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# First record of *Pluchea dioscoridis* (Asteraceae) in Northern Libya

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**الملخص**

البرنوف أو الكوش كما يُسمى في دولة مصر هو أحد الأنواع النباتية البرية التي تستوطن شرق إفريقيا ومصر وشبه الجزيرة العربية. الدراسة الحالية تكشف النقاب عن تسجيل هذا النوع لأول مرة في شمال ليبيا، حيث تم تسجيل انتشار هذا النبات في مجموعات (عشائر نباتية) حول مدينة بنغازي يتجاوز بعض منها المئة فرد، حيث تنمو على حافة العديد من الطرقات وسط المدينة وداخل الحدائق والمنتزهات وبجانب المباني المُهدمة في العديد من الأحياء وخاصة تلك التي لازالت مهجورة بعد الحرب. أيضاً، تم تسجيل نمو هذا النبات طبيعياً على حافة الأراضي الملحية الرطبة التي تقع على بعد عدة كيلومترات شرق وسط المدينة وقريباً من مدخل المدينة الغربي، حيثُ تُعد هذه المواطن الرطبة من البيئات المناسبة للانتشار هذا النوع النباتي. تم تسجيل أول مشاهدات لهذا النوع النباتي الجديد على هذه المنطقة خلال عام 2018 وبعد انتهاء الحرب في المدينة، حيث كانت أول تجميعات لهذا النوع النباتي من المناطق المهجورة أو شبه مهجورة، وتم ذلك خلال مشروع بحثي استقصائي يهدف إلى تقييم حالة الغطاء النباتي بعد أربع سنوات من إخلاء المدينة.

**الكلمات المفتاحية:** البرنوف، تسجيل جديد، الفصيلة المُركبة، ليبيا، شمال أفريقيا.

**Abstract**

*Pluchea dioscoridis* (L.) DC. is a species native to Eastern Africa that has been recorded for the first time in northern Libya. It was discovered growing around the city of Benghazi in populations of more than 100 plants beside roads and inside city gardens, and also on the edge of the salt marshes in a typical wet habitat of halophyte plants about five kilometres east of Benghazi and not far from the shoreline in north-east Libya. Populations of this plant were first noticed in 2018 once the civil war was over in Benghazi and confirmed during an investigative research project that aimed to evaluate the state of vegetation four years after the evacuation of the city.

**Keywords:** Pluchea, new record, Compositae, Libya, North Africa.

## 1. INTRODUCTION

The composite (Asteraceae) is the largest plant family within the Libyan territory and, based on Jafri and El-Gady (1983) [1], consists of 97 genera and 240 species.

The genus *Pluchea* consists of about 80 species that are mostly native to tropical and warm temperate areas around the globe, distributed primarily in east Africa, northern and southern America, Asia and Australia [2]. *Pluchea dioscoridis* has been known by several synonyms (see below). The species of this genus have been used in phytotherapy as an anti-inflammatory, a diaphoretic in fevers, an antipyretic, an astringent, as nerve tonics, laxatives, a treatment of dysentery and in many other ways [2]. *Pluchea* is named after the French naturalist Noel Antoine Pluche, whereas the species *dioscoridis* is named after the Greek herbalist Dioscoridis [3].

*Plutchea dioscoridis* is native to eastern Africa and the Middle East, including Egypt and Chad adjoining Libya. In its native habitat, *P. dioscoridis* is a richly branched hairy perennial shrub that grows up to 3 m high and inhabits moist habitats such as banks alongside waterways and marshes, depressions along roads and deserted houses [4, 5]. In Egypt, a country bordering Libya, *P. dioscoridis* is commonly found along the banks of the Nile and islands, and also as a pioneer of moist rocky habitats [6].

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It is also found in fine loamy soils along the banks and canals within the Nile Delta region, depressions between the terraces of roads and railways, saline and non-saline abandoned fields, waste moist ground, solid and liquid refuse and near demolished houses [7, 8].

*Pluchea dioscoridis* was first recorded (as *Conyza dioscorids*) in Wadi Tanezzuft southwest of Libya in 2004 where only a few individuals were found [9]. Another study in 2012 mentioned this first discovery using the accepted scientific name [10]. This paper documents its discovery in northeast Libya for the first time.

