

## PLANT TAXA USED AS BROOMS IN SEVERAL SOUTHEAST EUROPEAN AND WEST ASIAN COUNTRIES

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The aim of this study is to determine the plants used as brooms by individuals and municipal authorities in some Southeast European (Bulgaria and Turkey) and West Asian (Azerbaijan, Saudi Arabia and Yemen) countries. The study was carried out from 1999 to 2005. At the end of the study, it was identified that 19 plant taxa belonging to 12 different families were used as brooms in the five countries. Among these species, *Sorghum bicolor* (broomcorn) was determined to be used extensively by municipal authorities for sweeping streets (Bulgaria) and by individuals for houses (Turkey and Azerbaijan). *Erica* sp. (tree heath) is commonly preferred by municipal authorities for sweeping streets in many areas of Turkey. We have established that the panicles and above ground parts of these plants are mostly used as brooms. Asteraceae is the largest family, represented by five species used as brooms. It is followed by Plumbaginaceae and by Poaceae with two species.

**Keywords:** Broom, plant, tradition, ethnobotany, Southeast Europe, Western Asia

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Cilj ovog rada jest utvrditi koje se biljke koriste za izradu metli u nekim jugoistočnoeuropskim (Bugarska, Turska) i zapadnoazijskim zemljama (Azerbejdžan, Saudijska Arabija, Jemen). Istraživanje je trajalo od 1999. do 2005., a utvrđeno je da se u 5 zemalja za izradu metli koristi 19 biljnih svojiti, koje pripadaju u 12 različitih porodica. Među tim vrstama ističe se *Sorghum bicolor* (sirak) koji se široko koristi i od strane lokalnih vlasti pri čišćenju ulica (Bugarska), i od strane stanovništva pri

čišćenju kuća (Turska, Azerbejdžan). *Erica* sp. (crnjuša) se više koristi od strane lokalnih vlasti pri čišćenju ulica u mnogim područjima Turske. Utvrdili smo da se za metle najčešće koriste metlice i nadzemni dijelovi ovih biljaka. Porodica Asteraceae zastupljena je s pet vrsta, a porodica Plumbaginaceae i Poaceae s dvije vrste.

**Ključne riječi:** metla, biljka, tradicija, etnobotanika, jugoistočna Europa, Zapadna Azija

## INTRODUCTION

Cleanliness is one of the most important things that humans value. All humans try to clean themselves in one way or another. A famous Turkish proverb goes: »You can tell a lion from where he dwells«. Meaning: A person's character shows itself from his surroundings. With the development of new technologies, cleaning has become easier compared to the past. However, in some places where technology is unavailable or deficient, the traditional methods are still widely used. One of the cleaning processes that are used is sweeping and the preferred implement is still the broom. Along with vacuum cleaners and brooms or brushes that have a lot of parts derived from hydrocarbons, brooms from natural sources are commonly used.

The names of the brooms show differences from one country to another, even from one region to another within the same country. Various species, such as *Cytisus scoparius* (L.) Link (English or Scotch broom), *Genista monspessulana* (L.) Johnson (Canary, French, Cape or Montpellier broom), *Spartium junceum* L. (Spanish broom), and *Cytisus striatus* (Hill) Rothm. (Portuguese broom) are known to be named after country names (LEBLANC, 2001).

Because brooms made out of plants are very cheap, they are still used as cleaning implements in poorer areas of the world. For this reason, they are in demand in some urban areas as well as rural areas (PANDIT & THAPA, 2004). In some parts of the world, broom production is a very important source of earnings for poorer individuals. They earn most of their income from this occupation (ANONYMOUS, 2002; RAO & SUSEELA, 2002; SAIGAL & SHARMISTHA, 2003; PANDIT & THAPA, 2004), particularly the women of those households (JOHN, 2001).

The aim of this study is to determine and present the plants traditionally used as brooms in different cultures as well as in different countries. This pattern of usage is, however, on the decline.

