

A taxonomic review study on Apiaceae family and its history

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Abstract:

This current study reviewed most important research and previous studies on the Apiaceae family, which is currently divided into four under the family (sub-families) due to its medical and economic importance and its different uses in various fields of life on a daily basis. The study touched on some medical aspects of some species belonging to the family such as *Apium* and the importance of some parts used in processing and food.

Key words: Ambiliferea , *Apium*, economic ,medical importance.

مراجعة مقالة تصنيفية للعائلة المظلية وتاريخها

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مستخلص:

تناولت الدراسة الحالية مراجعة اهم الابحاث والدراسات السابقة حول العائلة المظلية والتي قسمت في الوقت الحالي الى اربع تحت عائلة (عويثلة) نظراً لأهميتها الطبية والاقتصادية واستعمالاتها المتنوعة والمتعددة في شتى مجالات الحياة وبشكل يومي ، وتطرقنا الى بعض الجوانب الطبية لبعض الانواع العائدة للعائلة مثل الكرفس وبيان أهمية بعض الأجزاء المستخدمة في المعالجة والغذاء.

الكلمات المفتاحية: العائلة المظلية ، الكرفس ، الأهمية الطبية والاقتصادية.

Introduction

The Apiaceae (or Umbelliferae) is, a plant family includes at the existing time 466 genera while about 3800 kind (plunkett *et al.*, 2018). It is divide nearly worldwide, but is maximum diverse in moderate climatic areas, such as Eurasia ,north America. It is totally rare in equatorial humid regions wherever it is bounded to high mountains ,Mediterranean and atmosphere climatic conditions partiality high species variegation. The Apiaceae are existent in nearly whole types of habitats, from sea-field to alpine regions: aquatic biotopes, prairie ,grazed pastures, woodlands including their absolution and margins ,cliffs ,scree ,rocky mountains ,open sandy ,gravelly earth ,steppes ,cultivated place ,fallow ,road sides ,waste grounds .The largest issue of races,289,and the bigger generic endemism,177,is setup in Asia, yonder are 126 genera at Europe, but just 17 are endemic . Africa has around the same general with 121 genera, wherever North Africa includes the largest appearance of 82 genera,13 from which are resident. North and middle America have a quite high level from diver-

sity 80 races and 44, endemics species ,anywhere South of America accommodates minimum generic diversity for 35, genera,15 from which are resident. Oceania is house to 27 genera,18 endemics (plunkett *et al.*,2018). The Apiaceae belongings appears to have organize in Australasia (zone including Australia , New Zealand ,Tasmania , New Caledonia , New Guinea , and sundry island, groups), together the origin history to the delayed cretaceous/soon Eocene,c.87 Ma (Nicolas and plunkett,2014).The Apiaceae subfamilies(see below)thereafter diverged in the meridional Hemisphere between 45.9 and 71.2 Ma: Apioideae , saniculoideae to Southern Africa ,Azorelloideae at South America , and Mackinlayoideae also at Australasia (Calvino *et al.*, 2016).



1.1 TAXONOMY AND ITS HISTORY

The Apiaceae were recognized by man ago the most old times . Many tropical plants of that family were infect used in primary cultures because world soon noticed those odor ,flavor ,excellence or poisoning. The names `coriander`,`cumin`,`fenne`l were known in a Mycenaean version dating from 17th into 15th century bce(Chadwick, 1958). Several Apiaceae are recognized in the early talk of China(material medical) ,in Sanskirt (Constance,1917).A utilitarian basic taxonomy was developed through the native USA of Mexico, tall before the find of the Modern World(Rodriguez,1957).theophrastus from Eresus ,the Greek vegetarian and follower of Aristotle, called the Apiaceae `Narthekodes`(Greene,1909). He visibly defined anise, coriander, dill,

cumin and fennel, in extension to other umbelliferae scattered in its books. Later ,Dioscorides, in his Greek grass ,cited about 50 Apiaceae beneath his general address of `Herbs` (Gunther, 1959), 40 of those are now fully identified

with fundamental documentation (Evergetis and Haroutounian,2015). In the 16th century, the Herbalists amend-ed the grouping about umbelliferous plants founded upen vegetative similarity, but still inclusive many external component from several different plant families. Cesalpino (1583) synthet-ic the first total grouping as `Univer-sum sex Ferulaceum` which involve about 60 herbs.by the same time, Do-doens(1583) used the specification`De Umbelliferis Herbis`, and a brief time later Dalechamps (1586-1587) hand the name about`plantae Umbellifer-ae` to this collection of plants. The

