A taxonomic revision of *Henckelia* (Gesneriaceae) in South India with a new species, one new combination and seven lectotypifications

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**Abstract:** The genus *Henckelia* Spreng. (Gesneriaceae) in South India is revisited based on field and herbarium data. Fifteen species are recognized. *Henckelia wayanadensis* is described new to science while *Didymocarpus lyratus* Wight var. *protractus* C.B.Clarke and *Henckelia sivagiriensis* (Rajakumar, Selvak., S.Murug. & Chellap.) E.S.S.Kumar are reduced to synonymy of *Henckelia lyrata* (Wight) A.Weber & B.L.Burtt and *Henckelia wightii* (C.B.Clarke) A.Weber & B.L.Burtt respectively. Lectotypification of seven names are carried out in this paper. Detailed descriptions, illustration/photographic images and key for the identification of South Indian species are provided.

**Keywords:** Conservation assessments, Endemic, *H. wayanadensis*, Lectotypifications, New combination.

**Introduction**

The genus *Henckelia* Spreng. was first recognized as *Roettlera* by Vahl in 1804. Since this name was preoccupied with another genus, it was renamed *Henckelia* by Sprengel (1817). Wallich (1819) described *Didymocarpus* Wall. and transferred all epithets under *Henckelia* to *Didymocarpus*. Later taxonomists followed this treatment for almost 180 years. Weber and Burtt (1998[“1997”]) resurrected the former name *Henckelia* from synonymy and included about 180 species. In 2011, Weber et al. (2011) remodelled *Henckelia* to include 56 species formerly belonging to *Henckelia* sect. *Henckelia*, *Chirita* Buch.-Ham. sect. *Chirita* (excluding species belonging to *Damrongia* Kerr ex Craib), the monotypic genus *Hemiboeopsis* W.T.Wang and excluded the species of *Henckelia* sect. *Loxocarpus* (R.Br.) A.Weber & B.L.Burtt, sect. *Didymanthus* (C.B.Clarke) A.Weber & B.L.Burtt, sect. *Heteroboea* (Benth.) A.Weber & B.L.Burtt and sect. *Glossadenia* A.Weber & B.L.Burtt. The genus under its current definition is distributed in Sri Lanka, India, Myanmar, Nepal, Bhutan, southern China, northern Vietnam, northern Laos, and northern Thailand. A few species were recently described bringing the total number to c. 70 species worldwide (Manudev et al., 2012; Middleton et al., 2013; Kumar, 2014; Janeesha & Nampy, 2015; Ranasinghe et al., 2016; Krishna & Lakshminarasimhan, 2018; Borah et al., 2019; Cai et al., 2019; Sirimongkol et al., 2019; Yang et al., 2019; Kanthraj et al., this issue). It is the eighth largest genus in tribe Trichosporeae and tenth largest in subfamily Didymocarpoideae (Möller & Clark, 2013). Thirty five species and one variety have so far been reported from India (Sinha & Datta, 2016; Möller et al., 2017; Krishna & Lakshminarasimhan, 2018; Borah et al., 2019; Kanthraj et al., this issue). Lectotypification of some species of this genus has been carried out by Vitek et al. (2000), Janeesha and Nampy (2016) and Ranasinghe et al. (2019). *Henckelia* is the largest genus of Gesneriaceae in India with a high proportion of endemism, particularly in South India. However, since Clarke’s (1885[“1884”]) pioneering work in Hooker’s *Flora of British India*, there has been no real revision of this genus in India.
The purpose of the present study is to understand the diversity, distribution and taxonomy of the South Indian species of Henckelia, based on extensive field work and consultation of specimens and digital images deposited in major herbaria. Fifteen species are recognized in South India while two names are reduced to synonymy.

**Materials and Methods**

The materials for this study were obtained through field trips in various parts of South India. Data sheets were prepared for each population studied. Herbarium voucher specimens were prepared and deposited at Calicut University Herbarium (CALI). The specimens consulted, including types, are held at BLAT, BSD, BSI, CALI, CALI, DD, DEV, E, FRC, JCB, KFRI, MH, RHT, SKU, TBGT and online databases (https://plants.jstor.org; https://www.ipni.org; https://www.tropicos.org; https://www.biodiversitylibrary.org; https://www.wcsp.science.kew.org; https://www.samlenger.snm.ku.dk; https://www.linnean-online.org; http://apps.kew.org/herbcat/navigator.do; https://science.mnhn.fr; https://botanik.snm.ku.dk; https://www.nhm.ac.uk). The acronyms of herbaria are as per Thiers (continuously updated). Detailed morphological descriptions were prepared after studying fresh and herbarium specimens using the terminology of Weber and Burtt (1998["1997"]) and Simpson (2006). The genus description, preceding those of the species from South India, is applicable to the entire genus. Each species was identified by consulting types, and protologues. The nomenclature was updated with the latest literature. Colour photographs of the dissected floral parts were taken with a Leica EZ4HD stereo microscope (Mannheim, Germany). The distribution maps were prepared using the software QGIS 3.12.1–Bucuresti (QGIS Development Team, 2020) and conservation assessments were done using IUCN Standards and Petitions Subcommittee Criteria (2019). The information on phenology, ecology, habitat and distribution of each species was based on field studies and herbarium specimens consulted. The chromosome numbers and medicinal uses cited were gathered from the literature and referenced in the text.

**Taxonomic Treatment**


Perennial or annual herbs or subshrubs. Stem reduced (rosette-forming) or erect, ascending, rarely creeping. Leaves opposite, whorled or alternate by reduction of one leaf at a node in creeping species, sometimes one or two (rarely three) in a plant, short to long petiolate; laminae variable. Cymes axillary (or sometimes appearing terminal by reduction of the vegetative shoot); flowers (1)-10–38; bracts paired, ovate to linear, narrowly ovate or narrowly triangular, sometimes early caducous. Calyx of 5 sepals, free or fused into a tube for part of the length; lobes linear, lanceolate, ovate or triangular to narrowly triangular. Corolla zygomorphic, variously shaped, infundibuliform to campanulate, sometimes ventricose, 2-lipped, with upper lip of 2-lobes and lower lip of 3-lobes, colouration variable, often with yellow markings in throat. Stamens 2, usually included; filaments long, slightly bent (in South Indian species) to geniculate; anthers cohering, glabrous or pubescent; staminodes slightly bent, rarely straight or curved, with or without a prominent antherode, glabrous or pubescent. Disk cylindrical or cup shaped (absent
Ovary conical or ovoid, straight in relation to pedicel or with an angle between the pedicel and the ovary (usually between 120–135° in South Indian Henckelia); stigma chiritoid or obliquely subcapitate (in South Indian species, except Henckelia pradeepiana and H. repens) Capsules linear, rarely globose, stipitate or sessile, dehiscing loculicidally, splitting into 2 valves or opening only along the dorsal side (mostly in plagiocarpic ones), stipitate or sessile, orthocarpic or plagiocarpic (plagiocarpic in South Indian species). Seeds minute, numerous, ellipsoid.

Distribution: Sri Lanka, southern and northeastern India, Nepal, Myanmar, Bhutan, southern China, northern Vietnam, northern Laos and northern Thailand (Weber et al., 2011; Sirimongkol et al., 2019).

Key to the species of Henckelia in South India

1. Plants with creeping stems or tuberous herbs with 1–3 leaves ........................................ 2
2. Rosette-forming herbs with many leaves in basal rosette .................................................. 3
3. Leaves distinctly petiolate; petioles not winged .................................................................... 4
4. Peduncles scaly towards apex; filaments glabrous .................................................. H. missions
5. Peduncles not as above; filaments puberulent towards apex ......................................... H. ovalifolia
6. Laminae obovate–spatulate or widely spatulate to elliptic .............................................. 6
7. Laminae not as above, but of variable shapes ............................................................................. 7
8. Peduncles 30–54 cm long, golden brown hairy ..................................................................... H. macrostachya
9. Peduncles 10–18 cm long, glandular hairy ............................................................................. H. wightii
10. Leaf margins doubly crenate or doubly serrate; ultimate segments irregular ................. 8
11. Leaf margins crenate (occasionally doubly crenate in H. meeboldii); ultimate segments regular ............................................ 11
12. Petioles lacerate; leaf bases lyrate; bracts pilose .................................................................. H. lyrate
13. Petioles not lacerate; leaf bases attenuate; bracts not as pilose .......................................... 9
14. Leaves usually in whorls of three; calyx lobes hispid on both sides ................................... H. innominata
15. Leaves usually in whorls of four; calyx lobes tomentose outside, glabrous inside .......... 10
16. Laminae ovate–widely ovate; bracts lanceolate .................................................................. H. fischeri
17. Laminae narrowly elliptic to widely elliptic; bracts ovate ................................................ H. wayanadensis
18. Leaves usually in whorls of three .......... 12
19. Leaves usually in whorls of two, decussate (occasionally whorls of three in H. humboldtiana) .............................................................. 13
20. Capsules 13–15 mm long, tomentose .................................................................................. H. gambleana
21. Capsules 21–28 mm long, hispid .......... H. incana
22. Bracts 10–21 mm long, elliptic to obovate; anthers bearded at the junction of the anther lobes and filament ............................................. H. bracteata
23. Bracts 3–5.1 mm long, linear; anthers glabrous .................................................................... 14
24. Calyx lobes linear; corolla villous outside; ovary 8–9 mm long .................................. H. humboldtiana

1. Rosette-forming herbs with many leaves in basal rosette .................................................. 3
2. Tuberous herbs; leaves single (rarely up to 3); laminae broadly ovate or elliptic; capsules ovoid to sub-globose ....................... H. pradeepiana
3. Plants with creeping stems; leaves appearing alternate by reduction of one leaf in a pair at a node; laminae broadly ovate to sub-orbicular; capsules linear .............................................. H. repens
4. Peduncles scaly towards apex; filaments glabrous .................................................. H. missions
5. Peduncles not as above; filaments puberulent towards apex ......................................... H. ovalifolia
6. Laminae obovate–spatulate or widely spatulate to elliptic .............................................. 6
7. Laminae not as above, but of variable shapes ............................................................................. 7
8. Peduncles 30–54 cm long, golden brown hairy ..................................................................... H. macrostachya
9. Peduncles 10–18 cm long, glandular hairy ............................................................................. H. wightii
10. Leaf margins doubly crenate or doubly serrate; ultimate segments irregular ................. 8
11. Leaf margins crenate (occasionally doubly crenate in H. meeboldii); ultimate segments regular ............................................ 11
12. Petioles lacerate; leaf bases lyrate; bracts pilose .................................................................. H. lyrate
13. Petioles not lacerate; leaf bases attenuate; bracts not as pilose .......................................... 9
14. Leaves usually in whorls of three; calyx lobes hispid on both sides ................................... H. innominata
15. Leaves usually in whorls of four; calyx lobes tomentose outside, glabrous inside .......... 10
16. Laminae ovate–widely ovate; bracts lanceolate .................................................................. H. fischeri
17. Laminae narrowly elliptic to widely elliptic; bracts ovate ................................................ H. wayanadensis
18. Leaves usually in whorls of three .......... 12
19. Leaves usually in whorls of two, decussate (occasionally whorls of three in H. humboldtiana) .............................................................. 13
20. Capsules 13–15 mm long, tomentose .................................................................................. H. gambleana
21. Capsules 21–28 mm long, hispid .......... H. incana
22. Bracts 10–21 mm long, elliptic to obovate; anthers bearded at the junction of the anther lobes and filament ............................................. H. bracteata
23. Bracts 3–5.1 mm long, linear; anthers glabrous .................................................................... 14
24. Calyx lobes linear; corolla villous outside; ovary 8–9 mm long .................................. H. humboldtiana
14. Calyx lobes ovate to lanceolate; corolla glandular hairy outside; ovary 4–5.5 mm long

........................................................................... *H. meeboldii*  

**Henckelia bracteata** Janeesha & Nampy, Willdenowia 45(1): 53. 2014. Type: INDIA, **Kerala**, Kottayam district, Kurisumala, near to 10th Cross, 1100 m, 07.08.2014, *A.P. Janeesha & Santhosh Nampy* 134270 (holo CALI!; iso CAL!, MH!)  

