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Research Article

An assessment of indigenous knowledge of apitherapy in the Oromia region, Ethiopia

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Abstract

Apitherapy is the use of bee products such as honey, pollen, propolis, royal jelly, bee venom, and wax is used to prevent or treat illness and promote healing. The objectives of this study are to assess and document indigenous knowledge on the medicinal values of bee products in Ethiopia and generate baseline information on indigenous practices of the medicinal value of beehive products for further study. This study was conducted in beekeeping potential areas of Oromia Regional state by selecting seven zones and from each zone two districts and a total of 14 districts (Woreda) based on their potential for beekeeping, the existence of long-aged bee-keepers and accessibility. using a purposive sampling method and questionnaires were distributed to the elders and well-known traditional healers of the study areas. In answering the questionnaires 22-100 ages dwellers or respondents participated. The survey was conducted in 7 zones namely Jimma, Ilu ababora, West wollega, East wollega, East Shoa, West shoa, and Buno Bedele. Simple descriptive statistics were used to analyze the data obtained by collected questionnaires. The result of the study showed that 49.3% of Apis mellifera honey and 31.9% of stingless bee honey, majorly used bee products for apitherapy, and 70.3 % of the bee products used using traditional collection method. According to this study's results, the traditional drug was prepared from honey in liquid form which comprises the biggest portion mark of 63.4% of respondents. The majority of the respondents strongly agree with bee products as a treatment for different diseases such as asthma, cough, common cold, TB, and wounds. A major challenge faced during using of bee products as medicine is the absence of awareness of apitherapy as it was reported by 28.8%. of the respondents. Thus, it can be concluded that bee products are well-known apitherapy in the Oromia region and it was recommended that awareness creation of bee products as apitherapy and further research on the medicinal value of beehive products for confirmation as medicine for different diseases since it may be a solution for various diseases resisting modern drugs.

Introduction

Apitherapy (Apis is a Latin word that means bee) is the practice of using bee products such as honey, pollen, propolis, royal jelly, and bee venom for disease prevention or treatment purposes. It can be also described as "the science (and art) of the use of honeybee products, to maintain health and assist the individual in regaining health when sickness or accident interferes" Cherbuliez [1]. Apitherapy can be also defined as the consumption of bee products such as honey, pollen, propolis, royal jelly, bee venom, and wax which are habitually used to prevent or treat illness and promote healing. According to Stefan (2006), it is said to be, 'the art and science of treatment and all-inclusive healing through the honeybee and her products for the use of mankind. The roots of Apitherapy can be traced back more than 6000 years to ancient Egypt. The Greeks and Romans also used bee products for medicinal purposes. This was described by Hippocrates (460–370 BC), Aristotle (384–332 BC), and Galen (130–200 AD), who prescribed the use of honey and bee venom as a cure for baldness. However, whether these practitioners from the ancient world represent the fathers of Apitherapy is questionable. There is a major difference between Apitherapy and the use of bee products in defined medical conditions. Apitherapists believed that bee products can be used to cure most diseases. However, the use of bee products in conventional medicine is limited to certain indications where they have shown effects that are equal to or better than those of standard treatments such as, in treating wounds and burns and curing arthritis [2,3]. Traditional medicine therapies are historically used worldwide for disease prevention and

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treatment purposes. Apitherapy is part of the traditional medicine based on bee product use. Complementary medicine practices which incorporate the use of some traditional herbal, mineral, or animal kind substances very often are discussed with pharmacy professionals because these products are often sold in pharmacies as dietary supplements [4].

Bee products are readily available to any local beekeeper and can be produced with minimal or zero capital outlay [5]. Bee products are safe and do not require precise dosages as in allopathic medicines. Honeybees crop six products, which have strange medicinal and money-making values. These are honey, royal jelly (bee milk), pollen, propolis, beeswax, and bee venom. Out of the six products, four products (honey, beeswax, propolis, pollen) are easily extractable by beekeepers. They have high nutritional value and immense health (therapeutic) benefits [6]. Honey has medicinal uses like disinfectants and wound medicinal properties while propolis is used to treat diabetes patients. Moreover, pollen has antioxidant properties and anticoagulant and anti-inflammatory properties and bee venom serve to treat arthritis and other inflammatory conditions. Beeswax has antibacterial properties and when applied to the skin improves its elasticity and makes it look fresh and smooth and royal jelly is excellent for wound healing and tissue repair. It is the primer of the immune -system and regulates hormones as well as improves cognitive function [7].

