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Cover: Mixed media illustration of a Blue bird and Sunbird. © Lakshmi Niranjana.



New distribution record of Slender Wild Basil *Clinopodium gracile* (Benth.) Kuntze (Lamiaceae: Nepetoideae: Mentheae) for the flora of Himachal Pradesh, India

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Abstract: *Clinopodium gracile* (Benth.) Kuntze has been recorded for the first in the Chamba district of Himachal Pradesh. The study provides descriptions, illustrations, and photographs to aid in the identification of the species. The new distribution record has been entrenched upon investigation based on observation and verification obtained from herbarium, literature, and plant web databases.

Keywords: Calamint, distribution, flora, identification, keys, native.

The mint family *Lamiaceae* Martinov (also known as *Labiatae* Juss.) has profound distribution, confining 232 accepted genera. According to Angiosperm Phylogeny Group (APG IV), the genus '*Clinopodium*' is bound within the sub-family *Nepetoideae* (Dumortier) Luerssen and tribe *Mentheae* Dumortier (Stevens 2001 onwards). *Clinopodium* L. comprises about 20 species in Asia and Europe (Li & Hedge 1994). In accord with Plants of World Online (POWO 2024), *Clinopodium* has nativity in tropical and sub-tropical regions with 186 species. The genus is commonly known as Calamint (Weakley 2010) due to the inclusion of *Calamintha* Mill. members. Doroszenko (1985) served *Clinopodium* as a section of *Calamintha*. However, the latter remains as a synonym for the former genus due to the priority of *Clinopodium* (1753) over *Calamintha* (1754). According to the database of POWO, *Clinopodium* is native to India and portrayed by seven

species: *Clinopodium capitellatum* (Benth.) Kuntze, *C. gracile* (Benth.) Kuntze, *C. hydaspidis* (Falc. ex Benth.) Kuntze, *C. javanicum* (Blume) I.M.Turner, *C. piperitum* (D.Don) Murata, *C. umbrosum* (M.Bieb.) K.Koch., and *C. vulgare* L. The species '*Clinopodium gracile*' is native to Asia (Weakley 2010). It can be allocated from China, Indonesia, Japan, Jawa, Korea, Laos, Malaysia, Myanmar, Taiwan, Thailand, Vietnam, and India (Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, & Tripura). It commonly flourishes near river banks, wild/semi-wild areas, and alongside forest margin sites (Li & Hedge 1994). In accord with Cantino & Wagstaff (1998), the species is associated with a morphologically diverse and taxonomically complex group called the 'clinopodioid complex'. The species retain a 2n = 18 chromosomes number and distinct in possessing one vascular bundle in its petiole (Hsieh & Huang 1998).

Clinopodium gracile is known as slender wild Basil (Zomlefer et al. 2011). According to Mao & Dash (2020), *Clinopodium* is represented by three species in Himachal Pradesh: *Clinopodium capitellatum*, *C. umbrosum*, and *C. vulgare*. However, in accord with POWO (2024), three additional species *C. hydaspidis*, *C. javanicum* and *C. piperitum* can also be found. The presently

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examined '*Clinopodium gracile*' is the seventh addition of *Clinopodium* species to the flora of Himachal Pradesh.

MATERIALS AND METHODS

The first author collected the plant specimen from Gajnoi region during a field trip in Chamba district, Himachal Pradesh. Field photographs, and GPS location were recorded and flowering plant parts were collected for further investigations. The morphological attributes, including stem, leaves, inflorescence, bract, flowers, calyx, corolla, androecium, and gynoecium have been studied. The vegetative and reproductive features have been examined and the species was identified as *Clinopodium gracile* (Benth.) Kuntze. Further, the species identity was confirmed based on microfilms of herbarium records as furnished in specimen examined section. The voucher specimen of the presently examined species has been deposited in GUBH. The map showing the precise location of *Clinopodium gracile* in the Chamba district of Himachal Pradesh has been laid out (Figure 1).

