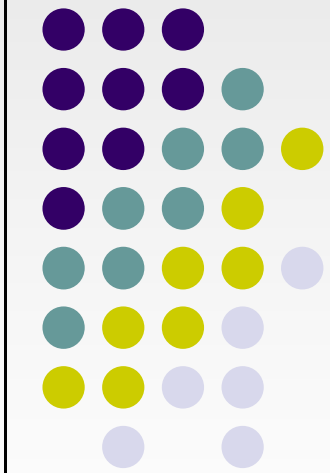
The effect of different dietary phosphorus levels on growth and lipid composition of freshwater crayfish, *Astacus leptoductylus*



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Introduction

Phylum: Arthropoda

Class: crustacea

Subclass Malacosraca

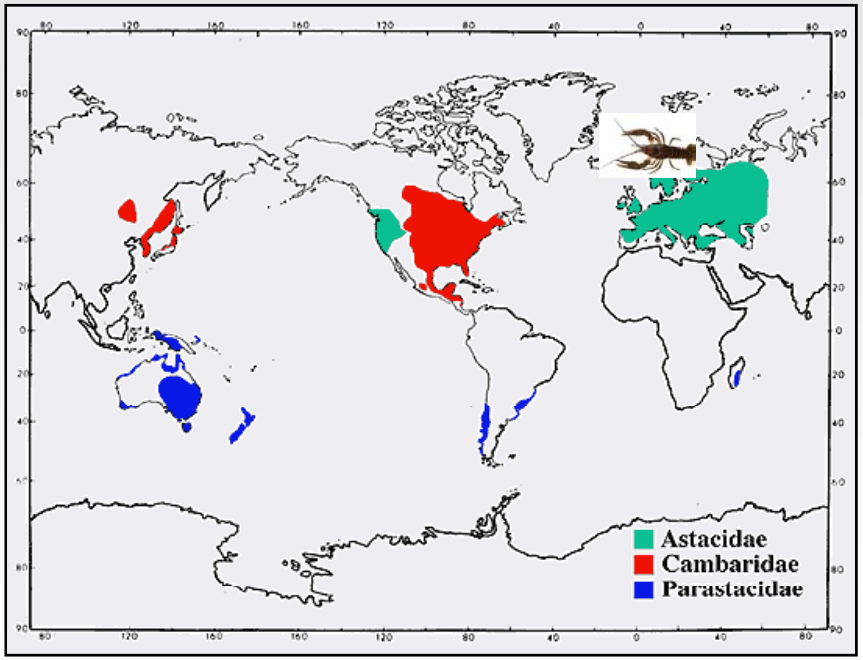
Order : Astacidea

Family : Astacidae

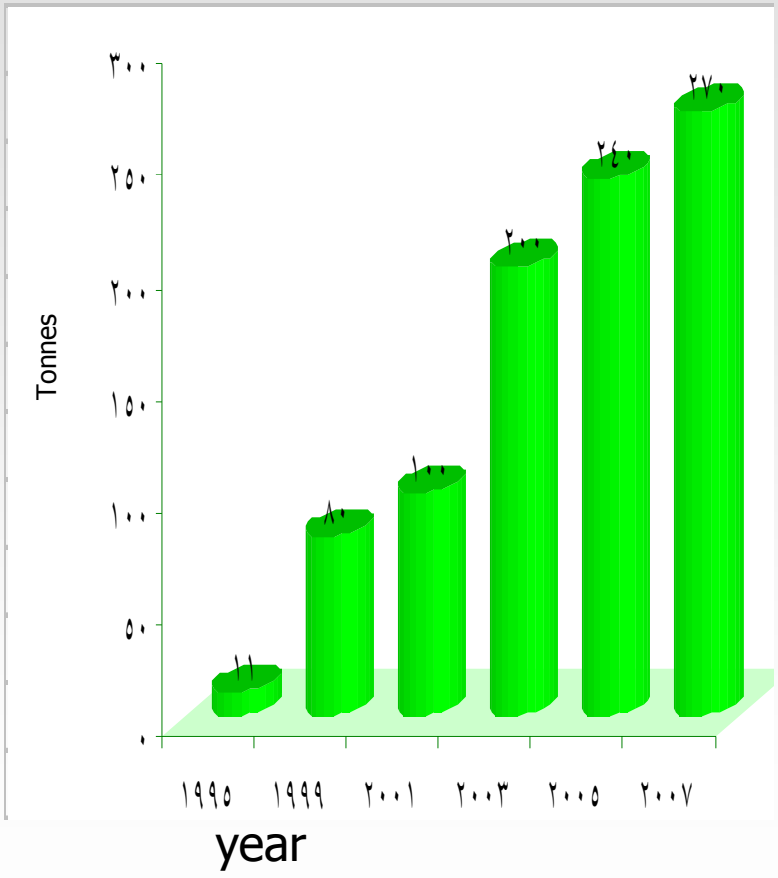
Genus: Astacus

Introduction

The only native crayfish species in Iran, Astacus leptodactylus, is widely distributed in lakes and ponds in southern parts Caspian sea of the country. Its distribution area was considerably decrease in Iran after 1999 because over-fishing and pollution



Introduction



