

## SOME NEW RECORDS FOR IRAN AND FLORA IRANICA AREA COLLECTED FROM BOUJAGH NATIONAL PARK, N. IRAN

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*Melilotus polonicus* L. (Papilionaceae), as psammophyte plant on the Caspian coast, is reported as new noteworthy record for the flora of Iran. *Apium leptophyllum* (Apiaceae), *Sisyrinchium exile* (Iridaceae) and *Tagetes minuta* (Asteraceae) are recorded for the first time from Iran/Flora Iranica area. Moreover, the two latter records are the first reports of these genera for the Flora Iranica area. All records were collected in different habitats of Boujagh National Park, the newly founded land-marine National Park in North of Iran. Taxonomic remarks and distribution map for these species are provided.

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جنسها و گونه های جدید برای فلور ایران و منطقه فلورا ایرانیکا، جمع آوری شده از پارک ملی بوجاق،

شمال ایران

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*Melilotus polonicus* از ماسه رست های ساحل دریای خزر به صورت گزارش جدید معرفی می شود. همچنین گونه ها و جنسهای *Apium leptophyllum*، *Sisyrinchium exile* و *Tagetes minuta* برای اولین بار از فلور ایران و فلورا ایرانیکا گزارش می شوند. دو جنس اخیر برای فلورا ایرانیکا نیز جدید می باشند. تمامی گونه ها از زیستگاههای مختلف پارک ملی بوجاق در شمال ایران گزارش می شوند. یادداشتهای تاکسونومیک و نقشه پراکنش برای گونه ها فراهم شده است.

### Introduction

The coastal parts of south Caspian Sea (Hyrcanian plain) have been largely destroyed and replaced by cultivated lands, human settlements and industry (Zohary 1973). Some relatively small patches along the Caspian shore are still natural. Present study was carried out on one of the somewhat natural coastal areas namely, Boujagh National Park (located in Gilan province, NW Iran) (Fig. 1). This area is the first land-marine National Park founded in Iran and a critical refuge for many migratory birds and a huge number of valuable coastal flora and fauna. Part of the park (Kiashahr lagoon and mouth of Sefidrud river) is designated as one of the 22 wetlands of International Importance (Ramsar) catalogued in the country (Anonymous 2006). All of recorded plants in this paper were found mainly in two main habitats of the park, i.e.

sand dune parts and plain parts. Sand dune parts of the park constitute a belt between Caspian Sea and other parts of the park and characterized with some psammophytes flora. A new plant *Melilotus polonicus* (L.) Desr. from this part of the Park are added to the flora of Iran for the first time. Large plain parts with grassland vegetation occur in the bank of Sefidrud river which may be flooded during some rainy seasons. Some parts of this habitat have been covered with more or less large patches of *Juncus acutus* L. populations. Three new plants, *Sisyrinchium exile* Bicknel., *Tagetes minuta* L. and *Apium leptophyllum* (Pers.) F. Muell., from this habitat are added to the flora of Iran for the first time.

The materials recorded here were deposited in MMTT (Herbarium of Natural History Museum), TARI and Gilan University Herbarium and

