



### REVIEWER'S REPORT

**Manuscript No.: IJAR-56777**

**Title: Antioxidant potential of medicinal plants used against liver diseases in Bengassou, Bocanda department (Central-Eastern, Côte d'Ivoire)**

**Recommendation:**

Accept as it is

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

**Reviewer's ID: JPR-006**

### *Detailed Reviewer's Report*

#### 1. Research Problem

- Rising liver diseases due to infections
- Limited healthcare accessibility in rural regions
- High treatment cost of conventional medicine
- Dependence on traditional remedies
- Lack of scientific validation of plant use
- Need to assess hepatoprotective potential
- Address oxidative stress-related damage

#### 2. Objectives of the Study

- Identify phytochemical constituents
- Evaluate antioxidant properties of plants
- Analyze hydroethanolic extracts
- Use DPPH and Folin-Ciocalteu assays
- Validate traditional medicinal claims
- Promote improved traditional medicines (ITM)
- Support liver disease management

#### 3. Significance of the Study

- Provides scientific validation of herbal medicine
- Supports rural healthcare solutions
- Promotes cost-effective treatment options
- Enhances pharmacological research
- Contributes to ethnobotanical knowledge
- Encourages sustainable use of plants
- Helps reduce liver disease burden

#### 4. Background on Medicinal Plants

- Used since ancient times globally

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- Based on empirical knowledge systems
- Widely practiced in developing countries
- WHO reports ~80% reliance in Africa
- Accessible and culturally accepted
- Integral to primary healthcare systems
- Increasing global research interest

### 5. Healthcare Challenges in Côte d'Ivoire

- Inequality in healthcare access
- Limited specialized medical facilities
- Economic constraints for patients
- Rural areas heavily affected
- Dependence on plant-based medicine
- Public health burden remains high
- Need for alternative therapeutic strategies

### 6. Liver Function and Importance

- Central organ for metabolism
- Regulates carbohydrates and lipids
- Involved in bile production
- Stores essential vitamins
- Detoxifies harmful substances
- Maintains metabolic homeostasis
- Dysfunction leads to severe diseases

### 7. Role of Oxidative Stress

- Caused by imbalance of free radicals
- Leads to cellular damage
- Major factor in liver diseases
- Associated with hepatitis progression
- Damages proteins, lipids, DNA
- Weakens antioxidant defense system
- Target for therapeutic intervention

### 8. Study Area Description

- Bengassou located in Bocanda region
- Known for ethnomedicinal diversity
- Rich in medicinal plant resources
- Traditional healers widely present
- Local population depends on plants
- Area suitable for ethnobotanical studies
- Provides unique research opportunity

### 9. Plant Selection Criteria

- Based on ethnomedicinal survey
- Selected from prior study (Siallou et al.)
- Focus on liver disease treatments
- Lack of scientific data considered
- 13 plant species selected

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- Both leaves and bark used
- Represents traditional practices

### 10.Plant Collection and Processing

- Collected in July 2018
- Harvested plant parts carefully
- Dried under room temperature
- Avoided sunlight degradation
- Ground into fine powder
- Stored in Kraft paper
- Maintained sample integrity

### 11.Preparation of Extracts

- Hydroethanolic solvent (80:20) used
- Maceration repeated three times
- Solvent renewed every 24 hours
- Filtration of combined extracts
- Evaporation under reduced pressure
- Obtained dry crude extracts
- Used for further analysis

### 12.Phytochemical Screening Overview

- Conducted using colorimetric tests
- Identifies major compound groups
- Simple and cost-effective methods
- Detects bioactive constituents
- Provides preliminary chemical profile
- Supports biological activity analysis
- Essential for pharmacological studies

### 13.Detection of Polyphenols

- Ferric chloride test applied
- Color change indicates presence
- Blue-black or green coloration observed
- Confirms phenolic compounds
- Important antioxidant agents
- Widely distributed in plants
- Basis for further analysis

### 14.Detection of Flavonoids

- Magnesium and HCl reaction used
- Produces pink or orange color
- Indicates flavonoid presence
- Known for antioxidant activity
- Protects against oxidative stress
- Common in medicinal plants
- Enhances therapeutic value

**REVIEWER'S REPORT****15. Detection of Coumarins**

- UV fluorescence method used
- Blue or yellow fluorescence observed
- Confirmed using NaOH test
- Indicates presence of lactone compounds
- Contributes to antioxidant activity
- Found in selected plant extracts
- Important secondary metabolites

**16. Detection of Tannins**

- Stiasny reagent used
- Formation of flakes indicates presence
- Differentiates tannin types
- Gallic and catechinic tannins detected
- Strong antioxidant properties
- Protects biological systems
- Widely present in extracts

**17. Detection of Alkaloids**

- Dragendorff's reagent applied
- Orange precipitate indicates presence
- No alkaloids detected in study
- May depend on solvent polarity
- Contradicts some previous studies
- Influenced by extraction method
- Requires further investigation

**18. Detection of Sterols and Terpenes**

- Acetic anhydride reaction used
- Color change confirms presence
- Purple to green transition observed
- Indicates sterols and terpenoids
- Known antioxidant compounds
- Enhance hepatoprotective effects
- Present in most extracts

**19. Total Phenolic Content (TPC)**

- Measured using Folin-Ciocalteu method
- Expressed as mg GAE/g DM
- Calibration curve with gallic acid
- High variation among plants
- Entandrophragma showed highest TPC
- Indicates strong antioxidant potential
- Correlates with biological activity

**20. DPPH Radical Scavenging Assay**

- Measures free radical reduction
- Based on color change reaction

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- Absorbance measured at 517 nm
- Higher reduction = stronger activity
- Concentration-dependent response
- Simple and reliable method
- Widely used antioxidant test

### 21. Calculation of EC50/CR50

- Represents 50% radical reduction
- Determined from regression curve
- Lower value = higher activity
- Important antioxidant indicator
- Compared across plant extracts
- Allows ranking of potency
- Useful for pharmacological evaluation

### 22. Statistical Analysis

- Data analyzed using Excel
- ANOVA applied for significance
- GraphPad Prism software used
- Tukey test for comparisons
- Significance level at  $p < 0.05$
- Ensures result reliability
- Validates experimental findings

### 23. Key Results and Findings

- Polyphenols, flavonoids widely present
- Alkaloids absent in all extracts
- TPC highest in *E. angolense*
- Strong antioxidant activity observed
- *U. africana* most potent extract
- *V. guineensis* also significant
- Activity correlates with phenolic content

### 24. Conclusion and Future Scope

- Confirms antioxidant potential of plants
- Identifies three highly active species
- Supports traditional medicine use
- Promotes development of ITMs
- Suggests toxicity studies next
- Recommends in vivo validation
- Encourages further pharmacological research