Also, a photoplate (Image 1) and an illustration (Figure 2) displaying the vegetative and reproductive parts have been presented.

Taxonomic treatment

Clinopodium gracile (Benth.) Kuntze Revis. Gen. Pl. 2:514.1891. — *Clinopodium confine* (Hance) Kuntze Gen. Pl. 2:515.1891; Hara In: Jour. Jap. Bot. 101:14.1935. — *Clinopodium gracile* (Benth.) Matsum Index. Pl. Jap. 2:538.1912 (isonym). — *Calamintha gracilis* Benth. In: DC. Prodr. 12:232.1848. — *Calamintha moluccana* Miq. Fl. Ned. Ind. 2:968.1859. — *Calamintha confinis* Hance In: Journ. Bot. 6:331.1868. — *Calamintha radicans* Vaniot Bull. Acad. Geogr. Bot. 14:182.1904. — *Calamintha argyi* H.Lév. In: Repert. Spec. Nov. Regni Veg. 8:423.1910. — *Satureja gracilis* (Benth.) Nakai In: J. Coll. Sci. Univ. Tokyo. 31:149.1911; Bailey In: Gent. Herb. 1:43.1920. — *Satureja confinis* (Hance) Kudô Mem. Fac. Sci. Taihoku Imp. Univ. 2:100.1929.

