

RELATIONSHIP BETWEEN CONDITION FACTOR AND EXTERNAL PARASITE DENSITY OF GOLDFISH (*CARASSIUS AURATUS*) AND KOI CARP (*CYPRINUS CARPIO*) IN ORNAMENTAL FISH BREEDING AND TRAINING CENTER IN RAMBADAGALLE

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This study was conducted to determine the influence of external parasite density on the growth of two fish species, goldfish and the koi carp at Rambadagalle ornamental fish breeding and training center. During preliminary examinations, internal parasites have not been observed, may be due to treatment process in the center. Therefore, in this study we focused only on the infection of external parasites.

According to the final harvest ratio, a sample of 30 goldfish and 50 koi were collected. Their length and weight data were recorded and gills, skin scrapings and fins were examined for ectoparasites. For each fish species, condition factor was estimated using the formula: $K = W/L^3$, where K= condition factor, W=weight and L=standard length. Graphs were plotted against parasite density vs. condition factor and Pearson correlation co-efficient (r) was estimated to determine the correlation between condition factor and parasite load. Non-parametric Kruskal Wallis test was used to determine whether there is a significant difference among parasite load between the two fish species.

Eight species of ectoparasites were observed from the two fish species namely, *Tricodina* sp., *Apiosoma* sp., *Centrocestus* sp., *Dactyrogryrus* sp., *Gyrodactylus* sp., *Posthodiplostomum cuticola*, *Argulus* sp., and *Ichthyobodo necatrix*. Among them, *Tricodina* sp. (goldfish=128172, koi carp=365) and metacercaria of *Centrocestus* sp. (goldfish=536 koi carp=50) were the most abundant parasite species in both fish species and others were recorded in low numbers (goldfish<300, koi carp<30). According to preliminary investigations, except *Tricodina* sp. and metacercaria of *Centrocestus* sp., other ectoparasite species did not show a negative effect on the growth of goldfish and koi carp species. Therefore, this study mainly focused on the influence of highly abundant parasites on the growth of two fish species.

Results revealed that when densities of total parasites, *Tricodina* sp. and metacercaria of *Centrocestus* sp. increase the condition factor decrease in goldfish indicating negative influence of parasite infection on the growth of the fish (Total parasites $r = -0.287$, *Tricodina* sp. $r = -0.291$, *Centrocestus* sp. $r = -0.015$). In contrast to that, for koi carp, when total parasite and *Tricodina* sp. densities increase, the condition factors also increase (Total parasites $r = 0.08$, *Tricodina* sp. $r = 0.402$). This result indicates that there is less effect on the growth of the koi carp from the infection of total parasite or the *Tricodina* sp. However, results showed that condition factor decreases in koi carp when metacercaria density increases, indicating a negative influence by metacercaria of *Centrocestus* sp. on the growth of this fish species ($r = -0.109$). In addition, according to the Kruskal Wallis test, the total parasite load was significantly higher in goldfish than koi carp ($p < 0.05$). According to the above results, it could be suggested that goldfish are more susceptible for diseases than Koi carp. The gathered information is important in implementing health management programs and best Management Practices for ornamental fish industry in Sri Lanka.