Phosphorus Level in Wild-Caught Shrimps of Kerala Coast

Priya E. R., Nelbin Joseph, Laly S. J., Satyen Kumar Panda and Zynudheen A. A.*
ICAR- Central Institute of Fisheries Technology, Cochin-29
**priyaer@gmail.com*

Phosphorus is an essential mineral, which is abundantly present in the human body contributes to around 1% of the total body weight (Calvo & Lamberg-Allardt, 2015). Phosphorus plays a major role in the metabolism of carbohydrates and sugars. It helps to keep the bone, teeth, and muscles strong, and ensure proper muscle contraction, kidney function, and heartbeat regulation. Foods that are rich in protein and calcium also serve as a rich source of dietary phosphorus. Seafood is considered one of the excellent sources of dietary phosphorus along with chicken, egg, milk, cheese, seeds, nuts etc.

In the present study, the natural level of phosphorus was determined in 8 commercially important wild-caught shrimps such as *Metapenaeus dobsoni* (flower tail prawn), *Penaeus semisulcatus* (green tiger prawn), *Parapenaeopsis stylifera* (kiddi shrimp), *Fenneropenaeus indicus* (white prawn), *Heterocarpus gibbosus* (humpback nylon shrimp), *Metapenaeus monoceros* (speckled shrimp), *Penaeus monodon* (giant tiger prawn), and *Macrobrachium rosenbergii* (giant river prawn). The samples were collected from different landing centres of Ernakulam & Alappuzha districts of Kerala and brought to the laboratory under iced conditions. The meat was collected and homogenized for analysis. Analysis of total phosphorous content was carried out using Inductively Coupled Plasma-Optical Emission Spectrometry (ICP-OES). The protein content was estimated according to AOAC 928.08.

It was found that all the shrimp species were having high amounts of phosphorous, ranging from 1801.53 mg/Kg to 2924.12 mg/Kg. The highest content was found in *P. semisulcatus*, and the lowest in *M. dobsoni*. Studies conducted by Yanar et.al., (2011), Samantha Nichole Stein (2014), and Dayal et.al.,(2013) also reported high content of phosphorus in various shrimp species viz., *P. semisulcatus* (2444.6 mg/Kg), *Litopenaeus setiferus* (2211.76mg/Kg to 4697.03mg/Kg), *P. monodon* and *F. indicus* (3034 mg/Kg -average value for *P. monodon* and *F. indicus*)

The total Phosphorus - to Protein Ratio (PPR) of different species of shrimp was found to vary from 8.67 to 16.14 mg/g. The lowest PPR value was found in *P. stylifera* while the highest value was found in *F. indicus*. Guillermina Barri-Cuadrado et al., (2013) also reported a PPR value of 9.58 to 10.22 mg/g for shrimps; the reference PPR value for crustaceans is 10.61mg/g (Dusek et al., 2003, Teixeira et al., 2017).

The present study of the natural level of phosphorus and phosphorus to protein ratio of different species of shrimps indicates that shrimps are having high and favorable PPR values for the general population as well as people with certain disease states such as chronic kidney disease (CKD).

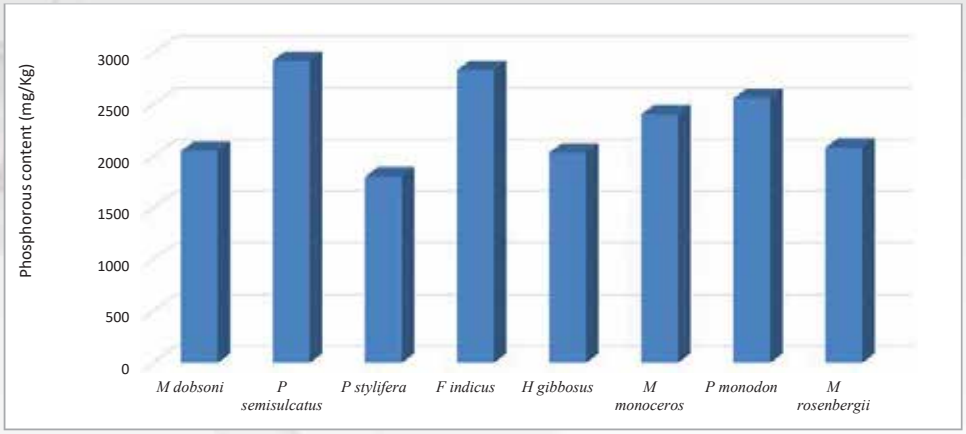

Fig 1. Total phosphorus content in different species of shrimps

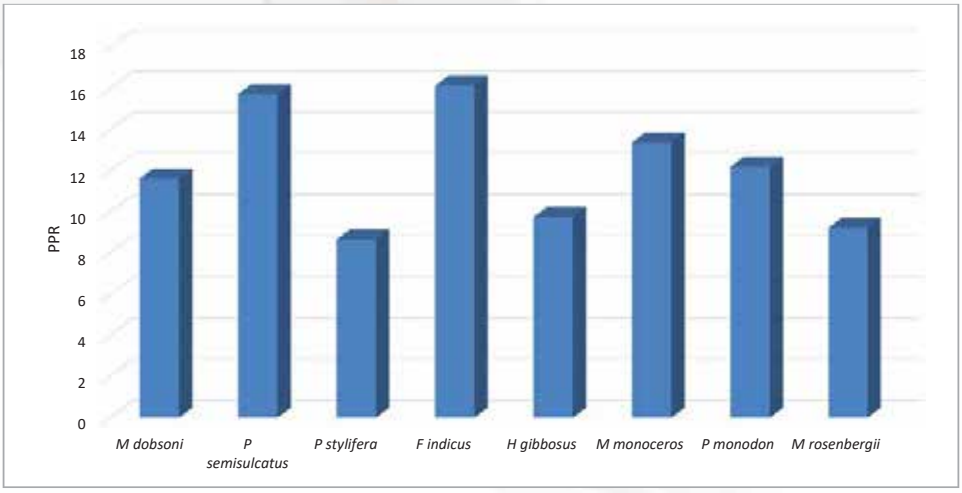

Fig 2. Phosphorus to protein ratio (PPR) of different species of shrimps

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