Studia Universitatis "Vasile Goldiş", Seria Ştiinţele Vieţii
Vol. 21, issue 3, Jul.-Sep. 2011, pp. 547-550

PHYTOTHERAPY, AN ALTERNATIVE IN THE TREATMENT OF RHEUMATIC INFECTIONS

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ABSTRACT
The traditional medicine has been using plants for centuries for treating different rheumatic troubles and joint pains. Harpagophytum is an alternative in treating the rheumatic inflammatory diseases. The studies of numerous researchers show the anti-inflammatory and analgesic properties of this species. This study aims to be a synthesis of the data published so far in relation to Harpagophytum procumbens. The *anti-inflammatory and analgesic properties are based on the plant composition of glycosides. According to the study Harpagophytum* exercises the *anti-inflammatory and analgesic action by blocking the cyclooxygenase 2 and the nitric oxide followed by the blocking of the formation of prostaglandins (the inflammation and pain being mediated by the prostaglandins at the level of the inflammatory tissues). The use of Harpagophytum* in case of inflammatory or degenerative rheumatism brings about the improvement of the symptoms and represents a viable alternative to the medication with non-steroidal *anti-inflammatory drugs.*
Key words*: Harpagophytum procumbens,* osteoarthritis, *cyclooxygenase*.

INTRODUCTION

The species Harpagophytum procumbens (Devil's Claw) belongs to the family Pedaliaceae, being spread in Occidental and South Africa, especially in the Kalahari desert, in the steppes of Namibia and Madagascar, growing in very dry conditions, at heights of 500-1000 metres. It is a creeper with very strong tuberous roots from which secondary roots come out. The stem is covered with leaves growing opposite, 2-3 lobed, of green colour covered with fine hairs producing mucilage. The flower is trumpet-shaped, with the margins coloured in shades of pink to purple and yellowish to the centre; it flowers in December –February. Its spiny fruit has a particular shape, from which the name is derived, being oval and capsuled in a woody skin with two big central spines and 2 lateral rows of 12-16 arms bearing thorns. The seed are black and elongated. The plant grows under very dry conditions. The root is harvested at the end of the rainy season. The plant has been used in the traditional South-African medicine for many centuries in different rheumatic troubles, joint pains. The studies of the German Schmidts showed the presence of three glycosides with iridoid nucleus in the root (garpagoside, harpagide and procumbide) responsible for the analgesic effect of this plant. *Harpagophytum procumbens* contains, besides iridoid glycosides, sugars, oleanolic and ursolic acid, phytosterols, aromatic acids – caffeic, cinnamic and chlorogenic, flavonoids – luteolin and kaempferol. The whole plant is used for phytotherapeutic purpose, being harvested after flowering.

It is an anti-inflammatory drug, analgesic, hepatic, spasomolitic, antipyretic, hypoglicemiant, anti-hypertensive, diuretic, causing uterus contractions.

The anti-inflammatory action was particularly demonstrated in tendinitis, osteoarthritis or arthrosis with different localizations (gonarthrosis, coxarthrosis), rheumatoid polyathrtritis, ankylosing spondylitis, scapulo-humeral periarthritis, spondylosis, chronic back pains, muscular- ligamentous tensions and pains, troubles of the fibrous tissue (fibromyalgia), gout (favouring the elimination of the uric acid). [1]

It can be used as decoction – ½ - 1 teaspoon full of rhizomes is placed in a mug of water and it is boiled for 10-15 minutes. To be drunk three times a day. The treatment is continued at least one month. The tincture – 1-2ml of tincture three times a day.



Fig.1, 2, 3 *Harpagophytum procumbens* flower, aerial part, root

MATERIAL AND METHOD

This study aims to be a synthesis of the data published so far in relation to the anti-inflammatory and analgesic properties of the species *Harpagophytum procumbens*. The anti-inflammatory and analgesic properties are based on the plant composition of glycosides and numerous studies in vitro as well as in vivo confirm this action.

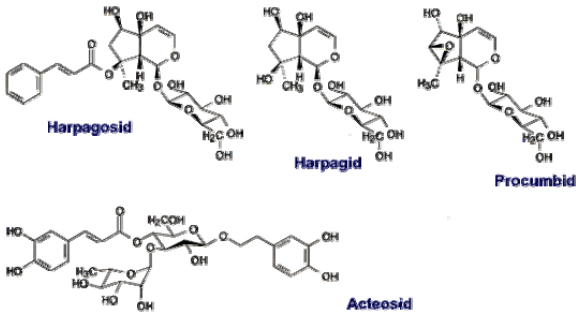

Fig. 4. Iridoid glycosides

A dried aqueous extract of devil's claw has been shown to exert a significant dose-dependent analgesic and anti-inflammatory effect in rats at 5 and 10 mg/kg. However, carrageenan-induced paw edema was not affected by the isolated harpagoside constituent, suggesting harpagoside may not have an anti-inflammatory effect, at least in the doses used in this animal model of inflammation. This suggests that other devil's claw constituents may be responsible for the anti-inflammatory effect.

