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News Release

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Suppression effect of "nanoe®"(*1) charged water particles on pet-related allergens, bacteria, fungi, and viruses have been verified.

Panasonic Corporation has verified that nano-size charged water particles generated by applying a high voltage to water, which is referred to as "Nanoe®", has a suppression effect on pet (dog, cat) related allergens, bacteria, fungi, and viruses. The study was conducted under the supervision of Professor Masahiro Sakaguchi, Faculty of Veterinary Medicine, Azabu University.

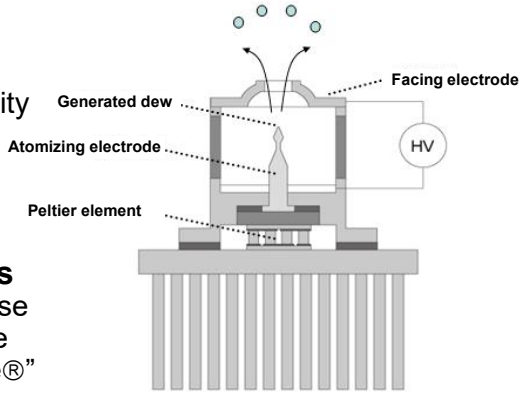
In the so-called pet-boom, 34.3%(*2) of all households have a pet. Dogs comprise the largest percentage at 58.6%(*3), or approximately 12 million dogs, followed by cats at 30.9%(*3), or approximately 10 million cats(*4). Approx. 72%(*5) are kept indoor, sharing the living space with their owners, which increases contact. This has resulted in an increase in animal allergy symptoms caused by pet-related allergens and diseases transmitted from pet to people (pet-related infectious diseases). A great many cases of infectious disease transmitted from pet to pet also has been reported. (*6,7,8)

Panasonic Corporation verified the suppression effect of "nanoe" charged water particles on the pet-derived allergens: Can f 1 (canine-derived), Fel d 1 (feline-derived), three types of bacteria (MRSP (methicillin-resistant staphylococcus pseudintermedius), Bordetella bronchiseptica, and Pasteurella multocida), three types of fungus (Candida albicans, Cryptococcus neoformans, and Malassezia furfur), and five types of viruses (feline coronavirus, canine adenovirus, canine distemper virus, canine parvovirus, and canine herpes virus).

■ Verified test subjects and collaborating laboratories

- Allergens: ITEA Co., Ltd. (Institute of Tokyo Environmental Allergens)
- Bacteria: Associate Professor Yasuo Kataoka, Nippon Medical School, Nippon Veterinary and Life Science University
- Fungi: Associate Professor Takashi Yaguchi, Medical Mycology Research Center (MMRC), Chiba University
- Viruses: Professor Takeru Maeda, Yamaguchi University, Faculty of Agriculture, Veterinary Medicine
  Professor Rikio Kirisawa, Veterinary Medicine, Rakuno Gakuen University

Charged water particles



■ Principle of generating "nanoe" charged water particles

The atomizing electrode is cooled by Peltier elements to condense water out of the atmosphere. A high voltage is applied across the atomizing electrode and the facing electrode to generate "Nanoe®" charged water particles of 5 to 20 nanometers (nm) in size.

*1: Nano-size charged water particles generated by applying a high voltage to water.
*2: Opinion Poll by Cabinet Office, Pet ownership http://www8.cao.go.jp/survey/h22/h22-doubutu/zh/z03.html, (Jul. 4, 2011)
*3. Opinion Poll by Cabinet Office, Types of pets kept by households http://www8.cao.go.jp/survey/h22/h22-doubutu/zh/z05.html, (Jul. 4, 2011)
*4: Japan Pet Food Association, 2010 Survey of dogs and cats kept as pets http://www.petfood.or.jp/data/chart2010/01.html, (Jul. 5, 2011)
*5: Fuji Keizai survey on pet-related market https://www.fuji-keizai.co.jp/market/11036.html, (Jul. 5, 2011)
*6: 2006 Ministry of Health, Labor and Welfare, allergic disease prevention and research promotion, Allergen Q&A
*7: Osaka Prefectural Institute of Public Health, Public Health and Hygiene News No. 27 http://www.iph.pref.osaka.jp/news/vol27/news27.pdf
*8: Animal infectious disease (volume 3) Kindai Shuppan

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■ Results of verification:

Overall supervision: Professor Masahiro Sakaguchi, Department of veterinary medicine, Azabu University

1. Pet-derived allergen

[Description of test]

Pet derived allergens were exposed to "nanoe" charged water particles to verify the virus suppression effects.
Test laboratory: ITEA Co., Ltd. (Institute of Tokyo Environmental Allergy)
Test period: February 2011–June 2011
Test subjects: Can f 1 (Canine-derived allergen), Fel d 1 (Feline-derived allergen)
Test device: Nanoe device
Test method: PP non-woven fabric containing an allergen solution is exposed to "nanoe" charged water particles in a 45-liter box. The allergen substances were then extracted and their density measured using the sandwich ELISA method.

