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Cover: A female Javan Leopard *Panthera pardus melas* in rehabilitation phase at Cikananga Wildlife Center. © Yayasan Cikananga Konservasi Terpadu.



## Salsola oppositifolia Desf. in Great Rann of Kachchh, Gujarat – a new record for India

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The genus *Salsola*, usually having small shrubby habit, commonly occurs in arid, semi-arid, and temperate regions of the world (Rasheed et al. 2013; Hanif et al. 2018). There are 100–150 species of this genus in the world (Altay & Ozturk 2020). The genus is characterized by the presence of axillary flowers with conspicuous bracteoles, winged fruit, and superior ovary (Borger et al. 2008). The name *Salsola* is derived from the Latin word ‘Salsus’ meaning ‘salty’ (Mosyakin 1996). *Salsola* taxon belongs to *Salsola* sect and it is distributed across Mediterranean region mostly prevalent from Morocco to Palestine (Botschantzev 1976; Greuter et al. 1984; Peruzzi & Passalacqua 2004). In India, five species of *Salsola* are recorded: *Salsola kali*, *S. hartmanii*, *S. monoptera*, *Caroxylon imbricatum*, *Halogeton glomeratus*. Among them, the latter two are more well-known through the synonyms *Salsola baryosma* and *Salsola glomerata*, respectively (BSI 2022; FOI 2022). They are recorded from different states of India like Rajasthan, Kashmir, Ladakh, Gujarat, Delhi, Haryana, and Punjab. They are used as fodder in many parts of the country (Altay & Ozturk 2020).

A hitherto unrecorded species of halophyte,

*Salsola oppositifolia* Desf., belonging to the family Amaranthaceae was recorded in the Great Rann of Kachchh (Kachchh district, Gujarat) in October 2021 during a study on flora and fauna of Great Rann of Kachchh by Gujarat Ecological Education and Research (GEER) Foundation. *Salsola oppositifolia* was recorded in three different localities of Great Rann of Kachchh between August 2021 and December 2021. This species constitutes a new record for India. The specimen was confirmed by a scientist at Botanical Survey of India (BSI), Jodhpur. The sample is deposited at BSI, Jodhpur (Accession No.: BSJO51890). Great Rann of Kachchh is the largest saline desert-cum-seasonal wetland in Gujarat, which is spread over an area of around 18,000 km<sup>2</sup>. It is important not only due to vast area, but also owing to some of its unique aspects like its dual ecosystem characteristic (i.e., saline desert-cum-seasonal wetland), unique genesis, evolution, and presence on hilly islands ('bets'). The Great Rann has been identified as one of the eight nationally important wetlands in Gujarat by MoEFCC. A large portion of it is under legal protection as a wildlife sanctuary named as Kachchh Desert Wildlife Sanctuary. 'Flamingo city' within the Great Rann is an

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important bird and biodiversity area (IBA).

***Salsola oppositifolia* Desf.**, Fl. Atl. 1: 219 (1798); *Salsola longifolia* Forsskal var. *oppositifolia* (Desf.) Vicioso in Anal. Jard. Bot. Madrid 6(2): 25 (1946); *Seidlitzia oppositifolia* (Desf.) Iljin in Bot. Mater. Bot. Inst. Komarova Akad. Nauk. SSSR 16: 88 (1954). (Image 1)

