

TICK REPELLENT

Preparations

Six complete recipes for adults

QUICK REFERENCE

Measurement	Equivalent
4 fl oz	120 mL
4 oz by weight	≈ 113 g
1 teaspoon	5 mL
1 tablespoon	15 mL
20 – 26 drops	≈ 1 mL (standard EO dropper)

Product One: Skin-Safe Field Spray

4 fl oz (120 mL) · Water-based · For exposed skin

INGREDIENTS

Ingredient	Amount	Notes
Geranium essential oil (<i>Pelargonium spp.</i>)	16 drops	Primary geraniol source
Citronella essential oil (<i>Cymbopogon winterianus</i>)	12 drops	Spatial and contact repellency
Lemon eucalyptus essential oil (<i>Corymbia citriodora</i>)	10 drops	High citronellal; related to CDC-recommended PMD
Patchouli essential oil (<i>Pogostemon cablin</i>)	7 drops	On-skin repellency; sesquiterpene fixative
Amyris essential oil (<i>Amyris balsamifera</i>)	9 drops	Fixative; three-species acaricidal evidence
Spearmint essential oil (<i>Mentha spicata</i>)	6 drops	Field-validated; attachment prevention
Total essential oil	60 drops · 3 mL	2.5% dilution
Sunflower Solubilizer (<i>Sodium Sunflowerseedate</i>)	6 mL	Approx. 1¼ tsp — added to water phase first
190-proof alcohol (<i>optional</i>)	10 mL	Approx. 2 tsp — extends shelf life
Distilled water or lavender hydrosol	101 mL	Approx. 6¾ tbsps — fill to 120 mL

HOW TO MAKE IT

1. Add the Sunflower Solubilizer to your distilled water or hydrosol and stir until fully dissolved. This solubilizer is water-soluble — it goes into the water phase first, not with the oils.
2. Add alcohol to the water mixture if using, and stir.
3. Combine all essential oils in the spray bottle.
4. Slowly pour the water mixture into the spray bottle over the oils, cap, and shake vigorously for 30 seconds.
5. Label with contents and date. Shake before every use.

The formula may appear slightly hazy rather than crystal clear — this is normal and does not affect performance. Make a small test batch first. If oil droplets are visible after shaking, increase Sunflower Solubilizer to 8 mL and reduce water by 2 mL.

HOW TO USE IT

Apply to all exposed skin: arms, legs, ankles, back of the neck. Avoid eyes and mucous membranes. Reapply every 60–90 minutes, or sooner in heat or with heavy perspiration. For best results, apply to both skin and clothing.

Shelf life: 3–4 weeks at room temperature; up to 8 weeks refrigerated. Discard if scent changes or formula becomes unusually cloudy.

Product Two: Clothing & Gear Spray

4 fl oz (120 mL) · Alcohol-based · For fabric only — NOT for skin

⚠ Do not apply to skin. The phenolic oil concentration is appropriate for fabric, not for repeated dermal contact. Keep away from face when spraying.

INGREDIENTS

Ingredient	Amount	Notes
Clove bud essential oil (<i>Syzygium aromaticum</i>)	18 drops	Eugenol pathway; contact repellency; acaricidal
Citronella essential oil (<i>Cymbopogon winterianus</i>)	24 drops	Aldehyde pathway; spatial repellency; documented longevity
Palmarosa essential oil (<i>Cymbopogon martinii</i>)	20 drops	Geraniol pathway; monoterpene alcohol repellency
Spearmint essential oil (<i>Mentha spicata</i>)	49 drops	Lead active; strongest field evidence
Virginia cedarwood essential oil (<i>Juniperus virginiana</i>)	17 drops	Fixative; lab-validated acaricidal
Amyris essential oil (<i>Amyris balsamifera</i>)	11 drops	Fixative; multi-species repellency
Total essential oil	139 drops · ≈7 mL	≈6% concentration
190-proof alcohol	113 mL	Approx. 7½ tbsp — base, dispersant, preservative

HOW TO MAKE IT

1. Combine all essential oils in the spray bottle.
2. Add alcohol, cap, and shake vigorously for 30 seconds. Oils will fully disperse — no dispersant needed.
3. Label with contents, date, and "CLOTHING ONLY — NOT FOR SKIN."

HOW TO USE IT

Spray onto boots, trouser hems, cuffs, and collar. Hold bottle 6–8 inches from fabric. Allow to dry 10–15 minutes before wearing. Reapply after 4–6 hours, after rain, or after fabric has been wetted through perspiration. Clothing may be pre-treated the evening before extended outdoor use — repellency holds with no significant decline over 24 hours.

