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Exploring wax moth infestation in Burkina Faso: A study on prevalence, risk factors, and beekeepers' practices

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Abstract
Wax moth infestation is a major threat to the beekeeping industry. This study aimed to determine the prevalence and risk factors of wax moth infestation in a large area following a pilot study and to analyse the knowledge and practices of beekeepers in this regard. The hive inspection method was used on 296 hives in 17 apiaries, data were collected on the apiaries, beekeepers' knowledge, and practices using an inspection form and a semi-structured questionnaire. The results show that all beekeepers could recognize wax moth infestation in their hives. However, cleaning and destroying heavily infested frames were the only methods used to control wax moth. The prevalence of infestation was 16.2%. Risk factor analysis revealed strong colonies and the presence of other predators/pests as protective factors against wax moth infestation. These findings suggest that good beekeeping practices and maintenance of strong colonies through regular visits could reduce wax moth infestation.

Keywords: Burkina Faso, bees, wax moth, epidemiology, risk factors, practices

1. Introduction

One of the most significant challenges that the beekeeping industry faces is the disappearance of bee colonies, which is commonly known as colony collapse disorder [1]. The causes of this phenomenon are complex, with research indicating that it is the result of a combination of pathogens, parasites, and pesticides [2, 3]. Colony collapse disorder not only results in bee mortality but also has economic and ecological implications [4]. Therefore, it is crucial to address this issue to ensure the sustainable development of the beekeeping industry. Indeed, beekeeping offers global benefits that are intricately connected to health, the economy, employment and the environment and plays a pivotal role in ensuring sustainable livelihoods by transforming vulnerability into security [5]. Beekeeping is also an important source of income diversification for beekeepers. The beekeeping sector in Burkina Faso is numerically significant, with over 16,000 beekeepers and more than 132,000 operational hives.

However, the beekeeping is facing many constraints including sanitary ones and recent specific preliminary studies on the prevalence of wax moth and *Varroa* spp. infestations in bee colonies in Burkina Faso [6, 7] have revealed a prevalence of 23.6% for wax moth infestation and 91.7% for *Varroa* spp. infestation. These infestations can lead to substantial losses in bee colonies and have a notable impact on the beekeeping economy, particularly in tropical regions [8], where beekeepers often possess limited knowledge about bee health [9]. Certainly, the wax moth stands out as a highly significant threat to honeybee products, earning its reputation as one of the foremost pests in this context [10, 11]. Therefore, there is a pressing need for more research into bee parasite/predator epidemiology and control measures in Burkina Faso to ensure the sustainability of the beekeeping industry.

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To advance the understanding of the wax moth and enable effective control measures, an investigation was conducted over a larger beekeeping region. The specific objective was to evaluate the prevalence and associated risk factors as well as the knowledge and practices of beekeepers in the Central, Centre-East, Centre-West and Central Plateau regions of Burkina Faso with respect to wax moth infestation.

2. Materials and Methods

2.1 Study area: The study was conducted in four administrative regions of Burkina Faso, including the Centre, Centre-East, Centre-West and Central Plateau regions (Fig 1).

