

### Review Form 3

Journal Name:	<a href="#">Asian Journal of Biology</a>
Manuscript Number:	Ms_AJOB_127442
Title of the Manuscript:	ASSESSMENT OF AIR POLLUTION TOLERANCE INDEX (APTI) AND EXPECTED PERFORMANCE INDEX (EPI) OF PLANTS ALONG NSUKKA. - ENUGU ROAD.
Type of the Article	Important manuscript, Can be considered after major revision.

#### **General guidelines for the Peer Review process:**

This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty**', provided the manuscript is scientifically robust and technically sound. To know the complete guidelines for the Peer Review process, reviewers are requested to visit this link:

<https://r1.reviewerhub.org/general-editorial-policy/>

#### **Important Policies Regarding Peer Review**

Peer review Comments Approval Policy: <https://r1.reviewerhub.org/peer-review-comments-approval-policy/>

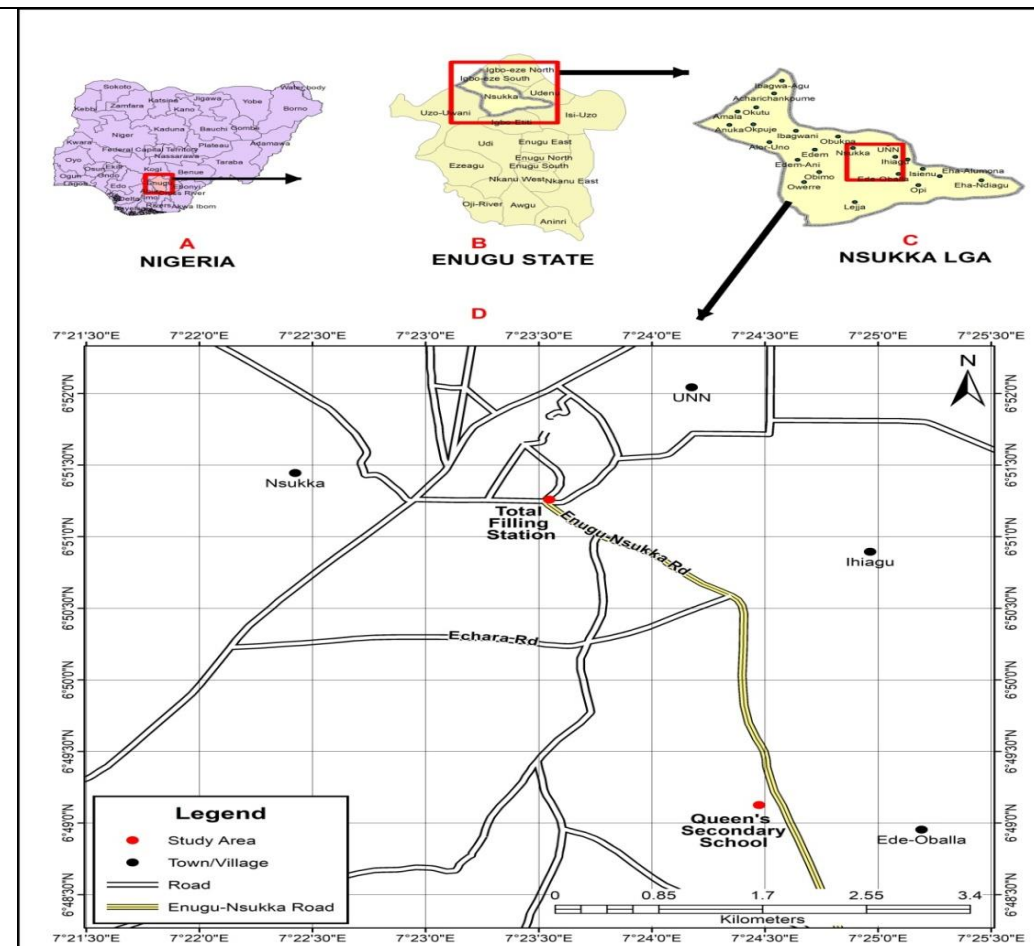
Benefits for Reviewers: <https://r1.reviewerhub.org/benefits-for-reviewers>

#### **PART 1: Comments**

	Reviewer's comment	Author's Feedback <i>(Please correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)</i>
Please write a few sentences regarding the importance of this manuscript for the scientific community. A minimum of 3-4 sentences may be required for this part.	It is an important work. It Should be published The draft needs major revision because some portions are not presented in scientifically proper way.	
Is the title of the article suitable? (If not please suggest an alternative title)		
Is the abstract of the article comprehensive? Do you suggest the addition (or deletion) of some points in this section? Please write your suggestions here.	No. It requires rewriting. Portions marked red should be taken care of. Values in braces should not be after the species should be after the low or high	
Is the manuscript scientifically, correct? Please write here.	Yes. Bust statistical analysis ANOVA is redundant	
Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.	A few more references of 2022-2024 may be included. Reference of Pradhan et al. of 2016 Biolife may be of some help in rewriting.	

