



JIMMAUNIVERSITY
COLLEGE OF NATURAL SCIENCE
DEPARTMENT OF BIOLOGY

**THE EFFECTS OF ANTS ON HONEY PRODUCTION IN BADABUNA KEBELE,
JIMMA, ETHIOPIA.**

By; Guteme Bekeko

Advisor: Mezgebe Getahune (MSc.)

A research submitted to the department of biology Jimma University, Collage of Natural sciences, for partial fulfillment of the requirement for the Bachelor of Degree in biology.

JUNE, 2013

Jimma, Ethiopia

THE EFFECTS OF ANTS ON HONEY PRODUCTION IN BADABUNA
KEBELE, JIMMA, ETHIOPIA

BY: GUTEME KEKEKO

ADVISOR: MEZGEBE GETAHUNE (MSc)

A RESEARCH PAPER SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF BACHELOR OF SCIENCE IN BIOLOGY

APPROVED BY

NAME _____ SIGNATURE _____ DATE _____

JUNE, 2013

JIMMA, ETHIOPIA

Tables of contents

Contents	pages
Tables of contents	iii
Acknowledgements.....	v
Definition of terms	vi
Abstract.....	vii
CHAPTER ONE.....	1
1. INTRODUCTION	1
1.1. Back ground	1
1.2. Statement of the problem	3
1.3. Significance of the study	4
1.4. Objectives.....	5
1.4.1. General objective.....	5
1.4.2. Specific objectives.....	5
1.5. Limitations	6
1.6. Delimitation.....	6
2. CHAPTER TWO	7
2.1. Literature review	7
3. CHAPTER THREE	13
3.1. Research Methodology.....	13

3.1.1. Study area	13
3.1.2. Population of the study	13
3.1.3. Sampling techniques	13
3.2. Sampling size	14
3.3. Data Collection.....	14
3.4. Data Analysis	14
Chapter 4.....	15
4 Results.....	15
4.1. Discussion	20
4.2. Conclusion.....	22
4.3. Recommendation.....	23
5. CHAPTER FIVE	24
References.....	24
Appendix.....	26

Acknowledgements

First of all, I would like to praise God for his help in all my life.

Secondly, I would like to send my deepest gratitude to Mr. Mezgebe Getahun for his continuous constructive comments and suggestion while I am doing the research proposal and the research.

Next, I would like to thank the employers in beddabuna kebele and Red Cross institution administrative bodies for their truthful and real information during my study.

Also, I would like to express my deep emotion, but no word can possibly be enough to express my heartfelt gratitude to my family especially for my dear mother W/r Gete Bajo all my sisters and brothers, my relatives like Msc students for their financial and moral support during my study.

Definition of terms

Ants: Is common small insect that lives in organized grouped and belonging to the family Formilidae of the order Hymenoptera and they are one of the world's dominant insect groups.

Bees: An insect of large group (super family Apoidea, order Hymenoptera) to which the honey bee belongs, including many solitary as well as social kinds.

Honey: Is the sweet food made by bees using nectar from flowers, the variety produced by honey bees (the genus, Apis).

Effect: Is something that is produced by cause or the result of zoology which is study of insects.

Shupe: External enemies that affect bees.

Abstract

Ethiopia is a potential bee keeping giant having a wide range of ecological zones from desert to mountain rain forests. The country is the largest honey producer in Africa and 10th largest honey producer in the world. Even if Ethiopia is the highest in honey production the degree of bee keeping is very traditional. The objective of this study was to identify the prevalence, characteristics and consequences of ants in the production of honey in beddabuna Keble Jimma zone. since the number of individuals in the Red Cross organization in study area is small no need of sample size determination. Therefore, all 30 employees were involved as study population in this study. Questionnaire and interview were conducted to obtain the reliable data from the sampled population. The responses were indicated there were serious influences of ants on honey production in study area. 100% of the participants responded that external factor is the major problem in the study area. This has been influenced the yield as well as the quality of honey in the study area. As a solution the respondents put spraying oil and ashes to minimize the problem.

CHAPTER ONE

1. INTRODUCTION

1.1. Back ground

Ethiopia is home to some of the most diverse flora and fauna in Africa. Its forests and woodlands contained diverse plant species that provide surplus nectar and pollen to foraging bees. The country is the largest honey producer in Africa and 10th largest honey producer in the world. Although thousands of tones of honey were produced every year, the products obtained from the subsector were still low as compared to the potential of the country (Girma, 1998).

Like all living animals, honey bees were infected with disease and attacked by parasites and pests endangering their health and life. These diseases of honey bees impose serious problem on honey bee production and productivity. Ants are usually considered to harmless in honey bee colonies. As evidence shows that ant is the most influential factor that affects honey bee production in Ethiopia. It is known that beekeeping has a long standing tradition in the Jimma Region, dating back to ancient times during the kingdom of Abajifari (Desalegn, 2004).

