



Research article

Medico-socio-religious uses of *Capparis zeylanica* L.

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Abstract: In the present study, distribution, morphology, biological activity, nutritional value, and traditional usage of *Capparis* species in general and *Capparis zeylanica* L. in particular are described. Different plant species are utilized in various Ayurvedic medicine formulations. Ancient texts including Shushrut, Dhanwantri, Nighantu, Kshem Kutulhan, and Madanpal highlight the medicinal benefits of *Capparis*. The paper presents the morphological characteristics and biological activity of the underused climber *Capparis zeylanica* for ethnomedicinal and socio-religious purposes.

Keywords: Socio-cultural rituals - Traditional knowledge - *Capparis zeylanica* L.

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INTRODUCTION

Plants have been an integral part of life in many local communities and a variety of plants are used traditionally for nutritional or medicinal purposes. Medicinal plants are widely used by all sections of the population either directly as folk remedies or indirectly in the preparation of modern pharmaceuticals (Sridhar 2013). These plants are significant on a global scale, having an impact on both trade and global health (Sofowora 1993). Since ancient times, several communities have utilized both cultivated and wild plant species as the foundation for nutraceuticals. Such practices are usually linked to different seasons as well as the rituals confined to the region (Principle of Siddha, TKDL 2021). *Capparis zeylanica* L. belonging to the family Capparidaceae is one of the important species termed as 'Ahimsra' in Ayurvedic 'Asadhua' in Odia, 'Ardanda' in Hindi, 'Adondai' in Telugu, 'Aantundikayee' in Kannad, 'Kalokera' in Bengali, 'Govindi/Wagati' in Marathi and in English as Ceylon caper (Muthu *et al.* 2006, Khare 2007, Deshmukh & Shinde 2010). The plant species is mentioned for multiple purposes in the ancient epic Shushrut, Dhanwantri, Nighantu, Kshem Kutulhan and Madanpal (Warrier 1969). The species occurs in Eastern Asia, namely Southern China, Southern India, Southern Pakistan, Sri Lanka, Bangladesh, Nepal, Myanmar, Thailand, Cambodia, Laos, Vietnam, and Malaysia (Hooker & Clarke 1875, Padhan *et al.* 2010a). It is distributed in peninsular India, the Andaman and Nicobar, as well as from eastern Uttar Pradesh (Deshmukh & Shinde 2010, Kumar *et al.* 2010). It is mostly found in hedges, brushwood, savannahs, and forest borders; at low to medium elevations, in areas with seasonal climatic conditions (Khare 2007). Preliminary phytochemical screening of the extracts showed the presence of alkaloids, flavonoids, saponins glycosides, terpenoids, tannins, proteins and carbohydrates (Ghule *et al.* 2007). The whole plant showed the presence of saponin, p hydroxybenzoic, syringic, vanillic, ferulic and p-coumaric acid. Leaves and seeds showed the presence of β -carotene, thioglycoside, glycocapparin, n-tricortane, α -amyrin and fixed oil whereas root bark showed the presence of an alkaloid, a phytosterol, a water-soluble acid and a mucilaginous substance (Raghunathan & Mitra 2003, Ghule *et al.* 2006, Padhan *et al.* 2010b). Haque *et al.* (2004) have isolated fatty acids (E-octadec-7-en-5-ynoic acid) from roots. Almost all the parts *i.e.* root, bark, fruits, leaves, fruits and seeds are used for different purposes. Despite its wide range of folk medicinal uses in the Indian sub-continent, there is a sporadic report on its nutritional, medicinal and socio-religious aspects. The

present paper describes the traditional practices of *Capparis zeylanica* L. for nutritional, medicinal and socio-religious purposes among the people belonging to Bhadrak region of Odisha and Vidarbha region of Maharashtra.

MATERIALS AND METHODS

Study site

The study site includes Chandabali areas (20° 47' N, 86° 46' E) of Bhadrak district of Odisha and Akola areas of Akola district (20° 7' N and 77° 0' E) of Maharashtra. The Bhadrak district is situated in the north-eastern part of Odisha and presents undulating to flat topography with an elevation varying from 37 m in the north-western part to around 3 m in the extreme eastern part along the coastal line. Akola district is located in the north-central part of Maharashtra. Two geological formations viz. Purna alluvium and the Deccan trap are known to occur in this region. Bhadrak and Akola district receives an annual rainfall of 1428 mm and 706 mm respectively. The vegetation of the Bhadrak district is tropical moist deciduous forest type whereas the forests of Akola districts are dry deciduous in the hilly regions and in the plain areas it is mostly scrub forests (Champion & Seth 1998).