## METHODS

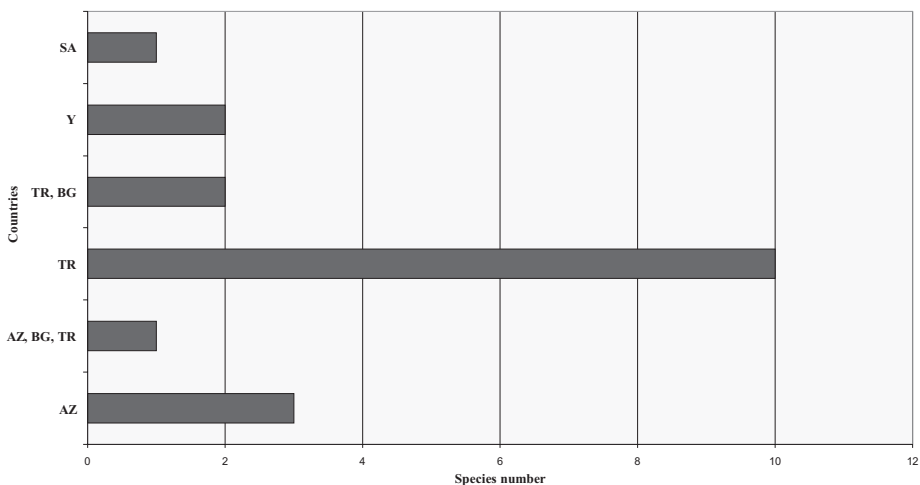
The plants used as brooms by individuals and some municipal authorities in Azerbaijan, Bulgaria, Saudi Arabia, Turkey and Yemen were analyzed. The study was carried out over seven years (1999–2005). The data about the plants were gathered from the people who make and use brooms, with the help of researchers in the aforementioned countries. The collected data, namely, scientific names of the plants, the families they belong to, common names in English, their local names, the parts used, where they are used, and their life forms (whether they are wild or cultivated) and the countries in which they are used are presented in the table. Photos of some brooms and plants are also presented in this paper.

## RESULTS AND DISCUSSION

Most plants used as brooms exhibit a natural distribution. After the collected mature plants have been made into brooms, they are either sold or used by the makers themselves. Collected plant materials are dried, and if necessary, a handle is attached and tightly tied with a plastic filament or a wire (MAZDRAKOV, 1961). Some brooms are used in cities to sweep the streets and roads; some are used for cleaning houses, lawns, yards and gardens. Besides cleaning, some brooms, such as *Grewia oppositifolia* Roxb., *Hibiscus manihot* L. and *Calamintha nepeta* (L.) Savi, are used for the collection of grains during threshing (RAWAT *et al.*, 2000; SALERNO *et al.*, 2005).

In this report, 23 plant taxa used for brooms in five different countries have been identified (Tab. 1). When the same species used in different countries are counted, a total of 19 taxa were obtained (Fig. 1). These taxa belong to 12 families. The most commonly used taxon is *Sorghum bicolor*. This result is supported by other researchers (UPHOF, 1959; JORDANOV, 1964; STOJANOV *et al.*, 1966; HEDRICK, 1972; SCHERY, 1972; VAKARELSKI, 1977; GRIEVE, 1998; SALERNO *et al.*, 2005; NEDELCHEVA *et al.*, 2007). Asteraceae is the most represented family with five species, followed by Plumbaginaceae and Poaceae with two species each (Fig. 2). Among the determined plants, only *Erica* is represented at the genus level. All members of this genus are used as brooms. Only four of the plants collected are monocotyledonous (*Phragmites australis.*, *Sorghum bicolor*, *Phoenix dactylifera* and *Washingtonia filifera*) and all the others are dicotyledonous. *Artemisia* is the most represented genus with three species. It is followed by *Limonium* with two species.

At the end of our study, plants with different features caused by geographical and climatic differences were determined. For example, in the Arabian Peninsula,



**Fig. 1.** The distribution of taxa used in different countries in the study area. Legend: AZ: Azerbaijan, BG: Bulgaria, SA: Saudi Arabia, TR: Turkey, Y: Yemen.

Tab. 1. The plants determined as being used as brooms in the study area.

