The paper is related with the proposal of a new device to detect the Volatile Organic Compounds related with the HLB citrus disease. Without a doubt, there needs to be more research in order to get sensors to early detect HLB adequately. This paper is an important contribution in this way but some modifications and improvements are needed before it can be published in Sensors Journal:

1. The principal problem related to poor specificity and sensitivity described in the manuscript, prevents the reported device could be properly called a sensor. It is suggested rename the title and scope of study, because in its current state, the device is far from the state of art requirements of a true useful sensor. There should be main emphasis in the advantages of method.

It is required improve the specificity of method and it is mandatory to make additional studies related to possible interfering molecules and approaches to gain enough sensitivity for field measurements.


2. It is suggested that edition changes must be done, some paragraph that deserve improving are listed below:

Line 55: “DNA molecules [9, 10] are naturally occurring polymers that have 55 many unique functions, including catalyzing chemical reactions [11] and controlling gene expression.”

This paragraph is out of context, additional argumentation must be inserted in order to connect DNA properties with the discussion above about the SWNT modification strategies.

Response: The introduction has been revised, please check the manuscript. This paragraph has is modified as following.

receptors and transducers have been reported in the literature. SWNT surface can be functionalized/decorated with inorganic molecules (TiO₂, SnO₂ nanoparticles) [24-26], organic macromolecules (porphyrin, polycyclic aromatic hydrocarbons) [27, 28] or biomolecules [29] and thus improves the sensing performance. DNA molecules [30, 31] are naturally occurring polymers that have many unique functions, including catalyzing chemical reactions [32], and controlling gene expression. Recently, some researchers found that the single-strand DNA can sense the VOCs (NO₂ and NH₃) with excellent performance.

Line 120: “Two types of single-stranded DNA”

The authors must include additional justification about the selection criteria of DNA sequences utilized, in terms of sensitivity, specificity and their relation with detection mechanism or interaction with the VOC.

Response: Two types of single-stranded DNA were selected according to the previous work published by the Nicholas J. Kybert ---” Nano-Bio Hybrid Electronic Sensors for Chemical
Detection and Disease Diagnostics”. Here, we try to use them to make a new biosensor array to diagnose the Huanglongbing infected citrus tree. The detection mechanism is discussed in the 3.4, but ssDNA-SWNTs can be considered as semiconductor material.

3.4 Sensing Mechanism

In order to experimentally identify the sensing mechanism, the ssDNA-SWNT chemiresistor devices were operated in a field-effect transistor mode using Si as the back-gate electrode. The changes in the transfer characteristic curves ($I_{DS}$-$V_{G}$, $V_{DS} = 0.1$ V) upon functionalization with ssDNA and exposure to the VOCs was used to explain the electrostatic interactions of the DNA and VOC molecules with the SWNTs.

Fig. 9(a) shows transfer characteristics ($I_{DS}$-$V_{G}$) curves for s1DNA-SWNTs exposed to air and saturated phenylacetaldehyde vapors. As illustrated in the figure, transconductance (slope of the transfer characteristics curve) changed after exposure to saturated phenylacetaldehyde vapors. The increase in device transconductance upon exposure to analyte is attributed to change in local work-function of the metal contacts and band alignment when the VOC molecules are adsorbed on the metal (gold) electrodes. When the s2DNA-SWNT device was exposed to phenylacetaldehyde vapors (Fig. 9(b)), the $I_{DS}$-$V_{G}$ curve shifts to the negative direction, and threshold gate voltage ($V_{TH}$) also decreases. This negative shift of $V_{TH}$ is attributed to adsorption of partially charged/polar VOC molecules that induce a screening charge (doping) of the SWNTs and shift the $I_{DS}$-$V_{G}$ curve to a negative voltage. This mechanism, known as electrostatic gating, is commonly seen in most SWNT-based sensing devices.

![Figure 9. Transfer characteristic ($I_{DS}$-$V_{G}$ curves at $V_{DS} = 0.1$ V) of (A) s1DNA-SWNTs and (B) s2DNA-SWNTs device in presence of air and saturated phenylacetaldehyde.](image)

Line 132: The rest of electrochemical measurements were collected using a gas sensing setup, which was designed and integrated by our group.

More information must be specified about the used setup related to electrochemical measurements and gas sensing procedures in order to justify and support a future fabrication of a true field portable sensor.

