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Original Article

Apitherapy: Usage And Experience In German Beekeepers

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This study aimed to investigate the practice of apitherapy - using bee products such as honey, pollen, propolis, royal jelly and bee venom to prevent or treat illness and promote healing - among German beekeepers and to evaluate their experiences with these therapies. A questionnaire incorporating two instruments on beekeepers' physical and mental health and working practice was included in three German beekeeping journals and readers were asked to complete it. The instrument included questions on the use of apitherapy. Simple descriptive methods, bivariate correlation, cross-tabulation and one-way ANOVA were used to analyze the data. Altogether 1059 completed questionnaires were received. The beekeepers reported the most effective and favorable therapeutic effects with honey, followed by propolis, pollen and royal jelly. The factors associated with successful experiences were: age, number of hives tended, health consciousness, positive experiences with one product and self-administration of treatment. Beekeepers were asked for which condition they would employ propolis and pollen. They reported that they used propolis most frequently to treat colds, wounds and burns, sore throats, gum disorders and also as a general prophylactic, while pollen was most commonly used as a general prophylactic and, less frequently, in treating prostate diseases. No adverse experiences were reported. The potential benefit of bee products is supported by the positive experiences of a large group of beekeepers who use some of these products to treat a wide range of conditions. The indications and treatments given here may be important in selecting bee products and designing future trials.

Keywords: apitherapy – beekeeper – beekeeping

Introduction

Apitherapy is the use of bee products such as honey, pollen, propolis, royal jelly, bee venom, wax and apilarnil to prevent or treat illness and promote healing. According to Dr Stefan Stangaciu, editor in chief of the International Federation of Beekeepers' Association, apitherapy is, 'the art and science of treatment and holistic healing through the honeybee and her products for the benefit of mankind and all the animal kingdom' (1). The roots of apitherapy can be traced back more than 6000 years to medicine in ancient Egypt. The Greeks and Romans also used bee products for medicinal purposes. This is 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 really represent the fathers of apitherapy is questionable.

There is a major difference between apitherapy and the use of bee products in defined medical situations. Apitherapists believe that bee products can be used

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Table 1. Dr Stefan Stangaciu's guidelines for apitherapy Lee et al. (4)

1. The diagnostic should be a 'holistic' one: classical (allopathic) but also energetic (as in Acupuncture), structural (Ayurveda), informational (Homeopathy) etc.
2. Before starting apitherapy, one must 'clean' the body with different 'detoxifying' methods: special diets, fasting, colon cleansing if necessary.
3. The fresh, 'organic' bee products have usually better effects than the 'industrial' processed ones; over-heat, excessive filtration and refining are detrimental.
4. Select attentively the bee products according to their origin, composition and pharmacological properties.
5. The quality and methods of storage are most important for good efficiency.
6. Apply with flexibility the producer's (manufacturer's) recommendations.
7. Always test for allergies before you start the treatment.
8. Gradually increase the doses of bee products.
9. Use several 'vehicles' in order to better reach the affected area: liquids (tea, water, juices); creams/ointments; inhalations; suppositories, injections etc.
10. Several methods of administration are better than only one.
11. The dose of each bee product must be established with accuracy according to the age, weight, general/local condition of each patient, time of application etc.
12. 'Simillia simillibum curantur': small doses can be used to treat bee product allergies (as in pollen, bee venom and honey allergies).
13. The time of treatments should be in harmony with different (bio) rhythms; these rhythms vary with the patient, the disease, the season, the hour of the day etc.
14. Apitherapy is not a 'panacea' and should be applied in harmony with other natural healing methods like Phytotherapy, Aromatherapy, Acupuncture, Organic diet, Ayurveda, etc.
15. 'Primum non nocere'! Do not experiment on your patient! Use only safe methods and high quality products!
16. It is very important to improve the blood flow through other methods like Massage, Acupressure, Gymnastics, *Taiji Quan*, *Qigong*, *Hatha* Yoga etc.
17. Good sleep and relaxation enhances the effect of bee products.
18. Good environment (clean, ordered, non-polluted) and a 'positive-thinking' family/friends group are also beneficial.
19. Individualise your treatment! Each patient is Unique and must receive a unique treatment!
20. Because of their composition, all bee products have more or less beneficial effects, on all patients.
21. Apitherapy is not a 'blitz' method! Perseverance and patience is necessary, especially in chronic diseases.
22. Educate your patients before, during and after treatments; make them true bee lovers and protectors! Each patient must become, in time, his own apitherapist.
23. A good apitherapist must know the bee colony's life in detail; he must be also at least a good 'amateur' beekeeper.
24. Continuous study, good exchange of information with other specialists from several 'Apitherapy related countries', regular use of Internet can help in finding the best medical strategy for each person.

to cure most diseases. However, the use of bee products in conventional medicine is limited to certain indications where they have shown effects which are equal to or better than those of standard treatments - for example, in treating wounds and burns and as an interesting approach in arthritis (2–4).