Data collection

The method employed was designed with a purpose of providing base line information through literature surveys and field visits to Chandabali areas of Bhadrak district of Odisha and Akola district of Maharashtra. The field study was carried out from June 2017 to May 2019 monthly following established and standard procedures (Jain 1987, Martin 1995). Morphological data of various plant parts were estimated using scale and weight box. The information on the traditional uses for medicine and socio-cultural rituals were obtained through questionnaires, complemented by free interviews, informal conversations and direct observations (Martin 1995, Huntington 2000). 57 respondents who made up the study's key informants were selected based on their familiarity and prior experience with the traditional usage of the species *Capparis zeylanica*. In each of the communities visited, interviews and conversations were held privately with local residents in their own language. Further group conversations (5–8 individuals) with old-age key informants and women were undertaken during repeated visits. There was some useful and particular information regarding the traditional usage of *Capparis zeylanica* that was learned via individual interviews and group discussions with local residents.

RESULTS AND DISCUSSION

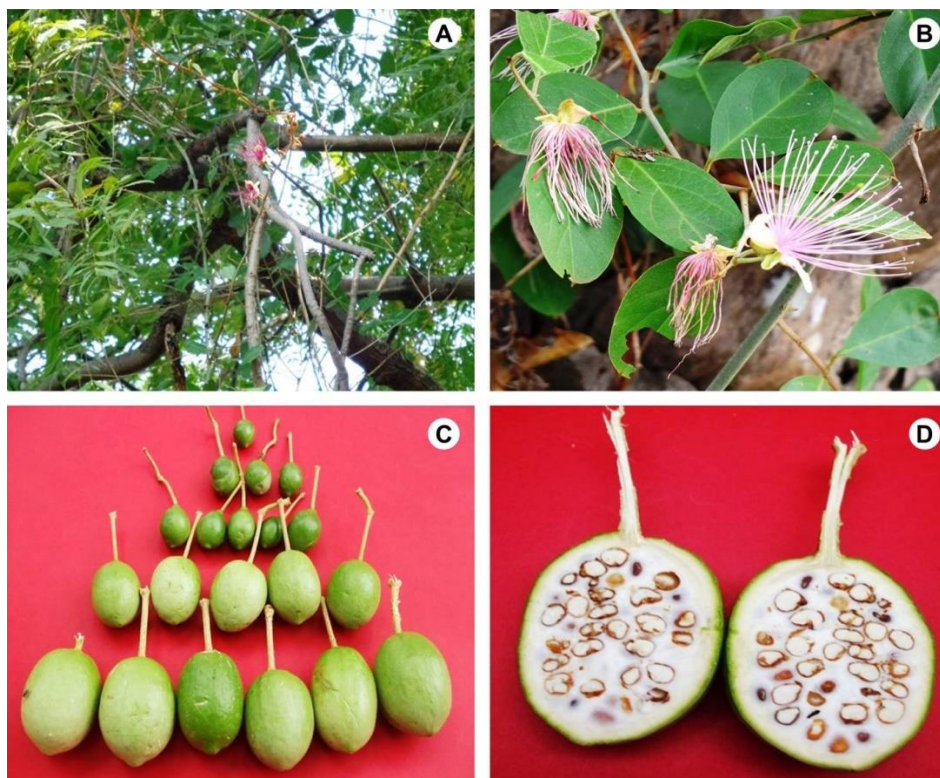


Figure 1. *Capparis zeylanica* L.: A, Plant growing on a Neem tree; B, Leaves and flowers; C, Fruits; D, Fruit showing seeds.

