ISSN: 2320-5407
ISSN NO. 2320-5407
International Journal of Advanced Research
Publisher's Name: Jana Publication and Research LLP
www.journalijar.com

REVIEWER'S REPORT

Manuscript No.: IJAR- 59601

Title: Pests of Oriental Spruce Picea orientalis (Link) and Measures to Combat Them.

Recommendation:
Accept as it is .....
Accept after Minor revision.....
Accept after Major revision
Do not accept (*Reasons below*)

Rating	Excel.	Good	Fair	Poor
Originality		✓		
Techn. Quality		✓		
Clarity			✓	
Significance			✓	

Reviewer Name:Dr. ANAPANA GOPAL

Reviewer's Comment for Publication.

General Comments
The manuscript addresses the sanitary condition of Oriental spruce (Picea orientalis) and associated coniferous forests in Adjara, Georgia, focusing on bark beetle infestations, tree damage, pest population characteristics, and forest protection measures. The study draws on long-term observations from 1999–2023, field monitoring, sample plots, model-tree assessments, and photographic documentation of infestation symptoms.
The topic is relevant to forest entomology, forest health management, and the conservation of coniferous ecosystems. The long observation period and inclusion of tree-level measurements are valuable features. The manuscript also discusses integrated pest management approaches, including pheromone traps, biological control agents, and sanitary cutting.
However, the manuscript requires substantial revision to improve its scientific clarity, methodological reproducibility, taxonomic consistency, and presentation of results. There are notable inconsistencies between the title, abstract, main text, tables, and conclusions regarding host-tree species and pest identities. The methods also lack sufficient quantitative detail about sampling design, monitoring frequency, and the evaluation of control measures. These issues should be addressed before the manuscript can be considered for publication.
Content and Originality
The manuscript addresses an important problem in forest protection by documenting pest-associated damage to Oriental spruce and fir stands in Adjara. The long-term observations and descriptions of infestation symptoms may provide useful information for forest monitoring and pest management.
Nevertheless, the scientific contribution needs to be more clearly established. The authors should identify the principal research questions and explain how the findings

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extend existing knowledge of bark beetle ecology, host-tree susceptibility, or integrated forest protection in the Caucasus region.

The manuscript primarily presents descriptive observations and measurements from selected forest plots and model trees. The authors should explain how these observations support the broader conclusions regarding pest population growth, forest decline, and the effectiveness of proposed control measures.

The title refers specifically to Oriental spruce, whereas the abstract and several sections focus on fir stands and different host-tree species. The authors should clearly define the scope of the study and consistently distinguish between Oriental spruce (Picea orientalis) and fir (Abies spp.).

The practical relevance of the findings could be strengthened by explaining how the proposed control measures may be applied under different infestation conditions and forest management scenarios.

Technical Quality

The manuscript requires significant improvement in methodological detail, data consistency, and scientific interpretation.

1. Sampling design and study period: The study refers to long-term observations from 1999–2023, but the number of sample plots, their dimensions, selection criteria, distribution across elevations, and monitoring frequency are not adequately described. These details should be provided to enable reproducibility.

2. Identification of pest species: The manuscript uses several common names, including "large spruce leafhopper," "great spruce bark beetle," and "pine bark beetle," alongside scientific names. These terms appear inconsistently across sections. The authors should verify the identity of each pest and use consistent scientific and common names throughout.

3. Host-tree identification: The abstract, title, results, and conclusions refer to different coniferous host trees. The authors should clarify which tree species were examined in each sample plot and identify the host species associated with each recorded pest.

4. Data consistency and calculations: The numerical results require careful verification. For example, Table 2 on page 6 reports 253 spruce trees, of which 100 are classified as healthy, but the accompanying percentage is given as 39%. The authors should verify that all category totals, percentages, and classifications are internally consistent. The calculations and units reported in Tables 3 and 4 should also be checked for accuracy and clarity.

5. Assessment of infestation severity: The manuscript presents several tree-health classifications and damage-severity categories, but the criteria used to assign trees to these categories are not sufficiently explained. The authors should provide clear operational definitions and describe how observations were recorded and validated.

6. Model-tree measurements: Pages 8–10 present measurements of maternal galleries, mating chambers, young beetles, pupae, and settlement density. The authors should explain the selection of model trees, the number of trees examined, the sampling procedures, and the formulas used to calculate population density and reproductive potential. The reported units and calculations should be checked carefully.

