# Bulgarian Academy of Sciences

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# Biological and Phytochemical Investigation of *Tribulus terrestris* L. in Thracian Floristic Region


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## Summary


The object of the present study was the medicinal plant puncture vine (*Tribulus terrestris* L.), family *Zygophyllaceae* R. Br., from which various pharmaceutical drugs and food additives are produced for the market.

The broad thematic scope planned in the research, predetermined the complex character of the aim set in the study, i.e. to establish the distribution and the resources of some perspective populations of *Tribulus terrestris* in the Thracian floristic region of Bulgaria and to describe some biological and phytochemical characteristics of the species.

For achieving the complex aim, the areas of *Tribulus terrestris* distribution in the Thracian floristic region of Bulgaria were established and the locations of the plant with industrial and economic significance were mapped.

In the four-year study period it was established that the total area of the economically significant fields varied as follows: 1346 dka in 2009, 960 dka in 2010, 990 dka in 2011 and 945 dka in 2012, respectively.

The resource capacities of the perspective plant populations were evaluated, the resources varying during the study period (2009-2012) within the limits of 49133 kg dry weight to 127539 kg dry weight.

For the first time a detailed phenological spectrum of the species in Bulgarian populations was presented. It was found out that the duration of the vegetation period was about 100-140 days, from June till October, and, in the warmer parts of the region – till November and it depended on the temperature maximum, as well as on the occurrence of the

first frosts. The reproductive biology of some Bulgarian populations of the species was studied with the aim of explaining the low and irregular germinability. It was found out that the seeds do not have morphological dormancy because the germ is matured, vital, proterandry is distinct and the pollen is of high viability. All the above mentioned characteristics ensure the high reproductive potential of *T. terrestris*, supporting sustainable populations.

The structure of the spermoderm and the trichoma were characterized by SEM analysis.

The specific quality content of the drug obtained from the Bulgarian populations of *T. terrestris* and the higher content of the active furostanol type saponins were evaluated in comparison with the extracts from Turkey, China, India, etc. Changeability of the steriodal saponins was established, due to the different locations and the climatic conditions, under which the populations of the species grow.

Some perspective economically significant sources were established, characterized by their high content of steroidal saponins – protodioscin, prototribestin, dioscin and flavonoid glycoside rutin.