

Fibre extraction from *Spartium junceum* L. (Fabaceae): ancient and present methods

A. MUSACCHIO¹, M. R. BARONE LUMAGA²

¹Dipartimento di Ecologia, Università della Calabria, 87036 Arcavacata di Rende, Cosenza, Italy; ²Orto Botanico, Università di Napoli Federico II, Via Foria 223, 80139 Napoli, Italy.
aldo.musacchio@unical.it mrbarone@unina.it

Abstract. *Spartium junceum* L. is used for the extraction of fibres with high tensile strength in some regions of Italy. Some families in Serrastretta (Catanzaro, Calabria region) extract fibre by retting for few minutes in hot water and then soaking in fresh water for 7-

10 days, followed by scutching. This method is more complex than that reported by Plinius (23/24-79 d.C.) for *genista* and appears similar to the accelerated extractive procedure reported in the XVI Century by Mattioli for *spartio*.

Key words: Fibre plant, Soaking, *Spartium junceum*

The use of *Spartium junceum* L. (Fig. 1) as a fibre plant is presently restricted to a few areas in the Mediterranean region. Some families in Serrastretta (Catanzaro, Calabria region, Italy) use this plant for the production of strong and valuable textiles. The fibres (Fig. 2) have high tensile strength: about 36% higher for *S. junceum* threads compared with *Linum usitatissimum* L. (AA.VV. 1965). *Spartium junceum*, as many other Fabaceae species, shows consistent structural variability (SCHWEINGRUBER 1990). The widths reported for *S. junceum* fibre cells range from 5 to 35 µm (AA.VV 1965), slightly wider than the range of 11.6-31.6 µm reported for *L. usitatissimum* (CATLING & GRAYSON 1982).

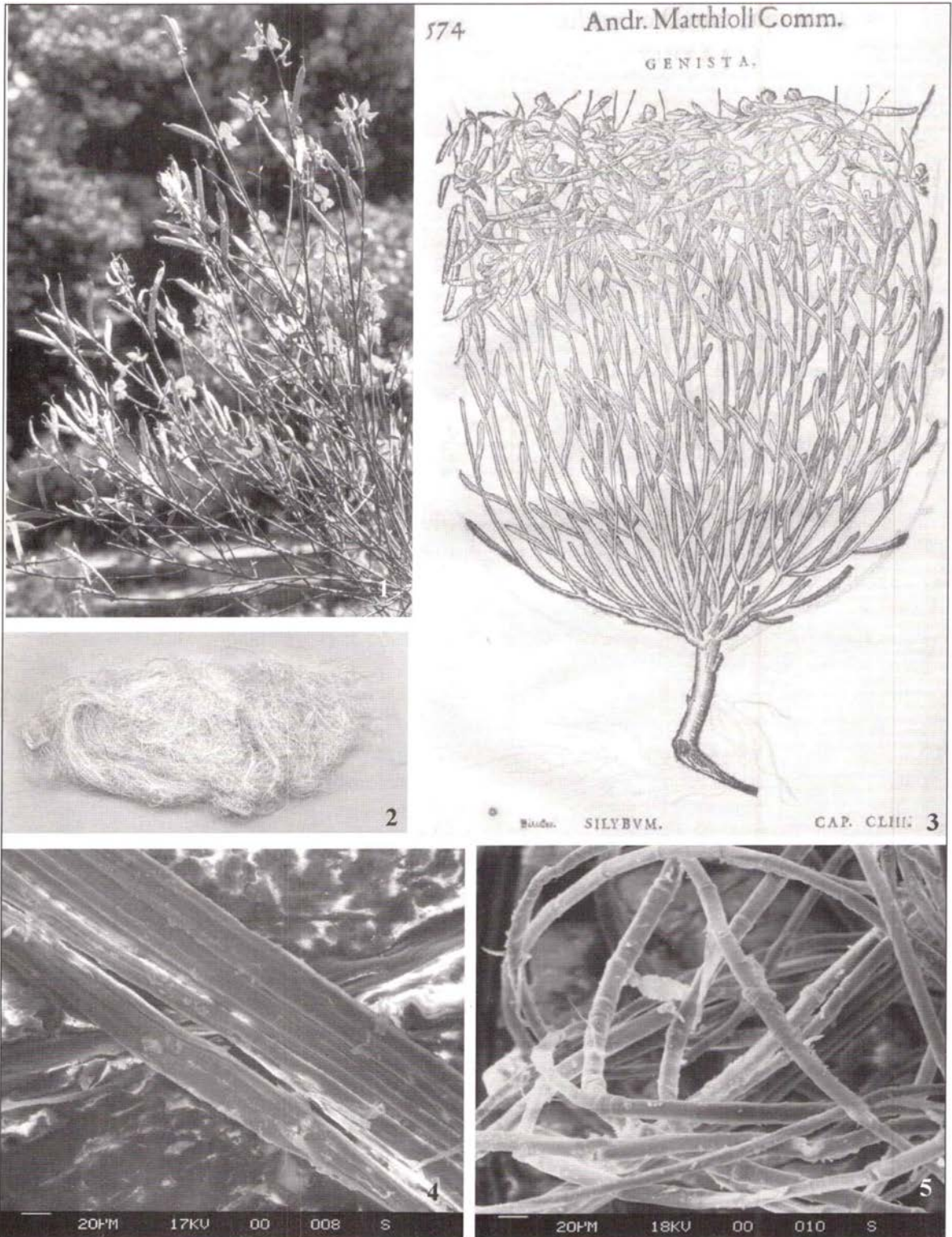
The use of broom as a fibre plant was first reported by Gaius Plinius Secundus (23/24-79 A.D.) in the XIX and XXIV books of the "*Naturalis historia*" dedicated to vegetables and useful wild plants, respectively. In these books, he mentions *genista* and reports the use of this plant, identified by himself as the "*sparton*" of Greek authors, for the production of fishing net and ropes. Plinius also specified that fibre extraction included soaking the stems for 10 days.

