

Parthenium argentatum

[Synonyms : *Parthenium argenteum*]

GUAYULE is an evergreen shrub. Native to south-western United States (state of Texas particularly) and to Mexico, it has small often yellow-tinged, white flowers.

It is also known as *Guayle-kumipensas* (Finnish), and Mexican rubber.

The flowers are pollinated by insects and wind. The seed shatters at maturity. Compared with other species in this genus this shrub contains more latex. It can be extracted from the roots and to a lesser extent the stems.

Guayule can be extremely invasive when introduced outside its native habitat.

Argentatum means 'silvery or silvered'.

The multitude of uses and benefits of rubber (not just for commercial, transportation and medical industries but also in military applications) and the fact that synthetic alternatives are unsuitable for certain products came to be well appreciated by many Western countries. As a result plant research scientists have long been interested in finding another natural source of rubber similar to that obtained from *Hevea* species which have dominated the market in the 20th Century. This is one of several plants (of over 2,000 rubber-producing species) that over decades has attracted their attention. It is interesting to note that like *Hevea* species its waterproofing attributes were also familiar to North American and Middle American Indians long before Europeans ever landed in those regions.

Some authorities recall that guayule's rubber was actually a major commodity for tyre production in the United States as early as the beginning of the 20th Century. But Mexican unrest in 1912 (the precursor of its Civil War) closed the Continental Rubber Company and other Mexican processing facilities. This, combined co-incidentally with the over-harvesting of the Mexican wild stands, halted guayule's gallop towards full commercial acceptance. Half-hearted attempts to establish research and development projects in the United States, which might have revived this plant's rubber future followed until the Second World War. As time passed (aside from other considerations) it was becoming more and more desirable to find some alternative source of suitable latex to reduce dependency upon the *Hevea* rubber plantations established in south-eastern Asia. There was an enthusiastic boost during the Second World War (1939-1946) when supplies from the Asian plantations dried up but still to no avail. From then until the 1970s all interest in guayule rubber ceased. Early in the 1970s however the world price of oil shot through the roof – and rubber research recovered its focus – a focus which is still relevant at the beginning of the 21st Century as despite ever-increasing demand for rubber, Asian rubber output is inexorably reducing with climatic changes and an emerging trend in Asia away from rubber plantations in favour of higher value agricultural farm crops.

Since then guayule (pronounced 'why-you-lee') maintains a leading position as a possible alternative source of rubber. Research has addressed quite a few issues (including the viable regeneration of the plant, and the need for reliability in a consistent high yield of quality latex) and in parallel as it continues commercial operations are now beginning to be established. It has already been appreciated that if successful guayule could offer

many diverse advantages – for instance, as the plant thrives in arid and semi-arid climates it could offer a commercial crop for regions where growth of conventional agricultural produce is impossible, the resinous by-products after rubber extraction have invaluable potential uses and rubber from *Parthenium* plants can be tolerated by people who are allergic to that derived from the ubiquitous *Hevea* species. With regard to the latter point these sufferers are estimated by some authorities as 10% of populations and they can experience a range of reactions from uncomfortable rashes to life-threatening shock. In recognition of their need (and the fact that the economics of such demand are viable) it seems that authorities believe it likely guayule will be used initially in the commercial production of medical products such as catheters, condoms, gloves, surgical balloons and tubing.

Researchers have also turned their spotlights on the plant remains (known as ‘bagasse’) left after rubber extraction and believe they may have identified several valuable applications for it. These include its use as an ingredient in ashless fuel or in paper pulp, the possibility of bonding it with recycled plastic to produce a viable and durable particle boarding – and a likely disaster for several types of termites and marine borers, the use of it in the form of a resin as an effective natural wood preservative for boats, decking, wooden buildings, and outdoor furniture.