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Nutritional composition of *Litopenaeus vannamei* post larvae

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Abstract
Shrimp post larvae was key role for successful aquaculture. Shrimps provide high quality rich protein, amino acid, calcium and minerals for human body, while low in calorie and fat and post larva of shrimp was use as feed in commercial finfish hatchery. Lipid of shrimp contains mostly polyunsaturated fatty acids (essential fatty acids). The main purpose for this alteration is that *Litopenaeus vannamei* has a higher stocking density, higher innate immunity, faster growth rate, yield and lower production costs than *Penaeus monodon*. The values of nutritional composition of *Litopenaeus vannamei* post larvae: crude protein: 13.05±0.25%, lipid content: 1.66±0.06%, carbohydrate content: 4.25±0.03%, moisture content: 79.45±0.60% and ash content: 1.59±0.04% were found.

Keywords: *Litopenaeus vannamei*, post larvae, nutritional composition, protein, lipid

Introduction
India is the second largest producer of fish in the world contributing to 5.68% of global fish production. The total fish production during 2017-18 is at 11.08 million metric tonnes with the overall growth 6.3% [1]. India is also a major producer of fish through aquaculture and ranks second in the world after China. The potential area of Indian coast brackishwater farming has been estimated at 1.19 million hectare(s), of which only 13.14% {0.157m hectare(s)} is so used[2]. In Indian crustacean aquaculture has recently been facing severe crisis owing to massive setbacks suffered by the shrimp culture industry, as rampant outbreak of viral and bacterial diseases still persist and also due to the imposition of legal regimes such as Coastal Regulation Zone Act etc. Shrimp is one of the world's most popular and most cultivable shellfish. Shrimps provide high quality rich protein, amino acid, calcium and minerals for human body, while low in calorie and fat[3] and post larva of shrimp was use as feed in commercial finfish hatchery. Lipid of shrimp contains mostly polyunsaturated fatty acids (essential fatty acids). These essential fatty acids are available in shrimp provides health benefits for human e.g., eye (retina) and brain development[4]. In India, there is no published report on biochemical composition of post larvae *Litopenaeus vannamei*. Therefore, the present investigation is the first of its kind on proximate composition of basic biochemical constituents, such as total protein, carbohydrate, lipid, moisture and ash in the muscle of *Litopenaeus vannamei*.

Materials and Methods
The shrimp, *Litopenaeus vannamei* post larvae (PL15) were procured from commercial shrimp hatchery at Kotada, Kodinar, District-Gir-Somnath, Gujarat. Post larvae were packed in oxygenated polythene bags and brought to Aquaculture laboratory, College of Fisheries Science, Veraval. The PL were stocked in 200L plastic tank at 27±1 ºC water temperature and 25±1 ppt water salinity with adequate aeration and feeding for acclimatization. After acclimatization process measure the biochemical composition of post larvae.

Proximate composition analysis
Proximate composition of samples was analyzed using standard methods of AOAC [5]. Crude protein content was analyzed by the Kjeldahl method. Crude lipid was estimated with the Soxhlet apparatus. Moisture and ash content were determined using the incubator and muffle furnace.

Crude protein (CP)
The protein content of the samples was estimated as total nitrogen by micro kjeldahl method after acid digestion. The nitrogen content of the sample was estimated constitutively by the semi-automatic micro-kjeldahl digestion and distillation apparatus (Gerhardt, Germany). Percentage of protein was calculated by multiplying the percent of nitrogen found with a factor of 6.25.

Crude protein (%) = N2 (%) X 6.25

Crude lipid
Crude lipid was analyzed by the ether extraction by Soxhlets apparatus with petroleum ether (Boiling point 40-60 °C) as the solvent. The contents of crude lipids were determined gravimetrically after oven-drying (80 °C) the extract overnight.

$$\text{Crude lipid (\%)} = \frac{\text{Weight of the ether extract}}{\text{Weight of sample}} \times 100$$

Moisture
Moisture content was determined by taking a known weight of samples in petri-dish for oven-drying at 100-105 °C till a constant weight was achieved. After process, weight loss in samples was calculated as moisture content, which was calculated by using following formula.

$$\text{Moisture (\%)} = \frac{\text{Wet weight of sample-Dried weight of sample}}{\text{Wet weight of sample}} \times 100$$

Ash
Ash content was estimated by taking a known weight of sample in silica crucible and placing it in a muffle furnace at 600 °C for 6 hours. The calculation was done as follows:

$$\text{Ash (\%)} = \frac{\text{Weight of Ash}}{\text{Weight of sample}} \times 100$$

Total Carbohydrate
Total carbohydrate was calculated by difference method given by the formula:

Total carbohydrate = 100 - (CP + CL+ Moisture+ Ash)

Results and Discussion
The Proximate composition analysis was carried out at for *L. vannamei* post larvae is shown in Table 1. The level of moisture (79.45±0.60%), protein (13.05±0.25%), lipid (1.66±0.06%), ash (1.59±0.04%) and carbohydrate (4.25±0.03%) content present in *L. vannamei* shrimp seed. The higher crude protein (16.53-17.62%), crude lipid (0.99-1.40%) and ash (3.13-3.27%) content of juveniles of *L. vannamei* at low salinity [6]. It has been reported that crude protein content of shrimp ranged between 17 and 21% depending on shrimp species [7, 8]. The biochemical composition of post larva of *L. vannamei* includes moisture content (75.87), protein (18.32), lipid (1.65) and ash (2.73) [9]. The body composition of juveniles of *L. vannamei* range of moisture (75.22-76.09), protein (17.96-18.78), lipid (1.80-1.96) and ash (2.65-2.85)[10]. In general, lipid act as major food reserves along with protein and subjected to periodic fluctuations influenced by environmental variables like temperature[11]. The result obtained in the present study is in agreement to the result obtained by [6-11].

Table 1: Biochemical composition of *Litopenaeus vannamei* post larvae

Ingredients (%)	Moisture	Crude Protein	Crude Lipid	Ash	Carbohydrate
Litopenaeus vannamei	79.45±0.60	13.05±0.25	1.66±0.06	1.59±0.04	4.25±0.03

Conclusion
Therefore, based on the results obtained from the present study it is concluded that post larvae of the *Litopenaeus vannamei* good source of protein and fat have beneficial nutritional composition is elevated their value as animal nutrition as well as may add to their efficacy as a dietary supplement or as part of a balanced diet used as a live feed.

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