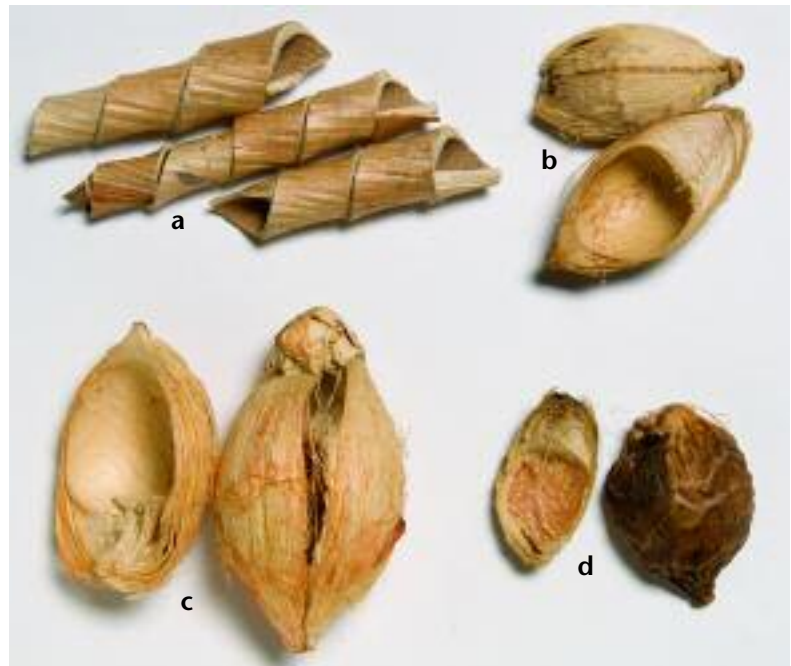


What's in the Pack? Palm Potpourri Ingredients

FRANCES E.M. COOK
*Jodrell Laboratory,
 Royal Botanic Gardens,
 Kew, Richmond, Surrey
 TW9 3AB, U.K.
 f.cook@kew.org*

1. *Areca catechu* potpourri items. **a.** leaf sheath fibers (Fiber Curls) EBC-PP 636; **b.** endocarp (Fiber Pod Halves) EBC-PP 109; **c.** endocarp (Bleached Betel Halves) EBC-PP 464; **d.** endocarp with exocarp (Fiber Cup Halves) EBC-PP 305.



Potpourri is big business. Potpourri packs are on sale everywhere, from trendy design shops and luxurious department stores to everyday supermarkets and the humble corner shop. The packs are bursting with botanical products from all over the world, but there is precious little information available as to what species are actually inside. Should we be concerned? Are they harvested sustainably? Might they harbor health risks? This paper looks inside the packs and describes the contribution made by palms.

Traditionally, potpourri was a mixture of dried, naturally fragrant, decorative plant material (especially flowers and petals) that was placed in bowls or pomanders to provide a gentle natural scent in the home. More recently, potpourri mixtures have evolved to include exotic, tropical, dried plant material that looks stunning but needs the addition of fragrances to fulfill the aromatic role. The stylish assortments of plant fragments are sold in packs that are carefully designed for color, texture, fragrance and form. The styles are forever changing to vary with the season, fashion and to encourage continuing demand.

Since 1990 the Centre for Economic Botany at the Royal Botanic Gardens, Kew has worked with companies involved in the design and production of potpourri packs for sale in the United Kingdom. The team has advised on the identification, conservation status and toxicity of nearly 1000 samples. A good proportion (about 6 %) of these involved palms. Samples, however, are often incomplete specimens, frequently fragmented, dyed, bleached and treated in many ways. Even top palm taxonomists have to pit their wits to identify them, and sometimes identifications are tentative. As well as taxonomic expertise, Kew's herbarium, carpological collections and library references have been invaluable. So far, 53 palm potpourri samples have been identified and added to Kew's Economic Botany Collection (EBC). These represent 36 different items from 17 species. (Potpourri samples from the same species are classed as different items if they utilize different plant parts or if the same plant part is shaped differently, e.g. twisted versus straight cut leaves).

Dried decorative botanical material (for both dried flower arrangements and potpourri) used in European markets has also been reviewed by Rohrer (1984), Sprunger and Wieler (1992) and Sprunger (2003). Although there is some overlap between palm taxa represented in these references and Kew's collection, 11 taxa are exclusive to the Kew collection whilst 17 items (including 6 taxa) are exclusive to the cited references. Furthermore, there are many well illustrated catalogues from wholesalers and distributors of dried decorative botanical material available on the internet, many from the U.K., Netherlands, India, Thailand, Australia and U.S.A. Just a few examples include:

Pierce A. Arnold & Son (UK)
www.piercearnold.co.uk,

Decofleur (Netherlands)
decofleur.bulbshop.nl/,

VAC International (India)
vacinternational.com, and

COAST Wholesale Florist (USA)
www.coastwholesaleflorist.com

Usually, product lists provide English names rather than Latin botanical names. Names tend to be loosely descriptive, e.g. King Spear, Palm Medallion, Palm Curly and Arrow Leaves. Only occasionally do they provide a clue to botanical identity, e.g. Uxi Cones, Raffia Bundle, Coco Boat and Coconut Crowns. Wholesalers' catalogues have not been trawled exhaustively for additional palm potpourri, but most items are covered in this paper or in the earlier reviews cited above.

