

The Sustainable Research Long While Between Bee Pollen and Honey Bee Diversity in Libya: Literature Review

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Abstract

*Despite the fact that being one of the third developed countries Libya considered one of the fealty rich environmental resources in the small country. Furthermore, one of the fundamental wealth is the bee pollen which has been widely spread in different areas of the country. Moreover, this study has moved in-depth to observe and reviews this important environmental resource which is has been presented in this paper body. **This study aimed** to answer the two main research questions as presented **RQ1**: Observe the plant sources in Libya which pollens can play in important role in determining the nutritional value of honey and its uses in alternative medicine to treat some diseases such as: Diabetes, Cough, Influenza, Antiseptic, Indigestion, Rheumatic, Breathlessness, Anticancer, Stomach and Colitis treatment, Dermatitis etc. the presented in schedule (1). **Q2**: What the relationship between bee and plant sources and the quality of honey production in the geographical environment? The result of this study is beneficial for different kinds of Libyan sectors such as education, healthcare, manufacturing sector. All in the result also will be beneficial for researchers all around the world.*

Keywords: pollen grain, pollen production, honey, taxonomy, bee plants, traditional, Libya.

1.1. Introduction

Shalibak and Zencirci, (2019); Al-Sghair et al., (2019); Keshlaf, (2017) has reported that the region of Libya is 1,759,540 (kilometer)², creating it the seventeenth largest nation in the world. Furthermore, Libya deceits along the southern coast of the Mediterranean Sea, in the location amongst latitude (18°) as well as (33°) North which is associated with (9°) as well as (25°) in the East. Moreover, the overall climate naturally, is dry as well as Simi-desert. On the other hand, the northern areas have a Mediterranean climate all most of the commercial beekeepers are ranged in an agricultural about thirty km from the coast. Mahklof and Etayeb, (2018) has declared that Libya remains recognized via arid climatic situations, except the coastal strip belongs to the northern hills toward the east as well as the west (Essghaier et al., 2015). In addition, the presence of environmental conditions, for instance, temperature, humidity, as well as rainfall which is reflected on the biological components of the plants belongs to the animals

that remain able to coexist in several ways with those difficult environmental surroundings (Mahklof and Etayeb, 2018).

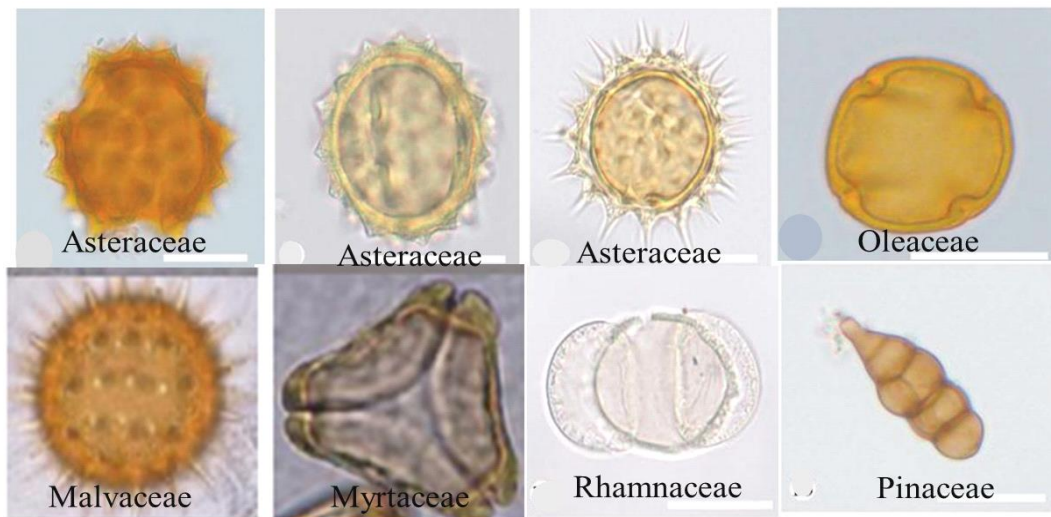


Figure.1. The shape of pollen grains recovered from the sum of honey samples under Photomicrographs

Pollination servicing is not practiced in Libya in contrast of other African countries. Consequently, the major sole income is considered by honey for beekeepers. Moreover, beekeepers are requested to provide honey to farmers as a rental fee for accessing to a flowering plants. Therefore, beekeepers largely depend on non-crop wild plants, diverse species of which occur in diverse areas of the country. In addition, migratory beekeeping remains largely practiced for honey production (Keshlaf, 2017).

