



## Five new generic records for the flora of Odisha from Koraput district, India

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### Abstract

Koraput district in Odisha is highly enriched with huge number of diversified flora. Neoteric field works in the discrete parts of the district including agricultural lands have managed to collect five vascular plants new to terrestrial flora of the state. These new additions include five new genera. Comprehensive morphological features, distribution and habitat of each of these species are furnished along with elucidation and photographs. The record of new additions to the flora of Odisha showed that the state needs exhaustive floral explorations.

**Keywords:** flora, terrestrial, new records, Koraput, Odisha

### 1. Introduction

Koraput, a district of Odisha located in the ambiance of green valley's contemplating pristine freshness, embellished by northern tropical semi-evergreen and scrubby forests, waterfalls, terraced valleys and zipping springs that is generally situated between 18° 85' 615" North latitude and 82° 73' 745" East longitudes. The district is surrounded by Rayagada in the east, Bastar district of Chhatisgarh in the west and Malkangiri district in the south. It has an approximate elevation of 880 m and engulfs an average area of 8,806 sq.km. This area experiences highest temperature of about 30 °C and lowest temperature of about 18°C with a mean rainfall of about 1600 mm. It harbours largest mountain range of Odisha, popularly known as Deomali along with Chandragiri mountain. The district bears 301,000 hectares lands which is useful for cultivation purpose. The study area although botanically endowed with enormous phytodiversity still it has not been explored extensively except some few sporadic reports [1, 2, 3, 4, 5].

### 2. Material and Methods

Field visits were undertaken to different locales in various seasons and collected the digital photos of specimen in their original habitat and plants for observation, identification and data preparation in the laboratory during the study period. During floral survey of Koraput district five new genera namely *Ageratina*, *Pseudognaphalium* (Asteraceae), *Lamium* (Lamiaceae), *Rhampicarpa* (Orobanchaceae), and *Scadoxus* (Amaryllidaceae) were collected from terrestrial land of Kotpad and Panchpatmali hill. The species were identified with the help of pertinent literature [6, 7, 8, 9, 10, 11, 12, 13, 14] and the taxa were confirmed by consulting the BSI, Calcutta, herbarium as well. The voucher specimens have been deposited in the herbarium of Post Graduate Department of Botany, Utkal University, Bhubaneswar, Odisha. It was observed that the plants which are recorded here did not match with any species recorded in the earlier flora of the region [15, 16, 17].

### 3. Result and Discussion

***Ageratina adenophora*** (Spreng.) R.M. King & H. Rob. Phytologia 19(4): 211. 1970. (Asteraceae)

**Synonym:** *Ageratina trapezoidea* (Kunth) R.M. King & H. Robinson. Phytologia 24: 98. 1972. *Eupatorium adenophorum* Spreng. Syst. Veg. ed. decima sexta 3: 420. 1826. *Eupatorium adenophorum* var. *peruvianum* Hieron. Bot. Jahrb. fur Syst. Pflanzen. und Pflanzeng. 36:470 1905. *Eupatorium glandulosum* Kunth Nova Genera et Species Plantarum (folio ed.) 4: 96, t. 346. 1818. *Eupatorium pasadenense* Parish Zoe 5: 75.1900.