Fig. 1

Perennials, rosette-forming hairy herbs with rootstocks. Roots adventitious, thin. Leaves 8–14, basal, decussate; petioles 2–9 cm long, pubescent, winged; wings 2–3 mm broad; laminae elliptic-ovate, 5.5–12.5 × 3–9 cm, acute or obtuse to rounded at apex, narrowly cuneate to attenuate at base, tomentulose on both surfaces, but more so on the younger leaves and on lower veins, becoming less so with age, margins shallowly crenate, ultimate segments regular, surfaces usually rugose; veins usually 5 on each side, much branched and conspicuous beneath. Cymes axillary, dense, 1–11 per plant, 3–5(–6) times divided, 14–38-flowered, pubescent; peduncles terete, 14–32 cm long, reddish brown, pubescent; bracts two at each branching, elliptic to obovate, 10–21 × 5–8 mm, obtuse to rounded at apex, margins crenate, tomentose; pedicels terete, 2–10 mm long, pubescent. Flowers 10–20 × 4–9 mm. Calyx 5- or rarely 6-partite, very deeply divided or basally connate; lobes ovate, unequal, posterior lobe smaller, 2.9–3.1 × 1.2–1.6 mm, others 3.3–4 × 1.6–2 mm, slightly acute at apex, margins entire, reddish brown, white tomentose. Corolla zygomorphic, ventricose, two lipped, villous outside, glabrous inside; tube 7–9 × 5.5–7.5 mm, lilac to pale lilac with a yellow patch in the throat; lobes ovate to rounded at apex, lilac to pale lilac, upper lip of two lobes, 5.2–5.9 × 7.6–8.1 mm, lower lip of three lobes, 5.6–7 × 7.4–8.3 mm. Stamens 2, adnate to the base of corolla, included; filaments 4–6 mm long, glabrous or sparsely pubescent towards the region of the connective, green on the top and colourless towards base; anthers reniform, 1.5–1.8 × 0.8–0.9 mm, milky white, bearded at the junction of the anther lobes and filament. Staminodes 3 (sometimes 2); filaments 2.5–3 mm long, hyaline, glabrous; antherodes not seen. Ovary ovoid to oblong, 5–7 × 1.25–1.5 mm, green, pubescent; style terete, 2–2.5 mm long, green, glabrous; stigma obliquely subcapitate, 0.8–1.1 × 0.5–0.82 mm, papillate, greenish white. Capsules cylindrical, straight or randomly curved, 18–30 × 1.6–2 mm, plagiocarpic, dehiscing loculicidally along the dorsal side, reddish brown, tomentulose with persistent stigma. Seeds numerous, elliptic, 0.4–0.6 × 0.2–0.25 mm, slightly acute at apex, truncate at base; testa dark brown to black, reticulate.

**Flowering & fruiting**: Flowering from July to September and fruiting from August to October.  

**Habitat**: In wet humus in granite rock crevices, at altitudes 1100 m above sea level, along with *Mitracarpus hirtus* DC. (Rubiaceae), *Porella* sp. (Porellaceae) and species of moss, *Selaginella* sp. (Selaginellaceae) and grasses (Poaceae).  

**Distribution**: Endemic to the southern Western Ghats, hitherto known only from the type locality and adjoining areas (Fig. 6).  


**Conservation status**: The species can be found at two localities in Kurisumala and Elaveezhapoonchira about 20 km apart, with an estimated Extent of Occurrence (EOO) of 34 km². Eighty two mature plants were observed across these two localities and the plants at Kurisumala and the series of crosses represent a continuous population. A continuing decline in population size has been observed over three years because the localities are tourist destinations. Therefore, this species is assessed here as Endangered (EN), B1ab(ii,iii,iv,v), B2ab
Fig. 1. *Henckelia bracteata* Janeesha & Nampy: **a.** Habit and habitat; **b.** A portion of the inflorescence; **c.** Flower; **d.** Calyx; **e.** Calyx with pistil; **f.** Bract; **g.** Stamens; **h.** Staminode; **i.** Pistil; **j.** Capsule; **k.** Seeds (from A.P. Janeesha & Santhosh Nampy 134270).
(ii,iii,iv,v), D, according to IUCN’s guidelines (IUCN, 2019).

Notes: This species is morphologically close to *H. humboldtiana* in the shape of leaves, presence of bracts and much longer scapes than the leaves (Janeesha & Nampy, 2015; Janeesha, 2017). However, it is distinguishable by its thick laminae with narrowly cuneate to attenuate base, larger, elliptic to obovate bracts, ovate calyx lobes that do not reach the full length of the ovary and hairs at the junction of the anther lobes and filaments. *Henckelia bracteata* plants are robust and dull green throughout while the peduncles, pedicels, calyx and capsules are usually reddish brown. Although the margins of the laminae are crenate, the crenation is shallow when compared to *H. humboldtiana*. When grown in the greenhouse at low altitudes, the colour of the corolla changes from pale lilac to dark lilac to violet.


Figs. 2 & 3

Perennials, rosette-forming hairy herbs with rootstocks. Roots adventitious, thin. Leaves 12–20, basal, in whorls of four; petioles 0.7–5 cm long (sometimes up to 7.5 cm), pubescent, winged; wings 4–12 mm broad; laminae ovate–widely ovate, 8–23 × 6–12 cm, obtruse to slightly acute at apex, attenuate at base, tomentose on both surfaces, with small white patches on the upper surfaces, golden brown on younger leaves and on lower veins, becoming less so with age, margins doubly crenate, ultimate segments irregular, surfaces usually rugose; veins usually 6–8 on each side, much branched and conspicuous beneath. Cymes axillary, 3–7 per plant, 4–7 times divided, 16–37-flowered; peduncles terete, 17–38 cm long, green-pale reddish brown, glandular hairy; bracts two at each branching point, lanceolate, 2–4 × c. 1 mm, acute at apex, margins entire, tomentose, with a tuft of hairs at the apex, green to purple; pedicels terete, 6–24 mm long, glandular hairy. Flowers 11–17 × 9–22 mm. Calyx 5-partite, very deeply divided or basally connate; lobes linear to broadly lanceolate-ovate, unequal, posterior lobe smaller, 2.5–3.8 × 0.8–1.6, others 3.6–6 × 1.2–1.9 mm, slightly acute or obtuse to rounded at apex, margins entire, reddish brown hairy. Corolla zygomorphic, ventricose, two lipped, glandular hairy outside, glabrous inside; tube 6.8–12 × 5.7–7.9 mm, dark to pale lilac with a yellow blotch at the throat; lobes rounded or very widely ovate with undulate margins, dark to pale lilac, upper lip of two lobes, 6.6–7.3 × 7.7–10 mm, lower lip of three lobes, 6.9–7.8 × 8.6–10.9 mm. Stamens 2, adnate to the base of corolla, included; filaments 4–5.3 mm long, glabrous, yellow; anthers reniform, 1.5–2.75 × 0.75–1.16 mm, milky white to cream. Staminodes 2 (the lateral ones), sometimes 3; filaments 2.4–4 mm long, hyaline, glabrous; antherodes sometimes present. Ovary ovoid to oblong, 3.7–6 × 1–1.27 mm, green, glandular hairy; style terete, 1–4.5 mm long, green, glabrous towards the apex, basally glandular hairy; stigma obliquely subcapitate, 0.65–0.87 × 0.9–1.1 mm, slightly papillate, pale green. Capsules cylindrical, straight or randomly curved, 14–37 × 1.8–2.4 mm, plagiocarpic, dehiscing loculicidally along the dorsal side, reddish brown, glandular hairy with persistent stigma and calyx. Seeds numerous, elliptic, 0.57–0.69 × 0.22–0.29 mm, slightly acute at apex, truncate at base; testa dark brown, reticulate.

**Flowering & fruiting:** Flowering from May to October and fruiting from July to December.
Fig. 2. *Henckelia fischeri* (Gamble) A.Weber & B.L.Burtt: **a.** Habit and habitat; **b.** Inflorescence; **c.** Flower; **d.** Calyx; **e.** Calyx with pistil; **f.** Stamens; **g.** Staminode; **h.** Pistil; **i.** Seeds; **j.** Immature capsule (a & b from A.P. Janeesha, Habeeb Rahman & A. Kabeer 134216; c-j from A.P. Janeesha & Santhosh Nampy 134224).

Distribution: Endemic to southern Western Ghats (Fig. 6).


Conservation status: The species is widely distributed in Kerala with a few localities in Tamil Nadu with around twelve localities. The Extent of Occurrence (EOO) is estimated to be c. 5600 km². The Area of Occupancy (AOO) is likely less than 50 km², since the plants occur in localized populations. Even though the species is widely distributed, because of the likely small AOO the species could be categorized at present as Endangered (EN), B2ab(ii,iii,v), according to IUCN (2019) criteria.

Notes: This is a fairly large plant with deeply crenate leaves and many-flowered, long scapes. The flowers are deeply pouched and horizontally oriented. Their scapes are pale greenish-red under natural conditions, but bright green when grown in the greenhouse.

Typification: This species was described by Gamble (1924) based on specimens collected by C.E.C. Fischer from Anamalai hills. Vitek et al. (2000) cited “South India, Anamalai hills, Coimbatore district, 500–600 m alt., 02.08.1915, C.E.C. Fischer (K)” as the type. While searching for the type specimens,
two relevant sheets were found in K (K000450837, K00122291). Both sheets were annotated, “Didymocarpus Rottleriánus, Wall., Anamalai hills, South India, 1700 ft., C. Fischer, 2.8.1915”. The sheet K000450837 has a flowering plant, and two fruiting scapes separately mounted on it, but contains a note by Gamble “a letter from Mr. Fischer dated 27.11.22 says that three specimens were collected at a place called Pachchathani on the lowest slopes of the anamalais ...... towards mount Stuart, 13.1.23” while the other sheet has two flowering plants. According to Art. 9.17 of ICN (Turland et al., 2018), we take a second step lectotypification by narrowing them to a single specimen. We chose K000450837 that agrees with the protologue and has the inscription by Gamble, while the other specimen (K00122291) is designated as isolectotype.


