



Evaluation of the effects of **LIGHT PROGRESS**[®]

UV-C air purification devices on the microbial
and fungi load present in the air

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1. TARGET

Verify the UV-C rays effect on microorganisms present in the air.

2. OPERATIVE SPHERE

Tests have been made following the request of **Light Progress S.n.c.** to Prof. Emanuele Montomoli, superintendent of the Molecular Epidemiology Laboratory of the Department of Physiopathology, Public Health and Experimental Medicine of the Università degli Studi di Siena.

3. STAFF

Staff of the Department of Physiopathology, Public Health and Experimental Medicine (post-graduated, doctor's students, specialize's students, technicians, etc.) that have access to the Molecular Epidemiology Laboratory.

4. TOOLS AND EQUIPMENT USED

- Devices equipped with UV-C lamp - provided by **Light Progress S.n.c.**
- "Microflow" aspirator
- Thermostated Bath
- Laminar Flow Hood with HEPA BIO /4 filter
- Refrigerator +2 +8 °C
- Precision Balance
- Thermostated Chambers
- Steriling Autoclave



5. COMMODITIES AND ELEMENTS USED

- Culture medium, Saboraud Dextrose Agar Oxoid
- Culture medium, Plate Count Agar Oxoid
- Rodac Plate 55 mm diameter
- Various glassware

6. OPERATIVE TECHNIQUE

For the tests **Light Progress** provides two UV-C devices for air purification, serie **UV-FAN M2/95P**, name A and B. These devices consist in an extract fan on the lower side, which direct the air drawn from the room in an UV-C chamber, where the air is irradiated with UV-C rays emitted from particular lamps. Then, the air comes out from some slots on the upper side of the device. Lamps are shielded so that it is possible to use the device in the presence operators. The experimental protocol provides active samplings of 1 m³ of air usinf the “Microflow Aquaria” aspirator in which there have been positioned the Rodac plates containing Plate Count Agar and Saborand Dextrose Agar. First sample has been made next to the entry slots of both devices with lamps turned OFF. Afterwards other 1 m³ samples has been made next to the exit slots after the UV-C treatment.

Rodac plates with Plate Count Agar and Sabourand Dexrose Agar used for the sampling have been incubated at 36°C and 22°C respectively, in this way it has been possible to obtain the total microbial load of mesophyll and psicrofilii. Results are expressed as Unit Forming Colony for air cubic meter (UFC/m³).

Tests have been made inside the Department of Physiopathology, Public Health and Experimental Medicine of the Universita' degli Studi di Siena, where usually lessons and administration activities take place.

7. RESULTS EVALUATIONS

Results are expressed on tables and charts enclosed.

Table 1 regards the *Psicrofila* load detectable at 22°C while Table 2 examines the Mesophylls detectable at 36°C. In both tables in the first column there are the two devices for purification (A and B), in the second there are the



UFC/m³ average of aspirated air in different rooms with lamps turned OFF, following column shows the UFC/m³ average with aspirations made with devices turned ON; furthermore the percentage reduction of microbial parameters has been calculated. Both devices, **UV-FAN M2/95P** (A and B) succeed in reducing almost completely the microbial load of *Psicrofilia* and Mesophyll.

8. CONSIDERATIONS AND CONCLUSIONS

For many years the international scientific community has been interested in studying the air contamination in closed rooms. Indoor pollution concern confined rooms such as domestic places, work places, public spaces such as schools, hospitals, stations (police stations, military stations, etc.), transportations, etc. where we spend most of our time during the day, for this reason is easy to understand the importance that this problem represents for public health. In fact, is not uncommon to find potential dangerous microorganisms that can cause allergic and infective pathologies in confined rooms. This study regards the purifying effect of UV-C lamps, such as those present inside **UV-FAN M2/95P** (A) and **UV-FAN M2/95P** (B) provided by **Light Progress**, in environment where is performed a normal working activity. Results obtained shows that the devices mentioned succeeded in destroy the microbial load almost totally, with percentage above 98,00% and 99,00%, but also the fungi load has had satisfying results (percentage above 99,99% and 99,00%). In our opinion, these results represents a remarkable innovation for all those environments where a low level of air contamination must be provided and warranted, such as health sector (recovery rooms, surgery rooms, etc.) or food industry sector, especially for food processing and packaging. In general, in all confined areas, particularly those which are usually really crowded, it's possible to improve air quality using UV-C rays which, in short times, succeed in producing a consistent and coherent destruction of both microbial and fungi load in the air.

9. SAFETY RULES

Employees should respect all the provided rules for manipulation and use of potential toxic and infected material.