Standardized methods are utilized to represent pollen grains which has been found in natural honey. Furthermore, the honey bee contains of pollen (bee production materials) and species composition of the plants foraged by the honey bees, on the other hand, the quality as well as purity of the honey type is depends on the flower of regions. Therefore, it is reported that the most contents of pollens were belonging to *A. pavarii*. Furthermore, honey purity utilizing mellisopalynology as qualitative method (El abidi El and shatshat, 2016). This can be clarified via the fact that the presence of the pollens because of the vegetation cover in the region which associated with the reason that the flowering season of *A. pavarii*, from (Oct to Feb). Naturally, *A. pavarii* is one of important special and specific honey sorts in Libya which considered as endemic plants (Shalibak and Zencirci, 2019); (El shatshat, 2015). According to this plant critical situation (El shatshat, 2015) a number of methods should take in account utilizing conservation programs to protect this species as well as others from diverse impacts caused via climatic changes and human activities. In addition, subsequently, protect it as specific forage plant for bees not in the area, however, the world

Bee pollens are collected by the bees and mixed with nectar and honeybee salivary substances, carried out by worker bees and collected at the hive's entrance (Komosinska-Vashev, Olczyk, Kafmierczak, Mencner, and Olczyk, 2015; De Florio Almeida et al., 2017). Moreover, the bee pollen consists of substances that are nutritionally essential, for instane, antioxidant vitamins

(Arruda,Pereira, Freitas, Barth, and Almeida-Muradian, 2013), as well as polyphenols (De Florio Almeida et al., 2017). Additionally, the bee pollen was justified as heterofloral. according to Komosinska-Vassev et al. (2015) the bees desire a particular sort of polliniferous plant. On the other hand, it occasionally happens that the bees also collect pollen from different other plant sources.

1.2. The research structure, the research aim,

This research study structured in three main sections as presented as below.

- Section one: Introduction, The research structure, the research aim, research questions.
- Section two: Literature review, plants and honey bee in Libya, the morphology of pollen of some plant (bee pollen), distribution of bee, the usage in medicinal domain, application Area, Cosmetics usage, Food, Medicine usage, Pollen effect on insects in biological influences, The uses of pollen and its implication for Entomology, other usage of pollen.
- Section three: Conclusion and future work.

1.3. The research aim

This research study aimed to cover the following points which is presented below.

- To observe the plant sources in Libya which pollens can play an important role in determining the nutritional value of honey and its uses in alternative medicine.
- To review the relationship between bee and plant sources and the quality of honey production in the environment.
- To justified as determined the application are of pollen grains.

1.4. Research questions

In this study aimed to answer the three main research questions as presented in figure.3. below.

- **RQ1:** What are the plant sources in Libya related to pollens?

Rational1: There are several plant sources in Libya related to pollens which is presented in the literature review and the Table.1.1.which presented the bee pollen grains of some plants in Libyan found in natural honey product and traditional usage.

- **RQ2:** What's the important role of pollens in determining the nutritional value of honey and its uses in alternative medicine?

Rational2: the important role of pollens in determining the nutritional value of honey and its uses in alternative medicine which is presented further in the literature and Table.1.1. in detail.

- **RQ3:** What the relationship between bee and plant sources and the quality of honey production in the geographical environment?

Rational3: the relationship between bee and plant sources and the quality of honey production in the geographical environment which is presented in Table.1.1. which presented the Bee Pollen grains of some plants in Libyan found in natural honey product and traditional usage.

2. Literature review

2.1. Plants and honey bee in Libya

Honey is the natural sweet substance from nectar or from the secretions of the living parts or excretions of plants which the honey bees collect and store in the honey. Traditional importance and use of honey as therapeutics has been mentioned by the Egyptian and Sumerian physicians as early as 4000 years ago (Gweirif et al., 2015) The main honey plants in Libya including;

Acacia spp, *Pinus spp*, *Cupressus spp*, *Thymus vulgaris* *Lantana camara*, *Hisbiscus rosa-sinensis*, *Eucalyptus cawaldulensis*, *Medicago sativa* and many wild plants (Hussein et al., 2000). Of those types, Eucalyptus honey (*Eucalyptus gonphocephala*), is one of the main honeys produced and consumed in Libya especially in the north where its extensive trees flowering in November and December. (Gweirif et al., 2015)

In the western region of Libya, there are three main honey flows, the heaviest from spring flowering plants in late March and April. Many beekeepers move their colonies to hilly country located east of Tripoli for the second flow from wild flowers of Sider, *Zizaphus Spina*, from May to June, then for the third flow from thyme, *Thyme vulgaris*, in June to July. In desert areas, tamarisk, *Tamarix nilotica*, of provides exceptional honey flow (Zboray, 2013). In the eastern region there are other bee plants such as schamiry, *Arbtus pavarii* and carob, *Ceratonia siliqua* (Keshlaf, 2014).

