



# Cistaceae, a new family record for India

R.M. Patel<sup>1,\*</sup> and K.V.C. Gosavi<sup>2</sup>

<sup>1</sup>Gujarat Institute of Desert Ecology, PO Box 83, Mundra Road, Bhuj – 370 001, Kachchh, Gujarat, India.

<sup>2</sup>Department of Botany, HPT Arts and RYK Science College, Nashik – 422 005, Maharashtra, India.

\*E-mail: rmpecology@gmail.com

## Abstract

*Helianthemum lippii* (L.) Dum.Cours. (Cistaceae), a species that has recently been collected from Kachchh district in Gujarat represents the first record of this species, genus and family for India. Detailed description, illustrations and photographs are provided here to facilitate identification.

**Keywords:** Cistaceae, Gujarat, *Helianthemum lippii*, India, New Record

## Introduction

Cistaceae Juss. comprise 9 genera and c. 170 species and are distributed in temperate and warm regions of West Eurasia, North Africa, North America and Mediterranean regions (Arrington & Kubitzki, 2003; Mabberley, 2008). The family is closely allied to Dipterocarpaceae and Sarcolaenaceae belonging to the order Malvales (Arrington & Kubitzki, 2003). However, it can be distinguished from them by the presence of tufted hairs, absence of coloured latex, absence of involucre in flower, 3–5 imbricate sepals, occasional presence of nectariferous tissue, longitudinal dehiscence of anthers, usually monad or rarely tetrad pollen grains, mono- to multicarpellary ovary with a single style, one- to many-seeded fruit, usually hook-like folded embryo, non-ruminate endosperm and non-stratified phloem (Kubitzki, 2003).

*Helianthemum* Mill. (Cistaceae) is one of the largest genera in the family with c. 80 species and is distributed from Europe to Sahara and Northeast Africa to Central Asia in the World (Mabberley, 2008). During our plant exploration tours between 2010 and 2015 in Kachchh district, Gujarat, the senior author has collected an unknown plant specimens from Lakhpat taluk. After the critical examination of specimens with relevant literature (Jafri, 1977; Arrington & Kubitzki, 2003; Ghazanfar, 2003; Danin, 2006; Venturella *et al.*, 2015) and in consultation of type specimens (K000230925, K000230927 and LINN-HL689-53, images!), it was identified as *H. lippii*, a species distributed widely from south Italy, North Africa, Israel, Palestine, Syria, Iraq, Arabia, south Iran to south Pakistan.

A scrutiny of literature pertaining to flora of India (Karthikeyan, 2000, 2009) revealed that the family Cistaceae is hitherto not reported from India. Therefore, the present report of this taxon from Gujarat forms the first report of the species, genus and family for India. Detailed description, illustrations and photographs of the species are provided below to facilitate identification.

***Helianthemum lippii*** (L.) Dum.Cours., Bot. Cult. 3: 130. 1802; Pers., Syn. Pl. 2: 78. 1806; Boiss., Fl. Orient. 1: 443. 1867, p.p.; Burkill, List Fl. Pl. Baluchistan: 14. 1909; Täckh. *et al.*, Fl. Egypt: 362. 1941; Rech.f., Fl. Iran. 46: 2. 1967; Jafri, Fl. Pakistan 112: 1. 1977; Ghaz., Fl. Sultanate Oman 1: 262. 2003. *Cistus lippii* L., Mant. Pl. Altera: 245. 1771. **Figs. 1,2,3**

Herb or subshrub, perennial, 10–20 cm high, branching from base; branches erecto-patent with white stellate-tomentose. Stipules linear, 1.5–3 mm long, acute at apex. Leaves opposite to subopposite at base, alternate towards apex; petioles 2–4 mm long; lamina ovate to elliptic, 5–15 × 2.5–10 mm, acute to obtuse at base, entire or revolute at margins, acute at apex, coriaceous; veins prominent beneath. Inflorescence a raceme, 4–10-flowered. Flowers bisexual, bracteate; bracts linear-lanceolate, c. 2 mm long; pedicels 4–5 mm long. Sepals 5, unequal, persistent, accrescent; outer 2 linear, c. 2 mm long, 1-veined; inner 3, obovate, c. 4 × 2–2.5 mm, 3-veined. Petals 5, obovate to oblanceolate, c. 6 × 4 mm, 5-veined, yellow, caducous. Stamens many; filaments to 3 mm long, glabrous, yellow; anthers basifixed, dithecal. Ovary 1–1.5 mm long, pubescent; style c. 2.5 mm long; stigma 3-lobed. Capsules discoid, c. 4 mm. Seeds many, c. 1 mm in diam., angular, dark brown.