**Figs. 4 & 5**

Perennials, rosette-forming hairy herbs with rootstocks. Roots adventitious, thin. Leaves 6–12, basal, usually in whorl of three; petioles 0.7–1.8 cm long, younger leaves subsessile, pubescent, winged; wings 5–8 mm broad; laminae widely ovate, 4–7.7 × 3.2–6 cm, acute to obtuse at apex, narrowly cuneate to attenuate at base, hispid on the upper surface, golden brown hairy on lower surface, but more so on younger leaves and lower veins, becoming fewer with age, margins crenate, ultimate segments regular, surfaces usually rugose; veins usually 4 on each side, much branched and conspicuous beneath. Cymes axillary, 2–4 per plant (rarely up to 11), 3–5 times divided, 12–36-flowered; peduncles terete, 8–19 cm long, green to reddish brown, golden brown hairy; bracts two at each branching point, lanceolate to triangular, 3–3.5 × 0.36–0.4 mm, obtuse to slightly acute at apex, margins entire, white tomentose; pedicels terete, 4–14 mm long, pubescent. Flowers 8–11 × 5–6.5 mm. Calyx 5-partite, very deeply divided or basally connate; lobes lanceolate to narrowly oblong, unequal, posterior lobe smaller, 2.7–3 × 0.42–0.53 mm, others 2.9–3.2 × 0.5–0.68 mm, obtuse at apex, margins entire, reddish brown, white hairy. Corolla zygomorphic, ventricose, two lipped, villous outside, glabrous inside; tube 7–8 × 5.8–6.4 mm, lilac to pale lilac with a yellow patch in the throat; lobes widely ovate, rounded to truncate at apex, lilac to pale lilac, upper lip of two lobes, 3.8–4.3 × 3.5–4.1 mm, lower lip of three lobes, 4.2–5.1 × 4–5 mm. Stamens 2, adnate to the base of corolla, included; filaments 2.2–2.7 mm long, glabrous, green on the top and colourless towards base; anthers reniform, 1.3–1.5 × 0.6–0.7 mm, milky white, glabrous. Staminodes 2; filaments 1.6–1.8 mm long, hyaline, glabrous; antherodes not seen. Ovary narrowly ovoid to oblong, 4–4.7 × 0.9–1 mm, green, pubescent; style terete, 2.6–2.9 mm long, green, glabrous; stigma obliquely subcapitate, 0.21 × 0.5 mm, papillate, pale green. Capsules cylindrical, straight, 13–15 mm long, plagiocarpic, dehiscing loculicidally along the dorsal side, reddish brown, tomentose with persistent stigma and calyx. Seeds numerous, elliptic, reticulate.

**Flowering & fruiting:** Flowering from July to late September and fruiting from September to November (sometimes up to March).
Fig. 4. *Henckelia gambleana* (C.E.C.Fisch.) A.Weber & B.L.Burtt: a. Habit and habitat; b. A portion of the inflorescence; c. Flower; d. Calyx; e. Calyx with pistil; f. Bract; g. Stamens; h. Staminode; i. Pistil (from A.P. Janeesha & Santhosh Nampy 137677).
Habitat: On moist hill slopes, along with *Adiantum raddianum* C.Presl (Pteridaceae) and a few species of moss.

Distribution: Endemic to the southern Western Ghats (Fig. 6).


Conservation status: The species occurs in several populations in three to four localities widely disjunct in the SW and NW of Tamil Nadu. Because of this disjunction, the Extent of Occurrence (EOO) is with of c. 3500 km² large. The authors have observed only 27 mature plants in one population in Kakkachi, in the Tirunelveli district in Tamil Nadu. This might suggests that the populations in general are rather small. However, since the status of other localities is unknown and potentially intervening localities may exist, the species is best categorised as Data deficient (DD).

Notes: This species can be easily differentiated from the morphologically allied *H. incana* by its broadly winged petioles, and much shorter (13–15 mm long), tomentose capsules.

Typification: *Henckelia gambleana* was originally described as a variety of *Didymocarpus rottlerianus* Wall. ex R.Br. by Clarke (1883) based on Wight's manuscript name *D. lanuginosus*. Clarke (1885[“1884”]), subsequently treated it as a variety of *D. tomentosus* Wight (as *D. tomentosus* var. *lanuginosus*). Gamble (1924), however, elevated it to a distinct species (as *D. lanuginosus*). Gamble’s *D. lanuginosus*, being a later homonym of *D. lanuginosus* Wallich ex Candolle (1845), was renamed as *D. gambleanus* (=*H. gambleana*) by Fischer (1938). While searching for the type specimens, three sheets were found, two in K (K000858182, K000858183) and one in E (E00627530). The sheet K000858182 with HRWP label is annotated “*D. lanuginosa*, 561/1835” by Wight. This sheet has two plants and two scapes separately mounted on it. The other sheet K000858183 has a field label, Courtallam 561. There is one plant in vegetative stage and a scape separately mounted on it. The specimen in E (E00627530) has three plants, two in vegetative stage and another flowering plant and a separate
scape. This sheet also has a field label 561, Courtallam July 1835. Vitek et al. (2000) cited “Wight 561 (K)” as the type. According to Art.9.17 of ICN (Turland et al., 2018), we take a second-step lectotypification by narrowing them to a single specimen at K (K000858182) that agrees with the protologue and designate the rest of the specimens as isolecotypes.


Perennial, rosette-forming hairy herbs with rootstocks. Roots adventitious, thin. Leaves 4–12, basal, decussate, rarely in whorls of three; petioles 2–6 cm long, longer in older leaves, narrowly winged, pubescent; wings 0.5–2 mm broad;
Fig. 7. *Henckelia humboldtiana* (Gardner) A.Weber & B.L.Burtt: **a.** Habit; **b.** A portion of the inflorescence; **c.** Flower; **d.** Calyx; **e.** Calyx with pistil; **f.** Bract; **g.** Stamens; **h.** Staminode; **i.** Pistil; **j.** Immature capsule; **k.** Seeds (*a* from A.P. Janeesha & A.J. Robi 134201; *b*-**k** from A.P. Janeesha, Habeeb Rahman & S. Syam Radh 134221).
laminae elliptic-ovate, 5–8 × 2.1–5.9 cm, slightly acute at apex, attenuate at base, margins crenate, ultimate segments regular, slightly undulate, surfaces rugose, tomentulose on both surfaces, but more so on the younger leaves and on lower veins, becoming less so with age; veins 5–6 pairs on each side, much branched and conspicuous beneath. Cymes axillary, lax, 1–4 per plant, 2–3 times divided, 6–10-flowered, pubescent; peduncles terete, 8–12 cm long, pale green, pubescent; bracts two at each branching point, linear to oblong, 4.2–5.1 mm long, obtuse at apex, tomentose; pedicels terete, 5–10 mm long, slender, pubescent. Flowers 10–12 × 6–7.5 mm. Calyx 5-partite, free or very deeply divided; lobes linear, unequal, posterior lobe smaller, 4.3–4.8 × 0.6–0.75 mm, others 5.1–6 × 0.72–0.9 mm, slightly acute at apex, margins entire, pale green with a pinch of reddish brown at the base, tomentose. Corolla, zygomorphic, ventricose, two lipped, villous outside, glabrous inside; tube 5–9 × 4.2–5.5 mm, pale lilac to white with a yellow patch in the throat; lobes rounded, rounded at apex, white to pale lilac, upper lip of two lobes, 3.1–3.4 × 3.2–3.7 mm, lower lip of three lobes, 3.3–4.4 × 3.5–5.6 mm. Stamens 2, adnate to the base of corolla, included; filaments 5 mm long, slightly bearded, pale green at the top, base hyaline; anthers reniform, c. 1.3 × 0.8 mm, milky white, glabrous. Staminodes 2. Ovary ovoid to oblong, 8–9 × 1–1.1 mm, green, pubescent; style terete, 3.5–4 mm long, green, base slightly hairy; stigma obliquely subcapitate, 0.65–0.8 × 0.34–0.42 mm, papillate, pale green. Capsules linear, straight or slightly curved, 12–21 × 1.1–1.6 mm, plagiocarpic, dehiscing loculicidally along the dorsal side, pale green, tomentulose with persistent stigma. Seeds numerous, elliptic, 0.32–0.5 × 0.1–0.19 mm, slightly acute at apex, truncate at base; testa dark brown to black, reticulate.

Flowering & fruiting: Flowering from May to September and fruiting from July to November.

Habitat: On moist slopes or on rocks, at medium elevations of 350 m, along with Selaginella sp. (Selaginellaceae), Pteris sp. (Pteridaceae), Impatiens gardneriana Wight, I. acaulis Arn. (both Balsaminaceae) and a few grass species.

Distribution: South India and Sri Lanka (Fig. 11).

A taxonomic revision of *Henckelia* (Gesneriaceae) in South India

Conservation status: This species is widely distributed in Kerala and Tamil Nadu and in Sri Lanka and we consider it as of Least Concern (LC) according to IUCN (2019) criteria.

Notes: This species is close to *H. bracteata* and *H. meeboldii* in leaf shape, but can be easily distinguished by its linear to oblong bracts, linear calyx lobes and hairy connectives.


**Vernacular name**: Elichuzhien (Malayalam).

Perennials, rosette-forming hairy herbs with rootstocks. Roots adventitious, thin. Leaves 6–18, basal, usually in whorls of three, rarely two; petioles 0.8–3 cm long, pubescent, winged; wings 2.3–3.4 mm broad; laminae elliptic–widely ovate, 5.5–11 × 3–9 cm, acute to obtuse at apex, attenuate at base, margins shallowly crenate, ultimate segments regular, surfaces usually rugose, pilose on the upper surface, tomentose on lower surface, but more so on the younger leaves and on lower veins, becoming less so with age; veins usually 5 on each side, much branched and conspicuous beneath. Cymes axillary, dense, 2–6 per plant, 2–4 times divided, 8–17-flowered, pubescent; peduncles terete, 6–23 cm long, reddish brown, pubescent; bracts two at each branching, ovate to lanceolate 2.2–2.8 × 0.5–0.6 mm, obtuse to narrowly acute at apex, margins crenate, hispid along the margin; pedicels 7–15 mm long, terete, narrow, glandular hairy. Flowers 10–15 × 6–10 mm. Calyx 5-partite, very deeply divided; lobes lanceolate, unequal, posterior lobe small, 3.4–4.4 × 1–1.23 mm, others 4.1–5.2 × 1.2–1.3 mm, slightly acute to obtuse at apex, margins entire, reddish brown, hispid. Corolla zygomorphic, ventricose, two lipped, glandular hairy outside, glabrous inside; tube 6.7–7.3 × 5.4–7.1 mm, lilac to pale lilac with a yellow patch in the throat; lobes oblate to widely, rounded to slightly acute at apex, lilac to pale lilac, upper lip of two lobes, 3.6–4.2 × 2.7–4.5 mm, lower lip of three lobes, 4.3–4.8 × 3.9–5.2 mm. Stamens 2, adnate to the base of the corolla, included; filaments 4–5.4 mm long, glabrous, rarely few (3–5) hairs towards the top, green on the top and colourless towards base; anthers reniform, 1.6–1.8 × 0.7–0.9 mm, milky white, glabrous. Staminodes 2; filaments 2.4–3.1 mm long, hyaline, glabrous; antherodes globose or not prominent, glabrous, if globose rarely with 1 or 2 hairs. Ovary ovoid to oblong, 3.8–4.3 × 1.16–1.46 mm, green, glandular hairy; style terete, 3.23–3.86 mm long, green, glabrous; stigma obliquely subcapitate, 0.4–0.6 × 0.74–1 mm, papillate, pale green. Capsules cylindrical, straight or slightly
Fig. 8. Henckelia incana (Vahl) Spreng.: a. Habit; b. A portion of the inflorescence; c. Flower; d. Calyx; e. Calyx with pistil; f. Stamens; g. Staminode; h. Pistil; i. Immature capsule; j. Seeds (from A.P. Janeesha, P.M. Shahina & K.M. Manudev 134255).
curved, 21–28 × 2–2.4 mm, plagiocarpic, dehiscing loculicidally along the dorsal side, reddish brown, hispid, with persistent stigma and calyx. Seeds numerous, elliptic, 0.5–0.56 × 0.22–0.26 mm, slightly acute at apex, truncate at base; testa dark brown to black, reticulate.

**Chromosome numbers:** $n = 27$ (Thathachar, 1942), $n = \pm 45$, $2n = \pm 90$ (Ratter & Prentice, 1967).

**Flowering & fruiting:** Flowering from May to October and fruiting from July to December.

**Habitat:** On moist slopes and in rock crevices, together with *Begonia floccifera* Bedd. (Begoniaceae), *Justicia japonica* Thunb. (Acanthaceae), species of moss and grass.

