Amphibians are the first vertebrates to come on land but go back to water for reproduction since, they did not evolve cledoic eggs suitable for development on land. Anuran amphibians lay their eggs in various ecological setups, ranging from ephemeral ponds, rain-filled puddles, gently flowing streams and even in phytolemeta (bromeliads and tree holes) etc., that hatch into tadpoles in aquatic medium (Hoff et al., 1999). A tadpole is an energy gathering, non-reproductive phase in the life history of anuran amphibians. Anuran tadpoles are ideal subjects for studies as they occur in large numbers and generally remain confined to an area or small water bodies until metamorphosis. Despite considerable work on tadpole biology from North America and Europe, there is limited information on these subjects from elsewhere especially from Indian sub-continent (Mohanty-Hejmadi and Dutta, 1981; Saidapur and Girish, 2000, 2001; Hiragond and Saidapur, 2001; Veeranagoudar et al., 2004 a, b; Gramapurohit et al., 2006; Mogali et al., 2011, 2012, 2015).

Phenomenon of kin recognition among anuran tadpoles has been a subject of researches since late seventy’s, and it is studied in several species of animals (Pfenning and Sherman, 1995) and also in some plants (Dudley et al., 2013). Since most anurans lay a large number of eggs, their tadpoles form very suitable subjects for kin discrimination studies. Eggs belonging to different parental lines can be easily collected and tadpoles can be reared in a laboratory setup with ease. The ability to discriminate kin from non-kin has been
reported in some species of tadpoles (Blaustein and Waldman, 1992; Saidapur and Girish, 2000; Waldman, 2005; Gramapurohit et al., 2006). A few species are known not to exhibit kin recognition (Fishwild et al., 1990). Interestingly, not much attention is paid to understand whether ecological pressures have any influence on kin discrimination behaviour in tadpoles. For instance, relation between aggregation behaviour and/ or hydroperiod with kin discrimination, if any, is not known. A few species of tadpoles are known to be cannibalistic. Not much information is available on kin discrimination in cannibalistic tadpoles. Some studies carried out on cannibalistic tadpoles show a variation in their ability to discriminate sibs from non-sibs. Tadpoles of *Spea bombifrons* are reported to discriminate between sibs and non-sibs, but more hungry individuals cannibalize their sibs as well (Pfenning et al., 1993). On the other hand, tadpoles of *Dendrobates auratus* cannibalize both sibs and non-sibs indiscriminately (Gray et al., 2009). Hence, work on more cannibalistic species is needed to know about kin discrimination in these tadpoles. In the first chapter, I describe kin discrimination behaviour in three species of tadpoles: (1) *Hylarana temporalis* (formerly known as *Rana temporalis*), (2) *Sphaerotherca breviceps*, each of these species live in different ecological habitats and also exhibit different habits viz. living in loose aggregations or not forming aggregations, and (3) cannibalistic tadpoles of *Hoplobatrachus tigerinus* which are found in ephemeral water bodies. Gosner staging of tadpoles (Gosner, 1960) was followed in all the studies reported in this thesis.
Tadpoles of some species of anurans are known to exhibit different forms (dense/ small/ loose) of aggregations (Blaustein, 1987). Staying in aggregation has benefits and non-benefits (Roche, 1993). Tadpoles of *H. temporalis* live in gently flowing streams. They form small groups close to one another, giving a pattern of loose aggregation. I was interested to know whether, *H. temporalis* tadpoles that form small groups/ aggregations belong to kin group. The work carried out in the second chapter of the thesis was aimed to know whether, *H. temporalis* tadpoles reared in sib group or mixed (sibs and non-sibs) group exhibit any difference in aggregation pattern. If tadpoles of sib group exhibit aggregation and non-sib group do not exhibit aggregation, it may imply existence of a relationship between kin discrimination behaviour and their living in small and loose aggregation in their natural habitat.

As outlined earlier, anuran tadpoles of some species live in dense aggregations while others live in small and loose aggregations, and yet others live in a randomly distributed manner. Since, tadpoles live in murky water where visibility is low; they mainly depend on chemical cues of food to detect it. Living in aggregation may have both advantages (Fritz and De Garine-Wichatitsky, 1996; Sontag et al., 2006) and disadvantages (Giraldeau and Beauchamp, 1999; Coolen, 2002) in foraging. Not much attention is paid to relative role of information sharing among group members and personal information obtained from food source in reaching out to food in tadpoles. Hence,
it was of interest to study foraging behaviour especially time to locate
and reach food, in tadpole species that form dense aggregations
(*Duttaphrynus melanostictus*: formerly known as *Bufo melanostictus*),
small loose aggregations (*H. temporalis*) and those forming no
aggregations (*S. breviceps*). Third chapter of the thesis deals with a
study to decipher extent of perception of food cues by these three
species of tadpoles with different living habits. Time taken by first
tadpole in different density groups provided with food patch of different
quality (amount) in each species is used as criteria to assess
individual sense of perception of food patch as well as on information
sharing among the group members.

Since more than one species are likely to breed in the same
water bodies during monsoon, it is natural that the tadpoles of different
species would compete with each other for food and space to
successfully metamorphose before the water bodies dry up (Alford,
1999). Competition between two individuals could be symmetric (both
influence each other equally) or asymmetric (only one species has
more influence on the other). Most studies carried out on tadpoles
describe influence of either density of tadpoles or food on intraspecific
and interspecific competition. Only a few studies are carried out to
know the influence of both density of tadpoles and level of food
leading to competition between tadpoles of two species (Smith *et al.*, 2004; Jin-dong, 2007). Hence, there is a need to generate more
information on this aspect. Fourth chapter of the thesis describes
competition within (intraspecific) and between (interspecific) tadpoles of *D. melanostictus* and *S. breviceps* induced by manipulating their density of rearing and providing them with food either in limited quantity or in excess.