Palm Species Identified in Potpourri

An annotated, alphabetical list of palm potpourri species is given below. The majority of items are illustrated in Fig. 1–6 where their EBC accession numbers and supplier's common names are given. For items not represented in this collection, reference sources are cited.

Allagoptera arenaria (M.Gómez) Kuntze. The Seashore Palm is widely cultivated throughout South America for its sweet, fibrous fruits which are eaten fresh or made into a drink (Haynes & McLaughlin 2000). Infructescences are used as a dried decorative plant material (Sprunger 2003: 185, Sprunger & Wieler 1992: 71).

Areca catechu L. (Fig. 1). Betel Halves, Fiber Pod Halves, Fiber Cup Halves are various names for potpourri components from the endocarp of *Areca catechu* fruits. Frequently these cups are bleached and occasionally they include the exocarp too. They are waste products from the Betel nut trade, the nuts being a popular masticatory stimulant (Plant Cultures 2005). Occasionally curled leaf sheath fibers, Fiber Curls, are also used.

Attalea speciosa Mart. (syn. *Orbignya phalerata* Mart.). The Babassu is one of the most economically important Brazilian palms and wild stands are exploited for multiple uses including oil, flour, thatch, baskets, mats, fermented beverages and palm hearts (IPK 2002). Male inflorescences and infructescence rachises have decorative uses for floral arrangements (Sprunger & Wieler 1992: 57, 116).

Borassus flabellifer L. (Fig. 2). The Toddy or Palmyra palm is extensively used for a wide range of purposes in India, northern Sri Lanka and mainland south-eastern Asia (Davis & Johnson 1987, Uhl & Dransfield 1987). It probably contributes the largest number of individual components to potpourri of any plant, palm or non-palm. Leaves may be twisted or their bases cut into spear and fan shapes. In the trade these components are known as Twisted Leaves, Palm Spears and Pammy Leaves, respectively. Husks, also, are cut and made into leaf shapes known as Spear Leaves. The whole perianth (calyx and corolla) without the fruit (Palm Blute) and individual parts of the perianth are used; the latter is sometimes painted gold (Palm Cup Petals). From the fruit, halved fibrous mesocarp (Gyan Pods) and shaved mesocarp are obtained. Additionally, the whole male inflorescence and whole fruit are illustrated as dried decorative material in Rohrer (1984: 22), Sprunger (2003: 186), Sprunger and Wieler (1992: 32, 81). The

male inflorescences are sometimes straight and sometimes curled – both make a striking display – and they are also used sliced (Palm Snake, cut).

Brahea dulcis (Kunth) Mart. Male inflorescences of the Rock Palm or Sombrero Palm from Mexico and Central America are occasionally used as dried decorative material (Sprunger & Wieler 1992: 32) but the species is more commonly noted for the use of its leaves in hats and for its edible fruits (IPGRI 2000–2006.)

Calamus spp. and other rattans (Fig. 3). Although stripped and curled rattan stems are to be found in potpourri (e.g. Curly Thing, probably from *Calamus viminalis* Willd.), rattan species are mainly represented by individual fruits (e.g. *Calamus acanthospathus* Griff., Rattan Seeds and *Daemonorops jenkinsiana* (Griff.) Mart., Cane Fruit) and fruiting branches (e.g. *Calamus andamanicus* Kurz, Andy Cane Berries, *Calamus viminalis* Willd., Canella

2. *Borassus flabellifer* potpourri items. a. mesocarp (Gyan Pod) EBC-PP 776; b. shaved mesocarp EBC-PP 598; c. perianth (Palm Blute) EBC-PP 312; d. perianth part (Palm Cup Petal) EBC-PP 770; e. male inflorescence (Palm Snake, cut) EBC-PP 689; f. husk (Spear Leaf) EBC-PP 767; g. part of leaf (Pammy Leaf) EBC-PP 100; h. part of leaf (Palm Spears) EBC-PP 679; i. leaf parts (Twisted Leaf) EBC-PP 606.



berries with stem and *Calamus longisetus* Griff. (Sprunger 2003: 186, Sprunger & Wieler 1992: 81).

***Caryota urens* L.** (Fig. 4). *Caryota urens* is a multipurpose palm from South and South East Asia. It is an important ornamental species but the trunk yields starch in times of famine. It is tapped for sugar or palm wine, the apex can be eaten cooked and kittul fiber, obtained from the fibrous vascular bundles, is exported from Sri Lanka (CSIR 1950, Flach & Rumawas 1996). For potpourri, the infructescence rachis is bent into a spring shape (Turia Spring or Twig Spring).

***Cocos nucifera* L.** (Fig. 5). The coconut palm, one of the most economically important palm species, provides many different components to the potpourri trade. The majority of items are fruit parts including the endocarp (Coconut Shell), mesocarp and epicarp (Coco Curl or Coco Cut), perianth (Coco Flowers or Coco Heads) and the individual parts of the perianth (Coco Petals). Additionally, curled peduncular bracts known as Maha Curl are most likely to be from the coconut. Rohrer (1984: 13, 20), Sprunger and Wieler (1992: 86, 204) and Sprunger (2003: 186) add two items to this list: whole peduncular bracts and the fruiting stalk with perianth but not fruit.

***Hyphaene compressa* H.Wendl.** (Fig. 4). Fruits of this African species occur in potpourri occasionally (as Palm Seed) despite their importance for food and drink within Eastern African cultures.

