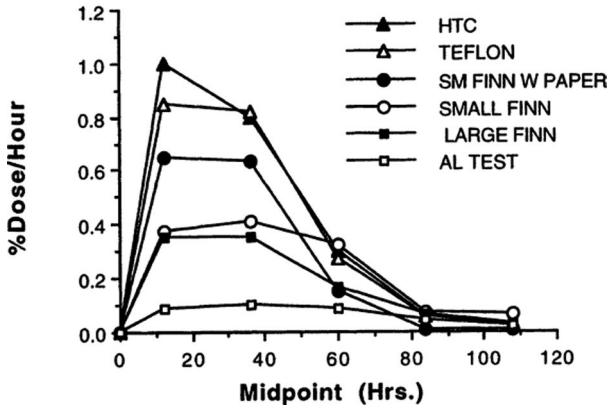

FIGURE 15.1 *In vivo* percutaneous absorption of PPDA (2 mg/mm^2) following a 48-hour exposure on the dorsal lumbar region of guinea pigs. *Abbreviations*: *HTC*, Hill Top chamber; *Teflon*, sheet of Teflon; *sm Finn w paper*, small Finn chamber with paper insert included; *small Finn*, small Finn chamber with paper insert removed; *large Finn*, large Finn chamber with paper insert removed. (Redrawn from Reference 18.)

evaporated from the skin surface. The extent of absorption following single-dose administration was determined using ^{14}C radiotracer methodology. The fragrance materials were well absorbed through monkey skin. Plastic wrap occlusion of the application site resulted in large increases in absorption (Table 15.2). The authors also presented *in vitro* data documenting the significant increase in percutaneous absorption of these chemicals under occluded compared to nonprotected conditions, that is, left open to the air.

Investigation of the effect of occlusion on the percutaneous absorption of six additional volatile compounds (benzyl acetate, benzamide, benzoin, benzophenone, benzyl benzoate, and benzyl alcohol) was conducted using the same *in vivo* methodology. These studies included occlusion of the site of application with a glass cylinder secured to the skin by silicone glue and capped with Parafilm, occlusion with plastic wrap, and nonprotected conditions (20). As shown in Table 15.3, occlusion in general enhances the percutaneous absorption of these compounds. However, differences in percutaneous absorption were observed between plastic wrap and "glass chamber" occlusive conditions. The absorption of benzoin and that of benzyl acetate were lower under plastic wrap compared to the

TABLE 15.2
***In Vivo* Percutaneous Absorption of Fragrances in Monkeys**

	Percent Dose Absorbed[a]	
	Nonprotected	**Plastic Wrap Occlusion**
Cinnamyl anthranilate	26.1 (4.6)	39.0 (5.6)
Safrole	4.1 (1.6)	13.3 (4.6)
Cinnamic alcohol	25.4 (4.4)	74.6 (14.4)
Cinnamic acid	38.6 (16.6)	83.9 (5.4)

Source: Data from Reference 19.

Note: Values were corrected for incomplete renal elimination. Mean ± SD ($N = 4$).

[a] Single 4-µg/cm^2 dose with a 24-hour exposure prior to soap and water washing.