7. Evaluation of control measures: The abstract recommends pheromone traps, entomophagous insects, and sanitary cutting. However, the manuscript does not provide sufficiently detailed comparative data to quantify the effectiveness of these measures. The authors should present treatment-specific observations, appropriate

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comparisons, or clearly acknowledge that the recommendations are based on existing practices rather than a controlled evaluation conducted in this study.
8. Biological control: The roles attributed to Thanasimus formicarius and Rhizophagus grandis should be supported by appropriate references and, where applicable, by observations from the study. The authors should distinguish between control measures directly evaluated and those recommended from previous research.
9. Interpretation of long-term changes: Photographs on page 7 illustrate forest conditions in 2006, 2013, and 2023. However, photographic comparisons alone cannot establish changes in pest abundance or demonstrate that particular factors caused forest decline. The authors should support temporal claims with quantitative monitoring data wherever available.
10. Statistical analysis: The manuscript mainly reports descriptive measurements and percentages. The authors should explain whether statistical comparisons were conducted across years, locations, host-tree species, or infestation categories. If no inferential analysis was performed, the conclusions should remain appropriately descriptive.

Language and Presentation

The manuscript requires comprehensive language editing and technical proofreading to improve readability and scientific precision.

- Correct grammatical errors, awkward sentence constructions, and inconsistent punctuation throughout the text.
- Standardize scientific names, including italics for genus and species names.
- Use consistent terminology for bark beetles, leafhoppers, host trees, infestation symptoms, and biological control agents.
- Correct inconsistent spellings and transliterations of pest names and locations.
- Standardize decimal separators, measurement units, percentages, and numerical notation.
- Improve the legibility of tables, particularly the extensive data tables on pages 5, 6, 8, and 9.
- Provide clear captions and explanatory legends for the photographs and figures.
- Remove duplicated statements and improve transitions between the results, discussion, and conclusion.

The terminology used in the title and throughout the manuscript should be revised carefully to avoid confusion between different insect groups and coniferous host species.

Structure and Organization

The manuscript follows a conventional research-paper structure, but its organization should be improved to establish a clearer connection between the objectives, methods, findings, and conclusions.

- Abstract: Clearly state the study objectives, study period, sampling approach, principal quantitative findings, and evidence supporting the recommended control measures.
- Introduction: Establish the research gap, summarize relevant research on bark beetle infestations in Oriental spruce and associated coniferous forests, and state the specific objectives.
- Materials and Methods: Describe the study sites, sampling design, monitoring procedures, pest identification methods, tree-health assessment criteria, and calculations used to estimate population parameters.

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- Results and Discussion: Present the findings systematically, separating forest characteristics, tree-health assessments, pest identification, infestation intensity, reproductive measurements, and management implications.
- Tables and Figures: Correct inconsistencies in numerical values and labels. Ensure that all tables and figures are numbered sequentially and referenced accurately in the text.
- Control Measures: Provide a dedicated section distinguishing measures evaluated during the study from recommendations based on previous literature.
- Conclusion: Summarize the principal findings without introducing unsupported claims or switching between pest and host-tree identities.

A clearer structure would improve the scientific value of the manuscript and make its findings more useful to forest managers and researchers.

References and Citations

The manuscript includes references on forest health, bark beetle biology, spruce-forest management, and pest-control practices. However, the references and their use in the text require further attention.

- Ensure that claims about pest biology, reproductive characteristics, host-tree susceptibility, and control methods are supported by appropriate references.
- Verify the accuracy and completeness of bibliographic details, including author names, publication titles, years, volume numbers, page ranges, and publication sources.
- Correct duplicate numbering and formatting errors in the reference list, particularly the repeated numbering visible in entries 8, 9, and subsequent entries.
- Ensure that all in-text citations correspond to entries in the reference list.
- Include relevant recent scientific literature on bark beetle ecology, forest decline, pheromone-based monitoring, and biological control where appropriate.
- Verify the cited regulatory provisions and ensure that recommendations concerning forest protection are consistent with the relevant guidance.
- Provide complete publication details for references that currently contain incomplete or unclear bibliographic information.

The reference list should be standardized according to the journal's prescribed citation style.

Overall Recommendation

Minor Revision

The manuscript addresses a relevant topic in forest entomology and forest health management. Its long-term observations, model-tree measurements, photographic documentation, and discussion of integrated pest management provide a useful foundation for further scientific reporting.

However, significant concerns remain regarding taxonomic consistency, sampling methodology, numerical accuracy, reproducibility, and the strength of the evidence supporting the recommended control measures. The authors should verify the underlying data, clarify the identities of the pests and host trees, improve the methodological description, and ensure that all conclusions are supported by the reported observations.

The manuscript also requires substantial language editing and correction of tables, figures, and references. Addressing these issues would improve its scientific reliability and practical relevance.

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Final Decision
Minor Revision.
The authors should revise the manuscript in accordance with the comments above, particularly by resolving inconsistencies in pest identification and host-tree terminology, validating the quantitative results, providing reproducible methodological details, and strengthening the evidence supporting the proposed pest-management measures. A further review is recommended after resubmission to determine whether the minor scientific and presentation concerns have been satisfactorily addressed.