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Diverse Application of Arthrospira Potential Herb

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ABSTRACT

Spirulina is a photosynthetic, filamentous, spiral-shaped, multicellular and green-blue microalga. The two most important species of which are Spirulina maxima and Spirulina platensis. It is a microalga belonging to Chyanophyceae class. Its chemical composition includes proteins (55%-70%), carbohydrates (15%-25%), essential fatty acids (18%) vitamins, minerals and pigments like carotenes, chlorophyll a and phycocyanin. Used in food and cosmetic industries. Spirulina is considered as an excellent food, lacking toxicity and having corrective properties against viral attacks, anemia, tumor growth and malnutrition. It has been reported that the use of these microalgae as animal food supplement implies enhancement of the yellow coloration of skin and eggs yolk in poultry and flamingos, growth acceleration, sexual maturation and increase of fertility in cattle. Spirulina can play an important role in human and animal nutrition, environmental protection through wastewater recycling and energy conservation. Spirulina is rich in proteins (60-70%), vitamins and minerals used as protein supplement in diets of undernourished poor children in developing countries. One gram of Spirulina protein is equivalent to one kilogram of assorted vegetables. The mass cultivation of Spirulina is achieved both in fresh water and waste water. Spirulina grown in clean waters and under strictly controlled conditions could be used for human nutrition. The micro alga grown in waste water is used as animal feed and provide a source of the fine chemicals and fuels. The waste water system is highly applicable in populated countries like India where wastes are generated in high quantities and pose environmental problem. It has high levels of vitamins, minerals, phenolics, essential fatty acids, amino acids and pigments. Furthermore, the development of new protein sources to supply the shortage of this nutrient is an urgent need, and protein from *S. platensis* plays an important role . In this sense, extraction processes that allow maximum protein yield and total utilization of biomass is an urgent need, and ultrasonic waves have proven to be an effective extraction technique

Keywords: food, microalgae, nutrition, Spirulina, Flamingos etc.

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INTRODUCTION

Spirulina, also named Arthrospira, are multicellular and filamentous cyanobacteria (blue-green algae). It has gained considerable popularity in the healthy food industry and is considered a food supplement for humans, livestock, poultry, and aquaculture diets. Spirulina grows in water and can be harvested and processed easily. It has very high macronutrient and micronutrient contents, as proteins, amino acids, unsaturated fatty acids, minerals, and vitamins. It has long been used as a dietary supplement for centuries by people living close to the alkaline lakes where it is naturally found, for instance, those living adjacent to Lake Chad in the Kanem region and Lake Texcoco in Mexico (Ciferri and Tiboni, 1985; Sotiroudis and Sotiroudis, 2013).

Currently, this traditional food is being used as a major source of protein in Africa. Due to its potential applications, it is now widely cultured and commercially produced in large outdoor or greenhouse ponds under controlled conditions throughout the world. In Asia, it is used as a complementary dietary ingredient in feed for fish, shrimp, and poultry, and it is also increasingly used as a protein and vitamin supplement to aqua feeds. For instance, China is using this *Arthrospira* spp. as a partial substitute of imported forage to promote the growth and immunity of shrimps (Habib et al., 2008). Recently, great attention and extensive studies have been devoted to evaluate its therapeutic benefits in an array of disease conditions, including hypercholesterolemia, hyperglycemia, cardiovascular diseases, inflammatory diseases, cancer, and viral infections (Deng and Chow, 2010).

Therefore, the primary objective of this chapter is to assess and evaluate the existing knowledge on Arthrospira's activities, side effects, and safety for both human consumption and animal feed.

MATERIAL AND METHOD

The aim of the present investigation as mentioned earHer was to focus on pregnant and lactating women and study the effect of spirulina supplementation on the vitamin A status of these women and their infants. In view of this, the study was designed in the following phases:

- Baseline data collection of the sample under study
- Supplementation with Spirulina flisiformis
- Post supplementation data collection

Pre-requirements for the study

A total sample of 133 pregnant and lactating women was selected randomly from the AnteNatal Care (ANC) ward of outpatient department (OPD) of NIMS Hospital jaipure The hospital was visited during the outpatient timings and all the pregnant women who came to register themselves fulfilling the below mentioned criteria were selected. Informed consent was obtained from the subjects before they were recruited for the study for blood collection at pre and post

Criteria for the selection of the subjects

1. Aged between 18 to 35 years

2. Registered at around 61/2 month of gestation

3. Free from any chronic/metabolic illness

4. Willing and available throughout the study period

SUMMARY AND CONCLUSIONS

A longitudinal study of 133 pregnant and lactating women selected from the hospital revealed that the subjects were residing in *pakka* houses located in the pregnant and lactating women recruited for the study, only 94 continued till the end of the study (29% dropouts). gives the number of subjects who participated in the study. Twenty-nine pregnant women from group I showed a continual participation during pregnancy and thus belonged to experimental Group I-P. Out of these 29 women, 19 subjects were willing to continue with the spirulina supplementation during lactation and thus were extended in Group I-PL. The follow-up could be obtained only in 18 subjects from control Group I-PL. The remaining 10 subjects from experimental Group I-P did not continue with the supplementation but contributed breast milk samples required for the study. Demographic details about the subjects indicated that the women from control and experimental groups were matched to the extent possible. It is seen that the mean age at marriage is at par with our national but higher than the given for Maharashtra (Raman, 1981). However, it ranged between 16 to 24 indicating that a few of the subjects were married before 18 years of age. It is suggestive that still a section of girls in poor communities get married before reaching their physiological maturity and are burdened further with untimely pregnancies. The risk of maternal death in industrialized countries is estimated to be between 10 & 25 per 100 000 live births, whereas that in developing countries is between 2000 & 6500 per 100 000. Childbirth in the poorer countries is now the leading cause of death in women aged 15-49 years in developing countries, 25% of all mortality is maternal while the corresponding figure in the USA is less than 1%. While these data serve to emphasize the poor quality care available to women in the Third World, they also demonstrate the preventable nature of the tragedy Thus, this issue of age at marriage and fertility are germane because they affect women's nutritional status directly. The general observation is that when the purchasing power of an individual increases the quantity and quality of food consumed also increases and improves.

A status is warranted during critical periods of pregnancy and lactation, which may help ameliorate fetal hepatic reserves of vitamin A and provide adequate amount of the vitamin in breast milk. Both consequences may contribute to effectively address the issue of childhood blindness due to VAD. Daily spirulina supplementation at physiological level during pregnancy and lactation has found to be efficacious in improving maternal and neonatal vitamin A status, and thus holds potential to be used as a wholesome food supplement that can target not only VAD but also other micronutrient deficiencies prevalent in Indian women.

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