In the western region of Libya, there are three main honey flows, the heavier from spring flowering plants in late March and April. In May to June, many beekeepers move their colonies in to hilly country to the east of the Tripoli for the second flow, from wild flowers of sider (*Zizaphus Spina-christi*) which offer the highest price of western honeys. Then, June to July, colonies usually migrated to *Thyme pastures*. Both sides and thyme are commonly used as traditional medicines, customers believing in the healing powers of its honey. In the eastern region there are other bee plants such as the schamiry tree (*Arbutus pavarii*), endemic to Libya, occurring only in the Green Mountain (Al-Jabal AlAkdar) and flowering in November to December; its unique honey (hanoon) is bitter in taste and commands a premium price. Carob trees (*Ceratonia siliqua*) are grown in the regions of El-Beida, Shahat, Sousa, Al-Abrage. The tree presents a great industrial and pharmaceutical importance and is considered as an important component for re-vegetation, environmental conservation and valuable bee plant. Numerous varieties of tamarisk (*Tamarix spp.*) of the Libyan desert provide an exceptional honey flow in the southern region (Zboray, 2013), and the consecutive blooming of Tamarix species supports both bees and beekeepers. (Keshlaf, 2017)

In Libya the local production of honey is about 500,000 kg per annum, and most Libyan honey sold directly to customers. This locally produced honeys brings a premium price, ranging from 17 to 30 US\$ per kg. On the other hand, different imported honey sells in grocery stores, for approximately US \$ 7 per kg. Libyans prefer to use local honey because of its quality and authenticity (Keshlaf 2014) They use local honey in preparing traditional food and a lot of sweet. In addition, Libyan people use local honey as a medicine to treat of different diseases and disorders as a popular home remedy. (Ahmida et al., 2017)

Brittan estimated, yielded about 18 kg of honey each year (Brittan, 1956). She reported that she had heard that these boxes were in use for more than 200 years, even before the Turkish era. Brittan mentioned that most families kept one or two hives but there were beekeepers with apiaries of up to 100 hives which they located in caves (Brittan, 1956). Until the 1950s, Libya was the 3rd poorest country in the world. After the discovery of oil reserves in 1959, the Libyan economy has changed dramatically (Keshlaf, 2014). Modern beekeeping has in Libya has developed only in the recent decades with the adoption of modern beekeeping techniques using hives with removable frames (Brittan, 1956). The successful introduction of modern hives to the east of Libya occurred after the ravages of the Second World War, and was supported by Olive

Brittan in 1952 (Showler,2011). Until today, beekeepers in the eastern region of Libya still use Langstroth hives, whereas in the western region Dadant hives are used and are believed to have been imported by the Italians during the occupation (1911-1932). Then, early in the 1960s, European-evolved races of honey bees, primarily the Italian, *A. mellifera ligustica*, formed the basis of a honey producing industry. Currently, there are more than 3,000 beekeepers, managing approximately 50,000 colonies. Although many of these bees are maintained in the one location (i.e. not migrated), they still produce an average of 500,000 kg per annum. Because of increasing management difficulties, associated with limited floral resources and bee diseases, some beekeepers have had to reduce their operations. While a number of beekeepers manage 200 or more colonies; the majority manage 50 or a few more colonies in their apiary to harvest respectable amounts of honey. Keeping bees as a second income is very common in Libya. As a result, increased competition from adjacent apiaries appears to have reduced nectar availability.

2.2. The morphology of pollen of some plant (bee pollen)

Honeybees need flowering plants for nectar and pollen as source of food and flowering plants need honeybees for pollination. Beekeeping is entirely depending on the types of flowering plants available in any given area. There is a need to understand honeybee plant relationship to study food preferences of honeybees and pollination requirement. Pollen of various plants representing potential source of nectar and pollen for the honeybees is an important pre-requisite for the developing apiary (Shubharani et al., 2013)

Pollen from the different flowers has specific shape, size and ornamentation. Microscopical analysis of pollen of plants forged by bees is an established method to determine the source of honey in the area.

