

## SUMMARY

The experimental results obtained by the candidate have been presented in Chapter II, III and IV which can be broadly divided as follows :

CHAPTER II : Role of quinone-hydroquinone system in pigmentation.

CHAPTER III : Comparative biochemical parameters of black and albino rats in relation to pigmentation.

CHAPTER IV : Melanized leucocytes in induced depigmentation and psoralen-treated toads (Bufo melanostictus).

In Section B of Chapter II, results relate to the measurement of endogenous hydroquinone level with pigmentation. To show the relationship high dose of ascorbic acid, psoralen (a pigmentogenic substance) and glucose have been used.

The results show that ascorbic acid which inhibits tyrosinase activity can elevate the hydroquinone levels in the skin, liver, blood and urine of the toads, and these are reversed by the treatment of psoralen. Again, glucose which has been shown to stimulate pigmentogenesis by the previous worker, reduces the hydroquinone contents in toads. From these observations it can be assumed that pigmentation has got an inverse relationship with the hydroquinone level.

In this connection, comparative study on the urinary hydroquinone levels of vitiliginous subjects and normal subjects, <sup>has been made.</sup> The results show that vitiliginous subjects have got lesser hydroquinone in their urine than the normal subjects. Patients with the larger lesions have got lesser amount of hydroquinone than with the smaller lesions. It turns out that probably the severity of vitiligo is associated with lower outgo of hydroquinone. Results are suggestive that endogenous hydroquinone may have some role in affecting depigmentation in vitiliginous subjects which is supported by the above experiments in toads.

In the Section-C of this chapter, effects of quinones on the enzyme tyrosinase as well as on the tryptophan pyrrolase activities have been presented. p-benzoquinone, naphthaquinone and anthraquinone - these three quinones have been observed to have pigmentogenic as well as tryptophan pyrrolase inhibiting actions. Regarding pigmentogenic action, naphthaquinone is more potent than anthraquinone which is again more potent than o-benzoquinone.

From the above two sets of experiments in Section B and C it is postulated that normally there is a balance between quinone and hydroquinone in the body, but when the concentration of hydroquinone is increased pigmentogenesis is inhibited, and when the concentration of quinone is increased pigmentation is stimulated, probably by inhibiting the tryptophan pyrrolase activity.

CHAPTER III : In Section A, comparison of the levels of amino acids and the enzymes related to pigmentation between black and albino rats have been presented. Free tyrosine, DOFA (Dihydroxy phenyl alanine) and tryptophan levels in the albino skin are greater than those of the black skin, and the reverse is obtained in case of liver. These results indicate that the black skins have got greater utilizing capacity of those amino acids than the albino skins. Again, although there is no significant variation in tyrosinase activity in these two varieties of rat, the tryptophan pyrrolase activities vary. The skin tryptophan pyrrolase activity in black rat is higher than the albino but the liver tryptophan pyrrolase activity is lower in the black rat than in the albino.

Section B deals with the hydroquinone level in the skin and liver of black and albino rats. The results also support the investigations observed in toads (in Section B, Chapter II).

In Section C, the trace metal contents have been measured in black and albino rat skins with the help of emission-spectroscopy. Nickel and lead levels in the albino skin are significantly higher than in the black skin suggesting that these metals may have some roles in the augmentation of depigmentation.

CHAPTER IV : The leucocytes containing melanin have been counted in the toads treated with 50 hydroquinone/toad/day and also after psoralen treatment to those toads. The percentage of

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melanin containing A.B.C. is decreased in hydroquinone treated toads and increased after psoralen treatment to the hydroquinone treated toads.