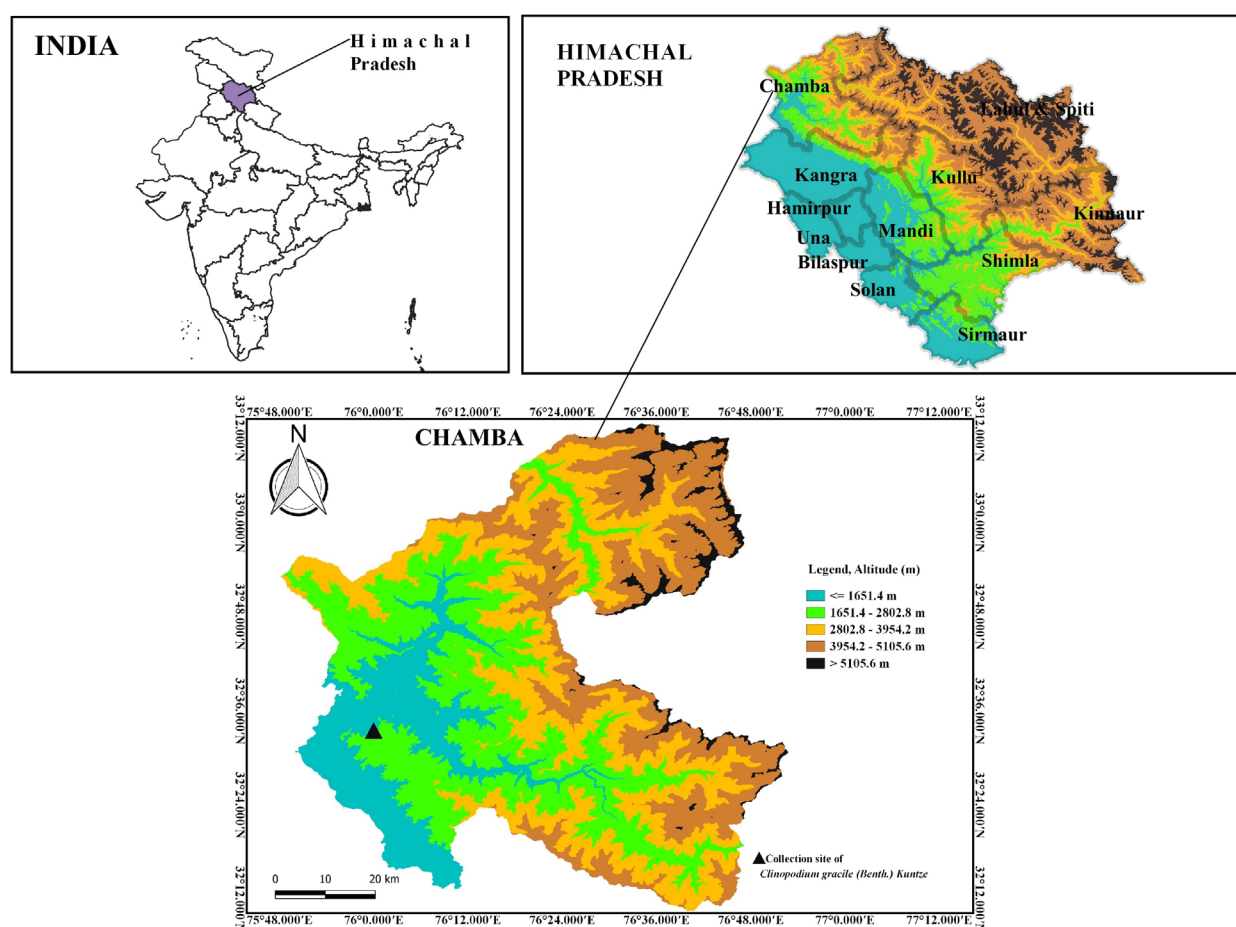


Figure 1. Map showing geographical location of *Clinopodium gracile* (Benth.) Kuntze in Chamba District of Himachal Pradesh (Map prepared through QGIS software).

