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**Project title: Agonistic Interactions in Invasive Crayfish**

Competition for resources is an essential factor in the social interactions among many species. The hierarchy for utilising these resources is usually maintained by size, fitness, and aggressiveness. Agonistic interactions occur when the interests of two or more individuals collide. Usually, the stronger competitor wins the bout and attains the dominant status. Moreover, the other hidden factors affecting the readiness for fighting and fight intensity can be personality or higher motivation to fight successfully. Recent studies on crayfish behaviour have revealed that males and females carrying juveniles are more likely to attain the dominant status during an agonistic bout. However, the role of other reproductive stages of an individual remained unexplained. As a result, the aim of this project is to investigate the impact of females’ reproductive status on their lifetime capacity for aggression and resource retention.

Recent studies showed that *Procambarus virginalis* (marbled crayfish) is an apomictic, obligately, thelytokous parthenogenetic cambarid crayfish. Over the last two decades, it has gained the attention of neurobiologists and behavioural researchers due to its genetic identity and central nervous system similarity with *P. clarkii.* Therefore, we will study the aggressive interactions for shelter and activity in this genetically cloned crayfish female dyads at various reproductive stages: females with eggs (E), with glair glands (G), and non-reproductive ones (N). To see the differences among these three groups, we will arrange six combinations (E vs. E, G vs. G, N vs. N, E vs. G, E vs. N, and G vs. N) in which dyads of similarly sized females will interact in experimental arenas. The interactions and activity of opponents will be recorded for 24 hours (12 h daylight and 12 h dark) using digital video recording systems. Further, the number of contacts, fights, avoidance, tail flip, initiator and winner of the fight, and dominance establishment will be analysed visually. The EthoVision® XT 13.0 software will be used to determine the activity, velocity, distance moved, and shelter usage of the individuals.

Finally, we will use advanced statistical methods to compare the difference in the behaviour of females in R software. This comparison will form the basis of neurobiological and genetic studies in future and will be helpful in developing strategies for controlling the invasion of this species in natural waters.