**Vernacular name(s):** Ahimula (O); Crofton weed, Sticky snakeroot (E).

**Habit:** sub-shrubs, perennial herbs, 25-220 cm. **Habitat:** terrestrial mesophyte. **Stems:** erect; branches opposite, purplish at juvenescence, then leucoush or ferruginous puberulent, upper part and peduncles generally so, lower part, glabrescent or glabrous obliquely ascending, stipitate, glandiferous. **Leaves:** cauline, opposite, petiolate; petiole 1.5-3cm long, blade five nerved from base, abaxially pale, adaxially porraceous, ovate, triangular-ovate, or rhombic-ovate, 3-8 × 1.3-3.5 cm, psilic, both surfaces scarcely puberulent, basally trinerved, base truncate or scarcely cordate, margin roughly crenulate, apex acute to acuminate. **Inflorescence:** a Synflorescence, terminal, corymbose or compound-corymbose, 10-15 cm in diam. **Heads:** clustered, numerous, 1.5-4.5 cm, 35-55 flowered. **Peduncles:** 6-14 mm, heavily stipitate-glandular and occasionally scarcely glutinous puberulent. **Involucres:** broadly tintinnabulate, 3.5-4 mm. **Phyllaries:** biseriata, linear or linear-lanceolate, apices acute-acuminate, abaxial faces stipitate-glandular. **Receptacle:** convex to conical, epaleate. **Corollas:** leucoush, rosy-tinged, or purplish, tubular, ca. 4 mm, lobes lowly hispidulous. **Calyx:** replaced by pappus, setae uniseriate, decasetaeous, barbellate, basally connate, candid, fine, equal to corolla. **Androecium:** 5 stamens, epipetalous, alternating with corolla lobes, anthers approximately generally united into a tube encircles the

Style and filaments free i.e. syngenesious; dithecous, connective generally elongate, introrse, longitudinally dehiscent, antheropodium cylindrical, generally elongate; anther appendage grandiform, ovate-oblong, longer than wide. Gynoecium: bicarpellary, syncarpous, ovary inferior, unilocular, one ovule, anatropous, basal placentation, unistylous, ramifications of style, occasionally sparsely broadened distally, glutately papillose with protuberating cells on lateral and outer surfaces, biramified, stigma diversified. Fruit and Seed: a cypsela, nigro-phaeoc, angustiformly elliptic, 1-1.5 mm, pentangled, devoid of hairs and glands. (Plate-1A&B).

**Flowering:** April- September. & **Fruiting:** September - October.

**Distribution:** California, Mexico, Baja, also introduced in Europe, New Zealand, China, India etc.

**Ecology:** Margins of stream, ditches, pool, hillsides and road embankments.

**Specimen examined:** both sides of the Panchpatmali hill range (within 15 Km. radius) N 18° 57' 118" & E 83° 08' 923", 20.7.2015, RM 729 (Herbarium, Utkal University, Vani Vihar, Bhubaneswar), 782-850 m.

**Associated species:** This species is specially found among various pteridophytes like *Sphenomeris chinensis*, *Pteris biaurita*, *Dryopteris concholor*, *Hemionitis arifolia* etc.

**Lamium album** subsp. **crinitum** (Montbret & Aucher ex Benth.) Mennema Fl. Iran. 150: 323. 1982. (LAMIACEAE)

**Synonym:**

*Lamium crinitum* Montbret & Aucher ex Benth. Ann. Sci. Nat., Bot. II, 6: 48 1836. *Lamium leucolophum* Hausskn. ex R.R. Mill Notes Roy. Bot. Gard. Edinburgh 38: 37 1980. *Lamium oreades* Azn. Magyar Bot. Lapok 17: 22 1918. *Lamium persicum* Boiss. & Buhse Nouv. Mém. Soc. Imp. Naturalistes Moscou 12: 180 1860. *Lamium petiolatum* Royle ex Benth. Hooker's J. Bot. Kew Gard. Misc. 3: 381 1833. *Lamium robertsonii* Boiss. Diagn. Pl. Orient. 7: 54 1846. *Lamium setidens* Freyn Oesterr. Bot. Z. 41: 58 1891.

