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AWARENESS, ATTITUDE AND USAGE OF APITHERAPY FOR DISEASE PREVENTION AND TREATMENT AMONG UNIVERSITY STUDENTS IN KASHMIR

[1]MASRAT SIRAJ, [1]MUNAZAH YAQOOB, [2]BILAL AHMAD BHAT, [2]IMTIYAZ QAYOOM, AND [3]SYED SABAHAT ASHRAF

[1]Division of Entomology, Faulty of Agriculture, Wadura, Sopore, SKUAST-Kashmir, J&K

[2]Division of Social Science, FoFy, SKUAST-Kashmir, J&K

[3]Regional Research Institute Of Unani Medicine, Naseem Bagh Campus, Hazratbal. Srinagar, Kashmir, J&K

Correspondence author: bhat_bilal@rediffmail.com

ABSTRACT

Worldwide traditional therapies are used for disease prevention and treatment purposes. Apitherapy is part of the traditional medicine based on bee product use. Complementary medicine practices which incorporate use of some traditional herbal, mineral, or animal kind substances very often are discussed. This study is aimed at determining the attitude, knowledge, and practices of apitherapy among university students of Kashmir valley studying in various higher educational institutions of Kashmir valley. The study involved a sample of four hundred students randomly selected from different higher educational institutions of Kashmir valley using a well designed questionnaire. The questions about attitudes, experience, knowledge, and practices for disease prevention and treatment of different bee products, their safety, and informational sources were included. Analysis of the data collected was done using standard statistical tools. Respondents understudy shared opinion that use of bee product is part of the traditional medicine and most of them had experience on honey product use for treatment and disease prevention for themselves and their family members. The result of the study indicated that the students in Kashmir valley showed interest towards beekeeping, bee product use for diseases prevention and treatment purposes. On interacting with the experts and farmers, it was observed that Kashmir has a great potential for beekeeping and exporting honey to different states of India. Finally, pressing issues, which are hurting the beekeeping industry in Kashmir valley are reported. There is an urgent need of giving mass awareness on importance of bee keeping to the people of the state.

1. INTRODUCTION

Honey bees are an amazing, highly beneficial insect species on planet earth which are an essential part of both our agricultural economy and the overall ecosystem, including homeowners, wildlife and anyone with an interest in nature. Honey bees are the important components of agro-ecosystem as they provide free ecosystem services in the form of pollination which not only enhance the productivity of agricultural crops but also help in conservation of biological diversity through propagation of wild flora besides, providing honey and other hive products. Currently, only seven species of honey bee are recognized, with a total of 44 subspecies, though historically, from six to 11 species have been recognized. Honey bees represent only a small fraction of the roughly 20,000 known species of bees. Some other types of related bees produce and store honey, but only members of the genus *Apis* are true honey bees. The study of rearing of honey bee and commercial production of honey is known as Apiculture. Apiculture (Beekeeping) as non land based income and employment generating activity is fast becoming a prime component of present day strategies for integrated rural development and off farm employment. Why bees are important? There are various ways in which honey bees are important: Each year, honey bees kept by beekeepers, produce more than $6 million worth of that delicious food. Honey is a popular food product also a number of valuable non-food products produced by the honey bee, such as beeswax, royal jelly, bee pollen, beauty products and other hive products have a variety of uses, such as beeswax for candles and cosmetics, royal jelly for cosmetics, bee pollen as a protein source, and more. Besides these products honey bees also pollinates a number of crops. Globally there are more honey bees than other types of bee and pollinating insects, so it is the world's most important pollinator of food crops. It is estimated that one third of the food that we consume each day relies on pollination mainly by bees besides other insects, birds and bats. Many domestic and imported fruits and vegetables require pollination. Examples include avocados, soybeans, asparagus, broccoli, celery, squash and sunflowers for oil, cucumbers, citrus fruit, peaches, kiwis, cherries, cranberries and melons. For crops like blueberries and almonds, the honey bee plays an essential role in pollination of commercial crops as around 80 per cent of the crop is said to be dependent on honey bees. Honey bees can also pollinate clover and alfalfa, which are fed to cattle, so there are implications for the meat and dairy industry too. In addition, honey bees play a significant role in the pollination of other important crops such as cotton and flax. Cross pollination of entomophilous crops by honeybees is considered as one of the effective and cheapest method for triggering the crop yield both qualitatively and quantitatively. It has been reported that there are more than 25000 described species of bees in the world and account for 65 per cent pollination of various flowering crops. Apitherapy (*Apis*, a Latin word that means bee) is the science or practice of using bee products such as honey, pollen, propolis, royal jelly, and bee venom for disease prevention or treatment proposes (e.g., Cherbuliez 2013; Baltuskevicius 2003). In many parts of the world the bee products are part of traditional medicine since time immemorial. The ancient

