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Cancer, Ethnobotany and *In vitro* Cytotoxicity Assays

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Mini Review

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Abstract

Cancer is a major health problem worldwide. In recent years a lot of studies are focused on preliminary screening of plant extracts for their cytotoxic effect on human cancer cells. This brief review summarizes some of them [1-10]. Chosen studies share similar distinctiveness:

✓ Medicinal plants were selected on the basis of their ethnomedicinal uses;

✓ Native and endemic species from geographical regions which possess a great diversity of species have been elected;

✓ Whole plant extracts have been tested;

✓ Anticancer potential of plant extracts was investigated *in vitro*;

✓ The results illustrate the value of preference based on the traditional knowledge.

Keywords: Cancer; Ethnobotany; *In vitro* Cytotoxicity Assays

Cancer Prevention and Treatment

A common feature of cancer is uncontrolled cell division. Modern medicine cannot treat or prevent most cancer diseases. Scientists are expected to pay attention to development of effective and safe anticancer drugs. The scope of current investigations is to achieve selective action only to the particular cancer cells. This brief review summarized findings of several recent studies [1-9]. The results obtained indicate that numerous plant extracts exhibit promising anticancer potential.

Ethnobotany

Plants have been used to treat human diseases from ancient times plants. Nowadays traditional medicine is a common approach in some parts of the world. Moreover, it is well known that a lot of conventional drugs have been isolated from plants. Recently, different medicinal plants have been selected to be investigated based on their ethnobotanical use. Of particular interest are geographical regions which possess a great diversity of species. Some of them are endemic. So, traditional knowledge of particular area could lead to discovery of drugs for people all over the world.

In vitro Cytotoxicity Assays

Chemical interactions among plants and other organisms are mediated through secondary metabolites [10]. Different interactions between secondary metabolites were established – synergistic, additive, etc.

So, preliminary testing of whole extracts represents an object of interest.

Nowadays the principle of the "Three Rs" - Replacement, Reduction and Refinement is widely accepted in laboratory techniques. "Replacement" refers to avoidance of animal testing. In the case of the numerous plant extracts *in vitro* assays represent a useful alternative of animal experimentation [11,12]. These informative methods are suitable for preliminary screening and selection of cytotoxic plant extracts. A key strategy in cancer research is to discover how to affect particular malignant cells without toxicity on normal cells in human body. Using different cancer cells specific effects of extracts on cell proliferation could be detected. At the same time, this rapid assay allows to estimate side effects using normal human cells.

Conclusion

Selection of medicinal plants for preliminary testing relying on traditional medicine represents a useful tool in anticancer researches. Some plants possess high cytotoxic potential only on cancer cells tested. These extracts may represent sources for the development of effective and safe drugs.

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