2.3 Fabrication of biosensor arrays

SWNT based biosensor arrays were fabricated using the protocol reported by Ramnani et al [32]. Briefly, single gap microelectrodes were written on the SiO2/Si substrate using standard lithographic

Line 136: SWNT based biosensor arrays were fabricated using the protocol reported by Ramnani et al.
The bibliographic reference of Ramnani protocol is missing, authors must include it in text and in the Reference Section.

2.4 Gas-sensing setup

The gas sensing setup [33] shown in Fig. 2 was divided into two parts, gas-delivery and data-collection, which were controlled by the software program using LabView. For the controlled gas-delivery to the sensor, an air cylinder was connected to the inlet ports of two mass flow controllers
Line 136: could authors provide the appropriate reference. Only the authors name is mentioned.

Line 161: “dome with a gas inlet and outlet ports for gas sealed glass dome with a gas inlet and outlet ports for gas was applied”
Correct the text repetition in this phrase
Response: varying the MFCs’ flow rates to achieve the certain concentration. For real-time data-collection, the electrodes were connected to Keithley 2636 sourcemeter using a clip and applied 0.1 V between drain to source without the gate voltage. The electrode covered with a 1.2 cm³ sealed glass dome, which had inlet and outlet ports. The biosensor arrays were first exposed to dry air until a stable baseline

Line209: “As shown in Fig. 5(b), the threshold gate voltage (VTH) of bare SWNT was -12 V”
The Authors must check the value of threshold gate voltage of bare SWNT in this paragraph to be consistent with Figure 5 data.
threshold gate voltage ($V_{TN}$) of bare SWNT was -12.96 V. Compared with the bare SWNTs, the transfer curve for s2DNA-SWNT shifted to the negative direction and had a more negative threshold gate voltage of -26 V. Additionally, upon functionalization with s2DNA, the mobility decreased from 150-168.8 cm²/Vs for bare SWNTs to 121 cm²/Vs for s2DNA-SWNTs. The shift in threshold voltage and decrease in hole mobility can be explained by reduction in hole concentration of p-type SWNTs due to charge (electron) transfer from negatively charged phosphate backbone of s2DNA.

Line 309: “Based on these results, it is recommended that for real world applications water vapor must be removed during sampling of the VOCs from the citrus trees.”
The elimination of water vapor in natural sampling it is not a simple issue, otherwise the real use of reported sensor is challenged by a possible strategy to remove the vapor for a valid VOC analysis.
Response:

Line 322: “which were exhibited in Fig. 11.”
Figure 10 is missing! an improve in figures numbers must be done.
Response:
Figure 10. The real value versus the predicted value towards the different concentrations of four VOCs (ethylhexanol, linalool, tetradecene, and phenylacetaldehyde) calculated by the NNF.

Figure 11. The real value versus the predicted value towards the different concentrations of four VOCs (ethylhexanol, linalool, tetradecene, and phenylacetaldehyde) calculated by the NNF.

Supplementary Materials: The following are available online at www.mdpi.com/xxx/s1, Figure S1: title, Table S1: title, Video S1: title. “The content of supplementary file is different of the description in this paragraph, please realize adequate change for consistency.

Supplementary Materials: The following are available online at www.mdpi.com/xxx/s1, Figure S1. IDS-VDS characteristics of SWNTs before and after functionalization with s1DNA at Vc=0 V; Figure S2. Calibration curves of bare and ssDNA coated SWNTs sensor towards different concentrations of ethylhexanol vapors performed at VDS=0.1 V; Figure S3. Calibration curves of bare and ssDNA coated SWNTs sensor towards different concentrations of tetradecene vapors performed at VDS=0.1 V; Figure S4. Calibration curves of bare and ssDNA coated SWNTs sensor towards different concentrations of linalool vapors performed at VDS=0.1 V; Figure S5. Calibration curves of bare and ssDNA coated SWNTs sensor towards different concentrations of water vapors performed at VDS=0.1 V; Figure S7. PCA plot (PC1 vs. PC2) of scores using three sensors (bare SWNTs, s1DNA-SWNT and s2DNA-SWNT) for four VOCs and water test; Figure S8. The real value versus the predicted value calculated by the NNF; Table S1. The concentrations of four VOCs at 25 °C.