All bee products if they are appropriately selected could contribute to inhibition of the progression of the disease and even alleviate or cure the disease [8]. In a review of beekeeping in Ethiopia Deffar Girma [9] indicated that there is an ancient tradition of beekeeping in the country and pointed out that the Indigenous knowledge system has played a vital role in beekeeping development for generations in Ethiopia.

Indigenous knowledge is the knowledge that is sole to a given culture or society and valuable knowledge collected by farmers over generations. In various places in the world, scientists and indigenous people are collaborating to build bridges between modern science and indigenous knowledge, among others, to advance the ecological management of a particular region (Reijntjes, 2004) as cited by Abebe, et al, 2008 [10]. As reviewed by Kolawole [11] farmers have quite a sophisticated knowledge of agriculture based on insights from several generations and he stresses the need to document and preserve the knowledge in situ and ex-situ. Thus, the success of development efforts in apiculture in our country is dependent on the extent of recognizing indigenous farmers' knowledge, documenting their knowledge, and incorporating it into the development process. Studying indigenous knowledge of Apitherapy is a pre-request to recognize indigenous knowledge systems in modern medicinal practices and to ensure its sustainability. Indigenous peoples have experimentation and ways of research, and knowledge, which allow the local knowledge to be innovated in the local practices and systems (Reijntjes, 2004) as cited [10]. Realizing the importance of this form of knowledge in the development process leads to faster diffusion and better adoption of technology resulting in sustainable development.

The community pharmacists are familiar as available to the public wellbeing care specialists. They are similar to porters when charitable advice for patients who come to community pharmacies to obtain a medication, dietary supplements, or medicine goods [12]. Pharmacy professionals often encourage people to use dietary supplements because there is no prescription need for them, this gives additional income to the pharmacy and pharmacists value their knowledge on dietary supplements. Dietary supplements are often used for disease prevention purposes [13]. The indigenous knowledge of common traditional medicines practices is necessary to assist further research needs and proof the questions. This includes providing information that allows future researchers to make informed decisions about the health benefit to treat different diseases.

Although Ethiopia has a long tradition of beekeeping, having the highest bee density and its extensive practices, beekeeping research conducted in the nation so far did not cover to characterize and document the medicinal value of beehive products and the potential of honeybee products for the treatment of various diseases and ailments in the country. The only work is done by Workeneh Abebe [14] on the traditional use of honey as a medicine around the west, South West, and North Shoa of the Oromia region. However, the study did not cover all bee products in all parts of the country.

Documenting traditional medicinal knowledge is important to facilitate the discovery of new sources of drugs through further research, promote the beneficial effects of bee products on the human body, and promote a healthy lifestyle through the consumption of these products. On the other hand, identifying the factors involved in the selection of treatment options at the household level is important for health service planning and incorporating Apitherapy into a country's health care delivery system.

Having of detail information on the potential of honey bee products for Apitherapy and documenting beekeepers' and other stakeholders' status and experience on the medicinal value of bee products are very essential in the formulating of appropriate scientific investigation and for further development strategies of Apitherapy in the country. Therefore, the study provides a baseline data for researchers, beekeepers, policymakers, social workers, health workers, and administrators in the country to undertake further research and development plans on the medicinal value of bee products in the country, and also to document experience and status on traditional knowledge of the medicinal value of bee product and conservation of associated the indigenous knowledge Apitherapy of traditional practitioners in the country. In order to understand more about Apitherapy and its applications, there is a need to collect and analyze the information on indigenous knowledge of Apitherapy. The information obtained from this research is useful in selecting and designing scientific research on bee products and their applications. Therefore, the objective of the study was to assess and document indigenous knowledge of the medicinal values of bee products in Ethiopia and to generate baseline information for further research.

