

## Overcoming Cigarette for Health without altering the Flavor (Brief illustration of scientific background and evidences)

SB. Sumitro\* and G. Zahar\*\*

\*Nanobiology and Molecular Biology Laboratory, Faculty of Science and Mathematics, Brawijaya University, Malang 65145

\*\*Free Radicals Institute, Jl. Surakarta 5, Malang 65143

### A. The Basic Philosophy and Concept

This is about technology to eliminate free-radicals and to transform particulates contained in the smoke having characteristic to develop order. The idea is based on the assumption that in the biological system, life is an ordered system with internal driven activities. We consider a complexity concepts cover self-organization and edge-of-chaos phenomena in the living systems. As may we know that in the basic process of life (called metabolism), there is ceaseless flow of energy and matter through a network of chemical reactions, which enables a living organism to continually generate, repair and perpetuate itself. Thermodynamically, the ordered structure of the living system is maintained by continually exert entropy to the outside of the system. The living system is self-generating while having interacting with the environments. The ordered system is a dynamic process with homeostatic character of complex process in which simple molecules behave autonomously construct complex structure. The simple molecule, using their potentials, interact within their local relationships enable to develop higher order complex structure, and finally to emerge complex system with adaptive behavior (individual organism). On the other way round, within the process of life there is also decay as part of homeostatic character of living system (figure 1).

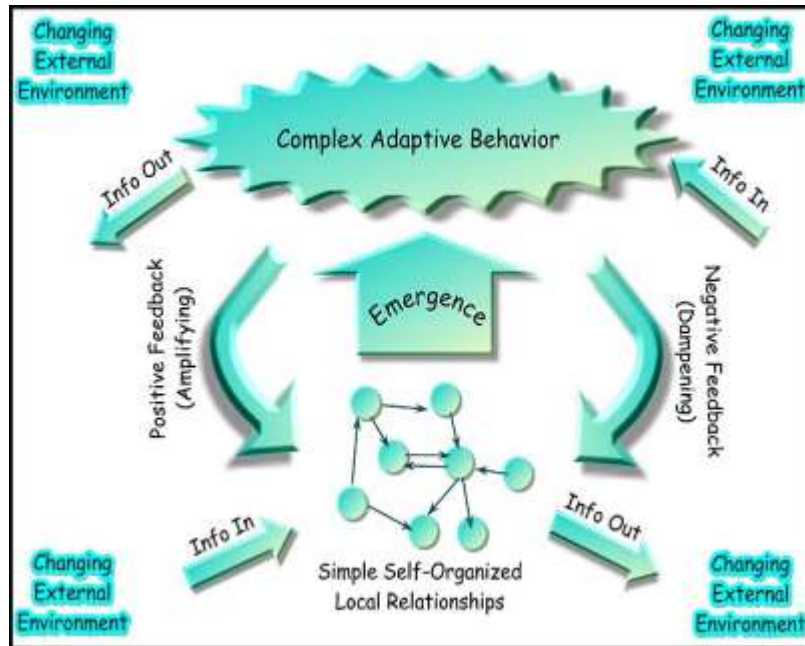


Figure 1: A diagram depicting complexity in living system which should be considered in every idea in developing understanding of life and medical technologies

The innovation is dealing with constructing huge molecule block (nano structure) which has sensitizer character in which thermodynamically potential to develop biological order. Molecular bio-nanostructures of tobaccos having advantages as compared to other's smart material structures that is *the intra spin-spin interaction of the conjugated di-HO•-Phenanthrenedieryl* were very mobile electron. The polymers are also having high density of electron beneficial for normal biological process

When the cigarette smoke either passes through the **divine filter**, or the tobacco are formulated with sets of scavengers and freeze, the free radicals are filtered off, and the particulates, complex structures of non-chemically bonding interacting excited components, become smaller in their size. The smaller sized particulates are having higher electron dense, and due to its radical free-situation, they will have capacity to donate electron in which thermodynamically may enable to contribute on the development of biological order.