**Distribution:** Endemic to the southern Western Ghats (Fig. 11).

**Specimens examined:** INDIA, Karnatika, Bangalore district, Savandurga hilltop, 14.08.1979, K.P. Sreenath 8954 (CAL); Mysore district, Devagiri betta—Beduguli, 08.09.1961, Seshagiri Rao Rolla 73794; Ibid., 17.04.1962, A.S. Rao 80020 (E, CAL).


Conservation status: This species is widely distributed in Karnataka, Kerala and Tamil Nadu and the thresholds for Extent of Occurrence (EOO) and Area of Occupancy (AOO) are not met by this species to fall into one of the threat categories. We therefore consider it as of Least Concern (LC) according to IUCN (2019) criteria.

Notes: Wallich (1829) in his catalogue listed *Didymocarpus rotterianus* and quoted *Roettlera incana* as a synonym. *D. rotterianus* Wall. is thus validated by *Roettlera incana* and became nomenclaturally superfluous (for more information, see Burtt, 1954) and both names have Rottler’s specimen as type.

Typification: Vahl (1804) described *Roettlera incana* (Vahl) Spreng.) based on Röttler’s specimen from mountains in Madurai, India. Vitek et al. (2000) cited the sheet at C (C10012757 digital image!) as the holotype. A further search revealed a photograph of the above sheet from C at E with the barcode E00155176 (photograph E!). The sheet C10012757 contains two flowering specimens mounted separately but do not bear any field label or collector’s information to ascertain it as a type material. A further search revealed one sheet with...
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Wight (1848) described *Didymocarpus tomentosus* Wight and included an illustration of his collection from Kaitie falls, on the Neilgherries. It was further mentioned in the protologue “I have since received many specimens from hills near Coimbatore, and have often met with it in similar situations”. All of this is original material and available for lectotypification. Vitek *et al.* (2000) cited “Wight (K)” as the type. We traced three relevant specimens at K (K000858193, K000858195, K000858196 digital images!). One sheet K000858193 with an HRWP label is annotated “*Did. tomentosa?*, Jamalay Coimbatore” by Wight. The sheets K000858195 and K000858196 have the annotations “2352 *Didymocarpus tomentosus* Wt”, with field labels, one with “Jamalay, June 1848” and the other “Jamalay near Coimbatore, November 1847” respectively. Specimens from Kaitie falls are, however, not available in any herbaria. The sheet K000858196, earliest among them with five mature plants and scapes is chosen here as the second-step lectotype while the others (K000858193, K000858195) are consequently isolectotypes.


**Figs. 9 & 10**

Perennials, rosette-forming hairy herbs with rootstocks. Roots adventitious, thin. Leaves 6–15, basal, usually in whorls of three; petioles 2.5–9 cm long, pubescent, winged; wings 1–3 mm broad; laminae elliptic, 8.5–12 × 4.7–6.7 cm, acute at apex, narrowly cuneate to attenuate at base, margins doubly serrate, first serration deep and ultimate segments irregular, surfaces usually rugose; hispid on both surfaces, but more so on the younger leaves and on lower veins, becoming less so with age, veins usually 5 on each side, much branched and conspicuous beneath. Cymes axillary, 2–7 per plant, 3–5 times divided, 12–22-flowered, pubescent; peduncles terete, 18–24 cm long, green, pubescent; bracts two at each branching point, linear, 3–5 × 1.3–2.4 mm, obtuse at apex, margins entire, hispid; pedicels terete, 4–14 mm long, narrow, pubescent. Flowers 10–20 × 4–9 mm. Calyx 5-partite, very deeply divided or basally connate; lobes elliptic to oblong, unequal, posterior lobe small, 2–2.2 × 0.68–0.77 mm, others 2.3–2.9 × 0.71–1 mm, obtuse at apex, margins entire, reddish brown towards the base and green towards the apex, hispid on both sides. Corolla zygomorphic, ventricose, two lipped, glandular hairy outside, glabrous inside; tube 6.8–7.9 × 5.3–6.2 mm, pale lilac with a yellow patch in the throat; lobes widely ovate to orbicular, rounded at apex, slightly undulate, pale lilac, upper lip of two lobes, 4.5–5.2 × 5.3–5.9 mm, lower lip of three lobes, 5.4–5.8 × 5.3–6.2 mm. Stamens 2, adnate to the base of the corolla, included; filaments 3.3–3.8 mm long, glabrous, green on the top and colourless
Fig. 9. Henckelia innominata (B.L.Burtt) A.Weber & B.L.Burtt: a. Habit and habitat; b. A potion of the inflorescence; c. Flower; d. Calyx; e. Calyx with pistil; f. Stamens; g. Staminode; h. Pistil; i. Capsule; j. Seeds (a from A.P. Janeesha, Dani Francis, S. Resmi & K.S. Arathy 137682; b-j from A.P. Janeesha & Santhosh Nampy 137681).
towards base; anthers reniform, 1.45–1.6 × 0.62–0.7 mm, milky white, glabrous. Staminodes 2; filaments 1.8–2 mm long, hyaline, glabrous; antherodes a small knob like structure. Ovary ovoid to oblong, 3.1–3.5 × 1.15–1.3 mm, green, glandular hairy; style terete, 2.4–2.6 mm long, green, glabrous; stigma obliquely subcapitate, 0.53–0.58 × 0.3 mm, papillate, pale green.Capsules cylindrical, straight, 12–19 × 1.4–1.6 mm, plagiocarpic, dehiscing loculicidally along the dorsal side, reddish brown, tomentulose with persistent stigma and calyx. Seeds numerous, elliptic, 0.43–0.56 × 0.2 mm, slightly acute at both ends; testa dark brown to black, reticulate.

Chromosome numbers: n = 16, 2n = 32 (Ratter & Prentice, 1967).

Flowering & fruiting: Flowering from (May) June to September and fruiting from August to December.

Habitat: On moist slopes and in rock crevices, along with Selaginella sp. (Selaginellaceae), Spermacoce alata Aubl. (Rubiaceae) and a few grass species.

Distribution: Endemic to the southern Western Ghats (Fig. 11).

Specimens examined: INDIA, Karnataka, Coorg district, s.loc., s.d., s.coll. s.n. (CAL). Kerala, Idukki district, Chinnar, 19.01.1986, B. Gurudev Singh & K.R. Sasidharan 12428 (FRC); Ibid., 07.10.1994, E.S. Santhosh Kumar 17595 (TBGT); Kollam district, Achancol, 22.05.1979, C.N. Mohanan 63025 (MH); Moonnamra–Thenmala, 17.08.2016, A.P. Janesh & Santhosh Nampy 137681; Moonnamra–near constructing railway track, 17.08.2016, A.P. Janeshha, S. Resmi Francis & K.S. Arathy 137682 (CAL); Palakkad district, Dhoni reserve forest, 20.07.1963, J. Joseph 17220 (MH); Pathanamthitta district, Achankovil to Mekkarai, 05.09.1913, M. Rama Rao 1652 (CAL). Tamil Nadu, Coimbatore district, Attakatti, 04.07.1961, J. Joseph 12685 (MH); Ibid., 21.11.1980, M. Chandra Bose & V. Chandrasekaran 69044 (MH, CAL); Parappalar dam, 11.11.1986, K.M. Matthew 47293 (RHT); Siruvani, 14.08.1960, A.N. Henry 351 (MH); Siruvani–near Bungalow, 14.08.1960, A.N. Henry 350 (BLAT). Dharmapuri district, Chitteri hills, 12.08.1978, K.M. Matthew 16362; Ibid., 09.01.1980, K.M. Matthew 25618 (RHT); Kanyakumari district, s.loc., 29.10.2015, K. Thoiba & A.P. Janeshha 137651, 137652 (CAL); Nilgiri district, s.loc., s.d., G. Thomson 1351 (CAL); Ramnad district, Ayyanarkoil, 23.09.1971, E. Vajravelu 38715; Cumbummedu, 14.03.1970, E. Vajravelu 33767; Yanaimutti rocks, 13.12.1972, E. Vajravelu 39412 (MH); Salem district, Krishnagiri, 24.09.1917, s.coll. 14935 (MH); Yercaud, 28.06.1980, V. Sainaba 28364 (CAL); Tenkasi district, Courtallam, 18.07.1901, C.A. Barber 3374; Ibid., 16.07.1907, C.A. Barber 8378; Ibid., 23.07.1957, K. Subramanyam 3745 (MH); Ibid., 29.06.1980, K. Indira Devi 5760; Ibid., 30.06.1980, K.S. Hema 8143; Ibid., 30.06.1980, T. Usha 30144; Ibid., 30.06.1980, M.S. Baby Usha Kiran 3783 (CAL); Tirunelveli district, around Shembagadevi, 27.09.1975, K.K.N.
Fig. 11. Distribution of Henckelia humboldtiana (Gardner) A.Weber & B.L.Burtt, H. incana (Vahl) Spreng. and H. innominata (B.L.Burtt) A.Weber & B.L.Burtt in South India (drawn using QGIS v.3.12.1).

Conservation status: The species occurs widely in 13 districts in three states, Karnataka, Kerala and Tamil Nadu. The Extent of Occurrence (EOO) is estimated to be c. 34100 km². However, during field surveys of two localities, only 106 mature plants were observed, suggesting that the populations are not large. Not all of the localities are in protected areas and those outside face high risks of habitat destruction, particularly one that is located very near to a railway track construction site. However, because of the number of populations and localities, the species can be considered at present of Least Concern (LC) according to IUCN (2019) criteria.

Typification: Wallich (1829) in his catalogue named this species Didymocarpus rotterianus Wall. but quoted Roettlera incana Vahl as its synonym. The name D. rotterianus thus got validated and became nomenclaturally superfluous (for more information, see Burtt, 1954). Burtt (1954) named Wallich's specimen 778 as D. innominatus B.L.Burtt. Vitek et al. (2000) cited “Wallich 778 [K]” as the type. We have traced five Wallichian collections at K (K001129365, K00085184, K001111885, K001111884, K001111886 digital images!). In order to narrow down the choice to a single specimen, we carried out a second-step lectotypification here. The sheets K001129365 (labelled 777C & D) and
K001111886 are mixed collections, and the specimens mounted on the upper side alone belong to *H. innominata*. K00085184, K001111885, K001111884 are labelled 778, 778B & 778.1 respectively and all belong to *H. innominata*. Of these, sheet K001111885 with a complete plant and inflorescence is chosen here as the lectotype while the other specimens (K00085184, K001111884) are consequently isolecotypes.