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Materials and methods

Selection of study area

This study was conducted in beekeeping potential areas of the Oromia Region state. Accordingly, from the region, seven zones, and each zone two districts and a total of 14 districts (Woreda) were selected based on their potential for beekeeping, the existence of long-aged bee-keepers, and accessibility. Purposive sampling was used to select kebeles and stakeholders or households based on their experience and traditional experience in Apitherapy usage and interest to evaluate the medicinal value of bee products, and accessibility of the areas to transportation service.

Selection of key informants

The selection of informants was performed following Martin (1995) who indicated that when recording indigenous knowledge held by knowledgeable traditional healers or by certain social groups the choice of the key informant is crucial. Key informants from each of the study sites whose ages ranged from 22 to 70 were selected systematically based on their knowledge and long experience in beekeeping as well as Apitherapy in the area, following a recommendation from elders and local authorities (Kebele administration leaders and DAs), considering factors such as gender, a reputable thorough knowledge of Apitherapy and beekeeping, time availability and willingness to participate. The key informants include selected beekeepers, peasant associations' development agents, district agriculture and rural development bee experts, district administrator, traditional healers, elders, and knowledgeable persons.

Data collection

As noted by Dick, et al. (2004), a full understanding of the complexities involved in the survey study can only be achieved by mixing methods such as structured interview schedule, group discussion, key informant interview, and field observation. A questionnaire consisting of structured items was designed for the collection of primary data. Primary data were collected through structured and semi-structured questionnaires administered to various respondents. A structured survey questionnaire was used to gather primary household data at the village level. Designed questionnaires and key informants' interviews were elaborated and directed to the traditional healers and the knowledgeable elders. For this particular study, mixing methods of the aforementioned were used. The dependent variables were measured by asking the respondents to score their statement of opinion given to them using the Likert four points scale of strongly agree (4), agree (3), disagree (2), and strongly disagree (1).

Preparation and administration of the questionnaire

A questionnaire was prepared and pre-tested in a preliminary survey and conducted on 20 households near to research center before the main study. These households were included in the main study sample. The main reason for the preliminary survey is to test the relevance of the questions. This is an effort to ensure that only relevant and well-phrased questions are to be posed to the interviewees and also give an opportunity to rephrase some of the questions during the main study. A checklist of questions was prepared in English language and translated into the local language of the study area for undertaking interviews and discussions. The questionnaire was incorporated dichotomous (yes or no question), multiple-choice and open-ended questions.

Data management and statistical analysis

The survey generated both qualitative and quantitative data, and the data was summarized, and coded in an excel spreadsheet. All qualitative responses were then entered into SPSS statistical program version 20. So the quantitative data were analyzed for various parameters. Descriptive statistics such as sum, mean, and percentages are presented in tables and figures for easy interpretation and quick visual comparisons of variables.

Results and Discussion

Socio-economic characteristics of the respondents

The average age of the respondents was 45 years with a range of 22- 100 years ago. As shown in above Table 1 of the total respondents about 95% are male and the rest are female beekeepers. The study also showed that of the total respondents about 21.7% were illiterate, 0.7 % literate or informal school education, 18.8% had high school (9-12), 0.7% had religious education and 3.6 % has College or University diplomas. But the majority (about 53.65%) of the farmers are in elementary school (1-8). The study also showed that from the total respondents regarding occupations about 94 %, 3.6%, and 0.7 % were beekeepers, traditional healers and beekeepers, and traditional healers, respectively.

Table 1: Distribution of respondents based on selected socio-economic characteristics in the study area.

