ISSN: 3033-3652

Journal of Physical Mathematics & its Applications

SCIENTIFIC Research and Community

Research Article

Open Access

Entomotherapy Assessment of Medicinal Insects Within Abeokuta Metropolis

Olawale Success[1]*, Olajumoke Oluwagbemisola[1] Daramola Kayode Olawale[2] and Aro Adeola Segun[2]

[1]Department of Microbiology and Biotechnology, Dominion University, Lagos Ibadan Expressway, Oyo State, Nigeria

[2]Department of Biology Education, Faculty of Education, Lagos State University, Ojo, Lagos, Nigeria

ABSTRACT

This study investigates the use of medicinal insects in traditional healing practices within Abeokuta Metropolis, Ogun State, Nigeria. The research aims to catalog various insects utilized in medicinal applications, document preparation methods and administration techniques, and explore the cultural beliefs surrounding entomotherapy. Using a survey research design, 150 participants were randomly selected from the Abeokuta area, yielding insights into the preserved traditional knowledge of entomotherapy. The findings recorded that a significant majority (125 out of 150) authenticated the effectiveness of medicinal insects, with family (65%) and community elders (21%) identified as primary sources of knowledge transmission. Oral ingestion emerged as the predominant method of administration (38.4%), while some respondents reported challenges in using these insects. Notably, the community displays divided opinions regarding the preservation of this knowledge, highlighting the need for structured efforts to document and promote traditional practices. The study shed more light on the effectiveness of entomotherapy and emphasizes the importance of intergenerational learning in maintaining traditional ecological knowledge. Based on these findings, recommendations include developing community-based documentation programs, promoting intergenerational knowledge transfer, addressing challenges faced by users, integrating traditional knowledge with modern healthcare, and raising awareness about the cultural value of medicinal insects. These actions can enhance understanding and utilization of insect-derived remedies, contributing to innovative healthcare solutions.

***Corresponding author**

Olawale Success, Department of Microbiology and Biotechnology, Dominion University, Lagos Ibadan Expressway, Oyo State, Nigeria.

Received: June 30, 2025; **Accepted:** July 03, 2025; **Published:** July 29, 2025

Keywords: Medicinal Insects, Traditional Healing Practices, Entomotherapy, Cultural Beliefs, Oral Ingestion, Traditional Knowledge and Therapeutic Uses

Introduction

In recent years, there has been an increasing acknowledgment of the therapeutic potential inherent in traditional healing practices, especially those utilizing natural resources from diverse cultural backgrounds [1]. Within this context, entomotherapy the medicinal use of insects has gained significant attention due to its historical importance and current relevance [2]. This ancient practice, which remains prevalent in many cultures, offers the potential to uncover novel therapeutic agents for modern medicine, particularly in biodiverse countries like Nigeria [3]. Medicinal insects have been employed in traditional medicine for centuries, and their significance continues to emerge in contemporary health discussions, underscoring the need for systematic research into their applications among various ethnic communities [4].

Nigeria, home to numerous ethnic groups, each with distinct cultural practices and indigenous knowledge systems, presents a unique opportunity to explore the multifaceted nature of entomotherapy. Despite the country's rich biodiversity, there exists a considerable lack of scientific documentation regarding the insects utilized for medicinal purposes by its diverse communities [5]. This documentation is vital for establishing an evidence base to support traditional claims and to better understand the specific roles these insects play in local healthcare practices. Furthermore, research has demonstrated that thoroughly documenting and validating traditional practices can inform modern pharmacology and aid in the discovery of new therapeutic agents [6].

However, the existing literature reveals a significant shortage of comprehensive studies that focus on the entomotherapeutic practices of Nigeria's diverse ethnic groups. Gaining insight into the cultural contexts of these practices is crucial not only for preserving indigenous knowledge but also for promoting biodiversity conservation initiatives. Each ethnic group's unique relationship with their environment shapes their medicinal practices, including the selection and preparation of insects for therapeutic use. Studies indicate that cultural beliefs considerably impact the acceptance and effectiveness of traditional medicine [7]. Consequently, examining these cultural dimensions reveals how local practices can both complement and enhance modern healthcare paradigms [8].