During the process of burning, all aromatic compounds which have sensitizer capacity tend to form ligands with metals. These aromatic compounds such as, Benzenepyrrene\*, exitedantracene\*, and chrycene\* are unstable and excited. Along with this, all heavy metals such as Cd, Pb, As and Mercurio\* (Hg\*) produce amalgamate\*. As illustrated on the figure 1, both of sensitizer components and amalgamated metals can be induce to be excited, and they will form a stable complex structure by means of hydroxycyclohexadienyl (HCHD). The size of this complex structure can be reduced by freezing and when the free-radicals are filtered off.

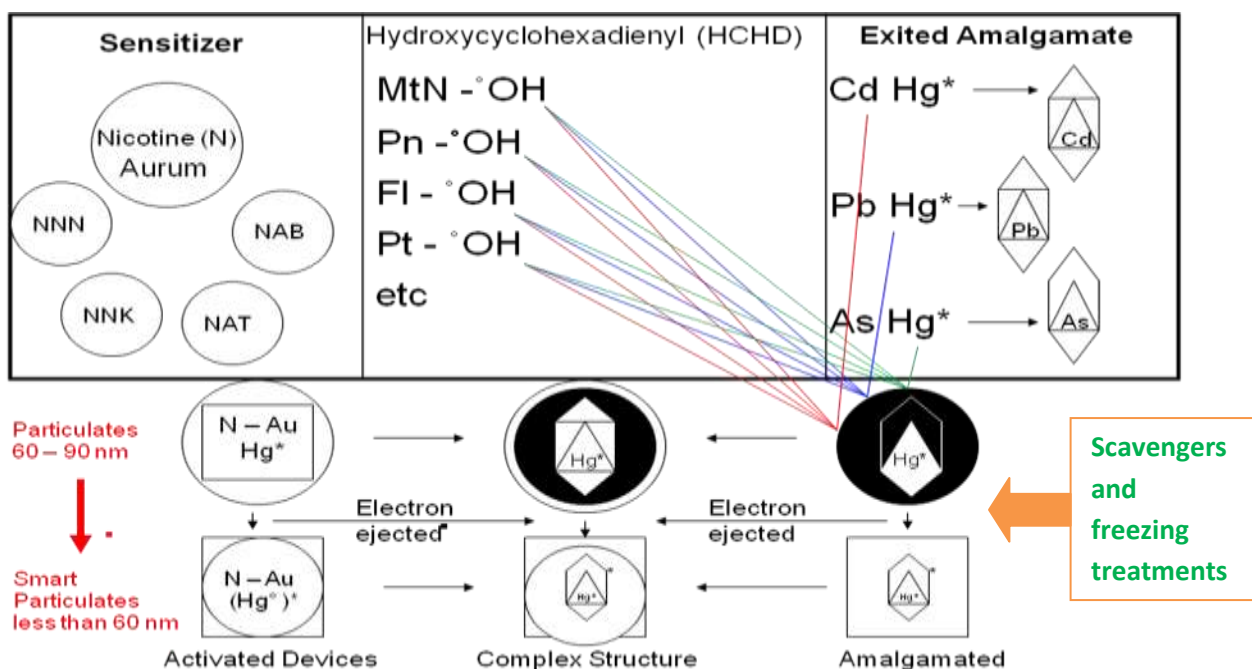
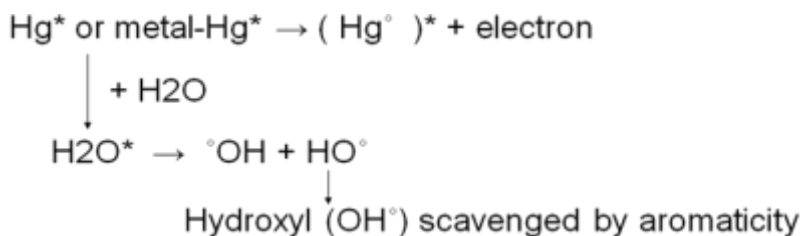


Figure 2: The diagrammatic illustrating the excited amalgamated heavy metals induce interaction of aromatic compounds to form nanostructure (particulates).