The existence of ants was a major challenge to the honeybees and beekeepers. Ants are serious pests in honeybee colonies. Certain species may enter colonies to search for food or establish nesting sites (Gulati and Kaushik,2004). Ants are typically found between the inner and outer covers of the hive and in pollen traps. Various workers have observed different ant species, which attack honeybee colonies for honey, pollen and brood. They will attack the hives in mass, taking virtually everything in them: dead or alive adult bees, the brood and honey. In addition to this destruction, they can also be a nuisance to beekeepers and may sometimes cause pain from their bites (Desalegn and Amsale,1999).

Hone production currently has strong growing end markets making and viable enterprise for Women and Landless Youth. To fully exploit opportunities in this sector, interventions to address constraints and detecting the occurrence of harmful pests like ants of honey bee colonies is key step to prevent their harmful effects as early as possible. However, despite the probability for the

presence of honey bee pests and other problems, the study so far conducted on such problems in Jimma (Maza, 2010). Therefore, the present study will be conducted to determine the effects of ants on honey bee production and assess the cause of ants on honey production in Badabuna Keble.

1.2. Statement of the problem

In Ethiopia most of the time traditional bee keeping is common in such conditions bees are faced with many challenges to exist. There are numbers of factors that affect honey production the most common are pests, pesticides, natural hazards like deforestation, and fires, Ants are among the most common predators of honey bees in Ethiopia. They attack the hives in mass, taking virtually everything in them: dead or alive adult bees, the brood and honey. In addition to this destruction, they can also be a nuisance to beekeepers and may sometimes cause pain from their bites. Due to the above facts the production of honey is reduced from time to time.

Based on the stated problem the research was tried to solve the problems finding answers for the questions which are stated below.

- Knowing how ants affect honey production?
- To determine what are the most consequences of ants?
- To know how low production of honey affects the economic status of the population?
- To know what are the mechanisms to control effects of ants on honey production?

1.3. Significance of the study

The research finding was help peasant termers of third world and raising their living standard through the development of honey bee production activities are bright.

- ✓ The research can identify the mechanisms how it helps to preventing honey bees from damage like ants has many advantages listed below
- ✓ It helps farmer to improve their well being through the honey they gain
- ✓ It helps to record for the socio-economic standing in areas with subsistence agriculture
- ✓ The finding of the study help farmers in developing countries can substantially supplement the family income, sometimes even double it this means the family can be food secured.
- ✓ Finally the study was two significant for peoples who depends their life on products provide brief description of bees by indicating the effects of ants on the production
- ✓ After this study is conducted, it can be decided that works and other peoples should take action for each of the factors included in the research.

1.4. Objectives

1.4.1. General objective

- To determine the effects of ants on honey production

1.4.2. Specific objectives

- To identify the influence of ants on bee production and its effect on socio-economy
- To recommend possible solutions to protect bees from ant damage.
- To forward possible controlling and defense mechanism that helps to prevent damage.

1.5. Limitations

To conduct the research the researcher will be faced a number of constraints that affect the validity and reliabilities of the researches. The possible problems the researcher will face might be:-

- Time shortage
- Cost
- Distance of the study place
- Transportation problems

1.6. Delimitation

Due to the stated constraints the study is focused on the effects of ants on honey production in Badabuna Keble Jimma zone. There for the other Keble is not is not included in this research because Badabuna Keble was selected for this study on the assumption that the effect of ants on honey production is almost similar to other Keble.

2. CHAPTER TWO

2.1. Literature review

Ants are not usually serious pests in honeybee colonies. Occasionally, however, certain species may enter colonies to search for food or establish nesting sites. Ants are typically found between the inner and outer covers of the hive and in pollen traps. Various workers have observed different ant species, which attack honeybee colonies for honey, pollen and brood. (Subhpradhan, 1961; Akwatanakul, 1986; Buys, 1990; Woodward and Jones, 1991; Abrol, 1997; Abrol and Kakroo, 1994). Argentine ants, *Iridomyrmax humilis* Mayr, are capable of destroying strong, populous colonies. In South Africa, it is known as serious pest of honeybees (Buys, 1990).

Persistent attacks by ants induce absconding in Africa. *mellifera* and Africa. *cerana* colonies. Poneroid ants especially *Eciton* sp., *Anomma* sp. and *Dorylus* sp. kill honeybees. Ants attack in groups of thousands, which can destroy an entire apiary within few hours (Dubois and Collart, 1950). *Camponotus compressus* F. (carpenter ant) is occasionally a serious pest of bee colonies in India (Singh, 1962; Thakur, 1991) and USA (Walshaw, 1967). In India, Singh and Naim (1994) also reported *Tetraponera rujanigra* as pest of honeybees, whose attack resulted in partial (8-18%) to complete (8-9%) destruction of *Apis cerana* colonies. The small red household ant, *Dorylus labiatus* and small black ants, *Monomorium indicum*, *M. destructor* are some of the other ant species which visit bee colony for food purposes. Even though majority of ants species seldom disturb the-bees, these can be nuisance to the beekeeper.