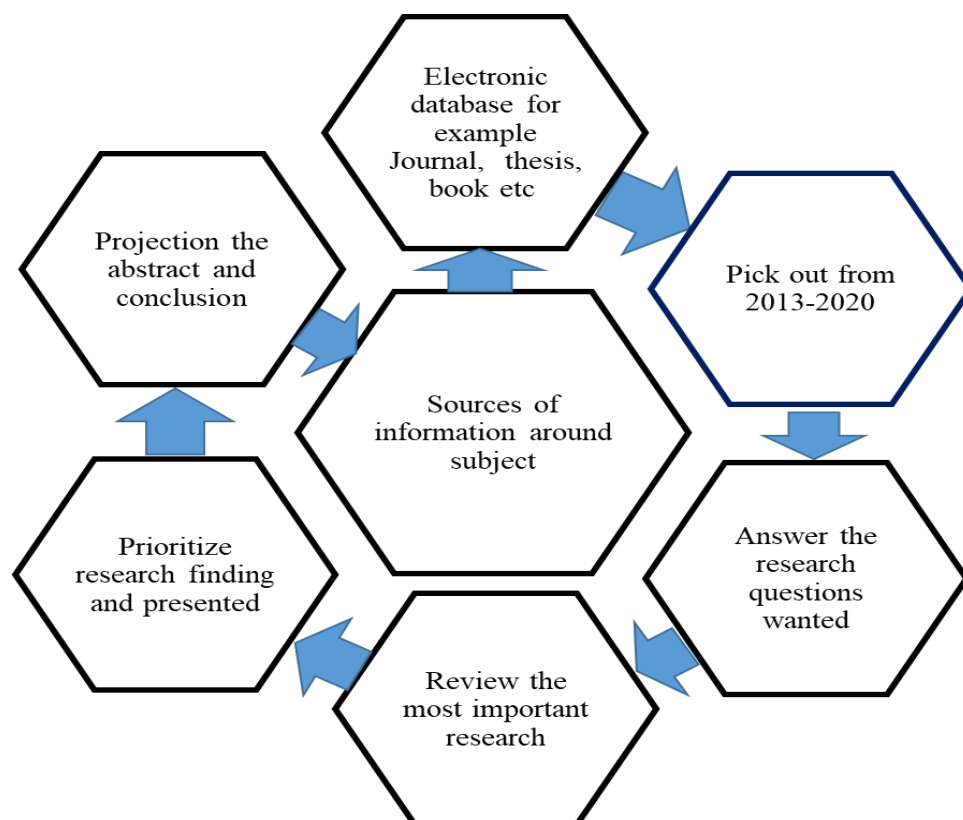


Figure .2 The adaptation of the research methodology related to a bee cells.

Table 1.1. The Bee Pollen grains of some plants in Libyan found in natural honey product and traditional usage

Pollen souses (plant name)	Traditiona l name	Family of plant	Type of honey	Traditional usage	Reference
<i>Arbutus pavarii</i>	Shmari	Eriaceae	Hanone honey	Diabetes, Bowel infections, Laxative effect, Urinary tract infection, Epigastric pain, Renal colic and Constipation	(El abidi & El Shatshat, 2017) (Shalibak and zencirci, 2019)
<i>Ziziphus lotus</i>	Sider	Rhamnacea e	Sidr honey	Constipation, Sciatica pain, Hair parasites, Bowel infections, Abscess, hermorrhoids, Hepatitis (b) and Vermicide	(Zerrouk et al., 2017) https://bassetrazig.wordpress.com/ (Elbagermi1 et al., 2019)