**Vernacular name(s):** Deerghamukha (O); Deaf Nettle, Blind Nettle, White Dead Nettle, Bee Nettle, Dumb Nettle (E).

Habit: perennial herbs, 25-80 cm Habitat: terrestrial mesophyte. Stems: scapes or solitary, ascending or erect, generally acaudate, quadrangular, frequently purplish beneath, foliolate, with a scarce indumentum of usually retrorse hirtellous hairs to subglabrous. Leaves: upper leaf lamina ovate to ovate-lanceolate, ca. 2.5-9 x 1.5-5 cm, adaxially moderately appressed, slightly hispid, especially proximal to margin, base cordate to truncate, serrate-

crenate, acute to acuminate, with a psilic indumentum of eglandular crinis; petiolate, petiole of above leaves 2-8 cm. Inflorescence: Verticillasters 4-(8) or 15-(20) flowered. Flower: bracteate, bracts ± linear, 3-7 mm, ciliate, complete, hermaphrodite, zygomorphic, hypogynous. Calyx: 5 sepals, gamosepalous, tubular-tintinabulate, eglandular graciliform indumentums, 8-15 × 2-4 mm, base occasionally purple red, moderately bristly, slightly hirtellous, teeth triangular-linear to subulate or lanceolate, equal, ciliate-setulose, usually longer than or as long as the tube, densely-spreading in fruit, awned, margin ciliate, vallvate, bilipped. Corolla: 5 petals, gamopetalous, bilipped, leucoush, occasionally light roseus to fulvid, 2-2.5 cm, tube as long as calyx, ± sigmoid, convex at base, 2-2.5 mm in diam., pilose, incompletely obliquely hispidly annulate inside, throat dilated; upper lip ± highly velutinous or barbellate, 6-10 × 7 mm, cucullate-obovate, obtuse, lower lip ± reflexed, 1-1.5 cm, middle lobe 3-6 × 3-5 mm, obreniform, margin ciliate; lateral lobes orbicular, ca. 1.5-2.5 mm, with a subulate tooth ca. 1-1.5 mm. Androecium: Stamens 4, didynamous, epipetalous, pubescent, anterior two longer, ascending below upper lip; anther cells two, divaricate, included under upper lip, dithecous, thecae merulous, anthers nigro-purpureous, villous, dorsifixed, dehiscence longitudinally. Gynoecium: bicarpellary, syncarpous, ovary superior, deeply tetralobed, lobes apically truncate, glabrous, bilocular at juvenescence but becomes quadrilocular due to the formation of pseudoseptum; 2 ovules in each locule in bilocular condition, but in quadrilocular condition one anatropous ovule is present in each locule; axile placentation, style gynobasic, style apex subequally bicleft, stigma bifid, hypogynous, nectar secreting disc is present. Fruits and seeds: a schizocarp of 4 nutlets, merulo-phaeoc, tenuiformly ovoid, triquetrous, 2-3.5 × 1.5-1.8 mm, with a dwarf broad stipe, glabrous, tuberculate, each nutlet contacting one seed. (Plate-1 C&D)

**Flowering & Fruiting:** July-September & August-October  
**Distribution:** India, China, Pakistan, east Turkey, Iran and Iraq, east Russia and from China to Mongolia, Iceland, North America and New Zealand.

**Specimen examined:** Koraput, Narayanpatna hill, N 18° 87'.779" & E 83° 16'.564", 21.8. 2018, RM 595 (Herbarium, Utkal University, Vani Vihar, Bhubaneswar).

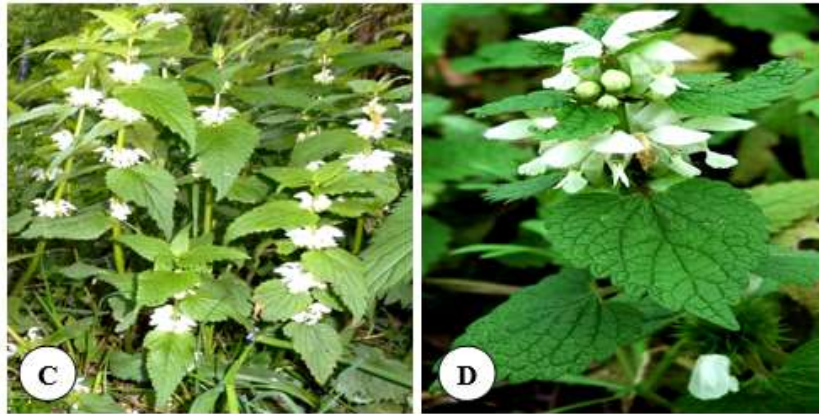
**Associated species:** Plant is generally found associated with many plant species like *Leucas martinicensis*, *Eleusine indica*, *Portulaca quadrifida*, *Richardia scabra* etc.