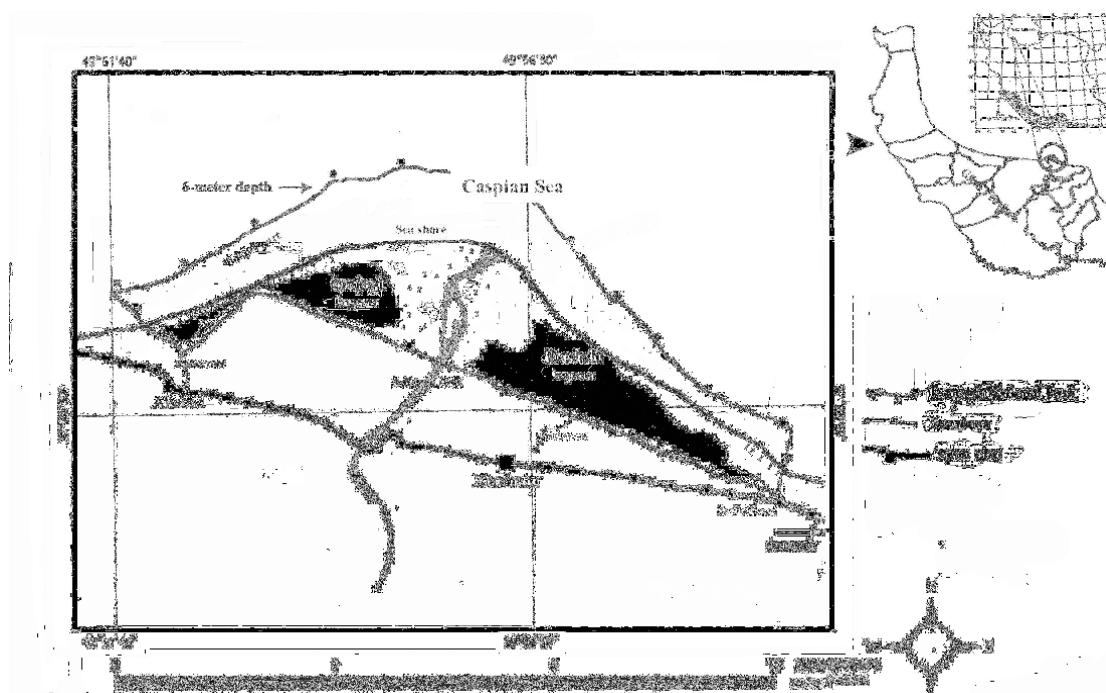


Fig. 1. Location of *Melilotus polonicus* (1), *Sisyrinchium exile* (2), *Tagetes minuta* (3), *Apium leptophyllum* (4) in Boujagh National Park, N. Iran.

Mazandaran University Herbarium and confirmed by a comparison with the materials of Natural History Museum, Vienna (W) and Kew Herbarium (K). Figure 1 shows the location of new record species in Boujagh National Park.

## Results

### *Melilotus polonicus* (L.) Desr. in Lam. (Figs. 1 & 2)

*Material examined.* Iran, Province Gilan, Astaneh, Kiashahr, Boujagh National Park, on the coastal line of Amirkiasar village (Hasht-Anten area), 37°24'48.6" N, 50°00'91.5" E, 4.10.2005, -25 m, Naqinezhad 12984-MMTT

Biennial. Stems erect, 60-120 cm long, robust, sparsely leafy, divaricately branched from base, puberulent above. Stipules subulate, entire, 3-5 mm long. Leaflets 4-8 toothed to subentire, rather thick and leathery, prominently few-veined and appressed-pubescent beneath, the lower obovate, cuneate at base, the upper spatulate or sublanceolate, acuminate sometimes almost spinescent. Racemes ca.5 cm long, very few-flowered, slightly elongating in fruit. Pedicels filiform, 4-6 mm long, bracteoles one-third to half length of pedicel. Flower 5-6 mm long with horizontally spreading

pedicels. Calyx ca.3 mm long, sparsely pubescent. Corolla pale yellow, the petals subequal. Ovary glabrous, 2-ovuled. Style about as long as ovary. Pod pendent, 7-9 mm long and ca.3 mm broad, lanceolate or oblong-rhomboid, yellowish or light brown, rugose by anastomosing veins. Seeds solitary or rarely 2, ca. 3 mm long, yellowish brown.

*Taxonomy, habitat and distribution.* Bobrov (1945) reported the species from Iran in his general distribution without close clarification of the locality. In Flora Iranica (Rechinger 1984) no material of this species from Iran and Flora Iranica area was quoted. Wiersema et al. (1990) similar to Rechinger (1984) mentioned this plant from Iran on the basis of Flora of USSR (Bobrov 1945). Therefore, the occurrence of *M. polonicus* in Iran can be confirmed now. The genus *Melilotus* now consists of seven definite species i.e. *M. albus* Medicus, *M. dentatus* (Waldst. & Kit.) Pers., *M. indicus* (L.) All., *M. neapolitanus* Ten., *M. officinalis* (L.) Pall., *M. polonicus* and *M. sulcatus* Desf. as well as a doubtful species i.e. *M. messanensis* (L.) All. based on works by (Rechinger 1984; Akhani 1996; Mussavi 2001; Hamzeh'ee & Jalili 2002).

