

## Efficacy of KU Herbal-Extract Lotions Against *Malassezia pachydermatitis*

Narong Chungsamarnyart\*, Srisamai Viriyarampa, Suwanna Thipayarak,  
Julee Pankumnoed and Thanasorn Thipayarak

---

### ABSTRACT

The fungicidal activity of KU herbal-extract lotions was assessed using a broth-dilution method with test tubes containing clinically-isolated *Malassezia pachydermatitis* ( $1.9 \times 10^7$  colonies/ml). The lotions tested were: KU Natural Miticide® and KU herbfungusmite® (crude-extract lotions of *Annona squamosa* L.); KU herbmalacide® and KU Takaikaeng® (crude-extract lotions of *Cymbopogon citratus* Stapf.); KU Takaihom® (crude-extract lotion of *Cymbopogon nardus* Rendle); KU Thongphanchang® (crude-extract lotion of *Rhinacanthus nasutus* Kurz.); and KU Plu® (crude-extract lotion of *Piper betel*). Each test tube sample was shaken for 10 seconds and then subcultured onto slant potato dextrose agar. There was a complete absence of yeast growth on the subcultures from the KU herbal-extract lotions, which indicated that these lotions might act as an effective, commercial fungicide treatment against *M. pachydermatitis*.

**Key words:** KU herbal-extract lotions, *Malassezia pachydermatitis*

### INTRODUCTION

*Malassezia pachydermatitis* is a commensal, lipophilic yeast that is frequently isolated from the external ear canal and from the skin of about 50% of all healthy dogs. The excessive sebum, skin moisture and immunological factors enhance its multiplication and the development of dermatitis. In such circumstances, erythema and pruritus are always present and keratoseborrhoeic disorders may occur including: scaling; crusting; alopecia and greasiness of the hair and skin; and lichen-like skin on the ear pinnae, lips, muzzle, neck, axillae, ventrum, inguinal area, peri-anal area and the forearms, caudal thighs and feet (Reberg and Blakemore, 1999; Muse, 2000). Topical therapy

is often used in combination with or as an alternative to a systemic anti-fungal medication. Some anti-fungal drugs have exhibited hepatotoxicity effects after long-term treatment e.g. ketoconazole (Tilley *et al.*, 2000; Plumb, 2002). Therefore, topically-applied drugs that are safe to apply are in high demand, especially herbal-extracted products. Essential oils extracted from *Cymbopogon citratus* and *C. nardus* have exhibited potent antifungal properties on human and animal microflora (Koba *et al.*, 2003). A 1% concentration of alcohol tincture of Betel leaves was effective against the dermatophytes, *Candida albicans*, *Microsporum gypseum* and *Trichosporon beigellii* (Rahman *et al.*, 2005). KU Natural Miticide developed for sarcoptic mange treatment (Chungsamarnyart *et al.*, 2003) has been shown

---

Faculty of Veterinary Medicine, Kasetsart University, Kamphaeng Sean, Nakhon Pathom 73140. Thailand.

\* Corresponding author, e-mail: fvetnrc@ku.ac.th

to be effective against fungicidal activity by *Microsporum canis*, *M. gypseum*, and *T. mentagrophyte in vitro* (Chungsamarnyart *et al.*, 2006). This study considered the fungicidal activity of the KU herbal-extract lotions for the treatment of *M. pachydermatitis* in dogs.