**Note:** *Lamium album* has three sub species namely ssp *album*, *barbatum* and *crinitum*.

Plate 1



A&B: *Ageratina adenophora* population and its single flowering twig

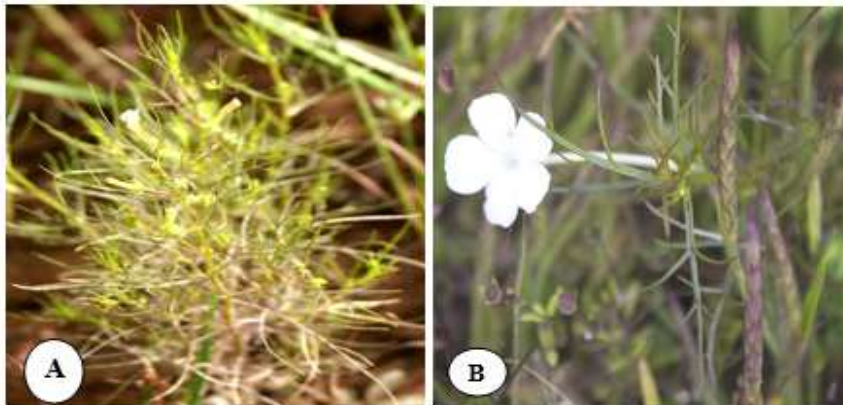


C&D: *Lamium album* ssp *crinitum* population and its single flowering twig

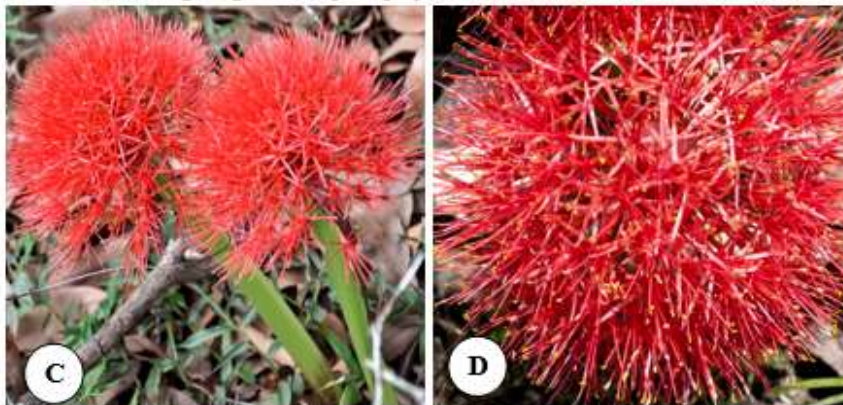


E&F: A single twig of *Pseudognaphalium microcephalum* and zoomed flower

Plate 2



A&B: A flowering twig of *Rhampicarpa fistulosa* with zoomed flower



C&D: Patched population of *Scadoxus multiflorus* ssp *multiflorus* and a single flower

**Key for the differentiation of three sub species**

*Petiole* of the most beneath floral leaves as long as or pusillus than the flowers of the same verticillasters, *floral leaves* (2-) 3-7 (-10) cm long. *Bracts* (1-) 2-4 (-8) mm long. *Calyx* 1-1.5cm long, the teeth as long as or dwarfed than the tube. *Corolla* leucoish, occasionally roseus, (1<sup>3/4</sup>) 2-2<sup>1/4</sup> cm long.