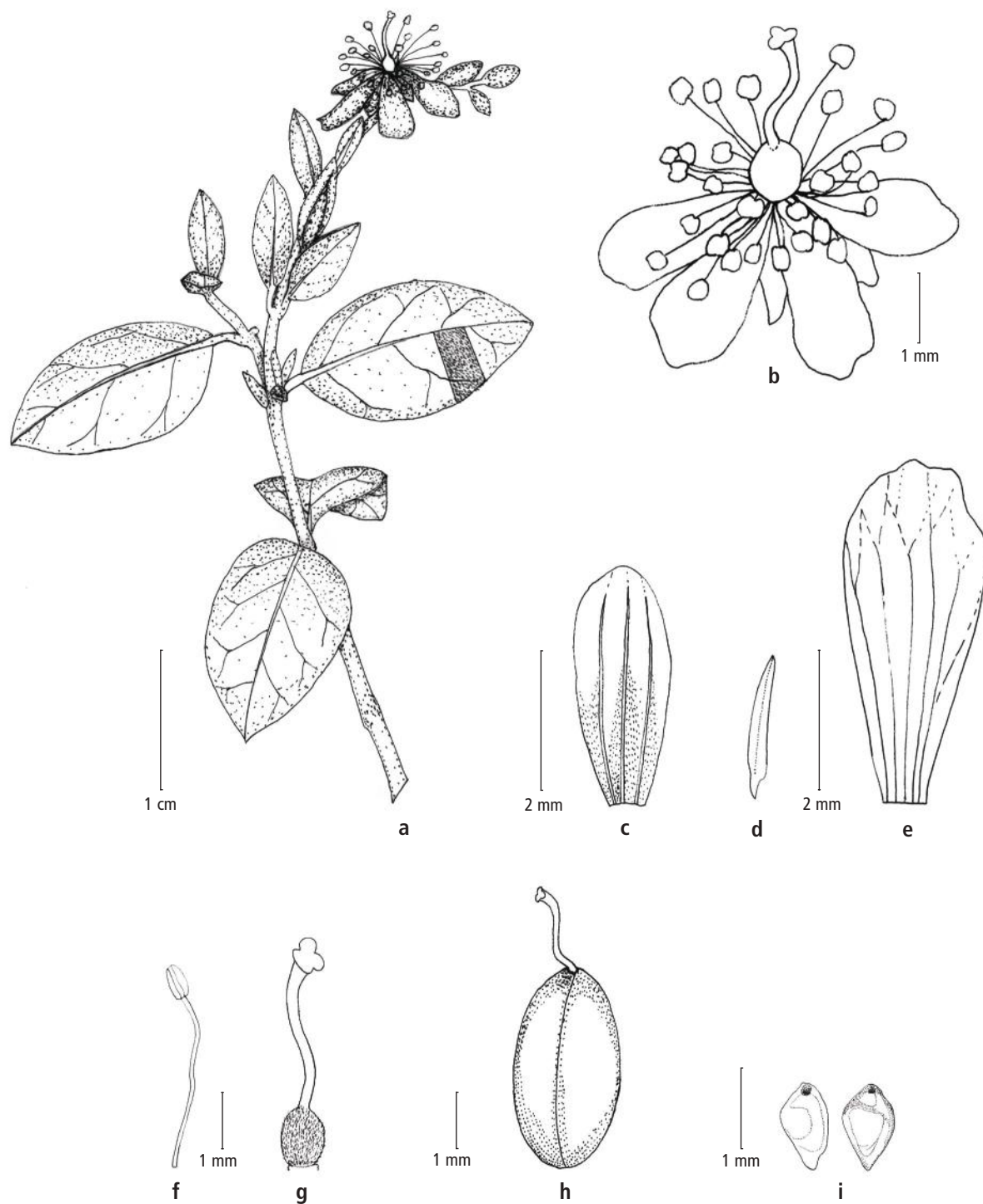


Fig. 1. *Helianthemum lippii* (L.) Dum.Cours.: a. Flowering-twig; b. Flower; c. Inner sepal; d. Outer sepal; e. Petal; f. Stamen; g. Gynoecium; h. Fruit; i. Seeds.

*Flowering & fruiting:* August–September.