Benghazi is a southern Mediterranean city. The mean maximum monthly temperature ranges between 21ºC in January and 41ºC in June. The lowest minimum monthly temperature is normally recorded in December and January at 7ºC and 6ºC, respectively. The climate is very dry in summer (June to August) and wetter in winter (November to April). The highest mean monthly rainfall is c. 65 mm and is usually recorded in December and January. Within the last two decades, the mean annual rainfall was 300 mm but was spatially very erratic [11].

## 2. MATERIALS AND METHODS

Plant specimens were first collected around Benghazi between latitudes (32° 05' 41.65" and 32° 08' 25.13" N) and longitudes (20° 04' 01.13" and 20° 05' 22.09" E) at less than 5 m above sea level. Plants were collected between January and May 2020. The whole city, which is located between the eastern main checkpoint in Sidi Khlaifa to the western city main access in Alquarsha (30.4 km) and along the sixth ring road between

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Alquarsha and Sidi Khlaifa (40.5 km) (Fig. 1), with an area of approximately 291 km$^2$, was assessed.

The first taxonomic check of these samples was made using the Flora of Libya (Jafri & El-Gadi 1983) followed by consulting specimens held in the Cyrenaica Herbarium (CHUG) based on the Flora of Egypt [12, 13]. Plant specimens are held in the Cyrenaica Herbarium (CHUG), Department of Botany, Faculty of Sciences, University of Benghazi (Fig. 2a,b).

## 3. RESULTS

*Pluchea dioscoridi* **(**L.) DC., Prodr. (DC.) 5: 450 (1836).

***Synonyms:***

*Baccharis dioscoridis* L., Cent. Pl. 1:27 (1755), *Conyza odora* Forssk., Fl. Egypt. Arab. 148 (1775), *Conyza dioscoridi* **(**L.) Desf., Tabl. Ecole Bot., ed. 2, 114 (1815), *Baccharis aegyptiaca* Forssk. Ex DC., Prodr. 5: 450 (1836) and *Pluchea dioscoridis* (L.) DC. var. *glabra* Oliv. & Hiern, Fl. Trop. Afr. 3: 329 (1877).

***Common names:***

Ploughman's spikenard, Conyza and Marsh fleabane (English), Dörrkraut (German), Conyze (French), Barrnuf and Kenevir otu (Turkish) and Barnuf and Kush (Arabic) (Shaltout and Slima, 2007).

***Description of the species:***

This bushy shrub is distinctive in being a tall (1-3 m), evergreen perennial shrub, pilose and glandular. Leaves are oblong or elliptic narrowing at the base which is auriculate. Leaves range from 2-7 cm long × 2-4 cm wide, dentate or entire, attenuate and auriculate at the base. It forms plentiful and easily noticed densely corymbose panicle inflorescences, peduncles up to 1-1.5 cm long, with hairy leaves which are glandular and puberulent, slightly simple lanculate, serrate and sessile. The flowers are pale purple. The 4 to 12 disc flowers are normally tubular and hermaphrodite but functionally staminate. By contrast, the marginal flowers are in several rows, pistillate and filiform. The receptacle is flat and naked. The flowering season is between April and June.

***Habitat and sites of Pluchea dioscoridis and associated species in Benghazi:***

*Pluchea dioscoridis* was collected from more than 44 locations around Benghazi, mostly located in the west, north, and middle and up to the east of the city, in areas such as Garyounis, ElBerka, AlKish, City Centre, ElSabry, BuDzira and ElKwifia.

This new record plant species was found in relatively small populations ranging from 5 to more than 100 individuals and occasionally isolated single individuals. It was very abundant beside roads within some areas of the city (Fig. 3a). Interestingly, local people in the city's main car scrapyard east of the city stated that the plant was first seen five years ago after the arrival of certain imported cars, which suggests that cars being scrapped were a possible source of seeds of this species.