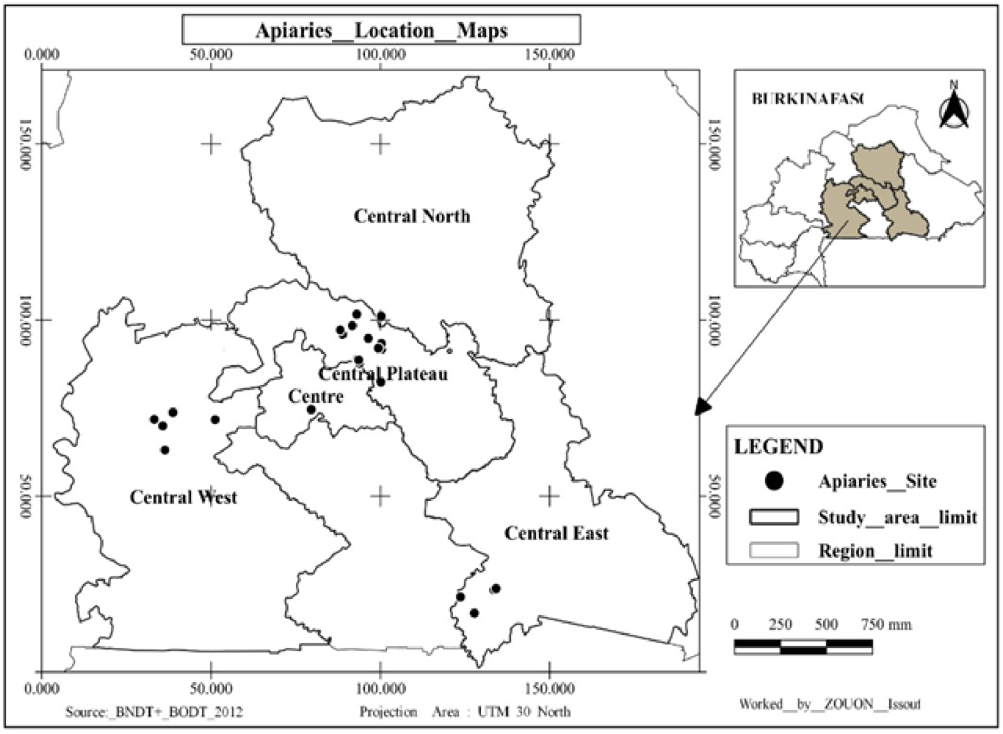

Fig 1: Location of apiaries in the study area

2.1. Method of data collection

2.2.1 Sampling

The sample size was calculated based on an expected prevalence (p) of 23.6%[6] and a precision (e) of 5%. Using the sample size formula $n=z^2pq/e^2$, a minimum sample size of 260 should be used for this study. During the investigation, a total of 296 hives belonging to 17 beekeepers were inspected for signs of wax moth infestation. The search for wax moth consisted of direct identification of the signs of wax moths by sanitary inspection of the hives: larvae, pupae, galleries in the wax and woven silk on the wax combs, in order to confirm the presence of wax moth infestation. A semi-structured questionnaire on the socio-economic characteristics of the beekeepers, the characteristics of the farms and the knowledge and practices regarding wax moth infestation was administered to the beekeepers to gather additional information.

2.2.2 Inspection of hives and colonies

The observation of the hives in each apiary was done after the interview with the beekeeper. Data was collected using a pre-prepared observation form. Only hives already colonized were inspected on the farm. After each hive was opened, observations were made to identify moths escaping from the hive or signs of wax moth inside the roof and above the bars. The combs were then removed and examined for larvae, pupal cocoons or galleries in the wax or woven silk. Finally, the walls and bottom of the hive were inspected for signs of wax moth. Other pests present in the hive were reported and colony strength was estimated using the criteria described by Kebede et al. [12].

2.2.3 Statistical analysis of data

The data collected from beekeepers and hive inspections were entered into a Microsoft Excel spreadsheet (version 2019), which was used to create tables and some graphs. The database was then transferred to R Studio (version R 4.2.0) for further analysis. Descriptive statistics were used to determine parameters such as proportions, averages, standard deviations and maximum/minimum values. The association between categorical explanatory variables (related to beekeeper and apiary characteristics) and the prevalence (dependent variable) was evaluated using Pearson's Chi-square test with Yates' continuity correction and/or Fischer's exact test. The analysis of risk factors associated with colony infestation was done using logistic regression. Both univariate and multivariate logistic regression were employed to ascertain the variables that showed significant associations with infestation. These variables included region, apiary size, hive type, colony strength and colony feeding status.

3. Results

3.1 Description of beekeeper characteristics and beekeeping practices

The beekeepers surveyed in our study were all men with an average age of 55.2±9.5 and were mostly educated (table I). On average, they had 18 years of experience in beekeeping, and 94.1% (16/17) of the respondents had received training in beekeeping. About 76% of the beekeepers were involved in beekeeping associations. The acquisition of essential resources for beekeeping varied among the beekeepers. Approximately 70% of the beekeepers acquired their equipment with their own funds and/or through subsidies

(12/17), while 58.8% (10/17) benefited from donations and 29.41% proceeded with self-confection. The motivations for conducting beekeeping were varied (figure 2), but profitability remained the main one.

Table 1: Socio-economic characteristics of the beekeepers surveyed

Variables	Modalities	Number of beekeepers	Frequencies (%)
Gender	Men	17	100.00
	Women	0	0.00
Level of education	Primary	3	17.65
	Secondary	3	17.65
	University	1	5.88
	Literacy in local language	5	29.41
	Koranic	1	5.88
	None	4	23.53
Beekeeping training	Yes	16	94.1
	No	1	5.9
Experience in beekeeping (years)	Average	18	-
	Under 6 years old	2	11.76
	6-11 years old	4	23.53
	12-17 years old	2	11.76
	18-23 years old	4	23.53
	24-29 years old	3	17.65
	30 and over	2	11.76
Sources of hive acquisition	Purchase/Grants	12	70.60
	Donations	10	58.82
	Self-construction	5	29.41