Due to over-fishing, pollution and a disease (crayfish plague), the total production decreased. In recent years (1999-2005), there has been a gradual increase in the production of crayfish in Iran from 80 to 270 tonnes.

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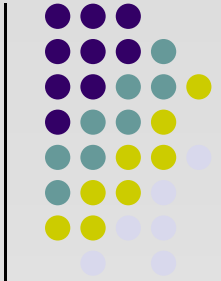
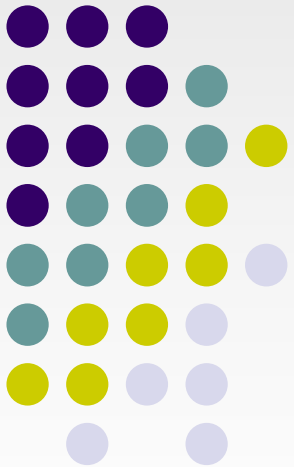
Introduction



Phosphorus is a major essential mineral in diets of fish and crustacean (NRC, 1993) which has important role in vital function of body such as structure of molecules containing energy (ATP), nucleic acid, phospholipids osmotic regulation and growth.

Method

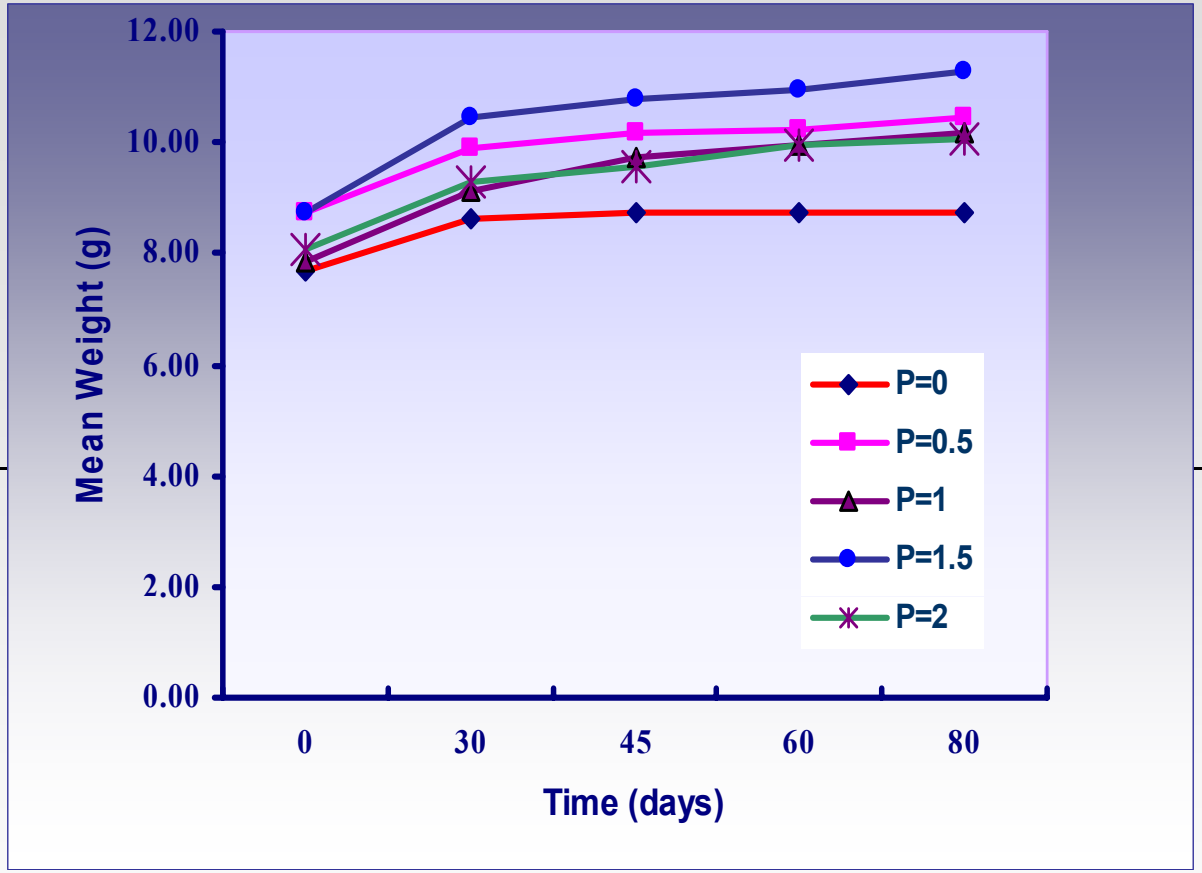
basal diet was prepared containing 35% proteiin and 7% lipid. Five different diets were formulated with five levels of phosphorus (0, 0.5, 1 , 1.5, 2 percentages)