Honeybees are capable of defending hives against ants by fanning. They use propolis to fill cracks and crevices; closing through artificial material (resin) is also advisable. Regular maintenance of strong colonies keeps ants away. Subhpradhan (1961) advocated the use of 30-50cm high hive stands. Effective control of ants were recorded when legs of stands were smeared with corrosive mercuric chloride sublimate (May, 1961) or spent engine oil and grease (Abrol and Parmer, 1998). Legs of the stand in broad earthen cups containing water also check upward movement of ants. Abrol and Parmer (1998) suggested destruction of ant nests. Use of chemicals like ethyl or methyl alcohol, sodium fluoride, borax powder, salt or powdered sulphur for ant

control is also available in literature (Nikiel, 1972; Ramsey, 1946). Carbon disulphide fumigation (2-4 tsp.) or 0.1% Aldrin solution to destroy underground nests of ant (Thakur *et al.*, 1981) is also in practice. Woodward and Jones (1991) recommended the use of pyrethroids and organophosphates for the control of ants.)

Natural repellants like *Nepeta cataria*, *Chrysanthemum*, *Juglans regia* (Bond, 1947) and dusting with turmeric powder (Abrol and Kakroo, 1998) is also used by many workers to keep ants away from the hives.

Ethiopia has a huge natural resource base for honey production and beekeeping is traditionally a well established household activity in almost all parts of the country. But the benefit from the sector to the nation and beekeepers is not satisfactory (Beyene and David, 2007).

Beekeeping sector provides an employment opportunity for many Ethiopian. Number of farmers engaged in honey production is not well known, but is estimated that around one million farmers are actively involved in honey production throughout Ethiopia using the traditional, intermediate and modern hives (Beyene and David, 2007). A large number of people participate in honey collection and retailing. Thousands of households are engaged in Tej-making in almost all urban areas, hundreds of processors are emerging and exporters are also flourishing. The density of hives occupied by the honeybees on the land may be the highest, at the present moment, of any country in the African continent (Ayalew and Gezahegn, 1991).

In Ethiopia Export of honey and beeswax is estimated to contribute an average of 1.6 million USD to the annual national export earnings (Ethiopian Customs Authority and Export Promotion Agency, 2006). It is the leading honey producer in Africa in terms of volumes of honey and one of the ten largest honey-producing countries in the world (Ayalew, 1990). About 10 million bee colonies exist in Ethiopia out of which farmers keep about seven million in traditional and modern hives and the remaining exists in forests and caves (Ethiopian Mapping Agency (EMA), 1981).

Bees likely evolved from wasp like ancestors, contemporaneously with the angiosperm plants towards the end of cretaceous period, 60 to 100 million years ago (Martin, 1976). According to

Dietz (1986) the present bee fauna probably originated more than 70 million years ago.

Currently, eleven families of bees are generally recognized, only some of which are identified by derived traits setting them apart from other bee families. There are about 1000 genus (and sub genus), combined with sub genera, approximately 600 generic groups and an estimated 20,000 living species of bees residing in the world's museums (Roubik, 1989).

Poor management in beekeeping weakens the bee colony-making colony susceptible to pest and predator attack. Although, honeybees have a strong defense mechanism involving 'the sting' against most of the enemies but sometimes they need assistance from beekeeper to defend. Enemies of honeybees are those animals, which cause disturbances and nuisance in functioning of the colony and range widely in size from microscopic mites to large mammals such as bears. These can be broadly classified into two categories: pests and predators of honeybees (Gulati and Kaushik, 2004).

Predators are those animals which seize/ capture other live animals for food. Rest of the enemies which are not predaceous but nevertheless cause some harm or disturbances in honey bee colonies are considered as pests which can cause heavy damage to bee life as part of their seasonal activity.

Major enemies of honeybees are wax moths, birds, wasps, mites, ants, bee lice, hive beetles, mice, skunks, and bears (Morbe, 1999). Cockroaches, leaf cutter bees, Death's head moth, robber flies, dragon flies, praying mantis, spiders (Thakur and Sharma, 1984) etc. are some of the minor pests which cause nuisance in to bee coloriy. Present article is an attempt to concise the information available on honeybees pests and predators excluding mites which can be dealt in separate article.

Bees (Apoidea) are a super family of about 20,000 species, in the order Hymenoptera. The majority of bee species are 'solitary' while the minorities are social (bumble bees and stingless bees), and only a few species of social bees, are kept in hives by beekeepers.

Beekeeping, which is today practiced over a greater area of the earth's surface than perhaps any other single branch of agriculture, passed through different stages of development: honey

hunting, traditional (forest and backyard) and improved (movable-frame and movable top-bar) methods of beekeeping.

It is likely that man hunted for wild nests of bees and looked for their honey during the whole of his existence. Early man probably took honey from bees' nests wherever he found them, and the collection of honey from wild nests continued except in some regions where it has been entirely superseded by beekeeping (Crane, 1990).