Description: Perennial, succulent, shrub, 1–2 m tall, branches are not jointed. Stem erect, 5–10 mm diameter, branched with opposite branches, glabrous, cylindrical, woody base, rarely prostrate, stipules absent. Leaves upto 20–30 mm, cylindrical to terrete, decurrent, sheathing at base and adanate to stem, ramal, opposite (two leaves at each node), ramal, opposite (two leaves at each node), 6–10 x 2–3 mm in size, sessile or amplexicaul, tip acute or pointed, subulate lips, apiculate depressed above. Flowers are axillary and solitary, hermaphrodite. Bracts linear to oblong, keeled, sessile, lower bract larger, clavate to dumb-bell shaped. Bracteoles are acute, linear to oblong about 3–4 mm long and 0.5–0.8 mm broad. Perianth ovoid, 15–20 mm in diameter, yellowish, fructiferous t. Tepals 4–5 mm long, 2–3 mm wide elliptical, rounded apex and undulate margin. Stamens 4–5, 1–2 mm long, exerted. Anther tetragonal and two styles. Staminodes are absent. Fruits are winged, homogeneous, about 10–15 mm broad. Wings 2–3 mm, orbicular, unequal (two smaller and three bigger). The smaller wings are about 4–6 mm wide while bigger wings are 9–10 mm wide. Seed is horizontal and covered with smooth membrane.

#### (Dichotomous Key)

- 1a) Annual herb, leaves and bracts spinose or aspinose at the apex ..... 2
- 2a) Plant erect or prostrate, Leaves and bracts spinose at the apex ..... 3
- 3a) Plant erect, Spines long upto 1–2 cm or more ..... *Salsola kali*
- 3b) Plant prostrate, Spines short less than 1 mm ... ..... *Salsola monoptera*
- 2b) Plant erect or prostrate, Leaves and bracts aspinose at the apex ..... 4
- 4a) Plant erect, Stem curved .... *Salsola glomerata*
- 4b) Plant prostrate ..... *Salsola hartmanii*
- 1b) Shrubs, leaves and bracts without spines .... 5
- 5a) Leaves alternate, stem hairy ..... *Salsola baryozoma*
- 5b) Leaves opposite, stem glabrous ..... ..... *Salsola oppositifolia*

Flowering and Fruiting: October–January

Habitat: It was often found in association with *Suaeda nudiflora*. It was recorded on muddy bunds and on the hilly outcrops.

Distribution: Italy, northern Africa, Palestine, Spain, western Sahara (Brullo 1982; Peruzzi & Passalacqua 2004).

Conservation status as per IUCN Red Data List of Threatened Species: Not Evaluated (NE).

Taxonomic notes: *Salsola oppositifolia* species was first described by Desfontaines in 1798 (Brullo 1982). In early 1800, this species was considered to be identical to *Salsola longifolia* and *S. verticillata* (Fiori 1923; Maire 1962; Zohary 1966). But later on, it was proved that three species are completely distinct from one another. *Salsola longifolia* and *S. verticillata* was kept in *Darniella* (Maire & Weller) Brullo. Sect while *S. oppositifolia* was kept in *Coccosalosa* Fenzl. sect. of *Salsola* (Brullo 1982, 1984). Out of the six species of *Salsola* recorded in India, four species are distinct in one or another morphological characters like herbaceous habit, presence of spines, and prostrate stem. The only species having a close resemblance with *Salsola oppositifolia* is *Salsola baryozoma*. On close observation of characters of the two taxa, it was found that both the taxa are morphologically different. This species (= *Salsola oppositifolia*) was not recorded in India. In India, *Salsola baryozoma* is most commonly occurring species of this genus. *Salsola baryozoma* recorded in India has alternate leaves and hairy stem, while *S. oppositifolia* has opposite whorl of leaves and glabrous stem. Both are branched though.

Specimen examined: Tunisia, 06.x.1981, Brullo, S., FI005525(FI); Spain, Canary Island, Tenerife, La Orotava, 28.291N, 16.629W, 2,481m, 01.xii.1985, Bourgeu, K000243929 (RBGK); India, Gujarat, Kutch, Khadir bet, 23.818N, 70.328E, 15.5 m, 24.viii.2021, Vinesh Gamit & Rakesh Gujar GRK002 (GEERF) (Image 2).