Dr Stangaciu is one of the foremost protagonists of apitherapy and he states that he has had more than 7000 treatment successes with bee products (5). He has developed guidelines for apitherapy and these are reproduced in Table 1 (5). There are various other reports on the internet of healing through apitherapy but unfortunately no detailed information is available (6).

Despite the relative lack of scientific evidence, the concept of apitherapy strongly appeals to many people, especially beekeepers. Beekeepers have used and promoted bee products for a long time, sometimes even defying state laws to do so (7). In order to learn more about apitherapy and its applications, we assessed the extent of its use in beekeepers and their experiences with this therapy in a nationwide study in Germany.

Methods

Study Questionnaires

As there have been no previous studies on this subject, we had to develop a suitable instrument for gathering information—this was the Questionnaire for the Assessment of Beekeepers' Health (QABH). The questionnaire was based on previous research in other fields of medicine and on reports of various disorders in beekeepers (8–17). The questionnaire assessed several aspects: The beekeepers' sociodemographic data, her/his current health status with a focus on bee-related health problems, her/his experiences with the therapeutic effects of bee products (tried out on themselves, friends, family and/or others) and the motivation for beekeeping. Bee venom allergy was classified according to Müller (18). The intelligibility of the questionnaire was tested beforehand in 10 volunteers. The QABH was combined with the Inventory for the Measurement of Bodily Negative Affectivity—trait version (INKA-h) questionnaire which provides validated and robust evidence of emotional instability such as neuroticism, negative affectivity or stress-reactivity (19). However, the underlying hypotheses for the use of this questionnaire do not relate to the topic of this analysis.

Subjects

In Germany, some 81 818 beekeepers are members of the national Deutscher Imkerbund (DIB; German Beekeepers Association), an organization which is structured into regional groups. According to the association, only 5–10% of German beekeepers are not members. Most members subscribe to journals informing them of regional news. The Deutscher Landwirtschaftsverlag GmbH (German Agricultural Publishing Company; www.dlv.de) publishes three of these journals - *Die*

Biene, *Der Imkerfreund* and *ADIZ*. Journal readership is particularly high in the following geographic areas: Baden, Bavaria, Hesse, Mecklenburg-Western Pomerania, Nassau, Rhineland-Palatinate, Rhineland, Saxony, Saxony-Anhalt, and Saarland. The QABH and INKA-h were incorporated into one questionnaire and included in the May 2006 issues of the three Deutscher Landwirtschaftsverlag beekeeping journals sent to subscribers in the areas mentioned above. The survey, therefore, reached approximately 35 000 beekeepers (Deutscher Landwirtschaftsverlag GmbH, personal communication). Readers were asked to complete the printed questionnaire and to return it by mail or fax or to complete the electronic questionnaire on the internet. A copy of the questionnaire is available from one of the authors (KM).

Reference Group

Members of the beekeeping association in the Giessen region were asked to serve as a reference group in order to detect or rule out any potential biases between beekeepers who responded to our journal survey and non-responders. The Giessen association has 181 members: 178 individual members and 3 institutional members. Concurrently with the distribution of the questionnaire in journals, individual members of the Giessen association were asked to complete the questionnaire and return it using a postage paid envelope.

Statistical Analysis

SPSS version 10.0 (SPSS, Chicago, IL, USA) was used for data management and statistical analysis. Various statistical methods were used in the study, including simple descriptive methods, bivariate correlations, cross-tabulation and one-way ANOVA. A P-value of < 0.05 was considered statistically significant.

Ethical Approval

The study was submitted to and approved by the ethics committee of the Justus-Liebig-University.

Results

In all, 1059 completed questionnaires were received, mainly by mail, by fax and few via e-mail. A total of 58 beekeepers completed the survey on the internet. The demographic data are shown in Table 2. One way ANOVA or χ^2-test showed no statistically significant differences between the beekeepers who participated in the survey via the beekeeping journals and those who were asked to take part as members of the Giessen beekeeper association.