Socio-economic Characteristics of individuals	Frequency of Respondents	Percentage (%)
Gender/Sex		
Male	132	95.7
Female	6	4.3
Education		
none	30	21.7
primary	74	53.6
secondary	26	18.8
university college	5	3.6
Marital Status		
Married	133	96.4
Singles	5	3.6
Occupation		
farmer	130	94.2
merchant	2	1.4
traditional healer	5	3.4
framer and traditional healer	1	0.7

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Duration of practicing of apitherapy and source of their knowledge

As shown in the above Figure 1, the study shows that a large portion (80.4%) of the respondents practiced apitherapy whose age was above 10 years followed by 5-10 years (9.4%) and 1-5years old (8.7%). The source of knowledge for the majority of respondents (72%) learned apitherapy from their families, those who are thought by religious institutions recorded 2.9%, of the remaining four sources were learned from self-innovation, from training, from family relatives and friends, and from relatives recorded 7.2%, 5.5%, 3.6%, and 2.2%, respectively.

Bee product used for apitherapy and method of collection

According to these results and as shown in Figure 2 below about 51.4 % honey, 31.9% stingless bee honey, 5.8% honey with royal jelly, propolis, and venom, 4.3% honey and royal jelly, 2.9% honey and bee venom, 1.4% pollen were used for apitherapy. The bee products listed above as apitherapy were mentioned in the review of [15], as bee products used in modern medicine. In the case of apitherapy usage in different zones, only stingless bee honey was used as apitherapy in Jimma, Ilu Abba Bora, and Buno Bedele zones but almost all of the bee products were used in the rest of the zones of the study areas (Figure 2).

As shown in Figure 3, the result shows that 70.3% of the respondent practiced the traditional collection method, 11.6 % modern collection and processing method, 13% had no response and 1.4% used both traditional and modern collection and processing methods of bee products.

General treatment of apitherapy for different disease

As indicated in Figure 4, the respondents listed different diseases that are treated by bee products as apitherapy of which 68.11% cough, 55.07% cold, 34.05% asthma, 18.11% headache, 15.21% stomachache, 15.12% TB, 7.2% wound healing, 4.37% malaria, 3.6% TB, 3.6% ulcer are the major diseases treated by bee product apitherapy. The result of this study agrees with studies of [16].

Figure 1: Years of experience of respondent practicing apitherapy.

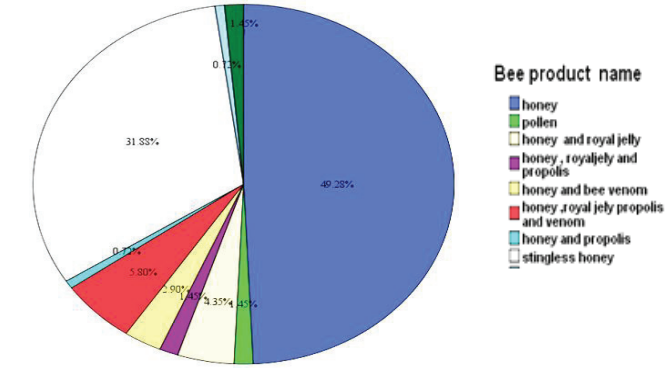

Figure 2: Relative percent of bee products used as apitherapy.

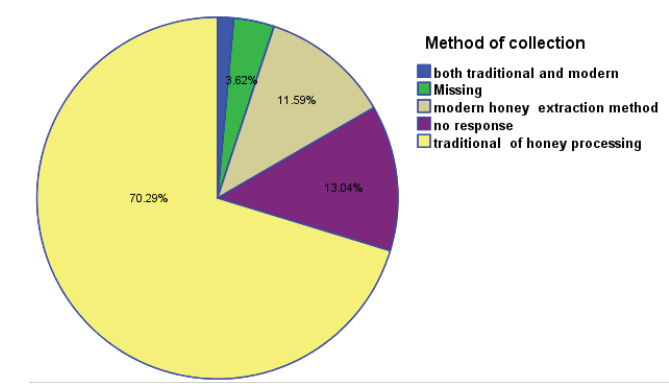

Figure 3: Method of bee product collection and processing.