Hg\* or metal-Hg\* always being excited, they are absorbing energy to form variety of pattern. It was reported that they have 13 kinds of electromagnetic waves. This is the basic Principle of our hypothesis about their role in inducing complex nanostructures.

Thus, the exiting mercury is a crucial event in generating the complex structure. Since they are also known to behave as gaseous radicals, in case of cigarette smoke, it should be taken into consideration to control its negative impacts.



The stable complex nanostructures (figure 2) can be formed by aromatic compounds which have biradical capacity as proposed by Kosower (1968) (figure 3), and confirmed by our ESR profile (Figure 4). We hypothesized that it should put the heavy metals and nicotine in side by pushing electron aside quite long way from the centre. The complex structure resulted are nanometer size particulates with high electron dense. Each component of these complex structures are interacting each other by means of their para- and diamagnetic power. The existing free radicals contained such as NO, NO<sub>2</sub>, HCN, CO, CO<sub>2</sub>, and unsaturated Hydrocarbon, are eliminated by capturing them with scavengers applied, and leaving the non-sensitizer compounds such as naphtalenes, and quinones which have also form ligand with Ca, Ni, Fe, and Cr becoming energy ashes. The successful application of scavengers in tobacco as well as filters is indicated by fumeless ashes, odorless smoke and smaller size particles.

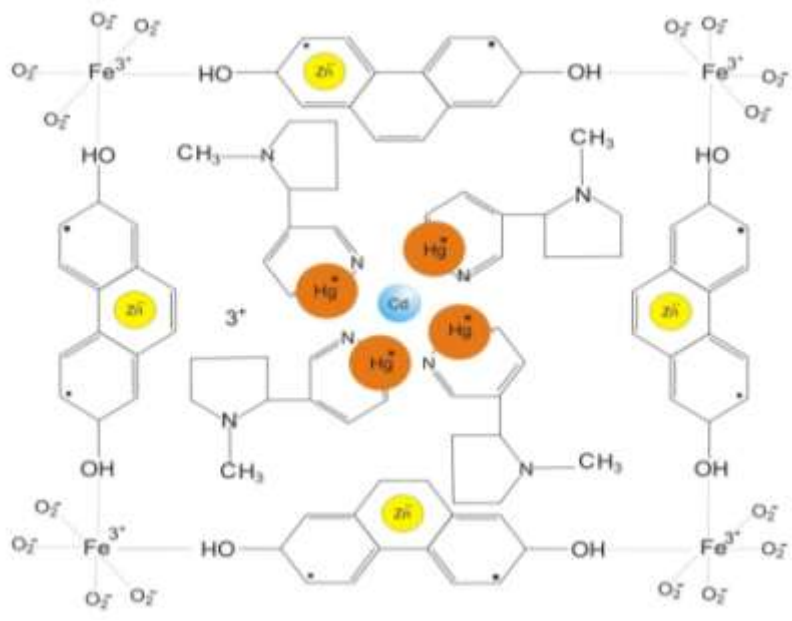


Figure 3: An example of large electron density can develop stable nanostructure. Such chemical nature complexity structure, identically formed by smoke filtered by divine tobacco

