

16.3.3 Antimicrobial Activity.....	306
16.3.4 Antiangiogenesis.....	309
16.4 Conclusion	310
References.....	312

16.1 INTRODUCTION

Plants have been indispensable sources of medicinal agents for thousands of years and an impressive number of modern drugs have been isolated from natural sources. Studies on natural products are aimed to determine medicinal values of plants by the exploration of existing scientific knowledge, traditional uses and the discovery of potential chemotherapeutic agents (Balunas and Kinghorn 2005). Exploitation and elimination of natural habitats consequently has led to gradual extinction of several medicinal plants, for which micropropagation is an effective approach to conserve such germplasm (Hassan 2008). It also a rapid propagation processes that can lead to the production of virus-free plants (Gonzales et al. 2010). Plant tissue culture is a modern tool available to rapidly propagate plants and there has been an increased interest in recent years in *in vitro* culture techniques (Nagarajan et al. 2009), which offer a viable tool for the mass multiplication of conservation of threatened, rare and endangered medicinal plants (Ajithkumar and Seenii 1998). In addition, plant tissue culture is considered to be the most efficient technology for crop improvement (Hussain et al. 2012). The micropropagation technology has a vast potential to produce plants of superior quality and the isolation of useful variants in well-adapted, high-yielding genotypes with better disease resistance and stress tolerance capacities (Brown and Thorpe 1995).

The preservative effect of many spices and herbs suggests the presence of antioxidative and antimicrobial constituents (Arjun et al. 2012). In recent years, multiple drug resistances in human pathogenic microorganisms have developed due to indiscriminate use of commercial antimicrobial drugs commonly used in the treatment of infectious diseases (Divya et al. 2014). The side effects and the resistance that pathogenic microorganisms build against antibiotics makes causes scientist to pay attention to herbal extracts and biologically active compounds which are good sources of novel antimicrobial agents (Essawi and Sraur 2000). Cancer causes increasing morbidity and mortality every year globally. Tumour growth and systemic metastasis are highly dependent on angiogenesis (Hansen et al. 2000; Siegel et al. 2012).

Angiogenesis is a normal process in growth and development of blood vessels (Zhang et al. 2010) and is a process essential for tumour growth. It is a tightly regulated complex procedure which involves signalling features and extracellular matrixes that induce the migration of endothelial cells in existing blood vessels to target areas which are sources of pro-angiogenic signalling compounds (Ribatti et al. 2003). It promotes tumour growth by supplying nutrients and oxygen and removing waste products while facilitating tumour invasion and metastasis (Wu et al. 2012), hence it is a target for cancer chemotherapy. Antiangiogenic therapy aims to prevent the formation of new vessels around tumours and to frustrate the existing abnormal capillary network that supports the tumour (Mahtabifard et al. 2003). Design and