



### Summary on work done for Better Air International

INDOOR Biotechnologies is the world leader in assessing environmental exposure to allergens - in the home, workplace, schools, and commercial buildings. It has developed several cutting-edge tools for measuring allergens in various matrixes. INDOOR Biotechnologies is organized as three affiliated companies, INDOOR Biotechnologies Inc. (IBI), located in Charlottesville, Virginia, USA, INDOOR Biotechnologies Limited (IBL) based in Cardiff, UK, and INDOOR Biotechnologies India (IBIndia).

Better Air International (BAI) is a company focused on Indoor Air Quality and develops products/devices to enhance the indoor air quality in a commercial and domestic setup. They have a probiotic product Enviro-Biotics® that could utilize environmental allergens for their growth, which can potentially be used for reducing environmental allergens in various living environments. For this purpose, BAI approached IBIndia to test the hypothesis: BAI's Enviro-Biotics® grows but utilizing the allergens in the media and thereby reduces the allergens in the media.

In the past, IBIndia has done experiments to test this hypothesis and found that the BAI Enviro-Biotics® does grow consuming the allergen in the media under laboratory conditions. Some of our observations from the experiments are highlighted below

#### **Experiment 1:** Does the Enviro-Biotics® in the presence of allergen alone as a nitrogen source?



Enviro-Biotics® grow in the presence of Dust Mite (Der p2) allergen as the only nitrogen source. **Test**

Enviro-Biotics® grow in the presence of (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>. **Positive control**

Enviro-Biotics® do not grow in the absence of nitrogen source. **Negative control**

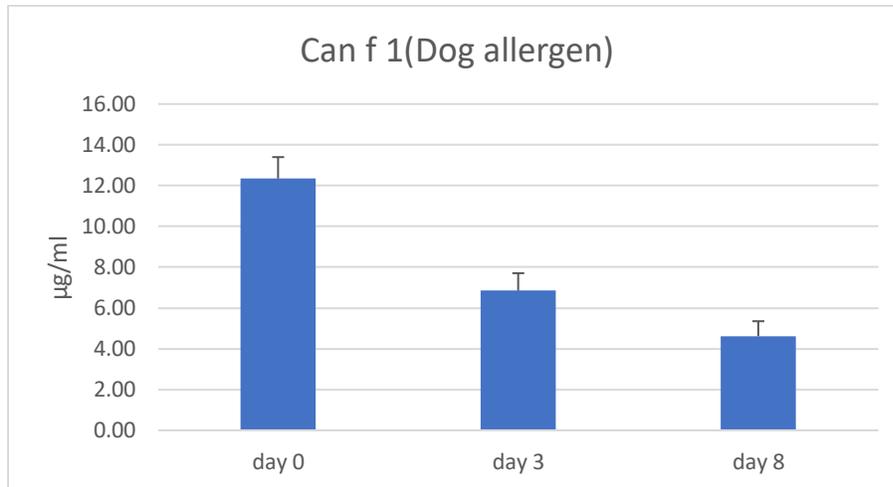
**Figure 1:** Enviro-Biotics® growth in the presence of Dust mite ( Der p2) allergen or (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>

Inference: BAI bacteria shows growth in the presence of allergen as only nitrogen source.

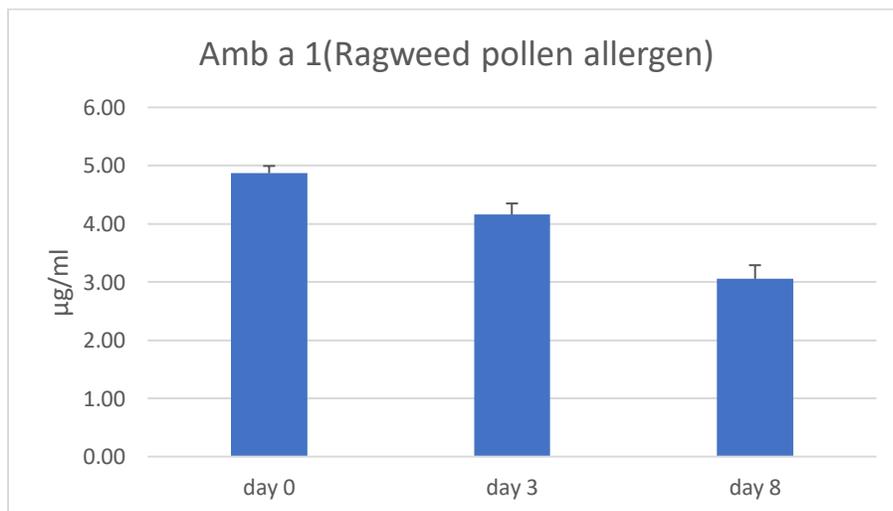


**Experiment 2: Does the Enviro-Biotics® growth in the presence of allergens results in a decrease in the levels of allergen in the growth media.**

