

INTRODUCTION

Cardamom (*Elettaria cardamom* L. Maton) is cultivated in the Western Ghats of Southern India. The cardamom growing tracts receive heavy rainfall and sufficient moisture is available during most part of the year. A rich herbaceous cover is, therefore, seen in these tracts till the dry months of February-March. It has been noticed that in the first few years after planting and in the areas where the canopy of cardamom does not cover the ground many weeds grow luxuriantly. Cardamom is a surface feeder and most of the weeds also have similar rooting pattern, thus causing a great set back to the growth and yield of cardamom.

In general, only the hand weeding is in vogue in most of the cardamom plantations. For the first two years after planting cardamom, periodical weeding is necessary (Parry, 1969). The plantations receive at least four weeding in the first year, three in the second year and two annually thereafter (Nambiar, 1980). But these days manual weeding is becoming difficult due to dearth and mounting cost of labour. For planning effective control of weeds by using herbicides in cardamom plantations it was considered necessary to make a survey of the weeds with special reference to dicotyledonous species that are encountered in plantations and also obtain field data regarding their extent of occurrence growth characteristics, dispersal mechanism of the fruits and seeds etc.

MATERIALS AND METHODS

A survey of weeds was carried out with a special reference to the dicotyledonous species commonly found in the cardamom plantations in Kodagu (Coorg) district of Karnataka. Field data were obtained regarding the nature of weeds i.e., annual, biennial or perennials, height of the weeds, nature of the leaves, leaf length and width, flowering habit and mode of seed dispersal. Observations were also made on the occurrence of weeds in the open and border areas, as well as light and densely shaded areas.

Dicotyledonous Weeds of Cardamom Plantations

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ABSTRACT

The paper includes information on the Dicotyledonous Weeds of cardamom estates in Coorg region of Karnataka. It covers field data regarding the extent of occurrence of weeds, growth characteristics, dispersal mechanism of fruits and seeds and frequency of occurrence. Amongst the weeds recorded the members of Asteraceae constitute a major weed flora. Most common weeds encountered are *Adgeratum conyzoides*, *Adenostimme lavenia*, *Bidens biternata*, *Spilanthus paniculata* and *strobilanthes urceolaris*.

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One of the spices of dicotyledonous
weeds found in cardamom planta-
tions can be seen in the photograph



RESULTS AND DISCUSSION

The description of each weed includes brief notes based on field observations. Botanical names are arranged alphabetically. Recent names are used as far as known. The arrangements of families is done as per Hooker (1872-1897). Familiar names, wherever available, are also included as synonyms.

1. *Ageratum conyzoides* L. Family: Asteraceae

It is an annual, erect and pubescent herb and slightly aromatic when bruised, shallow rooted, and grows to a height of 180cm. The leaves are simple and opposite decussate measuring 20 x 8cm. The heads are in axillary or terminal corymbs. The flowers are white to light blue. The mode of seed dispersal is through wind and also by direct clinging. Pappus consists of 5 scales which are broad and spiny at the base and ending in long points awned with short spines. They attach themselves to birds and clothes by spines or the achenes and by pappus scales. It is popularly known as 'Kempunola'.

It is the most common troublesome weed in cardamom estates, particularly in lightly shaded

conditions, exposed areas and all along the borders of the estate.

2. *Adenostemma lavenia* L. Family: Asteraceae

It is an erect annual herb. Shallow rooted and grows upto a height of 1 M. The leaves are simple measuring 22 x 13cm. The heads are white and appear in terminal or axillary panicles. Stocks of the flower heads are slender and sticky (Eyson, 1977). Dispersal of achenes is mainly through wind. It is found mostly in dense and light shaded conditions.

3. *Bidens biternata* L. Family: Asteraceae

It is an annual erect, shallow rooted herb with angular stem which grows upto 2 m. The leaves are compound, 3-5 foliate, leaflets measuring 1.5-7.5 x 1.5-2 cm. The heads are in terminal or axillary cymes or panicles. The flowers are white to light yellow. Dispersal of achenes is through wind or by human clothes. It is the most common weed in light shaded and exposed conditions.

4. *Borreria Ocymoides* (N. Burman) D. Family: Rubiaceae

It is an annual erect herb, shallow rooted with an angular erect stem grows upto a height of 35cm.

The leaves are simple and opposite measuring 3.4 x 1.6cm. The white flowers cluster at the nodes. The seeds mostly fall around the plant. It is a less common weed. It is found in almost all type of shades, moist and open conditions.

5. **Crassocephalum crepidiodes** (8th) Moore. Family: Asteraceae

It is an annual slender erect herb with shallow root system. It grows upto a height of 2 M. The leaves are simple measuring 15 x 4 cm. The heads are in terminal panicles florets are red, achenes with loose hairy pappus. The mode of dispersal is mainly through wind. It is most common in the border areas.

6. **Drymaria cordate** wild. Family: Caryophyllaceae

It is an annual spreading herb, with rooting at nodes. The leaves are opposite, cordate measuring 1.5 x 1.8cm. The flowers are white and they appear in axillary or terminal dichasial cym or panicle. The dispersal of fruits is with the help of glandular pedicel. It is most common in lightly shaded conditions.

7. **Elephantopus scaber** L. Family: Asteraceae

It is an annual erect herb with shallow roots. It grows upto 40cm. The leaves are simple measuring 7.4 x 2.5 to 4.5cm. The flowers are white. Its dispersal is mainly through wind. It is not a common weed but found mostly along the borders and roadsides of the plantations.