## MATERIALS AND METHODS

The KU herbal-extract lotions tested in this study were: KU Natural Miticide<sup>®</sup> and KU herbfungusmite<sup>®</sup> (crude-extract lotions of *Annona squamosa* L.); KU herbmalacide<sup>®</sup> and KU Takaikaeng<sup>®</sup> (crude-extract lotions of *Cymbopogon citratus* Stapf.); KU Takaihom<sup>®</sup> (crude-extract lotion of *Cymbopogon nardus* Rendle); KU Thongphanchang<sup>®</sup> (crude-extract lotion of *Rhinacanthus nasutus* Kurz.); and KU Plu<sup>®</sup> (crude-extract lotion of *Piper betel*). The study used the two fold broth-dilution test tube methods of Isaksson *et al.*, 1991, since all samples were derived from commercial crude-extract lotions. Ten tubes of each lotion were diluted by Sabouraud dextrose broth containing clinically-isolated *Malassezia pachydermatitis* ( $1.9 \times 10^7$  colonies/ml), shaken for 10 seconds and then subcultured onto slant potato dextrose agar (0.1 ml/tube). A control group was diluted with sterile distilled water instead. The yeast growth in each subculture tube was observed after one week. Some of the herbal-extract lotions (KU Takaihom<sup>®</sup> and KU Thongphanchang<sup>®</sup>) were clinically applied on a few dogs with skin having erythema and pruritus caused by *Malassezia*, by wiping the lesion with lotion-soaked cotton.

## RESULTS

The subcultures of the *M. pachydermatitis* showed normal growth in all ten tubes in the control (Figure 1a). However, the subcultures showed no yeast growth (Figures. 1 b-h) in all ten tubes for: KU Natural Miticide<sup>®</sup>

and KU herbfungusmite<sup>®</sup> (crude-extract lotions of *Annona squamosa* L.); KU herbmalacide<sup>®</sup> and KU Takaikaeng<sup>®</sup> (crude-extract lotions of *Cymbopogon citratus* Stapf.); KU Takaihom<sup>®</sup> (crude-extract lotion of *Cymbopogon nardus* Rendle); KU Thongphanchang<sup>®</sup> (crude-extract lotion of *Rhinacanthus nasutus* Kurz.); and KU Plu<sup>®</sup> (crude-extract lotion of *Piper betel*).

The clinical-application results from a once-a-day application of two KU herbal-extract lotions, KU Takaihom<sup>®</sup> and KU Thongphanchang<sup>®</sup>, showed no erythema and no scaling of the skin, with the skin appearing normal after 2 and 4-5 wks of application, respectively. (Figures 2, 3 and 4).

## DISCUSSION

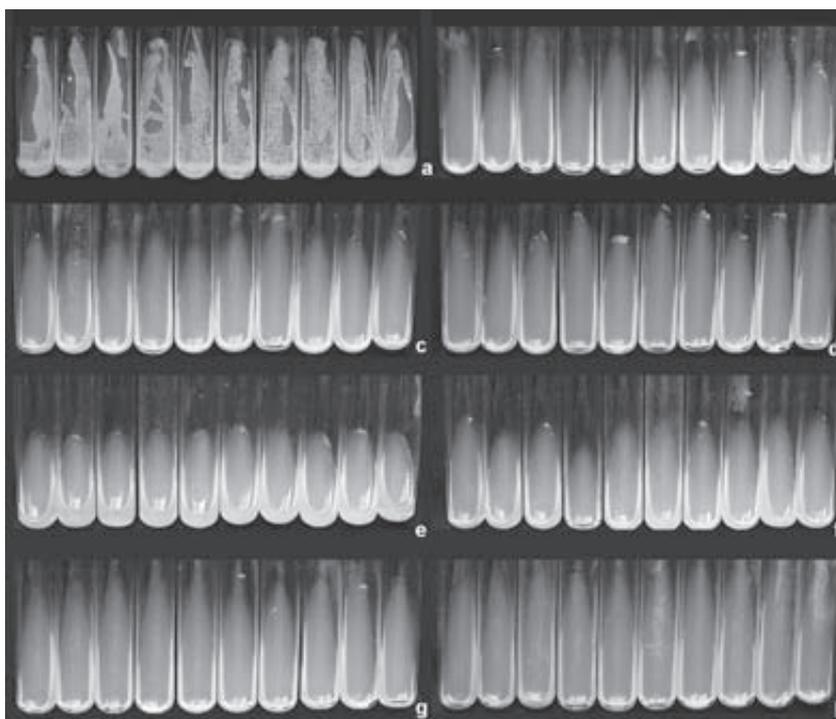
The subculture of the *M. pachydermatitis* did not grow after half-diluting and contacting for 10 seconds with any of the lotions: KU Natural Miticide<sup>®</sup> and KU herbfungusmite<sup>®</sup> (crude-extract lotions of *Annona squamosa* L.); KU herbmalacide<sup>®</sup> and KU Takaikaeng<sup>®</sup> (crude-extract lotions of *Cymbopogon citratus* Stapf.); KU Takaihom<sup>®</sup> (crude-extract lotion of *Cymbopogon nardus* Rendle); KU Thongphanchang<sup>®</sup> (crude-extract lotion of *Rhinacanthus nasutus* Kurz.); and KU Plu<sup>®</sup> (crude-extract lotion of *Piper betel*). These results indicated that the KU herbal lotions were 100% effective at killing *M. pachydermatitis* within 10 seconds. Thus the lotions may provide an alternative topical application drug for the treatment of *Malassezia* dermatitis in dogs by wiping the lesion with the lotion-soaked cotton, subject to further and more extensive clinical trials.