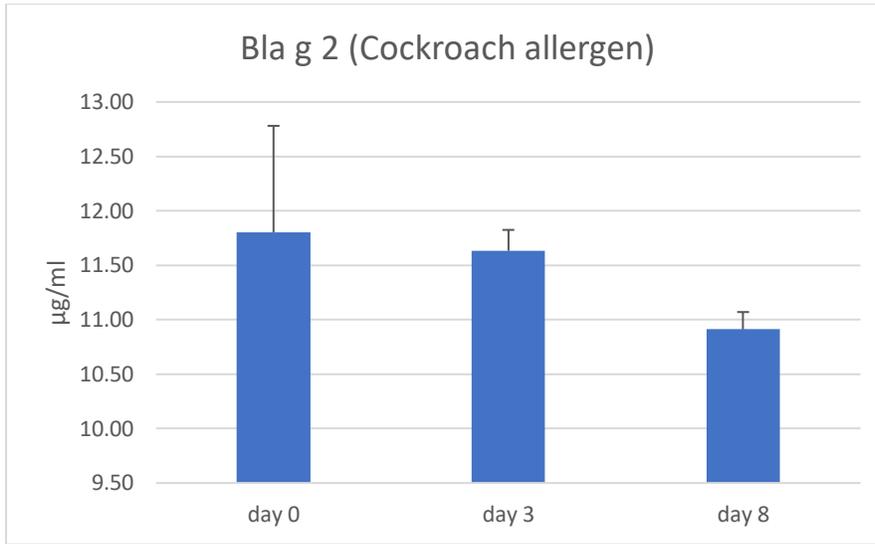
Enviro-Biotics® were grown in the presence of 10µg/ml of the following allergens Can f1, Amb a1, Bla g2, and Alt a1 individually, and the allergen content was measured at different time points.



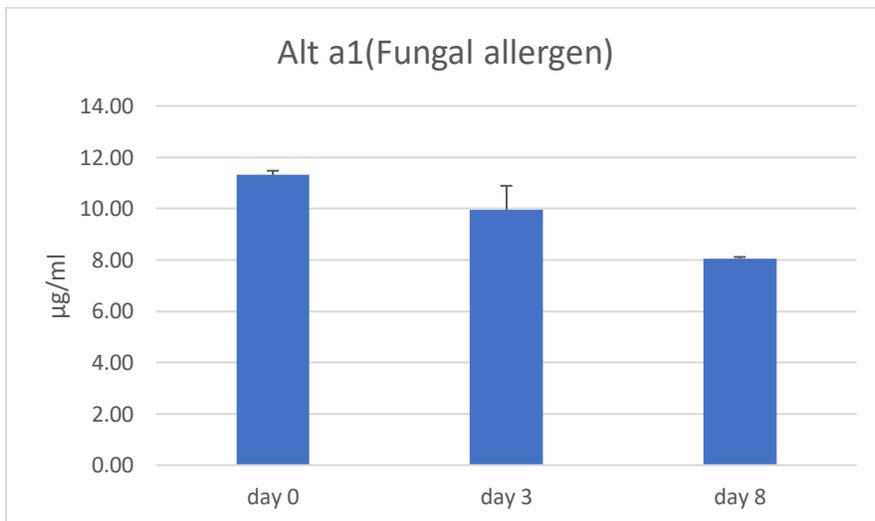
**Figure 2:** Dog Allergen (Can f1) concentration over time after incubation with Enviro-Biotics®



**Figure 3:** Ragweed pollen allergen (Amb a1) concentration over time after incubation with Enviro-Biotics®



**Figure 4:** Cockroach allergen (Bla g2) concentration over time after incubation with Enviro-Biotics®



**Figure 5:** Fungal allergen (Alt a1) concentration over time after incubation with Enviro-Biotics®

**Inference:** Enviro-Biotics® shows growth in the presence of allergen as only nitrogen source with a concomitant reduction in allergens in the growth media over a period.

**Conclusion:** In summary, Enviro-Biotics® grows using the allergen as its nitrogen source. However, the work requires further experiments to substantiate the observations under different experimental conditions.

For **INDOOR Biotechnologies India Private Limited**

*B. Sivasankar*



Dr. Sivasankar Baalashankar, Executive Director