There are many references to honey in ancient records and literature, but most of them gave no clue as to whether the honey was obtained by honey hunting or beekeeping. Wherever writing was known, honey was mentioned so many times in the Holy book of the people, and it often held a place of honor in their rights (FAO, 1986).

The earliest known evidence of honey hunting scenes was a painting made in a rock shelter in the mountains of eastern Spain in Mesolithic times, probably dated to about 5000 BC (Dams, 1978 cited by Crane, 1990). Africa has many rock paintings about honey hunting than any other continent and some of the countries, which can be mentioned, are South Africa (Natal), Zimbabwe, Morocco, Libya and Tanzania (HBRC, 1997).

Honey hunting has been a very common practice even up to present generation in many parts of Africa, including Ethiopia. In southwestern parts of Ethiopia, some households entirely depend on honey hunting and forest beekeeping for their entire livelihood. Honey hunting is also common in pastoral communities in which beekeeping seem impossible.

Beekeeping properly started when man learned to safeguard the future of the colonies of bees he found in hollow tree trunks, rock crevices or elsewhere, by a certain amount of care and supervision. Crane (1990) reported that by 2500 BC, before forest beekeeping is known to have existed, fully fledged beekeeping was being practiced in ancient Egypt and the earliest written records that relate to the keeping of bees in hives are from about 1500 BC. Generally, the earliest known evidence of beekeeping has been found in the Africa continent (Cran, 1990).

Ants control recommendation is as varied as bee keeping methods. Some types of the hive stand so that colonies are not in contact with the ground otherwise. It was reported that every colony

will have an ant nest under it. Ants cannot be excluded from hives by simply placing on stand, but by limiting direct access routes a large scale on slough by ants may be avoided (George, 1999).

Beekeeping up to 1500 AD continued in the traditional form using primitive hives. Of all the regions under consideration, tropical Africa has the oldest tradition of beekeeping and still with primitive hives (FAO, 1986). Between 1650 and 1850 AD many hives with top-bars and frames were invented, but after these two centuries of effort there was still failure on the fundamental point: whatever bars or frames were used, the bees attached their comb to the walls of the hive as well, and the combs could, therefore, only be removed from the hive by cutting them out.

Lorenzo Lorraine Langstroth made the step, which changed this, in 1851 when he discovered practical movable-frame hives with an appropriate 'bee-space'. The pattern of modern beekeeping was thus established between 1850 and 1900 AD. Different equipments were invented in this period, but Langstroth's advance in 1851 remains the basic principle of the box hive, and thus of our beekeeping today (Crane, 1976).

Galleria mellonella L. (Greater wax moth) and *Achroia grisella* E (Lesser wax moth), *Vitula* spp. (dried fruit moth), *Plodia interpunctella* (Hbn.), *Ephestia kuhniella* (Zell) and *E. cautella* are associated with colonies of honeybees (*Apis cerana* E, *A. mellifera* L.; *A. dorsata* E and *A. florea* E) (Kumar, 1996). Among these, two species of wax moths viz. *G. mellonella* L. and *A. grisella* are responsible for enormous damage in beekeeping industry.

The key to protect the honeybees from predators and pests begins with a strong colony that can defend itself. Another line of defense is a secure hive with no cracks or holes in hive bodies. As per IPM programme, use of non-chemical methods to keep pest population densities below their economic injury level should be preferred over chemical treatment.

Appropriate chemicals in prescribed quantity and at proper time should be applied only when the other methods (cultural, mechanical etc.) prove insufficient.

The elimination of good nectar and pollen producing tree species in many areas makes it difficult to maintain bee colonies without feeding (Kerealem, 2005). Shortage of bee forage is mainly

resulted in Ethiopia due to population pressure and its ecological impacts such deforestation and shifting cultivation. Beekeeping contributes to conservation of the natural environment since its environmentally sustainable activity can be integrated with agricultural practices. It would be one of the most important for sustainable development of poor countries (Gibbon, 2001). Beekeeping plays a major role in socioeconomic development and natural resources conservation and pollination.

3. CHAPTER THREE

3.1. Research Methodology

3.1.1. Study area

The study will be conducted at Jimma town, located 353 km southwest of Addis Ababa Badabuna Kebele honey production center. The study period will be conducted from November, 2012 to June, 2013.

The research will use quantitative data. Primary and secondary source of data will also used for preparing the research. Primary data service will includes responses of sample respondents through questionnaires and interview with the workers of Badabuna honey production center .Secondary data source includes records of the center, books and other publication that are found in the organization.

3.1.2. Population of the study

The population of this study was employee that works in Badabuna honey production center their approximation is 30.The exact number of the employee is not known because their work depends on seasonal conditions that is why the researcher here considered the approximate number of the employees. So, since their number was small all the employees were involved as participants in this study.

3.1.3. Sampling techniques

The sampling technique used for this study was purposive sampling. Because of the small size of the population. All of the respondents were purposively included in the study.

