

NEAR INFRARED LIGHTING – Trying a Lynceus XHD-7000 camcorder.

ALEJANDRO ARIEL GARCIA ARRIAGA,
COACALCO DE BERRIOZABAL ESTADO DE MEXICO, MEXICO

INTRODUCTION:

Inspired by the amazing articles by David Walker about the topic of near infrared that I found in *Micscape*, I was looking for ways to obtain images in the near infrared part of the spectrum.

David Walker presents in his articles two ways of using this kind of illumination to reveal more details than the ordinary visible light that is regularly used with microscopes or in cameras. He uses a [black and white security camera](#) in one of his articles by exploiting a security camera's capability of receiving the near infrared part of the spectrum for night vision.

In the other method he modified [a conventional consumer digital camera](#) (a Sony S-75) by removing the filter before the sensor which blocks the passage of the infrared spectrum.

Both methods were difficult for me to do because I could not obtain any black and white camera and I had no available camera to be modified.

Since I was interested in the topic to apply to what I like the most i.e. microscopy, I started to search for information online. I found that a 1997 model of Handycam from Sony had the capability of allowing the passage of the near infrared spectrum but due to the misuse given to this capability it was discontinued by the company. I was looking for one but no seller of cameras had one of those old Handycams with that capability.

While continuing looking for the topic, I found a page that describes the properties of infrared photography and said that there is a trade mark that is dedicated precisely to sell cameras with the properties of allowing the passage of the infrared spectrum and with the logo '**IR-X ray vision revealing the hidden world**', so I looked immediately for that trade mark and I found it was located in Japan. I looked for information about their products and I found a model that seemed to me very appropriate. I read the information and after some days I ordered it - the **Lynceus™ XHD-7000 Full HD Camcorder with IR X-Ray Vision (See-Through Vision) & IR Night Vision**.

And the question is, does it work? Yes it does and has the capability of allowing the near infrared spectrum to pass by removing the filter from the lens with a mechanism similar to that of the old Handycam. It also has two additional filters that when placed in front of the lens for some materials it does allow to see through that material. The Handycam has come back and the possibility of applying it to microscopy with promising results, in fact very promising results. Today I just want to show some of the abilities of my new camera in allowing the recording of the near infrared spectrum.

DEVELOPMENT:

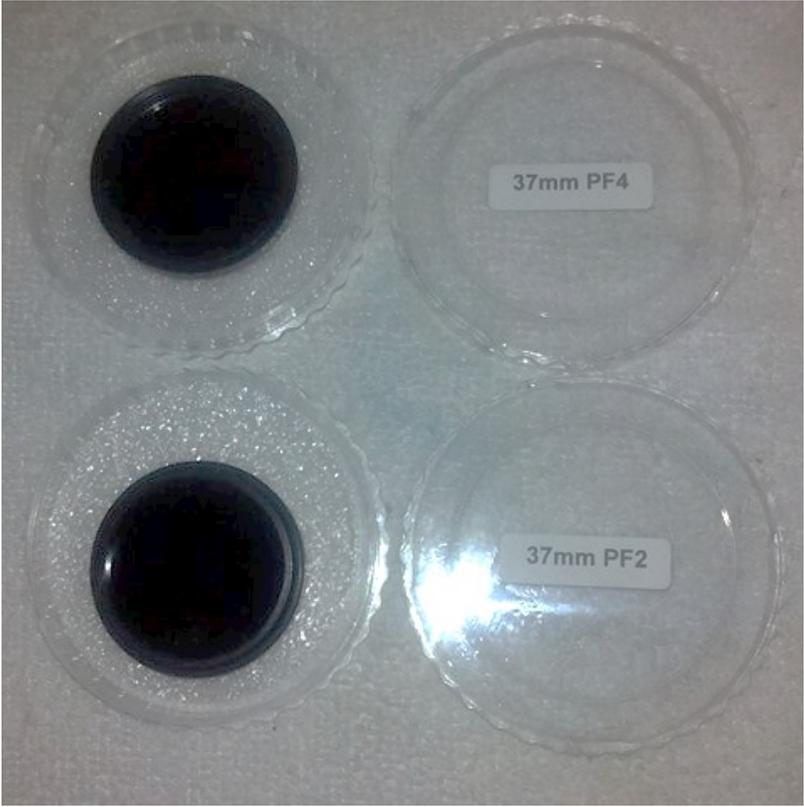
The infrared part of the spectrum covers a wavelength that is not possible to see with bare eyes, since the visible part of the spectrum is between the wavelengths of 430 – 690 nm. Infrared rays have much longer wavelengths than this. They are divided into "Near Infrared Rays" (690 -4,000 nm) and "Extreme Infrared Rays" (over 4,000nm).

