Freshwater crabs constitute an important component of food chain, since they are transferring the energy not only within an aquatic ecosystem but also to the terrestrial environment as they are consumed by fishes, birds (Skov and Hartnoll, 2001; Skov et al., 2002; Litulo, 2004) as well as human beings (Pathre & Meena, 2010 and Akin-Oloro et al., 2005). There are about 6700 species of crabs distributed throughout the world, whereas in India approximately 389 species have been reported so far (Padghane et al., 2016). Irrespective of marine or freshwaters, crabs form a substantial proportion of diet of communities along the coast as well as river basin (Bertrand, 1979 and Okafor, 1988) because of their high ash, mineral and crude protein fibre contents (Oduro et al., 2001). They are consumed either wholly or in parts by sick-folks and pregnant women also (Akin-Orola et al., 2005). In some parts of the world including India, powdered extract from crab meat is oftenly fed to livestock and poultry as a supplementary diet. Beside this, Crab’s powder is also used as fertilizer in agricultural operations (Agarwal and Kumar, 1987). The rapid growth rate, high meat yield, excellent palatability and resistance to the pathogens has led to the development of rapidly increasing aquaculture industry of different species of crabs (Reddy and Reddy, 2006). The Central Institute of
Fisheries Technology, Cochin, India, has been endeavoring to develop a variety of prawn/crab products having food, medicinal and industrial value (Gopakumar, 1993).

Besides food value various by products obtained from crabs such as chitin, chitosan have an intense utility in pharmaceutical and agricultural industries (Tharanthan and Kittur, 2003). Despite their great values and wide distribution throughout tropical and temperate zone of the world, freshwater crabs have remained to be a neglected component of the world’s inland ecosystem (Dobson, 2004). Inspite of fact that these freshwater crabs possess all desirable attributes of culturable organism viz., high fecundity, fast growth, early attainment of sexual maturity, they have not been exploited much on commercial scale. For successful culture of any organism, it is imperative to have a knowledge about their life cycle aspects such as, size frequency distribution, size at maturity, growth rate, fecundity, parental care and feeding ecology in relation to macrobenthic invertebrate fauna so as to assess its role in food web.

Sex ratio depicts the level of competition faced by crabs for reproduction while size frequency distribution helps in determining the dominant class size as well as maximum size gained by both the sexes of crabs. Freshwater crabs though are smaller in size as compared to their marine counterpart, they are larger enough to meet the protein dietary need of people consuming it (Padghane et al., 2016). The body of crustaceans is covered with exoskeleton of cuticle that needs to be replaced periodically for growth purpose by a process called ecdysis (Gupta et al., 2016 ). Thus crabs undergo moulting throughout their life, however, the periodicity of moulting depends on a number of factors viz., availability of food, temperature, size of the crabs and influence of hormones (Hamsa, 1982). Since crustaceans need to lose all of their hard parts during the moulting process for growth, so there is no direct method to determine the age of these crabs. Further growth studies though can be conducted under laboratory conditions but such data can provide information only regarding moult and intermoult period, yet actual growth could not be same as in natural condition and therefore, is not comparable to the natural environment (Wilber and Wilber, 1989).

Size at maturity is yet another important parameter which is frequently used by fishery managers as the basis for assigning the size for catch as well as for the retention
of that species (Watson, 1970). From time to time different authors purposed various criterion so as to identify the size at which crabs attain sexual maturity. In this context, Paul (1992) considered gonadal maturity as a criterion to ascertain size at maturity whereas other authors (Somerton, 1981; Conan and Comeau, 1986; Sainte-Marie et al., 1995) laid stress on importance of external morphological characters to determine the size at maturity.

In crustaceans, certain part of the body grows faster than other, such growth is called as allometric growth. Analysis of class size at which such body part (chela in male and abdomen in female) attain allometric growth with respect to carapace width play a key role to determine the size at morphological maturity (Sukumaran and Neelakantan, 1996). Moreover, in crabs gonadal maturity (physiological maturity) does not necessarily coincide with functional maturity which is a broader concept that include mating capability also. As only morphological or physiological maturity independently do not depict the size at maturity therefore, a crab can be classified as adult only when it attains both morphological as well as physiological maturity that may vary among species (Vergaz et al., 2000).

In crabs, condition factor is determined based on relationship between body weight and carapace width that help to estimate the population size of a stock for the purpose of its sustainable exploitation. Condition factor is mainly used to compare the status of well being of any species and is mainly affected by the environmental factors such as temperature, availability of food, degree of parasitism and sexual cycle (Mohapatra, et al., 2010).