Review Form 3

<p>Is the language/English quality of the article suitable for scholarly communications?</p>	<p>No. It requires immense care and corrections.</p>	
<p><u>Optional/General</u> comments</p>	<p>The paper be accepted after major revision</p> <p><b>ASSESSMENT OF AIR POLLUTION TOLERANCE INDEX (APTI) AND EXPECTED PERFORMANCE INDEX (EPI) OF PLANTS ALONG NSUKKA. - ENUGU ROAD.</b></p> <p><b>ABSTRACT</b></p> <ol style="list-style-type: none"> <li>1. Twenty-eight plant species comprising herbs, shrubs and tree species were sampled and determination of APTI used combined biochemical parameters measurements.</li> <li>2. APTI showed that herbs are sensitive with APTI range of &lt; 7 to 11.91, shrubs are mostly moderate tolerant with range of 9.38 to ≤ 17.43 while trees species are tolerant that ranged from ≥ 10.58 to ≥ 23.26 at t ≤ 1.51, p&gt;0.05 in the both sites.</li> <li>3. Based on APTI grades, <i>R. vomitoria</i> (11.91) had highest sensitive index and <i>E. canadensis</i> (6.45) had the least, <i>P. americana</i> (16.11) had highest moderate tolerant index and <i>R. communis</i> had the least while <i>T. catappa</i> (23.26) produced the highest tolerant index and <i>G. arborea</i> (17.50) had the least in the experimental site. EPI revealed that plants can be categorized as fit, very fit and unfit for plantation and those under excellent to 'best' performer category can be highly recommended as 'very fit' for plantation to control air pollution. <i>D. edulis</i> (94.74%) was in the 'Best' performer category and the best recommended species for plantation planting to monitor and control air pollutants.</li> </ol> <p><b>INTRODUCTION</b></p> <ol style="list-style-type: none"> <li>1. Air pollution is a major environmental problem which is as a result of man's activities such as industrialization, wood or fossil fuel combustion or natural processes such as volcanic eruption and forest fire (Odilara <i>et al.</i>, 2006).</li> <li>2. Determination of plants that can absorb air pollutants or act as phytoremediator is achieved through the use of air pollution tolerance index (APTI).</li> <li>3. The objectives of this study are; to determine the APTI and EPI of some plants growing along Nsukka - Enugu road. The tolerant and sensitive abilities of each of the plants will provide information on their Phyto remediating and phyto-indicating information of the plants respectively.</li> </ol> <p><b>MATERIAL AND METHODS</b></p> <p><b>Study Area</b></p> <ol style="list-style-type: none"> <li>1. Though, surrounding temperature is largely influenced by harmattan (the cool dry wind that blow through the Sahara region) (Oparaku <i>et al.</i>, 2021). <b>Not a complete statement</b></li> <li>2. The topography is characterized as undulating and the vegetation type is derived savannah. The soils in the area is a mixture of different types, including ferrallitic soils, also known as red earth or acid sands and hydromorphic soils on the floodplains (Anon, 2003), which contribute to dust pollution. <b>It is a paper of 2003. I think the reference must be available.</b></li> <li>3. Selected experimental site was Nsukka-Enugu road from Total Filling Station to Ede-Oballa where there is heavy traffic (Plate 1). <b>Plate needs clarity. It should be legible</b></li> </ol>	



**Sample collection**

1. Twenty-eight plants were randomly sampled based on the availability and commonly identified plants growing along Nsukka-Enugu road and control sites. This study used belt transect sampling method because of the obvious environmental gradients at the experimental site.

**Biochemical analysis**

1. The pH reading was taken with calibrated Elico-112 pH meter (Shannigrahi *et al.*, 2004).  
**It gives the impression that Sanigrahi et al. did pH estimation**
2. Ascorbic Acid was determined by reading the absorbance of the extracted and homogenized fresh leaves with UV digital spectrophotometer (S-22BOECO Germany) at 760 nm as explained by (Ogbonna *et al.* 2014).
3. Total Chlorophyll (TCC) was determined with the help of (Gogoi and Basumatary, 2018) method by reading the absorbance of the extracted supernatant at 645 nm and 663 nm using UV digital spectrophotometer and was calculated with below formula. **Needs Rewriting**
4. Plant socio-economic characters and morphological parameters like habit, crown structure, and type of plant, laminar structure and economic value were noted qualitatively in Table 1.
5. Assessments category of plants on the basis of their Expected Performance Index (EPI) scores were graded as from “Not Recommended to Best” in Table 2 to select best in designing pollution tolerance Green Belt and Urban Forest.