It is said that infrared rays are not as easily refracted as other parts of the spectrum are, so they pass from one medium to the other almost unchanged. This property gives the capability to some devices of converting this wavelength into visible ones.

It is also said that the majority of the cameras lenses respond only shorter than 1400 nm so this fact establishes that the part of the infrared that is going to be used will be just the near infrared. And this is the characteristic of the camera that I now have with this properties



It comes with a pair of filters that when placed in front of the lenses they block all the visible light and just allow the passage of the near infrared rays giving with some materials the ability to see through them.



Results:

In near infrared photography plants and trees look like as if the were covered in snow.



A tree on the street in my neighborhood.



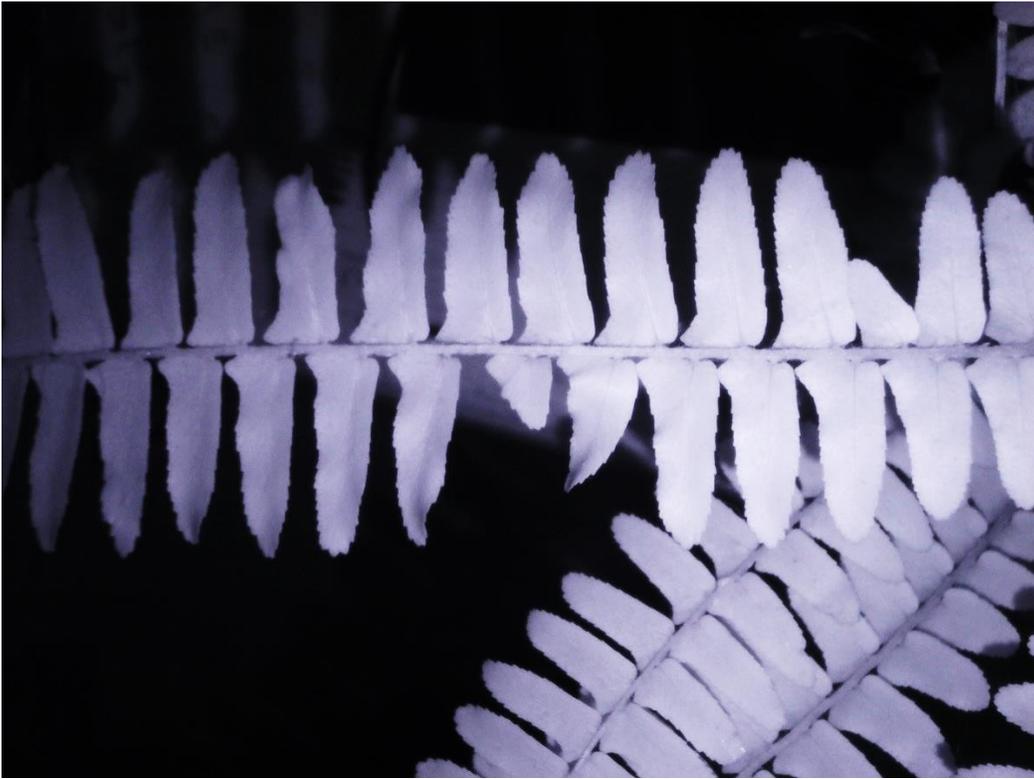
Also a tree in the same street as above.



A bush on the street.



Aloe vera



Fern



Fern



A dog and a plant next to it.