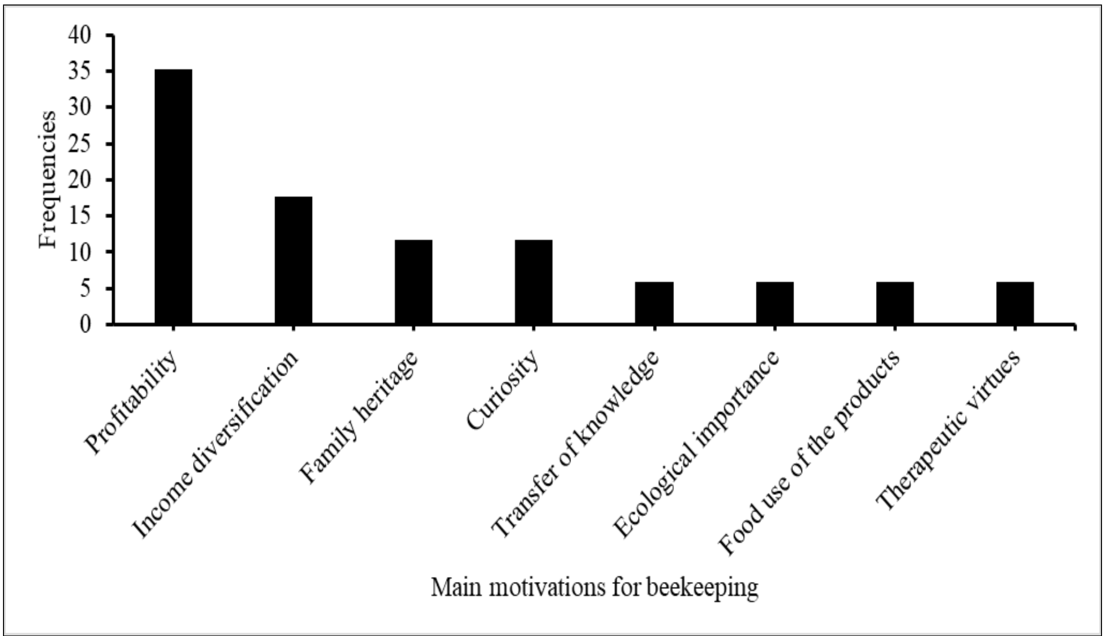

Fig 2: Main motivation of beekeepers in the practice of the activity

The data collected on beekeeping practices allowed for the identification of production techniques and colony management strategies in the study area, as shown in table II. The majority of respondents practiced modern beekeeping, using modern equipment and techniques for production, and harvesting. The hives owned by the respondents were mainly of modern types, with 48.3% French hives, 41.9% Kenyan hives, 2.7% Dadant hives, and only 7.1% traditional hives. Regarding the management of colonies, only 5.9% of the respondents provided food in times of shortage by using honey syrup, while 76.5% of the respondents provided water. When it comes to visits to the apiaries, 76% of the respondents made them at least once a month, 7.8% once every two months, 3.4% only at harvest time, and 12.8% made irregular visits. With an average apiary size of 24±14 hives and an occupancy rate of 70.4%, the respondents used honey (100%), pollen (23.5%), wax (11.8%), propolis (5.9%), and brood (5.9%) in order of importance.

2.3 Beekeepers' knowledge and practices regarding the wax moth

All the respondents were aware of the existence of the wax moth in their area, and 82.35% of them observed it in their hives during 2019. The beekeepers surveyed recognized the wax moth mainly based on five (05) elements: moth larvae (100%), woven silk (88.24%), cocoons, and prints on hive frames (82.35%), and adult moths (47.06%). While all beekeepers use cleaning to combat the wax moth, 47.1% of them destroy highly infested frames. On the other hand, very few have means of preventing wax moth, as shown in Table II.

Table 2: Knowledge, attitudes, and practices of beekeepers regarding wax moths and other predators/pests of bee colonies

Variables	Modalities	Number of replies	Frequencies (%)
Knowledge of the existence of wax moth	Yes	17	100.0
	No	0	0.0
Time of observation of wax moth in the hives	Routine visit	6	35.3
	Harvesting	14	82.4
Signs of wax moth in hives	Larvae	17	100.0
	Cocoons	14	82.4
	Silk galleries in wax	15	88.2
	Fingerprints on frames	14	82.4
	Adult moths	8	47.1
Means of control of wax moth	Cleaning	17	100.0
	Destruction of empty selves		47.1
Means of prevention against wax moth	No	12	70.6
	Removal of empty shelves	2	11.8
	Keeping the bottom clean	2	11.8
	Regular monitoring	1	5.9
	Removal of old combs	1	5.9
	Cleanliness of the apiary	1	5.9

Regarding the periods of wax moth recrudescence, Figure 3 illustrates the observations made by the beekeepers. Thus, it appears that there are two main periods of wax moth recrudescence in the year, and the peaks were observed during the months of April (41.2%) and October (64.7%).