'Apiaceae' were born! The following achievement was an serious moment in the date of botany. The top monograph of a flora group separate of their utilization carried outside by Morison (1672) who select the Umbelliferae as a pattern where he suggested a clas-

sification based fundamentally on fruit morphology, next this the Linnaeus ranking of Umbellate was founded on inflorescence features, most significant being the existence of involucre(bracts),involucel(bracteoles)(fig.1)

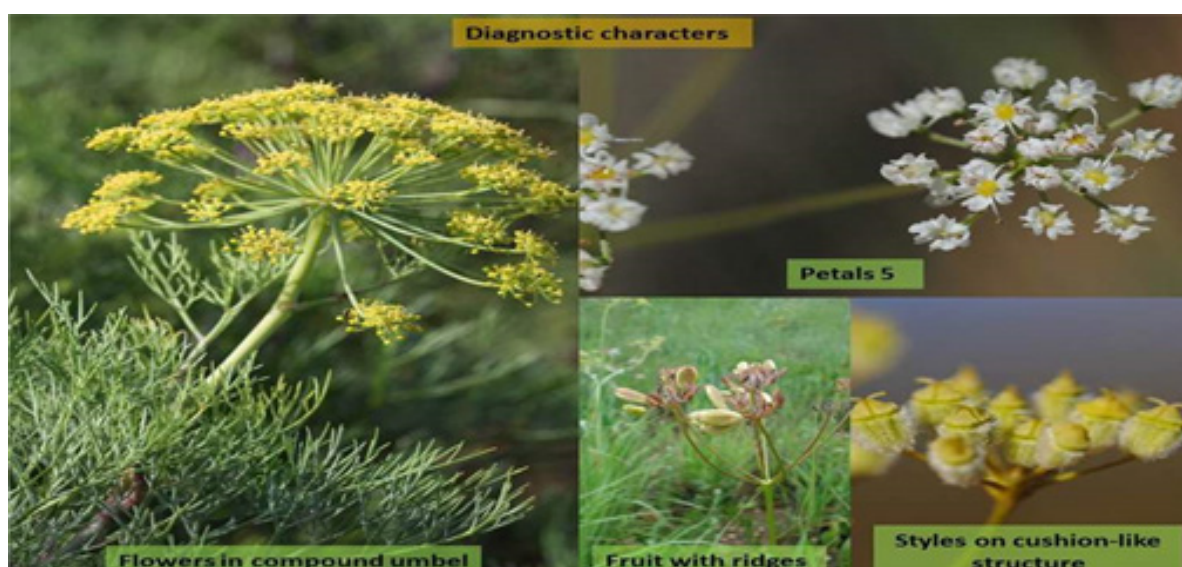


Fig. (1)

contrary to Morison's order .Von Crantz (1767) response then to the Linnaean order ,bringing prop the use of regular and fruit. Numerous classifications arose through the 19th century overall those of Hoffmann (1816), Koch (1824), Lagasca (1826), Rrichenbach (1828), de Candolle (1829,1830), Lindley (1836) who suggested the alternative denomination ' Apiaceae', and Bentham, Hook-

er(1862-1883). The most broad used classification of this century be the one of Drude (1897-1898) documentary for Die natuerlichen pflanzenfamil-ian, frequently considered a basic job by later agent ,where Drude division the family inside three subfamilies,12 tribes. The 20thcentury begin with the liberality of Koso-Poljansky (1916). The productive German 'apiologist' H.Wolff (1910,1913,1927) consulta-

tive many important genera such as *Bupleurum*, *Eryngium* and *Pimpinella*. Cerceau-Larrival (1926) suggested a very original standing founded on inoculation and seedling (cotyledon) morphological. L.Constance (1909-2001) from UC Berkeley USA lead out a large work on Apiaceae, propagation many taxonomic, geographical monographs until North and South America, Asia, he posted a 'History of the standing of Umbelliferae' (stability 1971) ranging from the origin to 1969. Hedge and Lamond (Edinburgh) inclusive a treatment of the Umbelliferae in the plant of Turkey, the East Aegean Islands (Davis, 1972) and in plant Iranica (Rechinger, 1987). Pimenov, Leonov (1993) chatty Drude's system, steward four new clan. Nowadays, some of the major workers on those family include M.Pimenov (Moscow), G.Plunkett (New York), S.R.Downie (Urbana-Champaign, Illinois), K.Spalik (Warsaw), B-E.van Wyk and P.Tilney (Johannesburg). The scientific classification of Apiaceae begin using morphological standards but added thereafter were new performance elements advent from several majors: Anatomy, karyology, seedling morphology