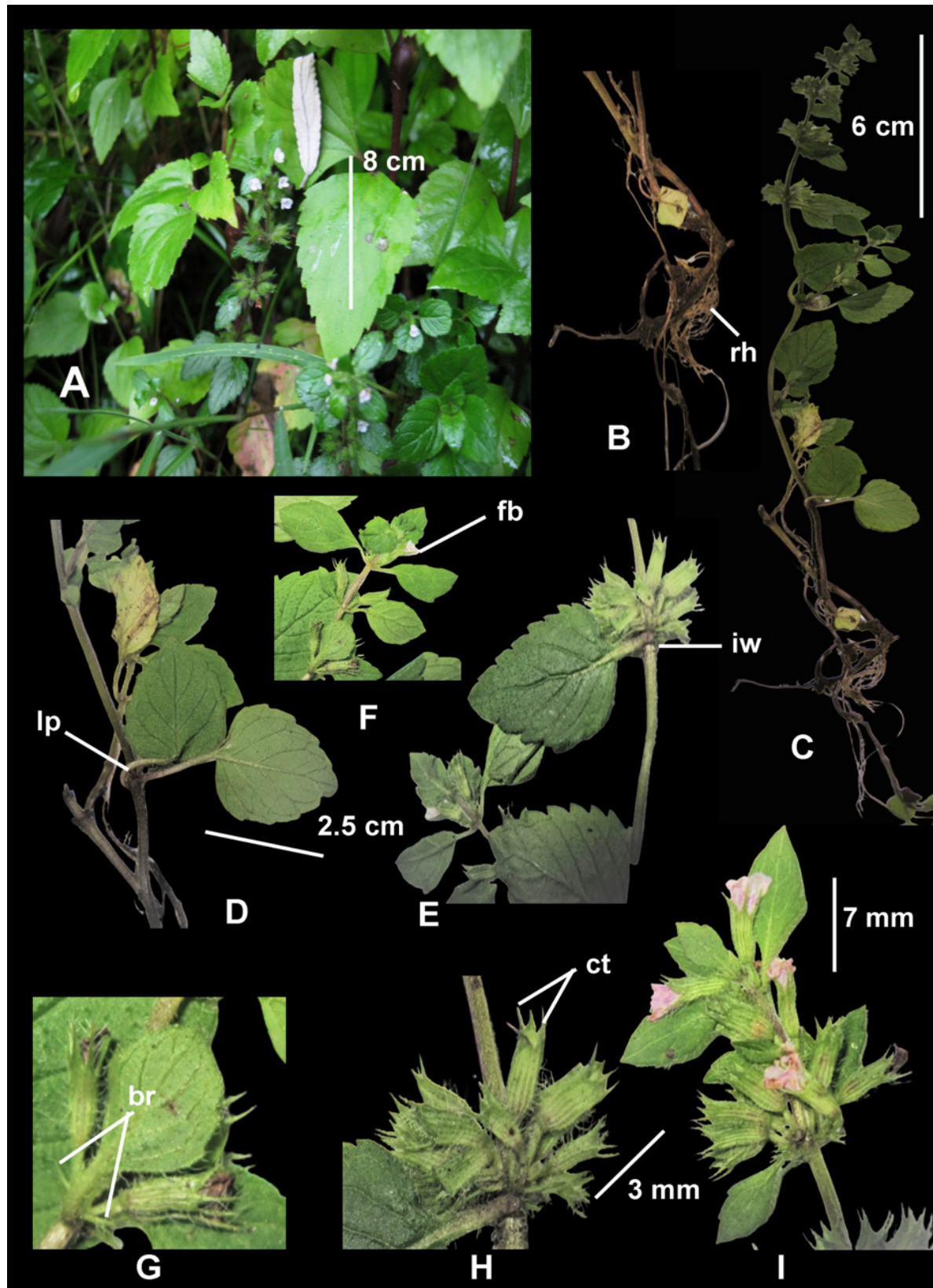


Image 1. *Clinopodium gracile* (Benth.) Kuntze: A—Habit of the plant | B—Stolonerous root showing root hair (rh) | C—Whole plant revealing its vegetative and reproductive parts | D—Abaxial surface of leaf with leaf petiole (lp) | E—Adaxial surface of leaf and inflorescence whorl (iw) | F—Young shoot displaying floral bud (fb) | G—Base of pedicel manifesting bract (br) | H—Calyx portraying its tooth (ct) | I—Verticillaster inflorescence exhibiting flower arrangement. © Rimjhim Chandra.