3.2. Sampling size

The sample size of this study was 30 people who are employed in Ethiopia Red Cross association Jimma branch

3.3. Data Collection

The most crucial method of data collection in this study were primary data collection method by using interview, and self administered structured, questioner to both male and female employees and workers.

3.4. Data Analysis

After collecting research data it is necessary to analyze them. It provides us with process for deterring the structure of data that should direct as towards the proper inference procedure. Data analysis involves interpreted, analyzed and presented by using tables on the basis of percentage and average. Also the methods used during analyzing of the collected data were both the quantitative and qualitative, the methods of questionnaire where only the clothed ended questions for the all employers.

CHAPTER FOUR

4 Results

Table1: Responses of participants on the way and average amount of honey production in beddabuna kebele Jimma zone, southwest Ethiopia.

Parameters	No. of respondents	Percentage
1.To produce honey in a modern way		
Costly	30	100.00%
cheaply	-	-
2.which one way the way produces the greater amount		
Modern	30	100.00%
Traditional	-	-
3.In average how much honey is produced annually from one hive		
50kg	-	-
90kg	7	23.3%
>100kg	23	76.7%

As shown in the table above all 30 (100%) of the participants indicated (in table1) that using modern hive is difficult for them. This is because of its cost .On the other hand 30(100%) of the respondents also responded using modern hive is better than the traditional one to produce honey in good amount and quality (Table1). Regarding the average amount of honey produced annually from one hive, 23(76%) of the respondents showed greater than 100kg whereas 7(23.3%) were indicated 90kg honey had been produced averagely annually from one hive.

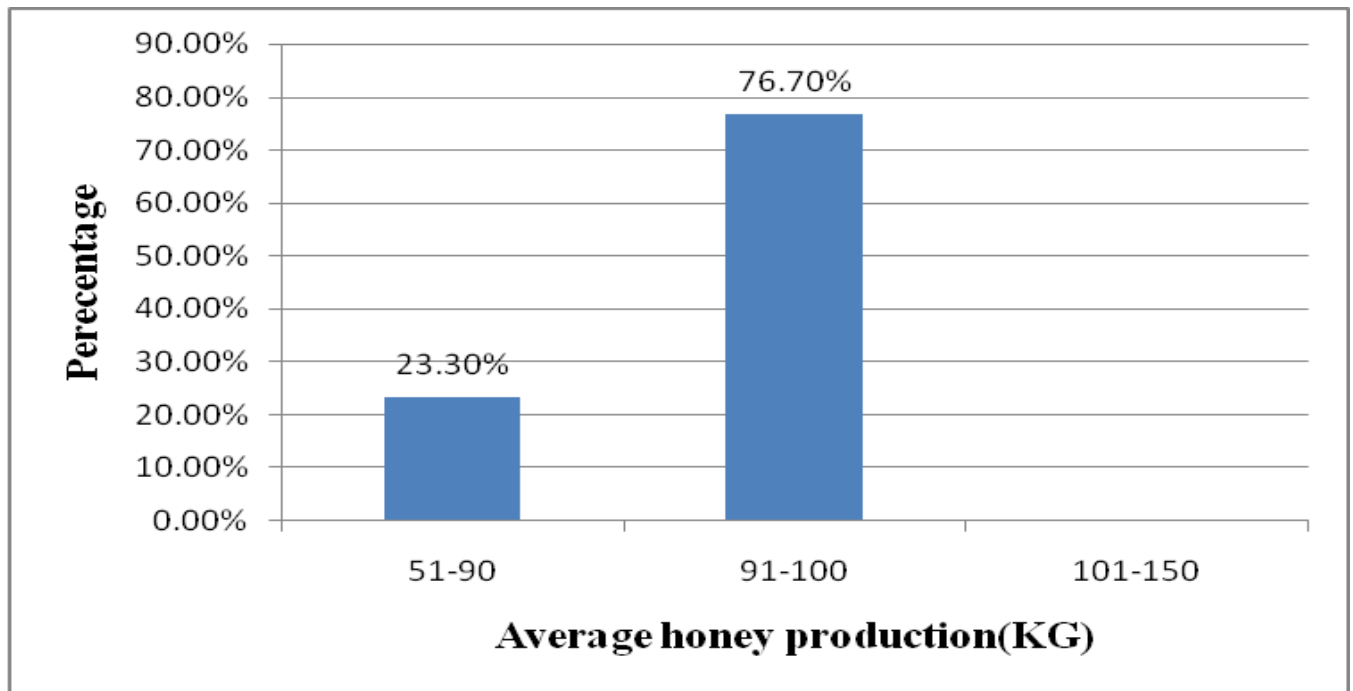


Fig1. Annual production of honey in beddabuna kebele Red Cross organization Jimma zone
 As shown in the above figure1 annual production of honey beddabuna beekeeping farm was 76.7% which is between 91-100kg per hive.