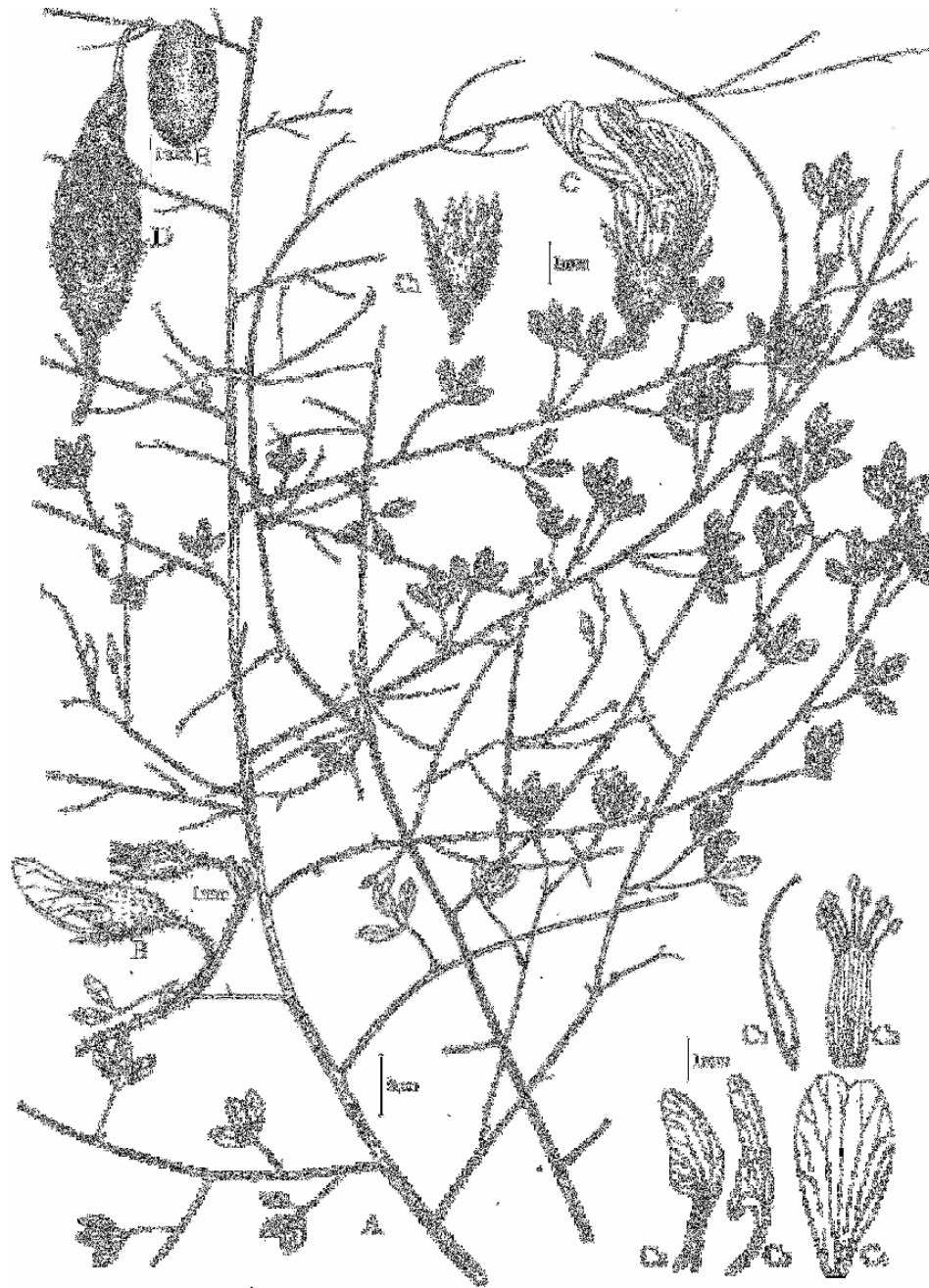


Fig. 2. *Melilotus polonicus*. -A: Habit, -B: Inflorescence, -C: Flower and its parts, C<sub>1</sub>: Calyx, C<sub>2</sub>: Stamen cluster, C<sub>3</sub>: Ovary, C<sub>4</sub>: Standard, C<sub>5</sub>: Wing, C<sub>6</sub>: Keel, -D: Fruit, -E: Seed.