<i>Quercus coccifera</i>	Pallot	Fagaceae	Honey alman, honeydew	Stomach and Colon treatment	https://bassetrazig.wordpress.com/ (Zerrouk et al., 2017)
<i>Sinapis alb</i>	Aslose	Brassicaceae	Rabi honey	Stomach and Colon treatment	(El abidi & El Shatshat, 2017) (Bataw & Shareef., 2018) (Bataw & Shareef., 2018)
<i>Pelargonium radula</i>	Alater	Geraniaceae	Rabi honey	Stomach and Colon treatment	(El abidi & El Shatshat, 2017) (Bataw & Shareef., 2018)
<i>Malva parviflora</i>	Khobbeiza	Malvaceae	Rabi honey	Anemia, Gastroenteritis, Angina, Laryngitis and Abscess	(El-Mokasabi, 2014) (El abidi & El Shatshat, 2017) (Bataw & Shareef., 2018)
<i>Stachy stournefortii</i>		Lamiaceae	Rabi honey	Stomach and Colitis treatment	(El abidi & El Shatshat, 2017) (Bataw & Shareef., 2018)
<i>Ballota pseudodictamnus</i>	Mayla	Asclepiadaceae	Mayla honey	Gastritis, Hair parasite as well as Urinary tract infection	(El-Mokasabi, 2014)
<i>Thymus capitatus</i>	Zaatar	Lamiaceae	Zaatar honey	Cough, Influenza, Antiseptic, Indigestion, Rheumatic, Breathlessness, Anticancer, Strengthening the immune framework	(El-Mokasabi, 2014) (https://bassetrazig.wordpress.com/) (Shalibak and zencirci, 2019)
<i>Cynara Cyrenaica</i>	Karshoof	Asteraceae	Qahmoul honey	Anaemia, Ucler, Gastritis, Colic, Arteriosclerosis, Burns, Metritis, Ovulation	(El-Mokasabi, 2014)
<i>Eucalyptus promoting purposes</i>	Alkafoor	Myrtaceae	Eucalyptus Honey	Microbial infections, against bacteria, Respiratory therapies, Anthelmintic, Gum therapist	(Gweirif et al., 2015) (Maraia, 2016)
<i>Citrus spp</i>	Alhamdiate tree	Rutaceae	Rabi honey	Stomach and Colitis treatment	(Keshlaf, 2014) (Ahmida et al., 2012)
<i>Peganum harmala</i>	Harmal	Zygophyllaceae		Dermatitis	(Keshlaf, 2014)
<i>Tamarix Africana</i>	Tamarix	Tamaricaceae	Elatheal	Diabetes	(Ahmida et al., 2012)
<i>Ceratonia siliqua</i>	Carob tree	Fabaceae	Elkharob	Antiphlogistic, Reduces cholesterol in the blood	(Ahmida et al., 2012)

2.3. Distribution of bee

The North African honeybee subspecies west of Libya (*A. m. sahariensis* and *A. m. intermissa*) belong to the mitochondrial lineage A (Garnery et al., 1995) whereas the near East (O) evolutionary lineage has been reported in *A. m. syriaca* from Turkey (Palmer et al., 2000) and Lebanon, *A. m. lamarckii* from Egypt and one colony of *A. m. litorea* from Somalia (Franck et al., 2000b, 2001). Our results show that the distribution of this evolutionary lineage spans through Libya and identifies a contact zone between the African A lineage and the O lineage in western Libya at the Tunisian border. Hence the endemic honeybee of Libya enhanced the frequency of the private haplotypes in relation to the other haplotypes that are more common in the other sampled populations.

2.4. The usage in medicinal domain

The higher ratios of TUS/TS in pollen supported the use of bee pollen as a food supplement in the diet to reduce the total amount of fats and cholesterol, preventing some cardiovascular disease. There were considerable variations in the unsaturated/saturated fatty acid ratio, which might be contributed to the different botanical origins or the processing and storage conditions. The results were also consisted with the notion that bees collect pollen with a high level of unsaturated fatty acids (Bonvehí and Jordà, 1997). In addition, the presence of pollen types as *Peganum harmala*, *Lotus*, *Eucalyptus*, *Taraxacum*, *Cistus*, *Trifolium*, *Carduus* and *Matricaria* could be useful to differentiate this honey type from sidr honey of other geographical origin.