| Scientific name  | Family          | English name              | Local name                        | Status | Place of use | Part of plant used | Life form | Country |
|--|-----------------|---------------------------|-----------------------------------|--------|--------------|--------------------|-----------|---------|
| <i>Arenaria gypsophilioides</i> L.   | Caryophyllaceae | Sandwort                  | Süpürgeotu                        | N      | Street, home | Aboveground        | Ph        | TR      |
| <i>Artemisia annua</i> L.  | Asteraceae      | Annual wormwood           | Sirken süpürge                    | C      | Yard         | Aboveground        | Ah        | AZ      |
| <i>Artemisia meyeriana</i> Bess.   | Asteraceae      | Wormwood                  | Boz yovşan                        | N      | Yard         | Aboveground        | Ph        | AZ      |
| <i>Artemisia scoparia</i> Waldst. & Kit  | Asteraceae      | Redstem wormwood          | Süpürgelik                        | N      | Yard         | Aboveground        | Bh        | TR      |
| <i>Chamaecytisus austriacus</i> (L.) Link  | Fabaceae        | Austrian clustered broom  | Süpürgelik                        | N      | Street, yard | Aboveground        | Sh        | TR      |
| <i>Erica</i> sp. (Especially <i>E. arborea</i> L. and <i>E. manipuliflora</i> Salisb.) | Ericaceae       | Tree heath, Heath         | Strandzhanski piren-Funda-TR      | N      | Street, yard | Aboveground        | Es        | TR, BG  |
| <i>Kochia scoparia</i> (L.) Schrad.  | Chenopodiaceae  | Fireweed, Kochia          | Obiknovena metla-BG Süpürgeotu-TR | C/A    | Street, yard | Aboveground        | Ah        | BG, TR  |
| <i>Limonium scoparium</i> (M.Bieb.) Stankov  | Plumbaginaceae  | Sea lavender              | Göy süpürge                       | N      | Yard         | Aboveground        | Ph        | AZ      |
| <i>Limonium gracuum</i> (Poiret) Rech. f.  | Plumbaginaceae  | Sea lavender              | Kunduzotu                         | N      | Street, yard | Aboveground        | Ph        | TR      |
| <i>Osyris alba</i> L.  | Santalaceae     | Dyer's broom, White broom | Süpürge çalısı                    | N      | Street       | Aboveground        | Sh        | TR      |

| Scientific name                                     | Family           | English name                     | Local name  | Status | Place of use | Part of plant used | Life form | Country    |
|---|------------------|----------------------------------|---|--------|--------------|--------------------|-----------|------------|
| <i>Phoenix dactylifera</i> L.                       | Arecaceae        | Date palm                        | Nakheel   | N      | Street       | Leaflet            | Tc        | Y          |
| <i>Phragmites australis</i> (Cav.) Trin. ex Steudel | Poaceae          | Common reed                      | Kamiş   | N      | Home         | Panicle            | Pg        | TR         |
| <i>Pimpinella tragium</i> Vill.                     | Apiaceae         | Pimpinelle saxifrage             | Geyzi   | N      | Yard         | Aboveground        | Ph        | TR         |
| <i>Polygonum bellardii</i> All.                     | Polygonaceae     | Narrow leaf knotweed             | Stüpürge  | N      | Yard         | Aboveground        | Ah        | TR         |
| <i>Scrophularia orientalis</i> L.                   | Scrophulariaceae | Figwort                          | Scacaotu  | N      | Yard         | Aboveground        | Ph        | TR         |
| <i>Sorghum bicolor</i> (L.) Moench                  | Poaceae          | Broomcorn, Shattercane           | Teknik hint dansı-AZ<br>Metla-BG<br>Stüpürge dansı-TR | C      | Street, home | Panicle            | Ah        | AZ, BG, TR |
| <i>Tagetes minuta</i> L.                            | Asteraceae       | Muster, John Henry               | Narjes bari   | N      | Street       | Aboveground        | Ah        | Y          |
| <i>Washingtonia filifera</i> (Lindl.) Wendl.        | Arecaceae        | California fan palm, Desert palm | Nahle   | C      | Street, home | Leaflet            | Tc        | SA         |
| <i>Xeranthemum annuum</i> L.                        | Asteraceae       | Pink everlasting, Immortelle     | Dağ karanfili   | N      | Yard         | Aboveground        | Ah        | TR         |

Abbreviations: C: cultivated, N: native Ad: Adventive, Ah: Annual herb, Bh: Biennial herb, Ph: Perennial herb, Pg: Perennial grass, Sh: Shrub, Es: Evergreen shrub, Tc: Tree with cylindrical trunk, AZ: Azerbaijan, BG: Bulgaria, SA: Saudi Arabia, TR: Turkey, Y: Yemen

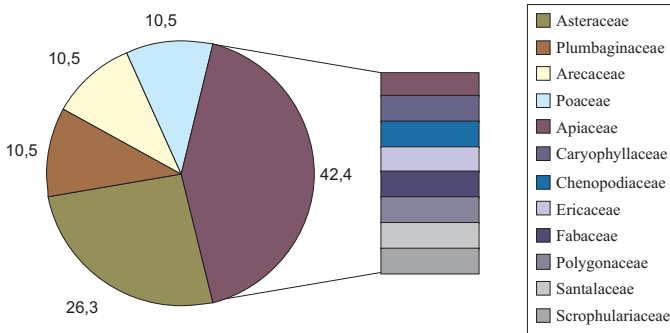


Fig. 2. Plant families found in the study (in %).

brooms made from *Washingtonia filifera* and *Phoenix dactylifera* are commonly used, because palms are common in these countries. However towards the north, palms are not preferred, although they are commonly cultivated, mainly due to the fact that collecting plant materials for brooms is difficult. Instead, herbaceous plants such as *Artemisia* are more commonly preferred.

