

## Outdoor Protection for Everyday Living

Research has demonstrated NootkaShield™ nootkatone can repel many of the mosquitoes and ticks that transmit diseases.

### Why the need?

The number of people affected by diseases spread by mosquitoes and ticks is increasing. The United States Centers for Disease Control and Prevention (CDC) has determined vector-borne disease cases (diseases transmitted by mosquitoes, ticks, fleas, etc.) doubled from 2004 to 2018.<sup>1</sup>



## A new approach for protection against insects

Mosquitoes and ticks are not only annoying when they disrupt outdoor activities, they also can transmit diseases that seriously harm human health. The news is full of reports of Lyme disease, West Nile virus, Zika, and others. Killing mosquitoes and ticks is a critical part of keeping people and pets safe from disease, but these pests are becoming resistant to killing by widely-used pesticides.

NootkaShield contains nootkatone, a naturally-occurring compound in various plants, including grapefruit, Alaskan yellow cedar, and some grasses and herbs. Evolva has developed a proprietary method to reliably produce nootkatone in large quantities without the necessity of cutting down trees or extraction from fruit.

### Nootkatone is a powerful new tool against pesticide-resistance

Nootkatone was tested by the CDC against strains of *Anopheles* mosquitoes known to be resistant against widely-used pyrethroid, carbamate, and organophosphate pesticides. These mosquitoes required 16 to 5000 times more of the existing pesticides for effective killing than a control strain, but nootkatone killed all resistant strains using less than twice as much material as for the control strain.<sup>2</sup>

### Nootkatone is powerful against ticks that transmit Lyme disease

The CDC has demonstrated that nootkatone is a highly effective agent against the ticks that transmit Lyme disease and a variety of other insects including nuisance pests.<sup>3</sup>

### Nootkatone is highly active against other types of pests

Laboratory studies carried out by third party testing labs have shown that nootkatone is effective in killing several other pest species, including Argentine ants, fire ants, biting midges, and dust mites.<sup>4</sup>



## NootkaShield properties:

- Purity  $\geq$  99%
- EPA Reg. No.: 91873-1
- Molecular weight: 218.34 g/mol
- Appearance: pale yellow to white solid
- CAS #: 4674-50-4
- Toxicity: Class IV
- Shelf life: 3 years

NootkaShield™ nootkatone from Evolva is a fresh alternative for the pest control industry



Manufacturers rely on consistent quality and purity, ingredient safety, and reliable sourcing. NootkaShield is:

- Produced at metric ton scale with aggressive expansion plans in place
- Produced at high purity
- Consistent from batch to batch
- Not classified as a carcinogen, not genotoxic and Class IV for toxicity, the lowest possible acute toxicity classification
- Backed by a strong IP portfolio and access to CDC patents
- Supported by the CDC
- US EPA for registration as a new biopesticide active ingredient

## CDC support:

Evolva received US federal funds from the Office of Assistant Secretary for Preparedness and Response (ASPR), Biomedical Advanced Research and Development Authority (BARDA), through CDC, under Contract No. HHSO100201700015C. Funds were awarded to Evolva to develop nootkatone-based end-user products against select mosquito-borne diseases like Zika.

## About Evolva:

NootkaShield is produced by Evolva, a Swiss biotech company focused on the research, development and commercialization of products based on nature. We have leading businesses in flavors and fragrances, health ingredients and health protection. Evolva's employees are dedicated to producing the best ingredients that can contribute to health, wellbeing and sensory enjoyment. Find out more at [www.evolva.com](http://www.evolva.com).

## For more information:

We have sales support in the US and Europe, with distribution worldwide where approved. Our technical team can advise on formulations and ideal combinations and our marketing team can help you plan your marketing strategy for NootkaShield. We are happy to supply samples for testing and formulation guidance.

Evolva's website: [www.evolva.com](http://www.evolva.com)

NootkaShield website: [www.nootkashield.com](http://www.nootkashield.com)

For general inquiries and customer service inquiries please email: [nootkashield@evolva.com](mailto:nootkashield@evolva.com)

Connect with us:

LinkedIn: [www.linkedin.com/showcase/nootkashield](http://www.linkedin.com/showcase/nootkashield)

Twitter: [@NootkaShield](https://twitter.com/NootkaShield)

Facebook: [www.facebook.com/NootkaShield/](http://www.facebook.com/NootkaShield/)

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## References

1. CDC. "Vector-Borne Diseases in the United States, 2004-2018" Division of Vector-Borne Diseases (DVBD). May 2018. <https://www.cdc.gov/ncezid/dvbd/vital-signs/index.html>.
2. McAllister and Adams. Mode of action for natural products isolated from essential oils of two trees is different from available mosquito adulticides. *Journal of medical entomology*. 47.6(2010): 1123-1126.
3. Panella NA, Dolan MC, Karchesy JJ, Xiong Y, Peralta-Cruz J, Khasawneh M, Monteneri JA, Maupin GO, Use of novel compounds for pest control: insecticidal and acaricidal activity of essential oil components from heartwood of Alaska yellow cedar. *Journal of medical entomology*. 42(3): 352-358 (2005).
4. Proprietary Evolva data.