PROCEEDINGS
– OF RESEARCH AND PRACTICE IN ALLIED AND ENVIRONMENTAL HEALTH –

Undaria pinnatifida and Cancer: A Literature Review

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Background: Cancer is a prevalent chronic disease and a leading cause of death worldwide, with treatment options having limited effectiveness and severe side effects [1,2].Searching for new therapeutic options has been conducted over the years, including research with natural compounds [1]. *Undaria pinnatifida* (known as wakame), presents high nutritional quality and bioactivity due to its composition mainly of polysaccharides (fucoidan), carotenoids (fucoxanthin) and proteins [1–4]. Some research has been performed on the potential biological activities of the *U. pinnatifida* constituents, including its anti-cancer properties [5,6]. **Objective:** The main objective of this study is to discuss the *in vitro* studies regarding cytotoxic activity of wakame and its compounds against different cancer cell lines. **Methods:** A narrative review was conducted using the PubMed® database and a combination of keywords with Boolean search terms, to find articles published between 2015 and 2025, related to *in vitro* cytotoxic activity of *U. pinnatifida* and its compounds. **Results:** Twenty articles were selected. Wakame and its compounds (polysaccharides or fucoidan and fucoxanthin) have demonstrated *in vitro* cytotoxic effects on several cancer cell lines, including prostate (PC-3), cervical (HeLa 229 and SiHa), ovarian (A2780 and SKOV3), pancreatic (PANC-1), breast (MCF7 and MDA-MB-231), lung (A549) and melanoma [7–16]. Nanoformulations have shown considerable potential, since enhanced delivery of fucoidan and quinacrine resulting in a reduction in IC_{50} values [11]. Fucoidan administered concomitantly with other drugs demonstrated synergistic (aspirin, paclitaxel, lapatinib or tamoxifen) and additive (topotecan) effects[7,14,17]. Additionally, anti-cancer effect may be explained though the induction of apoptosis and inhibition of cell proliferation [7,10–13,16]. **Conclusions:** *U. pinnatifida* and its compounds showed anticancer properties and potential enhanced efficacy of other compounds when administered concomitantly. Future research should focus on pharmacokinetics, toxicity assessment, mechanism of action and *in vivo* efficacy to establish its potential as a therapeutic agent.

keywords: *Undaria pinnatifida*; wakame; cancer; cytotoxic

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