.....  
ssp. **album** Mennema

*Petiole* of the most beneath floral leaves generally longer than the flowers of the same verticillasters, *floral leaves* (4-) 4<sup>1/2</sup>-7 (13) cm long. *Bracts* (2-) 3-5 (-7) mm long. *Calyx* (1-) 1<sup>1/4</sup> (-1<sup>1/2</sup>) cm long, the teeth generally longer than the tube. *Corolla* roseus or leucoish, also amalgamated coloured populations, (2.5)-3(4) cm long.....ssp.

**barbatum** (Siebold & Zucc.) Mennema

*Petiole* of the most beneath floral leaves usually as long as or pumilus than the flowers of the same verticillasters. *floral leaves* (2<sup>1/2</sup>) 3.5-5<sup>1/2</sup> (-9) cm long. *Bracts* (3-) 4-7 (-12) mm long. *Calyx* (1-) 1<sup>1/4</sup>-1.5 (-2) cm long, the teeth generally longer than the tube. *Corolla* leucoish or occasionally roseus, (2-) 2<sup>1/4</sup>-2<sup>1/2</sup> (-3.5) cm long.....

ssp. **crinitum** (Montbr. & Auch. ex Benth.) Mennema

Distribution: Alpine and subalpine region of E. Turkey, N. Iraq, N. Iran (Kurdistan and Elburs), Asiatic U.S.S.R. (Turkmeniya), Afghanistan, Pakistan (Punjab), N. India and Nepal.

**Pseudognaphalium microcephalum** (Nutt.) Anderb. Opera Bot. 104: 147. 1991. (ASTERACEAE)

**Synonym:**

*Gnaphalium canescens* subsp. *microcephalum* (Nutt.)

Stebbins & D.J. Keil Novon 2(4): 437. 1992.  
*Gnaphalium microcephalum* Nutt. Trans. Amer. Philos. Soc., n.s. 7: 404. 1841.

**Vernacular name(s):** Kutakeshi (O); San Diego rabbit-tobacco (E)

Habit: perennial herb, (40-)60-120 cm. Habitat: terrestrial mesophyte, more commonly lithophytes, found on degraded soil and crevices of mossy soil. Stem: erect, constantly cinero tomentose, eglandulate, (2-5 mm diam. adjacent to the bases), fleshy. Leaf: angustiformly oblanceolate, 3-5(-9) cm × 5-12(-20) mm (gradually pusillus distally, becoming lanceolate), bases not colliding, not decurrent, platy marginal, faces poorly bicolor, abaxially highly tomentose, adaxially lowly pilose, devoid of gland, acute, lowly greenish. Inflorescence: a head or capitulum. Heads: in laxly corymbiform arrays. Involucres: inverted cone-tintinnabulate, 4-7 mm. Phyllaries: in 4-5 series, candid (obscure, dull), ovate to oblong-ovate, inner angustiform, generally with nematiform but absolutely thickened keel and scarce apiculum, tomentose at least bases. Receptacles: platyform, leioic, epaleate. Peripheral (Pistillate) florets: 28-50, corolla flavid. Inner (Bisexual) florets: 5-9, corolla flavescens. Calyx: represented by pappus, readily falling, of 10-12 distinguished barbellate bristles in one series. Androecium: 5 stamens, epipetalous, alternating with corolla lobes, anthers nearly always united into a tube around the style and filaments free i.e. syngenesious, ditheous, connective prolonged, introrse, longitudinally dehiscent. Gynoecium: bicarpellary, syncarpous, ovary inferior, unilocular, one ovule, anatropous, basal placentation, unistylous, bicladate, stigma diversified. Fruit and Seeds: a cypsela, crowned by persistent pappus, oblong-compressed, 4-6 longitudinal

ridges are present, leioic to poorly papillate-roughened; seeds one per fruit with copious and straight embryo and non-endospermic. (Plate-1 E&F)

**Flowering:** April-June & **Fruiting:** August- November.

**Distribution:** Widespread in Baja, California, Canada, North America, China, India

**Ecology:** Grassy hillsides, chaparral systems, coastal sage scrub.

**Specimen examined:** On the way to Panchpatmali, (within 20 Km. radius), upper surface of the Panchpatmali hill, N 18° 57' 118" & E 83° 08' 923", 20.7.2015, RM 728 (Herbarium, Utkal University, Vani Vihar, Bhubaneswar), 782m.

