Martynia annua L. (Martyniaceae): a new record for the flora of Sudan

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Abstract:

Martynia annua L. (Martyniaceae) was reported for the first time for the flora of Sudan in the Damazin area, Blue Nile State in South Eastern Sudan. Plant specimens were collected for the first time near Damazin Town (N 11 56.186 E: 34 22.895 GPS) about 10 km downstream Roseires dam. It was later observed on the eastern and western flanks of the Blue Nile. Also *M. annua* was encountered near Al Gadarif Town in Al Gadarif State in Eastern Sudan (West of Elglabat in Bassanga, 240 km south of Al Gadarif). Detailed morphological description is given to help the identification of this species in the future.

Keywords: New record, *Martynia*, Dmazin, Al Gadarif, Sudan

1. Introduction:

Martynia is a monotypic genus of annual herbs represented by *M. annua* L which is a wild herbaceous plant native of Mexico and Central America. It is found in tropical and sub-tropical regions of America, Burma, West Pakistan and throughout India. Studies on the flora of the Sudan are scanty. The only compiled references which include herbaceous plants were those of Broun and Massey (1929), and Andrews (1950, 1952, 1956). However, many Botanists made valuable contributions to regional Sudanese floras such as Obaid and Mahmoud (1968) *Vegetation of Khartoum Province*; Ahti *et al*. (1973) *Flora of Wadi Halfa*; Hassan (1974) *Plants of Erkawit*; Wickens (1976) *Flora of Jebel Mara*; Braun *et al.* (1991) *Weeds of Central Sudan*; Bebawi and Neugebohrn (1991) *Plants of Northern Sudan*. None of these floristic references described *Martynia annua* L., an indication that the present paper is the first to report this plant as a new record for the flora of Sudan

1.1 The Damazin study area and collection sites

No published field survey of the vegetation of Damazin region existed. However, Harrison and Jackson (1958) in their ecological classification of the vegetation of the Sudan included the Damazin area in the zone known as *Low Rainfall Woodland Savannah*. The present study area lies approximately 1 km to the north of the Damazin-Roseires dam. It occupies an area of about 500 sq. km extending for 18 km from west to east and 28 km from south to north. The Blue Nile divides the study area into two parts: one on the eastern flank and the other on the western flank. Within the boundaries of the study area five sampling sites were selected for intensive surveys of the vegetation: two locations on the western side and three on the eastern side of the Blue Nile. Map Fig. 1 shows the five locations where *Martynia annua* was found.

1.2. Climatic conditions of Damazin and Al Gadarif area

The climatic conditions of the study areas are summarised table 1.

Table1: Summary of some climatic conditions in Damazin and Al Gadarif Area

Climatic conditions	Damazin	Al Gadarif
Maximum annual rainfall	967mm / year	603.7 mm / year
Rainiest months	July, August, September	June, July, August
Maximum average temperature	45^{o}C	41^{o}C
Hottest months	April, May, June	March, April, May
Minimum average temperature	12^{o}C	17 ^{o}C

Source: Sudan Meteorological Corporation

Taxonomy of *Martynia annua*

Kingdom: Plantae

Division: Magnoliophyta

Order: Scrophulariales

Family: Martyniaceae

Genus: Martynia

Species: *Martynia annua L.*

Common name: Devil's claw,

Synonyms

Carpoceras angulata A. Rich.

Carpoceras longiflora A. Rich.

Disteira angulosa (Lam.) Raf.

Martynia alternifolia Lam.

Martynia angulosa Lam.

Martynia diandra Glox.

Martynia jussieui (Steud.) Howell

Martynia pallida Salisb.

Martynia proboscidea Glox.

Proboscidea cordifolia Moench.

Proboscidea jussieui Steud.

Vatkea diandra (Glox.) O. Hoffm.

Local names in Ed Dmazin area: El nig (Hosa), Abido Mino (Arabic)

