

## Aromatherapy – Nothing to Sneeze At

Say “lavender aromatherapy” and one can evoke images of crystals, candlelight, and New Age practitioners – a far cry from mainstream medicine. However, medicinal usage of lavender markedly predates modern medical approaches, dating back to ancient Greece, Persia, and Rome.<sup>1</sup> Lavender has had applications that transcend the calming properties most commonly associated with it. For example, ancient Egyptians used lavender in the mummification process, wherein they wrapped bodies in strips of linen soaked in lavender oil and asphalt, which then produced a hard shell around their contents after drying in the sun.

Lavender research has focused largely on one species, called *Lavandula angustifolia*, also known as “true” lavender, English lavender, *Lavandula officinalis*, or *Lavandula vera*.<sup>2 3</sup> However, other types of lavender may be less expensive because each plant provides more oil. Spike lavender grows in Spain. Lavandin, a hybrid made by crossing spike lavender with true lavender, yields double the oil of true lavender, and grows at lower altitude, making it easier to produce.

Lavender has been generally regarded as safe (GRAS) at recommended oral and topical doses. However, a recently published study in the *New England Journal of Medicine* drew a link in boys between prepubertal gynecomastia and repeated topical applications of either lavender oil, tea tree oil, or both.<sup>4</sup> The authors found that both lavender and tea tree oils possess weak estrogenic or antiandrogenic activity. They suggested that these actions could have disturbed the balance in signals operating on estrogenic and androgenic pathways. Nonetheless, lavender appears in a wide range of foods consumed by humans, including baked goods, jellies, and teas. Aside from contact allergies, the main other safety concern noted with lavender pertains to its potentially additive effects with other central nervous system depressants such as barbiturates or chloral hydrate.<sup>5</sup>

Dogs and other animals who rely heavily on their sense of smell fall into the “macrosmatic” category; members of this group possess far more well-developed olfactory systems than their microsmatic counterparts, such as human beings. In either case, odorants such as lavender oil diffuse into the atmosphere and land

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<sup>1</sup> Basch E, Foppa I, Liebowitz R, et al. Lavender (*Lavandula angustifolia* Miller). Monograph from Natural Standard. *J Herbal Pharmacotherapy*. 2004;4(2):63-78.

<sup>2</sup> Clarke S. *Essential Chemistry for Safe Aromatherapy*. Edinburgh: Churchill Livingstone, 2002. Pp. 131-136.

<sup>3</sup> Basch E, Foppa I, Liebowitz R, et al. Lavender (*Lavandula angustifolia* Miller). Monograph from Natural Standard. *J Herbal Pharmacotherapy*. 2004;4(2):63-78.

<sup>4</sup> Henley DV, Lipson N, Korach KS, et al. Prepubertal gynecomastia linked to lavender and tea tree oils. *NEJM*. 2001;356(5):479-485.

<sup>5</sup> Basch E, Foppa I, Liebowitz R, et al. Lavender (*Lavandula angustifolia* Miller). Monograph from Natural Standard. *J Herbal Pharmacotherapy*. 2004;4(2):63-78.

on the olfactory epithelium – a collection of cells that lines the nasal cavity. These chemicals diffuse across the mucus layer to stimulate chemosensitive cilia from olfactory receptor neurons. The slowly conducting axons collect into bundles called olfactory fila that pass through the cribriform plate and terminate in the olfactory bulb. Through a series of relays, olfactory information influences several brain structures associated with attention, learning, memory, emotions, and instinctual behaviors, including reproduction. Sites such as 1) the hypothalamus, associated with autonomic and affective states; 2) the hippocampus and amygdala, linked to learning, emotions, and memory; and 3) the thalamus, a critical sensory processing center, all participate in the processing of olfactory information. As such, the neurophysiologic connection between odorants and centers becomes clear, making the claims concerning aromatherapy's actions less far-fetched.