Represent of cultures system for *Astacus Leptoductylus*

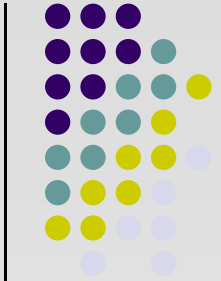
Proximate composition of experimental diets(as dry mather basis).

Dietary phosphorus level(%)	0	0.5	1	1.5	2
Protein(%)	36.2±1.22	35.93 ±0.34	37.4 ±0.28	35.8 ±0.022	35.37 ±0.36
Lipid(%)	5.69 ±0.18	5.06 ±0.24	6.35 ±0.56	5.69 ±0.021	6.12 ±0.18
Fiber(%)	15.99 ±2.21	17.75 ±2.28	17.70±0.16	14.55 ±2.08	14.74 ±0.36
Ash(%)	3.22 ±0.088	4.48 ±0.369	5.94±0.141	7.93 ±0.237	11.93±1.887
NFE(%)	38.88 ±1.07	36.71 ±2.86	32.57 ±0.82	36.14 ±2.05	31.79 ±2.48
Ca (%)	0.425±0.035	0.45 ±0.071	0.45 ±0.071	0.55 ±0.071	0.5 ±0.00
P (%)	0.425 ±0.007	0.98 ±0.014	1.54 ±0.099	2.12 ±0.042	2.64 ±0.289
Energy (kcal/kg)	3724.75	3565.5	3589.05	3598.95	3444.65



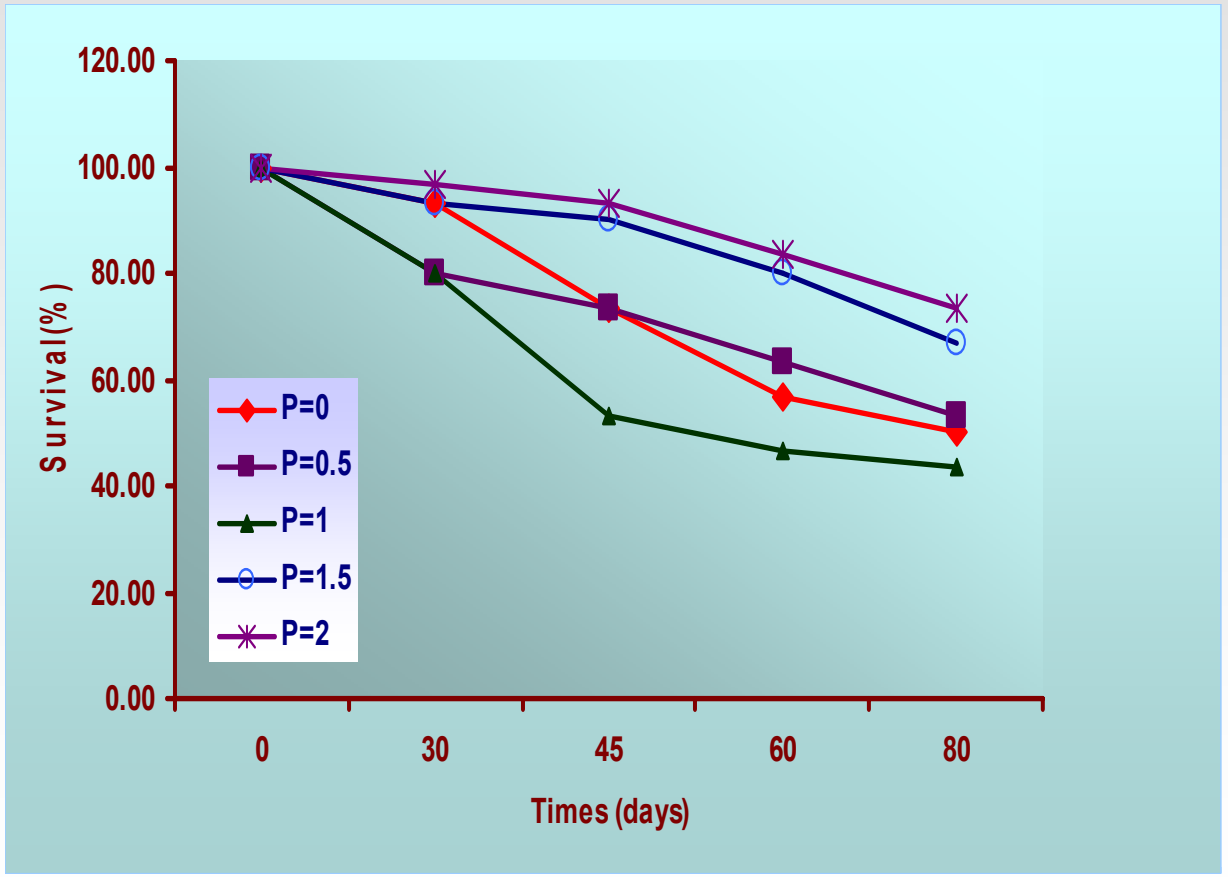
Growth of *Astacus leptoductylus* juveniles fed different levels of dietary phosphorus over a 80 days period.