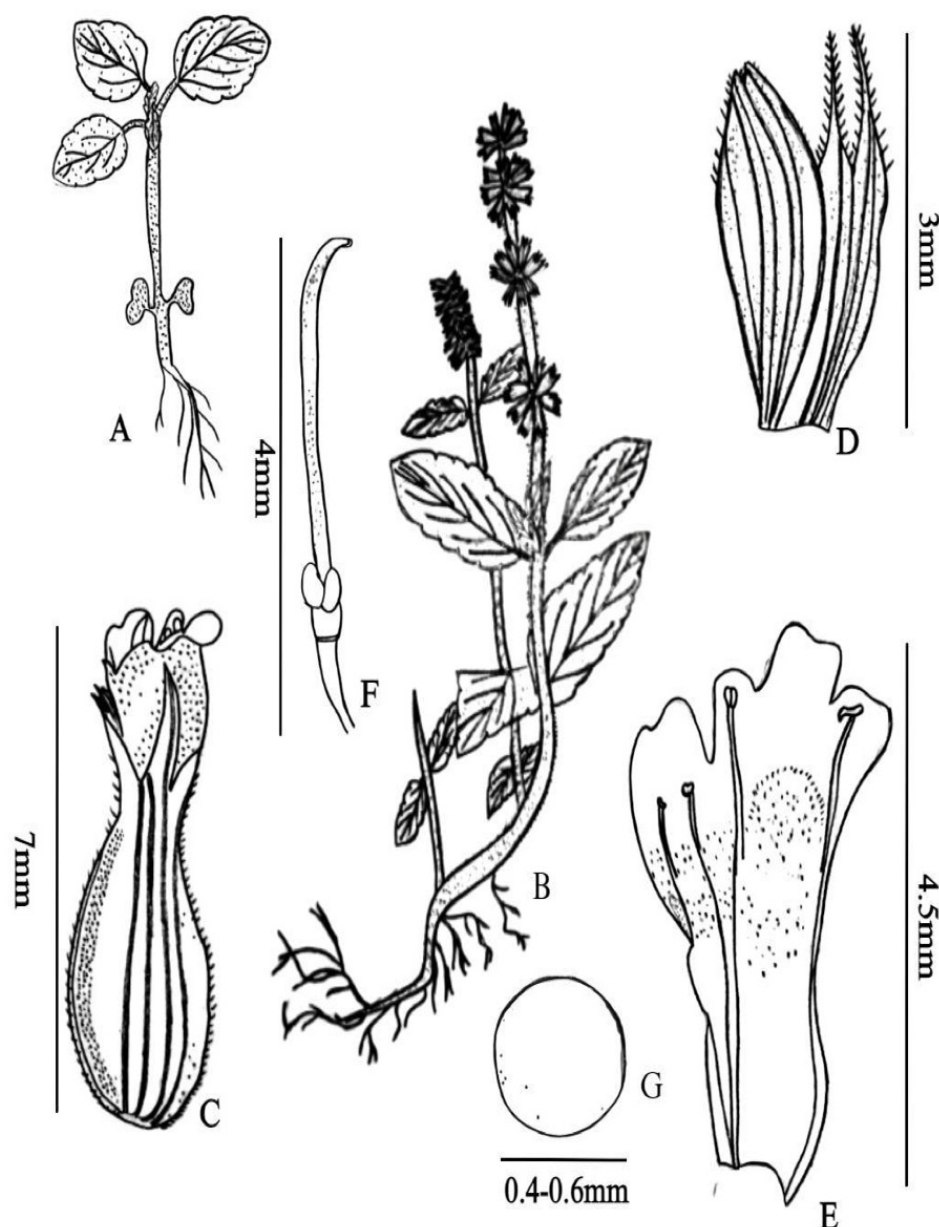


Figure 2. *Clinopodium gracile* (Benth.) Kuntze. A—Young sapling | B—Habit of the plant | C—A complete flower | D—Dissected view of the calyx | E—Corolla showing epipetalous stamens | F—Gynoecium | G—Nutlet. © Rimjhim Chandra.

Description

Small perennial herb, slender, stoloniferous; Stem quadrangular, numerous, tufted, erect or procumbent at the base, ascending, 8–30 cm, retrorse, pubescent; Leaves opposite, basal leaves circular-ovate, 1.2–1.5 × 1–1.1 cm, base rounded, apex obtuse, margin remotely crenate, lower and mid stem leaves ovate, 1.5–2.5 × 1–1.5 cm, papery, sub-glabrous, abaxially sparsely hispid on veins, apex obtuse, base rounded to cuneate, margin remotely dentate or crenate-serrate, petioles 0.3–1 cm; Inflorescence verticillaster, few flowered (5–10), lax or

dense, crowded in short terminal raceme, floral leaves ovate-lanceolate, 0.5–1 × 0.3–0.8 cm, margin serrate, acute; Bract linear, acute, puberulous, much shorter than pedicel; Flower rose-pink, 5–7 × 3–4 mm, pedicel 1–3 mm; Calyx tubular, base rounded, ca. 3–5 mm and declinate in fruit, puberulent or subglabrous, minutely hispid on veins, throat sparsely fine pilose, teeth ciliate, lower two subulate, upper three triangular, reflexed in fruit; Corolla ca. 4.5 mm, puberulent; nutlets ovoid, smooth 0.4–0.5 mm (Image 1 and Figure 2).

Common name: Calamint, Savory, Slender Wild Basil,

Key to four species of *Clinopodium* L.