Evidence points most strongly to inhaled lavender's anxiolytic effects.<sup>6</sup> This effect may be due to potentiation of the inhibitory neurotransmitter GABA as well as a dose-related binding to glutamate, one of the main excitatory neurotransmitters in the central nervous system.<sup>7</sup> Lavender induces sleep, reduces perineal discomfort following childbirth, relieves intestinal pain, and offers some antimicrobial activity.<sup>8</sup>

For veterinary usage, studies done in the 1920's examined the influence of diluted lavender oil on gut motility, demonstrating that lavender oil infusions increased intestinal tone, peristalsis, and rhythmic contractions.<sup>9 10</sup> Recent evidence from the Canine Behaviour Center in the School of Psychology at Queen's University in Belfast indicated that lavender oil, diffused into the atmosphere, produced significant effects on dogs' behavior. First, a 2005 article in *Applied Animal Behaviour Science* evaluated the effects of four essential oils – lavender, chamomile, rosemary, and peppermint, on the behavior of fifty-five dogs housed in a rescue shelter.<sup>11</sup> Workers diffused the oil into the environment by means of oil burners placed out of the dogs' reach at each end of their individual enclosures. Each day, for five consecutive days, the dogs receive exposure to one of the oils for four hours. Researchers imposed a two-day washout period between each experimental condition, which occurred in the

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<sup>6</sup> Basch E, Foppa I, Liebowitz R, et al. Lavender (*Lavandula angustifolia* Miller). Monograph from Natural Standard. *J Herbal Pharmacotherapy*. 2004;4(2):63-78.

<sup>7</sup> Basch E, Foppa I, Liebowitz R, et al. Lavender (*Lavandula angustifolia* Miller). Monograph from Natural Standard. *J Herbal Pharmacotherapy*. 2004;4(2):63-78.

<sup>8</sup> Basch E, Foppa I, Liebowitz R, et al. Lavender (*Lavandula angustifolia* Miller). Monograph from Natural Standard. *J Herbal Pharmacotherapy*. 2004;4(2):63-78.

<sup>9</sup> Plant OH. The effect of carminative volatile oils on the muscular movements of the intestine. *J Pharm Exp Ther*. 1920;16:311-325.

<sup>10</sup> Plant OH and Miller GH. Effects of carminative volatile oils on the muscular activity of the stomach and colon. *J Pharm Exp Ther*. 1926;27:149-164.

<sup>11</sup> Graham L, Wells DL, and Hepper PG. The influence of olfactory stimulation on the behaviour of dogs housed in a rescue shelter. *Applied Animal Behaviour Science*. 2005;91:143-153.

following order: control (no added odor), lavender, peppermint, chamomile, and rosemary. They recorded behaviors indicating activity level, body position, and vocalizations on days one, three, and five. The eight specific parameters chosen had been linked previously to indicators of canine welfare and positive public perception of sheltered dogs. Results indicated that dogs exposed to lavender or chamomile spent less time barking and moving. Atmospheric peppermint or rosemary created the opposite effect by encouraging significantly more vocalizing and physical activity. From an animal welfare perspective, then, diffusing essential oils into the atmosphere of sheltered dogs may help the inhabitants by reducing noise stress and providing overall sedation. In turn, adoption rates may rise, although this remains to be proven, because the animals are exhibiting behaviors that the public views more favorably. Furthermore, visiting a shelter wherein the humans, too, inhale calming aromas may make for a more pleasant experience for all.

The second study, published in the September 15, 2006 issue of the *Journal of the American Veterinary Medical Association* reported that ambient odor of lavender may be beneficial in calming dogs susceptible to travel-induced excitement.<sup>12</sup> That is, dogs who would otherwise bark and exhibit restlessness during car rides calmed significantly after exposure to 5 milliliters of lavender oil sprayed onto a flannel cloth. Those inhaling the ambient lavender spent more time sitting, resting, and vocalizing than did dogs in the control group who received no aromatherapy. In contrast to the aforementioned study that took place in animal shelters, though, one must take into account the effects of lavender on the driver. That is, while diffused lavender may make traveling dogs less excited, it may affect the driver's concentration and alertness, unless they smelled a different odor – peppermint, for example.

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<sup>12</sup> Wells DL. Aromatherapy for travel-induced excitement in dogs. *JAVMA*. 2006;229(6):964-967.