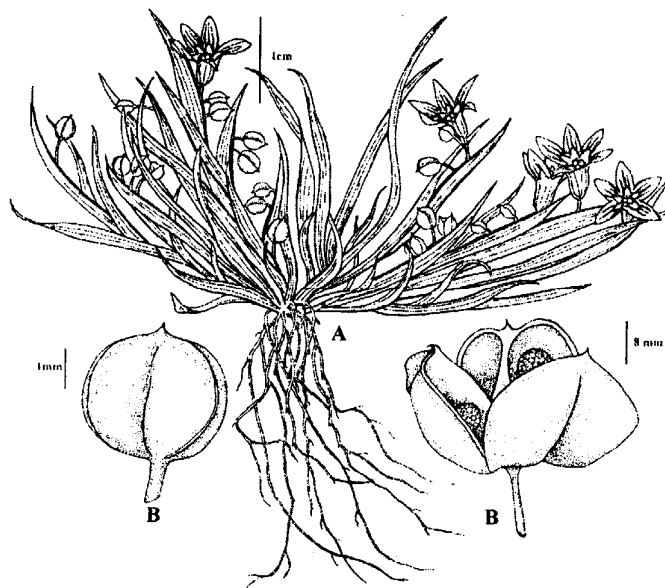


Fig. 3. *Sisyrinchium exile*. -A: Habit, -B: Fruits in two states.

*Melilotus polonicus* occurs on sand dunes of Boujagh National Park where it is associated with *Arguzia sibirica* (L.) Dandy, *Atriplex tatarica* L., *Cakile maritima* Scop., *Convolvulus persicus* L., *Corispermum orientale* Lam., *Daucus littoralis* Smith subsp. *hyrcanicus* Rech. f., *Digitaria sanguinalis* (L.) Scop. subsp. *pectiniformis* Henrard and *Plantago psyllium* L. Other psammophytes which are common in sandy habitats of *Melilotus polonicus* are: *Agriophyllum squarrosum* (L.) Moq., *Arguzia sibirica* (L.) Dandy, *Artemisia tscherviniana* Besser, *Cakile maritima* Scop., *Cerastium* sp., *Cerastium semidecandrum* L., *Chenopodium ambrosioides* L., *Convolvulus persicus* L., *Corispermum aralocaspicum* Iljin, *Corispermum orientale* Lam., *Corynephorus articulatus* (Desf.) P. Beauv., *Daucus littoralis* Smith ssp. *hyrcanicus* Rech. f., *Digitaria sanguinalis* (L.) Scop. subsp. *pectiniformis* Henrard, *Eleocharis caduca* (Delile) Schultes, *Isolepis cernua* (Vahl) Roemer & Schultes, *Maresia nana* (DC.) Batt.

*Melilotus polonicus* has a limited distribution around the Caspian Sea. Till now, this species has been found in East Russia, W Kazakhstan, Daghestan, Transcaucasica and Talish (Bobrov 1945; Hansen 1968; Stevenson 1969).

***Sisyrinchium exile* Bicknel. (Figs. 1 & 3)**

*Material examined.* Iran, province Gilan: Astaneh, Kiashahr, Boujagh National Park, along the Sefidrud river, on the lowland plain between Gammi village and Sefidrud conservatory station, 37°27' 41.8" N, 49°55'51.8" E, -25 m, 24.6.2005, Naqinezhad 12983 – MMTT.

Annual, 3-8 cm high in diminutive tufts of one to few erect stems within a cluster of ascending leaves, dull pale green and glaucescent, somewhat discoloring when dry. Roots pale and exceedingly delicate, more or less fibrillate. Stems simple with terminal spath, 1.5-6.5 cm high, less than 1 mm wide, very narrow, sometimes longer than the supporting stem. Larger leaves equaling or surpassing the stems, 0.75-1.5 mm wide, narrowed to acute apex firm but rather thin and weakly few-nerved; the edges smooth or nearly so or sometimes minutely ciliolate towards the tip; their bases membranously broadened and with conspicuously white-hyaline edges. Both bracts foliaceous and prolonged; the outer one 12-25 mm long much surpassing the more attenuate inner one, narrowly white-hyaline below and connate for about 3 mm at base; inner scales silvery-white, less than half the length of the shorter bract. Flower few on hair-like pedicels, much shorter than the bracts and early

recurved from midway in the spath. Perianth very small and delicate, about 5 mm long, rather broadly seated on the ovary around the point of attachment, appearing pale yellowish; the obscurely nerved segments aristulate. Staminal column 1.5-2 mm high; the filaments free at the tip for about 0.5 mm and slightly diverging; anthers ca. 1 mm long. Capsule subglabrose, 2 mm high, sparsely puberulent to glabrate.

