

**OR-62****Immunomodulatory Effects of *Zingiber Officinale* Roscoe var. *Rubrum* (Halia Bara) ON Inflammatory Responses Relevant to Psoriasis**

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This study reveals the therapeutic efficacy and mechanisms of action of the ginger species Halia Bara, or *Zingiber officinale* Roscoe var. *rubrum* (ZOR), on key immunopathogenic mechanisms relevant to psoriasis. It is known that psoriasis is a chronic autoimmune skin disease characterised by hyperplasia of epidermal keratinocytes and the accumulation of activated immune cells at sites of the disease. The disease is associated with aberrant activation of phagocytes (such as macrophages), T-lymphocytes and the production of pro-inflammatory cytokines and chemokines. In-depth experiments showed that ZOR chloroform extract (HB02), its active fraction (F6) and two identified compounds (6-shogaol and 1-dehydro-6-gingerdione) effectively inhibited nitric oxide (NO) and prostaglandin E<sub>2</sub> (PGE<sub>2</sub>) production by activated macrophages. These effects were comparable to dexamethasone and indomethacin. More interestingly, ZOR samples at 20 µg/mL strongly down-regulated mRNA level of iNOS, IL-12p40 and IL-23p19 in pre-treatment experiments of activated macrophages. Further, studies of immune cell migration showed that F6 and the compounds inhibited the migration of polymorphonuclear neutrophils (PMNs) through human vascular endothelial cells (HUVEC) by influencing CD11b expression and CD62L shedding. In addition, F6 and the compounds were also shown to modulate activation of CD8<sup>+</sup> cytotoxic T-lymphocytes as indicated by reduction of 'activation markers', CD25 and CD69 expression. An *in vitro* model of epidermal inflammation indicated that ZOR samples directly inhibited keratinocyte proliferation and the production of IL-20 and IL-8, both are key psoriasis-promoting cytokines. Hence, these experimental evidences substantiate the potential mechanisms of action of ZOR in ameliorating psoriasis.

**Keywords:** Psoriasis, *Zingiber officinale* Roscoe var. *rubrum* (Halia Bara), 6-shogaol, 1-dehydro-6-gingerdione.

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