**Associated species:** Plant is found among *Ageratum conyzoides*, *Blumea* spp. pteridophytes like *Sphenomeris chinensis*, *Dicranopteris linearis*, *Sphaerostephanos unitus* etc.

**Rhamphicarpa fistulosa** (Hochst.) Benth. Prodr. 10: 504 1846. (OROBANCHACEAE)

**Synonym:** *Buchnera longiflora* Arn. Nova Acta Phys.-Med. Acad. Caes. Leop.-Carol. Nat. Cur. 18: 356 1836. *Macrosiphon elongatus* Hochst. Flora 24: 374 1841. *Macrosiphon fistulosus* Hochst. Flora 24: 374. 1841. *Rhamphicarpa australiensis* Steenis Blumea 10: 564 1970. *Rhamphicarpa elongata* (Hochst.) O.J. Hansen Bot. Tidsskr. 70: 117 1975. *Rhamphicarpa longiflora* Benth. Compan. Bot. Mag. 1: 368 1836.

**Vernacular name(s):** Swetatoori (O); Tutari (H); Grassland trumpet, Rice vampire weed, Fishing-net plant (E).

Habit: annual parasitic herb, 20-50 cm in height, rarely may grow up to 70 cm depending upon locality, at maturity may attain reddish colour. Habitat: ephemeral or marshy hydrophytes

Stem: psilic, quadrangular, solid, glabrous, frequently ramified. Leaves: simple, opposite, leioic, acicular, porraceous, petiolate, petiole nematiform, 2 to 12 mm long, margin entire or sharply divided with one to three pairs of nematiform segments, width below 1 mm and with a nematiform terminal segment, 1-5cm × 0.5-1mm, amphilaterally glabrous. Inflorescence: a raceme, solitary, axillary or terminal. Flower: pedunculate, peduncle 5 to 20 mm long, bracteates, bract scaly, bracteolate, 2 bracteoles, filiform, very much slender than bracts, generally free, occasionally scarcely to evidently connate with calyx-tube, 1 to 6 mm long lines at mid-height of the stalk hermaphrodite, hypogynous, zygomorphic. Calyx: 5 sepals, gamosepalous, fused in tube at the base, 4-6 mm long, with lobed top corner and lengthily acuminate, imbricate. Corolla: gamosepalous, bilabiate, campylar, tubular-campanulate with 5 sub-equal lobes; upper lip entire, lower lip 3-lobed, tube of 20 to 40 mm long and 10 to 15 mm diameter at the end, terminated by orbicular to spatulate lobes. Androecium: stamens 4, didynamous, epipetalous, in 2 subequal pairs, anthers mostly connivent, filaments filiform, frequently hirtellous at the base, introrse, anthers unitheous, dorsifixed. Gynoecium: ovary superior, bicarpellary, syncarpous, bilocular, with numerous anatropous ovules on each locule, parietal placentation; style simple, frequently long with campylar tip and ± bi-lobed, capitate stigma. Fruit and Seed: an ovoid capsule with 2 loculus, scarcely flattened longitudinally, about 1 cm long, at the top terminating in keen beak, asymmetrical, 4 to 7 mm long, inclining on one side, sutures of the capsule are sharply winged, dehiscent on one side, and contains 100-

250 merulo-phaeoc; seed oval, pusillus, dark phaeoc to nigrescent, 0.2-9 × 0.55 mm, exterior seed coat forms a reticulate network ensheathed by conspicuous ridges. (Plate-2 A&B)

**Flowering & Fruiting:** August- November

**Distribution:** India, Sub Saharan Africa, Botswana, Malawi, Mozambique, Zambia, Zimbabwe, Tanzania, Benin, Burkina Faso, Mali, Senegal, Guinea, Madagascar, New Guinea, North Australia.