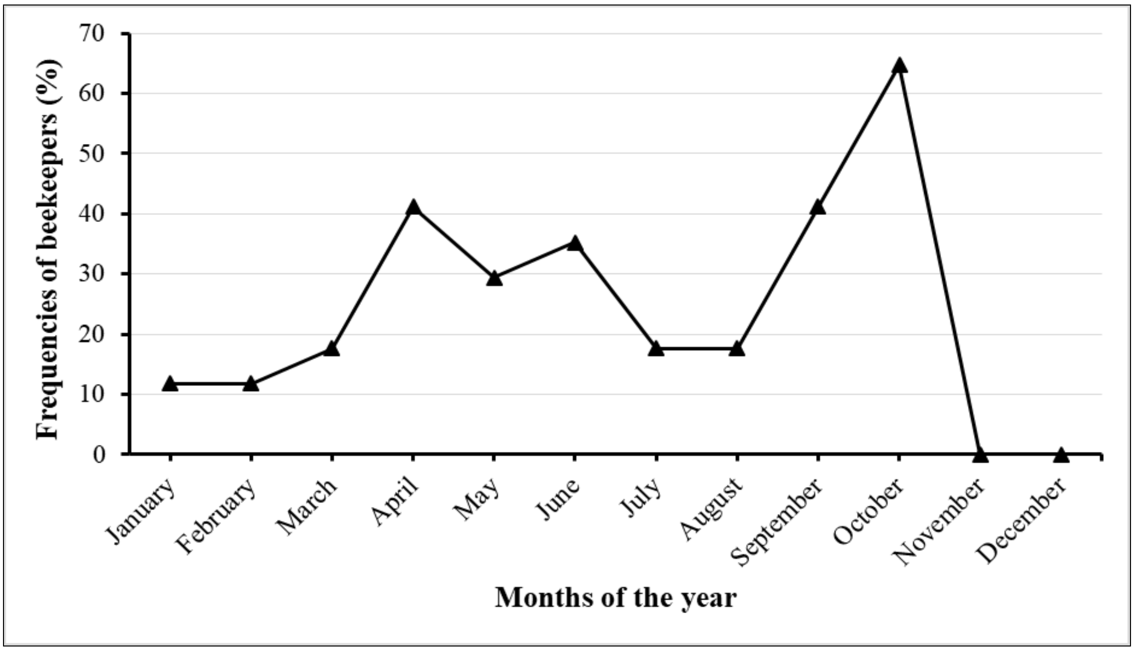

Fig 3: Observation periods for wax moth signs by beekeepers throughout the year

2.3 Prevalence of wax moth

Out of a total of 296 inspected hives, signs of wax moth were identified in 48 hives, resulting in an overall prevalence of 16.2% [95% CI: 12.0%-20.4%], based on reports of wax moth presence or passage. Table III shows the prevalence according to the detected signs.

Table 3: Prevalence of wax moth according to infestation control

Infestation signs	Number of positives colonies	Prevalence (%) and 95%CI
Larvae	18	6.1 [3.4-8.8]
Cocoons	46	15.5 [11.4-19.6]
Gallery in the combs	13	4.4 [2.1-6.7]
Woven silk web	12	4.1 [1.8-6.4]
Overall prevalence	48	16.2 [12.0-20.4]

2.4 Factors influencing the prevalence of wax moth infestation

The analysis of the relationship between variables revealed that the prevalence of wax moth varied significantly according to several factors related to the study area, apiary characteristics, and beekeeper characteristics. The prevalence varied significantly by region, commune, frequency of visits, level of education, and colony strength ($p<0.05$), (Table IV). Specifically, higher prevalences were observed in the Centre (26.7%) and Centre West (29.3%) regions, as well as in the commune of Sindou (62.5%), compared to other regions and communes. Prevalence was also higher in apiaries belonging to beekeepers without no formal education (21.5%), as well as at those with secondary (24.6%) and university (26.7%) education levels. Membership in an association of beekeepers was also associated with higher prevalence. In terms of colony strength, the prevalence was significantly higher in weak colonies (39.1%) and hives deserted by colonies (32.1%). Finally, prevalence was significantly higher in irregularly visited apiaries (42.1%) and large apiaries, with more than 50 hives (29.3%).