In the XXIV book Plinius (PLINIO 1985) distinguishes *spartum* plants introduced from Spain and Africa and similarly used for fibre production. He describes these plants separately from *genista*, listing proprieties applicable to different kind of

plants. *Spartum* is now thought by some authors to refer to grass plants, i.e. *Lygeum spartum* L. and *Stipa tenacissima* L. (FANTUZZI 1985). For *spartum* Plinio describes a more complex extractive procedure: the plants were bound for two days in bundles, dried in the sun, soaked in sea or fresh water, dried again in the sun and then soaked again. A quick method suggested the immersion of stems in hot water; then the stems were dried in bundles.

Pietro Andrea Mattioli (1501-1577) in the "*Discorsi*" and in the "*Commentarii*" (Fig. 3) affirms *genestra* (*genista*) and *spartio* (*sparthium*) to be very similar in appearance (MATTIOLI 1557, 1583) but he re-proposes the distinction between the two plants. In his works, Mattioli depicts *genestra* as a plant usually related to *Spartium junceum*. In these books the *spartio* is depicted with a morphology referable to a plant belonging to Fabaceae. The *spartio* reproduced in MATTIOLI (1557, 1583) is interpreted by MARIOTTI (1997) as *Lygos sphaerocarpa* (L.) Heywood. About the *genestra*, Mattioli mentions that the plant is used for the production of sack textiles; concerning the *spartio* Mattioli reports Plinius and describes the fibre extraction, explaining also the accelerated method including soaking by immersion of stems in hot water, followed by drying, and scutching, in fresh or sea water.

During the first decades of the XX Century, *S.*



Figs. 1-5 1- *Spartium junceum*; 2 - Fibres extracted from *S. junceum*; 3 - Reproduction of *genista* from MATTIOLI (1583); 4 - SEM image of fibres extracted from *S. junceum*; 5 - SEM image of fibres extracted from *Linum usitatissimum*.

junceum was an economically relevant fibre plant in Italy. During those years the soaking was industrially carried out using hot alkaline solutions. Unfortunately, the industrial production has now practically disappeared and only few regions (Calabria, Basilicata, and Toscana) have centres where the broom is still used as a fibre plant (AA.VV 1965).

In Serrastretta (Catanzaro, Calabria) some families use *S. junceum* for fibre extraction. The methods utilised include retting for few minutes in hot water and soaking in fresh water for 7-10 days, followed by scutching. These methods lead to the production of filaments with a regular fibre arrangement. Observations by Scanning Electron Microscopy show that the *S. junceum* threads (Fig. 4) have a stronger alignment than *L. usitatis-simum* (Fig. 5) at the same stage of processing.

The working methods used by the people

manufacturing *Spartium junceum* seem more similar to the accelerated method reported by MATTIOLI (1557) for *spartio*, rather than to the ancient and recent extractive methods elaborated for *genista*. Especially, they are more complex than that reported by Plinius for *genista*.

Plinius, in "*Naturalis historia*" (PLINIO 1985), describes *Spartium junceum* only as a source for strings or for the production of fishing net; this fibre plant is reported by Mattioli in the XVI Century as used also for the production of ropes and sack cloth. In today's manufacturing it is used for the production of sack cloth and other useful textiles.

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