Greeks, Romans and Chinese used bee products for medicinal purposes more than 6000 years back. The famous ancient prescription book with fifty-two prescriptions dating back to the third century B.C. found in Changsha, Hunan Province, contains two prescriptions involving bees, one of which uses honey to treat diseases (T. Cherbuliez, 2013; Baltuskevicius; 2003; Hellner et al., 2008 and Zhu and Wongsiri; 2011). Honey is refered in almost all major religions of the world. In fact, honey bee are present in some form, whether venerated or not, in nearly every culture from which we have evidence. It is noticed that Political theorists, artists, poets, architects, scientists and mathematicians have all found some inspiration from honey bees. For architects, inspiration can be found in the engineering of the strength and efficiency of honeycomb, which optimize space for the materials used. For political theorists, from Aristotle to Karl Marx, honey bees serve as a metaphor for human society. From a prehistoric painting near Valencia, Spain, to tree carvings in Australia, to the art of more recent individuals, such as Salvadore Dali and our very own Zee Avi, the bee is popular in all forms of art. Contemporary artists today have often chosen honey bees as their muse, and one exhibit at London's Contemporary Applied Arts hosts the work of 28 artists. Even engineers have something to learn from honey bees. Recently, the bee products have been incorporated into modern medical practice, where the focus of attention is mainly the illness and its prevention (WHO, 2013; Zhang, Leach, 2015 and Kraft, 2009). Nowadays, bee products, particularly honey and propolis and its prepa-rations (tablets, suppositories, ointments, mouth sprays, and others), are quite popular among consumers and are available in most of the Lithuanian community pharmacies usually positioned as dietary supplements. The changing role of pharmacists encourages them to discuss with pharmacy patients not only the correct usage of medication but also disease prevention and public health issues. The provision of information on disease prevention is part of the public health issues and may empower people to increase control over and to improve their health. The patients who make decisions about their health often use integrative practice and combine both conventional and complementary medicine practices (Zhang, Leach and Hall et al., 2015; Robinson, et al., 2002). Pharmacy professionals often encourage people to use dietary supplements because (1) there is no prescription need for them, (2) this gives additional income for pharmacy, and (3) pharmacists value their knowledge on dietary supplements. Dietary supplements are often used for disease prevention purposes (Koh, Teo, and Ng, 2003; Tiralongo, et al., 2010). The correct knowledge on common complementary medicines practices is necessary to assist patient needs and answer the questions. This includes providing information that allows the patient to make the informed decisions about their health. The aim of this study was to investigate the experience, knowledge, attitude, and practices of students towards bee products for disease prevention and treatment purposes.

2. METHODS

In the present study carried out in Kashmir valley of J&K state we adopt descriptive survey research design. A well designed questionnaire based on previous studies on this topic was used to collect the information from 400 students (200 boys and 200 girls) studying in various Universities of Kashmir valley using stratified random sampling technique. Data collected from our survey was analyzed using standard statistical methods. Based on the five-point scale (5: strongly agree; 4: agree; 3: neutral; 2: disagree; 1: strongly disagree), a mean score of 3.0 was used as the benchmark of the study. Therefore, any item that scored below 3.0 was rejected while any item that scored 3.0 and above were accepted. Statistical test, Mann-Whitney U was used for comparison purpose. The Statistical software SPSS (version 20.0) was used for data analysis.

3. RESULTS AND DISCUSSION

The data presented in Table 1, shows the distribution of study population as per the characteristics Gender, Family status, Economic status, Location, Education Level and Subject chosen. It is observed that majority of the male respondents were from urban areas (56.5%), post graduate students (62.5%) and having science subject (58.5 %), middle class families (93.5 %), nuclear family (76.50%) and 63.5% respondents having no experience towards beekeeping. Further, it is observed that majority of female respondents were from rural areas (53.0%), post graduate students (59.5%) and having science subject (53.5 %), middle class families (92.5 %), nuclear family (73.50%) and 69.0% respondents having no experience towards beekeeping. Statistically, non-significant difference was observed between male and female respondents in all characteristics studied ($p>0.05$).

