Evolution has resulted in behavioural responses to threat which show extensive similarities between different animal species. The reaction to predator cues is one example of such prevailing responses, and functional homologies to mammalian limbic regions involved in threat-sensitive behaviour have been found in the teleost telencephalon. The dorsolateral (Dl) and dorsomedial (Dm) regions of the pallium are thought to perform hippocampus and amygdala-like functions respectively. To what degree these regions are involved in the neuroendocrine responses to stress and predator cues however remains largely unknown. In the present study the involvement of Dl and Dm in such responses was investigated by exposing Nile tilapia (Oreochromis niloticus) to a standardized confinement stress and to skin extract from conspecifics. Nile tilapia develops a characteristic anticipatory behaviour to hand feeding, and effects of skin extract on this behaviour and locomotor activity were studied to characterise threat sensitive behaviour. Nile tilapia responded behaviourally to conspecific alarm cues by reducing feeding anticipatory behaviour. This may reflect a general elevation of alertness, and further studies combining skin extract with other challenges are needed to reveal neuroendocrine effects associated with this predator cue. Confinement stress resulted in an elevation of cortisol and serotonin (5-hydroxytryptamine, 5-HT) metabolism in both Dl and Dm. A similar tendency was observed in fish exposed to chemical alarm cues, but this effect did not reach the level of statistical significance. Hence, limbic responses to stress and fear, akin to those seen in extant mammals, are also present in the teleost lineage.