Pharmacognosy and physico – chemical evaluation of homoeopathic drug *Erigeron canadensis* Linn.

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Erigeron canadensis Linn.

- **Botanical Name** : *Erigeron canadensis* Linn.
- **Family** : Asteraceae
- **Vernacular Names** : Eng: Canada Fleabane
- **Distribution** : Europe, Siberia, Central Asia, Iran, Japan, China and N. America and found growing in Nilgiris, India.
- **Source of collection** : Supplied by SMPCU, Ooty.
- **Parts used** : Leaf & Stem
- **Medicinal Uses** : Black eye, cough, dysuria, gonorrhoea, hemorrhages, wounds
- **Morphology** : Erect leafy annual herb , sometimes with vertical erect branches, leaves oblanceolate, enitre or serrate, heads small, numerous, paniculate, involucre 3-4 mm.
- **History & Authority:** Proved by W.H. Burt and quoted in Amer. Homoeopathic observer 1866.

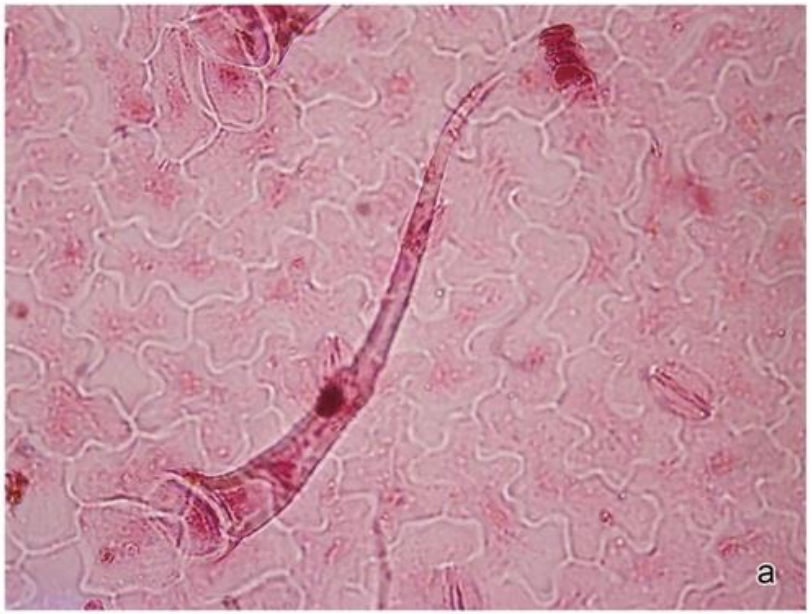
SALIENT PHARMACOGONOSTIC STUDIES ON LEAF AND STEM OF ERIGERON CANADENSIS

Macroscopic :

- Leaves sessile, linear obovate, dark green, 2.5 – 4 cm long and upto 0.5 cm wide; margin entire, apex acute, surface rough.
- Stem rounded, 2.5 mm thick, light green, densely hairy, ridged, white internally, fracture splintery.

Microscopic : (Leaf Surface)

- In surface adaxial epidermal cells 5 – 6 sided, polygonal, sides wavy to sinuate, contents scanty; abaxially with sides deeply sinuate; cells 2480 per sq.mm on adaxial and 1440 per sq.mm on abaxial.
- Stomata on either sides, anomocytic, anisocytic and tetracytic types, indistinct, 150 per sq.mm.on adaxial and 162 per sq.mm. on abaxial.