***Hyphaene thebaica* (L.) Mart.** The Doum Palm, an African and Arabian species, also cultivated in India and Sri Lanka, is esteemed for many uses. Trimmed leaves, infructescences and infructescence rachises are illustrated as dried decorative material in Rohrer (1984: 12, 13), Sprunger and Wieler (1992: 100, 172) and Sprunger (2003: 186).

***Latania loddigesii* Mart.** The fruits of the Blue Latan Palm, an ornamental fan palm, appear in Sprunger and Wieler (1992: 208) but not in the later volume (Sprunger 2003). Apparently, the red shelled seeds are useful in Christmas floristry. No samples have been received in Kew's potpourri work. This species is a popular landscape plant on account of its blue foliage, especially when younger.

***Mauritia flexuosa* L.f.** (Fig. 4). *Mauritia flexuosa* is an important multipurpose palm in the South American region between the

Orinoco and Amazonas (IPK 2002). Potpourri items include fruits (Wood Orange) and male inflorescences (Rohrer 1984: 22 and Sprunger & Wieler 1992: 56).

***Metroxylon sagu* Rottb.** The infructescences of the Sago Palm are useful dried botanical material (Rohrer 1980: 12, Sprunger 2003: 187) especially in decorating candles and balls for Christmas displays (Sprunger & Wieler 1992: 112). They are sometimes partially dyed. Of course, the main use of the sago palm is for the starch, from the trunk, used on an industrial scale for both food and non-food uses (Flach & Rumawas 1996).

***Phoenix* spp.** (Fig. 6). Short lengths of leaves from *Phoenix sylvestris* (L.) Roxb., the Wild Date Palm, from India and Pakistan are used either free (Strip Grass) or tied into bundles (Strip Grass Bundles) or sometimes leaves are woven into Sunny Medallions and used as 'toppers' in potpourri packs. Leaves of the Dwarf Palm (*Phoenix loureiroi* Kunth), an ornamental and fiber species, and infructescence branches of *Phoenix sylvestris* (Date Bunches), are occasional potpourri items as are those of *Phoenix dactylifera* L., according to Rohrer (1984: 12), Sprunger (2003: 159), Sprunger & Wieler (1992: 58, 118).

***Raphia* spp.** (Fig. 4). *Raphia* species are multipurpose palms with uses including raffia fiber, food, oils, soaps and buttons (IPK 2002). *Raphia* fruits are valued in potpourri. Species used include *Raphia farinifera* (Gaertn.) Hyl. (Palm Nut), *Raphia taedigera* (Mart.) Mart. (Uxi Cone) and *Raphia hookeri* G.Mann & H. Wendl. Other *Raphia* potpourri items include the rachis, which can be striking in appearance. Rohrer (1984: 22), Sprunger (2003: 123), and Sprunger and Wieler (1992: 187) illustrate the fruits and rachis of *Raphia vinifera* P.Beauv. Leaves (Raffia bundles) are also advertised in internet potpourri distributors' catalogs.

***Syagrus* sp.** (Fig. 4). *Syagrus* is a tropical American genus of palm that includes 34 species including *S. coronata* (Mart.) Becc. (Licuri or Ouricuru), the leaves of which produce urucury wax (a carnauba wax substitute). The leaf-like structure at the base of the flower stalk that encloses and protects the flower bud (the peduncular bract) of *Syagrus* sp. (Leaf Husk) occurs infrequently in potpourri samples.

***Trachycarpus fortunei* (Hook.) H.Wendl.** (Fig. 4). The Windmill Palm occurs wild in China and is cultivated for fiber and medicine there;

it is also a popular ornamental. The infructescence (Palma uva) is used in potpourri.

Geographical Origin

There is a wide geographical distribution of palm potpourri species, with a bias towards Asia but Central and Southern America, Africa and the Mascarenes are also represented. Widespread tropical species include *Cocos nucifera* and *Phoenix dactylifera*. *Brahea dulcis* is from Mexico and Central America, and South American species include *Allagoptera arenaria*, *Attalea speciosa*, *Mauritia flexuosa*, *Raphia taedigera* and *Syagrus*. Those from Asia (largely South and South East Asia) include *Areca catechu*, *Borassus flabellifer*, *Calamus* spp., *Caryota urens*, *Daemonorops jenkinsiana*, *Phoenix sylvestris*, *Phoenix loureiroi*, *Raphia farinifera* and *Metroxylon sagu* with *Trachycarpus fortunei* from China, and *Calamus andamanicus* from the Andaman Islands. *Hyphaene* and some *Raphia* spp. are from Africa (*Raphia hookeri* is West African and *R. vinifera* is a West and West central African species). Although *R. taedigera* occurs from Nigeria to Cameroon, and from NW Colombia and Brazil including Para, the samples in potpourri seem to originate from Brazil. Similarly, *R. farinifera* samples tend to come from India, where it is cultivated (although the species is native to Tropical Africa and Madagascar).

Plant Parts

The vast majority of palm parts used in potpourri come from the infructescence. These include the fruits themselves, fragments of fruits and even whole fruiting branches. Scaly fruits are the most popular (although occasionally large, smooth spherical fruits are used). Rachises without fruits or with just the perianth attached are also used and infructescence fragments occurring in the mixes include the perianth (whole or separated), endocarp, mesocarp and epicarp.

Other palm parts that make an appearance in potpourri packs include male inflorescences (either whole or sliced) and peduncular bracts (whole or curled). Leaves are sometimes used trimmed, twisted, bundled or made into handicraft items; leaf husks can be shaped and leaf sheath fibers curled. Lastly curled rattan stems are occasionally used.

