# CONCLUSION

The present study, entitled Extraction and Characterization of Natural Pigments (Anthocyanin and Curcumin) from Plant Materials,was carried out to explore plant materials as natural sources of useful colouring pigments and to study some of their basic physicochemical characteristics. Red rose petals were used as a source of anthocyanin pigment, while turmeric was used as a source of curcumin pigment. The pigments were extracted using ethanol, providing a simple and convenient method for obtaining coloured extracts from the selected plant materials.The extracted pigments showed distinct and characteristic colours. The rose petal extract exhibited the colour characteristics associated with anthocyanin, whereas the turmeric extract produced a yellow-orange colour characteristic of curcuminoids. The characterization studies further demonstrated that the properties of these natural pigments are influenced by environmental conditions such as pH and temperature. Anthocyanin showed noticeable changes in colour at different pH conditions, demonstrating its characteristic pH-sensitive behaviour. The thermal-stability study indicated that temperature can influence pigment stability. The colour retention observed on cotton fabric after washing also indicated some degree of pigment retention under the experimental conditions used.

Curcumin also showed characteristic behaviour during the characterization studies. Its colour and stability were influenced by changes in pH and temperature, which is consistent with the known chemical properties of curcuminoids. The results demonstrate that both plant materials can provide naturally occurring pigments with identifiable and useful colouring properties.

Thus, the study successfully achieved its objective of extracting and characterizing anthocyanin and curcumin from selected plant materials. It also demonstrates the importance of plant sources such as red rose petals and turmeric as readily available sources of natural pigments. These pigments may have potential applications in areas where naturally derived colourants are preferred, including food, textile and other colouring applications, subject to appropriate safety and stability evaluation.The study was performed using simple qualitative characterization methods; therefore, further investigation using techniques such as UV-Visible spectroscopy, chromatography and quantitative pigment estimation would provide more detailed information about pigment composition, concentration, stability and possible applications. Overall, the findings support the potential of plant-derived anthocyanin and curcumin as natural pigments and provide a basis for further research into their properties and practical applications.