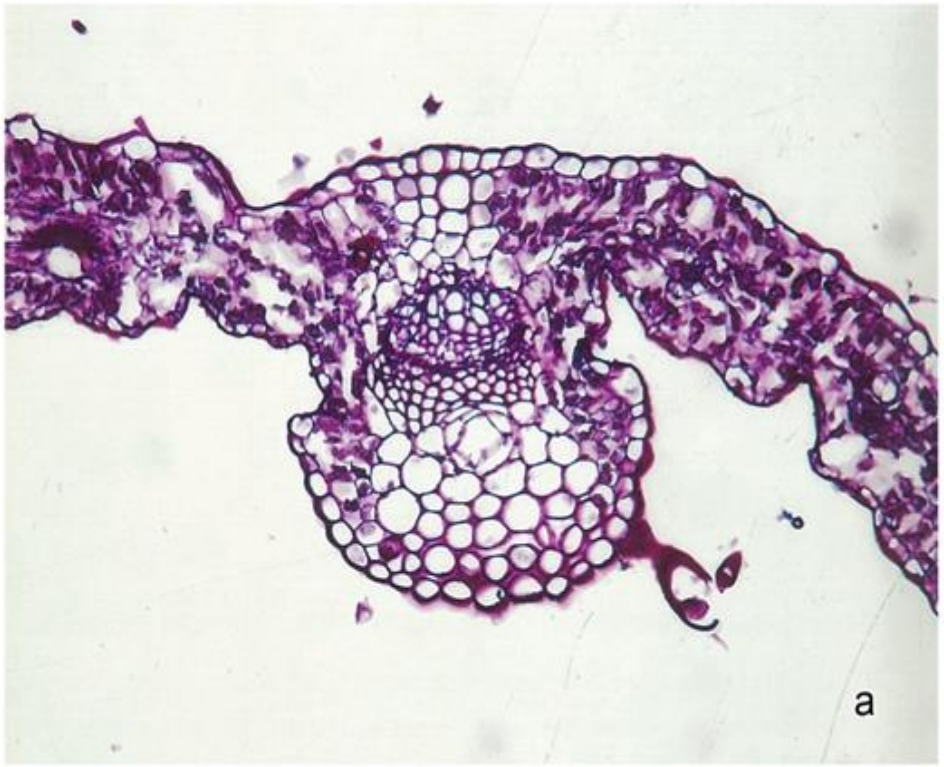


➢ Microscopic : (Leaf Surface)

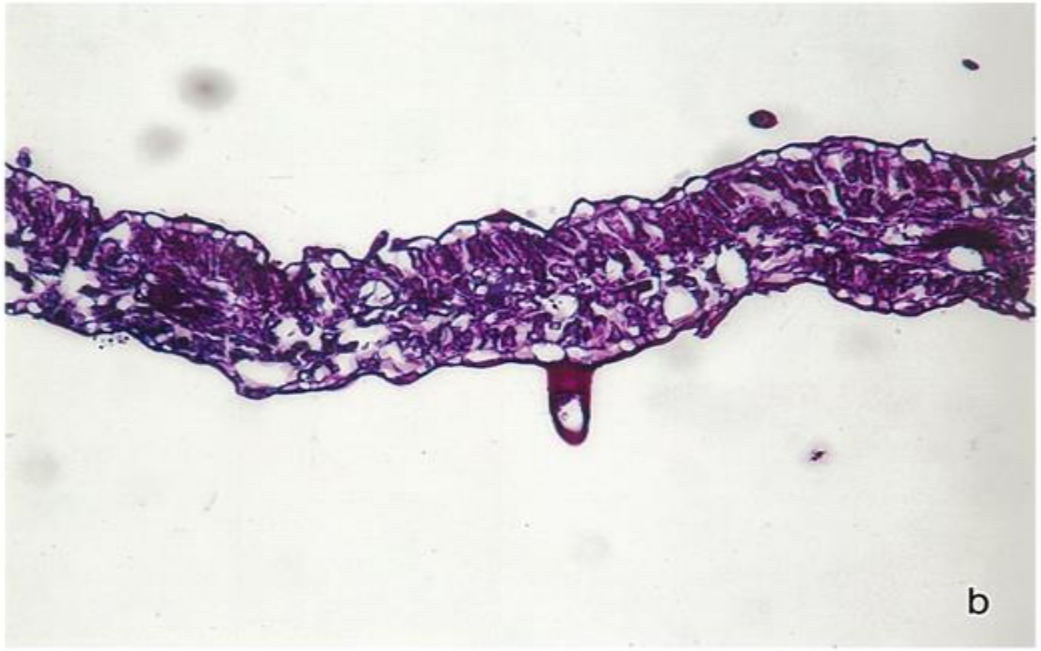
➢Stomatal Index 5.82 on adaxial and 6.2 on abaxial.
Trichomes are uniseriate macroform conical hair,
common, all over on either sides and more frequent on abaxial.