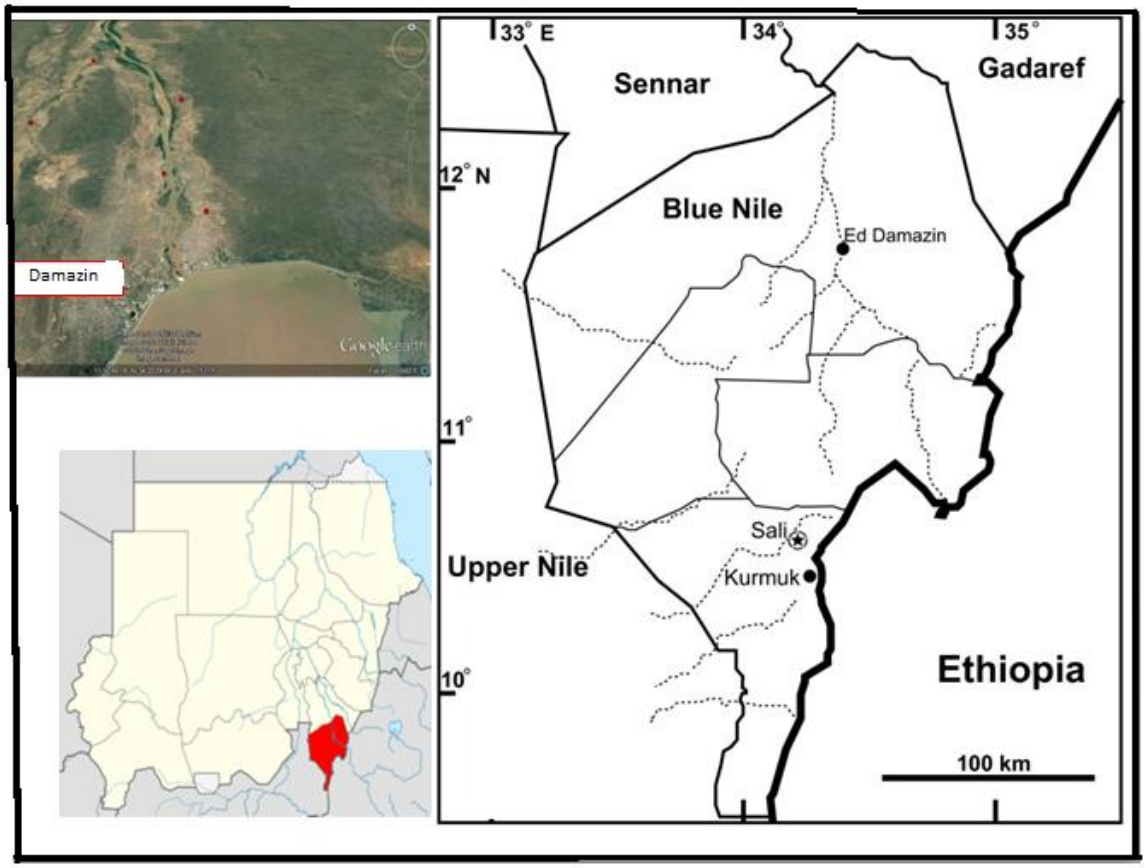

Figure. 1: Study area map and satellite image showing sample collection sites

1.3. The systematic position of Martynia

Different authors treated *Martynia* in different taxa. Bentham and Hooker (1862-1863) and later Cronquist (1968) placed it under Pedaliaceae. Bentham and Hooker (1862-1863) divided Pedaliaceae into four tribes namely: Martynieae, Pedalieae, Sesamieae and Pretrieae. Engler

and Prantl (1895) treated the tribe Martynieae as a separate family Martyniaceae as did many taxonomists including Hutchinson (1964-1967) due to the possession of characters such as unilocular ovary, parietal placentation and horned capsules. Martyniaceae is thus a small family comprising three genera and several species. Hutchinson (1973) moved members of the Martyniaceae once more to the family Bignoniaceae as did Thorne (1983) while Takhtajan (1980) and Cronquist (1981) placed them under Scrophulariaceae.

2. Materials and methods

Field excursions were conducted during 2015-2016 to collect plants for the Department of Botany Faculty of Science, University of Khartoum and as part of a research project funded by the Directorate of Scientific Research of the Ministry of Higher Education and Scientific Research to study the riparian flora of Sennar and Damazin Areas. The vegetation surveys were conducted during the dry season in February and April 2016 and at the end of the rainy season during the period 27 October-1 November 2016.

The collected plant specimens were identified using relevant flora, revisions and monographs. After being processed following standard taxonomic procedures the specimens were deposited in the Herbarium of the Botany Department, Faculty of Science, University of Khartoum. A detailed morphological description and photographs of *Martynia annua* are given here to facilitate easy identification.

3. Results

3.1. Botanical description of Martynia annua

M. annua is an erect, branched herbaceous, plant woody at the base. Terete **stems** 30 – 120 cm tall, are densely covered with glandular sticky hairs (Plate 2). **Leaves** are large, simple, opposite palmately veined; petiole 6–15 cm long; lamina 13-24 cm wide, kidney-shaped, lobed, margins entire to minutely dentate; apex acute, base cordate. Sticky-topped glandular hairs present on both surfaces of the leaf (Plate 3). **Flowers** are bell shaped with unpleasant smell, white in colour with purple spots on the inner surface. Flowers aggregate in raceme inflorescences up to 8 cm long. **Pedicels** 1–2 cm long. **Calyx** 5 free sepals, lanceolate, glandular, pale yellow-green 15-20 mm long. **Corolla** glandular outside is funnel shaped, 55-65 mm long, with yellow spots on the inner surface (Plate 4); petals 5 unequal lobes, the posterior lobe the

largest. **Stamens** epipetalous; 2 fertile stamens, filaments glandular at the base, 2 staminodes slightly curved about 5 mm. **Carpels** 2 united, ovary unilocular, superior, globose; placentation parietal, style slender, persistent, stigmas 2. **Fruits** oblong 3-4 cm long, 1-1.5 cm wide**.** Fruits are green, fleshy when young becoming black bi-lobed and woody flattened capsule; when mature more or less ovoid, 2 valved, with the style splitting into 2 curved, sharp hard claws which are shorter than the body of the fruit (Plates 4 and 5). Fruiting throughout the year. **Seeds** are flat oblong black, two seeds to each pod, usually remaining inside the capsule.