8. **Eupatorium rependum** willd. Family: Asteraceae

It is a perennial gregarious shrub. It is deep rooted and grows upto 2.5cm, with angular and erect stem. The leaves are simple measuring 12 x 5.4cm. The heads are in axillary or terminal panicles. The florets are white to light purple. The dispersal of achenes (fruits) is through wind. It is a recent introduction seen in lightly shaded, exposed and also border areas.

9. **Girardinia zeylanica** Dcne. Synonymous: **Giradinia heterophylla** or **Urtica heterophylla** Family: Urticaceae.

It is an annual erect, stinging, under shrubs or shrub. It is deep rooted and it grows upto 2m. The leaves are alternate measuring 46 x 26cm. The mode of dispersal is through passive mechanism. It is not commonly found inside the plantations but found mostly in the border and open places.

10. **Hydrocotyle javanica** Thun b. Family: Apiaceae

It is an annual herbaceous runner with rooting habit at nodes. The leaves are alternate and simple measuring 80 x 10cm. The flowers are light yellow. The mode of dispersal is through passive mechanism.

This weed is common in dense and light shaded conditions. Some of the planters like to retain this weed since it strikes roots at nodes and binds the soil thus preventing soil erosion particularly in steep slopes.

11. **Impatiens kleini** W.&A. Family: Balsaminaceae

It is a slender erect annual herb. It is shallow rooted and grows upto 50cm. The leaves are simple measuring 7 x 2.5cm. The flowers are in axillary cyme and light pink in colour. The dispersal of seed is through bursting of the pads commonly found in moist places at dense shaded conditions.

12. **Jussieua linifolia** vahl. Family: Ongraceae

It is an annual erect slender herb. It is shallow rooted and grows upto 60cm. The leaves are simple, measuring 1.8x0.5-1.5cm. The flowers are yellow. The mode of dispersal is through passive mechanism. It is less commonly found weed of border and roadside areas.

13. **Pogostemon paniculatus**. Will d. Family: Lamiaceae

It is an annual erect scented herb with shallow roots. It grows upto a height of 1.5 M. The leaves are simple, measuring 16 x 8.2cm. The flowers are blue in axillary or terminal thyrsus. The mode of dispersal is through passive mechanism. It is not a common weed but, found only in light and dense shaded conditions.

14. **Pilea wightii** wedd. Family: Urticaceae

It is an erect flaccid annual herb, shallow rooted and grows upto 40 cm height. Leaves are simple measuring 5.8 x 2.1cm. Flowers in axillary panicles. Mode of dispersal is through passive mechanism. More common in dense shaded conditions.

15. **Phaulloopsis dorsiflora** (Retz) Sant. Family: Acanthaceae

An annual spreading herb rooting at nodes with shallow root system. Leaves are simple measuring 5.5 x 2.5 cm. Flowers in spikes. Mode of dispersal is through passive mechanism. Less common weed found mostly in light shaded conditions.

17. **Strobilanthes ureceolaris** Camb. Family: Acanthaceae

Perennial shrub or undershrub with long internodes in the forest, and very sparsely branching in open places. Both shallow and deep rooted and grows to a height of 3 M. Leaves are simple and opposite measuring 7.5 x 5.0 cm. Inflorescence terminal or axillary short spikes with prominent petaloid bracts. Flowers are light blue. It flowers once in 6-7 years. Dispersal of seeds is through ejaculatory mechanism.

It is the most common weed found in the cardamom estates. It is an undergrowth in most of the virgin forest. At the time of establishing the estate this particular weed is uprooted completely. The stems are used for putting across the slope between the rows of cardamom for conserving the soil. Some experienced planters are of the opinion that the presence of this particular weed is an indication of better soil fertility.

18. **Spilanthes paniculata** Wall ex. DC. Family: Asteraceae

Annual erect herb shallow rooted and grows to a height of 1.5 M. Leaves are simple and opposite measuring 17x6cm. Heads in axillary or terminal cymes or panicles. Florets are white. Most common in lightly shaded conditions and exposed areas.

19. **Syndrella nodiflora** (L.) Gautner. Family: Asteraceae

An annual erect herb. Shallow rooted and grows to a height of 70cm. Leaves are simple and opposite measuring 5.3 x 2.3cm. Inflorescence is a

few flowered axillary head. Flowers are yellow. Has flattened oblong achenes with the two edges being serrate and the two sepals being broadened and toothed. The achenes of the central tubular flowers narrower and not serrate edged. Thus it shows polymorphism and its spread is slow because its involucral bracts are not spreading, but enclosing the achenes and preventing them from being dispersed by wind or ready attachment to passers by.

Most common in slightly exposed and lightly shaded conditions and all along the border.

20. **Solanum myricanthum** L. Family: Solanaceae

Perennial prickly shrub, deep rooted and grows to a height of 3 M. Leaves are simple and alternate measuring 33 x 26 cm. Inflorescence extra, axillary cyme. Flowers are white. Mode of dispersal is through passive mechanism. Common in exposed conditions and border areas.

21. **Triumfetta rhomboidea** Jacq. Family: Tiliaceae

An annual erect herb to undershrub with offensive smell. Shallow rooted and grows up to a height of 2 M. Leaves are simple measuring 12x4.2 cm. Inflorescence axillary fascicled cyme. Flowers are yellow. Dispersal of seeds is through clinging. Less common weed mostly found in exposed areas.

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