Fig. 12

Perennials, rosette-forming hairy herbs with rootstocks. Roots adventitious, thin. Leaves 6–9, basal, usually in whorls of three; petioles 4.5–14 cm long, pubescent, lacerate; laminae widely elliptic-orbicular, 4.5–7.5 × 4.5–6.3 cm, rounded to obtuse at apex, lyrate at base, margins doubly crenate to serrate, sometimes the first crenation is very deep and irregular, surfaces usually rugose, pilose on both surfaces, but more so on the younger leaves and on lower veins, becoming less so with age; veins usually 5 on each side, much branched and conspicuous beneath. Cymes axillary, 3–9 per plant, 3–5 times divided, 12–21-flowered, pubescent; peduncles terete, 13–29 cm long, green, pubescent; bracts two at each branching point, linear, 3–5 × c. 1 mm, obtuse to rounded at apex, margins entire, pilose; pedicels terete, 4–25 mm long, narrow, pubescent. Flowers 10–14 × 5–7 mm. Calyx 5-partite, very deeply divided; lobes broadly lanceolate, unequal, posterior lobe small, 2–4.5 × 0.5–1.3 mm, others 4–11 × 0.7–3 mm, obtuse at apex, margins entire, green, pilose. Corolla zygomorphic, ventricose, two lipped, minutely villous outside, glabrous inside; tube 8–10 × 5–6.7 mm, white to pale lilac with a yellow patch in the throat; lobes widely ovate, ovate to rounded at apex, white to pale lilac, upper lip of two lobes, 3.7–4.1 × 4–4.8 mm, lower lip of three lobes, 4–5 × 4.2–5.3 mm. Stamens 2, adnate to the base of the corolla, included; filaments 3.5–4.2 mm long, glabrous; anthers reniform, 1.5–1.6 × c. 0.62 mm, milky white. Staminodes 2; filaments 3.1–3.5 mm long, glabrous; antherodes highly reduced. Ovary ovoid to oblong, 2.6–3 × 0.78–0.86 mm, pubescent; style terete, 3–3.8 mm long, glabrous; stigma obliquely subcapitate, c. 0.34 mm diam., papillate, white to pale green. Capsules cylindrical, straight or slightly curved, 12–36 mm long, plagiocarpic, dehiscing loculicidally along the dorsal side, green, glandular hairy with persistent stigma and calyx. Seeds numerous, oblong-ovoid to elliptic, 0.4–0.51 × 0.17–0.21 mm, slightly acute at apex; testa dark brown to black, reticulate.

**Flowering & fruiting**: Flowering from May to October and fruiting from August to December. **Habitat**: On moist rocks, in association with *Porella* sp. (Porellaceae). **Distribution**: Endemic to the southern Western Ghats (Fig. 17).

**Specimens examined**: INDIA, Kerala, Idukki district, Neymakkad gap, N 10°08′ 46.322′ E 77°05′ 16.93′, 1784 m, 22.10.2004, M.P. Geethakumary & A.G. Pandurangan 55339 (TBGT); Kollam district, Aryankavu, 02.12.1961, K.N. Subramanian 77355 (BSI); Palakkad district, Dhoni forest–Korakkallu
Fig. 12. *Henckelia lyrata* (Wight) A.Weber & B.L.Burtt: a. Habit and habitat; b. A portion of the inflorescence; c. Flower; d. Calyx with pistil; e. Stamens; f. Pistil; g. Immature capsule; h. Seeds (from K.M. Prabhukumar 7559).
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**Conservation status:** The species occurs in Kerala and Tamil Nadu with around five localities in five districts, with one isolated disjunct locality in the North. The estimated Extent of Occurrence (EOO) is c. 7800 km². The authors were able to study three localities where they found a total of 26 mature plants. Of the three populations, two populations are located in unprotected areas and one in a wildlife sanctuary. The situation at Aryankavu and Mudaliaruthu are currently unknown. With view to the location and small size of the populations a further decline is likely. Thus, we assess the species as Endangered (EN), B2ab(iii,iv,v) according to IUCN (2019) criteria.

**Notes:** The lyrate, pilose leaves, shorter scapes and small flowers identify this species in the field. Clarke (1883) described another variety, *Didymocarpus lyratus* var. *protractus*, differentiating from the typical variety by its elliptic, narrowly winged lyrate, less pilose, crenate leaves, 8–12 cm long petioles and longer peduncles (up to 24 cm long). But most of these characters are within the limit of *H. lyrata* (see description above) and hence var. *protractus* is treated here as conspecific.


Perennials, rosette-forming hairy herbs with rootstocks. Roots adventitious, thin. Leaves 9–12, basal, usually in whorls of three, sessile to sub-sessile; laminae obovate–widely spatulate, 16–27 × 6–10 cm, rounded to slightly acute at apex, attenuate at base, margins crenate, surfaces usually rugose, white bullate hairy on the upper surface, with dense golden brown woolly hairs on the younger leaves and on lower veins, becoming less so with age; veins 7–8 on each side, much branched and conspicuous beneath. Cymes axillary, 1–2 per plant, 3–6 times divided, 16–28-flowered; peduncles terete, 30–54 cm long, stout, golden brown, covered with dense golden brown woolly hairs; bracts two at each branching point, broadly linear to elliptic, 1.5–4 × 1–1.9 mm, rounded at apex, basally hairy, green; pedicels terete, 3–11 mm long, slender, hairy. Flowers 10–20 × 13–18 mm. Calyx 5-partite, very deeply divided or basally connate; lobes ovate to elliptic, unequal, posterior lobe small, 2–2.7 × 0.8–1.3 mm, others 2.8–4.9 × 1–1.92 mm, slightly acute to obtuse at apex, margins entire, reddish brown, glandular hairy on the base, with golden brown woolly hairs towards the apex. Corolla zygomorphic, ventricose, two lipped, with white woolly hairs outside, glabrous inside; tube 8–12 × 4.3–5.5 mm, pale lilac to white with a yellow blotch at the throat; lobes very widely obovate with undulate margin, rounded at apex, white to pale lilac, upper lip of two lobes, 5.5–6 × 7–7.8 mm, lower lip of three lobes, 6.8–7.8 × 7.7–8.6 mm. Stamens 2, adnate to the base of the corolla, included; filaments 4.5–5 mm long, glabrous, yellow; anthers reniform, 1.5–2.75 × 0.75–1.16 mm, milky white to cream, bearded in the region of the connective. Staminodes 2; filaments 2.4–3.3 mm long, hyaline, glabrous; antherodes dome shaped, 0.4–0.62 × 0.5–0.7 mm, bearded in the region of connective. Ovary ovoid, 4–6 × 2.1–2.64 mm, pale green, with glandular and dense white woolly hairs all over; style terete, 1.8–3 mm long, green, glabrous; stigma obliquely subcapitate, 0.65–0.7 × 0.8–0.86 mm, papillate, pale green. Capsules cylindrical, stout,
Fig. 13. *Henckelia macrostachya* (E.Barnes) A.Weber & B.L.Burtt: a. Habit and habitat; b. Flower; c. Calyx; d. Calyx with pistil; e. Bract; f. Stamens; g. Staminode; h. Pistil; i. Immature capsule (from A.P. Janeesha & Santhosh Nampy 137616).
13–28 × 2.2–2.7 mm, plagiocarpic, dehiscing loculicidally along the dorsal side, reddish brown, glandular hairy with persistent stigma and calyx. Seeds numerous, elliptic, 0.57–0.69 × 0.22–0.29 mm, slightly acute at apex, truncate at base; testa dark brown, reticulate.

Flowering & fruiting: Flowering from July to early September and fruiting from late August to October.

Habitat: On moist slopes and in rock crevices, in association with *Cyanotis obtusa* Trimen (Commelinaceae), *Christella* sp. (Thelypteridaceae) and some grass species.

Distribution: Endemic to the southern Western Ghats (Fig. 17).


Conservation status: The species is currently known only from four localities in one district outside protected areas with an Extent of Occurrence (EOO) of c. 74 km². The authors observed 58 plants of different growth stages, of which 41 were mature at two localities. The species is possibly surviving as fragmented populations in a narrow range of distribution, being subjected to habitat alteration/destruction due to plantation activities and the growing tourism in those areas. It is therefore assessed here as Endangered (EN), B1ab(iii,iv,v), D (IUCN, 2019).

Notes: This is a robust plant with spatulate leaves and long scapes (about 50 cm long). The scapes, calyx and capsules are completely covered with golden brown woolly hairs.

Henckelia meeboldii (W.W.Sm. & Ramaswami)


Perennials, rosette-forming hairy herbs with rootstocks. Roots adventitious, thin. Leaves 8–13, basal, decussate; petioles 4–12 cm long, pubescent, winged; wings 2–3 mm broad; laminae widely elliptic-ovate, 6–16 × 5–11.5 cm, obtuse to acute at apex, attenuate at base, margins crenate, sometimes slightly doubly crenate, ultimate segments regular, surfaces usually rugose, pubescent on both surfaces, but more so on the younger leaves and on lower veins, becoming less so with age; veins 5–7 on each side, much branched and conspicuous beneath. Cymes axillary, 1–5 per plant, 6–9 times divided, 10–18–flowered; peduncles terete, 10–26 cm long, reddish brown, glandular hairy; bracts two at each branching point, linear, 3–4 × 0.8–1 mm, acute at apex, margins entire, pilose; pedicels terete, 4–25 mm long, slender, glandular hairy. Flowers 13–15 × 11–13 mm. Calyx 5-partite, very deeply divided or basally connate; lobes ovate to lanceolate, unequal, posterior lobe small, 2–3.1 × 0.7–0.92 mm, others 3.2–5 × 1–1.8 mm, slightly acute at apex, margins entire, reddish brown, glandular hairy. Corolla zygomorphic, ventricose, two lipped, glandular hairy outside, glabrous inside; tube 9–11 × 3.7–4.2 mm, dark lilac with a yellow patch in the
Fig. 14. *Henckelia meeboldii* (W.W.Sm. & Ramaswami) A.Weber & B.L.Burtt: **a.** Habit and habitat; **b.** A portion of the inflorescence; **c.** Flower; **d.** Calyx; **e.** Calyx with pistil; **f.** Bract; **g.** Stamens; **h.** Staminode; **i.** Pistil; **j.** Immature capsule; **k.** Seeds (from A.P. Janeesha & K.M. Manudev 134202).
throat; lobes ovate to slightly elliptic, rounded at apex, dark lilac, upper lip of two lobes, 3.7–4 × 5–5.8 mm, lower lip of three lobes, 6–7 × 5–6 mm. Stamens 2, adnate to the base of corolla, included; filaments 4–6 mm long, puberulent, green on the top and colourless towards base; anthers reniform, 1.5–1.7 × 0.9–0.95 mm, milky white, glabrous. Staminodes 2; filaments 2.2–2.5 mm long, hyaline, glabrous; antherodes 0.42 × 0.36 mm, hyaline, glabrous. Ovary ovoid to oblong, 4.8–6.5 × 0.9–1.2 mm, green, glandular hairy, sometimes slightly curved; style terete, 4–5.5 mm long, green, glabrous; stigma obliquely subcapitate, 0.3–0.35 × 0.2–0.25 mm, papillate, pale green. Capsules cylindrical, straight or slightly curved, 14–35 × 1.3–1.5 mm, plagiocarpic, dehiscing loculicidally along the dorsal side, reddish brown, tomentulose with persistent stigma. Seeds numerous, elliptic, 0.38–0.45 × 0.2–0.22 mm, obtuse to slightly acute at apex, truncate at base; testa dark brown, reticulate.

**Flowering & fruiting:** Flowering from July to October and fruiting from September to November.

**Habitat:** On moist slopes, in association with *Adiantum philippenes* L. (Pteridaceae), *Christella* sp. (Thelypteridaceae), *Selaginella* sp. (Selaginellaceae) and *Cyanotis villosa* Schult.f. (Commelinaceae).

**Distribution:** Endemic to the southern Western Ghats (Fig. 17).


**Conservation status:** This species is widely distributed in central areas of Kerala and some parts in western Tamil Nadu, with an Extent of Occurrence (EOO) of c. 3800 km². More than 240 mature plants were observed from nine populations across Kerala. The estimated Area of Occupancy (AOO) for all localities is an estimated 48 km². The majority of the localities are not in protected areas and are subjected to human disturbance due to plantation activities and tourism. Because if the small number of mature plants we consider the species to be of Endangered (EN) D, according to IUCN (2019) criteria.

**Notes:** Ramaswamy (1914) described the corolla tube and filaments as glabrous. But in the present investigation, the outside of the corolla tube was found to be glandular hairy and the filaments bearded. The species is morphologically close to *H. humboldtiana*, but can be distinguished by its broadly elliptic to ovate leaves, glandular indumentum on the pedicel, calyx lobes, corolla tube and ovary.