**Statistical Analysis:**

1. The data collected were subjected to analysis of variance (ANOVA) and T-test using IBM SPSS version 27. Student's t-test result is embedded in correlation table, but where is ANOVA

**RESULTS**

1. Several plants were encountered in the study sites and the photograph of the preserved herbarium samples presented on Fig 1.

**Table 1: The physiological features of the sampled plants. Does it reflect Physiological**

**Climatic parameters data of the study area**

1. The average climatic data of Nsukka during 2022–2023 was evident that air temperature was  $29.28 \pm 0.3^\circ\text{C}$ , the relative humidity was  $54.07 \pm 1.9\%$ , wind speed was  $3.15 \pm 0.5 \text{ m/s}$ , air pressure was  $92.9 \pm 0.2 \text{ kpa}$ , while average amount of rainfall was  $1.96 \pm 1.0 \text{ mm}$  respectively in Nsukka. Results observed significant difference between climatic parameters across the monthly variations ( $p < 0.05$ ) (Table 2). This section should clearly depict what you are saying

**Table 2: Average Climatic data of Nsukka town in Nigeria during 2022 – 23.**

Months	Air Temperature (°C)	Relative Humidity (%)	Rainfall (mm)	Wind Speed (m/s)	Air Pressure (kpa)
Jan	$27.9 \pm 0.3^c$	$34.15 \pm 1.9^c$	$0.0 \pm 0.0^c$	$3.4 \pm 0.6^a$	$93.8 \pm 0.2^{ns}$
Feb	$29.3 \pm 0.3^b$	$55.0 \pm 2.9^b$	$0.3 \pm 0.2^c$	$3.2 \pm 0.6^a$	$93.05 \pm 0.2^{ns}$
Mar	$30.6 \pm 0.2^a$	$58.75 \pm 1.8^a$	$3.3 \pm 1.9^b$	$2.9 \pm 0.5^b$	$92.15 \pm 0.2^{ns}$
April	$29.4 \pm 0.4^b$	$68.35 \pm 1.0^a$	$4.3 \pm 2.1^a$	$3.1 \pm 0.5^a$	$92.8 \pm 0.2^{ns}$

**What are a, b, c..... in Table 2**

**APTI of the studied plants**

1. The mean TCC concentrations were higher in experimental plants, with the highest concentration in *E. sonchifolia*. The RWC and AA values were also higher in experimental plants, with the highest in *R. cummunis* and the lowest in *A. cordifolia*. Itallics
2. **Table 3: Variation in biochemical properties and APTI.** Biochemical parameter values for different plant species at Experimental and Control sites

**Relationship between the climatic conditions, biochemical properties and APTI**

1. It is evident..... (Table 4). This section is not clearly portraying the message

**CONCLUSION**

1. This study used APTI parameters (i.e. ascorbic acid, leaf extract pH, total chlorophyll and relative water content) in combination and revealed that plants with high APTI are tolerant to air pollution and serve as pollutant absorbers and bioremediators, whereas those with low APTI are sensitive to air pollution and they serve as pollutant indicators as well as biomonitors to detect air pollution. *T. catappa* was the most tolerant and *E. canadensis* was the most sensitive plant. **Not a complete statement**

### Review Form 3

	<p>2. In combine assessment of APTI, socio-economic and biochemical parameters values, the EPI revealed plant species that are fit, very fit and unfit for plantation. <b>Not a complete statement</b></p> <p><b>Important notes</b></p> <ol style="list-style-type: none"><li>1. Some important research papers of recent times of 2022-2024, other than referred in the text must be included</li><li>2. English need to be given due attention, while keeping the scientific facts intact.</li><li>3. The paper "Air pollution tolerance index of three tree species along national high way-6 between Ainthapalli to Remed, Sambalpur District, Western Odisha, India A. A. Pradhan, S.K. Pattanayak, A.K. Bhadra and K. Ekka, Biolife, 2016, v.4(1):pp.111-120 would be of some help in rewriting.</li></ol>	
--	---	--

### **PART 2:**

	<b>Reviewer's comment</b>	<b>Author's comment</b> (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
<b>Are there ethical issues in this manuscript?</b>	<i>(If yes, Kindly please write down the ethical issues here in details)</i>	

### Reviewer Details:

Name:	<b>Sanjaya Kumar Pattanayak</b>
Department, University & Country	<b>Sambalpur University, India</b>