Table 4: Factors influencing the prevalence of wax moth infestation

Variables	Modalities	Statut of inspected colony			Prevalence (%)	Chi-square test statistic		
		Negative cases	Positive cases	Total		X_2	DF	P-Value
Region	Centre	11	4	15	26.7	14.41	3	0.002
	Central East	48	2	50	4			
	Central West	41	17	58	29.3			
	Central Plateau	148	25	173	14.5			
Municipality	Komsilga	11	4	15	26.7	35.47	6	3.49E-06
	Koudougou	35	7	42	16.7			
	Nagreongo	27	6	33	18.2			
	Sindou	6	10	16	62.5			
	Zabre	48	2	50	4			
	Ziniare	88	10	98	10.2			
	Zitenga	33	9	42	21.4			
Localisation of apiary	Surrounding of agricultural plots	66	17	83	20.5	3.29	2	0.19
	Savana type forests	171	27	198	13.6			
	Orchard	11	4	15	26.7			
Feeding of colonies	No	236	47	283	16.6	0.22	1	0.64
	Yes	12	1	13	7.7			
Frequence of colony visits colonies	At least once a month	197	28	225	12.4	23.06	3	3.92E-05
	Once every two months	19	4	23	17.4			
	Only at harvest time	10	0	10	0			
	Irregular visits	22	16	38	42.1			
Size of apiaries	25 to 50 hives	105	21	126	16.7	11.72	2	0.003
	Least than 25 hives	102	10	112	8.9			
	More than 50 hives	41	17	58	29.3			
Training in beekeeping techniques	No	18	0	18	0	2.55	1	0.111
	Yes	230	48	278	17.3			
Membership of a beekeeping	No	54	0	54	0	11.37	1	0.001
	Yes	194	48	242	19.8			
Level of education	None	51	14	65	21.5	14.1	5	0.015
	Bantaré	78	12	90	13.3			
	Koranic school	10	0	10	0			
	Primary	49	2	51	3.9			
	Secondary	49	16	65	24.6			
	University	11	4	15	26.7			
Experience in beekeeping	10 to 20 years	95	24	119	20.2	2.77	2	0.25
	Least than 10 years	36	4	40	10			
	More than 20 years	117	20	137	14.6			
Type of hive	Dadant	7	1	8	12.5	5.05	3	0.168
	French	120	23	143	16.1			
	Kenyan	100	24	124	19.4			
	Traditional	21	0	21	0			
Colony Strength of inspected hives	Weak colony	39	25	64	39.1	58.39	3	1.00E-12
	Strong colony	157	4	161	2.5			
	Deserted	38	18	56	32.1			
	Unsettled	14	1	15	6.7			
Presence of predators/pests	No	107	19	126	15.1	0.09	1	0.77
	Yes	141	29	170	17.1			
Overall		248	48	296	16.2			

3.5 Identification of risk factors for wax moth infestation

The outcomes of the univariate logistic regression (Table V) indicated a significant association between wax moth infestation and variables such as region, apiary size, and colony strength. However, when performing the multivariate logistic regression with adjusted odds ratios, only region and colony strength were identified as risk factors (Table V). Consequently, colonies located in the Center, Central-West, and Central Plateau regions were 13.3, 45.2, and 23.7 times more likely to be infested by wax moths, respectively, compared to colonies in the Central-East region. In terms of colony strength, weak colonies, and deserted colonies (hives) had respectively 39.7-and 47.9 fold higher likelihood of wax moth infestation (p<0.001) when compared to strong colonies. Ultimately, in hives that had not been colonized, the likelihood of infestation was merely 1.3 times greater compared to that of strong colonies.

Table 5: Univariate and multivariate logistic regression statistics of wax moth infestation as a function of different variables

Variable	Modalities	Univariate regression			Multivariate regression		
		Un-adjusted odds ratios	95% CI	P-Value	Adjusted odds ratios	95% CI	P-Value
Region	**Central-East**	**Reference**			**Reference**		
	Center	8.7	1.4-53.8	0.020	13.3	1.6-112.1	0.017
	Central-West	10.0	2.2-45.6	0.003	45.2	6.8-301.2	0.000
	Central Plateau	4.1	0.9-17.7	0.063	23.7	2.0-282.5	0.012
Colony feeding	**Oui**	**Reference**			**Reference**		
	Non	2.4	0.3-18-8	0.408	1.3	0.1-13.7	0.835
Apiary size	< 25 beehives	Reference					
	20-50 beehives	2.0	0.9-4.5	0.081	1.3	0.4-3.6	0.656
	> 50 beehives	4.2	1.8-10.0	0.001	1(omitted)		
Type of beehive	**Dadant**	**Reference**			**Reference**		
	French model	1.3		0.788	0.4	0.0-7.5	0.525
	Kenyan	1.7		0.635	2.1	0.1-43.5	0.623
	Traditional	1(empty)*		0.000	1(empty)*		
Strength of the colony	**Strong colony**	**Reference**			**Reference**		
	Weak colony	25.2	8.3-76.5	0.000	39.7	11.1-141.8	0.000
	Deserted colony	18.6	5.9-58.1	0.000	47.9	11.8-194.9	0.000
	Not colonised	2.8	0.3-26.8	0.371	1.3	0.1-20.8	0.838
Presence of predators/pests	**No**	**Reference**			**Reference**		
	Yes	1.2	0.6-2.2	0.648	0.6	0.2-1.3	0.162

3.6 Other predators/pests

The inspection of the hives revealed the presence of other pests and predators in addition to the wax moth. These predators were found in 57.8% of the inspected hives, with the small hive beetle (34.5%) and ants (31.4%) being the most prevalent (Figure 4).

