

European yew (*Taxus baccata* L.) in subalpine zone of the Greater Caucasus: anatomical-ecological peculiarities of upper limit distribution

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Genus *Taxus* L. (Taxaceae) is a relict conifer. It encompasses nine closely related species throughout temperate regions (zone) of the Northern Hemisphere. *T. baccata* is widely distributed tree (63°N-33°N). Usually it grows as a small stands or solitary trees. In the southern latitude of its range the yew represented from 650 up to 1,900 m a.s.l., but in northern Africa it extends 2,000-2,500 m, in the Himalayan temperate forests – 1,800-3,400m [1].

T. baccata occurs in all mountain forests of the Caucasus and altitudinally reaches up to 2,000 m or 2,050m [2].

On the base of personal observation (1962-1989), significantly in recent time (2014-2016), *T. baccata* in limestone area of the Greater Caucasus (Georgian part) occurs as dwarf trees or shrubs. For example, as low tree (8-10 m tall) it represented in maximum elevation about 1,800 m (e.g., on Mingaria Mts., West Georgia), and as small shrubs (1-1.5 m tall) in subalpine zone (e.g., Okhachkue limestone outcrops, 2,300 m). This latter as solitary shrub tends to grow on the shaded habitat dominated by the elfin stands of *Rhododendron caucasicum*. The most interesting site was discovered in Khvamli (Lechkumi region, West Georgia). Here, on tiny plateau, patch of *T. baccata* found on 2,002 m as homogenous semi-prostrate stand with a rare small straight-trunk (5-6 m) specimens. In this plenty of sun (because of lack forest canopy) ecotone area, nucleus of native, mostly relict and endemic flora (e.g., *Rhamnus imeretina*), yew shrubland appears as dominating arboreal vegetation, indeed. From 1,800 up to 2,300 m *T. baccata* shows zero sexual reproduction ability (because of lack of the characteristic cones). So, it's clear that all native populations of yew in Khvamli descend from a single founder via vegetative propagation.

So, Khvamli, if we take into consideration of Batsara Gorge (E. Georgia) yew forest with giant trees, in subalpine treeless mini-plateau niches is unusual (maybe single in Georgia) place which provide a home to extraordinary large, broadly spreading population of prostrate shrub form of yew.

In conclusion, as a solitary form (Okhachkue 2,300 m, record altitudinal distribution for Georgia and as it seems for the Caucasus as well), so rare sub-prostrate shrub population (Khvamli, the another very seldom fact) holds great scientific interest by means of investigation the heterogenous nature of the Caucasus.

Foliage cells of yew, as it broadly known today, are source of phytochemical (taxol), which largely requires as anticancer effects in modern medicine.

References

- [1] P. A., Thomas and A. Polwart. *Taxus baccata* L. *Journal of Ecology* (2003) 91:489-524.
- [2] N. Goginashvili and I. Tvauro. Beech forest with yew (*Fageta Taxceto*) in Georgia. *International Caucasian Forestry Symposium*. 24-26 October. Artvin, Turkey (2013) 976-981.