The *Capparis zeylanica* L. plants have hooked stipular spines and are climbers, shrubs, or trees. Leaves are elliptic-oblong, pubescent, with a densely pubescent petiole and reticulate veining. Flowers in supra-axillary clusters, solitary or in groups of two or three, with many, long-exserted stamens, and ellipsoid, aciculate ovary. Fruits are subglobose and have sharp 4-angles (Fig. 1). Significant variation was observed in the characteristics of the leaf, internode, pedicel, fruit, rind, and seed (Table 1). High coefficient of variation (34.68 %) was recorded in fruit weight followed by fruit width (21.56%) and fruit length (17.19%). 100 seed weight and pedicel length expressed low variability. The mean leaf length was 4.24 cm, with a range of 3.8 to 4.7 cm, while the mean leaf width was 2.86 cm, with a range of 2.6 to 3.5 cm. The average fruit measured 4.46 cm in length and ranged from 3.62 to 6.02, cm in width, 3.35 cm in length and ranged from 2.6 to 4.80 cm and in circumference (9.0–15.2 cm.). Mean fresh green fruit weight (38.47 g), mean rind thickness (2.78 mm) with a range of variation from (2.55–3.53 mm), and (23.18–68.90 g) respectively. The observed mean seed length (5.88 mm) ranged from (5.32–6.56 mm) while the recorded mean seed width (5.28 mm) ranged from (4.08–5.09 mm), 100 seed weight of unripe fruit was observed as 11.73 g.

Table 1. Morphological characteristics and estimates of variability parameters of *Capparis zeylanica* L.

Traits	Range	Mean \pm SE	CV (%)
Leaf length (cm)	3.80–4.70	4.23 \pm 1.12	8.1
Leaf width (cm)	2.60–3.50	2.86 \pm 0.09	9.23
Internode length (cm)	6.30–9.00	7.81 \pm 0.27	9.94
Pedicel length (cm)	2.00–2.40	2.15 \pm 0.05	7.35
Fruit length (cm)	3.62–6.02	4.46 \pm 0.28	17.91
Fruit width (cm)	2.62–4.80	3.35 \pm 0.25	21.56
Fruit circumference (cm)	9.00–15.20	11.33 \pm 0.74	18.59
Fruit weight (g)	23.18–60.90	38.47 \pm 4.71	34.68
Rind thickness (mm)	2.55–3.53	2.78 \pm 0.10	10.38
Seed length (mm)	5.32–6.56	5.88 \pm 0.17	8.56
Seed width (mm)	4.08–5.90	5.28 \pm 0.18	10.03
Unripe seed weight (g)	3.20–4.20	3.73 \pm 0.12	9.16
100 seed weight (g)	11.32–11.90	11.73 \pm 0.06	1.66

The fruit of *Capparis zeylanica* is used as a vegetable due to its nutritive ingredients like proteins, carbohydrates, minerals and vitamins. The present result draws support from the studies of Deshmukh & Shinde (2010). The root bark of *Capparis zeylanica* is used traditionally as a stomachic, sedative, antihydrotic and also in cholera spasmolytic, neuralgia, hemiplegia and rheumatism (Anonymous 1992, Chopra *et al.* 1992, Kirtikar & Basu 1993, Joshi 1997, Sivaraj *et al.* 2017, Goswami *et al.* 2018, Harsha *et al.* 2018). The indigenous people of the studied area use leaf extract with black pepper powder for the treatment of dysentery (Sen & Behera 2008). Leaf juice of this plant was taken orally with a cup of fresh goat milk for cough and cold (Shivanna & Rajkumar 2010). Stem bark extract was administered thrice daily for ingestion (Reddy *et al.* 2010). For the treatment of diabetes ripened fruits were consumed twice for a fortnight. The present result corroborates the findings of Reddy *et al.* (2010) and Shivanna & Rajkumar (2010). The fruits are used to remove ‘Tridosha’ bitter removes ‘Kapha’ and ‘Vata’. The seeds and fruits are used in urinary purulent discharges and dysentery and fruits as an antidote for snake bite (Kirtikar & Basu 1993).

Also served as an appetizer as a dipping paste with pepper, tamarind and garlic (Ragupathy & Newmaster 2009). The fruits of the plant played an important role in the socio-cultural rituals of the study site. It was offered to worship Lord Shiva during Asadh Ekadashi and on the next day, the fruit offered to Lord Shiva was cut into pieces and added in the curry preparation. This is considered as most auspicious in the studied region.

CONCLUSION

Capparis zeylanica L. has the potential to provide different therapeutic compounds for the treatment of various ailments. Dietary supplements can be made from fruits, flowers, and leaves that are high in vitamins, minerals, and nutrients. Plant genetic engineering may provide an excellent opportunity to make use of the synthesis of sweet proteins, which may present new opportunities for nutritionists and medical professionals, particularly in the case of diabetic condition.

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