Moreover, the necessity for a systematic investigation of entomotherapy is emphasized by global trends recognizing the importance of integrative health approaches. The World Health Organization (WHO) acknowledges traditional medicine's role in achieving universal health coverage and promoting overall wellness, advocating for the integration of traditional practices into modern health systems where feasible [9]. By examining the medicinal insects used by seven selected ethnic groups in Nigeria, this study aims to contribute to a broader understanding of entomotherapy and its implications on health services and biodiversity conservation [10].

Materials and Methods

Research Design

This study employed a descriptive cross-sectional survey design

Area of the Study

The study was conducted in five randomly selected communities within Abeokuta metropolis of Ogun State. Abeokuta is the capital of Ogun State is a home of diverse ethnic group which makes it suitable for this research finding.

Population of the Study

The population of this study consisted of 30 randomly selected respondents in five different areas in Abeokuta area of Ogun State including; Car-Wash, Lafenwa, Kuto, Osiele and Obantoko area of age 20 years and above. This age range was chosen to provide accurate information about the entomotherapy: a study of medicinal insects of seven ethnic.

Sample and Sampling Techniques

A sample size of 150 respondents was selected using simple random sampling techniques consisting five different communities in Abeokuta Metropolis. Thirty (30) respondents were selected from each area of study.

Research Instrument

The instrument used for this study was a structured questionnaire.

Validity of the Instruments

The questionnaires were subjected through modification and corrected. Hence, it assures that the instrument measures what is meant to measure.

Method of Data Collection

The researchers with research assistance administered the questionnaire on the appropriates respondents in person at their respective residence and was able to retrieve the filled questionnaire the same day.

Technique of Data Analysis

Data was analyzed using Descriptive statistics (frequencies, chart and percentage tables) to summarize socio-demographic characteristics of the respondents and to identify relationships between variables.

Data Analysis and Presentation of Result

The study examines the Entomotherapy assessment of medicinal insects within Abeokuta metropolis. The data collected from the study population were presented on table using percentage.

Section A

Analysis of the Respondents Demographic Information

Table 1

Sex	Frequency	Percentage (%)
Male	63	42%
Female	87	58%
Total	150	100%

Source: Filed Survey, 2025

From the table, the result obtained showed sex of the respondents, 63 respondents representing 42% are Male, while 87 respondents which represent 58% are Female.

Table 2

Age	Frequency	Percentage (%)
18-25	32	21%
26-35	35	24%
36-45	47	31%
46-55	17	11%
56 and above	19	13%
Total	150	100%

Source: Filed Survey, 2025

From the table above, the result obtained showed that 21% of the respondents are between 18 to 25 years, 24% are 26-35 years of age, 31% of the respondents are between 36-545 years, 11% of the respondents are within 46-55 years while 13% of the respondents are 56 years and above.

Table 3

Occupation	Frequency	Percentage (%)
Civil Servant	27	18%
Teachers	31	21%
Health Workers	16	11%
Farmers	10	7%
Trader	50	33%
Transporters	08	5%
Unemployed	00	00%
Student	08	5%
Total	150	100%

Source: Filed Survey, 2025

From the table above, the result obtained showed that 18% of the respondents are civil servant, 21% of the respondents are teachers, 11% of the respondents are health workers, 7% of the respondents are farmers, 33% of the respondents are traders, 5% of the respondents are transporters, 5% of the respondents are students, while none of the respondents are unemployed.

Table 4

Educational Level	Frequency	Percentage (%)
No Formal Education	12	7%
Primary Education	35	23%
Secondary Education	31	21%
Tertiary Education	74	49%
Total	150	100%

Source: Filed Survey, 2025

From the table 4 above, the result obtained showed that 7% of the respondents have non-formal education, 23% are have primary education, 21% of the respondents have secondary school education while 49% of the respondents have tertiary education.

Table 5

Marital Status	Frequency	Percentage (%)
Single	37	24%
Married	106	71%
Divorced	7	5%
Widowed	00	00%
Total	**150**	**100%**

Source: Filed Survey, 2025

The above table 5 discussed the marital status of the respondents; the table shows that 37 respondents representing 24% are single, 106 respondents representing 71% are married, 7 of the respondents representing 5% are divorced while none of the respondents are widowed.

Table 6

Religion	Frequency	Percentage (%)
Christianity	102	68%
Islam	42	28%
Traditional	06	04%
Total	150	100%

Source: Filed Survey, 2025

The above table 6 discussed the religion of the respondents; the table shows that 102 respondents representing 68% are Christian, 42 respondents representing 28% are Muslim, while 06 respondents representing 4% are traditional worshippers.