Table 1: Sociodemographic characteristics of the respondents

S.No.	Characteristic	Type	Gender			
			Male	Percentage (%)	Female	Percentage (%)
1.	Location	Rural	87	43.5	106	53
		Urban	113	56.5	94	47
2.	Education Level	UG	39	19.5	46	23
		PG	125	62.5	119	59.5
		PhD	36	18	25	12.5
3.	Stream	Science	117	58.5	107	53.5
		Arts	83	41.5	93	46.5
4.	Income Level	Low	13	6.5	15	7.5
		Middle	187	93.5	185	92.5

		High	0	0	0	0
5.	Family Type	Joint	47	23.5	53	26.5
		Nuclear	153	76.5	147	73.5
6.	Experience towards beekeeping	Yes	73	36.5	62	31
		No	127	63.5	138	69.0

The data presented in Table 2, revealed that in the study population as per the characteristics source of inform majority of the male respondents reported that that their main source of information on apitherapy were parents/ parents (54.5%), followed by internet sources (17.5%), followed by Friends/Community members (15.5%), follow Media (9.5%) then finally any other source (3.0%). Further, majority of the female respondents reported that that main source of information on apitherapy were parents/grand parents (59.5%), followed by internet sources (14.5% Media (12.0%), followed by Friends/Community members (11.5%), followed then finally any other source (2 Statistically, nonsignificant difference was observed between male and female respondents in their opinion (p>0.05

Table 2: Main Source of Information on apitherapy

S.No.	Source of Information	Gender		Chi-square	P-value
		Boys (%)	Girls (%)		
1.	Parents/grand parents	109 (54.5)	119 (59.5)	2.856	>0.05
2.	Friends/Community members	31 (15.5)	23 (11.5)		
3.	Internet sources	35 (17.5)	29 (14.5)		
4.	Media	19 (9.5)	24 (12.0)		
5.	Any other	6 (3.0)	5 (2.5)		

The data presented in Table 3, reveals that in response to statements 1,2, 6,7 and 8 i.e., Apitherapy is part of our traditional medicine, Apitherapy is very popular nowadays in our state, Apitherapy has less side effects than other remedies, The use of apitherapy products should be encouraged and Apitherapy products should be accessible in every community pharmacy both the respondents boys as well as girls showed good attitude towards apitherapy. Statistically, non-significant difference was observed between boys and girls respondents in all the statements (p>0.05).

Table 3: The attitude of respondents towards apitherapy

S.No.	Statement	Gender		
		Boys	Girls	
		Mean±S.D	Mean±S.D	P-value
1.	Apitherapy is part of our traditional medicine	3.62±0.63	3.71±0.57	>0.05
2.	Apitherapy is very popular nowadays in our state	3.74±0.69	3.81±0.71	>0.05
3.	Physicians have sufficient knowledge on apitherapy	2.21±0.81	1.99±0.78	>0.05
4.	As a future pharmacist I have sufficient knowledge on apitherapy	1.96±0.95	1.87±0.91	>0.05
5.	Apitherapy has less contraindication than other remedies	2.65±0.76	2.71±0.83	>0.05
6.	Apitherapy has less side effects than other remedies	3.48±0.49	3.62±0.52	>0.05
7.	The use of apitherapy products should be encouraged	3.12±0.57	3.19±0.61	>0.05
8.	Apitherapy products should be accessible in every community pharmacy	3.67±0.53	3.71±0.48	>0.05

5-point Likert scale evaluation (5: strongly agree; 4: agree; 3: neutral; 2: disagree; 1: strongly disagree)

The data presented in Table 4, reveals that in response to statements 1,2, 9 and 10 i.e., Enhancing immune system, Respiratory tract infections, Increasing of male/female fertility and Enhancing mental activity both the respondents boys as well as girls possesses good knowledge and use of bee products for disease prevention. Statistically, nonsignificant difference was observed between boys and girls respondents in all the statements ($p>0.05$).

Table 4: The knowledge and use of bee products for disease prevention.

