

**NATURAL POLYMERS**

**POLYTERPENES**

**HOPEFUL HERB:**

***Taraxanum koksagyz***

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# Time schedule

<b>LECTURE</b>	<b>SUBJECT</b>
<b>1</b>	Introduction to the subject – Structure & Terminology of nature polymers, literature
<b>2</b>	Derivatives of acids – natural resins, drying oils, shellac
<b>3</b>	Waxes
<b>4</b>	Plant (vegetable) gums, Polyterpene – natural rubber (extracting, processing and modification), Taraxacum_kok-saghyz
<b>5</b>	Polyphenol – lignin, humic acids
<b>6</b>	<b>Polysaccharides I – starch</b>
<b>7</b>	<b>Polysaccharides II – cellulosis</b>
<b>8</b>	<b>Protein fibres I</b>
<b>9</b>	<b>Protein fibres II</b>
<b>10</b>	<b>Casein, whey, protein of eggs</b>
<b>11</b>	<b>Identification of natural polymers</b>
	<b>Laboratory methods of natural polymers' evaluation</b>

# **POLYTERPENE = POLYISOPRENE**

## **Appearance in NATURE**

- **POLYTERPENE** - are contained in approx. 2000 plants from various geographic regions
- **Trees, Bush, Herbs**
- The most important is the Tree: *Hevea brasiliensis*
- **HOPEFUL HERB: *Taraxanum koksagyz***

## **Rubber bush** (*Ficus elastica*)

yields a milky white latex, a chemical compound separate from its sap and carried and stored in different cells. This latex was formerly used to make rubber, but it should not be confused with the Pará rubber tree, the main commercial source of latex for rubber making. Just as with *Hevea brasiliensis*, the latex of *Ficus elastica* is an irritant to the eyes and skin and is toxic if taken internally.

## **Gutta-percha** (*Palaquium gutta*)

refers to trees of the genus Palaquium and the rigid natural latex produced from the sap of these trees, particularly from Palaquium gutta.

*Palaquium gutta* trees are 5–30 m tall and up to 1 m in trunk diameter. The leaves are evergreen, alternate or spirally arranged, simple, entire, 8–25 cm long, glossy green above, and often yellow or glaucous below.

## **Balatá** (*Manilkara bidentata*)

Balatá is a large tree, growing to 30–45 m (98–148 ft) tall. The leaves are alternate, elliptical, entire, and 10–20 cm (3.9–7.9 in) long. The flowers are white, and are produced at the beginning of the rainy season. The fruit is a yellow berry, 3–5 cm (1.2–2.0 in) in diameter, which is edible; it contains one (occasionally two) seed(s). Its latex is used industrially for products such as chicle.

The latex is extracted in the same manner in which sap is extracted from the rubber tree. It is then dried to form an inelastic rubber-like material. It is almost identical to gutta-percha (produced from a closely related southeast Asian tree), and is sometimes called *gutta-balatá*.

## **Rubber root** (*Taraxacum\_kok-saghyz* )

is a perennial plant with a yellow composite flower. The Rubber latex is extracted from the Root of this Herb.

**It is NOT the Dandelion!**

A black and white photograph of a Taraxacum kok-saghyz plant. The plant has a basal rosette of leaves and several upright stems with white flower heads. A ruler is placed vertically to the left of the plant for scale. The ruler is marked in inches, with the numbers 2, 4, 6, 7, and 8 visible. A yellow box with a black border is superimposed on the top right of the image, containing the text '! Benchmark is in Inches!'.