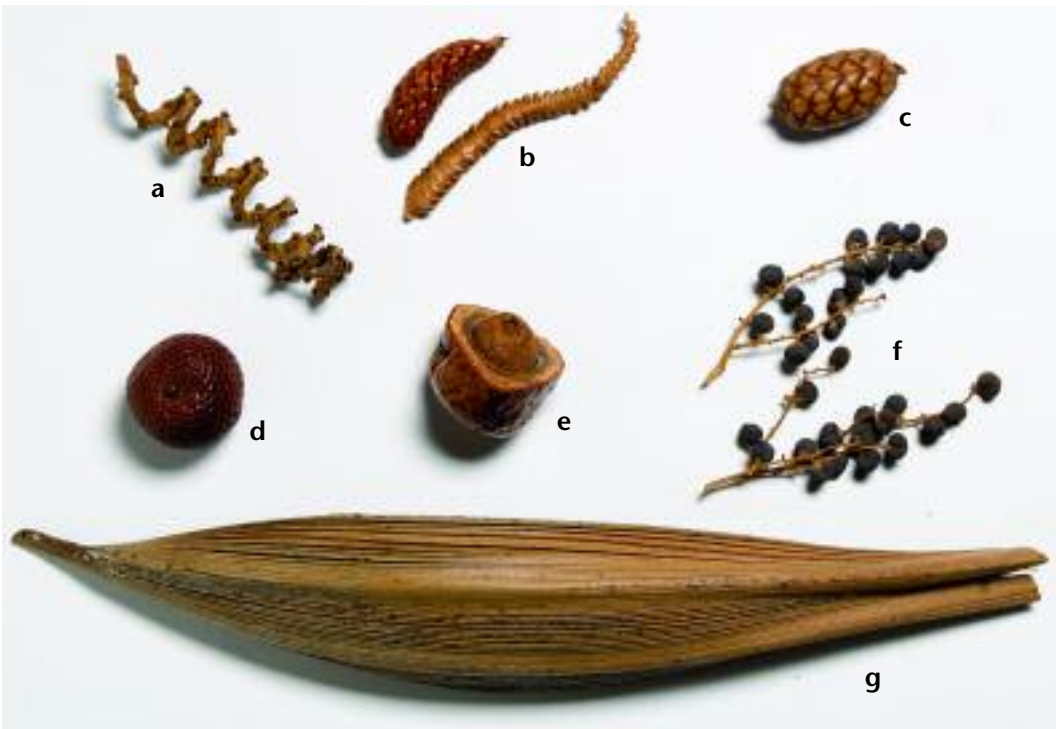
Other than shaping, palm parts are usually just dried and fumigated before use in potpourri, but other treatments include bleaching, dyeing, painting gold and addition of perfumes.

Contribution to Potpourri Designs

Palm parts contribute many varied roles to potpourri mixes. Items with interesting shapes that are sufficiently robust to keep their shapes on mixing are important. The flower-like

3. Rattan potpourri items. **a.** probably *Calamus viminalis* stem (Curly Thing) EBC-PP 765; **b.** *Calamus viminalis* infructescence (Candella on Stem) EBC-PP 69; **c.** *Calamus andamanicus* infructescence (Andy Cane Berries) EBC-PP 218; **d.** probably *Calamus acanthospathus* fruits including seeds (Rattan Seeds) EBC-PP 331; **e.** *Daemonorops jenkinsiana* fruits including seeds (Cane Fruit) EBC-PP 837.





4. Potpourri items from various palms. a. *Caryota urens* infructescence rachis (Turia Spring or Twig Spring) EBC-PP 782; b. *Raphia farinifera* fruit and rachis (Palm Nut) EBC-PP 313; c. *Raphia taedigera* fruit (Uxi Cone) EBC-PP 803; d. *Mauritia flexuosa* fruit (Wood Orange) EBC-PP 753; e. *Hyphaene compressa* fruit (Palm Seed) EBC-PP 696; f. *Trachycarpus fortunei* infructescence (Palm Uva) EBC-PP 406; g. *Syagrus* sp. inflorescence bracts (Leaf Husk) EBC-PP 808.

perianth of *Cocos nucifera* and *Borassus flabellifer* have these properties as do the infructescence rachises of, e.g., *Attalea speciosa*, *Caryota urens*, *Hyphaene thebaica* and *Raphia farinifera*, the curled leaf sheath fibers of *Areca catechu*, twisted leaf parts and sliced male inflorescences of *Borassus flabellifer*, curled stems of *Calamus* and curled peduncular bracts of *Cocos nucifera*. Other components are more useful for bulking up the contents of the packs without contributing so much to the form element of the designs. They take up dyes and perfumes well and impart color, fragrances and textures to the mixes. The endocarp, mesocarp and perianth fragments of *Areca catechu*, *Borassus flabellifer* and *Cocos nucifera* fall into this category.

Items that form the main visual focus of the potpourri packs are often known as 'toppers'. These are not mixed in the large potpourri mixing drums but are placed in the packs by hand once the main formulation or mix has been made (Hastings 2001). Palms are quite important contributors of toppers to potpourri. Toppers include items such as those handcrafted from leaves of *Phoenix sylvestris*,

shaped leaves or husks of *Borassus flabellifer* and *Hyphaene thebaica*, or shiny, scaly, cone-like fruits from *Calamus*, *Daemonorops*, *Mauritia* and *Raphia*. These contribute strong design elements as do the large spherical and smooth fruits of *Hyphaene compressa* and the fruits of *Borassus flabellifer*. The halved fibrous mesocarp of *Borassus flabellifer* provides a cup like component. (Large cups are frequently used in potpourri designs, but palms do not contribute many items to this form.) Additionally fruiting branches of *Calamus*, *Metroxylon sagu*, *Phoenix* and *Trachycarpus* and fruiting branches with perianth but not the fruit of *Cocos nucifera* and *Borassus flabellifer* may also be included as toppers together with whole male inflorescences of *Attalea speciosa*, *Borassus flabellifer* and *Brahea dulcis* and bracts of *Syagrus*.