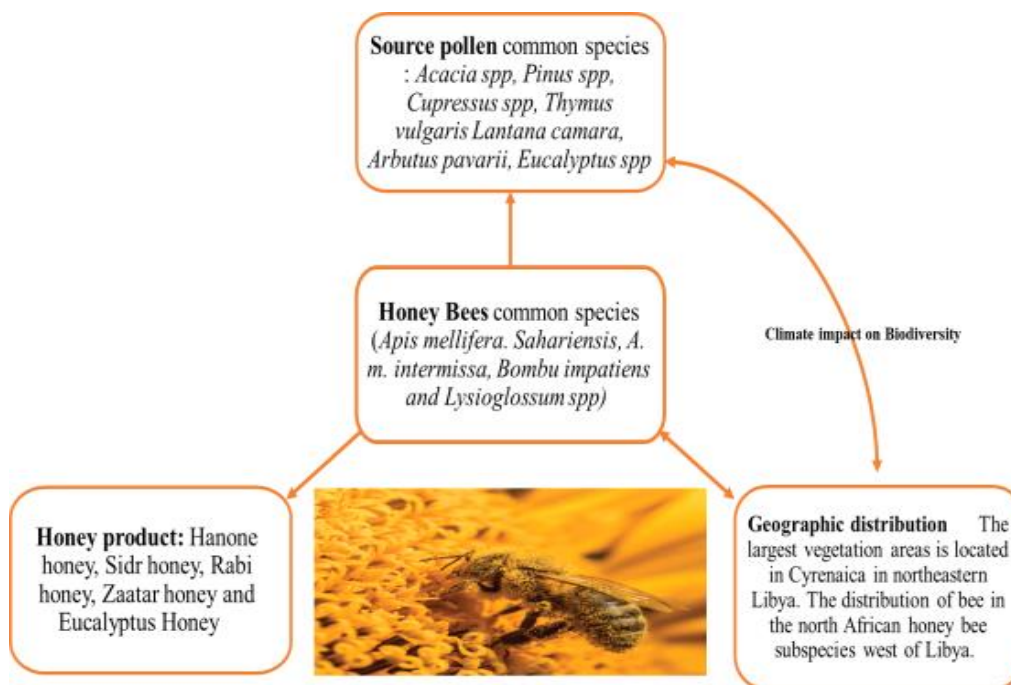


Figure.3 The usage in medicinal domain

2.5. Application Area

2.5.1. Cosmetics usage

Flower pollen grains have an intense, external divider that shields the internal hereditary material from physical damage, parching and sun based radiation. Moreover, similar to all living tissue, this inward cell material is comprised of a scope of natural and different mixes. A progression of investigations of pollen decided its creation to be as follows

- Pollen contains from 10 to thirty-five percent protein made out of eighteen distinctive amino acids (Kriesell et al., 2017); decreasing just as non-lessening sugars (Aubied and Hamzah, 2019); 1 to 20% fats; starch up to twenty percent; nucleic acids; follow components K, Mg, Ca, Fe, Si, P, as well as S; oligo-components Mn, Ti, Cu; nutrients A, B, C, D, as well as E; hormones; enzymes; as well as an antibiotic (Zhang et al., 2015); (Axenov-Gribanov et al., 2016).
- vitamins that were still a raised status in skin creams during the 1950s the hormones and compounds found in pollen were important to French specialists (Sénéchal et al., 2015). Moreover, corrective specialists felt that the 'biocatalysts' and 'biostimulants' found in pollen could be helpful increments to against wrinkle, supporting just as saturating skin creams (Celenk, 2019).
- Bee pollen utilized in cosmetics act as a sunscreen agent as well as could be utilized as an ingredient of sunscreen cosmetics reviewed its usage as an agent-protecting essential oil (Kocot et al., 2018).
- Pollen grows as well as plays a part in propagation so the idea was that it may contain vegetative forms of the 'skin reviving' substances as far as anyone knows found in fetus concentrates and plant renditions of the 'skin youthifiers' accepted to be delivered by creature hormones (Celenk, 2019).
- The effect of pine pollen against aging in human life diploid fibroblast 2BS cells as well as in an accelerated aging model, via subcutaneous injections with D-galactose daily for eight weeks in C57BL/6J mice (Mao et al., 2012). Furthermore, pine pollen remains proved to delay the replicative senescence of 2BS cells as evidenced by enhanced cell proliferation, reduce SA- β -Gal activity, as well as reversed the senescence-associated molecular markers, for instance, p53, p21Waf1, p16INK4a, PTEN, as well as p27Kip1 in late PD cells (Mao et al., 2012). Pine pollen which is linked with attenuate age-related illnesses in humans.

2.5.2. Food

The old Egyptians describe pollen as "a haze of nurturing pollen." Pollen and its healthy benefit are as yet encompassed by puzzles (Bogdanov, 2017). Moreover, it is known as the main consummately complete nourishment. Pollen arrangements are conveyed worldwide for dietary purposes and as diet supplement by expanding the complete dietary admission. Then again, date palm (*Phoenix dactylifera L.* family Palmae) pollens are normally utilized in the Middle East, particularly in Egypt (Hassan, 2011). Moreover, palm pollen grains are a decent financial dietary source can be utilized as human nourishment supplements. Moreover, methanolic concentrates of *C. sativa* pollens may be an elective common nourishment asset because of the safeguard properties (Avşar et al., 2016). Moreover, pollen assumes two significant jobs in angiosperm multiplication, filling in as a vehicle for the plant's male gametes, yet additionally, in numerous

species, as a draw for pollen nourishing creatures (Rivest and Forrest, 2019). Pollen foodstuff energy remains high; for instance, bee pollen produced by *Apis mellifera* collected in Thailand as well as containing corn pollen as a perfect complete foodstuff (Kocot et al., 2018).