The active substances of these KU herbal lotions are unknown, since the lotions are based on crude extracts. However, some plants had been reported to contain antifungal substances, such as the new antifungal naphthopyran derivative in *Rhinacanthus nasutus* Kurz (Kodama *et al.*, 1993). This plant provides the extract used in the KU

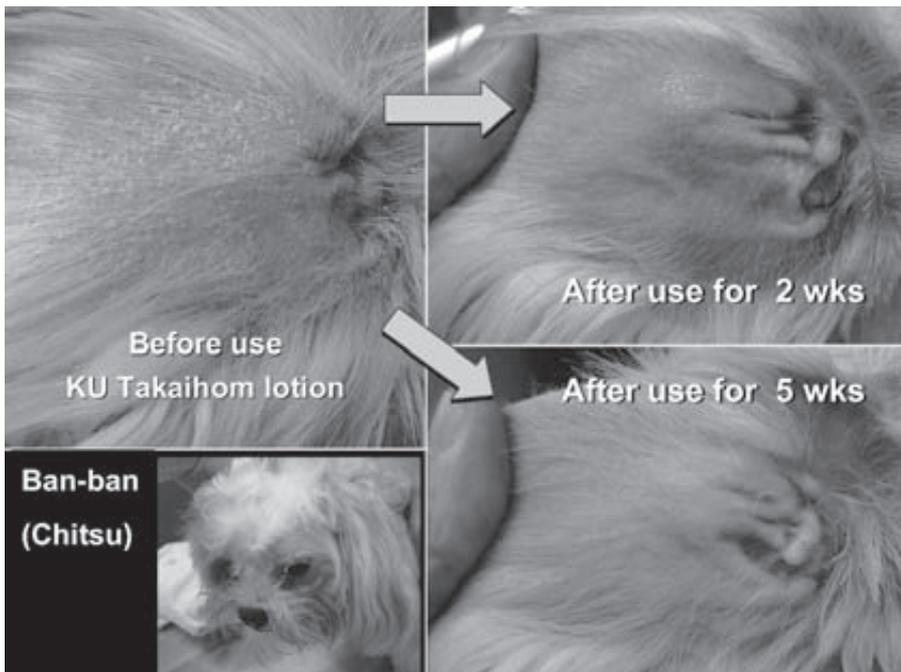
Thongphanchang<sup>®</sup> lotion. KU Natural Miticide<sup>®</sup> and KU herbfungusmite<sup>®</sup> are based on extracts from *Annona squamosa*. It has been reported that the antifungal substance from the *Annona squamosa*, Anonaine, is effective against *Candida albicans* (Oliver-Bever, 1986). The KU Takaikaeng<sup>®</sup> and the KU Taikaihoh<sup>®</sup> lotions use *Cymbopogon. citratus* and *C. nardus* oils, respectively. These two essential oils exhibited potent antifungal properties on human and animal microflora (Koba *et al.*, 2003). The KU Plu lotion is based on the crude extract from *Piper betel* which has been reported to have effective antifungal activity in a 1% alcohol tincture against *Candida albicans*, *Microsporium gypseum* and *Trichosporon beigelii* (Rahman *et al.*, 2005).