*Taxonomy, habitat and distribution.* *Sisyrinchium exile* is an annual species and native of temperate South America (Schinners 1962) but introduced to the other parts of the world. Some species of *Sisyrinchium* (i.e. *S. bermudiana*, *S. californicum*, *S. montanum*) have also been naturalized in Europe and Russia (Ingram 1980; Fedchenko 1935). Several populations of our discovered *Sisyrinchium* were collected in the western and Eastern parts of Sefidrud River. There are no reports on the occurrence of this genus and species in the local flora (Mathew & Wendelbo 1975; Davis 1984; Mazhari 2000).

*Sisyrinchium exile* growing on the wet alluvial parts of the Park where accompanied with *Juncus acutus*, *Centella asiatica*, *Euphorbia helioscopia*, *Fimbristylis bisumbellata*, *Juncus maritimus*, *Trifolium* spp., *Verbena officinalis* and *Mentha pullegium*.

#### **Tagetes minuta** L. (Figs. 1 & 4)

*Material examined.* Iran, Province Gilan: Astaneh, Kiashahr, Boujagh National Park, at the western corner of mouth of Sefidrud river, 37°28'13.9" N, 49°56'36.9" E, Naqinezhad 1500-MUH.

Annual plants 20-100 cm high, glabrous. Stem erect, branched; branches opposite. Leaves opposite but the upper alternate, pinnately parted, 4-8 cm long, 3-4.5 cm wide; parts 9-17 in number, linear-lanceolate, 1-4 cm long, 1.5-4 mm wide, acute, serrate at margin. Heads cylindrical, numerous in apical corymbiform dense inflorescence at the end of branches; involucre minute, 4-5 united (connate). Phyllaries forming acylindrical tube, naked at base, 7-10 mm long, 2-3 mm in diameter, with rounded free lobes. Ligulate florets 3 in number, dark-brown or lemon-colored, 2.5-3 mm long. Tubular florets orange, 3 mm long. Achenes 5-6.5 mm (excluding pappus) long, 0.5 mm wide, dark-brown, covered with appressed hairs. Pappus of 5 entire unequal often more or less united palea with 2 subulate bristles (ca. 2 mm) longer than the rest (ca. 0.5 mm).

*Taxonomy, habitat and distribution.* The genus *Tagetes* is a member of tribe *Helenieae* Benth and forms the overwhelming number of species of this tribe. This genus is indigenous to the new world (Tutin 1968) and some of its members have been introduced to other parts of the world. No species from this tribe grows

naturally in Flora Iranica area. This species grows in natural habitat in Boujagh National Park. It is the first report of a natural population of this species from Iran.

*Tagetes minuta* grows on riverside, low-lying marshy places and on waste dumps and cultivated grounds in Europe and America. Sometimes, this species occurs in disturbed areas during early succession stages. An affinity of disturbed sites has allowed the species to colonize many areas around the world. In Iran, *Tagetes minuta* is adapted to grow on seashore sands near to Sefidrud Estuary. *Tagetes minuta* is native to the temperate grasslands and mountain regions of southern South America but naturalized in Europe, Africa, Asia, Australia, New Zealand, United states including Hawaii, Cape Verde, Canary Is., Madeira & Madagascar (Munz & Keck 1968; Tutin 1968). The closest locality for this species to Iran is W Transcaucasia (Gorshkova 1959). It seems that the seeds cling to hair and were dispersed by migratory birds to Iran probably via Caucasus corridor. The occurrence of spine-shaped pappus on the nuts of this species are helpful for their dispersion.

#### **Apium leptophyllum** (Pers.) F. Muell. (Figs. 1 & 5)

*Material examined.* Iran, Province Gilan: Astaneh, Kiashahr, Boujagh National Park, along the Sefidrud river, on the lowland plain between Gammi village and Sefidrud protected station, 37°27'04" N, 49° 55'52" E, -25 m, 23.6.2005, Naqinezhad & Saeidi 12989-MMTT.