Economic context

The vast majority of palm potpourri items are from economically important palms, many being multipurpose species. It is often material left over from other uses that is used in potpourri. In reality this is unsurprising as

sufficiently large quantities of inexpensive material are required to ensure the viability of the potpourri industry.

Infructescence items. Many infructescence parts used in potpourri are by-products of harvesting fruits for food, oil, vegetable ivory, stimulants or even seed for cultivation of ornamentals. For example, *Attalea speciosa* fruits are important sources of seed oil and edible mesocarp flour in Brazil (IPK 2002) and *Caryota urens* seeds are highly valued in horticulture (Flach & Rumawas 1996). Rachises remain after harvesting fruits for these uses. Also *Borassus flabellifer* fruits are valued for the edible gelatinous endosperm, germinated seed, and sugary mesocarp pulp (Davis & Johnson 1987; IPK 2002) and the surplus perianth appears frequently in different guises in potpourri.

Fruit processing can also yield many potpourri items. The endocarp of *Areca catechu* remains after extraction of the masticatory seeds. The endocarp, mesocarp, and epicarp as well as perianth of *Cocos nucifera* are by-products of copra extraction (the dried solid endosperm used extensively in the food, pharmaceutical and cosmetic industries). Of course, not all waste material ends up in potpourri. The endocarp of *Areca catechu* has alternative industrial uses, as a raw material for fibers, hardboard and plastics (van der Vossen & Wessel 2000) and *Cocos nucifera* mesocarp is used in the manufacture of fibers, carpets, baskets, fuel, fertilizer and mulch (Taffin 1997, IPK 2002) as well as appearing as Coco Curls and Coco Cuts in potpourri. The endocarp of *Cocos nucifera* is mainly used for the manufacture of charcoal, ornaments and utensils (IPK 2002) and Coconut Shell potpourri components are a likely waste materials from this manufacture; i.e. by-products of by-products.

Fruits. In contrast to other infructescence parts, the use of palm fruits in potpourri, at first glance, does not seem to utilize waste material but instead competes directly with other uses. For example, *Calamus viminalis* and *C. longisetus* have edible fruits (IPK 2002, Dransfield & Manokaran 1993, respectively) and the endocarp of *Hyphaene compressa* is an important food item in Eastern and North-eastern Africa (Maundu et al. 1999). However, fruits utilized by the potpourri industry are often substandard or surplus to food demands. For instance, fruits from the upper branches of *Calamus* species, are less suited as a food (as

they are smaller and less ripe) and more suited to potpourri (as fruits are less likely to be shed from the branches). Similarly, it is smaller, unripe fruits of *Phoenix sylvestris* (Date Bunches) and *Phoenix dactylifera* that are used in potpourri.

The ovoid, scaly, rust-colored fruits of *Mauritia flexuosa*, Wood Orange, can contribute significantly to potpourri designs, as large ball shaped objects are increasingly an important element in potpourri and those with scales, like *M. flexuosa*, seem to be especially favoured. However, *M. flexuosa* fruits are also very important in the diet of some South American Indians and are consumed in many forms (Balick 1988, Padoch 1988, IPK 2002). Nevertheless, *M. flexuosa* is a prolific fruiter, with variation in consumer preference and patchiness in consumption popularity. For example, Balick (1988) described that, for food, darker coloured fruits are preferred and Padoch (1998) noted a high demand in some areas but not in others. This implies that some fruits are surplus to food requirements and available for other purposes such as potpourri.

Fruits of *Raphia* species also have various important food and manufacturing uses (including oil, raphia butter, soap and stearin production (IPK 2002) but they still find their way into potpourri. Their esteem in potpourri may enable a price that competes successfully with these other uses, or the potpourri business, being opportunistic, may seize chances to obtain surpluses when the possibility arises.

Inflorescence parts. In potpourri, male inflorescences of *Attalea speciosa*, *Borassus flabellifer*, *Brahea dulcis*, *Mauritia flexuosa* and *Phoenix* species are usually whole, but in *Attalea speciosa* and *Borassus flabellifer* both whole and sliced inflorescences occur. Slices are used for their circular shape which is a popular element in potpourri designs. Developing inflorescences of *Borassus flabellifer* are tapped for the sugar containing sap used in fresh drinks, wine, vinegar, or palm sugar (IPK 2002). Male inflorescences are largely a waste material.

It is likely that peduncular bracts of *Syagrus* in potpourri utilize the waste material from harvesting the buds for pickles or oil preserved vegetables, but alternative uses for these are also recorded, e.g., *Syagrus romanzoffiana* (Cham.) Glassman is used by artists and in decorations (Noblick 1996). Bracts of *Cocos*

nucifera, which can be whole (Rohrer 1984, Sprunger & Wieler 1992, Sprunger 2003) or curled (Maha Curl EBC-PP 884) remain after processing for coconut palm products.