Osteoarthritis (arthrosis of the knee, hip) was studied by Leblan et *all by* comparing the use of a powder extract of 435 mg capsules of *Harpagophytum* per day (about 60 mg harpagoside per day), with 100 mg from an anti-inflammatory drug called Diacerhein at 122 patients suffering from gonarthroris and coxarthrosis. [2]

Another study performed by Chrubasik *et all* compared the administration of an extract of 60 mg per day of harpagoside from the species *Harpagophytum* with 12,5 mg per day from the anti-inflammatory drug Vioxx for a period of 6 weeks at 79 patients with severe aggravations of the lumbar pains. The study proved that the plant had the same effects of reducing the pains as compared to the drug Vioxx. [3]

The anti-inflammatory effect was also studied by using watery extracts of *Harpagophytum procumbens* on the cell lines L929 at mice. [4]

The anti-inflammatory action determined in vitro on Devil's claw (100mg/ml) had no significant impact over the synthesis prostaglandin. [5]. Within the studies effected on test animals such as rats, mice and guinea pigs, the harpagoside reduced the inflammation experimentally induced. [6, 7,8].

RESULTS AND DISCUSSIONS

After 4 months, the patients under treatment with *Harpagophytum,* as compared with the Diacerhein drug, had excellent results manifested by reducing the pain and improvement of the joint mobility (comparable to the synthesis drug), not being though subject to side effects of the anti-inflammatory drug of chemical synthesis.

The study proved that *Harpagophytum* had the same effects of reducing the pain as compared to the rofecoxib drug, commercially designated as Vioxx, which was taken out the US market in 2002 as it was found to be associated to an increased risk of thrombotic events – acute myiocardial infarction.

The watery extracts of *Harpagophytum* proved to suppress the synthesis of prostaglandins (PG) type E2 and the production of nitric oxide by inhibiting the lipopolysaccharides from the fibroblasts of the cell line L929 at mice. According to the study *Harpagophytum* exercises the anti-inflammatory and analgesic action by *blocking the cyclooxygenase 2 and the nitric oxide*

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followed by the blocking of the formation of prostaglandins (the inflammation and pain being mediated by the prostaglandins at the level of the inflammatory tissues).

The E2 prostaglandin and the nitric oxide are newly synthesized chemical mediators of the inflammation of cellular origin. PGE2 is a derivate of the arachidonic acid, acid resulted from the membranous phospholipids under the influence of an enzyme, phospholipase, enzyme which is inhibited by the anti-inflammatory steroids. The metabolic evolution of the arachidonic acid under the influence of the enzyme cyclooxygenase (COX) leads to the formation of prostaglandins of which those having a more important role are prostacyclin (PGI2) causing vaso-dilation and inhibiting the platelet aggregation, the tromboxane A2 (TXA2) causing vaso-constriction and platelet aggregation and the molecules PGD2,PGE2,PGF2α with vaso-dilation properties and properties of increasing the vascular permeability. The cyclooxygenase presents two isoforms: COX1 (homeostatic action) and COX2 (enzyme appearing during inflammation and supposedly facilitating the inflammatory reply). [9]

The nitric oxide (NO) also known as EDRF (Endothelium-derived relaxing factor) is a gas produced by the endothelial cells, by macrophages and by the cerebral neurons. It produces vaso-dilation, adhesion and platelet aggregation.[10]

However, Devil's claw extracts were not as effective as indomethacin, nor were they as effective when given by mouth as when given by injection, apparently due to inactivation by gastric acids. .[11] In normal volunteers, three weeks of daily treatment with 2 grams of standardized Devil's claw extract had no impact on levels of prostaglandin E2, thromboxane B2, leukotriene B4, or 6-ketoprostaglandin F^{30}. In 13 arthritic patients treated for 13 weeks with Devil's claw tablets (410 mg TID) there were no significant improvements. In an open trial in 630 adults with joint pain, six months of treatment with Devil's claw extract in daily dosages of 1 – 3 gms TID resulted in pain relief in 42% - 85% (depending on site of pain); the only adverse effect was mild stomach upset even with the highest doses [12] In a double blind study of adults with joint pain, treatment with 770 mg TID of a standardized Devil's Claw extract resulted in significant improvement in pain and flexibility over two months; no side effects were reported. In two separate . randomized, double blind, placebo controlled trials of adults suffering from chronic low back pain, Devil's claw treatment provided significant improvement in pain scores within four weeks. [13]

Following the analysis on cell lines a study was performed, with a duration of 4 weeks, over 197 patients suffering from scapula-humeral periarthritis and chronic lumbar pains. The administration of *Harpagophytum* proved the reduction of pains and joint inflammation, obviously much more than the placebo lot.

CONCLUSIONS

The use of *Harpagophytum* in case of inflammatory or degenerative rheumatism brings about the improvement of the symptoms and represents a viable alternative to the medication with non-steroidal anti-inflammatory drugs which have many unwanted side effects and are counter-indicated for the patients with troubles at the level of the digestive tube (gastritis, ulcer), fro the patients with hepatic or renal insufficiency and those with bronchial asthma. The plant is safe and efficient if used under supervision and under guidance of the doctor.

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