Transection - Leaf:

- In T.S. flat adaxially and ribbed prominently on abaxial, 302 – 432 µm thick, lamina 108 – 194 µm thick.
- Epidermis is 1 – layered, cells barrel shaped, tabular, polygonal to spherical, cells surrounding trichomes large.
- Cells over midvein isodimetric, larger on abaxial.
- Stomata are intermittent on both sides, slightly raised above the surface.



- Mesophyll dorsiventral, palisade 2- layered throughout except at midvein. Spongy tissue irregularly dispersed, cells polygonal to spherical and cylindrical, dense with chloroplasts.
- Collenchyma at midvein is 2 – layered on adaxial and 1 – layered on abaxial cells, lamellar.
- Parenchyma is 2 – 3 layered on adaxial while 4 – 6 layered on abaxial, cells polygonal to spherical, contents in few with chloroplasts.



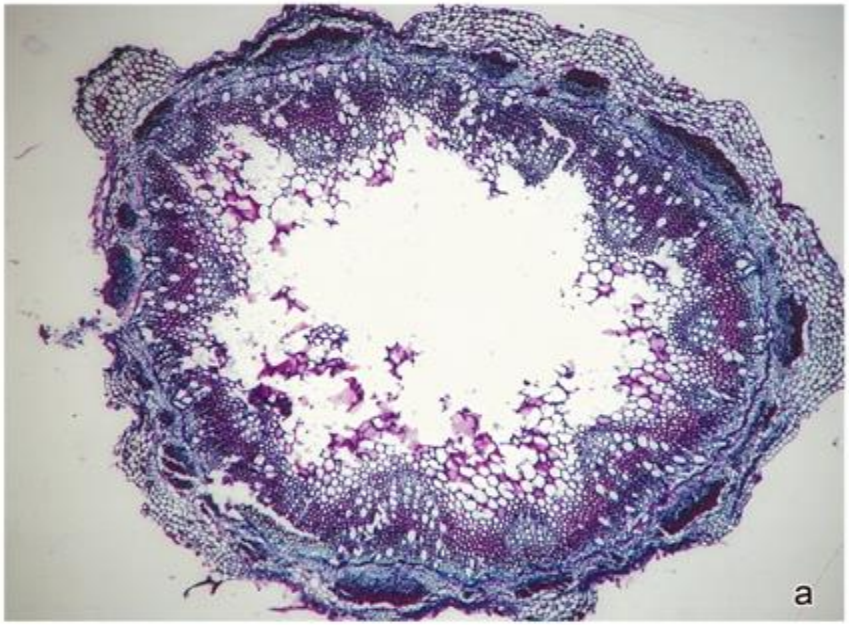
- A Secretory cavity is present beneath the vascular bundle which is enclosed with an epithelium.
- The central v. bundle is arcuate, endarch, collateral and conjoint, tracheary elements in radial rows.
- In L.S. vessel / tracheids show mostly helical thickenings and few scalariform and annular.
- Phloem is on the abaxial side with phloem parenchyma, fibers, sieve cells with companion cells.
- Secretory cavities are found attached also with lateral vein bundles.