Shelf life: 12 months. Alcohol base is self-preserving. Store in a cool, dark location.

Product Three: Light Body Oil

4 fl oz (120 mL) · Oil-based · For skin

ESSENTIAL OILS — 70 DROPS TOTAL · 3% DILUTION

Essential Oil	Amount	Botanical Name
Juniper berry	17 drops	<i>Juniperus communis</i>
Palmarosa	15 drops	<i>Cymbopogon martinii</i>
Lavender	13 drops	<i>Lavandula angustifolia</i>
Lemon eucalyptus	11 drops	<i>Corymbia citriodora</i>
Patchouli	14 drops	<i>Pogostemon cablin</i>
Total	70 drops · 3.5 mL	

CARRIER BASE — 116.5 ML TOTAL

Carrier	Amount	Notes
Joboba (<i>Simmondsia chinensis</i>)	70 mL	Fast-absorbing liquid wax ester; very stable
Fractionated coconut oil	29 mL	Light, non-greasy, non-comedogenic
Babassu oil (<i>Attalea speciosa</i>)	14 mL	Lauric acid source; documented carrier repellency
Neem oil (<i>Azadirachta indica</i>)	3.5 mL	Acaricidal support — use this amount

HOW TO MAKE IT

1. Combine all carrier oils in the bottle. No heat needed — all are liquid at room temperature.
2. Swirl or gently roll to mix.
3. Add all essential oils, cap, and invert several times to incorporate fully.
4. Label with contents and date.

HOW TO USE IT

Apply a thin, even film to exposed skin — arms, legs, neck, ankles. A little goes a long way. Reapply every 60–90 minutes in tick-prone areas, or after swimming or heavy perspiration.

Shelf life: 10–12 months. Store away from heat and direct light. Refrigerate to extend.

Product Four: Protective Outdoor Balm

4 oz · 113 g · Solid balm · For skin

ESSENTIAL OIL BLEND — 70 DROPS · 3% DILUTION

Essential Oil	Amount	Botanical Name
Geranium	19 drops	<i>Pelargonium spp.</i>
Citronella	14 drops	<i>Cymbopogon winterianus</i>
Lemon eucalyptus	11 drops	<i>Corymbia citriodora</i>
Patchouli	8 drops	<i>Pogostemon cablin</i>
Amyris	11 drops	<i>Amyris balsamifera</i>
Spearmint	7 drops	<i>Mentha spicata</i>
Total	70 drops · ≈ 3.5 g	

BALM BASE — 109.5 G TOTAL

Ingredient	Amount	Notes
Beeswax	9 g	Structure; water resistance; slows EO evaporation
Unrefined shea butter (<i>Vitellaria paradoxa</i>)	49 g	Emollient base; anti-inflammatory
Jojoba (<i>Simmondsia chinensis</i>)	44 g	Skin-compatible; very stable
Neem oil (<i>Azadirachta indica</i>)	7 g	Acaricidal support

HOW TO MAKE IT

1. Melt beeswax in a bain-marie over low heat.
2. Add shea butter; stir until fully melted. Remove from heat.
3. Add jojoba and neem. Stir to combine.
4. Cool to approximately 40°C (104°F) — warm to the touch, not hot. This step is critical: adding essential oils to a very hot base causes the more volatile compounds to evaporate before the balm sets.
5. Add all essential oils. Stir quickly and thoroughly before the base begins to thicken.
6. Pour immediately into tins or push-up tubes.
7. Allow to set undisturbed at room temperature for 2–4 hours. Do not refrigerate during setting — shea butter can become grainy if cooled too quickly.
8. Cap and label with contents and date.

HOW TO USE IT

Apply a thin layer to exposed skin — ankles, lower legs, wrists, back of the neck, and hairline. Reapply every two hours, or after swimming or heavy perspiration.

Shelf life: 12–14 months. Store in a cool location away from direct sun.

Product Five: Cooling Aloe Vera Gel

4 oz · 120 g · Water-based gel · For skin

INGREDIENTS

Ingredient	Amount	Notes
Palmarosa essential oil (<i>Cymbopogon martinii</i>)	12 drops	High geraniol; lighter than geranium
Lemon eucalyptus essential oil (<i>Corymbia citriodora</i>)	10 drops	High citronellal; related to CDC-recommended PMD
Lavender essential oil (<i>Lavandula angustifolia</i>)	10 drops	Skin-compatible; spatial repellency
Patchouli essential oil (<i>Pogostemon cablin</i>)	9 drops	On-skin repellency; fixative
Spearmint essential oil (<i>Mentha spicata</i>)	7 drops	Field-validated; cooling quality
Total essential oil	48 drops · ≈ 2.4 g	2% dilution
Sunflower Solubilizer (<i>Sodium Sunflowerseedate</i>)	5 g	Approx. 1 tsp — added to aloe first
Aloe vera jelly	113 g	Approx. 7½ tbsp — use jelly, not thin gel