S.No.	Prevention area	Gender		P-value
		Boys	Girls	
		Mean±S.D	Mean±S.D	
1.	Enhancing immune system	3.88±0.47	3.92±0.52	>0.05
2.	Respiratory tract infections	3.75±0.49	3.83±0.61	>0.05
3.	Cardiovascular diseases	2.12±0.72	2.19±0.69	>0.05
4.	Cancer prevention	2.18±0.82	2.24±0.79	>0.05
5.	Endocrine system disorders	1.92±0.73	2.07±0.68	>0.05

6.	Allergy	2.25±0.85	2.32±0.91	>0.05
7.	Skin aging	2.63±0.67	2.74±0.72	>0.05
8.	Anemia	2.29±0.76	2.35±0.68	>0.05
9.	Increasing of male/female fertility	3.18±0.74	3.23±0.77	>0.05
10.	Enhancing mental activity	3.12±0.66	3.21±0.58	>0.05

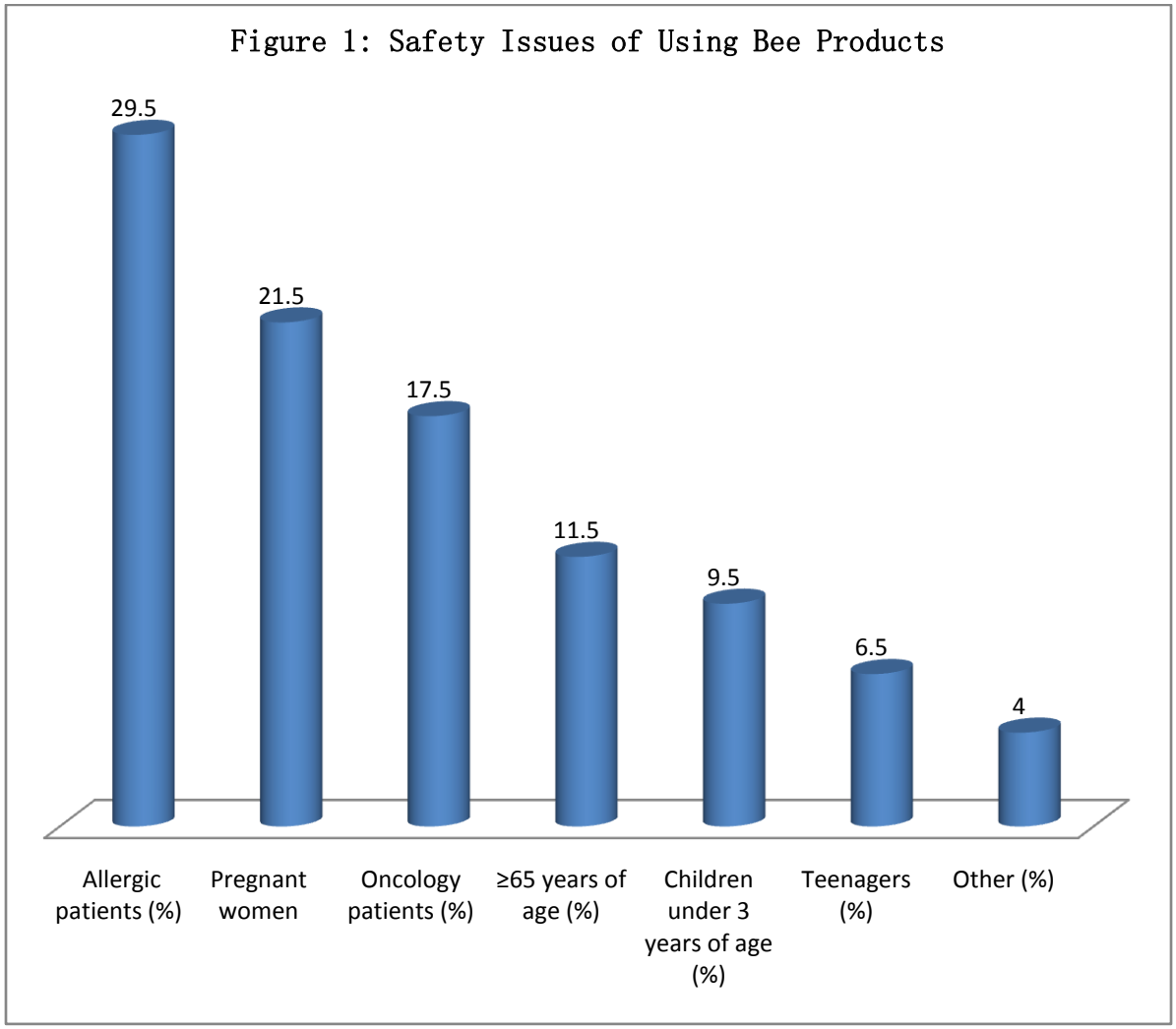
5-point Likert scale evaluation (5: strongly agree; 4: agree; 3: neutral; 2: disagree; 1: strongly disagree)