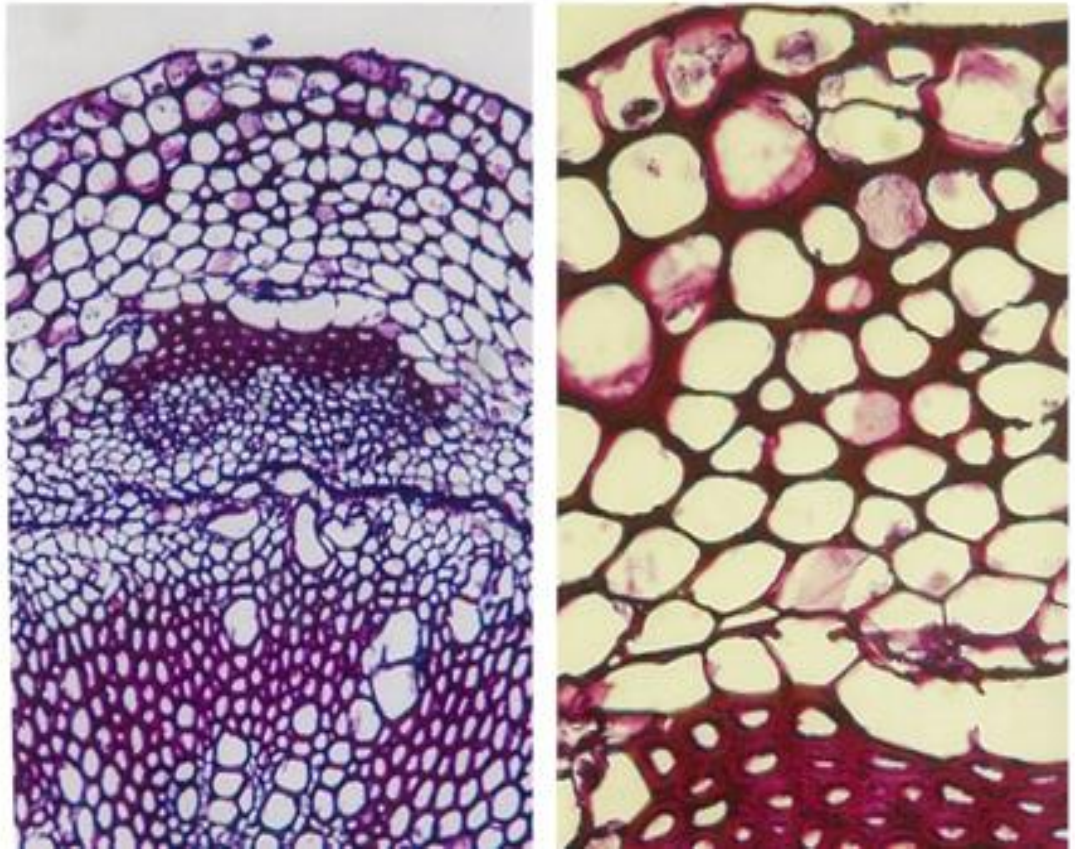
Margin is rounded.

Young stem:

- In T.S. stem is rounded, undulated with ridges and furrows and covered by conical hair.
- The outermost epidermis is 1 – layered, cells barrel shaped, tabular and polygonal, contents dense in few.
- The hypodermis is collenchymatous,3-5layered in ridges, cells angular while it is 3 – 4 layered chlorenchymatous in the furrows.
- Vascular tissue is made of several v. bundles arranged in a ring and covered with an endodermis.

- The v. bundles are capped by sclerenchymatous sheath.
- The phloem is external and xylem internal separated by vascular cambium.
- The xylem vessels / tracheids are arranged in radial rows interspersed with fibers and xylem parenchyma.
- The vessels / tracheids in L.S. possess mostly helical and scalariform thickenings and few bordered pitted and annular.
- Interfascicular tissue is present in between v.bundles.
- Centrally pith is present with polygonal to spherical parenchyma cells and is disintegrated in the middle.