*Habitat:* Grows on shallow undulated terrains of open lime stone rock deposition, in association with *Asparagus dumosus* Baker, *Chrysopogon fulvus* (Spreng.) Chiov., *Cleome brachycarpa* (Forssk.) Vahl

ex DC., *Periploca aphylla* Decne. and *Urochondra setulosa* (Trin.) C.E. Hubb.

*Specimens examined:* INDIA, Gujarat, Kachchh district, Lakhpat taluk, Narayan Sarovar Sanctuary, 27.11.2010, Rohit Patel GUIDE1446 (Herbarium of

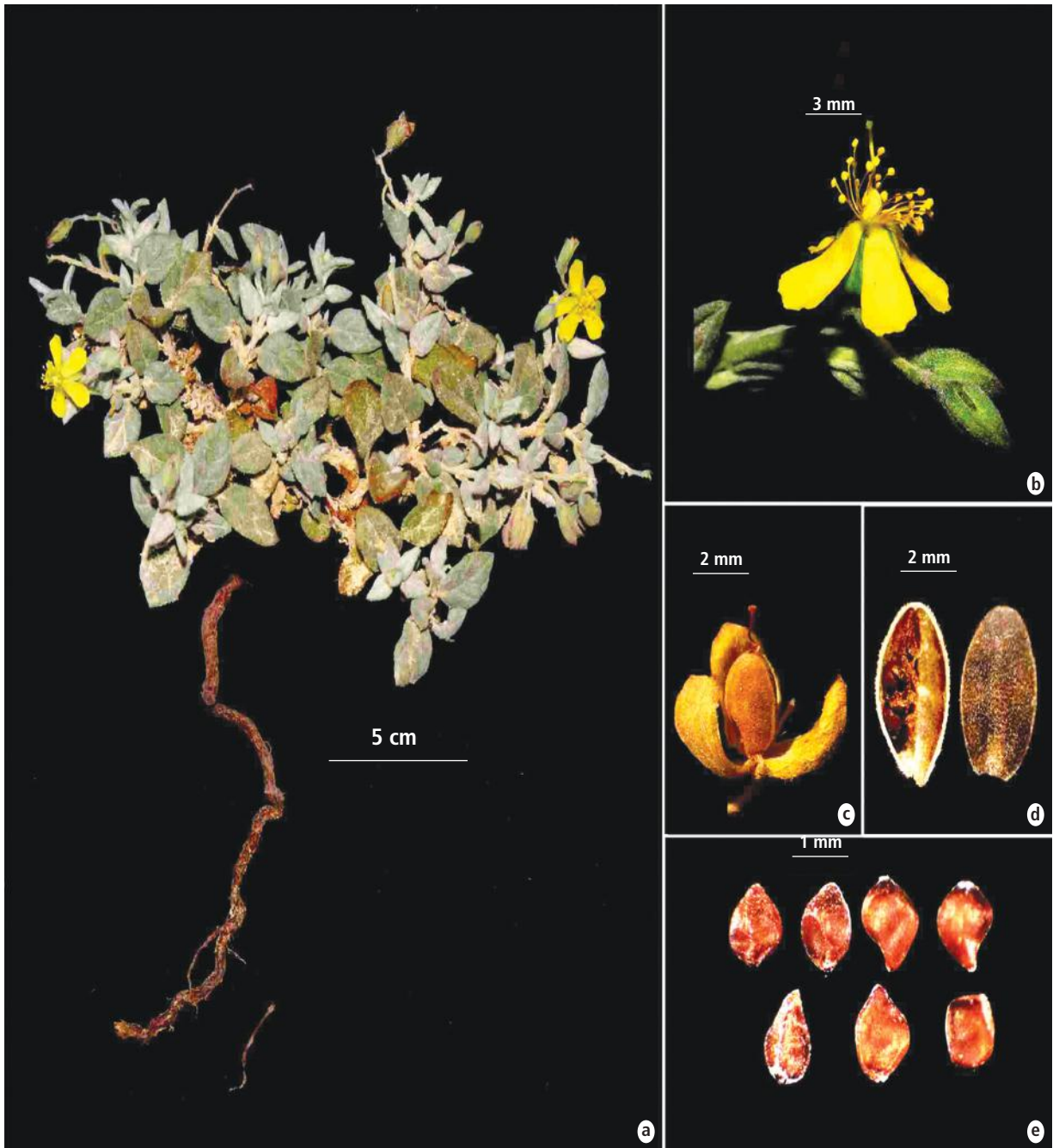


Fig. 2. *Helianthemum lippii* (L.) Dum.Cours.: a. A whole plant; b. Flower; c. Fruit with accrescent sepals; d. Inner surface of fruit wall showing placenta seed attachment and outer surface of fruit wall showing hairs; e. Seeds.