Leaves. Leaf potpourri items often utilize material left over from the manufacture of other products. For instance, trimmed leaf bases of both *Borassus flabellifer* (Palm spears and Pammy leaves) and *Hyphaene thebaica* remain after harvesting leaves for the wide range of purposes such as ropes, hats, mats and baskets described in IPK (2002). For *Borassus flabellifer*, fiber is also extracted from leaf bases, petioles and midribs for use in brushes, cordage, weaving and basketry (IPK 2002). Leaves left over from this process are a likely source of Twisted leaves potpourri.

Leaves of *Phoenix sylvestris* are widely used in India and Pakistan for thatching and for products such as mats, fans, baskets, bags, brooms and fishing nets (CSIR 1969). When woven into Sunny Medallions for instance, potpourri provides an additional outlet for this type of Indian handicraft. Potpourri also provides a use for otherwise wasted trimmed leaf ends (Strip Grass, Strip Grass Bundles). Other leaf potpourri items come from the ornamental Dwarf Palm (*Phoenix loureiroi*) better known for mats, hats, baskets and brooms (Brink & Escobin 2003), curled leaf sheath fibers of *Areca catechu* (Fiber Curls) and *Raphia* bundles.

Stems. Curled rattan stems (e.g. *Calamus viminalis* (Curly thing)) occasionally occur in potpourri which is just an additional outlet for rattan.

Toxicity

During the course of the potpourri work at Kew, literature-based research reports on the toxicity of potpourri items have been provided to the potpourri companies to assist in risk assessments. Chemical constituents and questions such as the consequences of ingestion and handling have been researched. The potpourri companies are largely interested in acute effects of exposure, such as likely consequences subsequent to ingestion by a child or pet. They are less concerned with chronic effects, e.g. the long terms effects of regularly chewing *Areca* seeds (Betel nut). No palm potpourri items have so far given cause for toxicological concern. Palms in general are of low toxicity and do not feature prominently in the poisonous plant literature. Palms are more likely to give rise to physical injury and

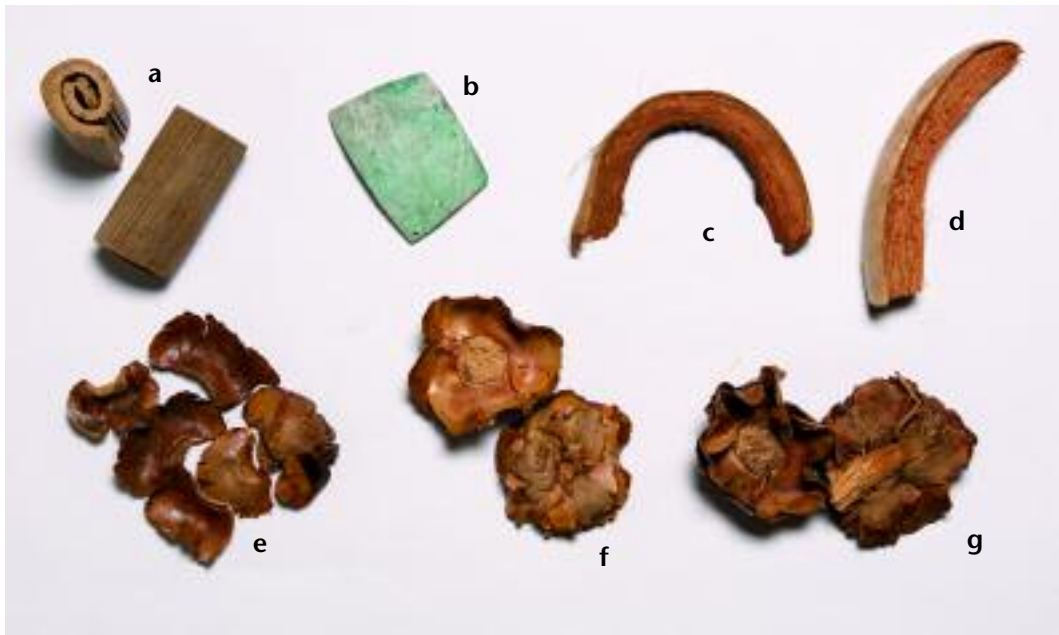
infection due to handling of contaminated spikes and thorns (BODD 2006). This is more an occupational hazard than one of concern to potpourri consumers.

Conservation and Sustainable sourcing

Conservation concerns are also reviewed in reports to the potpourri companies to help ensure sources of potpourri items are sustainable. Species are checked against threatened species listings to ensure their use in potpourri is not endangering wild populations. Armed with such information potpourri companies can chose whether to alter or discontinue the use of certain materials. Conservation lists referred to include those of the Convention on International Trade in Endangered Species of wild fauna and flora (CITES), and the global Red Lists of IUCN as well as regional conservation literature. The majority of species contributing palm potpourri ingredients have a wide natural distribution and/or are widely grown. For some species, there are concerns in their native habitat, but these species also tend to be cultivated ornamentals. In these cases, it is most likely that the source of the potpourri material is as a by-product of the horticulture trade. For instance, *Latania loddigesii*, from the Mascarenes is endangered (IUCN category EN C 2a) in its natural habitat (IUCN 2006). It has severely fragmented populations and is threatened with habitat loss or degradation (Johnson 1998). However, it is cultivated widely and is a popular landscape plant. Similarly, *Allagoptera arenaria* is regarded as vulnerable in its native environment of the Atlantic Coastal forest of the east coast of Brazil (Walter & Gillet 1998) but is widely cultivated throughout South America (Haynes & McLaughlin 2000). However, *Calamus andamanicus* from the Andaman and Nicobar Islands in the Indian Ocean is described as vulnerable by Walter and Gillett (1998). In the past, infructescences of *C. andamanicus* have been favored in potpourri over *C. viminalis* as their fruits remain on stems more successfully. This is one example where overexploitation for potpourri purposes should be avoided.