Table 2. Sociodemographic characteristics of the study group

Parameter	Entire group $n = 1059$	Journal survey $n = 907$	Giessen Beekeeper Association $n = 152$
Response rate (%)	-	~2.6	84.8
Age (y)			
Mean value	61.8	61.0	63.7
Median	65	65	66
SD	13.9	14.0	13.3
Range	4–94	4–94	12–90
Gender (%)			
Female	7.6	7.8	5.9
Male	92.4	92.2	94.1
Marital status			
Single	6.7	6.9	5.3
Married	86.2	86.1	86.8
Widowed	4.2	3.9	6.0
Divorced	2.9	3.0	2.0
Place of residence			
Town	25.7	25.4	27.3
Country	74.3	74.6	72.7
Time spent as a beekeeper (y)			
Mean value	25.9	26.2	24.4
Median	23	24	21
SD	17.3	17.5	16.1
Range	0–91	0–91	1–65
Number of bee hives			
Mean value	13.9	14.9	8,0
Median	10	10	7
SD	15.5	16.4	5,0
Range	0–240	0–240	1–30

The beekeepers were also asked about the health conditions in which they would use propolis and pollen. Their answers are depicted in Figs. 2 and 3, which show that propolis is most frequently used for treating the common cold, wounds and burns, sore throats, gingival disorders and also as a general prophylactic. Pollen is most commonly used as a general prophylactic and, less frequently, in treating diseases of the prostate.

Discussion

To the best of our knowledge this is the first study on therapeutic experiences with bee products among beekeepers. Most beekeepers definitely do not consider themselves as apitherapists, although they may be regarded as the primary therapists for this type of medicine. Most have had positive experiences in using honey, propolis, pollen and rojal jelly, which they employ

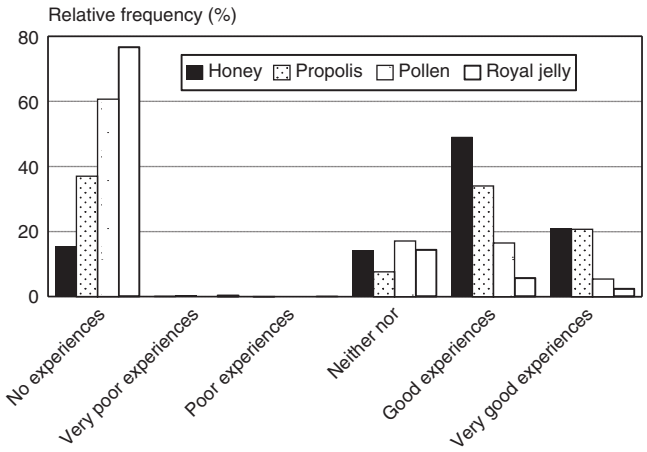

Figure 1. This figure details the beekeepers' experiences with various bee products. It shows that they had the greatest and most favorable experiences with honey, followed by propolis, pollen and royal jelly. Their experiences were not affected by gender or general health status. The factors associated with favorable experiences with bee products were as follows: (i) Age - older beekeepers generally claimed to be more familiar with the health effects of bee products ($P<0.05$). (ii) Number of bee hives tended - beekeepers who tended more beehives were found to have better experiences regarding the use of the various bee products ($r_{honey}=0.092$, $P=0.003$; $r_{propolis}=0.172$, $P<0.001$; $r_{rojal\ jelly}=0.124$, $P<0.001$; $r_{pollen}=0.180$, $P<0.001$). (ii) Health consciousness - beekeepers who considered themselves more health conscious more frequently reported positive experiences ($r_{honey}=0.072$, $P=0.021$; $r_{propolis}=0.126$, $P<0.001$; $r_{rojal\ jelly}=0.147$, $P<0.001$; $r_{pollen}=0.156$, $P<0.001$). (iv) Positive experiences with one bee product - positive experiences with one bee product were associated with positive experiences with other bee products as well as health effects ($r=0.213$–0.537, $P<0.001$). (v) Self-administration of treatment- very strong correlations were found between positive experiences with the bee product and self-administration ($r_{propolis}=0.792$, $P<0.001$; $r_{rojal\ jelly}=0.672$, $P<0.001$; $r_{pollen}=0.667$, $P<0.001$).