The data presented in Table 5, reveals that majority of the respondents understudy do not have knowledge about the use of bee products for the treat of various diseases. It is observed that only 12.25 consider bee products as main treatment for Arthritis, 11.0 % for Respiratory tract diseases, 16.25 % Skin diseases, 10.75% for Gastrointestinal disorders, 8.25% for Tuberculosis, 6.25% for Oncology, 5.50% for Anemia, 4.25 % Herpes, 8.75% Gynecological inflammations, 3.25 % Benign prostatic hyperplasia and 9.5% for Ophthalmologic disorders.

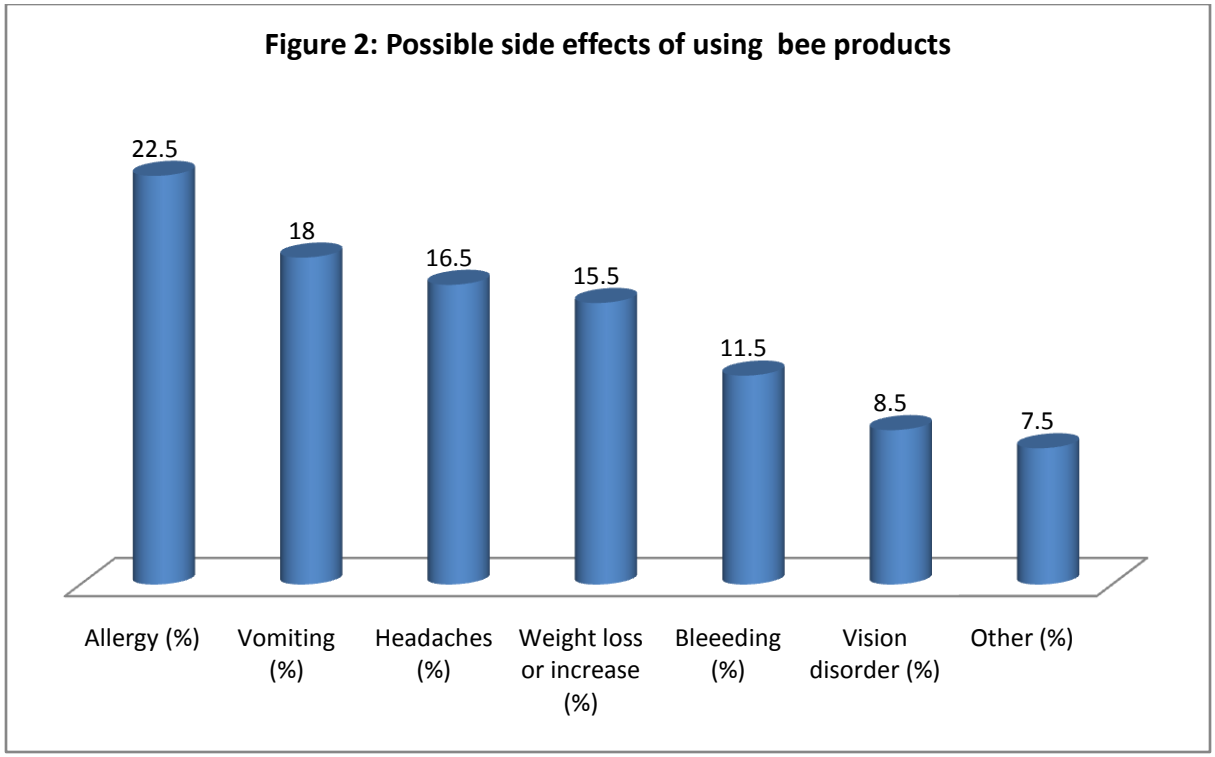
Table 5: The knowledge and use of bee products for treatment.