, palynology and photochemistry. The influx classification of Apiaceae pick now into tally many molecular information and associates there with morphological brow, still often global fruit anatomy. The belongings in sitting split to four subfamilies :1. Apioideae, have vittles present at valleculeae, at commissure, and the rib oil canal in general very little or It doesn't exist, all major Apiaceae cultivated as greens or spices belonging to that sub-family. Vegetables comprise, celeriac, carrot, and so parsnip, and also alexanders, great pignut, and pignut, so skirts, and tuberous-rooted chervil, and Canadian honewort, and Indian parsley and also squaw root with arracacha and celery and fennel and angelica and also chervil and coriander so dill and parsley as well as sweet cicely. Seeds comprise ajowan, anise, caraway, celery, coriander, cumin, dill, fennel and zira. 2. Saniculoideae having special (usually very big) the rib oil canal and generally non valleculear vittles, so different outgrowths with those exocarps (scales neither bristles and also prickles). At the latest serrated coriander, (*Eryngium foetidum*), utilized like an aromatically herb, wither to the sub-family.

3. Azorelloideae hold endocarp from fiber-such as sclereid and vallecular vittles deficiency ,rib-oil canal present and no huge, so dorsally pressed fruits (broadening from two lateral-ribs). No ordinarily cultured plants uses as a botanical nor spice was contain.4. Mackinlayoideae possess endocarp from fiber-such as sclereid and vallecular vittae reduction ,rib-oil canal presence but no huge ,so horizontal compressed fruits (Kadluczka and Grzebelus 2022) No generally cultivated plants applied used as vegetables or flavor are included , by the present time ,pure confession , circumscription from horde residue unsteady, because botanists face lack from morphological. discontinuities, reinforced with the convergences or parallelisms frequently occurring of plentiful morphological characters. Despite the great number of descriptive and taxonomic publications, the identification of many species remains difficult. Many species show a similar habit. Moreover, many species have a range of infra specific morphological variations, peculiarly in the leaf dissection, which is confusing for identification. The floral morphology is often weakly detailed and rarely

taken into account (if not merely forgotten) in the identification keys. Ripe fruits are in many cases essential for an undoubted determination, the young (green) fruits being misleading because of incomplete characters (such as ribs and wings). Moreover, several species demonstrate a great complexity due to high variability, hybridization and introgression processes, and influence of domestication. Despite the use of molecular data coupled with morpho-anatomical features, the Apiaceae family remains marked by a large amount from very little genera, with 40% from genera being mono-specific, and more than three-quarter have only 5 or little species (Jean-Pierre Reduron,2021) In contrast, there are several large genera. The largest one is *Eryngium* (c.250 species) present in the Old and New Worlds. *Bupleurum* (c.200 species) is mostly present at Eurasia. Next 3 largest the genera, *Ferula* (c.185 species), *Pimpinella* (c.180 species) and *Seseli* (c.140 species), are all distributed in the Old Word. *Heracleum* (c.130 species) and *Angelica* (c.120 species) are widespread across north temperate areas. *Lomatium* (c.86 species) is limited to North America. The next genera

encompass about 50 species: *Azorella* (c.58) of South America , New Zealand and *Arracacia* (c.55) at Mexico to South-America, *Ferulago* (c.50) of Europe, South-west Asia , North-Africa. Beyond these elements, phylogenetic studies have shown that many large genera (e.g. *Angelica*, *Heracleum*, *Lomatium* , *Pimpinella*) are composed of unrelated organisms descended from more than one ancestor (referred to as polyphyletic or paraphyletic groups), consequently still requiring progress to achieve reliable circumscriptions (Cameron and Lucas,2020)