Flowering & fruiting: Flowering from May to July and fruiting from July to September.

Habitat: On moist slopes and in rock crevices.

Distribution: Endemic to the southern Western Ghats (Fig. 17).

Specimen examined: INDIA, Tamil Nadu, Kanyakumari district, Kalikesam river side, Balamore, 700 m, 31.08.1976, A.N. Henry 48151 (MH).

Conservation status: The population status at the type locality (A.N. Henry 49421) is presently uncertain, since no plants were found during recent fieldwork in 2014. The situation of the nearby population at Kalikesam river side at Balamore (A.N. Henry 48151) is presently unknown. Because of these uncertainties, the species should be regarded as Data Deficient (DD) according to IUCN guidelines (IUCN, 2019).

Typification: Henckelia missionis (Wall. ex R.Br.) A.Weber & B.L.Burtt (Gesneriaceae) was first named (nom. nud.) as “Didymocarpus ? missionis” by Wallich (1829). Subsequently Brown (1839) validated the preceding name with a description (“Caule brevissimo, pedunculis axillaribus scapiformibus, folis cordato ovatis”) and as type, he referred to “Wall. List. no. 639”. Kuntze (1891) transferred this species to Roettlera as R. missionis (Wall. ex R.Br.) Kuntze while Weber and Burtt (1998[“1997”]) placed this species in Henckelia as H. missionis (Wall. ex R.Br.) A.Weber & B.L.Burtt. Meanwhile, Beddome (1874: 39, t. 176) described another species, viz., Didymocarpus membranaceus Bedd. from Pachemallai hills (Tamil Nadu) in South India as “leaves all radical, ... membranaceous, from obliquely cordate-ovate to cordate-lanceolate, corol-tube subinfundibuliform, ......”. Clarke (1883) synonymised Beddome’s species under D. missionis and this treatment was followed by subsequent authors (Clarke, 1885[“1884”]; Gamble, 1924; Henry et al., 1987). This species is endemic and very rare in South India (Nayar & Sastry, 1990; Walter & Gillet, 1997), and has been re-collected.


Perennials, hairy herbs with rootstocks. Roots adventitious, thin. Stems reduced. Leaves 6–10, basal, decussate; petioles 11–16 cm long, pubescent, not winged; laminae ovate to elliptic, 7.9–12.1 × 5.2–7.3 cm, membranaceous, acute to acuminate at apex, obliquely cordate at base, margins entire, with white pellucid hairs, strigose on the upper surface, surfaces rough; veins usually 6 on each side, much branched and conspicuous beneath. Cymes axillary, 1–5 per plant, 3–5 times divided, 6–10-flowered; bracts two, linear, 4 mm long; peduncles terete, 20–29 cm long, with scaly hairs towards apex; pedicels terete, 6–9 mm long, slender, pubescent. Flowers 20–25 mm long. Calyx 5-partite, very deeply divided or basally connate; lobes linear to lanceolate, 5–8 mm long, acute at apex, margins entire, pilose. Corolla zygomorphic, sub-infundibuliform, upper lip of two lobes, lower lip of three lobes, glabrous; tube pale lilac with a yellow patch in the throat; lobes pale lilac, ovate, rounded at apex. Stamens 2, adnate to the base of corolla, included, glabrous; anthers reniform, bearded. Staminodes 2; antherodes present. Ovary ovoid; style terete, glabrous; stigma obliquely subcapitate. Capsules cylindrical, 27–33 mm long, plagiocarpic, dehiscing loculicidally along the dorsal side, with persistent stigma. Seeds not seen.
only twice from Kanyakumari district in Tamil Nadu (Madras Herbarium: Henry 48151, 49421).

While examining “Wallich List. No. 639” (as cited by Brown l.c.), it was found that Brown’s (l.c.) citation refers to Arenaria globiflora Wallich (1829: 19), belonging to Caryophyllaceae. It was found that Wallich’s Didymocarpus missionis is more likely referable to “Wall. List. No. 6396” (probably a typographical error by Brown). According to Stafleu and Cowan (1988), Wallich’s main collections are kept at K (K-W). After a thorough search in various herbaria, two sheets of “Wall. No. 6396” were found, one each at BM and K. The lone sheet in BM (BM000617800 digital image!) has two flower buds separately mounted and carries two labels with annotations. The top one, probably the original label reads “Didymocarpus missionis Wall. Cat 6396 Herb Madras” and the second one, made by curators at BM “Wallich 6396: TYPE SPECIMEN Didymocarpus Wall. ex R.Br., Cyrtandreae: 119 (1839)” respectively. The flower buds are not, however, unquestionably referable to H. missionis. The sheet at K (K001123777 digital image!) has a single specimen with three scapes and a few leaves. There is an inscription on the sheet, possibly by C.B. Clarke written in pencil: ‘Didymocarpus missionis Wall. C.B.Clarke (= D. membranaceus Beddome Ic. t. 176)’. This sheet also carries a Wallich label on which is written: “6396 Didymocarpus ? missionis Wall (caet. spec. 777-793). Hb. Madras”. However, the ovate leaves with cordate base, long pedicels, infundibuliform corolla, and persistent calyx undoubtedly indicate that the specimen belongs to Jerdonia indica Wight (Wight, 1848: 10, t. 1352) (Gesneriaceae). The original description by Brown (1839) is applicable equally to J. indica also. Since the type specimens of H. missionis is demonstrably ambiguous and doesn’t
permit a precise identification and application of
the name, the name is illegitimate (Art. 52.1) and a
proposal is under preparation to conserve the name
with a conserved type according to Articles 14.1
and 14.9 of ICN (Turland et al., 2018).

Beddome (1874) described Didymocarpus
membranacea Bedd. based on his specimens from
“Pachemallay (2000 feet elevation), in South
Travancore ghats”, India. According to TL-2
(Stafleu & Cowan, 1976), the herbarium and type
materials of R.H. Beddome are mainly at BM, some
perhaps at K and CAL. Even after extensive search
no relevant materials have been found in these
herbaria. Hence the illustration in the protologue
(Bedd., Icon Pl. Ind. Or. 1: t. 176. 1874) is selected
here as the lectotype, according to articles 9.3 and
9.4 of ICN (Turland et al., 2018).

**Henckelia ovalifolia** (Wight) A.Weber &
1998[“1997”]; T.S.Nayar et al., Fl. Pl. Western
Ghats 1: 529. 2014; Janeesha & Nampy, Phytotaxa
268(1): 84. 2016. Didymocarpus ovalifolius Wight,
Icon. Pl. Ind. Orient. 4: 24. t. 1351. 1848, Ill. Ind.
Bot. 2: 131. t. 142, fig. 6. 1850; C.B.Clarke in
Hook.f., Fl. Brit. India 4: 354. 1885[“1884”]; Rama
Rao, Fl. Pl. Travancore 295. 1914; Gamble, Fl.
Madras 2: 988. 1924; M. Ahmedullah & M.P.Nayar,
Endemic Pl. Indian Region 1: 143. 1987;
A.N.Henry *et al.*, Fl. Tamil Nadu Ind., Ser I:
Analysis 2: 132. 1987; Manilal, Fl. Silent Valley
200. 1988; M.Mohanan & A.N.Henry, Fl.
Thiruvananthapuram Dist. 338. 1994; Gopalan &
A.N.Henry, Endemic Pl. India 117. 2000;
M.Mohanan & Sivad., Fl. Agasthyamala 495. 2002;
2: 476. 1891. Lectotype (designated by Janeesha &
Nampy, 2016): INDIA, Tamil Nadu, Courtallam,
08.1835, Wight 558 (E [E00155178 digital image!);
Perennials, rosette-forming herbs with rootstock. Roots adventitious. Leaves 8–18, decussate; petioles 4–14 cm long, hairy throughout, not winged; laminae usually ovate-broadly ovate, rarely orbicular, 3.3–12.8 × 2.5–7.7 cm, slightly acute to obtuse at apex, unequal at base, margins crenate to serrate, white strigose or tomentose above and on the lower veins; veins 7–10 on each side, much branched and conspicuous beneath. Cymes axillary, 2–5 per plant, 2–3 times divided, 6–8-flowered; bracts two, oblanceolate, 6.38 × 1.34 mm, white tomentose hairy out; peduncles terete, 9–22.5 cm long, green–pale reddish brown, hairy throughout; pedicels terete, 5–10 mm long, narrow, hairy. Flowers 12–20 × 8–15 mm. Calyx 5-partite, very deeply divided or basally connate; lobes linear to lanceolate, unequal, posterior lobe small, 4.2–5.1 × 0.8–1 mm, others 5.8–6.8 × 1.1–1.2 mm, slightly acute at apex, margins entire, reddish brown, white tomentose outside. Corolla zygomorphic, ventricose, two lipped, white hirsute outside, glabrous inside; tube 7.2–11.3 × 5–5.8 mm, very pale violet to brilliant purple, deep purple at the throat and a yellow blotch at the base of the tube; lobes very widely ovate, slightly acute to obtuse at apex, violet to brilliant purple, upper lip of two lobes, 6.5–7.2 × 5.8–6.6 mm, lower lip of three lobes, 8–8.4 × 7.1–7.25 mm. Stamens 2, adnate to the base of the corolla, included; filaments 5.3–5.7 mm long, puberulent towards the apex, light yellowish green towards the top and milky white towards the base; anthers reniform, 1.7–1.9 × 0.65–0.8 mm, yellowish brown, glabrous. Staminodes 2; filaments 3.5–3.7 mm long, hyaline, glabrous; antherodes not prominent. Ovary narrowly ovoid to cylindrical, tapering to a style, 4.9–5 × 1.1–1.21 mm, green towards the base and reddish brown towards the apex, hairy; style terete, 4–4.1 × 0.35–0.40 mm long, hyaline, hairy throughout up to the middle; stigma obliquely subcapitate, 0.68 × 0.38 mm, papillate, milky white. Capsules linear, straight, 36–44 × 2–2.2 mm, plagiocarpic, dehiscing loculicidally along the dorsal side, reddish brown, hairy with persistent stigma and calyx. Seeds numerous, elliptic, 0.49–0.59 × 0.21–0.24 mm, acute at apex, truncate at base; testa dark brown, reticulate.

Flowering & fruiting: Flowering from June to September and fruiting from August to October (up to February).

Habitat: In moist shady areas of dense evergreen forest, in humus rich soil or on fallen, moss covered tree trunks. Grows in association with Impatiens travancorica Bedd. (Balsaminaceae), Christella sp. (Thelypteridaceae), Osbeckia sp. (Melastomataceae) and some grass species.

Distribution: Endemic to the southern Western Ghats (Fig. 17).