S.No.	Treatment area	Main therapy (%)	Additional therapy (%)	No knowledge (%)	No use (%)
1.	Arthritis	49 (12.25)	29 (7.25)	311 (77.75)	11 (2.75)
2.	Respiratory tract diseases	44 (11.0)	37 (9.25)	306 (76.5)	13 (3.35)
3.	Skin diseases	65 (16.25)	27 (6.75)	296 (74.0)	12 (3.0)
4.	Gastrointestinal disorders	43 (10.75)	31 (7.75)	311 (77.75)	15 (3.75)
5.	Tuberculosis	33 (8.25)	23 (5.75)	323 (80.75)	21 (5.25)
6.	Oncology	25 (6.25)	22 (5.50)	329 (82.25)	24 (6.0)
7.	Anemia	22 (5.50)	26 (6.50)	321 (80.25)	31 (7.75)
8.	Herpes	17 (4.25)	14 (3.50)	330 (82.5)	39 (9.75)
9.	Gynecological inflammations	35 (8.75)	31 (7.75)	313 (78.25)	21 (5.25)
10.	Benign prostatic hyperplasia	13 (3.25)	30 (7.50)	341 (85.25)	16 (4.0)
11.	Ophthalmologic disorders	38 (9.5)	28 (7.0)	315 (78.75)	19 (4.75)

The data presented in Figure 1, shows that the safety issues of using bee products in the opinion of the respondents were allergy (29.5%), pregnant women (21.5%), Oncology patients (17.5%), patients with ≥65 years of age (11.5%), Children under 3 years of age (9.5%), Teenagers (6.5%) and other (4.0%).



The data presented in Figure 2, reveals that the most known side effect in the opinion of the respondents were allergy (22.5%), vomiting (18.0%), headache (16.5%), weight loss or increase (15.5%), bleeding (11.5%), vision disorder (8.5%) and other (7.5%). The results obtained in our study are in agreement with the earlier study (Sonata T. et al., 2015).



Field visit, interaction with experts and researchers

4. CONCLUSIONS

The state of Jammu and Kashmir is an agricultural land based state and around 78% of the population is directly associated with agriculture. Horticulture is the major part of agriculture. It is observed during our study that the

students in Kashmir valley showed interest towards beekeeping, bee product use for diseases prevention and treatment purposes. During our survey farmers and experts were also consulted to get the useful information related to our research work. On interacting with the experts and farmers, it was noticed that the Kashmir Valley, with huge resources available, especially vast tracts of horticultural land, has a great potential for beekeeping and exporting honey to different states of India. There are over 35,000 honeybee colonies in Kashmir valley and the number of registered honey cultivators is more than 1,484. According to the estimates of agricultural experts, there is a potential for 120,000 colonies in Kashmir considering the huge availability of horticultural land. The Kashmir region has 161,682 ha of land under horticulture and it is increasing every year, as some farmers prefer growing fruits rather than rice. Horticultural farmers who took to beekeeping are reaping rewards for their efforts and Apiary business has also given rise to successful processing units. The Government of Jammu and Kashmir is providing bee colonies at subsidized rate to the interested farmers and the farmers are satisfied with the financial benefits from beekeeping. The farmers understudy showed interested in increasing the number of bee colonies and told that they think of migrating colonies out of Kashmir during winter to warm areas that have more crops. Most beekeepers of Kashmir shift their beehives to other parts of India like Jammu, Rajasthan, Gujarat and Maharashtra in winters. At present, we are now promoting honey bees as agents of pollination and they will not only result in increasing crop productivity, but will also increase honey production. The idea is also to generate employment in the state through this sector by value addition. The industry is confronted with the threat of Varroa disease caused by Varroa mite that feeds on larvae and adult bees as this disease has destroyed *Apis cerana*, the honeybee, which has traditionally been found in Kashmir valley, almost entirely and has also caused extensive damage to *Apis mellifera*, the European honeybee, which was brought to our state from Europe. The Jammu & Kashmir government needs to address some pressing issues, which are hurting the beekeeping industry in Kashmir valley. The most important of these issues is the lack of proper training for beekeepers, the unavailability of preventive and control measures for tackling pests and diseases and marketing problem.

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CONFLICT OF INTERESTS

The authors declare that there is no conflict of interests regarding the publication of this research paper.

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ABOUT THE AUTHOR

Dr. Bilal Ahmad Bhat, has done Masters in Mathematics and Statistics then PhD in Statistics is presently working as Associate Professor (Statistics) in Faculty of Fisheries, SKUAST-Kashmir, J&K. Dr Bilal Ahmad was earlier working in Mathematics & Statistics Dept University of Kashmir and in SKUAST-Jammu as Assistant Professor (Statistics) before joining SKUAST-Kashmir. He has participated and presented a number of research papers in various national/international conferences. He has more than 15 years of experience in teaching/research, published more than 130 research papers in various *National/International Journals of repute and has guided a number of research scholars for their PhD programme. His field of research is probability theory, information theory and applied statistics.*