

ಕರ್ನಾಟಕ ರಾಜ್ಯ ವಿಜ್ಞಾನ ಮತ್ತು ತಂತ್ರವಿದ್ಯಾ ಮಂಡಳಿ
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A PROJECT REPORT ON

**“Characterization of antimutagenic compounds with therapeutic potential
from carrot (*Daucus carota*) (37S1017)”**

Submitted to Karnataka State Council of Science and Technology (KSCST)

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ABSTRACT

Based upon previous studies that seed germination inhibition could serve as a means for potential anticancer therapeutics, we chose to study the alterations in morphological and biochemical parameters- namely, seed weight, morphological differentiation and sugar metabolism in response to green gram seed treatment with aqueous carrot extract. The aqueous carrot extract was prepared by boiling and clarification of carrot root tissue (1:2.5 v/v with water). The weight of the 120h old green gram seedlings decreased by 35.6% upon treatment with the undiluted carrot extract. The specific amylolytic activity in seeds treated with the undiluted carrot extract was equal to $60.5 \pm 3.8\%$ of the control at the end of 120h as evident by the starch-iodine assay. The inhibition of amylolytic activity also varied significantly with the concentration of the carrot extract ($p < 0.05$). The reducing sugar content at the end of 120h treatment with the carrot extract was only $36.6 \pm 2.0\%$ of the control ($p < 0.05$). Moreover, SDS-PAGE profiles revealed that surplus protein bands occurred in the carrot extract-treated seedling homogenates harvested after 96h and 120h of incubation, which indicates the likelihood of endogenous growth inhibitor proteins being activated. Dialysis of the aqueous carrot extract, revealed that the inhibitor molecule/s was concentrated in the permeate fraction. The specific amylolytic activity in seeds treated with the permeate was equal to $57.1 \pm 3\%$ of the control whereas in case of retentate - treated seeds it was $84.9 \pm 4\%$ at the end of 96h. The reducing sugar content at the end of 96h was only $65.2 \pm 2\%$ of the control in case of permeate - treated seeds whereas no significant difference was observed in the case of treatment with retentate.

Our initial observations prompted us to explore the phytochemical constituents in the permeate fraction. Qualitative tests have revealed that the permeate fraction possibly contains saponins or terpenoid glycosides. The % radical scavenging activity was found to be 25.7% in the permeate, which was equal to 26.3 mM ascorbic acid equivalents /gm of carrot. The saponin content was equal to 3.25 gm/100gm of carrot. Also the inhibitory activity of the undiluted permeate fraction was equivalent to 0.29 mg/ml of vincristine, however its inhibitory activity was less than 0.1 mg/ml vinblastine. We propose that these thermostable antimetabolic phytochemical constituents present in carrot deserve to be purified to homogeneity and investigated further for their therapeutic potential in hyperamylasemic and proliferative disorders.