Specimens examined: INDIA, Kerala, Idukki district, Kallar Reserve Forest, 16.07.1989, s.coll. 90687 (MH); Periyar–Koruthode, 25.09.1996, Jomy Augustine 16811 (CALI); Kollam district, Thenmala, 15.06.1984, N. Mohanan 165 (TBGT); Palakkad district, Nillikkal South, 08.06.1982, Prasannan 10392 (CALI); Thiruvananthapuram district, Agasthyamala, 24.06.1993, N. Mohanan 11454 (CALI, TBGT); Ibid., 19.10.1993, G. Gangaprasad & S. William Decruse 18419 (TBGT); Ibid., 06.06.2014, K.M. Manudev & A.P. Janesha 138919, 138925; Ibid., 21.10.2016, K. Shinoj & A.P. Janesha 137658 (CALI); Pongalapara, 25.08.1990, N. Mohanan 10044 (TBGT); Ponmudi, 10.10.2014, K.P. Vimal, M.G. Prasad & A.P. Janesha 137602 (CALI); Western slopes of Agasthyamala, 06.10.1973, J. Joseph 44608 (MH); Wayanad district, Gurukula botanical sanctuary (cultivated), 25.11.2014, A.P. Janesha & S. Resmi 137609; Periya, 25.08.1984, R.T. Balakrishnan 40450; Thalapaya, 10.02.1986, R.T. Balakrishnan 41944 (CALI). Tamil Nadu, Kanyakumari district, Muthukuzhivayal, 06.08.1977, A.N. Henry 49610 (MH); Ibid., 01.09.1981, K.M. Matthew 17788 (RHT); Tirunelveli district, Agasthyamala, 22.06.1901, C.A. Barber 2918; s.loc., 1807, R.H. Beddome 164 (MH).
Fig. 18. *Henckelia ovalifolia* (Wight) A.Weber & B.L.Burtt: **a.** Plant in natural habitat; **b.** Habit; **c.** A portion of the inflorescence; **d.** Flower; **e.** Calyx; **f.** Calyx with pistil; **g.** Bract; **h.** Stamens; **i.** Staminode; **j.** Pistil; **k.** Immature capsule; **l.** Seeds (a from K.P Vimal, M.G. Prasad & A.P. Janeesha 137602; b-l from K.M. Manudev & A.P. Janeesha 138919).
Conservation status: This species is known from eight locations in seven districts in Kerala and Tamil Nadu with a narrow South–North distribution. The estimated Extent of Occurrence (EOO) is c. 1100 km² and Area of Occupancy (AOO) is 32 km². The authors surveyed three locations and found a total of only 81 mature plants. Since these locations are inside protected areas, the chances for a decline due to anthropogenic activity is small. The situation of just under half of the localities is known. However, when extrapolating the findings on mature plants to the entire distribution range, it may justify categorisation of the species as Endangered (EN), D (IUCN, 2019).

Notes: Henckelia ovalifolia and H. missionis are similar in having simple ovate, long petioled leaves, large flowers and long fruits. However, H. ovalifolia can be identified by its leaves with serrate margins and strigose hairs, scalps hairy throughout, hisrute corolla, puberulent filaments and a hairy style.

Type: INDIA, Kerala, Kozhikode district, Muthappanpuzha, N 11°26.6992’, E 076°05.2882’, 470 m, 19.08.2010, Santhosh Nampy & K.M. Manudev 3102 (holo CALI!; iso DEV!, W!).

Perennating tuberous herbs. Tubers 1–2.5 cm diam., discoid. Leaves usually 1, rarely up to 3; petioles 1.8–5.6 cm long, sparingly glandular hairy, not winged; laminae broadly ovate or elliptic, oblanceolate, 9–16 × 5.5–9 cm, acute at apex, slightly oblique or cordate at base, margins entire to serrulate, glabrous above, glandular hairy below, membranaceous, glandular hairy on the margins, surfaces smooth; veins usually 7 on each side, much branched and conspicuous beneath. Cymes axillary, 1–3 per plant, 1–6 times divided, 2–19-flowered, glandular hairy; peduncles terete, 5–20 cm long, green; bracts two at each branching point, lanceolate to triangular, 4.8–6.1 × 1.2–1.7 mm, acute at apex, margin entire, slightly hairy; pedicels terete, 1–3.8 cm long, slender, glandular hairy. Flowers c. 10 × 7 mm. Calyx 5-partite, basally connate; lobes ovate-lanceolate, unequal, posterior lobe small, 3–4.1 × 1–1.25 mm, others 4.3–7 × 1.3–2.1 mm, keeled, blunt at apex, margins entire, green, glabrous. Corolla campanulate, two lipped, glabrous inside and outside (but with a few hairs at the corolla mouth); tube 4–5.4 × 5.2–5.6 mm, lilac to pale lilac with a yellow patch in the throat, with 7–10 purplish streaks; lobes ovate to rounded at apex, lilac to pale lilac, upper lip of two lobes, 2–3.1 × 3.4–4.51 mm, lower lip of three lobes, 3–3.8 × 3.6–4.3 mm. Stamens 2, adnate to the base of corolla, included; filaments 2.4–3.3 mm long, glabrous, greenish yellow; anthers reniform, 1.3–1.5 × 0.53–0.73 mm, milky white, glabrous. Staminodes 2; filaments 1–1.2 mm long, hyaline, glabrous; antherodes ovate to oblate, c. 0.31 × 0.3 mm. Ovary ovoid, 2–2.4 × 1.35–1.75 mm, green, glabrous; style terete, 4–5.22 mm long, green, glabrous; stigma subpeltate, lower lip strongly expanded and slightly emarginate at apex, 1.7–2.1 × 0.5–0.87 mm, papillate, yellow to yellowish green. Capsules ovoid to subglobose, 5.6–6.3 × 5–6 mm, plagiocarpic, dehiscing by a longitudinal slit on the upper side, greenish brown, with persistent calyx and a prominent beak. Seeds numerous, elliptic, 0.4–0.52 × 0.15–0.2 mm, acute at both ends; testa dark brown, reticulate.

Flowering & fruiting: Flowering from July to August and fruiting from August to September.

Habitat: On moist rocks and mountain slopes, found in association with mosses and ferns.

Distribution: Endemic to the southern Western Ghats (Fig. 20).

Specimens examined: INDIA, Kerala, Kozhikode district, Muthappanpuzha, N 11°26.6992’, E 76°05.2882’, 470 m, 18.07.2010, K.M. Manudev 3022 (DEV); Ibid., 19.08.2010, A.K. Pradeep 90089 (CALI); Ibid., 19.08.2010, K.M. Manudev & Santhosh Nampy 3105; Ibid., 17.09.2011, Santhosh Nampy & K.M. Manudev 4547 (DEV); Ibid., 12.08.2014, A.P. Janesha & Santhosh Nampy 134287, 134288; Ibid., 15.06.2015, A.P. Janesha & S. Resmi 137624; Muthappanpuzha–Kundanthode, 15.06.2015, A.P.
Fig. 19. *Henckelia pradeepiana* Nampy, Manudev & A. Weber: a. Habit and habitat; b. A portion of the inflorescence; c. Flower; d. Calyx; e. Calyx with pistil; f. Bract; g. Stamens; h. Staminode; i. Pistil; j. Dehiscing capsule; k. Seeds (from A.P. Janeesha & Santhosh Nampy 134287).
84 A taxonomic revision of *Henckelia* (Gesneriaceae) in South India


*Conservation status:* The species is currently known only from the type locality which is an unprotected area, with two subpopulations separated by a distance of 2 kilometres. The locality has a total of 79 mature plants, with the possibility of future disturbances due to human activities since the area is near a stream which is used by local people for their daily needs. The Area of Occupancy (AOO) is less than 10 km². The species may be categorized as Critically endangered (CR), B2ab(ii,iii,iv,v), D (IUCN, 2019).

*Notes:* This species has several unusual features not found in any other *Henckelia* species in South India or the genus as a whole. This is the only species of *Henckelia* having tubers to enable the plants to overcome unfavourable conditions or periods. The plants usually have only one leaf, but sometimes up to 3 arranged alternately. The stigma is unusual for South Indian *Henckelia* in that they are chiritoid, with the upper lobe reduced and the lower one undivided and linguate (Weber *et al.*, 2011; Manudev *et al.*, 2012). The capsules are globose in contrast to the linear to cylindrical ones in other South Indian *Henckelia* species or any other species in the genus, but are plagiocarpic and dehisce similar to other South Indian *Henckelia*. They are reminiscent of those found in species of *Loxocarpus*, another genus previously included in *Henckelia* (Weber & Burtt, 1998[“1997”]) but recently resurrected (Weber *et al.*, 2011; Middleton *et al.*, 2013).


![Fig. 20. Distribution of *Henckelia ovalifolia* (Wight) A.Weber & B.L.Burtt and *H. pradeepiana* Nampy, Manudev & A.Weber in South India (drawn using QGIS v.3.12.1).](image-url)
Perennial creeping herbs, rooting at nodes and also along the internodes, hairy throughout. Roots adventitious. Stems slender, terete, hairy; internodes 6–12 cm long. Leaves two per node, one is highly reduced to a scale; petioles 3.5–18 cm long, not winged; laminae broadly ovate to sub-orbicular, 5.2–10 × 5–8.3 cm, acute at apex, cordate at base, margins doubly crenate, hairy; veins usually 5–6 on each side, much branched and conspicuous beneath. Cymes few-flowered, usually one from each node, 1–3 times divided, 2–4-flowered; peduncles 4–14.5 cm long, terete, green-pale reddish brown, hairy throughout; pedicels 5–10 mm long, terete, narrow, glandular hairy. Flowers 12–20 × 8–15 mm. Calyx 5-partite, very deeply divided or basally connate; lobes broadly lanceolate, slightly acute at apex, reddish brown, margins entire, hairy, unequal, posterior one small, 3.4–3.7 × 0.7–0.83 mm, others 3.8–4.2 × 0.83–1 mm. Corolla zygomorphic, ventricose, two lipped, glandular hairy outside, glabrous inside; tube 12–13 × 4.5–5.4 mm, dark to pale lilac with a yellow blotch at the throat; lobes elliptic to oblong, rounded at apex, dark to pale lilac, upper lip of two lobes, 4.1–4.9 × 4.7–5.2 mm, lower lip of three lobes, 5–6.65 × 4.3–5.47 mm. Stamens 2, adnate to the base of the corolla, included; filaments 7.5–8 mm long, broad and hairy at the middle, not geniculate, yellow at the middle, other parts milky white; anthers reniform, 2–2.1 × 0.5–0.7 mm, purple coloured except the cohering region of the lobes and also the region surrounding the connective. Staminodes 2; filaments 3.6–4.1 mm long, hyaline, hairy towards the middle; antherodes trilobed, 0.42–0.44 × 0.36–0.37 mm, prominent. Ovary narrowly ovoid, tapering to a style, c. 7.2 × 1.21 mm, green towards the base and reddish green towards the distal part, eglandular hairy; style terete, 4–4.4 × 0.5 mm long, hyaline, eglandular hairy throughout; stigma oblique, subpeltate, 1.7 × 1.23 mm, glabrous. Capsules linear, straight, 20–22 × 2–2.2 mm, plagiocarpic, dehiscing loculicidally along the dorsal side, reddish brown, hairy, with persistent stigma. Seeds numerous, elliptic, 0.49–0.59 × 0.21–0.24 mm, slightly acute at apex, truncate at base; testa dark brown, reticulate.

Flowering & fruiting: Flowering from (May) June to October and fruiting from August to December.

Habitat: Henckelia repens is found as an undercover in moist mixed evergreen and deciduous forests, in association with Elatostema sp., Pouzolzia sp. (both Urticaceae), Adiantum philippenes L. (Pteridaceae), Christella sp. (Thelypteridaceae), Selaginella sp. (Selaginellaceae) and some grass species.

Distribution: Endemic to the southern Western Ghats (Fig. 26).