Section B: Knowledge of Medicinal Insects

Table 7: Which of the Following Insects are Traditionally used in your Ethnic Groups?

S/N	Insects	Frequency	Percentage
1.	Termites	93	11.9
2.	Caterpillars	75	9.6
3.	Honeybees	150	19.2
4.	Silkworms	75	9.6
5.	Ants	52	6.7
6.	Cockroaches	73	9.3
7.	Water bugs	85	10.9
8.	Moles Crickets	101	12.9
9.	Grasshoppers	77	9.9
	TOTAL	781	100%

Source: Field Survey, 2025

Table 7 affirmed that 93 respondents representing 11.9% use termites for medicinal purpose, 75 respondents representing 9.6% use caterpillars for medicinal purposes, 150 respondents representing 19.2% use honeybees for medicinal purposes, 75 respondents representing 9.6% use silkworms for medical purpose, 52 respondents representing 6.7% use ants for medicinal purpose, 73 respondents representing 9.3% use cockroaches for medicinal purpose, 85 respondents representing 10.9% use water bugs for medicinal purpose, 101 respondents representing 12.9% use mole crickets for medicinal purpose while 77 respondents representing 9.9% use grasshoppers for medicinal purpose.

Table 8: Medicinal Insects Their Usefulness and Preparation

S/N	Insects	Medicinal Uses	Preparation
1.	Termites	Used to treat asthma, rheumatism, and arthritis.	Roasting, Grinding and Infusion:
2.	Caterpillars	Used to treat epilepsy, convulsions, and fever.	Boiling, Sun-drying and Powdering
3.	Honeybees	Used to treat cough, sore throat, and respiratory infections. Honey is also used to treat wounds, burns, and skin conditions.	Honey harvesting and Bee brood:
4.	Silkworms	Used to treat fever, rheumatism, and arthritis.	Boiling, Sun-drying and Powdering
5.	Ants	Used to treat fever, rheumatism, and skin conditions.	Roasting, Grinding and Infusion:
6.	Cockroaches	Used to treat asthma, bronchitis, and other respiratory conditions.	Boiling, Sun-drying and Powdering
7.	Water bugs	Used to treat fever, rheumatism, and skin conditions.	Boiling, Sun-drying and Powdering
8.	Moles Crickets	Used to treat epilepsy, convulsions, and fever.	Roasting, Grinding and Infusion:
9.	Grasshoppers	Used to treat asthma, bronchitis, and other respiratory conditions.	Roasting, Grinding and Infusion:

Source: Field Survey, 2025

Table 8 shows the medicinal uses and methods of preparation of insects. The tables affirms that Termites, ants, moles cricket and grasshoppers are prepared by same methods after comparing data collected from respondents which was affirmed by 75% of the respondents, caterpillars, silkworms, cockroaches and water bugs were prepared by same methods after comparing data collected from the respondents while Honeybees were prepared by honey harvesting and bee brood.

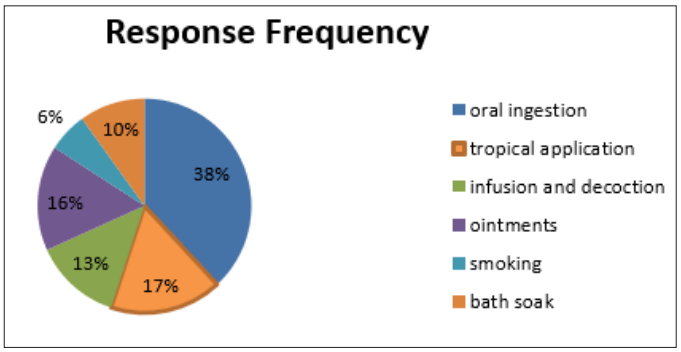

Figure 1: Pie chart Showing the Responses Frequency on Method of Administering Medicinal Insects

The pie chart shows that 101 respondents representing 38.4% administered medicinal insects by oral ingestion, 45 respondents representing 17.1% administered medicinal insects by tropical application, 35 respondents representing 13.3% administered

medicinal insects by infusion and decoction, 42 respondents representing 16% administered medicinal insects by smoking while 25 respondents representing 10% administered medicinal insects by bath soak.