*Pluchea dioscoridis* was also very abundant at ElSabry at the edges of demolished houses where the whole area was destroyed in the armed civil conflict between 2014 and 2017, (Fig. 3b). It was also found growing in the middle of the city (AlKish area) close to the Lakes Project (salt marshes covering an area of 20 hectares) associated with *Phragmites australis* (Cav.) Trin. Ex Steud. (Fig. 3c). Regionally, this shrub can be found in abandoned fields, abandoned pastures, demolished houses and depressions between the terraces of roads and railways [8]. However, it was concluded that this shrub is generally establishing in wet areas with a massive effect of environmental variables such as chloride, electrical conductivity, nitrogen, carbonate, and calcium since such variables have an impact on the distribution of this shrub [14].

## 4. DISCUSSION

It seems that evacuating huge areas of the city between 2014 and 2017 was the main reason for this particular plant species to be successfully growth and distribute, since this species is known to be mostly found in abounded areas and close to demolished buildings [8]. Also, dominance of wet environment in those areas as a result of the evacuation of the city and the overflow of sewage was another factor assisted this species to grow and bloom quite easily [7]. Currently and up to the time of submitting this manuscript, it has been noticed that this plant is still sweeping new areas in the whole region. It is very likely that *Pluchea dioscoridi* has arrived to this region through some kind of carrier [14]. Nonetheless, it has not been mentioned in any plant checklists or as outcome of any field observations in this region before 2018 [1, 11]. However, by recording this species in this area, it has now been distributing in the whole north of the continent [2].

It is clear that while *P. dioscoridis* is newly recorded in northern Libya, its abundance and spread across the landscape indicate that it is likely to persist and spread in the future.

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**Figure 1. A Map of Benghazi city illustrating the distribution of *Pluchea dioscoridis* within the city (44 locations).**

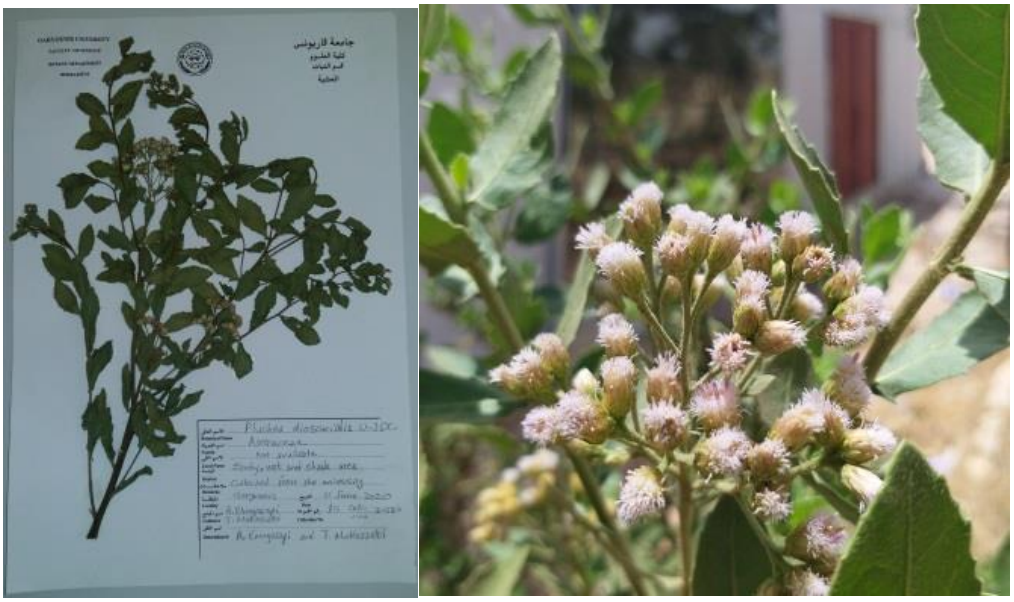


**Figure 2. *Pluchea dioscoridis* collected in Benghazi, a = herbarium sheet specimen, b = leaves and flowers of the plant. (Photos by T. Mukassabi)**

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**Figure 3. Distribution of *Pluchea dioscoridis* collected around Benghazi, a = alongside roads close to Benghazi Medical Centre, b = beside demolished houses in Alsabry area, c = in wet areas associated with *Phragmites australis*. (Photos by T. Mukassabi)**

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