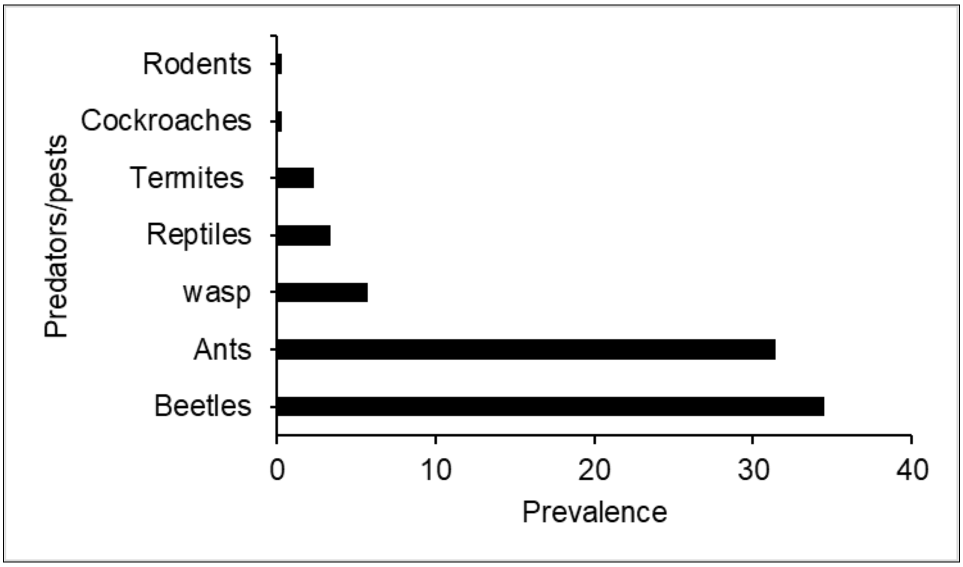

Fig 4: Predators/pests identified during the inspection of the hives

4. Discussion

Beekeeping serves as a crucial source of income diversification for many communities, particularly in rural and peri-urban areas. Given its importance, this activity attracts a wide range of investors with diverse motivations. In this study, the characteristics of beekeepers were found to be similar or close to those reported in previous studies. The activity is mainly practiced by men with experience, consistent with the nature of beekeeping in several regions of the country [13, 9, 7].

Regarding the level of education, the results reflect the national situation of low rates of schooling and limited access to advanced education. Beekeepers are mainly motivated by the profitability of beekeeping, which reinforces its potential as a promising activity for income diversification and poverty reduction. They acquire production equipment through their own purchases, subsidies, donations, or by self-construction using their endogenous know-how. Technical and financial partners play a role in promoting beekeeping through subsidies and training of actors. However, accessing credit for small-scale producers remains a challenge [14].

Regarding beekeeping practices, the results indicate the predominance of modern hives, specifically the French type, and the use of the smoker during harvesting, consistent with previous studies[13]. However, there was a difference in hive type predominance, with previous studies showing a higher prevalence of Kenyan hives. This could be explained by the promotion of different hive types to beekeepers, which varies according to geographical areas and partners.

In terms of colony management, the main contribution of beekeepers is providing water in the absence of a perennial water source. In the current context of small-scale beekeeping, most beekeepers rely on floral resources for colony survival by building up reserves after the harvest[15]. While most beekeepers in the study area visit their apiaries regularly, the fact that most only make external visits does not allow for timely detection of the presence of predators or enemies of bee colonies. This could be addressed through improved training and support for effective monitoring practices.

Indeed, the majority of beekeepers in Burkina Faso are aware of the existence of wax moth, as reported by previous studies [16, 6]. They are also able to identify the signs of wax moth infestation. Recent awareness-raising and training sessions for beekeepers include information on bee pathologies, as well as predators and pests such as the wax moth, due to the damage and losses they cause. The recent discovery of wax moth infestations in bee colonies highlights the persistence of this problem despite a lack of effective treatments and preventative measures. Beekeepers typically clean infested hives or destroy heavily affected combs to control wax moth, but these methods do not guarantee complete elimination of the pest regardless of its developmental stage. The best way to control wax moth is through good colony management, which includes having strong colonies, providing adequate nectar sources or feeding, repairing cracks and crevices in hives, and regularly monitoring for the presence of parasites and predators [8, 17]. However, these measures have limited effectiveness, especially in tropical climates that are favourable for the development of the wax moth and other pests. Thus, it is important to understand the epidemiological aspects of wax moth infestations to develop better control measures through integrated pest management and good beekeeping practices. Indeed, during this study, the of wax moth signs were observed in 16.2% of the inspected hives, which is lower than the 23.6% found in a preliminary wax moth study in the Central and Central-Western regions [6]. Similarly, the prevalence is lower previous findings in Burkina Faso (90%) [18], and Kebede et al. [12] in Ethiopia (27.4%). These differences in prevalence can be attributed to variations in the investigation periods and environmental conditions in the different study areas. The development cycle of the wax moth is significantly influenced by environmental factors such as season and temperature, which vary throughout the year and affect the moth's activity [8, 19]. The various stages of the wax moth life cycle are influenced by both warm and cool temperatures and the presence of favourable environmental conditions has the potential to enhance wax moth activity. The optimal temperature range for rapid reproduction and development of wax moths is between 28 °C and 30 °C [20, 21] and the short duration of the larval to pupal stage is thought to be related to the predominance of cocoons in warm climates, where a pupa can develop and hatch in as little as 3-6 days [20]. Concerning the factors of variation, the prevalence of wax moth was significantly higher in the Centre and Centre-West region but remains close to the 23.6% found by Kaboré et al. [6] in the same area. This level of prevalence would be related to the different beekeeping practices in the zones. Indeed, if in the Central Plateau regions, most beekeepers surveyed visit their colonies at least once a year, those in the other regions visit once every two months or irregularly and sometimes twice a year. The prevalence was significantly higher in apiaries with irregular visits supporting the importance of visits in the implementation of wax moth prevention measures including cleaning of hives, removal of old or unoccupied combs [12, 22].