## CONCLUSION

The KU lotions used in this study might be suitable as alternative topical application drugs for the treatment of *Malassezia dermatitis* in dogs by wiping the lesion with the lotion-soaked cotton once a day for 2-5 wks. The KU lotions used were: KU Natural Miticide<sup>®</sup> and KU herbfungusmite<sup>®</sup> (crude-extract lotions of *Annona squamosa*); KU herbmalacide<sup>®</sup> and KU Takaikaeng<sup>®</sup> (crude-extract lotions of *Cymbopogon citratus* Stapf); KU Takaihoh<sup>®</sup> (crude-extract lotion of *Cymbopogon nardus* Rendle.); KU Thongphanchang<sup>®</sup> (crude-extract lotion of *Rhinacanthus nasutus* Kurz.); and KU Plu<sup>®</sup> (crude-extract lotion of *Piper betel*).

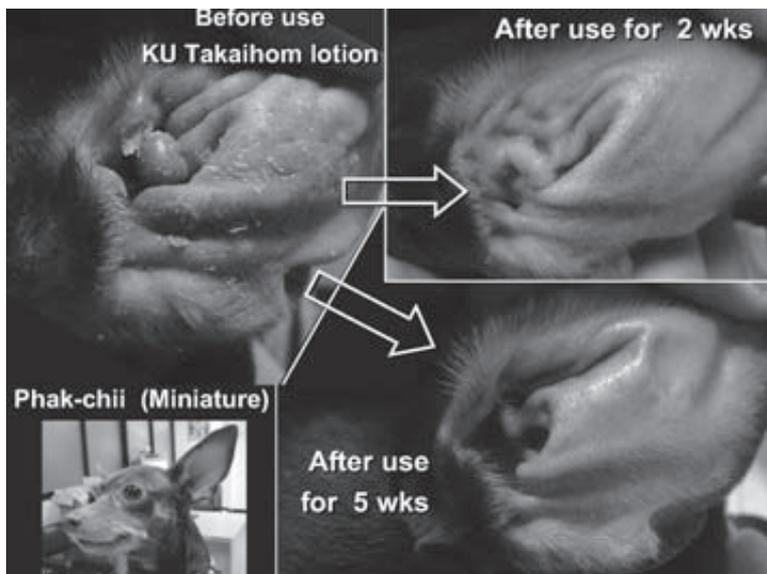


**Figure 1** The subculture of *M. pachydermatitis* from the sterile distilled water and herbal-extract lotions mixed-tubes, showing normal yeast growth in the sterile water diluted-tubes (Figure 1a) and no yeast growth in all ten tubes of each of the lotions: KU Natural Miticide<sup>®</sup>, KU herbfungusmite<sup>®</sup>, KU herbmalacide<sup>®</sup>, KU Takaikaeng<sup>®</sup>, KU Takaihoh<sup>®</sup>, KU Thongphanchang<sup>®</sup> and KU Plu, respectively (Figures b-h).