## Biradicals of Hidrocyclohexadienyl

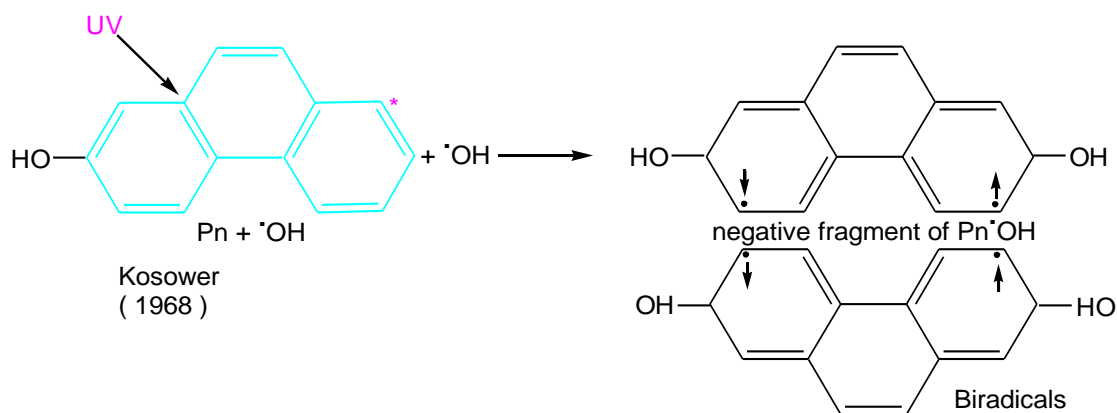


Figure 4: The biradical phenomena of “Aromatic + ·OH”, a concept proposed by Dr. Kosower (1968): Hydroxycyclohexadienyl (HCHD Sensitizer)

The smaller smoke particulates can be convincingly seen when observed using P-TRAK Ultrafine Particle Counter combined with Kanomax-Anemomaster Model AO31. The smoke volume calculated based on continued formulation of Bernoulli. The result was as the following figure:

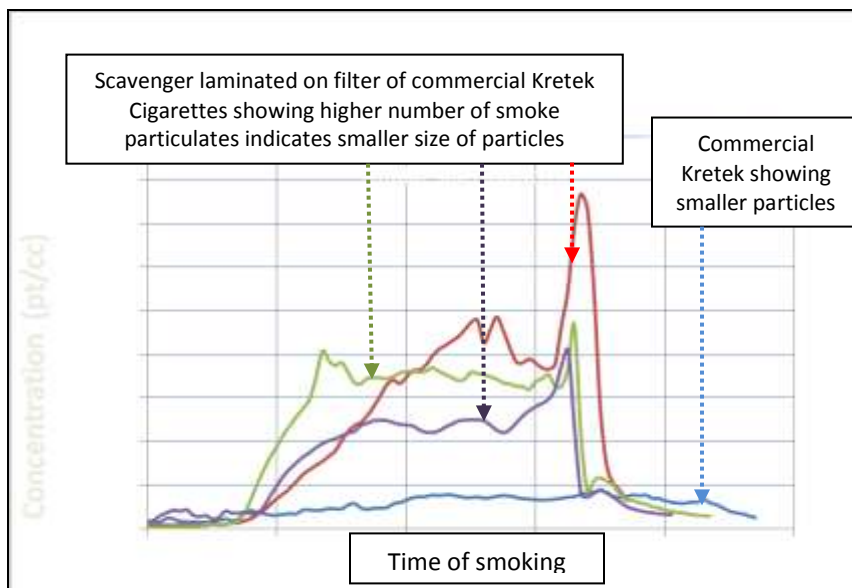


Fig. 4: The number smokes particles higher when scavenger sensitizers were put on the tobacco as well as laminated on the surface of the filter. This indicates the treatment enable induc smaller size of particulates as compared to the commercial Kretek