Specimens examined: INDIA, Kerala, Kollam district, Kolatoor, s.d., s.coll. 1293 (MH); Thiruvananthapuram district, Agasthyamala-Muththhatti, 06.06.2014, K.M. Manudev, A.P. Janeesha & Santhosh Nampy 138940 (CALI); Arthirumala, 12.08.1988, N. Mohanan 4227 (TBGT, CALI); Ibid., 07.06.2014, K.M. Manudev, P.G. Arun Kumar & A.P. Janeesha 138936; Attayar, 13.05.1988, N. Mohanan 9614; Bonaccord, 27.04.1993, A. Nazarudeen 17128 (CALI); Ibid., 21.12.1987, N. Mohanan 9066 (TBGT, CALI); forest near Bonaccord, 21.08.1975, J. Joseph 46470; Ibid., 02.10.1973, J. Joseph 44493 (MH); Chemungi, s.d., Rajkumar 11775; Ibid., 18.08.1992, E.S. Santhosh Kumar & M. Abdul Jabbar 14447; Ibid., 11.08.2011, P.M. Sheeba 66275 (TBGT); Pandimottai, 19.05.1979, M. Mohanan 61853 (MH); Pidichathamparamal, 31.05.2001, Non Wood Forest
Conservation status: The species is distributed in 4 districts in southern Kerala and southern Tamil Nadu and where seven locations are known. Only five of these fall in protected areas. The Extent of Occurrence (EOO) is calculated to be c. 600 km² and the Area of Occupancy (AOO) is 28 km². During field studies, the authors observed a total of only 52 mature plants at four locations. This might indicate that the species occurs with very few individuals in total and should belong in the Endangered category (EN), D (IUCN, 2019).

Notes: Henckelia repens is the only creeping species in South India while the other species, H. hurtitii D.J.Middleton & Mich.Möller, with a very similar habit is found in Northeast India (Burtt & Panigrahi, 1965; Wood, 1974). Henckelia repens has a longer corolla tube (up to 1.5) compared to other South Indian species. Beddome’s illustration (Icon. Pl. Ind. Or. 1: 24. t. 120. 1874) and drawings on the type sheet at K differ with the protologue in two points. The anthers are cohering in the specimens but they are drawn in the icon and on the illustration on the type sheet as non-coherent. Similarly, the filament is broad except at the apex, but it is drawn as narrow along its entire length in the type sheet and broad at the basal region in the icon.

Henckelia wayanadensis Janeesha & Nampy, sp. nov.

Figs. 22 & 23a1-i1

Henckelia wayanadensis is morphologically similar to H. fischeri, but can be readily identified by its elliptic to widely elliptic leaves (vs. ovate), ovate hispid bracts (vs. lanceolate tomentose bracts), small flowers 12–14 × 6.7–11 mm (vs. large flowers 11–17 × 9–22 mm), and purple glands on the ovary (vs. hyaline glandular hairs on the ovary).

Type: INDIA, Kerala, Wayanad district, Kaduvakuzhi hill top, 1200 m, 08.07.2016, A.P. Janeesha & Santhosh Nampy 137672 (holo CALI; iso MH!)

Perennials, rosette-forming, herbs with rootstocks. Roots adventitious, thin. Leaves 8–20, basal, usually in whorls of four; petioles 4–11.5 cm long, pubescent, winged; wings 3–8 mm broad; laminae elliptic to widely elliptic, 8–19.2 × 6–12 cm, obtuse at apex, attenuate at base, margins doubly crenate, ultimate segments irregular, first crenation very deep, surfaces usually rugose, white tomentose on both surfaces, becoming less so with age; veins 6–8 on each side, much branched and conspicuous beneath. Cymes axillary, 4–10 per plant, 3–5 times divided, 35–63-flowered; peduncles terete, 23–30 cm long, green-pale reddish brown, tomentose; bracts two at each branching point, ovate, 5.5–6.6 × 1–2 mm, slightly acute at apex, margin entire, hispid, green; pedicels terete, 4–26 mm long, narrow, tomentose. Flowers 12–14 × 6.7–11 mm, held horizontal. Calyx 5-partite, very deeply divided or basally connate; lobes linear to ovate-elliptic, unequal, posterior lobe small, 2.7–3.4 × 0.5–0.9 mm, others 3.55–4.35 × 0.8–1.4 mm, green, obtuse at apex, margins entire, glandular hairy. Corolla zygomorphic, ventricose, two lipped, glandular hairy outside, glabrous inside; tube 5–9 × 3.4–4.5 mm, dark to pale lilac with a yellow blotch at the throat, swollen towards the mouth; lobes widely ovate, rounded at apex dark to pale lilac, upper lip of two lobes, 3.7–4 × 4–5.1 mm, lower lip of three lobes, 3.9–4.4 × 4.2–5.8 mm. Stamens 2, adnate to the base of corolla, included; filaments 3.3–4.3 mm long, glabrous, yellow; anthers reniform, 1.2–1.7 × 0.4–0.76 mm, milky
Fig. 22. *Henckelia wayanadensis* Janeesha & Nampy; a. Plants in natural habitat; b. Habit; c. Bract; d. Flower; e. Calyx; f. Calyx with pistil; g. Hairs on the pedicel; h. Stamens; i. Staminode; j. Pistil; k. Purplish glandular hairs on the ovary; l. Immature capsule; m. Seeds (a-l from A.P. Janeesha & P.G. Arunkumar 137671; m from A.P. Janeesha & K. Haseem 137690).
Fig. 23. Comparison of *Henckelia wayanadensis* Janeesha & Nampy and *H. fischeri* (Gamble) A.Weber & B.L.Burtt: a1-i1 *H. wayanadensis*; a2-i2 & a3-i3 *H. fischeri*. a. Habit; b. Flowers; c. Calyx; d. Calyx with pistil; e. Stamens; f. Staminodes; g. Pistil; h. Immature capsules; i. Seeds.
white to cream. Staminodes 2; filaments 1.3–3 mm long, hyaline, glabrous; antherodes a small knob-like structure. Ovary ovoid to oblong, 2.7–3.5 × 0.9–1.3 mm, green, glandular hairy, gland tip purplish; style tetrate, 2.2–3.6 mm long, green, glabrous towards apex, glandular hairy towards base; stigma obliquely subcapitate, 0.4–0.5 × 0.22–0.24 mm, papillate, pale green. Capsules cylindrical, straight or slightly curved, 20–22 × 1.6–2 mm, plagiocarpic, dehiscing loculicidally long the dorsal side, reddish brown, glandular, hispid, with persistent stigma and calyx. Seeds numerous, elliptic, 0.65–0.72 × 0.20–0.24 mm, truncate at both; testa brown, reticulate.

*Flowering & fruiting:* Flowering from July to August and fruiting from August to September.

*Etymology:* The species epithet ‘*wayanadensis*’ refers to the locality ‘Wayanad’, the floristically rich district of Kerala in which the new taxon was discovered.

*Habitat:* In rock crevices, usually at an elevation above 900 m, in association with *Parahemionitis* sp. (Pteridaceae), *Cyanotis* sp. (Commelinaceae) and some moss and grass species.

*Distribution:* Hitherto known only from the type locality (Fig. 26).


*Conservation status:* The new species is currently known only from one locality with three subpopulations in an unprotected area, separated by a distance of 50–60 meters, with a total of 61 mature plants. There is the possibility of disturbances in the future due to human activities, where local peoples are exploring the area for wood, forage grasses *etc.* The Area of Occupancy (AOO) is likely to be less than 10 km². Therefore the species is categorized as Critically endangered (CR), B2ab(iii,iv,v) according to IUCN criteria (IUCN, 2019).


Perennials, rosette-forming, hairy herbs with rootstocks. Roots adventitious, thick. Leaves 12–20, bisexual, in whorls of 4–7, sessile to sub-sessile; laminae spatulate-oblanceolate to elliptic, 3.8–10.7 × 1.6–3.6 cm, obtuse to rounded at apex, attenuate at base, margins slightly crenate and undulate, surfaces smooth, velvety, with white woolly hairs on both surfaces, but more so on the younger leaves and on lower veins, becoming less so with age; veins 4–6 on each side, much branched and conspicuous beneath. Cymes axillary, dense; 2–6 per plant, 3–4 times divided, 5–13-flowered; peduncles terete, 10–18 cm long, greenish, glandular hairy; bracts two at each branching point, minute, completely
woolly, c. 2 mm long; pedicels terete, 9–18 mm long, narrow, glandular hairy. Flowers 11–15 × 10–14 mm. Calyx 5-partite, very deeply divided; lobes oblong-lanceolate, unequal, posterior lobe small, 1.8–2.1 × 0.45–0.6 mm, other lobes, 2–3 × 0.6–0.8 mm, slightly acute at apex, margins entire, with white woolly hairs on the upper side. Corolla zygomorphic, ventricose, two lipped, glandular hairy outside, glabrous inside; tube lilac to pale lilac with a yellow patch in the throat; lobes orbicular, ovate to rounded at apex, lilac to pale lilac, upper lip of two lobes, lower lip of three lobes. Stamens 2, adnate to the base of corolla, included; filaments c. 2 mm long, glabrous; anthers reniform, glabrous. Staminodes 3 (sometimes 2); filaments c. 1.2 mm long, glabrous; antherodes not seen. Ovary ovoid to cylindrical, c. 2.5 mm long, covered with dense white woolly hairs, completely enclosed within calyx; style terete, c. 1.3 mm long, glabrous; stigma obliquely subcapitate, papillate, pale green. Capsules linear-cylindrical, straight, 11–17 mm long, plagiocarpic, dehiscing loculicidally along the

Fig. 24. *Henckelia wightii* (C.B.Clarke) A.Weber & B.L.Burtt: a. Habit showing whorls of five leaves; b. Flower; c. Immature capsules (from plants cultivated at Gurukula Botanical Sanctuary, Periya).

Fig. 25. Lectotype of *Henckelia wightii* (C.B.Clarke) A.Weber & B.L.Burtt. © The Board of Trustees for The Royal Botanic Gardens, Kew. Reproduced with permission.
dorsal side, green, tomentulose with persistent stigma and calyx. Seeds numerous, reticulate.

Flowering & fruiting: Flowering from July to October and fruiting from August to November.

Habitat: On moist rocks.

Distribution: Endemic to the southern Western Ghats (Fig. 26).


Conservation status: The species is known from four districts in Kerala and Tamil Nadu where a total of five localities were known. The Extent of Occurrence (EOO) is estimated to be c. 2100 km² and Area of Occupancy (AOO) is 20 km². During a period between 2013 and 2017, one of the authors (JAP) visited four localities except Ayyanarkovil and was unable to observe more than 5 mature plants in two localities, i.e., Munnar and Courtallam. Thus, a decline in number of localities from five to two over five years has been observed, in (i) EOO (ii) AOO; (iv) number of locations or subpopulations and (v) number of mature individuals. Because of the very low number of plants found, we consider this species to be Critically endangered (CR), D according to IUCN guidelines, with a high risk of extinction in the near future (IUCN, 2019).

Notes: Rajakumar et al. (2009) described Henckelia sivagiriensis (as Didymocarpus sivagiriensis Rajkumar,
Semvak., S.Murug. & Chellap.) and differentiated it from H. wightii by its longer leaves, presence of glandular hairs, longer dichotomously branched scapes, bluish corolla, puberulous style and longer capsules. Critical examination of specimens and protologues of both these taxa revealed that the characters outlined for separating the former from the latter are intergrading (see description above) and hence H. sivagiriensis is reduced to synonymy of H. wightii.

Typification: Wight described this species based on material collected from the Shevghery hills, Courtallam in Tamil Nadu. Since Vitek et al. (2000) cited only syntypes, it cannot be considered a lectotypification. Two sheets of Wight’s materials were located, while searching for the type specimens, one each in E (E00155179) and K (K000858201). The sheet K000858201 has an HRWP label and bears a field label, “Shevghery hills August 1836” and an annotation by Clarke “the specimen from which Wight Ic. 1348 was taken”. The sheet itself has the no. 2323/1837 in the bottom left hand corner. The sheet in E (E00155179) has an HWP label annotated “Didymocarpus rotterianus var. wightii” and “Herb. Wight. propr. n. 2679” in the top right hand corner and another in the lower left hand corner “1837, No 2323”, presumably referring to the year 1837. The specimen at K (K000858201) used for illustrating this species by Wight is selected here as the lectotype and the other at E (E00155179) as the isolecotype.

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