Trade

Modern potpourri trade is sizeable but, it is difficult to provide exact figures for its value and volume. Potpourri related items are often hidden within broader categories defined in the Standard International Trade Classification used in compiling trade statistics. For instance,



5. *Cocos nucifera* potpourri items. a. Cocoeae, probably *Cocos nucifera*, inflorescence bract (Maha Curl) EBC-PP 884; b. *Cocos nucifera* endocarp (Coconut Shell) EBC-PP 785; c. mesocarp and epicarp (Coco Curl) EBC-PP 784; d. mesocarp and epicarp (Coco Cut) EBC-PP 586; e. perianth parts (Coco Petals) EBC-PP 585; f. perianth (Coco Flowers) EBC-PP 646; g. perianth (Coco Heads) EBC-PP 22.

retail packs of potpourri are included in a trade class with other room deodorizers. In 2005, UK imports in this class amounted to over £67 million, whilst UK exports were over £76 million pounds. Potpourri packs contributed an unrecorded, but likely high, proportion to this statistic. Similarly, over £4 million of dried foliage and branches and over £8.5 million of dried, cut flowers and flower buds were imported in the UK in 2005. Some, but not all of this, will have been used by the potpourri industry.

The Netherlands and India were by far the main exporters of raw materials into the UK in 2005 (HM Revenue & Customs 2006). Many other countries are involved but all on a very much smaller scale. Of the two market leaders, India mainly exports dried products whilst the Netherlands usually adds value to the plant material by dyeing, bleaching and preparing it in other ways, but both these countries source material from a wide range of countries.

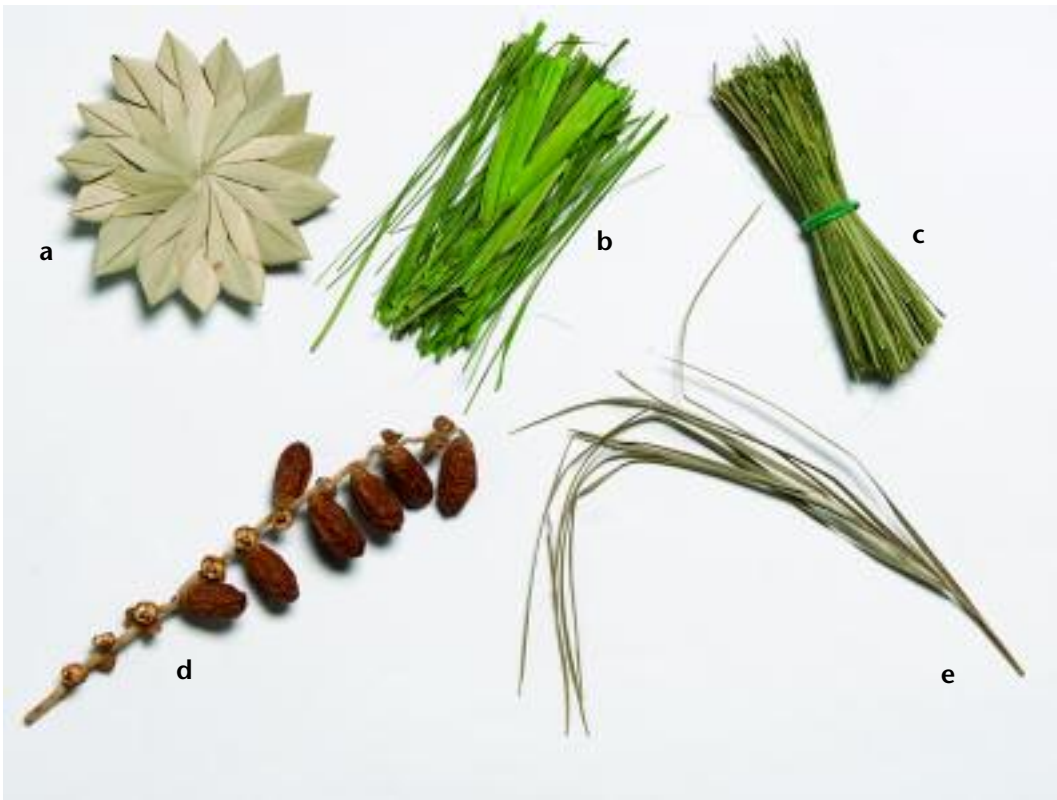
UK companies either design, source and mix potpourri batches in the UK or, increasingly, design the mixes in the UK, then manufacture them abroad in countries such as Thailand. Although the UK imports “room deodorizers” (the trade category including potpourri packs) from Spain, Hungary, Netherlands, Portugal, France, USA, China, Italy, Germany and

Thailand, it is still a net exporter in this category. The main end users of potpourri seem to be concentrated in a few countries. Just over 70% of “room deodorizers” (including potpourri packs) exported from the UK in 2005 were exported to just eight countries (Ireland, France, Italy, Spain, Hungary, Netherlands, Germany and the USA) whilst the remaining 30% or so was exported to over 90 different countries. It is evidently mainly a product for more economically developed countries.