Gujarat Institute of Desert Ecology); Godhatad Dam, 13.8.2015, Rohit Patel GUIDE1447 (CAL & Herbarium of Gujarat Institute of Desert Ecology).

*Distribution:* Africa, Arabia, India (Gujarat), Iran, Iraq, Israel, Italy, Pakistan, Palestine and Syria.

*Note:* Very rare and is restricted to an area of c. 20 km<sup>2</sup>. About 50 individuals were found in the collection localities.

## Acknowledgements

Authors are thankful to the Director and Additional Director, Gujarat Institute of Desert Ecology, Bhuj, Kachchh, for providing facilities. They are also grateful to: Dr. Shahina Ghazanfar, Royal Botanic Gardens, Kew, for confirming the identity of species, providing relevant literature and type images and valuable



Fig. 3. *Helianthemum lippii* (L.) Dum.Cours.: a. Habit; b. Top view of flower; c. Plants with flowers after shedding petals; d. Fruits enclosed in accrescent sepals.

comments on the manuscript; Prof. Giuseppe Venturella, University of Palermo, Italy, for providing literature; Prof. S.R. Yadav, Dept. of Botany, Shivaji University, Kolhapur, for encouragement; Dr. Yogesh Dabgar, Principal, R.R. Mehta Science College, Palanpur, for his guidance and moral support; Dr. S.S. Kambale, Department of Botany, Goa University, Goa, for his suggestions on the manuscript. KVCG is thankful to Science and Engineering Research Board (SERB), New Delhi, for financial assistance (File No.: SB/FT/LS-130/2012) under DST Fast Track Young Scientist Scheme. Authors are also thankful to the two anonymous reviewers, for their valuable comments and suggestion to improve the manuscript.

#### Literature Cited

- Arrington, J.M. & K. Kubitzki 2003.** *Cistaceae*. In: Kubitzki, K. & C. Bayer (Eds.), *The families and genera of vascular plants*. Vol. V. Flowering Plants. Dicotyledons: Malvales, Capparales, and Non-beta-line Caryophyllales. Springer, Berlin. pp. 62–70.
- Danin, A. 2006.** *Flora of Israel*. [<http://flora.org.il/en/plants/hellip/#moreinfo>].
- Ghazanfar, S.A. 2003.** *Flora of the Sultanate of Oman*. Vol. 1. National Botanic Garden of Belgium, Meise.
- Jafri, S.M.H. 1977.** *Cistaceae*. In: *Flora of Pakistan*. Vol. 112. University of Karachi and Missouri Botanical Garden, St. Louis. [<http://>

www.efloras.org/florataxon.aspx?flora\_id=5&taxon\_id=250068962]

- Karthikeyan, S. 2000.** A statistical analysis of flowering plants of India. In: Singh, N.P., Singh, D.K., Hajra, P.K. & B.D. Sharma (Eds.), *Flora of India, Introductory Volume. Part II.* Botanical Survey of India, Calcutta. pp. 201–217.
- Karthikeyan, S. 2009.** Flowering plants of India in 19th and 21st centuries – A comparison. In: Krishnan, S. & D.J. Bhat (Eds.), *Plant and fungal biodiversity and bioprospecting.* Goa University, Goa. pp. 19–29.
- Kubitzki, K. 2003.** Conspectus of the Families of Malvales. In: Kubitzki, K. & C. Bayer (Eds.), *The families and genera of vascular plants.* Vol. V. Flowering Plants. Dicotyledons: Malvales, Capparales, and Non-betaline Caryophyllales. Springer, Berlin. pp. 17–18.
- Mabberley, D.J. 2008.** *Mabberley's Plant-Book: A portable dictionary of plants, their classification and uses.* Third Edition. Cambridge University Press, Cambridge.
- Venturella, G., Gargano, M.L., Compagno, R., Rosa, A.L., Bella, S.L., Leto, C.L. & T. Tuttolomondo 2015.** Up-to-date report on the distribution of *Helianthemum lippii* (Cistaceae) in Italy. [<http://dx.doi.org/10.1080/00837792.2015.1024398>]

---

Received: 16.3.2016

Revised and Accepted: 14.6.2016