Biological performance of *Astacus leptoductylus* 8-9g fed diets for 80 days with NaH2PO4 supplementation. Entries are sample mean ± SD; 3 replicates per treatment. Values with different letters indicate significant differences.

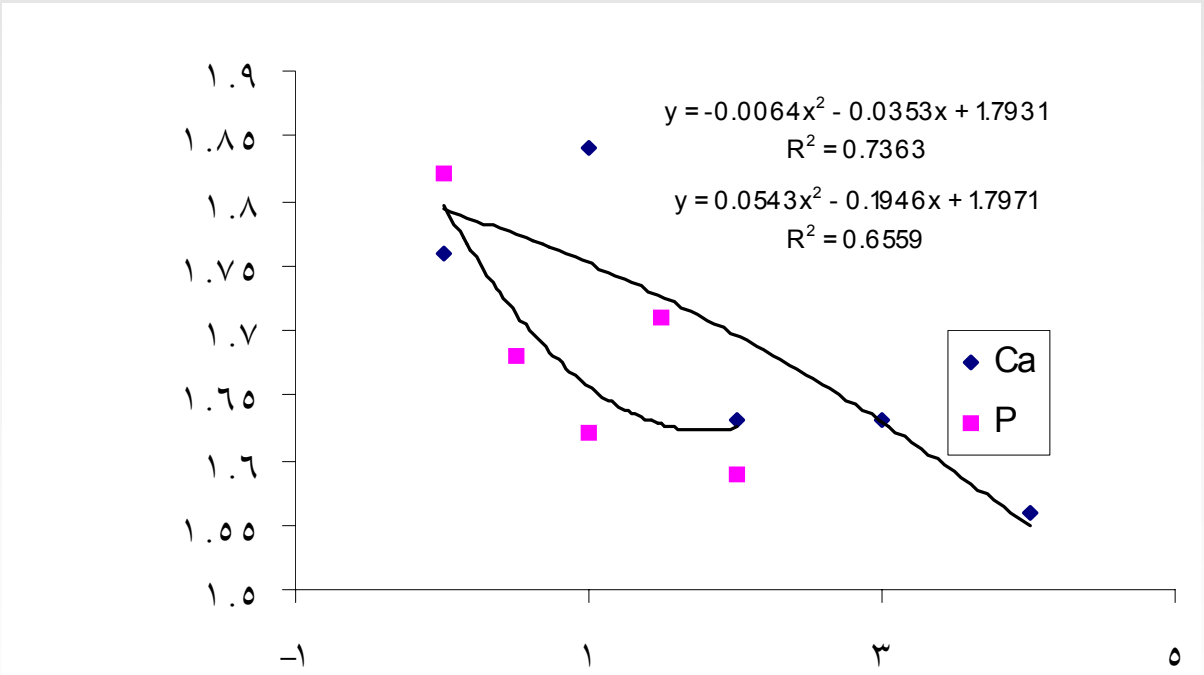


Dietary phosphorus Level (%)	0	0.5	1	1.5	2
Weight gain(g)	1.06±0.16[a]	1.74 ±0.38a[b]	2.34 ±0.18[b]	2.52 ±0.72[b]	1.99 ±0.81[a]
Growth rate(%)	13.77 ±0.85 [a]	20.39 ±2.74 [ab]	31.68 ±7.74 [b]	29.02 ±1.16 [b]	24.45 ±8.40 [a]
Survival(%)	50.00 ±10.00 [a]	53.33 ±15.28 [a]	43.33±23.09 [b]	66.67 ±5.77 [c]	73.33 ±23.09 [c]
Biomass (g/tank)	5.22 ±0.52 [a]	9.55 ±4.27 [b]	9.95±4.66 [b]	16.78 ±5.19 [c]	14.31±5.58 [c]
FCR (%)	8.12 ±4.10 [a]	8.94 ±3.03 [a]	5.31 ±1.38 [b]	7.57 ±0.97 [a]	8.59 ±1.67 [a]