Table2. Responses of participants on the factors affecting honey production, area of hanging hives traditionally, mechanisms to prevent hives from ants and average rate of honey harvest in beddabuna kebele Jimma zone, southwest Ethiopia.

Parameters	No. of respondents	Percentage
4.Which of the following affects the bees in the production of honey in beddabuna		
External enemies	30	100.00%
Unwisely using of hives	-	-
If any	-	-
5.In which area you hung your hives traditionally		
Far from your institution	-	-
Near to water bodies	23	76.7%
Other place	7	23.3%
6.What is your mechanism to prevent hives from ants		
Spraying antiantsinsecticides	12	40.0%
Spraying ashes	12	40.0%
If any others	6	20.00%
7.Annually how money times honey produced is obtained or taken in your institution		
1times	-	-
2 times	29	96.7%
3 times	1	3.3%

From the above (Table2) 30(100%) of the respondents had showed honey production was affected by external enemies like ants in the study area. Regarding hanging hive 23(76.7%) of the participants answered that they hang their hives near to the water whereas others 7(23.3%) responded that they hang their hives in other places. Among the respondents 40.0% had said spraying antiantsinsecticides and ashes are the best solution to alleviate the problems in the study

area. Regarding to annual honey harvesting rate, 29(96%) of the respondents revealed 2 times where as only 1(3.3%) showed 3 times annually honey has been harvested in the study area.

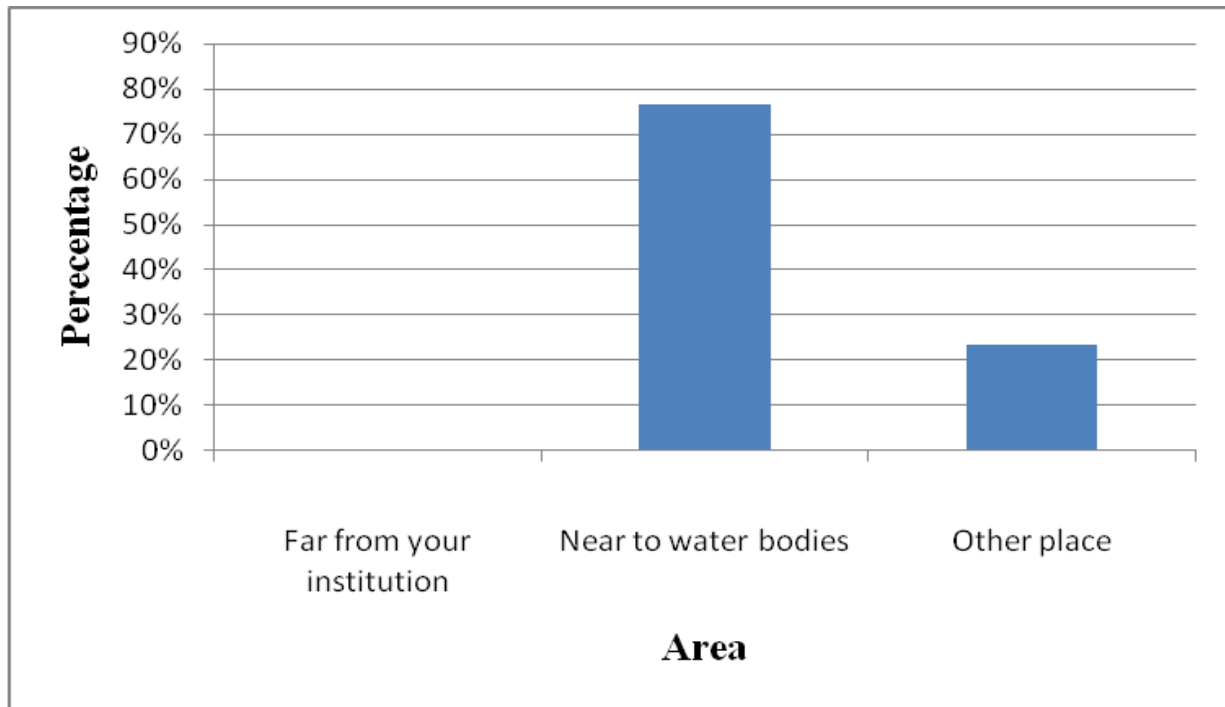


Figure2. Area where traditional hives were hanged in beddabuna kebele Red Cross organization Jimma zone

As it was indicated in the (figure2) above 76.7% of the respondents said that they have been hanging their hives near to the water bodies whereas the rest 23.3% were responded to other places.