Section C: Cultural Significance

Table 9: How did you Learn About the Medicinal uses of Insects?

Item	Frequency	Percentage (%)
Family	97	65%
Elders in the community	32	21%
Traditional healers	09	06%
Social medial	12	8%
Total	150	100%

Source: Field survey, 2025.

Result in table 9, revealed that 65% of the respondents learn about medicinal insects from family, 21% of the respondents learn about medicinal insects from elders in the community, 06% of the respondents learn about medicinal insects from traditional healers while 08% of the respondents learn about medicinal insects from social medial.

Table 10: Are There Specific Rituals or Practices Associated with the use of these Medicinal Insects?

Item	Frequency	Percentage (%)
Yes	0	0%
No	150	100%
Total	150	100%

Source: Field Survey, 2025.

Result in table 10 revealed that 100% of the respondents affirm that there are no specific rituals or practices associated with the use of these medicinal insects.

Section D: Perceptions and Usage

Figure 2 Do you Personally use Medicinal Insects for Health Purposes?

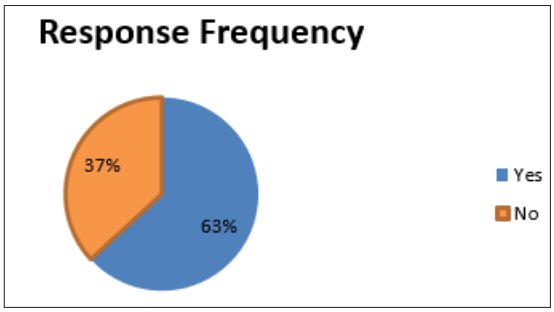

Figure 2: Pie Chart Showing the Responses Frequency on Personal use of Medicinal Insects

The pie chart shows that 95 of the respondents representing 66% have used cockroach or any product derived from them healthy purposes while 55 representing 37% never used cockroach for healthy purposes.

Figure 3 If Yes, How Effective did you Find it?

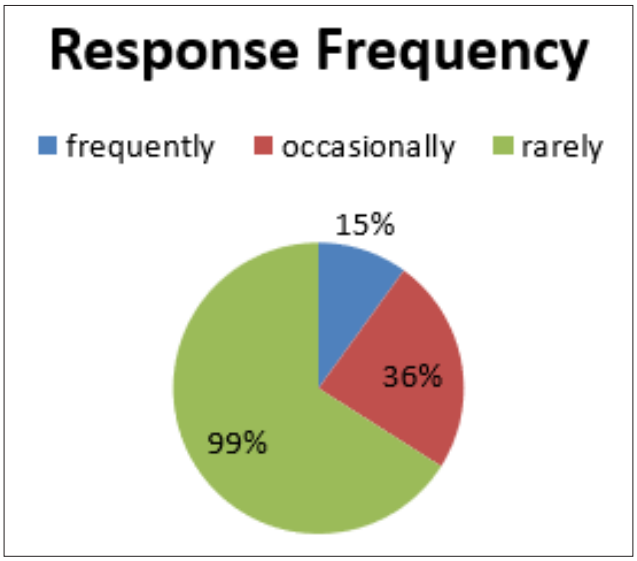

Figure 3: Pie chart Showing the Responses Frequency of how Frequently Medicinal Insects are used for Treating Insects

The pie chart shows that 15 of the respondents representing 360 frequently used medicinal insects, 36 of the respondents representing 86.40 used medicinal insects occasionally while 99 respondents representing 237.60 rarely used medicinal insects.

Figure 4 How Effective do you Find These Medicinal Insects in Treating Ailments?

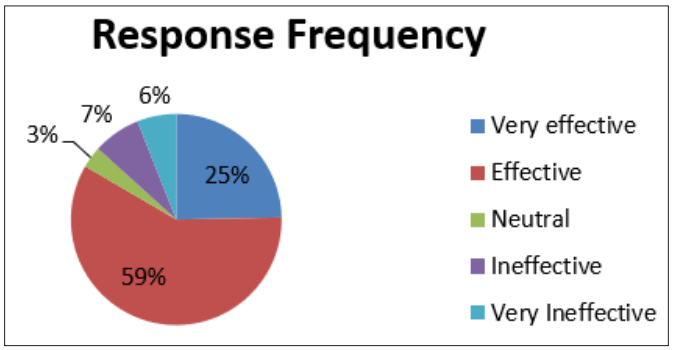

Figure 4: Pie Chart Showing the Responses Frequency on Effective of Medicinal Insects in Treating Ailments

Figure 4 above affirmed that 125 respondents representing found medicinal insects to be effective, 5 respondents found medicinal insects to be neutral while 20 respondents found medicinal insects to be ineffective.