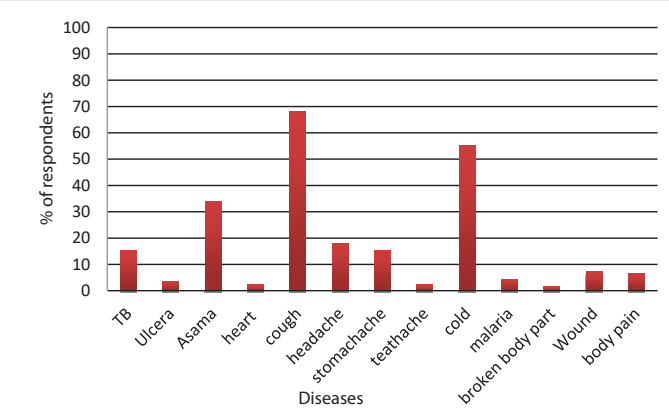

Figure 4: List general diseases treated by bee products.

Forms of drug preparation and mode of administration of the remedy

According to the respondent's method the drug was prepared in the form of liquid (63.4%,) liquid and chewed (19%), liquid, squeezed and chewed (8%), and powder (3%), also from of use 58.7% infusion, 32.5% Extract (tincture, solution, capsule), 4% infusion and extraction and 1.8 %bath and bathing remedies. Forms of dosage distribution of medicinal bee products were 75.4% liquid, 18.8% liquid and chewing, and 0.7% powder.

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Moreover, oral mode of administration of the remedial preparation was 86.2% of the respondents followed by 3.6% oral and 2.9% massage, oral, nasal, optical and dermal, 1.4% (oral, nasal, and rising) also oral and dermal 1.4% and both dermal and optical 0.7% of the respondents and the result is agreed with the result of Ja'afar-Furo, 2015 [17] reported that 70 % respondents practiced oral mode administration for use [18-23].

Perception of the respondent on different diseases treated by honey or other bee products

The majority of the respondent strongly agree on honey as a treatment for cough, ulcer, stomachache, and skin beauty (68%, 39.9, 47.8, and 50.7%), respectively. Also, the respondent stated that no response they do not know honey as a medicine for different diseases such as bedwetting, boils, rash, whitlow, ringworms, and dandruff (48.6%, 43.5%, 48.6%, 39.9 %, 35.5%, and 32.6%), respectively Table 2.

The majority of the respondent strongly agree with bee venom as apitherapy for body pain and headache (39.1% and 38.4%) respectively also 34.1% and 32.6% agree with bee venom medicine for arthritis and Body pain disease, respectively. Some of the respondents do not know the apitherapy use of bee venom for different diseases. Accordingly, 67.4% of respondent agrees with awareness of propolis as medicine for teeth disease but also the respondent doesn't know the apitherapy use of propolis for both measles and ringworm disease (68.8% and 67%) respectively. The other result of this study indicates that 67.4% and 71.1% of the respondent doesn't have any knowledge of apitherapy treatment of bees wax on frigidity in a woman and penile erection, respectively Table 3.

Material and place used for storage

According to this survey results, the place and material used to store the bee products were assessed and 58.7% of the respondent's stored within bottles in a cool and dry place and the rest 15.9% used 'Qabe' traditional material, 6.5% within bottle only without any specific place, 5.9% uses fertilizer sack and 1.4% uses clay pot.

Side effects of the apitherapeutic products

The side effect of the medicinal use of bee products was also assessed during this survey Accordingly 36.2% of the respondents state vomiting as a major side effect of using bee products as medicine, 13% (headache, vomiting, and weight loss/gain), 10.1% allergy, headache and vomiting, 8% headache and vomiting, 3% allergy and 3% of the respondents stated no side effect using of bee products as medicine (as apitherapy).

The Group of patients does not use bee products as medicine

The respondents categorize a group of the different social groups depending on the effect of using bee products as medicine. Therefore, the first group would not use bee products because their side effect was 38.4% of children less than three years categorized as major patient groups could not use bee products as medicine followed by 21.7% allergic patient and 13% pregnant and children under three years Table 4.

Table 2: Perception of respondent honey as apitherapy to different disease.