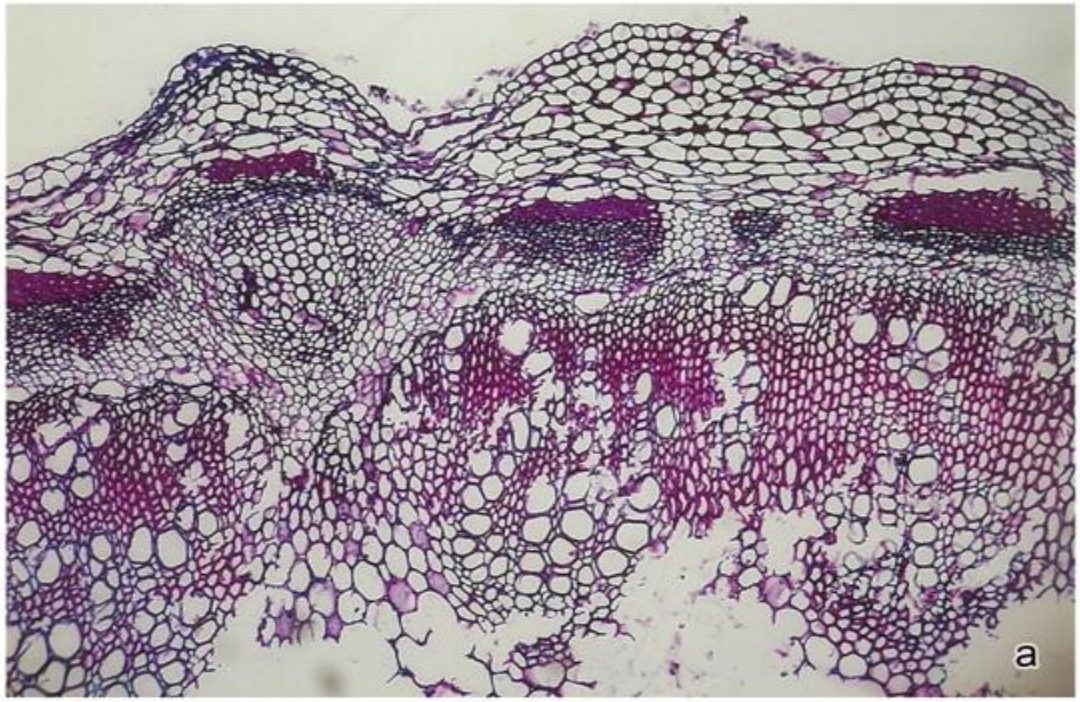


Mature stem:

- In T.S. the mature stem is almost similar to young stem.
- The outermost epidermis is replaced by phellem at places.
- The hypodermis in ridges is characteristically angularly collenchymatous.
- In furrowed areas the chlorenchyma is followed by a narrow cortex.

The xylem is well developed and is continuous and phloem is reduced and suppressed..

- The vascular cambium is present.
- The pith is hollow at the centre



Powder Microscopy:

- Pieces of epidermis of upper epidermis with anomocytic stomata and epidermal cells with straight to curved sides.
- Uniseriate macroform conical hair long, either whole or fragments, numerous with verrucose surface.
- Multiseriate spinulose hairs broken, many.
- Pieces of epidermis of lower surface with wavy to sinuate sides and stomata anomocytic and tetracytic .
- Pieces of leaf mesophyll with secretory canals attached to v. bundle.
- Pieces of vessels with scalariform and bordered pits and helical thickenings.
- Secretory canals with brownish contents.
- Groups of broken tracheary tissues with vessels or fibers.
- Pieces of cortical tissue with attached sclerenchymatous tissue.
- Pollen grains with spinescent surface.

Organoleptic characters:

Colour	–	Light green;	Taste	–	Not characteristic;
Odour	–	Pungent;	Touch		-Slightly coarse.

PHYSICO-CHEMICAL STUDIES of *Erigeron canadensis*

S.No	Parameters	Quantitative values
1	Moisture content (L.O.D. at 105° C)	9.20 % w/w
2	Total ash	9.87 % w/w
3	Acid insoluble ash	1.76 % w/w
4	Water soluble ash	3.00 % w/w

PHYSICO-CHEMICAL STUDIES of *Erigeron canadensis*

S.No	Parameters	Quantitative values
5	Extractive values in	
	a. Toluene	2.50 % w/w
	b. Chloroform	3.93 % w/w
	c. Methanol	11.18 % w/w
	d. Ethanol	9.00 % w/w
	e. Purified water	19.85 % w/w