Reproduction is the soul mechanism to maintain the proliferation as well as its continuity. In crabs, reproduction is extremely diversified which vary from production of maximum number of eggs with minimum parental care (marine crabs) to comparatively less number of egg production and maximum parental care (Yeo et al., 2008). Fecundity in crustaceans is generally determined by the number of eggs produced by female during particular spawning season (Hines, 1989). Parental care is a common strategy in freshwater crabs which is mainly shown by females only. Females usually hold the eggs underneath her abdomen for incubation as well as protection of brood till post hatching
period. Development is direct and eggs hatch out as crablets rather than larvae as observed in marine crabs. Female thus usually invest most of its energy for the protection of eggs as well as crablets on hatching till they attain considerable size, a reproductive strategy commonly observed in all families of true freshwater crabs (Cumberlidge and Ng, 2009). Fecundity in general exhibits a positive correlation with size of crab and a lack of such correlation represent individual variations as well as scarcity of food. (Hines, 1982).

Food is a prerequisite for all living organisms for their survival and in food certain nutrients are more important than other for proper functioning of the body. Thus, like other living organisms, crabs also require a wide range of nutrients which they obtain from the food. The growth, reproduction as well as migration rate of crabs are largely governed by availability of preferred prey organisms (Vinagre et al., 2007). As crabs consume a wide variety of food and thus have many modes of feeding, therefore, stomach content analysis has been used to investigate the diet of brachyuran crabs (Bernardez et al., 2000). Regardless of the large number of potamid species in tropical and subtropical freshwater environments, information regarding feeding ecology of these crabs are very scare (Yeo et al., 2008). As crabs usually feed on macrobenthic invertebrates, therefore, study of feeding ecology in relation to macrobenthic invertebrates provide appropriate information regarding its role in food web.

Population of any organism never remain static. It rather fluctuates due to variation in the environmental factors that influence one or other stages of life cycle and hence affect the overall population abundance (Gupta, 2012). Brachyuran breeding and size at maturity is additionally influenced by cumulative action of exogenous and endogenous factors (Sastry, 1983).

Fishery potential of any organism is primarily determined by the status of particular water body, it inhabits. Discharge of pollutants from domestic sewages, agricultural runoff and other sources leads to contamination of water body and thus affect the aquatic organisms. Distribution and existence of crabs depend on specific environmental parameters such as pH and DO (Diaz and Conde, 1989, Lee and Winckin, 1995, Carmona-Suárez and Conde, 2002). In this context Warner (1977) held that
brachyuran crabs inhabiting tropical water usually breed throughout year whereas those found in temperate aquatics breed only in certain months of year. As freshwater crabs are excellent indicators of water quality (Yeo, et al., 2008) therefore, correlation between physico-chemical parameters and crab population provide the information regarding the optimum conditions under which crabs can reproduce and thus maintain the population.

Review of literature on different aspects of life cycle and feeding ecology reveals that such studies though have been conducted in different species of marine crabs (Xiao & Kumar, and Rostant et al., 2008) except for few reports (Gupta, 2012, Manhas, 2012 and Badral, 2015) nothing much is available about *Maydelliathelphusa masoniana* and *Himalayapotamon emphysetum* from India in general and Jammu region of J&K state in particular. Further in comparison to marine crabs which have received great amount of attention by researchers (Hines., 1989, Vergáz et al., 2000, Tongdee, 2001, Xiao & Kumar, 2004 and Litulo et al., 2005), very little is known about abundance and population dynamics and feeding ecology of decapods (Dobson et al., 2007).

Thus presently, an endevour has been made to study the life cycle and feeding ecology of freshwater crabs *Maydelliathelphusa masoniana* and *Himalayapotamon emphysetum* inhabiting Jammu waters. An attempt has also been made to draw a correlation between various physico-chemical parameters and their population structure. Study has been aimed to achieve the following objectives:

- To determine the sexual dimorphic characteristics, sex ratio and size frequency distribution.
- To identify the class size at which both the species of crabs attain maturity.
- To study the breeding ecology of two species.
- To estimate the fecundity and its relationship with different morphometric parameters (viz, carapace width, body weight and abdomen width).
- To estimate the condition factor and Relative condition factor.
- To study the molting process.
- To investigate the feeding ecology of two species.