Plate1. *Martynia annua* General view in the natural habitat in (a) Damazin area (b) Al Gadarif area

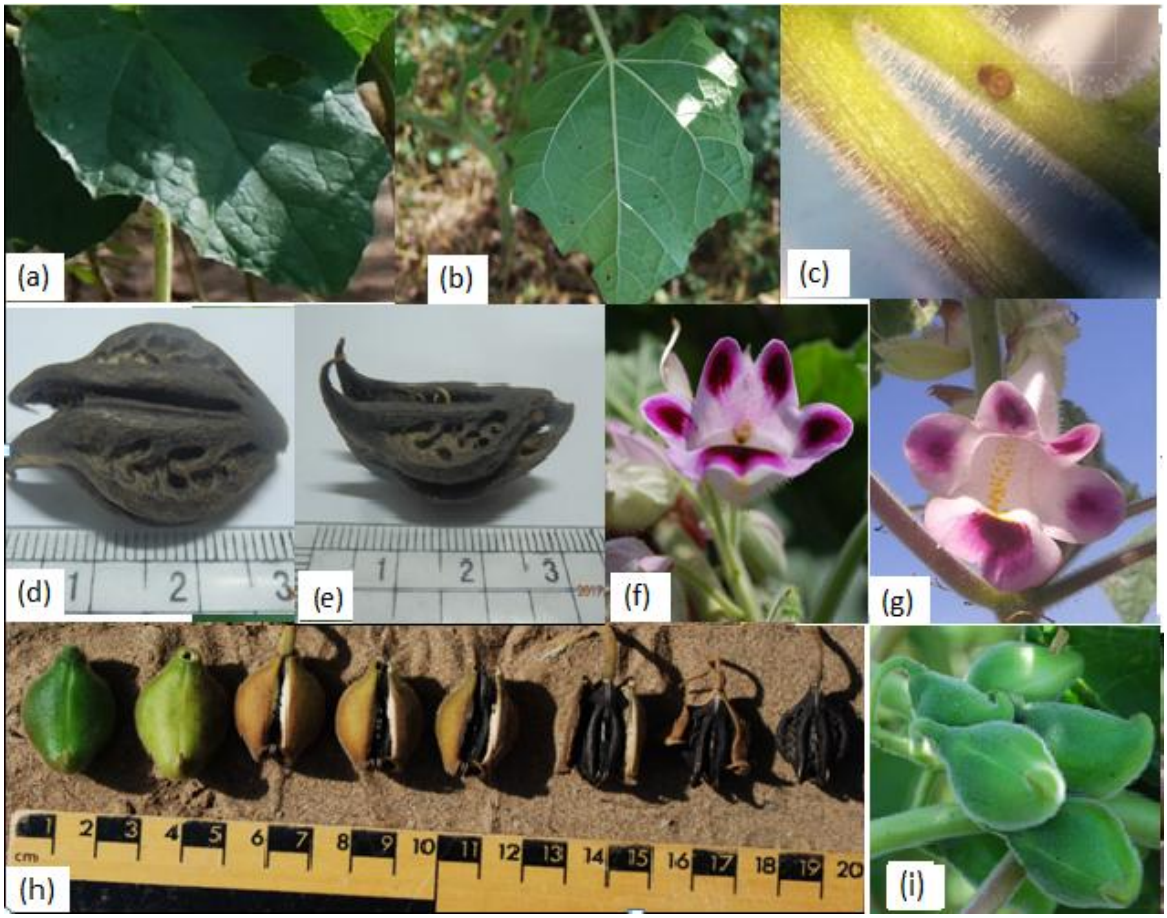

Plate 2: *Martynia annua* (a) Leaf upper surface. (b) Leaf lower surface. (c) Stem with glandular hairs. (d,e) Mature fruit. (f,g) Flower. (h) Comparison of immature green fruits to the ripening stages. (i) 5 Immature fruits.

4. Concluding remarks

M. annua is a new addition to the flora of the Sudan. According to the local tribes of Goni village in the Damazin area the plant is native of the region. Although the plant is used extensively in folk medicine in India and other parts of the world, local tribes in the Damazin area avoid it since they consider it as a poisonous devil plant. Surprisingly in Al Gadarif area although known as devil thorn the plant is very important in folk medicine used in the form of powder as anti venom and for external use to cure skin diseases and tumors.

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