Annual, 15-30 cm tall, sometimes prostrate, glabrous, branched. Stem 1 or many from the base. Basal leaves 3-4 pinnately decomposed, 3-10 cm long, long-petioled; the upper smaller, short petioled; ultimate divisions 4-20 mm long, linear to subfiliform. Leaf bases sheathing; the sheath white margined. Bracts and bractlets lacking. Umbels shortly pedunculate Rays 1-3 but often 2. Fruit ovoid to suborbicular, 1.5 mm long, 1.3 mm broad, glabrous, ridges prominent, furrows 1-vittate.

According to Flora Iranica (Rechinger, 1987) and Flora of Iran (Mozaffarian 2007), there are two species of *Apium* in Iran and adjacent. *Apium leptophyllum* is the third species of this genus that is new for the Flora Iranica area.

*Apium leptophyllum* grows on plain habitats along the Sefidrud river in Boujagh National Park. This plant was accompanied with *Juncus acutus*, *Centella asiatica*, *Euphorbia helioscopia*, *Fimbristylis bisumbellata*, *Juncus maritimus*, *Sisyrinchium exile*, *Trifolium* spp. *Verbena officinalis* and *Mentha pullegium*.

*Apium leptophyllum* is a cosmopolite species, which has been originated from South America. In Europe,

this species seems to be often impermanent but persisted in Portugal (Tutin 1968). In the closest record, Pakistan, it has been collected only from Hazara district (Nasir 1992).

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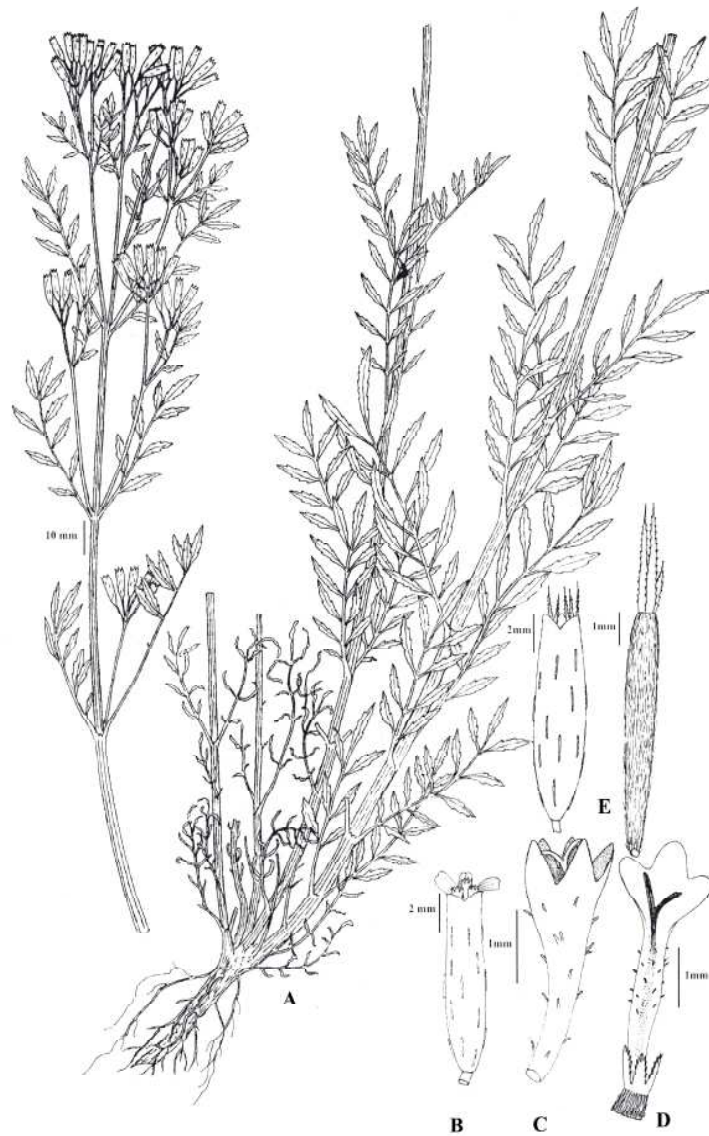


Fig. 4. *Tagetes minuta*. -A: Habit, -B: Capitule with ligulate and tubulate flowers, -C: Tubulate flower, -D: ligulate flower, -E: Achene and capitule.



Fig. 5. *Apium leptophyllum*. -A: Habit, -B: Inflorescence, -C: Fruit.