HOW TO MAKE IT

1. Spoon the aloe vera jelly into a bowl. Add the Sunflower Solubilizer directly to the aloe and fold in until evenly distributed — it disperses into the gel phase before the oils are added.
2. Combine all essential oils in a small, separate bowl.
3. Add the oil mixture to the aloe-and-solubilizer base in small amounts, folding in gently after each addition. Avoid vigorous stirring, which can break down gel viscosity.
4. Transfer to a jar or pump bottle, cap, and label with contents and date.

Make a small test batch first. If oils are not fully dispersing into the gel, increase Sunflower Solubilizer to 7 g and reduce aloe by 2 g.

HOW TO USE IT

Apply to exposed skin wherever you would normally reach for a lotion. Reapply every 45–60 minutes — aqueous and gel bases evaporate faster than oil bases. Keep refrigerated between uses for best shelf life and a cooling effect on application.

Shelf life: 2–3 weeks at room temperature; up to 6 weeks refrigerated. Make in small batches. Discard if scent changes or texture breaks down.

Product Six: Vegan Protective Salve

4 oz · 113 g · Solid salve · Candelilla-based · For skin

ESSENTIAL OIL BLEND — 70 DROPS · 3% DILUTION

Essential Oil	Amount	Botanical Name
Geranium	19 drops	<i>Pelargonium spp.</i>
Citronella	14 drops	<i>Cymbopogon winterianus</i>
Lemon eucalyptus	11 drops	<i>Corymbia citriodora</i>
Patchouli	8 drops	<i>Pogostemon cablin</i>
Amyris	11 drops	<i>Amyris balsamifera</i>
Spearmint	7 drops	<i>Mentha spicata</i>
Total	70 drops · ≈ 3.5 g	

SALVE BASE — 109.5 G TOTAL · FULLY PLANT-DERIVED

Ingredient	Amount	Notes
Candelilla wax (<i>Euphorbia cerifera</i>)	5 g	Vegan wax — approx. half the quantity of beeswax
Unrefined shea butter (<i>Vitellaria paradoxa</i>)	50 g	Emollient base; anti-inflammatory
Joboba (<i>Simmondsia chinensis</i>)	45 g	Stable liquid wax ester; skin-compatible
Black cumin seed oil (<i>Nigella sativa</i>)	6 g	Documented tick repellent carrier activity
Neem oil (<i>Azadirachta indica</i>)	3.5 g	Acaricidal support; reduced for aroma balance

HOW TO MAKE IT

1. Melt candelilla wax in a bain-marie over low heat. It melts at a higher temperature than beeswax — keep heat gentle and be patient.
2. Add shea butter; stir until fully melted. Remove from heat.
3. Add jojoba, black cumin seed oil, and neem. Stir to combine.
4. Cool to approximately 40–45°C. Candelilla sets more quickly than beeswax — watch the temperature closely.
5. Add all essential oils, stir quickly and thoroughly, and pour immediately into tins or push-up tubes.
6. Allow to set undisturbed at room temperature for 2–4 hours. Do not refrigerate during setting.
7. Cap and label with contents and date.

Note on texture: candelilla wax produces a slightly harder, less creamy set than beeswax with a subtle waxy finish on skin. Both are normal.

HOW TO USE IT

Apply a thin layer to the ankles, lower legs, wrists, the back of the neck, and the hairline. Reapply every two hours, or after swimming or heavy perspiration.

Shelf life: 12–14 months. Store in a cool location away from direct sun.

Which Preparation Is Right for You?

The most effective approach combines a clothing spray with a skin preparation.

Situation	Best Choice
Quick outdoor tasks; easy reapplication	Product One — Skin Spray
Full day outdoors, hiking, farm work	Product Four — Balm or Product Six — Vegan Salve
Hot weather; large skin coverage area	Product Three — Body Oil
Hot weather; sensitive or post-sun skin	Product Five — Aloe Gel
Fully plant-based preparation	Product Six — Vegan Salve
Treating clothes, boots, and gear	Product Two — Clothing Spray
Maximum coverage (recommended approach)	Product Two on clothing + any skin preparation

*All recipes are original formulations developed by the School for Aromatic Studies.
For adult use only. For children, consult the age-specific safety guide.*