In addition to the factors discussed earlier, the prevalence of wax moth infestation was found to be significantly higher in apiaries with more than 50 hives and in weak colonies. The high prevalence in large apiaries could be due to the heavy workload that prevents beekeepers from regularly checking all hives. Similarly, weak colonies are more vulnerable to wax moth infestations because they have unoccupied combs and are unable to eliminate the different stages of wax moth unlike strong colonies. It is also possible that the high prevalence in deserted colonies may indicate the role of wax moth in the desertion of severely affected colonies.

Our results also showed that beekeeper characteristics were associated with wax moth prevalence. Specifically, membership in an association, lack of education, or high education level were all linked to higher prevalence rates. In the study area, most beekeepers work in associations, which use common equipment without practising disinfection, leading to the spread of infestations. Uneducated beekeepers may have limited access to knowledge of good practices and colony health, while highly educated beekeepers may have other responsibilities that prevent them from managing their colonies properly. The region and colony strength were identified as risk factors. Wax moth development is dependent on climatic conditions, and the environmental conditions in different regions can impact its development and distribution, consequently affecting the risk of infestation in colonies. Ambient temperature is the most influential bioclimatic variable affecting wax moth distribution [23]. In addition, weak colonies and those that have been abandoned appeared to be more susceptible to infestation. The strength of a colony serves as a protective factor against wax moth infestation. Strong colonies can maintain low wax moth populations by occupying all the combs in the hive, and the presence of a significant number of adult bees helps prevent wax moth damage. Although wax moth larvae may occasionally be found in an active and healthy colony, they are promptly removed or rejected [17]. Conversely, in a weak colony, the availability of unoccupied space provides an opportunity for wax moths to hide and develop. The presence of wax moth signs in deserted hives may lead to the abandonment of infested weak colonies that could not effectively eliminate the wax moth infestation. Moreover, previous studies have reported the coexistence of wax moth with other predators/pests in bee colonies [24]. This indicates that while wax moths cause significant damage to bee colonies, the presence of other predators can exacerbate the impact of the threat on the colony and the profitability of the farms. Therefore, implementing good beekeeping practices should take into account the broader spectrum of potential threats to ensure effective colony management and sustainability.

5. Conclusion

This study, conducted over a wide geographical area, underscores the extensive prevalence of wax moth infestations in bee colonies. Although beekeepers are generally aware of the issue, they often lack effective strategies for controlling this pest in their apiaries. The high incidence of wax moths, coupled with factors such as infrequent colony inspections, large apiary sizes, and weak colonies, suggests that insufficient beekeeping practices are the main contributors to colony vulnerability. To address this challenge, it is recommended that beekeepers prioritize regular colony inspections and undergo training in the sanitary management of bee colonies. Support programs should focus on enhancing beekeeping skills through education on best practices, promoting production guidelines, and strengthening colony health management.

Future research should aim to quantify the economic losses attributed to wax moth infestations and investigate integrated pest management approaches. These efforts are essential for developing effective control strategies and ensuring the long-term sustainability of the beekeeping industry