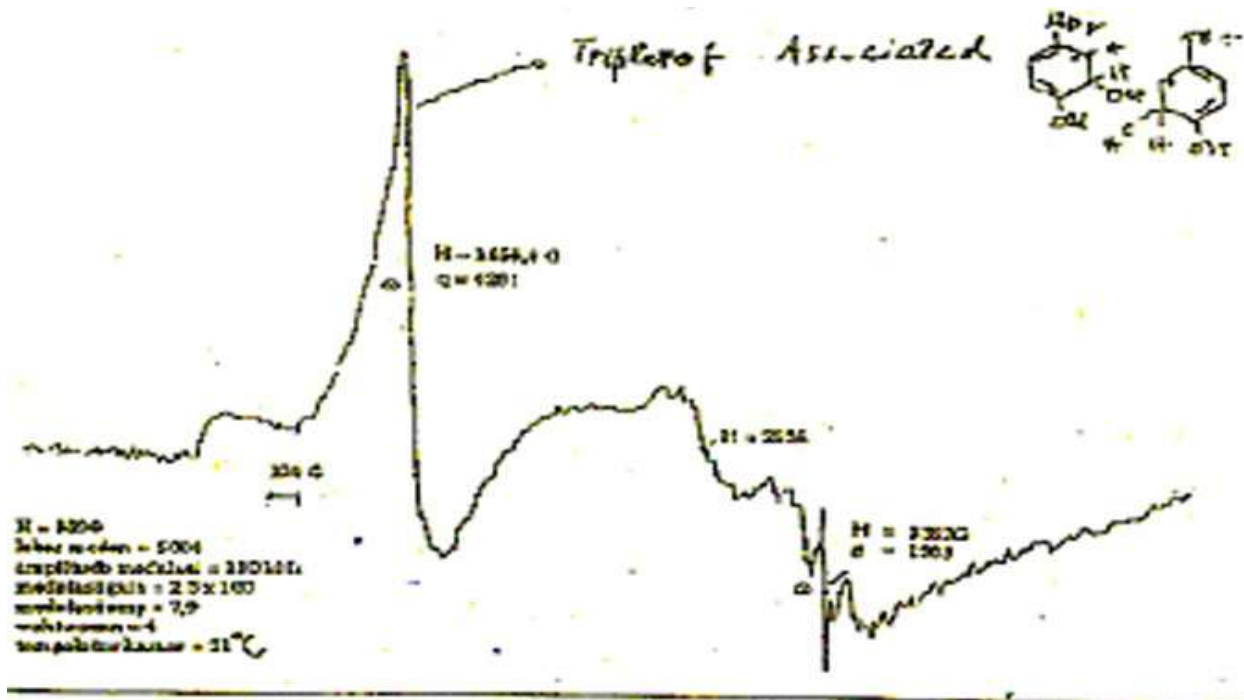


Figure 5. The biradical spectrum of Hydroxycyclohexadienyl as showed by Electron Spin Resonance (ESR) apparatus. The peak of triplet association are indicated by arrow

The observation of their electromagnetic resonances using Electron Spin Resonance Apparatus as seen on figure 5, indicates that the particles are excited similar to any biological complex structures such as Chlorophyll and Cytochrome.

## B. The Experiments

### a. Experiment 1:

Experiments are done in order to observe the capacity of smoke particulates in contributing action to develop order by observing their capability to induce complex crystals formation. The result showed many different unique architecture types of crystal structures can be developed after application of the smoke into different kind of amino acids solution (Figure 5). These crystals are easily formed when they were dried, and unique frozen structure also can be observed when they were freeze. Microscopic observation showed that the crystals are tube-like structure and having green fluorescence (Figure 6). The capacity of the smoke to induce amino acid solution forming unique complex structure when it was either dried or frozen, are interpreted as their capacity to develop order. The structure is repeatable to form consistence typical structure when it was either resolute and defreeze