**Specimen examined:** Kotpad, Koraput, on agricultural land, N 18° 27' 115" & E 83° 17' 875", 22.10. 2015, RM 1054 (Herbarium, Utkal University, Vani Vihar, Bhubaneswar), 650-745m.

**Associated species:** It is a semi-aquatic herb that generally prefers peaty soils over rocky substratum, on or between rock crevices, slow running streams, but more commonly in grassy marshes, permanently on lowland rice fields. Plant is generally found associated with many *Cyperus* species, *Dopatrium lobelioides*, *Limnophylla* species.

**Note:** *R. fistulosa* has a fibrous root system with ramified, but poor, candid roots that are frequently associated to grasses of Poaceae, if it develops juxtapositionally to grasses then it parasitizes the host by its roots, through a specialized organ designated as 'haustorium'. *Striga* species another member of Orobanchaceae family develop both terminal as well as lateral haustoria, but *R. fistulosa*, develops haustoria only on lateral side.

**Scadoxus multiflorus** (Mart.) Raf., Fl. Tellur. 4: 19: 1838. ssp. multiflorus (AMARYLLIDACEAE)

**Synonym:**

*Amaryllis multiflora* (Mart.) Tratt. Ausw. Gartenpfl. 37. 1821. *Haemanthus abyssinicus* Herb. Amaryllidaceae 232. 1837. *Haemanthus andrei* De Wild. Ann. Mus. Congo Belge, Bot. V, 3: 173 1910. *Haemanthus arabicus* M. Roem. Fam. Nat. Syn. Monogr. 4: 42 1847. *Haemanthus arnoldianus* De Wild. & T. Durand Bull. Soc. Roy. Bot. Belgique 40: 30 1901. *Haemanthus bequaertii* De Wild. Pl. Bequaert. 1: 44 1921. *Haemanthus bivalvis* Beck Harrar 452. 1888. *Haemanthus ceciliae* Baker Bull. Misc. Inform. Kew 1906: 28 1906. *Haemanthus colchicifolius* Salisb. Prodr. Stirp. Chap. Allerton 217. 1796. *Haemanthus cruentatus* Schumacher & Thonn. Beskr. Guin. Pl. 168 1827. *Haemanthus delagoensis* Herb. Amaryllidaceae 233 1837. *Haemanthus eurysiphon* Harms Bot. Jahrb. Syst. 19(47): 27. 1894. *Haemanthus filiflorus* Baker ex Hiern J. Bot. 16: 194 1878. *Haemanthus kalbreyeri* Baker Gard. Chron. n.s., 10: 202 1878. *Haemanthus lynesii* Stapf Bot. Mag. 148: t. 8975 1923. *Haemanthus micrantherus* Pax Bot. Jahrb. Syst. 15: 140 1892. *Haemanthus mildbraedii* Perkins Wiss. Erg. Deut. Zentr.-Afr. Exped., Bot. 2: 64 1910. *Haemanthus multiflorus* Martyn Monogr. s.p., t. 1795. *Haemanthus nicholsonii* Baker Fl. Trop. Afr. 7: 392 1898. *Haemanthus otaviensis* Dinter Repert. Spec. Nov. Regni Veg. 29: 258 1931. *Haemanthus rupestris* Baker Gard. Chron. n.s., 7: 656 1877. *Haemanthus sacculus* E. Phillips Fl. Pl. South Africa 14: t. 531 1934. *Haemanthus seretii* De Wild. Ann. Mus. Congo Belge, Bot. V, 3: 173 1910. *Haemanthus somaliensis* Baker Bull. Misc. Inform. Kew 1895: 227. 1895. *Haemanthus tenuiflorus* Herb. Bot. Mag. 67: t. 3870 1841. *Haemanthus tenuiflorus* var. *coccineus* Hook.f. Bot. Mag. 97: t. 5881. 1871. *Haemanthus tenuiflorus* var. *mocambicensis* Herb. Bot. Mag. 67: t. 3870.