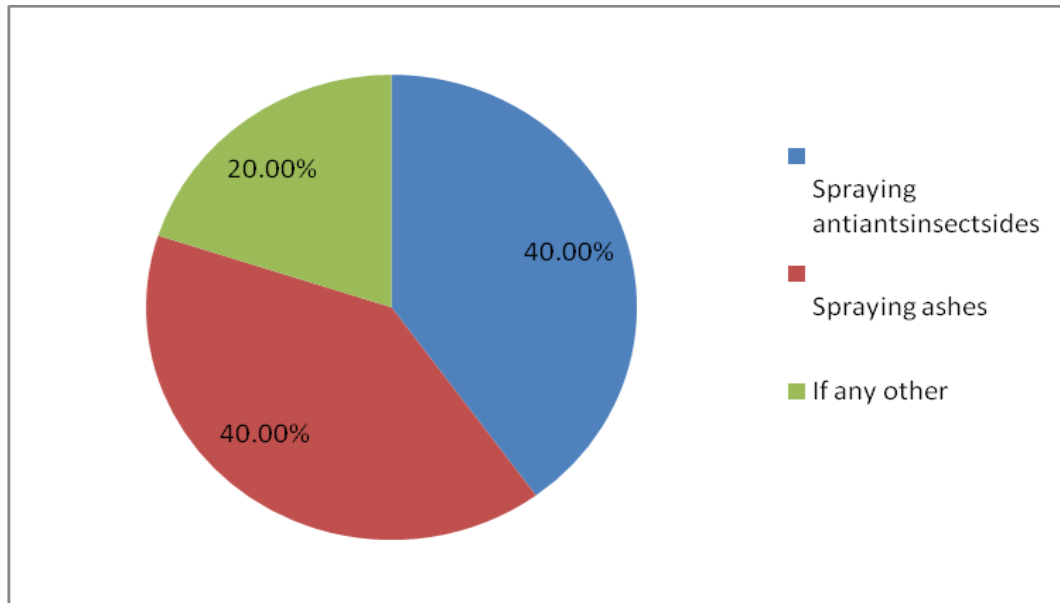


Figure 3. Mechanisms to prevent hives from ants in beddabuna kebele Red Cross organization Jimma zone

From the figure above 40% each of the respondents indicated that they had used spraying antiantinsecticides and spraying ashes for prevention of hives from ants. Whereas 20% of the honey producers were using other mechanisms.

From researchers observation during study the honey beekeepers in the study area were found using brush and rotten wood as mechanism for elimination of ant nesting sites. In addition, the beekeepers were found hanging the honey bee hives at extreme height.

4.1. Discussion

Honey is one of income sources for people in the tropical countries particularly like Ethiopia (Desalegn and Amssalu, 1999). The product of honey has been affected by various factors like poor hive management, lack of awareness among the users, and some predator insects. Ants are one of such an insect predator that has been reported to affect honey production (Desalergn, 2006). As it was indicated in the questionnaire response from participants majority said that ants have highly affected the production of honey in the study area. This is in line with the study by (Camilo *et al.*, 2011). To minimize this problem in the study area education is considered to be powerful tools in making the people aware and prevent bees from external enemies. In addition, there are different methods of prevention of hives from other dangerous materials thus are by cleaning the part of hives, by using oils or grease to the ground of hives and also by the use of shupe to prevent bees from other external enemies. An effect of ants on honey bee is not influence only the production of honey but also affect people economically and sociologically (Maggi, 2000). It was known that modern hives produces honey more than two times annually however in the present study 96.7% indicated only two times per year. This may be due to problem of hive management and other related factors (Malone *et al.*, 2001). On the other hand 100% of the respondents indicated external factors are one of the serious problems for honey production in the study area. As the possible solution 40.0% each of the respondents have the practice of spraying antiantinsecticides and ashes in order to eliminate the existing problem. This the best solution also highlighted by (Kumar, 1996).

Ants are the one of the major factors for honey production in the present study as indicated by respondents. The major problems of beekeeping in the area are honeybee enemies such as ants, honey badgers, birds and small hive beetles which may account for 40.7% of the total honey production loss annually. Similarly, many researchers found that ants attack is the most serious problem in beekeeping sector (Edessa, 2005; Desalegn, 2007). The result also supported by study of Gidey *et al.* (2012) which reported that bee pests, predators and absconding are major constraints affecting honey subsector loped extension system.

4.2. Conclusion

The purpose of this research is to find out the effect of ants on honey production in beddabuna Red Cross center. In order to do this various information and data have been collected by the researcher from individual employers working in beddabuna Red Cross institution and observation was also made. Accordingly, several problems were observed in the study areas that limit the productions of honey. Ants are among the most common predators of honey bees in the study area. They are highly social insects and will attack the hives as a whole, taking virtually everything in them: dead or alive adult bees, the brood and honey. In addition to this destruction, they can also be a pest to beekeepers and may sometimes cause pain from their bites. Apiaries of *Apis mellifera* under ant attack become aggressive and difficult to manage; weak colonies will sometimes escape, which is also the defense of *A. cerana* against frequent ant invasions. Another major problems are high cost of engages, lack of fund, abscondment of bees, effects of ant infestation with lack of flowering plants encountered in beekeeping or honey production in the study area.

