CHAPTER ONE: INTRODUCTION & OBJECTIVES OF STUDY

1.1 Introduction

Qat or Khat plant (Catha edulis) is widely cultivated in certain areas of East Africa and Arabian Peninsula predominantly in Yemen. It has been reported that several million people from these regions are habitual qat chewers. The main effects of chewing qat are a moderate degree of euphoria and excitation (Kalix, 1987). This is due to its amphetamine-like effect as qat are chewed continuously for more than 5 hours daily during social-cultural meetings. Qat leaves are usually kept in the mouth in the lower distal buccal fold during the chewing process.

There is an extensive literature about qat, providing information about its history, botany, production, geographical distribution, chemistry and pharmacology, and exploring the social, economic, medical, and oral aspects of its use. Even with this extensive literature, studies that have investigated its effect on the different aspects of dental and oral health are much less than one may expect. Stomatitis is one of the adverse effects of qat chewing due to the chemical irritation of the buccal oral mucosa. Qat has been linked to gingivitis, periodontal pocket formation, gingival recession and tooth mobility (Al-Sharabi, 2002). Recent study by Al-Hebshi et al., (2005) suggested that tannin in qat contribute to it being anticariogenic. This suggestion was based on their work on the ability of qat in inhibiting synthesis of water-soluble and water-insoluble glucans which were important for *Streptococcus mut*ans attachment.

Qat has also been shown to contain fluoride in low levels (Hill & Gibson, 1987; Hattab, 1999). However, Al-Sharabi, (2002) reported that there was higher incidence of cervical caries among qat chewers. It was suggested that the cervical caries may be related to chewing qat coupled with crystallized sugar.

The caries incidence may also be associated with lower salivary flow as qat chewers often experience dryness of the mouth. This may be explained either by the sympathomimetic effect of qat or by its astringent taste (Al-Sharabi, 2002).

Although this recent study has associated qat chewing habit to dental caries, its ability to cause demineralisation of enamel and at restoration interface has not been well documented. This study may be crucial in assisting dental practitioners in their caries assessment of qat chewing patients.

Dental caries can be produced in the laboratory using chemical or microbiological systems to produce the early manifestation of caries, namely, the white spot lesion on smooth surfaces and secondary caries around restorations. One of these systems most commonly used to stimulate enamel demineralization (caries-like lesion) is acidified gel technique. Caries-like lesion histopathology is similar to natural caries (Kidd, 1983; Wefel & Harless, 1984). The lesion on smooth enamel surface only showed as outer surface lesion. However at restoration interface, the lesion consists of two parts, an outer surface lesion showing features of primary attack on enamel surface and a cavity wall lesion which form as consequence of microleakage of acidic products along the restoration interface (Gilmour & Edmunds, 1998). These features are most clearly seen under polarized light microscope (Kidd, 1977).

Hence, this study will be carried out to document the demineralization potential effect of qat on smooth enamel surface and at restoration interface.

1.2 Aim of the study

To evaluate the demineralization potential effect of qat extracts on smooth enamel surface and at restoration interface.

1.3 Objectives of the study

1- To evaluate the demineralization potential of qat extract on smooth enamel surface.

2- To compare the demineralization potential of qat extracts and acid gel on smooth enamel surface and at restoration interface.

3- To evaluate the effect of concentration of qat extracts on demineralization of smooth enamel surface and at restoration interface.

4- To compare the extent of demineralization caused by acid gel and qat extracts at the coronal and cervical margins of Class V restorations.