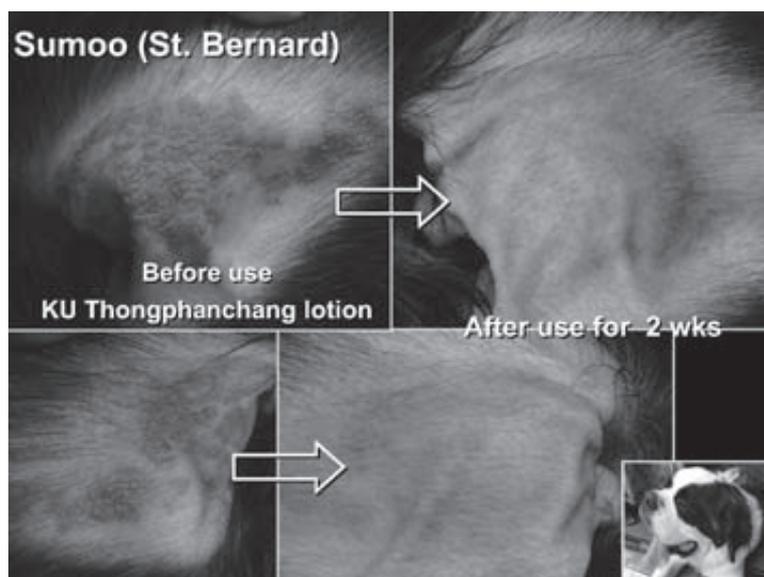


**ORIGINAL**

**Figure 2** Photographs of the right medial pinna showing erythema and scaling of the skin before using the KU Takaihom lotion and skin returning to normal after 2-5 wks of a once-a-day application by wiping the skin with the lotion-soaked cotton.



**Figure 3** Photographs of the left medial pinna showing erythema, edema, greasiness and scaling on the skin before using the KU Takaihom lotion and the skin returning to normal after 2-5 wks of a once-a-day application by wiping the skin with the lotion-soaked cotton.



**Figure 4** Photographs of the left and right medial pinna showing erythema, edema and crusting skin before using the KU Thongphanchang lotion and the skin returning to normal after 2 wks of a once-a-day application by wiping the skin with the lotion-soaked cotton.

#### ACKNOWLEDGEMENTS

The authors wish to thank the Department of Veterinary Public Health and Diagnostic Services for their support in the provision of research facilities.

#### LITERATURE CITED

- Chungsamarnyart, N., W. Jansawan, T. Tassanawat and T. Thipayarak. 2003. *In vivo* efficacy of herbal miticide lotion; KU Natural Miticide® against sarcoptic mange of dogs and cats. **Cong. Proc. World Small Ani. Vet. Assoc.** p 723.
- Chungsamarnyart, N., S. Viriyarampa, S. Thipayarak, T. Thipayarak and T. Tassanawat. 2006. *In vitro* fungicidal activity of herbal extracted Lotion, KU Natural Miticide® on the dermatophytes of dogs and cats. **Kasetsart J. (Nat. Sci.)**, Suppl. 40: 290-297.
- Isaksson, I., Hanberger, H., Maller, R., Nilsson, L.E. and M. Nilsson .1991. Synergic post-antibiotic effect of amikacin in combination with  $\beta$ lactam antibiotic on gram-negative bacteria. **J. Antimicrob. Chemotherapy.** 28: 25-34.
- Koba, K., K. Sanda, C. Raynaud, D. Mandin, J. Millet and J.P. Chaumont. 2003. Antimicrobial activity of essential oils of *Cymbopogon citratus* L. (DC) Stapf., *C. nardus* L. Rendle and *C. schoenanthus* L. **J. Mycol. Méd.** 13: 175-180.
- Kodama, O., H. Ichikawa, T. Akatsuka, V. Santisopari, A. Kato and Y. Hayashi. 1993. Isolation and identification of an antifungal naphthopyran derivative from *Rhinacanthus nasutus*. **J. Nat. Prod.** 56(2): 292-294.
- Oliver-Bever, B. 1986. **Medicinal plants in tropical West Africa.** Cambridge University Press, Cambridge, UK.
- Plumb, D.C. 2002. **Veterinary Drug Handbook.** 4<sup>th</sup>ed. Iowa State Press. A Blackwell Publishing Company.

- Muse, R. 2000. *Malassezia* dermatitis, pp 574-577. In J. D. Bonagura (ed.). **Kirk's Current Veterinary Therapy XIII Small Animal Practice**. W.B. Saunders, Philadelphia.
- Rahman, I., Dutta, B. K. and T.K. Das. 2005. Susceptibility of pathogenic fungi to *Piper betel* extracts, an *in vitro* evaluation. **Env. Ecol.** 23: 8-11.
- Reberg, B.S. and J.C. Blakemore. 1999. *Malassezia* dermatitis in dogs. **Vet. Med.** 94: 613-622.
- Tilley, L.P. and W.K. Francis and J. Smith. 2000. **The 5-minute veterinary consult canine and feline**. 2<sup>nd</sup> USA. pp. 610-615.