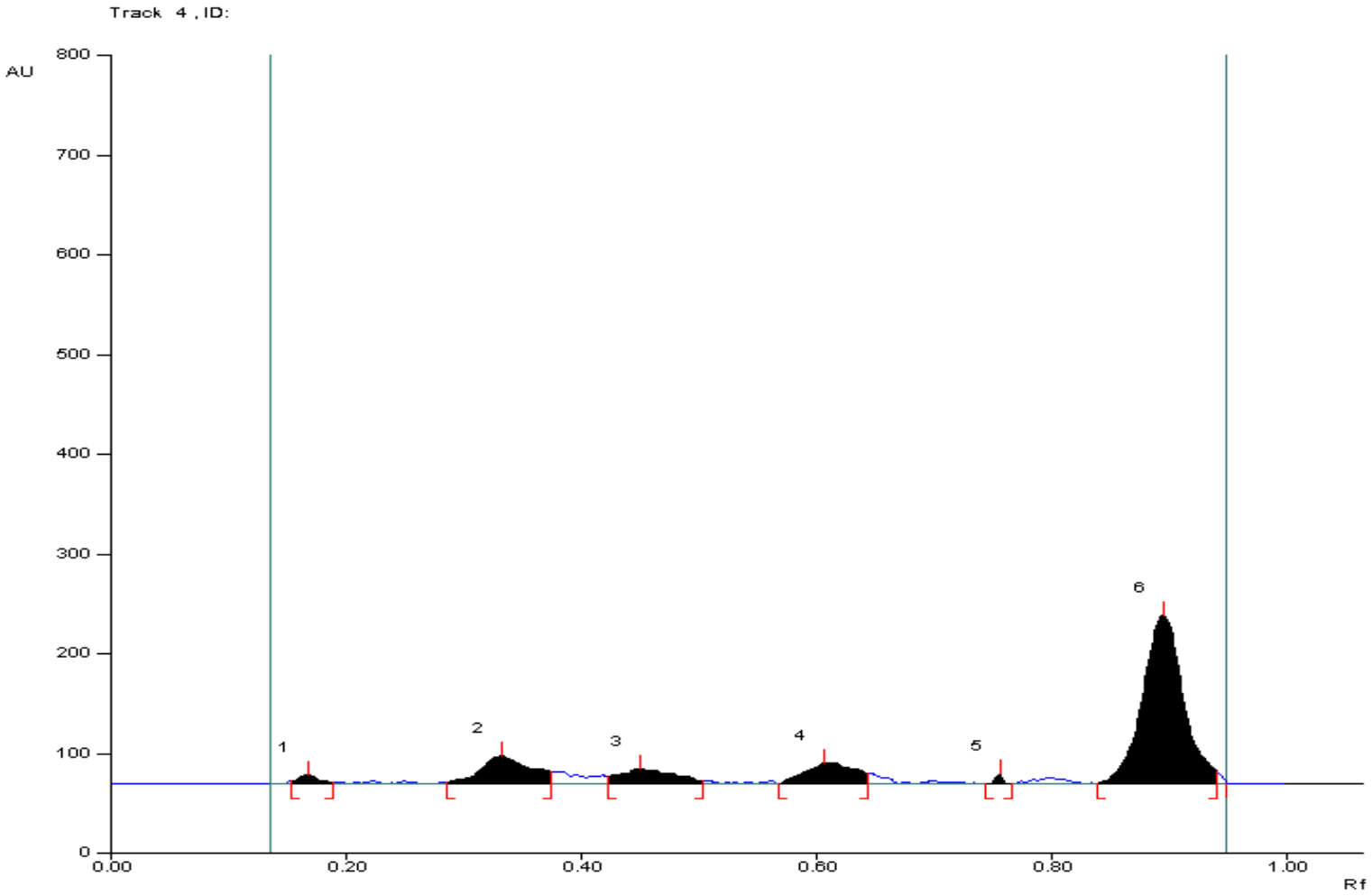
Formulation of mother tincture

Alcohol	65% v/v(As per HPUS,1993)
Drug strength	1/10
Percolation technique was used.	
Preparation :	
Erigeron canadensis in coarse powder	100 g
Strong alcohol	677 mL
Purified water	350 mL
To make one thousand millilitres of the mother tincture	