Most of the plants identified are distributed naturally (78.9%) in the regions where they are used although a few of them are cultivated (15.8%). Among the plants, only *Sorghum bicolor* is an economic species and cultivated especially for brooms in Azerbaijan, Bulgaria and Turkey and it is unique in this respect (Fig. 3). Indeed, no other species is cultivated for this reason only. *Kochia scoparia* is not cultivated for commercial reasons. Other species are either directly collected from natural habitats to be used as brooms or for other purposes. *Sorghum bicolor* is cultivated extensively in Bulgaria. The plants are mainly exported from Bulgaria to Turkey after being made into brooms. The plant is cultivated in limited areas in Turkey. To meet the demand in Turkey, they are imported from Bulgaria. A lot of people both in Turkey and Bulgaria make their living out of manufacturing brooms. Brooms with a long handle are used for cleaning large areas and streets, while brooms with no handle are preferred for smaller places such as houses. Brooms obtained from *Sorghum bicolor* are mainly used for sweeping the streets in Bulgaria, whereas they are mostly used for cleaning houses in Azerbaijan and Turkey.

The aboveground parts of most of the plants are used for producing brooms (78.9%) (*Artemisia annua*, *Artemisia meyeriana*, *Artemisia scoparia*, *Arenaria gypsophiloides*, *Limonium scoparium*, *Limonium graecum*, *Tagetes minuta*, *Erica* sp., *Osyris alba*, *Pimpinella tragium*, *Polygonum bellardii*, *Scrophularia orientalis* and *Xeranthemum annuum*). These parts are preferred, mainly because these are bushes and herbaceous plants. Among these plants, the panicles of only *Sorghum bicolor* and *Phragmites australis* and the leaflets of palms are used for this purpose (10.5%). In fact, *Washingtonia filifera* and *Phoenix dactylifera* are mainly cultivated for ornaments or as food. Because the flora is not very rich in Saudi Arabia and Yemen, the leaflets of these plants are preferred as brooms, because the people do not have many options (10.5%). Interestingly, in an article named »Plants in the Works of Cervantes« writ-



Fig. 3. Brooms from *Sorghum bicolor* from Bulgaria. a. Broom seller in a street market in Sofia, b. Brooms of various sizes.

ten by PARDO-DE-SANTAYANA *et al.* (2006), *Phoenix dactylifera* was reported to be used in Spain as a broom during the 1500s.

In some cities of Turkey and Bulgaria, *Erica* sp. is a bush commonly used for sweeping the streets (STOJANOV & KITANOV, 1960; BAYTOP, 1994; BASER, 1997). For example in Izmir, most brooms made out of »tree heath« are used for cleaning the



**Fig. 4.** Brooms from *Erica* sp. **a.** *Erica* sp. in nature. **b.** Plants which are readied for making into brooms. **c.** Traditional broom makers in Izmir. **d.** Dry broom used by street sweeper in Izmir.







Fig. 5. A broom from *Artemisia scoparia*, common in several rural areas near Izmir.

streets of the city (Fig. 4). Considering that Izmir is the third largest city in Turkey and has a population of more than two million people, the scope of the issue is apparent. This large usage of tree heath threatens the plants and therefore some species of the genus may become extinct, if not carefully used. Outside our study area, this plant is reported to be used as a broom in Italy (SALERNO *et al.*, 2005). *Sorghum bicolor* is also used in Izmir for cleaning houses but very seldom for sweeping the streets. In some small towns, species such as *Limonium graecum* are preferred. In some rural areas of Izmir, *Artemisia scoparia* is used as broom (Fig. 5). In the past, this plant was preferred by small municipal authorities of Izmir, whereas nowadays it is mainly used by the individuals for brooming their gardens. Outside our study area, this plant is reported to be used as a broom in Pakistan (KHAN *et al.*, 2003).

