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Short communication

Traditional use of antitumor plants in the Pirot County of Southeastern Serbia

Ksenija Kojičić*[1], Dejan Pljevljakušić[2], Marija Marković[3], Dragoljub Miladinović[4], Biljana Nikolić[5], Olivera Papović[6], Ljubinko Rakonjac[5], Snežana Cupara[1]

[1]*University of Kragujevac, Faculty of Medical Sciences, Department of Pharmacy, Svetozara Markovića 69, 34000 Kragujevac, Republic of Serbia*
[2]*Institute for the study of medical plants "Dr. Josif Pančić", Tadeuša Koščuška 1, 11000 Beograd, Republic of Serbia*
[3]*University of Niš, Faculty of Sciences and Mathematics, Department of Biology and Ecology, Višegradska 33, 18000 Niš, Republic of Serbia*
[4]*University of Niš, Faculty of Medicine, Department of Pharmacy, Bulevar Dr. Zorana Đinđića 81, 18000 Niš, Republic of Serbia*
[5]*Institute of Forestry, Beograd, Kneza Višeslava 3, 11030 Beograd, Republic of Serbia*
[6]*University of Priština temporarily located in Kosovska Mitrovica, Lole Ribara 29, 38220 Kosovska Mitrovica, Republic of Serbia*

Introduction

Plant derived compounds have been an important source of several clinically useful anti-cancer agents (Cragg and Newman, 2005). Many researchers have focused attention on traditional herbal treatments, since it is an area from which a possible new antitumoral compound might emerge. Investigators search often in local folk medicinal plant treatments of different regions, in order to identify possible anticancer activity of the plants (Kojičić et al., 2019).

The subject of this study was the research of traditional knowledge of the use of antitumoral plants in the Pirot County in southeastern Serbia. Based on our data, it appears that unrelated medicinal use of the source plants may serve as an initial guide to the selection of plants for anticancer screening.

Materials and methods

Survey on participants' knowledge and use of medicinal plants in the Pirot County was carried in the form of interviews in four municipalities: Pirot, Babušnica, Bela Palanka, and Dimitrovgrad. The questionnaire included inhabitants of 144 villages of the Pirot County. A total of 631 participants were surveyed, of which 337 were male, and 294 female (Stankov Jovanović et al., 2018; Marković, 2019). The results were systematized and presented in a tabular manner including information on species, plant part used, pharmaceutical form, antitumor indication and number of reports.

Results and Discussion

Of the 631 persons who completed the questionnaire in the Pirot County, 50 respondents stated that they knew the use of plants against cancerous diseases, of which 47 were Serbian nationality (35 respondents in Pirot municipality, 4 in Babušnica municipality and 8 in Bela Palanka municipality), and 3 respondents were Bulgarian nationality (Dimitrovgrad municipality). Females were more familiar with anticancer plants (28) than males (22). The majority of respondents mentioned the general use of plants against cancerous diseases (41). Two individuals mentioned the specific use of herbs against breast carcinoma: the fresh fruit of the scallop (*Physalis alkekengi*) and the compress of the parsley lining (*Petroselinum crispum*). They mentioned also the use of the above-ground part of the celandine (*Chelidonium majus*) against cervical carcinoma. One person mentioned one specific use of the plant against throat carcinoma: above-ground part of the celandine (*C.majus*), liver and

*ksenija.kojicic@gmail.com

bile: above-ground part of the celandine (*C.majus*), lymph glands: the root of the butcher's-broom (*Ruscus aculeatus*) lungs: the flower of the "spotted" mullein (*Verbascum* sp.*diversa*) as well as against leukemia: the root of the butcher's-broom (*Ruscus aculeatus*).

The majority of respondents in the Pirot district are aware of the use of the above-ground part of the plant during the flowering of the species *Chelidonium majus* (16 subjects), known to the locals as a "lišaivac", "rosomača" or "lišavica" as well as the above-ground part of the plant during the flowering of the species *Gentiana cruciata* (13 subjects), with the folk name "plava lincura" or "otodovka" which means that with the use of the plant the disease "goes away". A total of 4 respondents said they knew bistort (*Polygonum bistorta*) as an anticancer plant. Two respondents mentioned butcher's-broom, (*Ruscus aculeatus*), and houseleeks (*Sempervivum tectorum*) as anticancer plants. One respondent mentioned the anticancer use of the following plants: sweet flag (*Acorus calamus*), burdock (*Arctium lappa*), European centaury (*Centaurium erythraea*), autumn crocus (*Colchicum autumnale*), field horsetail (*Equisetum arvense*), cleavers (*Galium aparine*), gentian (*Gentiana lutea*), lavender (*Lavandula officinalis*), parsley (*Petroselinum crispum*), bladder cherry (*Physalis alkekengi*), apricot (*Prunus armeniaca*), *Seselirigidum*, and "spotted" mullein (*Verbascum* sp.*diversa*).

A similar study on the use of wild plants in Serbia was done by Jarić et al. (2017), at Kopaonik (Central Serbia), but authors did not report the use of any plant against cancerous diseases .Zlatković and Bogosavljević (2014) studied the taxonomic and pharmacological valorization of medicinal plants of the Svrljiški Timok gorge (Eastern Serbia), where they observed only the traditional knowledge about the application of plant species *Colchicum autumnale* against cancer. Besides, in the most recent ethnobotanical study of Janaćković et al. (2019) in Negotinska Krajina (Eastern Serbia) only the use of *Chelidonium majus* in the treatment of skin cancer (melanoma) has been reported.

Conclusion

Based on the population survey in the Pirot County, it has been found that the rural population in this area is proficient in the use of medicinal plants against cancerous diseases compared to other regions in Serbia based on currently available literature results. We found that *Chelidonium majus* and *Gentiana cruciata* are the best known antitumor plant species in Pirot County. Furthermore, we believe that there is currently very weak public disclosure of data on the traditional use of anti-cancer plants in Serbia. Therefore,further research in this direction would berequired. The data could be categorized as a basis for chemical and pharmacological research, such as antimicrobial, cytotoxic or antioxidant activity.From conducted *in vitro* or/and *in vivo* studies on herbal extracts efficient antitumor medicinal product could be revealed.

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