**! Benchmark is in Inches!**

**Taraxacum kok-saghyz**



**45 % w/w of  
the Natural  
products in  
2013 year**

**100 % w/w of  
the Natural  
products in  
2020 year**

**CONTINENTAL Company**

**informs:**

**The Tire based on the**

***Taraxacum kok-saghyz* we  
launch in five years!**

***Taraxacum kok-  
saghyz***

***•It is no***

***Dandelion, it is  
only looking like!***

***• Latex is in the  
Root (approx. 10 -  
20 % w/w)***

***•Per-hectare yield  
is stated as 200  
kg/ha (hectare)***

***• Experiments  
were conducted  
mainly in USSR  
and in USA***

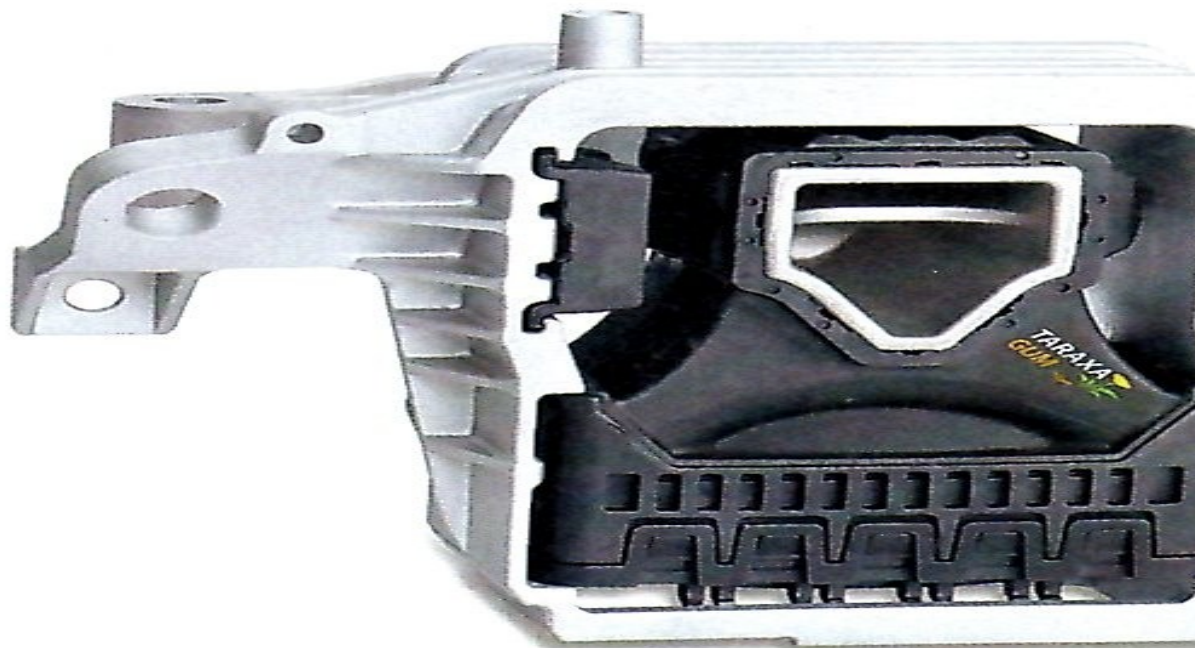


# Kde porosteš, pampeliško?

Navzdory rozšíření syntetického kaučuku se v autech stále používá přírodní guma. Typickými na pneumatikách a prvcích pružného zavěšení.

Continental představuje alternativní materiál označený jako taraxagum. Vyrábí ho z přírodních zdrojů, místo brazilského kaučukovníku však stačí kořeny pampelišek. Ekologický přínos spočívá v ušetření ohrožených tropických lesů i v nenáročném dopravě,

jelikož pampelišky lze pěstovat všude v oblastech mírného klimatu. Před dvěma lety Continental na bázi nového materiálu postavil zimní pneumatiku, nyní předvádí silentbloky pro zavěšení motoru, v nichž taraxagum dosahuje srovnatelných parametrů pružnosti i tepelné odolnosti jako klasická guma. Průmyslové nasazení materiálu závisí na možnosti pěstovat pampelišky v dostatečném objemu.



**Rubber bush  
Made of the  
Taraxacum  
kok-saghyz  
Natural  
Rubber**