Green (fresh) branches and shoots of the bushes, *Vaccinium scoparium* Leiberg. and *Vaccinium parvifolium* Sm. Red, belonging to the same family as *Erica* sp., which is used as broom in Turkey, are preferred for producing brooms in North America (Moerman, 1998). Some brooms work better due to their hard structures, while some others made from plants such as *Phragmites australis* in the study area, are used for cleaning sensitive surfaces, i.e. dusting ovens. It has been reported in the related literature that in some other countries, plants such as *Thysanolaena maxima* (Roxb.) O. Ktze. (RESURRECCION, 2000; SHARMA *et al.*, 2001) and *Thymelaea hirsuta* (L.) Endl. (DIEDERICHSEN *et al.*, 2002) are preferred for sensitive surfaces.

Although *Ficus carica* L., *Inula viscosa* (L.) Aiton, *Laurus nobilis* L., *Ruscus aculeatus* L. are commonly distributed in our study area, there are no findings of their usage as brooms. Outside our study area, however, SALERNO *et al.* (2005) reported that these plants are used as brooms in Italy. Again, SALERNO *et al.* (2005) reported the usage of green branches of *Euphorbia characias* L., *Laurus nobilis*, and *Ruscus aculeatus* in Italy. In our study, there is no observation regarding the usage of fresh branches of such taxa. All of the plants studied in these report are used after they are dried. They are made into brooms when they are still fresh and used for cleaning after they dry.

ERTUG (2000) in an ethnobotanical survey conducted in Central Anatolia reported that *Centaurea pulchella* Ledeb. and *Chenopodium album* L. were used for broom production. However, we could not obtain any data about these plants in our study.

Some broom plants, many of which grow naturally, are in danger of extinction due to excessive use, because of the high demand in both rural and urban areas. *Thysanolaena maxima* (Roxb.) O. Ktze., one of the plants used for broom making in countries such as Nepal, India, Philippines and China, is made into brooms by villagers before the seeds mature. While the upper part is used for broom making, the lower part of the plant is used as fodder for livestock. However, this over-consumption is making the species vulnerable to local extinction (PANDIT & THAPA, 2004). In Turkey, *Erica* sp. is also facing slow extinction due to over-collection from nature.

Poaceae members and palms are the most preferred plants as brooms in the world. In our study, only *Sorghum bicolor* and *Phragmites australis* are Poaceae members. In other studies, some of the other members of Poaceae that are used as brooms are listed below: *Vetiveria zizanioides* (L.) Nash (RAO & SUSEELA, 2002), *Saccharum spontaneum* L. (KHAN *et al.*, 2003), *Pennisetum typhoides* (Burm.) Stapf. & Hubb. and *Eleusine coracana* (L.) Gaertn. (RAWAT *et al.*, 2000), *Thysanolaena maxima* (FU *et al.*, 2003; SAIGAL & SHARMISTHA, 2003; PANDIT & THAPA, 2004), *Phragmites australis* (DUKE, 1979; OZTURK & OZCELIK, 1991), *Arundo donax* L. and *Arundo pliniana* Turra (SALERNO *et al.*, 2005) and *Sporobolus diander* (Retz.) P. Beauv. (MITRA & MUKHERJEE, 2005).

Palms are probably one of the most interesting groups of plants that are commonly used besides Poaceae. In addition to their economic importance for individuals (BERGERT, 2000; CAMPOS & EHRINGHAUS, 2003; KAMBLE, 2003), they are traditionally among the most frequently used plant species in many African, Asian and South American countries (MCKEAN, 2003). All parts of the plants, especially the leaves, trunks and fruits are used extensively. According to CAMPOS & EHRINGHAUS (2003), leaves of various palms are used not only in broom making but also for string, thatching material, hammocks, fishing nets, basket, ritual clothing, bracelets, fans, hats, toy animals, sieves, mats, rooftops, bridges, tobacco wrapping, lashing material, and tree climbing strings in the Southwest Amazon alone. In our study, only *Washingtonia filifera* and *Phoenix dactylifera* were determined to be used as brooms. Outside Yemen, as reported by KAMBLE (2003), *Washingtonia filifera* is used as a broom in India. In other studies, *Cocos nucifera* L. (CHAN & ELEVITCH, 2005, MATIUS, 2004), *Cocothrinax barbadensis* (Lodd. ex Mart.) Becc. (JOHN, 2001), *Trachycarpus fortunei* (Hook.) H. Wendl. (JONES, 1995; KREMPIN, 1993), *Phoenix acaulis* Roxb. (SAIGAL &

SHARMISTHA, 2003), *Arenga pinnata* (Wurmb) Merrill (MATIUS, 2004), *Chelyocarpus ulei* Dammer and *Oenocarpus bataua* Mart. (CAMPOS & EHRINGHAUS, 2003), *Elaeis guineensis* Jacq. (BERGERT, 2000) are also reported to be used for broom making.

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