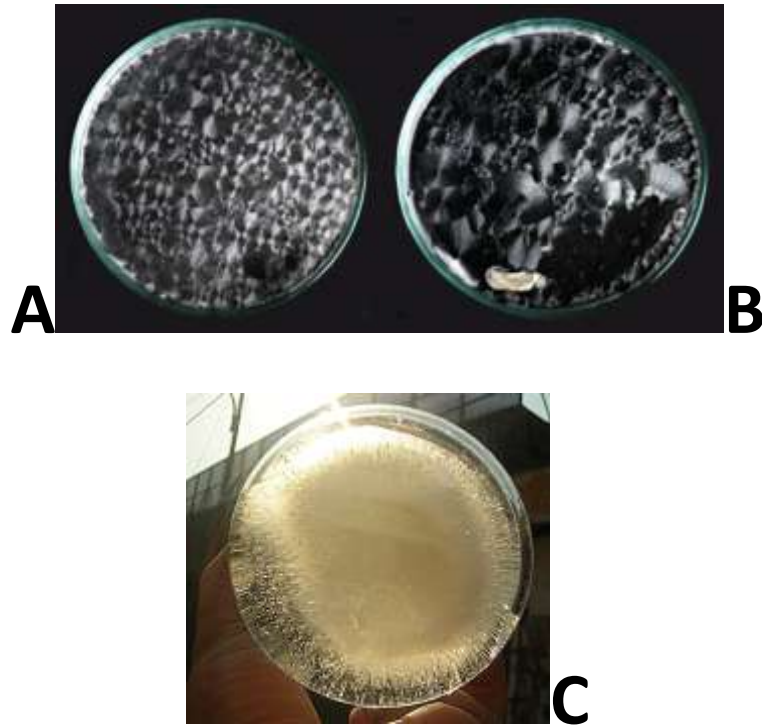


Figure 6. Crystals of threonine (A) and Manitol (B) after treated with define smoke, and spine like structure of frozen phenyl-alanin solution (C) after being smoked and freeze at  $-30^{\circ}\text{C}$ .

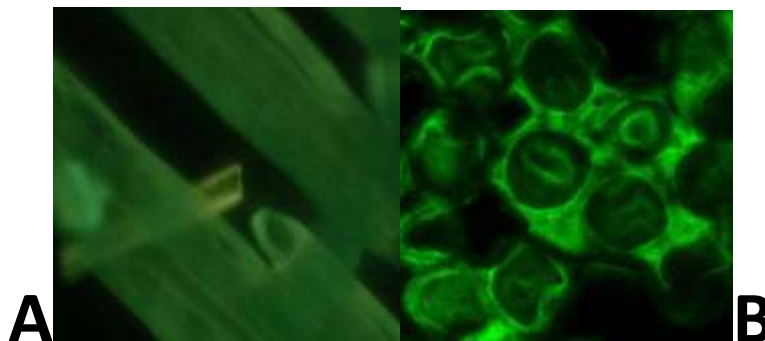


Figure 7 : Crystal observed with Fluorescence microscope (A), and its cross sectional image of digital imaging Confocal Laser Microscopy. This figure showed tube-like structure of the crystal.

## b. Experiments 2

This experiment is aimed to know the effect of divine smoke on Mammalian physiology using groups of mice and rats. The result indicated that the smoke had any significant effect on animal's vital signs such as feeding activities and their other

physiological signs. Indeed the graphic shows that the body weight of treated mice are more fluctuation, but it was considered due to the effect of technique (fogging) rather than due to the toxicity of smoke. The interesting result is dealing with the effect of smoke on their body weight are the facts that when treated juvenile animals showed slower rate of increasing body weight, but the adults shows that within their mature age, the animals had shown more stable in their body weight as compared to the control (untreated) groups (Figure 7). The experiments were done using “Kretek” cigarettes, an Indonesian specific cigarette. These cigarettes do not only contain tobacco but also mixing herbal components including clove.

Some other experiments (data not shown) are dealing with Western Cigarettes commercially available in Indonesia, showed similar results. Histological observations also done for liver, kidneys and lungs of treated mice (data not shown). It was confirmed that all tissues are normal and having any suspected different histological figure as compared to the control (untreated) groups. These histological observations were done on control and experimental animals which are daily fogged with divine smoke within the period of 6 months.