1. Calyx with glandular hairs
 2. Calyx teeth ciliate; leaves ovate; verticillate flowers crowded nearby; corolla rose-pink; nutlets ovoid; stoloniferous *Clinopodium gracile*
 2. Calyx teeth long; leaves sub-obtuse; verticillate flowers distantly cyme; corolla purplish; nutlets ellipsoid; woody rootstock *Clinopodium capitellatum*
1. Calyx with eglandular hairs
 3. Calyx with bristly hairs; leaves sharply toothed margin; many (30–40) flowered whorls; lower corolla with notched centre lobe *Clinopodium vulgare*
 3. Calyx with wooly hairs, leaves toothless or shallowly toothed; few (10–20) flowered whorls; lower corolla with smooth centre lobe *Clinopodium umbrosum*

Tower Flower.

Flowering: The flowering has been observed in July.

Habitat: Stream sides, open grasslands, forest margin, and thickets.

Specimen examined

China: Si-chu-shan, C. Sampson, i.1968, coll. No. 13045, K000193480! Indonesia: Bakh; Brink, 27.vii.1920, coll. No. 4839, K000193477! Japan: Pref. Chiba, Nokogiriyama, Yoshihiro Asai, 3.v.1959, coll. No. 8518, NY 02706540! USA: Florida, J.R. Burkhalter, 30.iv.1980, coll. No. 6908, 149957! Louisiana, S.R. Hill, 20.iv.1998, coll. No. 29989, 278039! South Carolina, K.A. Bradley, 22.vi.2016, altitude 165 m, coll. No. 4693, 295537! Florida, Tallahassee, Loran C. Anderson, 25.v.2017, 30.44718 N 84.25225 W, coll. No. 30676, NY 04416374! Louisiana, Iberia Parish, Roland M. Harper, 16.vii.1934, NY 03030120! India: Himachal Pradesh, Jot Chamba, Gajnoi, Rimjhim Chandra, 27.vii.2023, 32.4868 N 76.0593 E, altitude 2,880 m, coll. No. 103.

Taxonomic note

The specific epithet '*gracile*' (Latin=*gracilis*) suggests the slender and delicate habit of the species. *Calamintha gracilis* Benth. is the basionym for *Clinopodium gracile* (Benth.) Kuntze. Benth (1848) showed uncertainty about the species kinship to the genus '*Clinopodium*'. He further considered *Clinopodium gracile* features somewhere between *Clinopodium debilis* (*C. debile*) and *Clinopodium umbrosa* (*C. umbrosum*). Ohwi (1965) mentioned four varieties of *Clinopodium gracile* viz. *C. gracile* var. *latifolium* (H.Hara) Ohwi, *C. gracile* var. *minimum* (H.Hara) Ohwi, *C. gracile* var. *multicaule* (Maxim.) Ohwi, *C. gracile* var. *sachalinense* (F. Schmidt) Ohwi. However, these remain as synonyms of *C. latifolium*, *C. multicaule* var. *yakusimense*, *C. multicaule*, *C. micranthum* var. *sachalinense* respectively. No infra-specific ranks are available for *Clinopodium gracile* (POWO 2024).

DISCUSSION

Chen et al. (2013) reported 34 essential oil compounds in *Clinopodium gracile* with higher content of sesquiterpenoids followed by monoterpenoids. Thus, the species occurring in the Himachal Pradesh region can also act as a potent therapeutic plant. The species can be efficacious in floristic, biodiversity, and conservation studies. The present examined species is similar in morphological description provided by Weakley (2010).

CONCLUSION

The perennial herb *Clinopodium gracile*, was collected from natural habitat of Gajnoi, Chamba district of Himachal Pradesh. The location site was specified with 12 numbers of *C. gracile* plants, growing in deteriorated broad-leaved oak and pine forest. Few other species flourishing along with *C. gracile* were *Ageratum conyzoides* L., grasses being *Cynodon* sp., *Stachys* sp., ferns such as *Diplazium* sp., and *Matteuccia* sp. The species might be a prospective for multitude of medicative activities. The findings can further assist in exploring the extended distribution of *C. gracile* in the western Himalayan belt.

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