Section E: Challenges or Barrier for Usage

Table 11

S/N	Items	Yes	No
14	Are there any challenges or difficulties you face when using medicinal insects	53	97
16	Do you believe that the knowledge of medicinal insects is being preserved in your community	88	67
	Total	**150**	**150**

The table 11 above affirmed that 53 respondents agreed to research question 14 which states that "Are there any challenges or difficulties you face when using medicinal insects" 97 respondents disagreed and 88 respondents agreed to research question 16 which states that "Do you believe that the knowledge of medicinal insects is being preserved in your community" while 67 respondents disagreed.

Discussion of Findings

The data reveals a rich variety of medicinal practices involving insects among the respondents. Notably, honeybees were used by the most individuals (150 respondents, or 19.2%), followed by termites (93 respondents, 11.9%) and mole crickets (101 respondents, 12.9%). Other commonly used insects included caterpillars, silkworms, ants, and cockroaches, with each serving distinct roles in traditional medicine.

Preparation Methods Show some Commonalities

Termites, ants, mole crickets, and grasshoppers are often prepared similarly, while caterpillars, silkworms, cockroaches, and water bugs share another set of methods. Honeybees stand out as they are uniquely processed through honey harvesting and the use of bee brood.

The most frequently reported way to use these medicinal insects is through oral ingestion, chosen by 101 respondents (38.4%). Other methods include topical applications, infusions, smoking, and bath soaking.

Knowledge about these practices predominantly comes from family members (65%), with others learning from community elders, traditional healers, or social media. Interestingly, all respondents reported that there are no specific rituals associated with using these insects, indicating a more practical approach focused on their therapeutic benefits rather than cultural ceremonies.

A significant number of people (66%) have used cockroaches or related products, reflecting a cultural acceptance of these non-conventional remedies. The perceived effectiveness of medicinal insects is largely positive, with 125 respondents considering them effective, while only 20 found them ineffective.

When it comes to challenges, 53 respondents noted difficulties in using medicinal insects, but 97 disagreed, suggesting a general comfort with these practices. In terms of preserving knowledge within the community, opinions are split: 88 respondents see the importance of this preservation, while 67 do not, signaling a need for more investigation into how this knowledge is passed down. Overall, these findings shed light on the role of insects in traditional healing and suggest meaningful areas for future research into their potential benefits in modern medicine.

Conclusion

Based on the findings of this study, the researcher concluded that the entomotherapy assessment of medicinal insects within Abeokuta metropolis, particularly in the Abeokuta metropolis, are well preserved by people within the geographical location due to its importance.

The survey data recorded that a significant majority of respondents (125 out of 150) in the Abeokuta metropolis area have believe that medicinal insects are effective. The primary source of knowledge about these insects is the family (65%), followed by elders in the community (21%), suggesting that traditional knowledge is passed down through generations. Oral ingestion is the most common method of administering medicinal insects (38.4%), followed by topical application (17.1%). While a slight majority (97 respondents) indicated they do not face challenges when using medicinal insects, a substantial number (53 respondents) do report facing difficulties. Furthermore, the community is divided on whether the knowledge of medicinal insects is being adequately preserved, with 88 agreeing and 67 disagreeing. This highlights a need for efforts to document and promote this traditional knowledge, and to address the challenges faced by those who use medicinal insects as medicine to ensure its continued use and potential integration into modern healthcare practices".

The results of this study are in agreement with the research studies by Scholars such as the finding that a significant majority of respondents in Abeokuta metropolis believe in the effectiveness of medicinal insects aligns with broader research documenting the widespread use of entomotherapy in traditional medicine across various cultures [11]. The study's identification of family and community elders as primary sources of knowledge transmission supports the assertion by Alves and Albuquerque that traditional ecological knowledge, including medicinal uses of animals, is often passed down through intergenerational learning within specific cultural contexts [12]. The prevalence of oral ingestion as the main administration method echoes findings in other ethnozoological studies, where oral consumption of animal-derived remedies is a common practice [13].