Standardisation of Mother Tincture

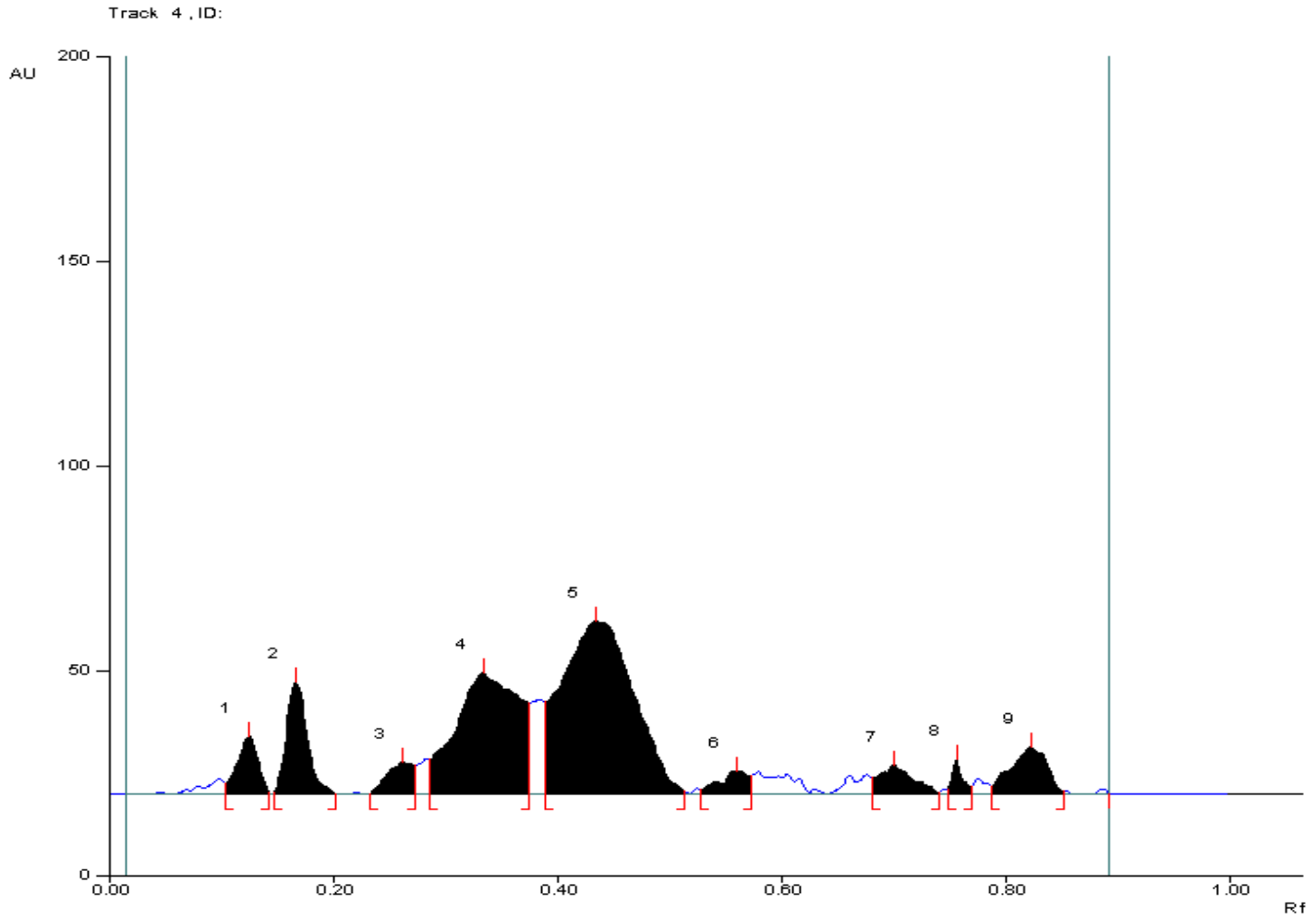
S.No.	Parameters	Observations
1	Organoleptic profile.	
	a. Appearance	Clear, non-viscous , transparent and foaming on shaking
	b. Colour	Yellowish green
	c. Odour	Fruity and aromatic
2	Sediments	Absent
3	Wt. per mL	0.88 g
4	Total solids	1.36 % w/v
5	Alcohol content	63-64 % v/v
6	pH 25±2 °C	5.0-6.0
7	λ max (absorbance)	233 and 278 nm

HPTLC Fingerprinting of *Erigeron canadensis* mother tincture



HPTLC densitogram of *E.canadensis* Φ scanned at 254 nm in chloroform: methanol(9:1 v/v)

HPTLC Video image of *E.candensis* at 254 nm
in chloroform: methanol(9:1 v/v)



HPTLC densitogram of *E.canadensis* at 366 nm in chloroform: methanol(9:1 v/v)

HPTLC Video image of *E.canadensis* at 366 nm in chloroform: methanol(9:1 v/v)

HPTLC Results:

- Under UV 254 nm, 6 spots appeared, out of which, one possess maximum composition with R_f at 0.89.

- Under UV 366 nm, 9 spots appeared, out of which, 2 possess maximum composition with R_f at 0.33 and 0.43.

Thank you