Disease Name	Perception of respondent %				
	Strongly agree	Agree	Disagree	Strongly disagree	No response
Cough	68	13.8	0.7	15.9	1.4
Ulcer	39.9	17.4	23.1	10.1	9.4
Fatigue	31.2	18.8	17.4	15.9	16.7
Insomnia	30.4	25.7	16.7	10.1	20.3
Inflammation	22.5	23.9	15.9	12.3	25.4
Sore throat	25.4	27.5	14.5	9.4	23.2
Pimples	18.8	26.8	10.9	12.3	30.4
Bedsore	13.8	21.7	11.6	11.6	4.3
Burn	36.2	23.2	8.7	10.1	21.7
Dandruff	16.7	23.2	13.8	13	32.6
Mouth infection	27.5	21.7	10.1	16.7	23.
Bedwetting	9.4	15.9	16.7	19.4	48.6
Ringworm	14.5	23.9	15.9	10.1	35.5
Boils	8.7	19.6	17.4	10.1	43.5
Whitlow	10.1	18.8	19.6	11.6	39.9
Measles	17.4	19.6	17.4	13	32.6
Stomachache	47.8	19.6	10.9	11.6	10.1
Skin beauty	50.7	17.4	9.4	12.3	10.1
Rash	6.5	24.6	12.3	7.2	48.6

Table 3: Perception of respondent bee venom as apitherapy to different disease.

Bee venom to treat different disease	Perception				
	Strongly agree	Agree	Disagree	Strongly disagree	No response
Arthritis	20.3	34.1	12.3	9.4	22.5
Blood pressure	19.6	27.5	20.5	11.3	19.6
Body pain	39.1	32.6	10.1	7.2	10.9
malarial	25.4	26.8	13.8	12.3	21.7
headache	38.4	27.5	13.8	9.4	10.9
stroke	23.2	23.2	16.7	13	23.9

Table 4: Perception of respondents on categorizing who don't use bee products as medicine.

Group	Pregnant women	children under three years	oncology patients	allergic patients	above 65 years	pregnant and children under 3yrs	not answered
% respondents	12.3	38.4	0.7	21.7	1.4	13	6.5

Reasons for accepting traditional remedy of bee products

The acceptance of the bee product is the major reason to use them as medicine therefore the respondents stated that 23.9% of reasons for accepting traditional remedy is effectiveness and availability 11.6% for socio-cultural, economic, and effectiveness reason, 9.4% for effectiveness and economic reason, 8.7% economic, effectiveness and availability, 5.1% socio-cultural and economic reasons and 2.9% socio-cultural, availability and economic reason.

Method of transferring indigenous knowledge

Every respondent has its knowledge and transferring methods from this method of indigenous knowledge, transfer method mentioned by respondents gives advice for different people about the apitherapy (67.8%) are the first followed

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by 11.6% oral and practical advice and 6.5 % transfer the knowledge by telling the importance of the bee products.

The belief of respondents for collection uses and challenges of using bee products as apitherapy

According to this survey result, the belief of respondents to collect and use medicinal bee products as apitherapy was the first thing is the effectiveness of the bee products (63.8%), it's the good medicinal value (15.2%), it is valued as cultural medicine (10.8%) and it is very well medicine that acceptable (8.7%). According to the response of respondents, the major challenges faced during the application of bee products as medicine were the absence of awareness of apitherapy (28.8%) lack of training, lack of awareness and pesticides (14.5%), absence of a standardized measure of preparation proportion of the medicine (10.1%) and lack of management practice, lack of awareness and training on the medicinal properties of bee products (9.4%) and answered no challenges (5%.)

Conclusion and Recommendations

It can be concluded that honey and stingless bee honey were well-known bee products used for apitherapy but to some extent, other bee products like propolis, pollen, royal jelly, and bee venom were also used. Most the bee products are used in the oral mode of administration of the remedies, the reason for accepting bee products as a traditional remedy is the effectiveness of the bee products. Thus, awareness creations on the medicinal use of bee products for further study are recommended for the development of valuable medicine for human health benefit from the products.

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