[Test results]

Two types of allergen substances were suppressed within the number of hours indicated below.

Subject		Time (Hr)	Suppression rate
(1)	Can f 1 (Canine derived allergen)	1	99.8% (Below the detection limit)
(2)	Fel d 1 (Feline derived allergen)	2	98.6%

*Value converted by us

2. Pet-related bacteria

[Description of the test]

Three types of pet-related bacteria were exposed to "nanoe" charged water particles to verify the virus suppression effects

- Collaboration with: Associate Professor Yasushi Kataoka, Nippon Medical School, Nippon Veterinary and Life Science University
- Test period: October 2011–January 2012
- Test subjects: MRSP (methicillin-resistant staphylococcus pseudintermedius), Bordetella bronchiseptica, and Pasteurella multocida
- Test device: Nanoe device
- Test method: Gauze containing a bacteria suspension is exposed to "nanoe" charged water particles from a distance of 15 cm for a pre-determined period in a 45-liter box. After exposure, the bacteria are extracted from the gauze and cultured in culture cells, and the viable bacteria are counted.

[Test result]

Over 99 % of each of the three bacteria was suppressed in the number of hours indicated below.

Subject		Time (Hr)	Suppression rate
(1)	MRSP (Methicillinn-resistant staphylococcus pserudintermedius)	2	99.5%
(2)	Bordetella bronchiseptica (Bordetella)	2	99.9% (Below the detection limit)
(3)	Pasteurella multocida (Pasteurella)	1	99.9% (Below the detection limit)

*Value converted by us

■ Results of verification:

3. Pet-related fungi (yeast)

[Description of test]

Three types of pet-related fungi (yeast) were exposed to "nanoe" charged water particles to verify the virus suppression effects

- Collaborated by: Associate Professor Takashi Yaguchi, Medical Mycology Research Center (MMRC), Chiba University
- Test period: October 2011–January 2012
- Test subject: Candida albicans, Cryptococcus neoformans, Malassezia furfur
- Test device: Nanoe device
- Test method: Gauze containing a fungi suspension is exposed to "nanoe" charged water particles from a distance of 15 cm in a 45-liter box for a pre-determined period. After exposure, the fungi were extracted from the gauze, plate diluted, and counted.

[Test results]

Over 99% of each of the three types of fungus (yeast) was suppressed within the number of hours indicated below.

Subject		Time (Hr)	Suppression rate
(1)	Candia albicans (Candida)	2	99.4% (Below the detection limit)
(2)	Cryptococcus neoformans (Cryptococcus)	2	99.8% (Below the detection limit)
(3)	Malassezia furfur (Malassezia)	4	99.7%

*Value converted by us

4. Pet-related viruses

[Description of the test]

Five types of pet-related viruses were exposed to "nanoe" charged water particles to verify the virus suppression effects

- Collaborated by: Professor Takeru Maeda, Yamaguchi University, Faculty of Agriculture, Veterinary Medicine
- Test period: May 2011 to January 2012
- Test subject: Feline coronavirus, Canine adenovirus
- Test method: Gauze containing a virus suspension is exposed to "nanoe" charged water particles from a distance of 15 cm in a 45-liter box for a pre-determined period. After exposure, the viruses are extracted from the gauze and the virus infection value measured
- Collaborated by: Professor Rikio Kirisawa, Veterinary Medicine, Rakuno Gakuen University
- Test period: January 2009–May 2010
- Test subject: Canine Distemper viruses, Canine Parvovirus, Canine Herpes Virus
- Test method: Gauze containing a virus suspension is exposed to "nanoe" charged water particles from a distance of 5 cm in a 45-liter box for a pre-determined period. After exposure, the viruses are extracted from the gauze and virus infection value measured.

[Test result]

Over 99% of each of the five types of virus was suppressed within the number of hours indicated below.

Subject		Time (Hr)	Suppression rate
(1)	Feline Coronavirus	2	99.3%
(2)	Canine Adenovirus	4	99.4%
(3)	Canine Distemper virus	4	99.7% (Below the detection limit)
(4)	Canine Parvovirus	6	99.8%
(5)	Canine Herpes Virus	4	99.5%

*Value converted by us

■ Comment by Professor Sakaguchi, Azabu University

We were able to verify the suppression effect of "nanoe" charged water particles on two types of allergen, three types of bacteria, three types of fungus and five types of virus. It suggests that "nanoe" has the potential to become a new technology for enabling people and pets to live in harmony.

■ Profile of Professor Sakaguchi, Azabu University

Masahiro Sakaguchi: Professor, Faculty of Veterinary Medicine, Azabu University

- History: Graduated from the Faculty of Veterinary Medicine, Osaka Prefectrual University. Completed Doctorate at Tokyo University, Faculty of Agriculture (Doctor of agriculture) Institute of Medical Science, La Jolla Institute for Allergy and Immunology (United States). Research Fellow at the National Institute of Infectious Diseases. Team leader at Rikagaku Kenkyusyo. Current position since 2007.
- Member of the Japanese Society of Allergology, The Japanese Society of Veterinary Science