HPTLC analysis of piperine from Piper nigrum, a possible candidate for vitiligo treatment

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INTRODUCTION
Dried fruit of Piper nigrum (Linnaeus), commonly known as black pepper corn, used in cooking as condiment, is also an important component of many Ayurvedic treatments including those for skin conditions along with piperine, being its main active ingredient which has been studied for properties such as anti-epileptic, anti-fungal, abortifacient, sedative hypnotic and muscular relaxant Kapoor, (1990), Johri & Zutshi, (1992) and Pei, (2007). Recently we have found it to be melanogenic also (Sajid and Ali, 2011).

Donata et al., (1990) have used P. nigrum fruits orally with other ayurvedic herbs including Psoralea corylifolia for the treatment of vitiligo where majority of subjects showed positive response. Despite the use of P. nigrum in several ailments cited above, there are no studies on its use as melanogenic agent, except for the work of Lin et al., (1999a) who reported that P. nigrum dried fruits and its pure active ingredient piperine induced melanogenesis in cultured mammalian melanocytes. Piperine is a major alkaloid present in black pepper, its IUPAC name is 1-[5-(1, 3-benzodioxol- 5-yl)-1-oxo-2, 4-pentadienyl] piperidene (Trease & Evans, 1983). Piperine provides protection against seizures in epilepsy and has been gaining increasing attention as a bioavailability enhancer in the formulations of several drugs (Timmers, 1994; Karan et al., 1999). It also exhibits a potent chemo-protective effect against procarcinogens and also bacteriostatic, fungistatic, and insecticidal activities (Reen and Rashmet, 1997). A hot-water extract of P. nigrum fruit and piperine to stimulate melanocyte proliferation in-vitro, and of piperine to stimulate pigmentation in-vivo (Lin et al., 1999a). Piperine, because of its protective effect against radiation, can also be administered to cancer patients before radiotherapy (Sharma et al., 2000). Because of the significant pharmacological activities exhibited by the piperine, several researchers have focused on the development of various analytical methods to determine piperine in different matrices such as plant extracts and serum. These methods include spectrometry (Prasad et al., 1997) high-performance liquid chromatography (HPLC) based on UV absorption (Funk et al., 2006). Recently, high-performance thin-layer chromatography (HPTLC) has become a routine analytical technique due to its advantages of its reliability and cost effectiveness (Gantiat et al., 2011).

We have also recently shown that the piperine extracted from Piperine nigrum and characterized using HPTLC techniques is a powerful melanogenic active ingredient and can be used as a possible candidate for the treatment of vitiligo, as it had induced powerful melanin dispersion via piperine like receptors in the isolated tail melanophores of Rana tigerina, (Sajid and Ali, 2011).