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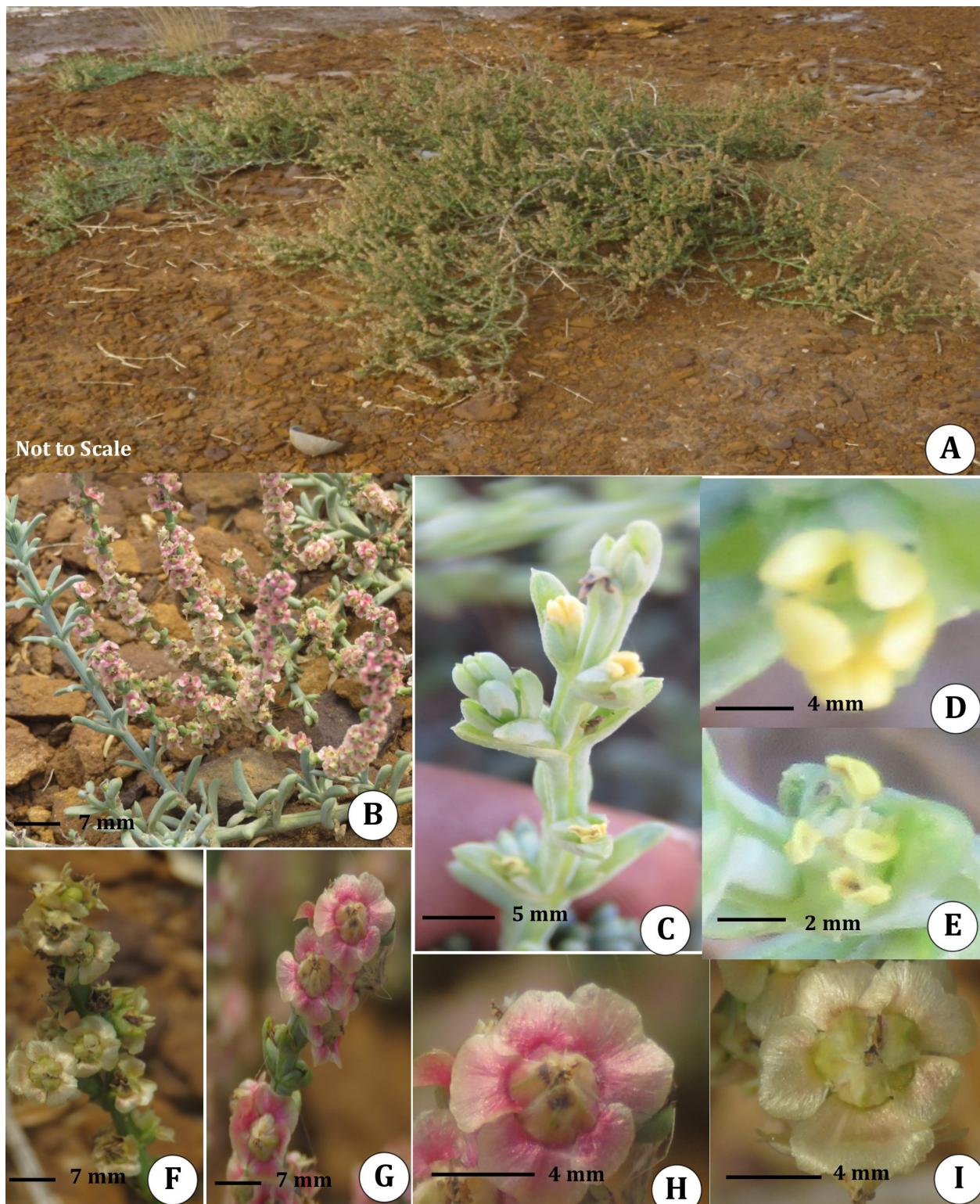


Image 1. *Salsola oppositifolia* Desf.: A,B—Habit | C—Flowering branch | D—Flower | E—Anthers | F,G—Fruiting branch | H,I—Fruit.  
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Image 2. Herbarium sheet of *Salsola oppositifolia* Desf. [GRK002].

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