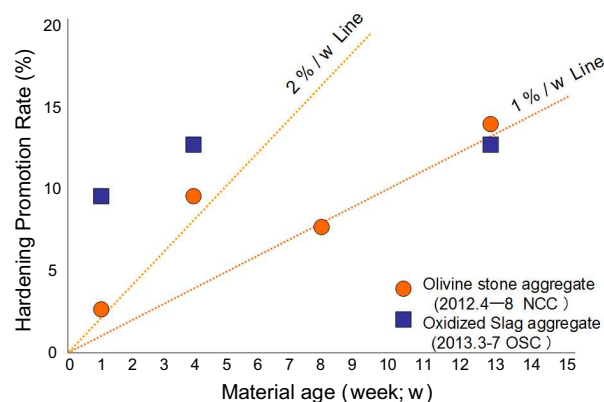


Figure 4: Concrete hardening promotion rate vs. material age using magnetized coarse aggregate: Circle marks with magnetized olivine crashed stones, and square marks with magnetized oxidized slag crashed stones comparing with non-magnetic aggregate.

roughly along the 1% per week line of the magnetized goldfish grow promotion rate as shown in Figure 2.

We found similar promotion rate versus time characteristics in the concrete hardening tests using magnetized coarse aggregate as shown in Figure 4 with measurements of the compressive strength of the concrete test pieces with the magnetized olivine crashed stones aggregate [13] and the magnetized oxidized slag crashed stones aggregate compared with test pieces with non-magnetic stones aggregate. Similarity of the organisms growth and the hardening of the concrete on the promotion rate is considered due to the free proton generation in the bio-body water and the concrete mixing water for activation of the bio-chemical reaction and the chemical reaction, respectively.

### 3. CONCLUSIONS

Definition of the promotion rate index “1–2% per week” makes a precise and numerical evaluation of the ELF magneto-protonics effect on the organisms growth and the concrete hardening at even short time test such as one week, that would be able to promote the new bio industries utilizing the magneto-protonics based on the intrinsic concept for the organisms with the effect accumulation. The bio-activation high strength concrete would be a basic infrastructure for the new bio industries.

## ACKNOWLEDGMENT

The authors wish to express their gratitude to Mr. T. Uemura of Tsuruta Sekizai Co, Japan and Dr. H. Nakagawa of Aichi Steel Co., Japan for their presentation of the magnetized olivine stones and the magnetized oxidized slag stones, respectively.

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