1841. *Haemanthus zambesiacus* Baker Fl. Trop. Afr. 7: 387 1898. *Nerissa multiflorus* (Martyn) Salisb. Gen. Pl. 131 1866.

**Vernacular name (s):** Chhatraprava (O), Blood Lily, Football Lily, Powder puff Lily (E).

**Habit:** perennial rhizomatous bulbous herb. **Habitat:** succulent xerophytes. **Stem:** herbaceous, bases of the leaves, stalks or petioles, are tightly wrapped together to form a pseudostem, 5-60 cm (2-24 in) long, compact, glabrous, erect, aerial, both the pseudostem and the scape are often covered with rubro-phaeoc to dark violet spots. **Leaves:** basal, simple, alternate, lanceolate to ovate with a thickened midrib, distichous, exstipulate, sessile, grandiform, scarcely linear, ensiform, entire, parallel venation. **Inflorescence:** an umbel, formed at the top of a long leafless stem i.e. scape. **Flowers:** umbel of flowers approximately globular, from 9(10) to 204(196+) individual flowers. Each flower has a stalk i.e. pedicel typically 15-45 mm (0.6-1.8 in) long. Length of free segments of the flower 12-32 mm; width of free segments of the flower 0.5-2.5 mm, bracteate, four or more bracts are present under the umbel at first; the bracts under the umbel soon wither, complete, hermaphrodite, actinomorphic, trimerous, epigynous, large, conspicuous, slightly aromatic. **Perianth:** tepals 6, arranged in two whorls of 3 each, not differentiated in to calyx and corolla, petaloid, united basally to form a long tube, length of flower tube 4-15 mm, salver-shaped, grandiform and conspicuous, imbricate, bases of the tepals are fused to form a cylindrical tube, 4-26 mm long; the free ends of the tepals are 11-34 mm long, angustate and spreading. **Androecium:** stamens 6, arranged in 2 whorls of 3 each, epiphyllous, present opposite the tepals, inserted at the throat of the perianth tube, filament long, flattened, scarlet, anthers dithecous, basifixed, introrse. **Gynoecium:** tricarpelly, syncarpous, ovary inferior, trilocular, numerous anatropous ovule in each locule, axile placentation, style 1, scarlet, fading to pink, stigma capitate. **Fruit & Seeds:** a loculicidal globose, berry, 5-10 mm (0.2-0.4 in) across; seed with small and straight embryo, and endospermic, orange to red when ripe. (Plate-2 C&D)

**Flowering:** June- July & **Fruiting:** July- September.

**Distribution:** Widespread in tropical climate like Africa, Senegal, Ethiopia, Somalia and Gambia, Namibia, Saudi Arabia Yemen, Oman. It is naturalized in Mexico and in the Chagos Archipelago.

**Ecology:** Lowland, medium-altitude and montane grassland, woodland and open secondary forest, gallery forest and coastal scrub.

**Specimen examined:** Koraput, Kotpad, near Gulmi water fall, N 19° 28' 279" & E 82° 18' 670" 15.6.2015, RM 547 (Herbarium, Utkal University, Vani Vihar, Bhubaneswar), 353m.

**Associated species:** Plant is found among the common grasses like *Bothriochloa pertusa*, *Cynodon dactylon*, *Desmodium triflorum*, *Chloris barbata* etc.

#### 4. Conclusion

The authors have gone through all the relevant published literatures [18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33] and visited the Utkal University Herbarium unit, CSIR-IMMT Herbarium unit, Bhubaneswar and the Herbarium of Regional Plant Resource Centre, Bhubaneswar to ascertain the occurrence, distribution and habitat of these species. It was observed that these species were never documented

earlier from the state. By detail observation of herbarium specimens and complete verification of literature published till date on these taxa, it can be proclaimed that these are new findings for the flora of Odisha.

### 5. Acknowledgement

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### 6. References

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