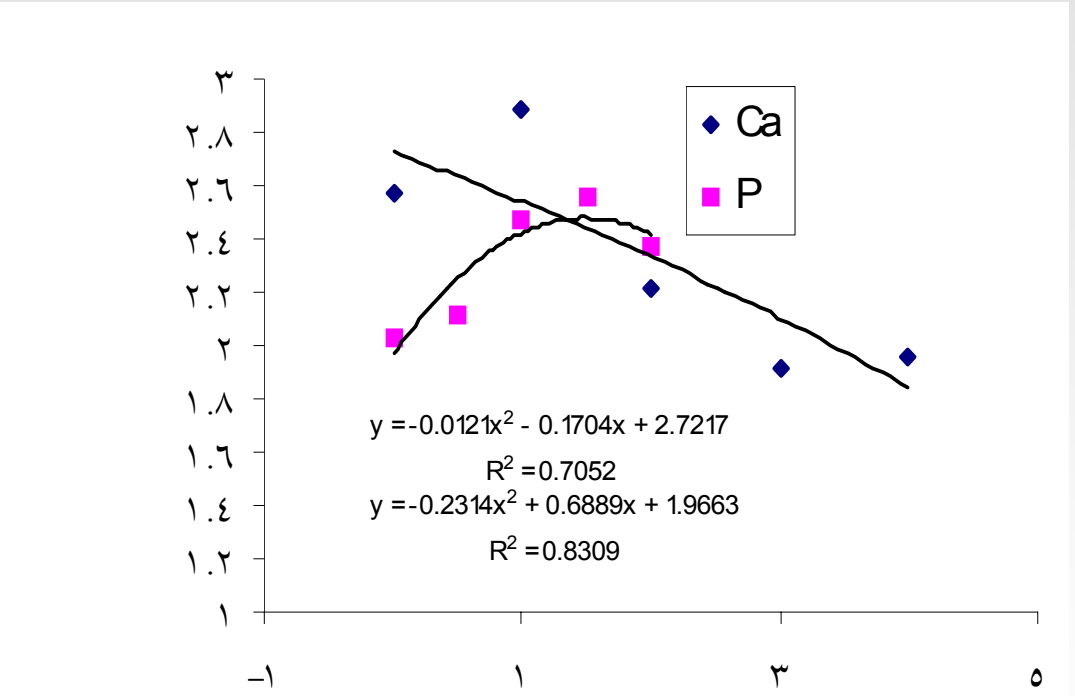
Survival of *Astacus leptoductylus* juveniles fed different levels of dietary phosphorus over a 80 days period.



Lipid percentage (%) in different whole body of, *Astacus leptoductylus 1-2 g* (80 days) feed with different levels of phosphorus and calsium



Lipid percentage (%) in different whole body of, *Astacus leptoductylus 8-9 g* (80 days) feed with different levels of phosphorus and calsium



conclusion

Diet had a significant effect on body lipid composition in fresh water crayfish with both weights.

graded levels of phosphorus were caused the reduction of body lipid in crayfish with 1-2g.

growth was different in various dietary levels of phosphorus.

Lowest weight gain was obtained in crayfish fed with diet without phosphorus supplementation