Conflict of Interest
Not available

Financial Support
Not available

6. Reference

1. Engelsdorp VD, Evans JD, Saegerman C, Mullin C, Haubruge E, Nguyen BK, et al. Colony Collapse Disorder: A descriptive study. PLoS One. 2009;4(8):e6481. DOI: 10.1371/journal.pone.0006481
2. Ellis JD, Evans JD, Pettis J. Colony losses, managed colony population decline, and Colony Collapse Disorder in the United States. J Apic Res. 2010;49(1):134-6. DOI: 10.3896/IBRA.1.49.1.30
3. Johnson R. Honey Bee Colony Collapse Disorder. Congressional Research Service; 2010, p. 17.
4. Rucker RR, Thurman WN, Burgett M. Colony collapse and the consequences of bee disease: Market adaptation to environmental change. J Assoc Environ Resour Econ. 2019;6(5):927-60. DOI: 10.1086/704360
5. Ahmad F, Joshi S, Gurung M. Beekeeping and rural development. In: Ritzer G, editor. The Wiley-Blackwell Encyclopedia of Globalization. Kathmandu: International Centre for Integrated Mountain Development; 2012, p. 35. DOI: 10.1002/9780470670590.wbeog308
6. Kaboré BA, Compaoré B, Dahourou LD, Dera KM, Pagabeleguem S, Ouédraogo/Sanon GMS, et al. Prevalence and risk factors of wax moth in bee colonies in the Central and Central-West regions of Burkina Faso: Pilot study. Int J Biol Chem Sci. 2021;15(4):1469-1478. DOI: 10.4314/ijbcs.v15i4.14
7. Kabore BA, Yougbare M, Dahourou LD, Dera KM, Sawadogo SE, Traore A, et al. Preliminary study on the prevalence of *Varroa* sp. in honeybee colonies in the village of Mondon (Burkina Faso). Sokoto J Vet Sci. 2022;20(2):141-144. DOI: 10.4314/sokjvs.v20i2.9
8. Kwadha CA, Ong'amo GO, Ndegwa PN, Raina SK, Fombong AT. The biology and control of the greater wax moth, Galleria mellonella. Insects. 2017;8(2):61. DOI: 10.3390/insects8020061
9. Kabore BA, Nignan BA, Ouattara N, Dahourou LD, Yougbare M, Traore A, et al. Analyse des connaissances, attitudes et pratiques des apiculteurs en matière de santé des abeilles dans les régions de la Boucle du Mouhoun et des Hauts-Bassins (Burkina Faso). 2022a;41(2):221-38.
10. Negi N, Thakur M, Sharma HK, Rana K. Incidence and management of greater wax moth, *Galleria mellonella*. J Entomol Res. 2019;43(2):139-43. DOI: 10.5958/0974-4576.2019.00027.6
11. Topno VP, Lovleen. Green management of wax moth: A devastating pest of apiculture. J Entomol Res. 2021;45(3):555-60. DOI: 10.5958/0974-4576.2021.00086.4
12. Kebede E, Redda TY, Hagos Y, Ababelgu NA. Prevalence of wax moth in modern hive with colonies in Kafta Humera. Adv Vet Sci. 2015;3(5):132-135. DOI: 10.11648/j.avs.20150305.12
13. Kanazoe IW, Nombre I, Boussim JI, Vereecken NJ. Caractérisation de l'apiculture dans les villages riverains du corridor n°1 du Complexe Pô-Nazinga-Sissili (PONASI) dans le Centre-Sud du Burkina Faso. Geo-Eco-Trop. 2021;45(3):455-66.
14. Singh AS, Kibirige D, Malaza PS. Analytical study of small scale beekeeping farming in Eswatini: A case study in Manzini Region, Eswatini. Asian J Adv Agric Res. 2023;23(1):1-9. DOI: 10.9734/ajaar/2023/v23i1449
15. Pouliquen D, Odoux JF, Bretagnolle V. Pénurie des ressources florales en période d'élevage. Info-Reines. 2017;120:38-40.
16. Aebi A. Vers une apiculture durable au Burkina Faso? Analyse de l'insertion du projet dans les réalités locales. Master's thesis, Université de Neuchâtel; 2016.
17. Jack CJ, Ellis JD. Wax moth control. EDIS; 2018, p. 3. DOI: 10.32473/edis-aa141-2018
18. Kientega Y. Choix des stratégies de vulgarisation pour l'adoption d'une apiculture améliorée ET durable. Université Nazi Boni, Bobo-Dioulasso; 2011, p. 82.
19. Kumar Y, Yadav S. Seasonal incidence of greater wax moth, *Galleria mellonella* Linnaeus in *Apis mellifera* colonies in ecological condition of Hisar. J Entomol Zool Stud. 2018;6(1):790-795.
20. Ellis JD, Graham JR, Mortensen A. Standard methods for wax moth research. J Apic Res. 2013;52(1):1-17. DOI: 10.3896/IBRA.1.52.1.10
21. Kumari P, Kumar P, Sheoran S. Problems of wax moth in apiculture. Just Agric. 2022;2(8):1-4.
22. Alemayehu G, Negera T, Bezabh A, Begna D. Management practices to prevent wax moth, a pest of honeybees in Ethiopia. Int J Res Stud Biosci. 2017;5(7):56-9. DOI: 10.20431/2349-0365.0507008
23. Hosni EM, Al-Khalaf AA, Nasser MG, Shaara AHF, Radwan MH. Modeling the potential global distribution of honeybee pest, Galleria mellonella under changing climate. Insects. 2022;13(5):484. DOI: 10.3390/insects13050484
24. Sankara F, Zakaria I, Edith IM, Fidel B, Moussa O, Sita G. Inventaire et analyse de l'entomofaune vivant avec les colonies d'abeilles, *Apis mellifera adansonii* Latreille dans la commune de Garango (Burkina Faso). Entomol Faun Entomol. 2015;68:173-83.

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