Pollen can be harvested utilizing a pollen trap as well as dried for human consumption. Furthermore, it remains also, rich in vitamins, trace elements, lipids, volatile oils, amino acids and oligopeptides (Kaškonienė et al., 2015), anthocyanes, carotenoids, ferulic acid as well as flavonoids. Actually, bee pollen remains a good source of energy having 1692 kJ (404.3 kcal) in 100 g. Besides, because of its unique composition, it remains termed as a super foodstuff. Recently, there has been a renewed interest in the research of the composition as well as biological properties of the pollen bee (Kaškonienė et al., 2015).

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2.5.3. Medicine usage

The early Egyptians as well as ancient Chinese has utilized pollen as a restoring restorative operator. It has been known as a "wellspring of youth". Suspension of date palm pollen is a home grown blend that is broadly utilized as a people solution for restoring male fruitlessness in customary prescription (Hassan, 2011). Egyptian researchers have announced the gonad invigorating intensity of date palm pollen. Pollen grains of date palm was likewise used to advance ripeness in ladies in antiquated Egypt. The most punctual references found to its restorative uses are in books by Arab and Jewish doctors in Islamic Spain, in spite of the fact that pollen might not have been honey bee gathered. Maimoides between (1135) to (1204) a doctor in Cordoba (Bogdanov, 2017), prescribed its utilization as an astringent and narcotic tonic. In the mid-1200s, Ibn el-Beithar depicted it as aphrodisiac, additionally gainful for the stomach, giving back the intensity of the blood and relieving swellings created by eating certain nourishments in new occasions honey bee gathered pollen started to be utilized for human sustenance simply after the subsequent world war when pollen traps were created (Bogdanov, 2017).

Furthermore, bee pollen products are termed for their medicinal and health-promoting properties. Their wide biological effects have been termed as well as utilized since antiquity (Kocot et al., 2018). Bee pollen and of their potential antioxidant-related therapeutic applications (Kocot et al., 2018). Moreover, the medicinal properties of pine pollen, the antioxidant which is linked with anti-inflammatory activities of the ethanol extract of pine pollen extract a strong free radical scavenger activity on 1,1-diphenyl-2-picrylhydrazyl radical as well as hydrogen peroxide (Lee et al., 2009). Also, the anti-oxidant activity inhibits significantly the amount of malondialdehyde which is linked with protein carbonyls formed from liver homogenates. In addition, the antioxidant activity, the reducing power of pine pollen remained excellent (Lee et al., 2009).

Antihistamines are powerful at treating gentle instances of pollinosis, this kind of non-endorsed drugs incorporates loratadine, cetirizine, as well as chlorpheniramine. They don't counteract the release of histamine, however it has been demonstrated that they do anticipate a piece of the chain response initiated by this biogenic amine, which impressively brings down fever side effects. Decongestants can be controlled in various manners, for example, tablets and nasal showers. Hypersensitivity immunotherapy (AIT) treatment includes directing dosages of allergens to familiarize the body to pollen, in this manner prompting explicit long haul resilience. (Moingeon et al., 2006) Allergy immunotherapy can be managed orally (as sublingual tablets or sublingual drops), or by infusions under the skin (subcutaneous). Restorative palynologists are worried about the association of pollen and spores with the human respiratory tract (Jones and Jones, 2001). Components influencing testimony incorporate molecule size, molecule thickness, the subject's action level, and so forth. Pollen allergens must be wind-borne, happen in huge amounts, produce roughage fever and be across the board. The practically omnipresent aeroallergen, grass pollen, causes hypersensitivity indications around the world (Jones and Jones, 2001). Firmly related plants may have similar proteins and cause the equivalent unfavorably susceptible reaction. The restorative network accepts that aerobiologists have recognized the majority of the regular taxa that influence a great many people. Presently it is up to the immunologists and natural chemists to decide when an individual demonstrates side effects to different pollen types.