10. REFERENCE AND/OR BIBLIOGRAPHY

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11. ENCLOSURES

Table 1

reduction of Psicrofila Load (CMT at 22°C)

LAMP TYPE	UFC/ m ³ AIR ENTRANCE	UFC/ m ³ AIR EXIT	REDUCTION %
(A) UV - FAN M2/95P	91	<1	>99,99
(B) UV - FAN M2/95P	119	1	>99,00

Table 2

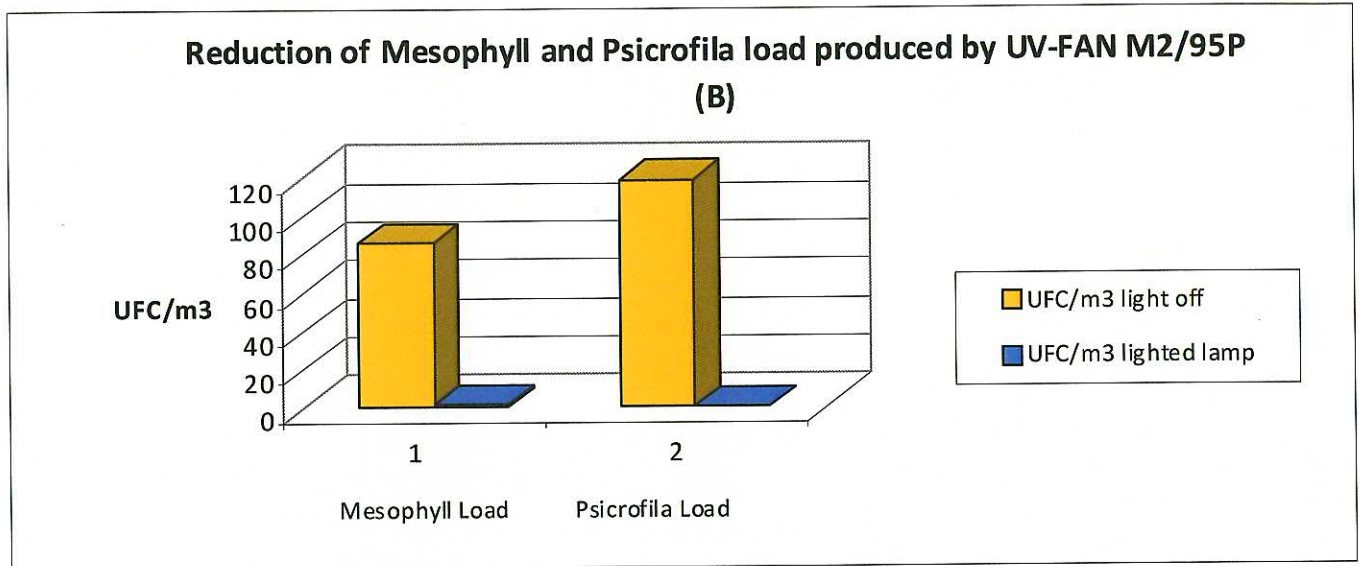
reduction of Mesophyll Load (CMT at 36°C)

LAMP TYPE	UFC/ m ³ AIR ENTRANCE	UFC/ m ³ AIR EXIT	REDUCTION %
(A) UV - FAN M2/95P	103	2	>98,00
(B) UV - FAN M2/95P	86	<1	>99,99

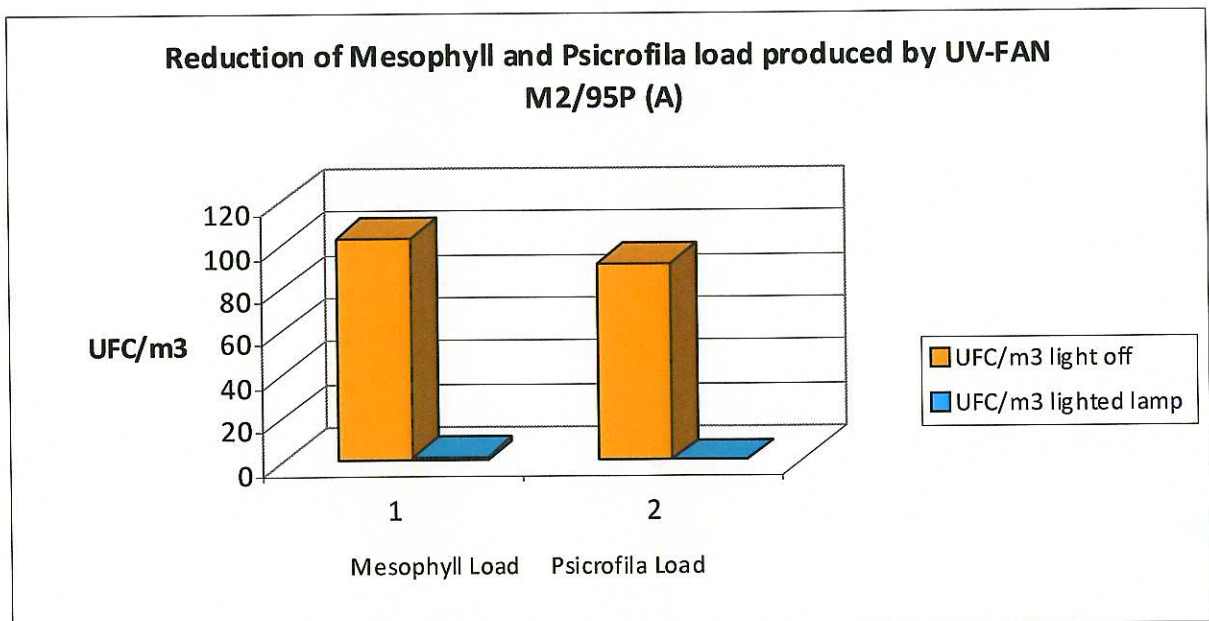
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Graph 1



Graph 2



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