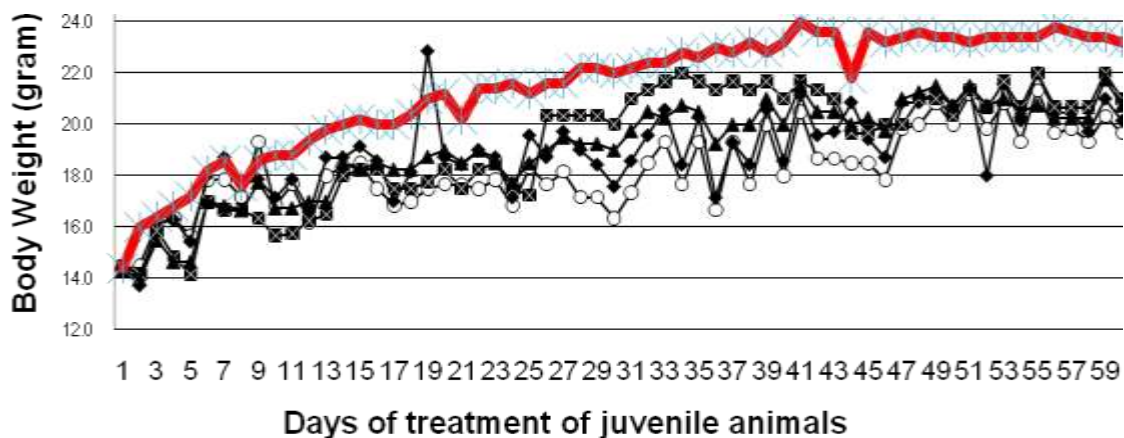
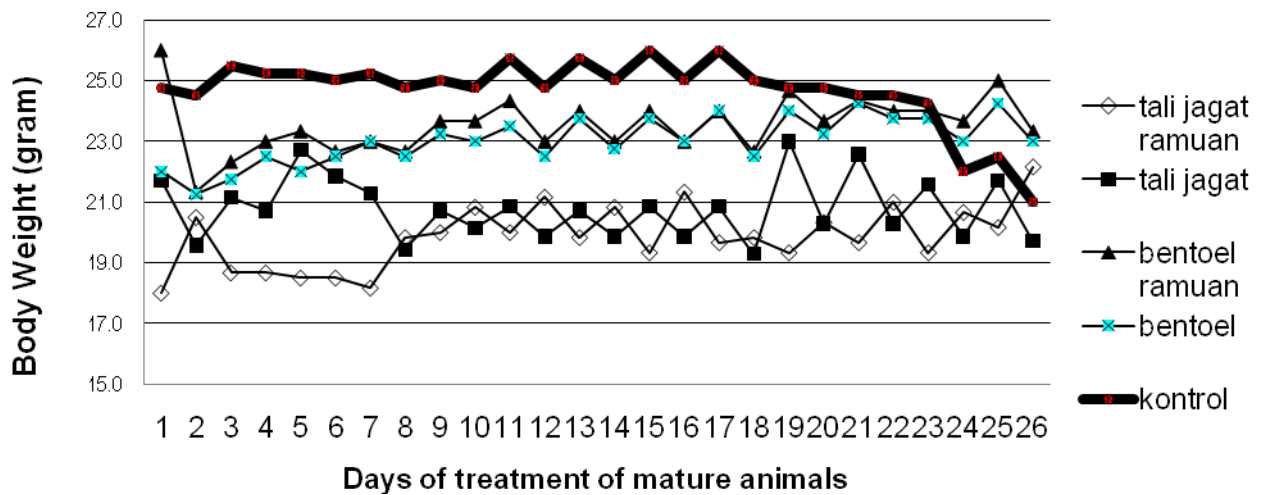


Figure 8: The effect of cigarette smoke on the body weight of mice

### C. Clinical trials

The clinical trials of the divine smokes had been done involving 50 respondents in every trial. Respondents are consisting of smokers and non-smokers. Most respondents said that the use of divine filter to replace the original filter of commercial cigarettes make the smoke taste is milder and odorless as compared to its original. Some respondents had medical symptoms such as migraine, cough, fever, hardly breathings indicated better improvement (Figure 10). The data below indicate their opinion:

Smokers, male	Non-Smokers, male	Smokers, female	Non-smokers, female
49	41	50	37

Figure 9: The number of respondents out of 50 who indicate that divine cigarette smoke is odorless

Milder	Better taste (1)	Better taste (2)
48	27	21

Figure 10: Number of respondents out of 50 who indicated that the filter gives milder smokes and better taste

Expectorant	Heavy Breath	Vertigo	Fever	unexpected mouth odor	heartburn
14	12	2	2	14	17

Figure 11: Number of respondents stating that the divine cigarette overcoming their chronic problem