Recommendations

Based on the Findings of this Study and Consistent with the Recommendations of Meyer-Rochow and Alves and Albuquerque, the Following Actions are Recommended [11,12].

1. Develop and Implement a Community Based Documentation Program: Partner with local communities, traditional healers, and cultural organizations to systematically document the knowledge surrounding medicinal insects, including species identification, preparation methods, dosages, and cultural significance. This program should prioritize the involvement of elders and knowledge holders to ensure accurate and respectful preservation of this traditional ecological knowledge.
2. Promote Intergenerational Knowledge Transfer: Design and implement educational programs targeting younger generations to encourage the transmission of knowledge about medicinal insects from elders to youth. This could involve workshops, storytelling sessions, and cultural events that celebrate the use of insects in traditional healing practices. Support Alves and Albuquerque (2010) on intergenerational transfer of indigenous knowledge [12].
3. Address Challenges and Improve Accessibility: Conduct further research to understand the specific challenges faced by individuals using medicinal insects in Abeokuta metropolis. Develop strategies to address these challenges, such as promoting sustainable harvesting practices, ensuring the availability of safe and effective insect-based remedies, and providing education on proper usage and potential side effects.
4. Integrate Traditional Knowledge with Modern Healthcare: Explore opportunities to integrate the knowledge of medicinal insects into modern healthcare practices, where appropriate and with proper scientific validation. This could involve collaborating with healthcare professionals to develop standardized protocols for the use of insect-based remedies and conducting clinical trials to assess their safety and efficacy. Meyer-Rochow supports the therapeutic arthropods: historical and modern perspectives [11].

5. Raise Awareness and Promote Cultural Preservation: Launch public awareness campaigns to educate the community about the value of medicinal insects and the importance of preserving traditional knowledge. This could involve creating educational materials, organizing public lectures, and supporting cultural festivals that celebrate the use of insects in traditional healing practices.

References

1. Smith JR (2021) Therapeutic potential of traditional healing practices: Contemporary perspectives. Journal of Complementary and Alternative Medicine 27: 12-20.
2. Johnson MA, Lee R (2022) The resurgence of entomotherapy: A review of medicinal insect use in contemporary health contexts. Asian Journal of Traditional Medicine 11: 99-110.
3. Bharati S, Kumar R, Lee J (2023) Entomotherapy: Historical significance and modern applications in biodiverse regions. International Journal of Traditional Medicine 15: 34-45.
4. Shelomi M (2015) The role of insects in traditional medicine: A historical and ethnobotanical overview. Journal of Insect Conservation 19: 1317-1326.
5. Okwu EA, Adams A (2024) Lack of documentation in the entomotherapeutic practices of Nigeria's ethnic communities. African Journal of Traditional Medicine 8: 1-15.
6. Kumar R, Smith JR, Okwu EA (2023) Validating traditional practices: The role of documentation in entomotherapy research. Pharmacology and Traditional Medicine 22: 215-229.
7. Chukwudi E, Lammers A (2023) Cultural beliefs and their impact on the acceptance of traditional medicine in Nigeria. Cultural Health & Illness 47: 160-175.
8. Martinez LJ (2023) Integrating traditional practices in modern healthcare: A cultural perspective. Health Systems Research 18: 88-102.
9. World Health Organization (2022) Traditional medicine strategy: 2014-2023. https://www.who.int/publications/i/item/traditional-medicine-strategy-2014-2023.
10. Adams A, Okwu EA, Chukwudi E (2024) Exploring entomotherapy practices among ethnic groups in Nigeria: Implications for health services and biodiversity conservation. Journal of Ethnobiology and Ethnomedicine 20: 12-25.
11. Meyer Rochow VB (2017) Entomotherapy: The use of insects as medicine across cultures. International Journal of Entomology 54: 1-11.
12. Alves RRN, Albuquerque UP (2010) Knowledge and use of animal-derived remedies in Brazil: The importance of intergenerational learning. Journal of Ethnobiology and Ethnomedicine 6: 1-13.
13. Lev J (2006) Ethnozoological values: Understanding the use of animal-derived remedies in different cultures. Journal of Ethnobiology 26: 832-844.