4.3. Recommendation

- ❖ Through the analysis of questionnaires response, the following recommendations were forwarded.
- ❖ In order to solve the effects of ants on the production of honey, the professional persons should aware and teach the bee keepers around them how to manage modern hives and use wisely.
- ❖ To reduce ant nesting sites include eliminating brush and rotten wood from the apiary and cutting the grass.
- ❖ The most effective method of controlling ants is to search systematically for the ants' nests in the surrounding area of the apiaries and, when found, to destroy them by burning. Honey production was profitable in the study area.
- ❖ The problems of ant infestation should be also controlled through personal effort by the beekeepers by way of good management practices including hygiene.
- ❖ There should be adequate links between the extension agents and the farmers who keep bees so as to improve their skill and keep them abreast of recently developed technologies.
- ❖ A good general protection of ant against apiaries is to place the hives on stands supported by posts 30-50 cm high and to coat the posts with used engine oil or grease.
- ❖ Frequent inspection and renewed application of lubricant are both necessary and a source of soil pollution.
- ❖ A more reliable method is to place the hive-stand posts in tin or plastic containers filled with either water or oil.
- ❖ Regular clean up is required to avoid the formation of bridges of vegetation or earth that can be crossed by ants and liquids need to be replenished frequently.

5. CHAPTER FIVE

References

- Abrol, D.P. (1997). Bees and Beekeeping, Kalyani Publishers, Ludhiana.
- Camilo Fagua, J. and James, D. (2011). Ackerman consequences of floral visits by ants and invasive honeybees to the hummingbird-pollinated, Caribbean cactus *melocactus intortus* plant species biology. **26**: 193–204.
- Caron, D.E. (1990). *Honeybee Pests, Predators and Disease* (Morse, R.A. and Nowogrodzki, R. eds.). Cornell Univ. Press. Ithaca. New York.
- Desalegn Begne and Amsalu Bezabeh (1999). Distribution of Honey bee disease *Nosema apis* and *Melgighamoeba mellificae* in Ethiopia. Holeta Bee research center. Annual report.
- Dessalegn Begna (2006). The occurrence of chalk brood (*Ascophaera APIs*): A new honeybee (*A. mellifera* L.) disease in west Shoa, Ethiopia. *Ethiopia journal of animal production*. Addis Ababa, Ethiopia, 6 (1). 1-8.
- Eckert, J.E. and Bess, HA (1952). Fundamentals of Beekeeping in Hawaii. Macmillan, New York.
- Edessa, N. (2005). Survey on honey production systems in West Shewa Zone. Fourth National Annual Conference of the Ethiopian Beekeepers Association (EBA), Addis Ababa, Ethiopia pp.60-69. EMA (Ethiopian Mapping Agency) (1981). National Atlas of Ethiopia.
- George, B. (1999). Johnson, Biology a business unit of the mcgrow.Hill companies, America.
- Gidey Y, Bethlehem K, Dawit K, Alem, M. (2012). Assessment of beekeeping practices in Asgede Tsimbla district, Northern Ethiopia: Absconding, bee forage and bee pests. *Afr. J. Agric. Res.* **7**:1-5.
- Girma Deffar (1998). Non wood forest products in Ethiopia – EC.FAO partnership programme (1998-2000). Addis Ababa, pp.1-5.
- Gulati, R. and Kaushik, D. H. (2004). Enemies of honeybees and their management - A Review *Agric. Rev.* **25**:189 - 200
- Maggi, V.L.(2000). Evaluation of the dietary effect(s) of insect protection protein 2 on adult honey bee (*Apis mellifera* L.): U.S. EPA MRID number: 450863-08.

- Malone, L.A, Pham-Delegue, M, H. (2001). Effects of transgene products on honey bees (*Apis mellifera*) and bumblebees (*Bombus* sp.). *Apidologie* **32**: 287–304.
- Maza Gebreyohans, (2010). Analysis of market oriented beekeeping in Atsibi wemberta Distract of Eastern Zone, Tigray region, Ethiopia M.SC .thesis, Mekele universirty.7-30.
- Peter, H.R .(2002).Biology six edition.mc Graw Hill.New York

Appendix

Questionnaires prepared to be filled with respondents

To produce honey in a modern way is it

A/. Costly

B/. Cheap

2. Which one of the way produces the greater amount?

A/. Traditional way C/.Equal

B/. Modern way

3. In average how much honey is produced annually from one hives?

A/. 50kg

B/.90kg

C/.>100kg

4/.Which of the following affects the bees on the production of honey in meddabuna?

A/. External enemies

B/.Unwisely using of Hives

C/.If any.....

5/.In which area you hung your hives traditionally?

A/.Far from your institution

B/. Near to water bodies

C/. Other places.....

6/.What is your mechanisms to prevent hives from ants?

A/. Spraying antiants Insecticides

B spraying Ashes

C/. If any others.....

7/.Annually hominy times the hone produced is obtained or taken in your institution?

A/.1 times

B/. 2 times

C/. 3 times