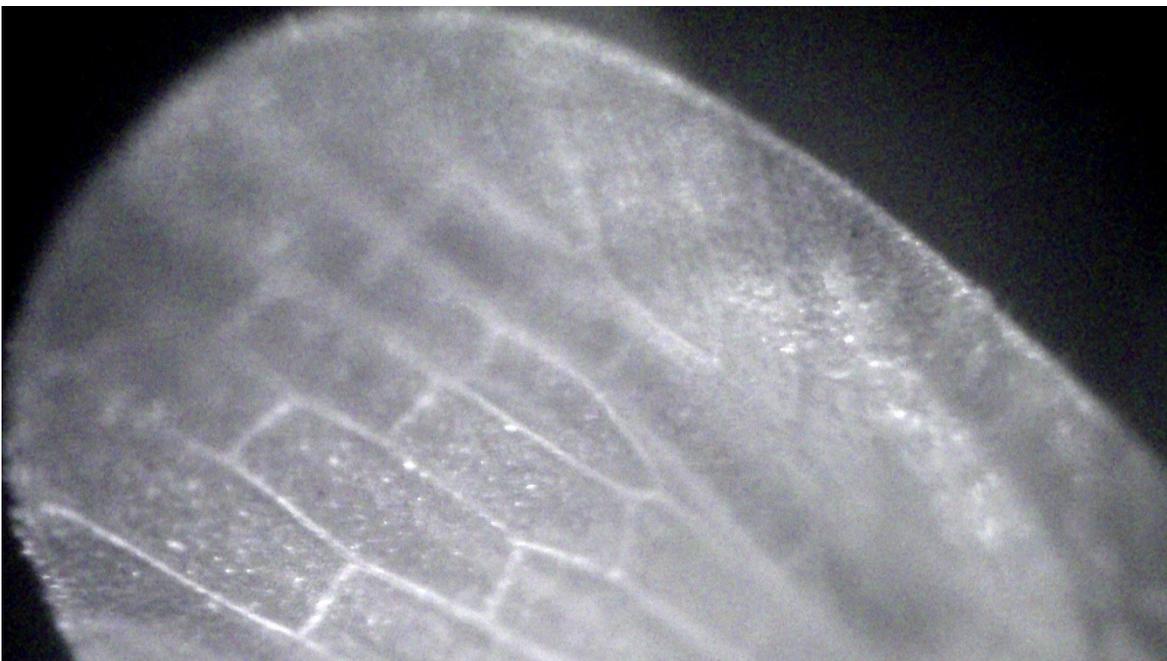
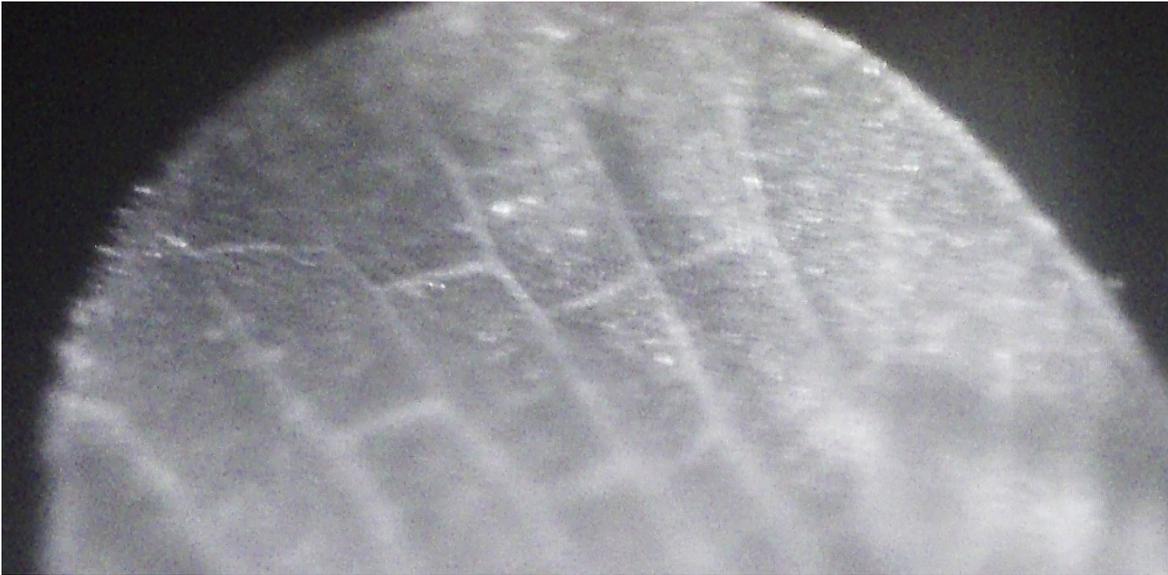


Spathiphyllum wallisii

- Here is a small taste of this illumination method when used in microscopy. I think that with some adjustments that I have in mind the results will be better than these.



A moth under the 4x objective with transmitted near infrared light



Parts of a wing of the moth above also under 4x objective.

The above images were captured in an epi-illumination like mode because in this case the sample allows the near infrared light to be reflected and the camera's mode of infrared vision captures the sample as if it were taking its surface in this wavelength - that is the concept of epi-illumination, isn't it?

CONCLUSION:

I am not promoting a device, because I do not belong to any enterprise. What I wish to show is that with some devices such as this we can get very good results in near infrared illumination and that it is possible to apply it to microscopy.

Email author: doctor2408 AT yahoo DOT com DOT mx

(Above in anti-spam format. Copy string to email software, remove spaces and manually insert the capitalised characters.)