STUDIUL MACRO-, MICROSCOPIC ŞI FITOCHIMIC AL PRODUSULUI VEGETAL DIN SPECIA *WITHANIA SOMNIFERA* DUNAL

MACRO-, MICROSCOPICAL AND PHYTOCHEMICAL STUDY OF VEGETABLE DRUGS FROM SP. WITHANIA SOMNIFERA DUNAL

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Aim of study

Species *Withania somnifera* Dunal (fam. Solanaceae) common name Ashwagandha is spontaneous, herbaceous plants, originary from India and Sri-Lanka. The content of withanolides of *W.radices* posses the high therapeutical effects, that why in nowadays is intensive cultivated in different regions from different European and Asian countries. The aim of this work is to study macro-, microscopical characteristics and qualitative, quantitative alkaloid analyses of new vegetable drugs (*W. folia* and *W.herba*, obtained from plants grown in the climate conditions of Moldova.

Materials and methods

The plants of Ashwagandha were multiplicated by biotechnological methods *in vitro* in Botany Garden of Academy of Science of the Republic of Moldova and grown in greenhouse and open field. The vegetable drugs (*W.radices* and *W.herba*), collected from *W.somnifera* plants were studied by microscopical and phytochemical methods (qualitative reactions for alkaloids identification and dosage of alkaloids by titrimetric method).

Results

Fragmented vegetable drug of *W.radices* consists from specimens of 5-6 cm in length and 1.0 to 2.5 cm in diameter, cylindrical, gradually tapering down with a brownish-white surface and pure creamy-white inside when broken. *W.herba* includes fragmented stems (outer surface is hairy, in fracture is white-yellowish), fragmented and entire leaves (simple, exstipulate, petiolate, ovate, acute up to 10 cm long) separated flowers (complete, pentamerous, actinomorphic, hermaphrodite), or cymose inflorescences, fragmented and entire fruits (berry enclosed in gamosepalous calyx). Odour is characteristic, mucilaginous bitter and acrid taste.

The microscopical indices are: roots – classical primary anatomy structure with oxalic sand in cortex; stem – epidermis with multicellular denroid trichomes, lacuna and oxalate sand cells in cortex, cambium, sclerenchymatic lignified fibres and collateral vascular bundles; leaf - epidermis with multicellular dendroid trichomes and secretory hairs (uni- or multicellular gland and unicellular stalk), calcium oxalate rosette, fruit – fatty globules in mesocarp.

The comparative qualitative and quantitative study of alkaloids in three vegetable drugs were effectuated: *W. folia, W. herba* and *W. radices*, from plants grown in greenhouse and open field. Qualitative identification of alkaloids by series of special chemical reactions (Bouchardat reagent, Dragendorff reagent, tannic acid, phosphomolybdic acid, phosphotungstic acid, picric acid, picrolonic acid) demonstrates that alkaloids are present in all vegetable drugs.

Quantitative study of alkaloids was effectuated by isolation with chloroform in separated funnel. After drying of alkaloid chloroform extract in acids medium were determinated the total content of alkaloids by titrimetric method with solution of sodium hydroxide. The results denote that the vegetable drugs (*W. folia* – 1.154%, *W. herba* – 1.016%) obtained from the greenhouse plants contain the higher value of total alkaloids than in vegetable drugs (*W. folia* – 0.851%, W. *herba* – 0.784%) from the open field plants. In both case (plants from greenhouse and in the open field) the highest content of total alkaloids there is in vegetable drug *W. folia* (respectively – 1.154%; 0.851%). Comparison, the highest content of total alkaloids there is in *W. radices* (1.415%) than in decreasing W. folia (0.851%) and *W. herba* (0.784%).

Conclusions

The specific micro- and microsopical characteristics to identify the vegetable drugs (*W. folia, W. herba* and *W. radices*) obtained from sp. *W.somnifera*, grown in the climate conditions of Moldova were established. The phytochemical study of 3 vegetable drugs demonstrated that the main source of alkaloids may be *W.radices*, and as alternative – *W.folia* and *W.herb.*