1.2 ECONOMIC IMPORTANCE, PROPERTIES AND USES

The phytochemical diversity of the Apiaceae, early noticed by man by odors and flavors, led to a large range of uses: foods, beverages, flavorings, remedies and industrial uses. In many countries, the carrot family plants are still collected from the wild. In contrast, the main utilitarian species have been cultivated for a long time and were improved for agronomical processes. Root vegetables so quite importance since some from them so commonly used. (Plunkett et al., 2018). The maxi-

mum well-known was carrots (*Daucus carota*) and celeriac (*Apium graveolens*) and parsnips (*Pastinaca sativa*). Less known are parsley root (*Petroselinum crispum* subsp. *tuberosum*), alexanders (*Smyrniolum olusatrum*), great earthnut (*Bunium bulbocastanum*), pignut (*Conopodium majus*), skirret (*Sium sisarum*) and tuberous-rooted chervil (*Chaerophyllum bulbosum*) in Eurasia. In North America, people sometimes eat the subterranean parts of Canadian honewort (*Cryptotaenia canadensis*), Indian parsleys (*Lomatium* spp.) and epos or yampah (*Perideridia gairdneri*). In South-America, roots from *arracacha* as (*Arracacia xanthorrhiza*) are commonly cooked. A few Apiaceae root, vegetables so extant at Africa, belonging to the genera *Annesorhiza* and *Chamarea*.(Castanha et al., 2018).

The parts of leaves are commonly uses at many countries, especially fleshy swollen parts that can be founded at celery (*A. graveolens*) , fennel (*Foeniculum vulgare*). More numerous are Apiaceae for which the foliage is used as an aromatic herb.(fig.2)

*A. graveolens**Foeniculum vulgare***Fig.(2)**

The main examples are: *alexanders* (*S. olusatrum*), angelica as (*Angelica* spp.), chervil (*Anthriscus cerefolium*), coriander (*Coriandrum sativum*), dill (*Anethum graveolens*), parsley (*P. crispum*) with sweet cicely as (*Myrrhis odorata*). More Apiaceae yield edible fruits, generally wrongly named ‘seeds’ in the marketplace. The most common are: ajowan (*Trachyspermum ammi*), anise (*Pimpinella anisum*), caraway as (*Carum carvi*), celery (*A. graveolens*), coriander (*C. sativum*), cumin (*Cuminum cyminum*), dill as (*A. graveolens*), fennel as (*F. vulgare*) and zira as (*Elwendia persica*). The most well-known flavouring species used for beverages

including alcoholic drinks are anise (*P. anisum*), giving the typical aniseed flavour at anisette, ouzo with raki; caraway (*C. carvi*), at kümmel and akvavit; and garden angelica (*Angelica archangelica*) in Chartreuse with vermouth (Emmanuel and Philipp, 2020). One must keep in mind that the geographic origins of many commonly used Apiaceae are not or only doubtfully known, i.e. where their native populations were located at their first time of use. This is the case for ajowan, anise, coriander, cumin, dill, fennel and parsley. These were used since ancient times, exchanged, cultivated and marketed, so that it is therefore quite impossible

to trace them. Consequently, the 'wild' populations are generally composed of plants escaped from cultivation and afterwards naturalized, becoming apparently spontaneous. The position of such populations in secondary habitats is generally linked with a non-native status. Since most of the Apiaceae (if not all) are loaded in chemical compounds, so great numbers from these compounds are used at local at more or little widespread pharmacopoeias. (Derouich *et al.*, 2020)

The active characters lead for antispasmodic and carminative and cosmetic and, diuretic and laxative and sedative or stimulant and stomachic and also topical applications. A great number of the above-mentioned Apiaceae are also used in such a way. One must add others, restricted to pharmacological interest: bellwort (*Ammi majus*),

Asiatic or Indian pennywort (*Centella asiatica*), hare's ear (*Bupleurum* spp.), Siberian phlojodicarpus (*Phlojodicarpus sibiricus*), and toothpick-plant or khella (*Visnaga daucoides*). Some of them produce oleo gum resins: gum-ammoniac or vasha (*Dorema ammoniacum* = *Ferula ammoniacum*) and several giant fennels (*Ferula* spp., like *F. assa-foetida*, *F. galbaniflua* = *F. gummosa*, *F. tingitana*) producing the galbanum. In contrast, many Apiaceae are more or less strongly toxically, like hemlock water-dropwort as (*Oenanthe crocata*) so poison hemlock as (*Conium maculatum*) also water hemlocks as (*Cicuta* spp.). Many species are can be known as cause dermatitis while the damp skin was exposed at bright sunlight as (*Heracleum*, *Pastinaca*). (Leo *et al.* 2009).



Fig.(3)

Finally, one can see now more and more Apiaceae used as ornamentals in gardens (Fig.3) especially belonging to the genera *Angelica*, *Astrantia*, *Bupleurum*, *Eryngium* and *Hgeracleum*.

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