Bee pollen as a protective agent against carbon tetrachloride hepatotoxicity which remains an active component of silymarin as a plant-origin substance utilized in hepatic disorder cure (Kocot et al., 2018). Furthermore, treatments caused a reduce in body weight gain. The enhancement of liver injury markers plasma activity of transferees ALT as well as AST reviewed in CCl₄-exposed rats remained considerably alleviated in animals cotreated with both silibinin and bee pollen. The effect of the higher bee pollen dose was not markedly (Kocot et al., 2018). Liver as well as plasma MDA remained found to be significantly increased by CCl₄ exposure, as well as again, both studied protective agents were capable of reversing this effect, although that in liver silibinin remained more effective. The SOD activity in plasma, RBC, which is linked with liver was depressed in CCl₄-exposed rats, as well as bee pollen proved to lack protective influence (Kocot et al., 2018).

Pollen remains perceived as a society drug in China just as Germany as a result of having a few important phytochemicals such a carotenoid, steroids, terpenoids and flavonoids (Avşar et al., 2016). Moreover, phenolic mixes particularly flavonoids show a wide scope of natural impacts including cancer prevention agent action, antiviral, mitigating, antiallergic, antithrombotic, vasodilatory activities just as the capacity to bring down the danger of coronary heart maladies.

What's more, antioxidative movement of phenolic mixes depends on the standard giving hydrogen molecules to free radicals (Avşar et al., 2016). The concentrates from pollen grains can likewise give a characteristic answer for looking for an option in contrast to manufactured medications treatments (Avşar et al., 2016).

2.6. Pollen effect on insects in biological influences

The biologically active components of this sort of propolis are flavonoids, phenolic acids (cinnamic acid), which is linked with their esters (Kocot et al., 2018). Furthermore, birch propolis, found in Russia, originates from *Betula verrucosa* Ehrh. In addition, contains flavones as well as flavonols. Mediterranean propolis remains characteristic of subtropic regions like Greece, Greek islands, Sicily, Malta, Cyprus, Croatia, as well as Algeria. It originates mainly from the resin of *Cupressus sempervirens* as well as is characterized via relatively high amounts of diterpene. In tropical zones, in turn, several sorts of propolis derived from numerous diverse sources (Kocot et al., 2018).

Moreover, bioactive properties, phenolic compounds and mineral contents of bee pollens. The oil content of pollen grains changed between (Alanya) as well as (Russia-Perm Region) (Özcan et al., 2019). The highest total phenolic content and antioxidant activity values were observed in pollens obtained from the Russia-Perm Region as well as Alanya districts. In addition, the pollen remains an important source of potassium, phosphorus, calcium, as well as sulfur. Furthermore, the antioxidant activity values of pollens remained reviewed that partly similar as well as varied depending on locations likewise, the tested pollen did not exceed the content of linoleic acid (Özcan et al., 2019).

2.7. The uses of pollen and its implication for Entomology

The sort of bee pollen grains plays a significant role in the fatty acid composition as well as the shelf-life of the product because of polyunsaturated fatty acids (Özcan et al., 2019). This is for the reason that high levels of linoleic as well as linolenic acid of pollen oils remain found. The composition, as well as oil properties of pollen grains, depending upon the locations, flora type as well as such plant growing conditions as a climatic factor as well as soil structure. The pollen grains that has been reviewed high levels of palmitic, α -linolenic as well as eicosenoic acids (Özcan et al., 2019).

Pollen grains from anthers of the flowers switch to the thorax hairs of the bees. They are combed off via the bee as well as, with an addition of bee saliva, rolled into 2 balls which remained put into two pollen baskets, pollen loads, at the hind legs, as well as carried to the hive (Kaškonienė et al., 2015).

3. 1. Conclusion

In last decades' pollen remains a vital phase of the plant cycle without pollen, there will be no seed. Most land plants are sporophytes normally diploids, and the sporophyte phase of the existence cycle interchanges with the gametophyte arrange. The gametophytes are a lot littler than sporophytes and are shaped inside structures on the sporophyte. Furthermore, this study has reviewed the investigation of the relationship between the flower nectar (plant source pollen grain) in terms of the pollen grain impact and it is environmental background based on the production quality (honey bee and it is medicinal usage) from the electronic database.

Furthermore, this study has observed the medical usage, as well as cosmetic applications. In addition, the result of this study has been reviewed and supported by some authors. The reason for choosing a few key honey and pollen grains sorts in Libya is because of the need to keep the paper within a manageable size without losing sight of the research contribution as well as objectives. In addition, this study will be maintained further to explore the chemical compounds of pollen grains in future.

3.2. Future study

This study will move in future to shed the light on the investigation on the biochemical composition as well as a biological activity. In addition, this study will record the experimental application area as well as pollen grain as well as pollen production. Also, the experimental result of the antimicrobial effect of pollen grain, anticancer effect of pollen grain, cosmetics usage as well as excavations.

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