Conclusions

A wide range of palm species from many parts of the globe are used in potpourri. The materials are generally safe for this purpose and the vast majority are from sustainable sources. They mainly represent spin-offs from well established palm based markets that would otherwise be wasted, or at best composted.

It is in the nature of the potpourri industry to be opportunistic, but there are also opportunities for botany as well as industry. Benefits could arise from alerting potpourri companies to potential new sources of material. It is likely that the full potential of palm potpourri has not yet been realized. Many commonly cultivated palms, e.g., the oil palm, *Elaeis guineensis*, are not yet found in



6. *Phoenix* spp. potpourri items. a. *Phoenix sylvestris* leaves (Sunny Medallions) EBC-PP 335; b. *Phoenix sylvestris* leaves (Strip Grass) EBC-PP 677; c. *Phoenix sylvestris* leaves (Strip Grass Bundle) EBC-PP 711; d. *Phoenix sylvestris* infructescence (Date Bunch) EBC-PP 579; e. *Phoenix* sp. possibly *Phoenix loureiroi* leaves (Dwarf Palm) EBC-PP 886.

potpourri, and some geographical areas, notably Africa, are less well represented than others. This patchiness in representation may also provide opportunities for local communities to play a more prominent and therefore profitable role in the potpourri business.

Significant benefits might also arise from the educational potential of potpourri in promoting a wider understanding of the value of plants. It is possible that the biodiversity, geographical origin and human interest of species represented in potpourri packs could become as much a part of the marketing of potpourri designs as the traditional aspects of colour, texture, fragrance and form. The future may bring packs emphasising various themes such as rainforest products or African fruits, thus raising awareness in consumers of the origins of their room decorations. Some packs may even be devoted entirely to palms!

Acknowledgments

I am extremely grateful to Dr John Dransfield for identifying the majority of the potpourri

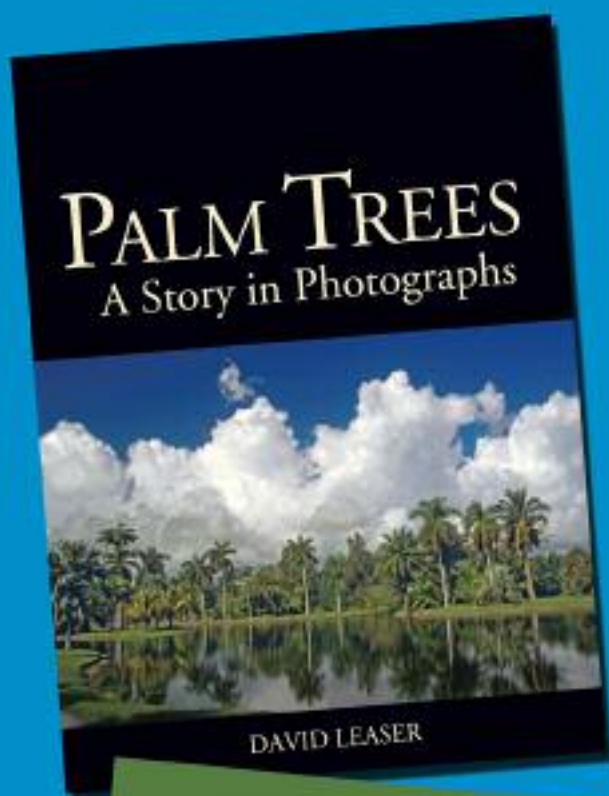
samples and for the wealth of his knowledge that he shared. Dr Bill Baker also kindly identified some samples. Laura Hastings, Dr Sasha Barrow, Helen Sanderson and James Morley, colleagues at the Royal Botanic Gardens, Kew, worked on toxicity and conservation reports for potpourri companies and information from these has been drawn upon for this paper. Laura Hastings, in particular, was also a valuable source of information on the potpourri industry. I am indebted to Christine Leon and Dr Mark Nesbitt who made invaluable suggestions for improvements to the text. Photography was undertaken by Andrew McRobb, Royal Botanic Gardens, Kew. Thanks are also extended to the commercial companies who took the responsibility to find out the identity, toxicity and conservation status of their products.

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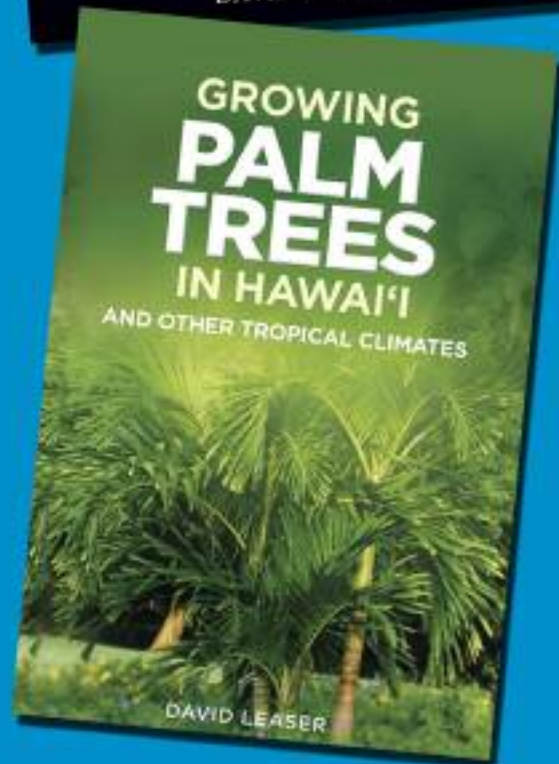
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