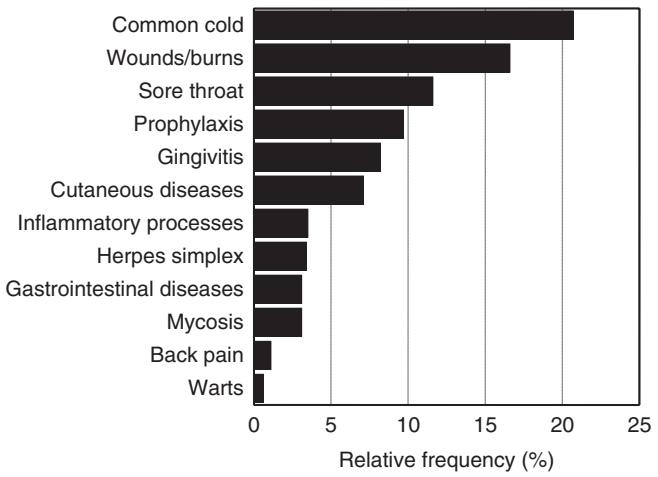

Figure 2. This figure shows that propolis is most frequently used for treating the common cold, wounds and burns, sore throats, gingival disorders and also as a general prophylactic. Pollen is most commonly used as a general prophylactic and, less frequently, in treating diseases of the prostate.

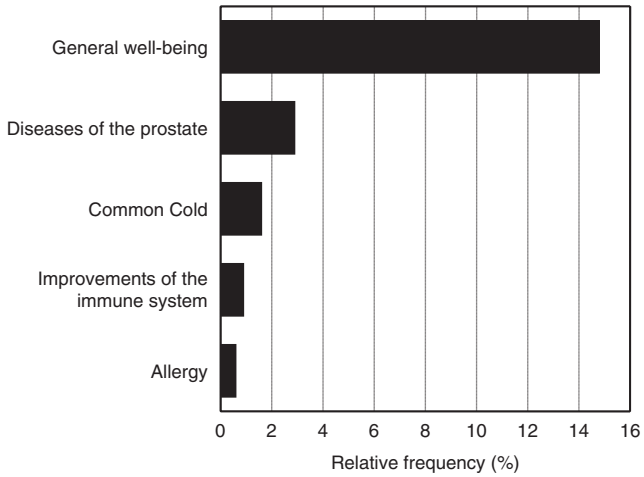

Figure 3. This figure shows that propolis is most frequently used for treating the common cold, wounds and burns, sore throats, gingival disorders and also as a general prophylactic. Pollen is most commonly used as a general prophylactic and, less frequently, in treating diseases of the prostate.

for various indications. It is interesting that no adverse experiences were reported by the beekeepers, which implies that these products seem to be safe. This study enabled us to determine the major indications for the use of propolis and pollen in beekeepers and factors which were associated with positive experiences and the use of bee products, especially self-administration of treatment, better health conciousness, greater age, larger number of bee hives tended and positive experiences with using one bee product.

The fact that older beekeepers use bee products more frequently than younger ones is similar to findings in a study on complementary and alternative medicine (20), that does have shortcomings. The first is the low response rate to the questionnaire published in the beekeeping journals. However, this is not unusual. Another questionnaire in the same journals had a similar response rate (21). Another problem may be the use of a non-validated questionnaire. However, to the best of our knowledge there have not been any earlier studies in the field. The third shortcoming is the possibility that the low response might lead to bias or a skewed distribution of results. In order to determine the potential for bias created by this type of investigation, we also analyzed a reference group - the Giessen Beekeeper Association. Comparison of the results showed that there were no significant intergroup differences in the major assessed demographic factors. In addition, characteristics of the beekeepers in a study on beekeeping traditions from Rhineland-Palatinate are very similar to those in our sample (22). It is also worth adding that data provided by the Deutsche Imkerbund (German Beekeepers Association) regarding beekeepers' age and the number of beehives tended do not suggest any important bias in our study

group. Furthermore, since the survey addressed several aspects of beekeeping, we do not believe that beekeepers with particularly strong views or problems regarding one aspect would have been more or less likely to respond to it. Thus we assume that the bias is low.

Apitherapeutic societies claim that bee products are efficacious in several circumstances (23,24). In general, these claims of effectiveness are not supported by published reports but an overview of the literature, especially on propolis, shows that some assertions could well be valid. Propolis has wide therapeutic spectrum, ranging from anti-inflammatory to antifungal, antibacterial, anti-tumor, anti-allergic and wound healing properties (23,25). Recent reports indicate that it may also have neuroprotective effects which could be helpful in cases of cerebral ischemia. There is also evidence supporting the use of pollen in diseases of the prostate. These studies were conducted with rye pollen and showed positive results (22). Although rye pollen is not collected by bees, there may be common properties.

In summary, the potential benefit of bee products is supported by several studies and now also by the positive experiences of a large group of beekeepers who used bee products frequently to treat a wide range of conditions. The indications stated here may be useful in selecting and designing future trials of bee products. The recent positive findings from the meta-analysis on honey and wound healing show that the some experiences may well prove interesting (2).

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